



Pre-Engineered Ultra-Span® Trusses— The Contractor's Best Choice



By Tom Valvo, President

This issue of *Steel Notes* is focused on those dedicated construction professionals for whom the concept of an 8 to 5 job is merely a fantasy—the general contractors and sub-contractors who build America's buildings.

The year 2004 was one of incredible challenges for all of us in the construction trade—material

suppliers, fabricators, contractors and building owners alike. The unprecedented escalation of building materials in general, and steel in particular, wreaked havoc with budgets, schedules, and operating margins. Nonetheless,

Aegis, our Ultra-Span fabricator partners, and the contractors they supplied weathered the challenges to face what most experts suggest will be a much more stable 2005.

One of the enduring messages driven home in 2004 was the value of partnering with established, reputable, and experienced suppliers. Aegis' network of authorized steel truss fabricators delivered time after time last year, while many upstarts and "fly-by-nighters" fell by the wayside. At bid day, their numbers might not have always been the cheapest, but if last year

proved anything, the old maxim "you get what you pay for" was proved over and over again. And through it all, pre-fabricated steel trusses continued to prove themselves as the most cost-effective means of framing complex architecturally-appealing roofs with totally non-combustible materials.

Aegis Ultra-Span fabricators provide the broadest array of light gauge steel trusses, connections, accessories, and services. More Ultra-Span fabricators offer turn-key truss and installation packages than any other



pre-fabricated light gauge system. They offer the easiest, most efficient means for general contractors and framing sub-contractors to procure trusses (and installation services) when the specification calls for light gauge.

Within the pages of this issue of *Steel Notes*, you will find an article on how to properly evaluate

light gauge steel truss proposals. I encourage you to read this article carefully and ponder the implications. Properly functioning steel

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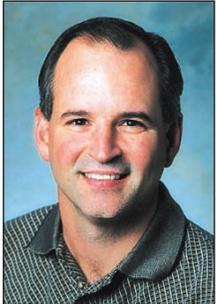
Special points of interest:

- Ultra-Span® *The Contractor's Best Choice*
- *Protecting Yourself and your Computer*
- *The Best Price*
- *Cutting That Measures up*
- *Design Responsibilities for Cold-Formed Steel Truss Projects*
- *Benefits of Embed Plates*



As I see it...

Design Responsibilities for Cold-Formed Steel Truss Projects



By Mike Pellock, PE, Vice
President of Technical Services

Bring up the subject of design responsibilities and it's a good bet a variety of opinions will be presented. At Aegis, we try to view the issues from both sides. One viewpoint is from the truss fabricator and their engineering support, which is Aegis. The other viewpoint is that of the structural engineer of record and the suppliers of other materials. Aegis looks at this with the approach of who is best suited to properly and efficiently design the individual parts of the project in order to create the complete design.

AEGIS AND OUR FABRICATORS APPROACH EACH PROJECT WITH THIS PRESUMPTION:

The owner/architect/engineer of the project will provide adequate information that will define the parameters of the truss design. This information will include the geometry and supports of the roof structure and the loads to be supported by the trusses.

From that information, the truss designer (fabricator) will produce an overall truss layout plan as well as the design of each truss required to create the roof structure geometry. The trusses will be designed to withstand the specified gravity loads, wind loads and any other loads as specified by the building designer. The truss design drawings will report truss reactions and uplifts and locations or indications of required permanent bracing to be used by the building designer as needed.

AISI STANDARD FOR COLD-FORMED STEEL FRAMING – TRUSS DESIGN, 2004 EDITION, SECTION B2, STATES:

The *building designer* shall provide for the following in the design and detailing of the building:

- Horizontal, vertical, or other truss deflection due to design loads
- Truss movement due to temperature changes
- Truss supports and anchorage accommodating horizontal, vertical, or other reactions or displacements
- Permanent truss bracing to resist wind, seismic, and any other lateral forces acting perpendicular to the plane of the truss
- Permanent lateral bracing as specified by the truss designer

There is little discussion of items (a) and (b). Item (c) delegates responsibility for the attachment of the truss to the support to the



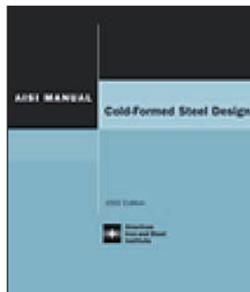
building designer. At Aegis, we realize this requires the building designer to obtain all of the reactions from the truss designer, and be familiar with proprietary systems and associated connectors. So, to assist the building designer, the Aegis fabricator will supply

these details when requested. In some cases it may require interaction between the truss designer and the building designer. There may be bearing conditions that do not provide for an adequate connection and alternatives may be needed. One example would be providing an embed plate for large uplift reactions. (This item is addressed on page 3 of this issue of *Steel Notes*.) The design of the embed plate would be the responsibility of the building designer. The attachment of the truss to the embed plate is the responsibility of the truss designer.

