Editor’s Note: This is Part Two of a two-part article. Part One appeared on page 28 of the October issue.

The following are specific concerns (continued from Part One) which must be accounted for in bidding, fabricating, loading, transporting and erecting pre-fabricated light gage steel framed panels.

(6). Embeds and Miscellaneous Connection Steel
Concrete structures generally require the inclusion of steel embeds and miscellaneous steel clips and angles for attachment of the panels. Typically, the panel manufacturer/erector is responsible for furnishing the embed items for placement by others. Miscellaneous steel angles and clips which attach to the embeds are generally furnished and installed by the manufacturer/erector.

(7). Material Buyout
Provided the project schedule allows it, material quantities should be taken off from approved shop drawings. This practice eliminates costly shortages and/or waste to maximize profits.

(8). Shop Fabrication
Framing Jigs
The framing jig is one of the most important pieces of equipment needed to fabricate light gage steel panels. Your level of involvement in panelization will dictate how elaborate your jig will need to be.

The more permanent jig is usually fabricated with structural angle into two pieces approximately 2'-0" wide x 30'-0" long x 32" high. Continuous guide rails are permanently anchored to the floor at 7'-6" o.c. in approximately 32'-0" lengths. One piece of the fixture is then bolted perpendicular and square to the guide rails while the other one is installed with rollers and locking devices in the guide rails. This allows adjustment for different panel heights. Most jigs of this type are also equipped with pneumatic cylinders which seat the studs tightly into the runner track and facilitate removing a completed panel from the jig. A jig of this type will accommodate panels up to 30'-0" high or up to 30'-0" in width.

Welding Equipment
Welding operations are generally isolated from the finish areas of a fabrication plant because of ventilation requirements, weld flash protection and cleanliness. All panel connections should be welded. I would recommend using 200 ampere Gas Metal-Arc (MIG) welders with...
stant speed wire feeders. These units typically require a 230 or 460 volt, three phase power source.

Wire feeder units should be mounted on a swing arm with a slide rail above the jig to provide optimum access to the entire area. One or two welding units should be installed per jig, depending on jig size and use.

**Welder Certification**

Welders should be certified per the *AWS D1.3-89 Structural Welding Code--Sheet Steel*. Copies of the code are available from the American Welding Society, 550 N.W. LeJeune Rd., P.O. Box 351040, Miami, FL 33135.

**Illumination**

Recommended illumination levels are 80 footcandles in the welding area and 100 footcandles in the finish space. Studies have proven that quality lighting increases production.

**Quality Control**

A tight quality control program is necessary for a panelization operation. Every panel should be checked for overall dimensions, squareness and member spacing while still in the jig. Panels should be re-checked prior to the sheathing installation.

Industry tolerances for completed panels are:

1. Height shall not exceed +/- 1/8 inch in 10 feet.
2. Width shall not exceed +/- 1/8 inch in 10 feet.
3. Squareness -- +/- 3/16 inch within length of panel.
4. Spacing of studs shall not exceed +/- 1/8 inch from the designed spacing, provided the cumulative amount does not exceed the requirement of the finish materials.

All welds should be primed with a zinc-rich primer.

**Safety**

All employees working in the welding areas should wear protective eyewear to prevent eyes damage from the welding process. The welding areas should be completely screened to prevent inadvertent exposure to weld finish.

Moving panels into place is part of the erection sequence.

Provide positive ventilation, air cleaner systems, or respirators as required to handle the fumes created from welding galvanized material.

**Panel Transportation**

Panels should be sized and bid with
Framing jigs are very important in the panel construction process. Transportation requirements in mind. Most panels are transported by truck to the job site. Wide load and excessive height loads will require the purchase of special permits for each state entered during shipment, and travel hours may be restricted. Extreme oversized loads will require single or double escorts. Check with each state’s department of transportation for specific information regarding regulation and permits.

Panels can be loaded flat or vertical, one-by-one, or in unitized bundles. Care should be taken to protect the finished surfaces and securely tie the panels to the trailer. Finished panels should be wrapped to protect them from diesel exhaust and road dirt.

(LO). Panel Erection

Factors affecting panel erection are:

--Field measurements and building survey.
--Connection alignment and installation.
--Crew size.
--Vertical travel of crew and panels.
--Site accessibility.
--Type of connection details.
--Erection sequence (wrap the building floor-by-floor or elevation-by-elevation).
--Leave-out areas (i.e., for buck-hoist or material stocking).
--Trueness of building structure.
--Weather conditions (high winds, rain, and extreme cold).
--Type of crane or hoist.

Crane service can have the greatest impact on erection costs and pro-
Transportation from the plant to the site also requires careful planning.

ductivity. On small to medium height buildings, a dedicated crane for panel erection is desirable, whether furnished by the erector or the general contractor. Be careful when negotiating a tower crane service on a high-rise building to carefully define the hours it will be provided. Often the crane is promised, but the erection is interrupted for concrete hoisting, material stocking, etc.

As you can see, manufacturing panels has become a specialty business, with its own set of challenges and problems. All of the above factors should receive consideration prior to submitting a prefabricated light gage steel framed panel price.

Do not be afraid to work with an established panelization company for your panel requirements. Most have invested a great deal in the business and learned many lessons along the way. Adding panels to your package might provide the impetus that gets you the contract.

About the Author:
Mark E. Nabity is President of Grayhawk, Inc., in Lexington, KY and has been active in the panelization business since 1979.

A member of the Foundation of the Wall and Ceiling Industry Board of Directors, Mr. Nabity served as President of the BlueGrass Chapter of the Construction Specifications Institute (CSI) during 1990-91. He is an active member of AWCI’s Academy Council and serves on the Membership Executive Committee and Technical Subcommittee 5 on Interior/Exterior Steel Framing. He led a task group of Technical Subcommittee 1 on Prefabricated Exterior Wall Assemblies which developed AWCI’s Guide Specifications for Panelization.