Panelization of Light Gage Steel Framing--From Start to Finish

By Mark E. Nabity, CDT

Editor’s Note: This is Part One of a two-part article.

An analysis of today’s construction market indicates, now more than ever, the need for highly engineered quality systems that are quick yet economical to install. One solution gaining momentum into the 1990s is the use of prefabricated light gage steel framed panels.

Why? The advantages are many:

1. Panels prefabricated off-site in a controlled environment are unaffected by inclement weather. Construction proceeds without uncontrollable delays.

2. A good manufacturing environment coupled with increased and efficient supervision provide high levels of quality and productivity.

3. Panel fabrication occurs while foundation and structural systems are being constructed on-site. Construction schedules can be compressed, reflecting this parallel in activities.

4. On-site erection of prefabricated light gage steel framed panels is among the most efficient construction systems in terms of square footage erected per man.

5. Scaffolding systems and jobsite clutter are eliminated allowing increased project access to other trades.

6. Off-site panel fabrication can often be performed at reduced labor rates. This is particularly true when the project is located in a high rate labor market.

7. Prefabricated light gage steel framed panels can serve as the structural frame for a wide variety of interior and exterior finishes (i.e., gypsum drywall, plaster, stucco, EIFS, stone, brick, ceramic tile, metal panels, etc.).

While some subcontractors get involved in panelization on a per job basis, a few have shifted from subcontracting to manufacturing. They have made a commitment to the business, backed by marketing plans, full-time facilities, and a staff of trained professionals. With this commitment comes the need for a constant volume of work to support the increased financial burden.

The key to any panelized project is extensive pre-planning.

Ideally, the panelization process starts in the early stages of design development. Meetings with the owner, architect and general contractor/construction manager help to determine whether or not a project is suited to prefabrication. If so, getting involved on the front end allows the maximum interface for the other structural elements for maximum economy. Regardless of what construction delivery system is used, the decision to use panels versus stick-framed methods should be “cast in stone” so that the contract documents reflect proper engineering and detailing. This contributes to clear and concise bidding.

While this is the idealistic approach the trend is for the design professional to shift the responsibility of engineering and detailing to the panel manufacturer. Many contract documents provide performance criteria and aesthetic concepts only, so that the panel manufacturer has some flexibility to engineer and design the most efficient system.

Because of this responsibility, it is important that a panel manufacturer have either a competent structural engineer on staff or a strong working relationship with an outside consultant. In recent years, several engineering firms have been established around the U.S. which specialize in light gage steel framing design. Shortcutting this process can lead to disastrous results.

The key to any panelized project is extensive pre-planning. Be exacting and have a backup for everything.

The balance of this article will cover specific concerns, from start to finish, which must be accounted for in bidding, fabricating, loading, transporting and erecting prefabricated light gage steel framed panels.

1. Terms of Payment

Make sure the architect, owner and lending institution all will allow payment for front-end engineering, shop drawings, materials stored off-site and fabricated panels stored off-site or in transit. Obtain specific instructions regarding required documentation, insurance and inspection trips required.
to certify an Application for Payment.

(2). Product Liability

Determine where your liability for completed panels ends. For example, who is responsible for panels damaged after they have been erected on a building? Who is responsible for damage incurred to panels stored on-site prior to erection?

(3). Insurance Coverage

Because panel manufacturing is different from subcontracting, make sure you analyze all of your insurance needs. Do you have sufficient contents coverage at your manufacturing facility to cover the materials and fabricated panels? Who is insuring the panels while they are in transit from your plant to the jobsite? What about panels stored on-site or at a remote off-site location?

(4). Structural Engineering

Determine if you are responsible for providing any structural calculations. Avoid trying to replace the Engineer of Record. Provide calculations (stamped or unstamped?) for the project engineer’s review and approval.

(5). Shop Drawings

Prepare complete and thorough shop drawings to be submitted for approval to the architect/engineer, including:

--Type and designation of members.
--Accessory items.
-Connection details complete with weld and/or mechanical fastener information.
- Erection diagrams (elevations and plan views).
--Size, gage and spacing of framing members.
--Relationship of framing to surrounding finish and structural members.

Some projects require all shop drawings to be stamped and sealed prior to submittal.

Next month: Embeds and more.

About the Author

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