Another View

Synthetic Stucco: A Revolution in a Traditional Material

by Jan Nogradi

[The following rebuttal was written in response to the special report, "Troubles with Synthetic Stucco" published in the June 1988 issue of New England Builder. *Given the complexity of the topic, we agreed to publish this response in full.]*

In his June 1988 *NEB* article, Richard Piper, a staff architect with the Massachuserts Executive Office of Communities and Development, addressed the EIFS Exterior Insulation and Finish Systems Industry in general. I am sure the industry as a whole represented by its association, EIMA, will respond. However, we believe STO Industries, Inc., is in an exceptional position to analyze Mr. Piper's article because we developed the synthetic resin-based plaster in the 1950s. In the early 1960s, we launched the STO Full Thermal System, consisting of expanded polystyrene and synthetic resin-based plasters, today called synthetic stucco. Additionally, STO Industries has in its product line various adhesively and mechanically fastened exterior insulation and finish systems, and "the STO Toughwall System," a so-called "hardcoat system."

We certainly understand the Massachusetts Executive Office's concerns regarding different EIFS Applications. However, if they investigated the system prior to their specification and installation, they could have avoided most of the problems they have been faced with lately.

Terminology. We reject the terminology of softcoat vs. hardcoat, because it is technically incorrect. Instead, we refer to EIMA's terminology: polymer-based, polymer-modified, and cementitious-based systems. What is generally called a softcoat system is the polymer-based (PB) system. The history of the PB systems has proved that the exterior gypsum sheathing can serve as a proper substrate. There are thousands of applications of ten-plus years performing well without any major problems. We do not question the higher quality of concrete block walls vs. exterior gypsum sheathing; it is to be expected based on the price difference of the two substrates.

Adhesive method. As far as the method of adhesive attachment is concerned, STO Industries has never specified the ribbon-and-dab adhesive method, because we do not believe it can be installed with consistent quality. We specify notched trowels of various sizes, depending on the adhesive to be used, which will control the size of the ribbons applied over the entire backside of the expanded polystyrene (EPS) board.

Exterior gypsum sheathing as a substrate. The U.S. Gypsum Company – the manufacturer of exterior gypsum sheathing – has not rejected the use of adhesively applied exterior insulation and finish systems. They recommend the use of additional mechanical fasteners, but have accepted the fact that thousands of buildings were coated with EIFS systems adhesively without any mechanical fasteners. They are more than willing to sell their product at a profit for this type of application. What they reject is the manufacturer's responsibility for a product sold for a particular purpose.

Only one of the projects Mr. Piper refers to had been coated with STO Products. It had some application-related problems, but the project was recoated at no cost to the owner, and has been performing well to the best of our knowledge. We have offered to cooperate in good faith with the Massachusetts Executive Office to help resolve any pending questions.

Based on extensive experience with our materials, we can state that if our specifications are followed, the system will not delaminate, and the exterior gypsum sheathing will not deteriorate over a large area of the project in a short period of time. If water penetration occurs, the system and the exterior gypsum sheathing may suffer in a rather limited area. If corrective measures are taken, the spread of the damage can be stopped at a rather limited cost. If no corrective measures are taken, the problem will spread, as with any other exterior skin, and after many years it may develop to the point where replacement provides the only proper solution.

The STO Full Thermal System requires little maintenance. If water penetrates along a crack or failed sealant joints, it is highly recommended to fix those areas, avoiding any future damage. The STO Full Thermal System acts as a weather and moisture barrier, and as long as it is not cracked, moisture cannot penetrate through the finish and the fiberglass-mesh-reinforced ground coat. We have investigated many projects in the past and found that leaking windows, improper flashing details, and wrong sealant material were sources of moisture entry more often than cracked STO system.

If the owner of a project is willing to spend more for higher quality, we recommend specifying a cementitious substrate board instead of exterior gypsum sheathing. Such a board will be available from STO Industries under the brand name STO Sheathing.

