Back to Basics: Panelizing with Exterior Insulation Finish Systems

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This is the sixth article in the Foundation's series on lightweight steel framing systems. Future article will discuss estimating, joists in floor, ceiling and roofing systems as well as an update on the revised AISI design manual.

Back to Basics:

As industry professionals, we realize that conventionally panelized exterior insulation and finish systems are a highly effective means of meeting architect and owner needs for aesthetically pleasing, thermally efficient buildings. Additionally, EIFS panels effectively address ever-present concerns for time and money.

It would be of great benefit to our industry if all architects and owners were aware of these systems and their inherent advantages. Unfortunately, this is not the case as evidenced by the fact that EIFS construction in 1988 accounted for less than 4% of exterior wall cladding, and panelized EIFS but a small fraction of that percentage. Brick, glass, and pre-cast concrete accounted for over 50% of the wall market in that same year.

As an industry, we have room for improvement. We can each start by furthering EIFS awareness utilizing our respective skills to maximum advantage within the industry. As an architect, I am keenly aware of the lack of product knowledge that exists with EIFS and panelization among future designers, specifiers, and even building owners. The purpose of this article is to provide a back to basics approach to many aspects pertaining to EIFS panelization.

The System:

Conventional EIFS panelization provides a systems approach to exterior wall cladding. EIFS panelization is the combining of a structural and non-structural system in a manner that furthers the performance characteristics of each. The structural portion of the system utilizes structural steel studs as a means of support for the non-structural portion of the system, a four component exterior insulation and finish system. The systems are joined by means of a compatible sheathing which is screw attached to framing members prior to mechanical or adhesive attachment of the EIFS.

Panelization Advantages:

1. Versatility

   EIFS panels can be designed and detailed to meet a wide range of design and engineering criteria. This inherent flexibility of EIFS panelization is due to the many sizes, types, and gauges of structural steel studs that are available from manufacturers. In addition to this structural versatility, color, shape, texture and material, are all variables afforded by EIFS systems currently in the marketplace.

2. Quality Control

   The number of skilled workers in the construction industry is in a state of steady decline. Panelization provides the ability to closely and more easily supervise both labor and material used in an EIFS panel system. These factors and the elimination of job-site environmental factors result in improved wall quality.

3. Scheduling Control:

   Prefabricated EIFS panels can be manufactured to exacting tolerances well in advance of completing build-
ing framework. This greatly reduces the amount of time required to enclose the building envelope. This time savings is particularly evident when contrasting the amount of time required to stick build a similar project from conventional scaffolding.

4. Cost Control:

Depending upon configuration, EIFS panels are less expensive and weigh less than traditional panel systems utilizing precast concrete, glass, or masonry. The lighter weight can significantly reduce structural framing and foundation requirements. These factors combined with added levels of thermal efficiency that are available with EIFS panels make them a value conscious solution to exterior cladding needs.

5. Adaptability:

EIFS panels are compatible with all forms of commercial construction including steel framing, pre-engineered metal building systems, cast-in-place, post tensioned or precast concrete.

Panelization Concepts:

There are several conceptional methods of EIFS panelization, including the three below. It is important to select a method best suited to individual project requirements, for many design or cost considerations are affected by decisions made in these initial planning stages.

1. INFILL CONSTRUCTION

Infill panelization involves the positioning of panelized elements between members (i.e. floor slabs, columns or beams.) Infill panelization is not generally advised due to difficulties that can be anticipated with building tolerances and less efficient erection procedures.

2. LOAD BEARING CONSTRUCTION

Load bearing systems transfer gravity or dead loads of the panels from uppermost panels to subsequent lower panels and ultimately to the building foundation. Typically horizontal forces imposed on the system are transferred to the structure at each floor level.

3. CURTAIN WALL CONSTRUCTION

Curtain wall construction positions the entire EIF panel system beyond the exterior face of supporting structural elements which include floor slabs, columns or beams. This enables the system to be quickly installed irrespective of minor variations in structural tolerance. Curtain wall is the most favored method of EIFS panelization.

Editor’s Note: This is Part I of a two-part article. Part II will be in the July issue of this magazine.

ABOUT THE AUTHOR

An architect by profession, Stan Mason’s involvement with the design and engineering of panelization utilizing lightweight steel framing goes back many years. An industry consultant, he has been a featured speaker at Foundation-sponsored workshops at the American Collegiate Schools of Architecture (ASCA) Construction Materials & Technology Institute. Stan is Manager of Prefabrication Services for Dryvit Systems, Inc.