Expo#ed aggregate finishes generally fall into three classes: 1. Portland cement bedding coats into which rock or other aggregate or decorative chips are thrown or blown. 2. Acrylic, epoxy or other polymeric matrices into which aggregate is embedded and 3. Epoxy or other polymeric or emulsion binders mixed with finely ground chips or granular aggregates which are spread on the wall in one operation without a separate bedding coat.

Portland cement bedding coats may be modified with hardeners, stabilizers or other admixtures or additives to give greater grip on the embedded chips. Chips may be thrown with a paddle or scoop or may be blown by a rock gun. To insure firm embedment of aggregate the rock should be tamped with a large true-plane float. Tamping is also done when a texture pattern is desired in which the rock is relatively flush with the matrix. After the bedding coat sets, a non-discoloring sealer should be applied to inhibit climatic damage to the stone, oxidizing or other deterioration from airborne contaminants or weathering, fading of chip or matrix colors, and absorption of moisture.

The seeding of aggregates into epoxy or polymeric matrices is done the same as for Portland cement bedding coats, except that, because of higher holding strengths the epoxy matrix need not be as thick. Since a smaller surface of the rock need be embedded for adequate anchor, more of the rock may be exposed resulting in a shaggier texture. The epoxy matrix may be reactive to certain of the sun’s rays, so sand of compatible color may optionally be placed on the epoxy on the surface spaces between aggregate chips.

Trowel Mixed

Premixed granular surfacing is trowel-applied with the aggregate already combined with the binder. These exposed aggregate finishes are particularly much-used in the eastern U.S. and in Europe.

Marblecrete, the coined name designating a portland cement bedding coat and exposed aggregate finish, is made with rock such as marble, granite quartz, onyx or naturally smooth pebbles, size and color graded. Other aggregates such as ground glass, sea shells, or almost any other non reactive, low purosity, hard material may be used. The matrix or bedding coat may be a job or factory mix and should attain higher strengths than conventional stucco.

Marblecrete may be used as accent panels, in mosaic patterns outlined by metal or plastic trim, or as surfacing for the total building.

Newspaper and magazine construction section editors frequently mistake good marblecrete jobs for “exposed aggregate concrete”. One such was the recently completed Pasadena Presbyterian Church an architecturally controversial contemporary Gothic sanctuary with its century-old congregation. Architect John Gougeon, in achieving a feeling of mass and durability, used to full advantage the flexibility and economy of structural steel framing and light gauge steel studs from Angeles Metals to form the innumerable graceful planes, angles and curves.

Plastering contractor Pete Berger and lather Jim Rutherford, both members of iaWCC/GDCI, working closely with the architect, ironed out construction detail problems which were not anticipated in the early design stages.

Control joints on all the skin surfaces, flat and curved, are spaced at 6' horizontal intervals to show the human scale of the space design chapel.

Embedded Pebbles

Pebbles were embedded in a modified portland cement matrix without added coloring. Because of their smooth, round contour, pebbles are the most difficult aggregate to embed-particularly on overhead sloping or horizontal surfaces.
On soffits rock had to be hand thrown by paddle to maintain the same density of aggregate dispersal as on the walls.

On interior surfaces the aggregate was tamped almost flush with a large metal-lath-wrapped trowel to avoid bringing moisture and fat to the surface of the bedding coat which would develop a cement shine or glaze.

Following tamping the marblecrete was given a spray coating of glaze to heighten aggregate color, waterproof and protect rock and binder from the deteriorating effects of smog and dust.

Even though screened or washed at the quarry or crusher, aggregate, delivered in bulk or sacked, is usually screened or preferably washed at the site.

Dust in the aggregate may create clouds or mottling in the panel as well as hazardous working conditions especially in rock gun applications.

A small concrete mixer is ideal for washing rock which may then be dumped into screens to dry or placed in piles to drain. Wet aggregate should not be seeded into bedding coat as a water film on aggregate particles may act as a bond breaker.

The size of aggregate particles may range for 1/8” “ought or O” to hand placed jumbo rock which may weigh one to two pounds. Polished river bottom pebbles, “Apache tears” in a wide variety of colors also create beautifully patterned and lustered effects.

Systems Approach

Using a systems approach to factory exposed aggregate panel fabrication, Design Cast West, subsidiary of the E. F. Brady Plastering Co. of La Mesa, California, brings a new dimension to exposed aggregate finishes. One of the most distinguishing characteristics of their volume approach to decorator assemblies and finishes is not so much the factory-made modular production method, but more distinctly the early promotional and design inputs made to acquaint architects and engineers with the novel applications and savings in structural design.

Working closely with designers at preliminary plan stages, basic economy engineering and design decisions can be made early in the game. Timing of the presentation is all-important to avoid later changes, redesign and recalculations.

Factory-built panels adapt to many textures, colors and wall shapes.

Working from shop drawings and scaled mock-ups, work on the panel construction can begin as the steel skeleton of a building comes out of the hole on the jobsite.

Cement asbestos board, 1/4” or 3/8” is screw attached to welded steel stud sections, lying flat in jigs. After attachments, connections and trim are installed, the panels are flooded with a set-regulated epoxy base matrix—usually about 1/8” thick for 3/8” to 5/8” aggregate. The aggregate, as selected by the owner or designer, is loaded by hand on the face of the panels. Then a sand load is placed on the interstitial or exposed epoxy so no matrix is bared to the sunlight.

After the matrix sets, loose sand and rock are blown or tipped off. Some installations require both sides of panels and both vertical ends to be coated. In these cases sides are done in sequence with no cold joint effect.

Shop and installation techniques and skills are still being honed down as production progresses. Panels are cushioned, stacked and trucked to the jobsite and are light enough to be positioned as the building wall structure and skin by small hoist or light crane. Panels are attached to structural members by bolts and self tapping screws and a minimum of welding to insulate the panels as much as possible from structural stresses.

The day of exposed aggregate finishes is here. Its use by such heavyweight architects as those listed above attest to that. Somehow, over the past decade or so we haven’t told our story too well. Or at least it hasn’t been heard too well. But now landmark jobs are in evidence in many parts of the country, and time is telling their story.

Marblecrete exterior of Pasadena, California Presbyterian Church done by Berger Bros.

January, 1977

San Diego contractor, E. F. Brady, right, and son Ron, field superintendent of varied Brady enterprises, check rock embedment of factory fabricated exposed aggregate panels.