This is a good point to address an important part of the interaction of truss and the truss support. The building designer may be assuming that the top of the support is being braced by the trusses that are attached to it. That is not completely correct. Although it is the trusses that are attached to the support and ultimately that connection of the truss is what braces the support, if the trusses were relied on alone, the force from the support would enter the truss at one end and leave the truss at the other end. That force could be the force from wind applied to a wall or the buckling force in a beam. In any event, neither support would be braced. What really braces the top of the support is the roof or ceiling diaphragm. The connection of the truss to the support is purely a mechanism for getting the force from the wall to the diaphragm. To this end, the building designer needs to specify the force from the support so the truss designer can incorporate it into the design of the connection of the truss to the support.

When addressing item (d) the building designer should understand that trusses are designed only for loads that are applied in the plane of the truss. The truss itself has virtually no capacity to withstand loads applied perpendicular (or at any angle for that matter) to it. Loads at that direction are to be resisted by other bracing elements. The design of those elements is the building designer's responsibility. If those elements need to be in the plenum of the trusses, Aegis can provide their design given the associated loads.

Item (e) is an area with which Aegis can help. Aegis fabricators can provide a bracing layout drawing that will locate and specify all permanent web and chord bracing required for compression members to support the truss design loads. The bracing is a



combination of lateral and diagonal bracing needed to prevent buckling of the compressions members.

Aegis would suggest that the issue of design responsibilities related to trusses in roof systems be simplified to this:

Truss designer:

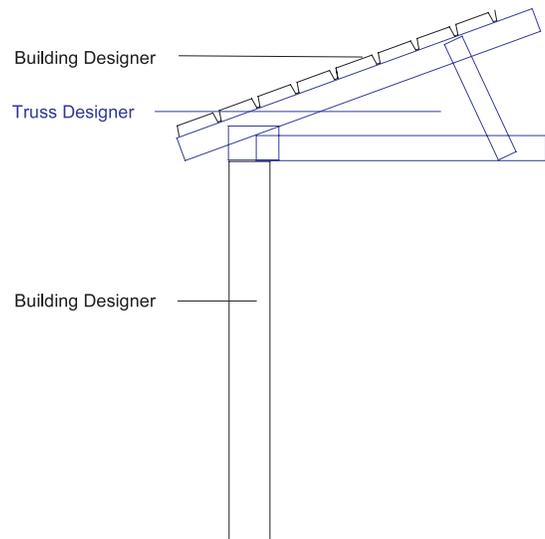
- Layout trusses to create roof geometry
- Design trusses
- Design connections of trusses to girder trusses
- Design connections of trusses to supports
- Design bracing of compression members, except diaphragm

Building designer:

- Specify Loads
- Design walls and bracing
- Design Diaphragm
- Design for loads perpendicular to trusses

EOR / Building designer

- Coordinate entire project



With the truss fabricator and the building designer working closely with the understanding of these responsibilities, complete roof framing packages can be quick and easy.

Ultra-Span® Truss to Bearing Attachments

By Eric Wilund, PE and Travis Keys, PE

Attachment of Ultra-Span® trusses to the structure for wind uplift forces is often very challenging when high uplift forces are present. The solution to this challenge is in the material provided for attachment of the truss. Connections to CMU and concrete for high uplift forces are often complex and involve Epoxy anchor bolts or specially designed shear transfer straps. Both attachments are labor intensive. However these attachment procedures can be avoided if an embed plate is provided. By using an embed plate, the connection can be made with a standard fillet weld. Welding is the cleanest and strongest truss anchorage available.



As a general rule, the building designer should consider specifying embed plates for buildings with roof systems that include design wind speeds exceeding 90 mph, long-span girders (more than 60 ft.), wide truss spacing, exceedingly tall buildings or trusses with long cantilevers and overhangs exposed to wind. Buildings that have one or more of these elements often result in trusses with very high uplift reactions. The most effective attachment of the truss to CMU and concrete walls is best solved by utilizing an embed plate.