Adhesives. We recommend that a 100-percent-polymer based adhesive be used to laminate STO EPS Board onto exterior gypsum sheathing. The STO Dispersion Adhesive has excellent adhesion properties and does not require any added cement. If water penetration occurs, the dispersion adhesive absorbs almost no water, protecting the gypsum sheathing from moisture influence. Again, STO industries has never

(continued on next page)

Letters

Tyvek Perm Rating Higher

To the Editor:

I would like to comment on Mr. Wilson's article regarding DuPont's Tyvek Housewrap that was in your June 1988 issue. Mr Wilson was incorrect concerning some of his comparisons of Tyvek versus competitive air barriers. The greatest error exists in his statement that "It [Typar] has a much higher perm rating than Tyvek." Nothing could be further from the truth. Typar's literature lists their moisture vapor transmission at 130 grams per square meter/over 24 hours. Our literature states Tyvek has a moisture vapor transmission of 51.3 grams per 100 square inches/over 24 hours. Although both pieces of literature base the moisture vapor transmission rate on the ASTM E-96 (procedure B) test method, the units of measure are different. If you convert our value into grams per square meter/over 24 hours, you will find that those units yield a value of 795, over 6 times the moisture vapor transmission of Typar! Mr. Wilson's statement has created a serious misconception in the trade that I trust you will correct to the best of your ability.

Mark Vergnano
Eastern Regional Mgr./Tyvek
Wilmington, Del.

Our apologies for misstating Tyvek's perm rating. Our error stemmed from the fact that some manufacturers report their data in metric perms, some use American perms, and some fail to state which they are using (see "More on Confusing Wrap Data," NEB *8188, p. 6). We'll continue to do our best to get accurate information into the hands of builders. And we hope manufacturers will do their part by publishing and distributing clear and accurate product information.*

– Editor

Take Load Off Kneewalls

To the Editor:

In the April 1988 "Case in Point" column on balloon framing, the kneewall will still experience stress and may eventually bow over time. One solution I've used is to install an extremely heavy-duty structural ridge beam, length permitting, capable of carrying the roof load.

Chris Gabiou
Wallace, Idaho

Glazing Eyes Closed

To the Editor:

More on reglazing windows: I'm glad to see that you are providing information on this once common chore. If you work on older buildings, you run into many fine wood windows which should be saved. However, I would like to offer a word of caution. I used to soften old glazing compound with a torch, until I found myself in the emergency room having glass removed from my eye. Of course, I've since learned to glaze with my eyes closed, but I do use goggles for this part of the job.

Also, glazing and paint can be easily softened with an electric device that looks like an iron and is actually built to do the job (check with your paint supplier). I'm sure the local fire officials will be much happier if we leave the heat guns, propane torches, and other incendiary devices at home.

Jerry Hiam
Sherborn, Mass.

Baffled Over Back Issues

To the Editor:

My husband loves *NEB* but back issues are hard to store on a shelf. He likes to have them accessible. Any ideas?

Elizabeth Wills
Liverpool, N.Y.

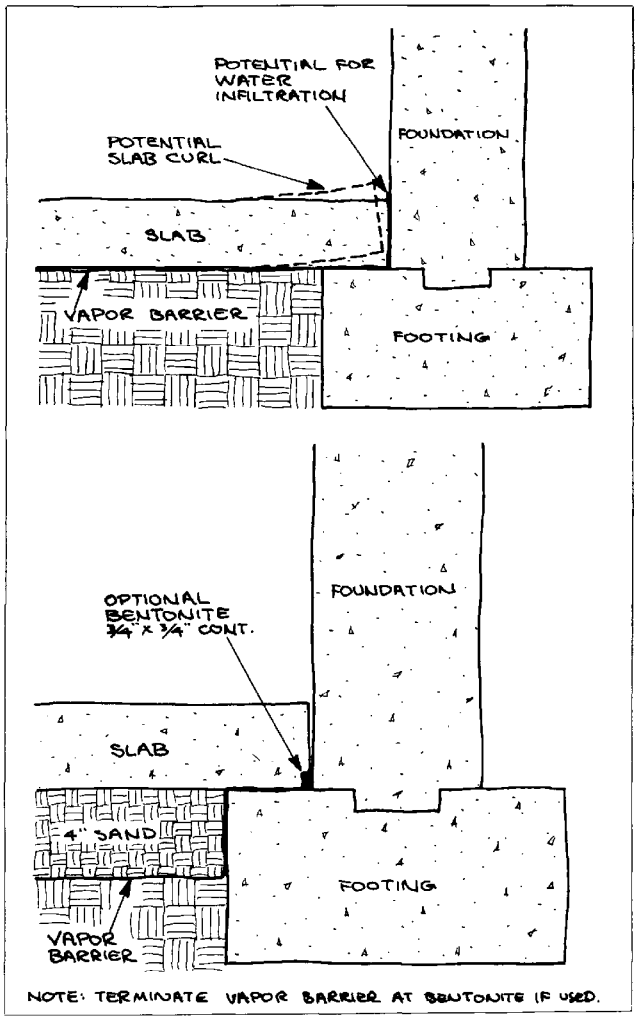
We receive many requests similar to yours and have tossed around several ideas. Our best suggestion at this time is to store your New England Builders the way we do—in inexpensive magazine boxes available in any office-supply store. Fold the magazine over once and place it in the box as shown in the photo. Six or more issues fit comfortably in one box. If anyone has a better idea, please let us know. –Editor.

Help for Curling Slabs

To the Editor:

In the March, 1988 issue of *New England Builder,* William Lotz wrote a good article called "Avoiding Classic Cracks." Although I have nothing to add regarding the control of cracks, I would like to add to the detailing of the vapor barrier under the slab. I am an assistant building structural engineer for New York State and our experience has been that slabs poured directly on a vapor barrier may be subject to "curling" at the edges (see illustration). The problem is that the slab dries out and shrinks more rapidly at the top than on the bottom, which remains moist for a longer period of time reducing shrinkage.

To compensate for the difference in shrinkage, our agency (and myself



Curling Slabs

when contracting) specify 4 inches of sand to be placed between the vapor barrier and the slab. Sand is easily leveled and compacted (sprinkle water on the sand if it is too dry). The sand helps to absorb moisture from the concrete and if the slab is properly cured, with either curing compound or poly, the vapor barrier will retain the moisture in the sand and slab.

Another item I would like to mention is the use of bentonite as a water stop. Bentonite swells when it comes in contact with moisture and when placed as shown, will stop water from percolating up between the slab and foundation. The shrinkage of a basement slab may be enough that you could slide a piece of paper (or vapor barrier) between the cured slab and the foundation wall. Bentonite will fill the gap left by the shrinkage. To install, just tack the bentonite in place with cut nails around the perimeter of the foundation, prior to pouring the slab.

These details involve added time and materials, all of which will be unappreciated unless problems arise. But the additional $500 to $1,000 in cost may be viewed as insurance against potential complaints in an area where problems are difficult to rectify.

William B. Held
New York State Division of Design
Albany, N.Y.

Keep 'em coming... We welcome letters, but they must be signed and include the writer's address. *New England Builder* reserves the right to edit for grammar, length, and clarity. Mail letters to *NEB,* P.O. Box 5059, Burlington, VT 05402.

Stucco

specified the ribbon-and-dab method to adhere EPS board to the substrate. Our specification has always required uniformly applied ribbons by STO Notch Trowel on the backside of the EPS insulation boards.

Ground coats. Thousands of successfully applied STO projects have been proving that the STO system is crack-resistant. STO offers a highly flexible weather- and moisture-resistant 100-percent synthetic resin-based fiberglass-reinforced ground coat, the STO RFP. The alternate ground coat of STO is the STO BTS-B with only 20-percent cement mixed into the product in the factory, supplied in bags. Both ground coats come ready to use. No cement or other additives have to be mixed in at the job site other than small amounts of clean water, providing the necessary quality control in the field. We reject offering a ground coat with cement added 1:1 at the job site, because we believe that these ground coats are more apt to crack, and efflorescence can occur.

We have long specified diagonal mesh reinforcing at window and door corners, and requested butting the EPS boards right, or filling any gaps between the boards with EPS slivers or spray foam.

We specify the thickness of the ground coat to be approximately $^1/_{16}$ inch and the STO Reinforcing Mesh should be properly imbedded. This is easily done, and even easier to control by inspecting the ground-coat application. If the mesh overlaps and the mesh itself are not visible, the specified thickness of the ground coat is achieved.

Our organization initiated the exterior insulation and finish systems in Europe in the early 1960s. STO has sold the same products, specified in the same way, in North America as in Europe.

We recommend a ground coat thickness of approximately 2mm in Europe, and to express it in a customary unit in this country, we chose approximately $^1/_{16}$ inch. Additionally, we specify that the STO reinforcing mesh has to be fully imbedded, which results, in a similar thickness of the ground coat as used in Europe. If our products are applied on a project according to STO specifications, there will not be any major differences between products in Europe and in North America. We cannot recommend two coats of ground coat because one good coat always performs better than two thin coats applied one over the other. While applying one good coat with STO Reinforcing Mesh imbedded, the mesh acts as a gauging factor and a smooth coat is easily applied. Two-coat application requires exceptional skills and often an uneven, rather rough ground coat is the result.

V-Joints. V-joints offer the design professional a highly appreciated means to break up larger areas, achieving architectural accents. It has been used successfully in all parts of the country. STO Industries provides a specially designed soft reinforcing mesh, the STO Detail Mesh, which can be easily imbedded into the ground coat in a v-joint with a v-joint trowel.

Sealant joints. Problems with sealant joints have existed in all industries using sealant material. The most tragic occurrence of sealant failure happened to the booster rocket of the space shuttle. STO Industries realized many years ago the difficulties associated with sealant applications. Therefore, we developed a sealant replacement to be used around windows, doors, and other openings instead of sealant joints. The STO Seal, a precompressed acrylic-impregnated polyurethane foam, is installed between the window frame and the polystyrene insulation board. By virtue of being precompressed, the foam seals the system automatically and the STO ground coat and finish coat can even be applied over it, achieving a rather pleasing architectural appearance. We offer the same STO Seal product to be used at penetrations going through the STO Full Thermal System. Over a million feet of STO Seal installed prove the superiority of the STO solution to the sealant joint alternative.

Casing beads. Many European systems like the systems sold by the STO Organization, do not require the use of any casing beads or similar accessories. While the sealant may adhere better to a casing bead, the casing bead represents a foreign material within the system, resulting in adhesion problems between the foam, various coats, and the bead. Additionally, the thermal expansion and contraction of casing beads and accessories that are substantially different from the system components, often cause cracking beside the sealant joint. We certainly support the idea of designing a building with as few sealant joints as possible. Each sealant joint breaks the system, representing a potential leak. This is true with any kind of building envelope.

Technical service. STO Industries has a rather sizable technical department consisting of field personnel (technical advisors) and in-house technical service. We have a training department giving applicator seminars and technical presentations to architects, general contractors, and other interested parties. Almost 30 years of experience with exterior insulation and finish systems shows that the installation of the STO Full Thermal System is rather easy. There certainly are important steps to follow; however, an average applicator can do it successfully. The more the involved parties (general contractor, architect, other trades) know about the exterior insulation and finish systems, the better the quality control of the system.

Independent testing. The STO Full Thermal System has been thoroughly and independently tested. When our system passed 4,000 hours of accelerated weathering, according to the ASTM G-23 Method, we were not surprised. Real life has been testing the STO Full Thermal System for 20-plus years. A list of independent tests including long-term performance tests is available from STO Industries and their distributors.

Flexible vs. rigid system. STO Industries has polymer-based and polymer-modified-based systems in its product line as well. We believe that each system has its advantages. We do not believe that one system can be conscientiously promoted over the other under all circumstances. For instance, while flexible systems do not require any control joints, the rigid system, like conventional stucco, does. Each control joint represents a potential water leakage. Even if the water does not penetrate the interior of a building, freeze-thaw cycling will damage even the thick coat system.

On the other hand, the rigid system has a better puncture resistance; using a dart, the rigid system will outperform the flexible system. However, this is not equal to better impact resistance. Using a 2-inch diameter steel ball and testing both systems according to the ASTM D-1037 method, the impact resistance of the flexible system will be substantially higher than the rigid system. The explanation is simple; a rigid system shatters while a flexible system flexes.

Because each building is different, each case should be investigated individually. We recommend the system that best meets the requirements of the design professionals and the owner. ■

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