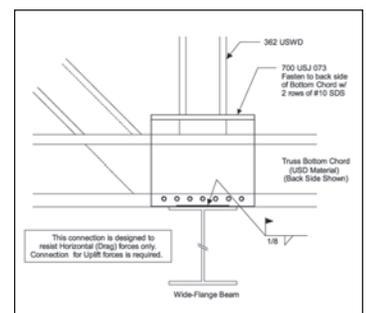
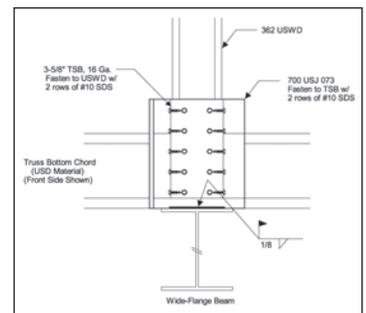
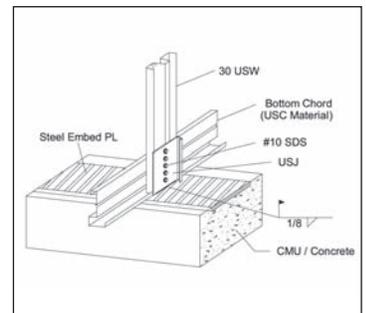
Welded truss uplift connections consist of fastening a USJ (073 mil. J-Plate Connector), or gusset plate to the truss with self-drilling screws, then welding the connector or gusset plate to the bearing as shown on the following details. Details "A" and "B" show examples of a welded connection of a truss to steel bear-

ing. Welded connections of this type can be designed to resist uplifts as high as 10,000 lbs. Appropriate member sizes and mil thicknesses are provided to resist the applied load and minimize the number of screws.

For the connection of high horizontal reactions, the idea is similar. Attach a

USJ or gusset to the truss and weld to the bearing. In this case, added strength in the connection is obtained by attaching the USJ to the back face of the Ultra-Span bottom chord. Detail C is an example of this type of connection.

Welding is an ideal method to connect for high uplift and horizontal reactions. When CMU and concrete are used, engineers and architects should understand that embed plates should be provided where high uplift reactions are a possibility. In many cases, it is the only way to make a satisfactory connection.



What's in a Number?



By David Boyd, Marketing Manager

Many of us understand that in consumer retail, things are not always as they seem. That 0% interest rate sounds great at first. However, two months later when you are hit with huge finance charges, you read the fine print only to find out that the 0%

is only good for one month. Ouch! During a trip to the local mall with my family, I was a target of a similar sales scheme. My son thought it would be a great idea to ask for a hermit crab. I am sure many of you have seen these kiosks around town. Imagine 50 hermit crabs crawling around with shells decorated like Mickey Mouse, Sponge Bob and every other idol popular with today's youth. The offer sounded great, the hermit crab was FREE! What a deal!

By now, I am sure you understand what happened next. Yep, we had to buy the cage, gravel and a sponge for water so the free crab didn't shrivel up from dehydration. Of course there was also a book to help us understand everything to know about hermit crabs. Well, to spare you all the fun details, I will sum this up by saying that we spent \$80 for three FREE hermit crabs (brother and sister had to have one too).

You may not care about free hermit crabs. However, there is another issue related to gimmicks and sales numbers. How often do you read construction bids to find out what is really included in that material price you are about to declare the winner? We provided an article a while back called Apples and Oranges, written by Tom Valvo. (That article is still available on our website if you would like to see it again.) The main idea of the article is to be sure that when you are comparing light gauge steel truss prices, be sure you are looking at comparable numbers. What do you get for that \$10, 000 or \$400, 000? There are many items that go together to create a complete truss system. Are you getting it all, or will you have to go back to the truss supplier and buy additional clips, connectors, bracing materials, or worse, additional trusses? I heard one true story about a contractor who awarded a truss package to a supplier whose price was literally half of anyone else's number. Guess what. It was only for half the trusses! Do



you think the contractor went back to that supplier to buy more trusses? Nope. After the hassle of deciding who was responsible for the mistake and who was to pay for the additional trusses, the contractor ended up choosing to use a different truss supplier for the rest of the job (and all future jobs). Delays, arguments and headaches were not worth the dollar amount he originally thought he would save by using the cheapest number. You can be sure

that contractor now does his homework when comparing quotes from various suppliers.

After going through the challenges we all faced in 2004 relating to material pricing and availability, many contractors have become much more savvy when it comes to interpreting bids. However, it is still tough to compare truss prices during the rush on bid day. In order to be sure you are comparing apples to apples, you might consider downloading the following chart from our web page, www.aegismetallframing.com. Many elements must be included in a truss package for it to be considered a complete system. It is just as critical now if not more so to know exactly what you are agreeing to pay and for what materials. In addition to materials, there are possible charges that may be incurred for required engineering, field labor, and even unknown changes. Only by breaking down each proposal can you be sure you are comparing apples to apples.

Consider the hypothetical example of three truss bids that seem to be competitive at first glance. The bid from Fabricator B even looks quite low. Only after each bid is separated into equal parts can you see that Fabricator A actually has the best overall price. One cost that is impossible to show on any charts is the time required to find and purchase the items not included by the "Cheapest" bid. Only with proper planning and a quick but thorough evaluation of competing bids can you be sure you are picking the *Best Price*, not the cheapest.

Item	Price (Trusses Only)	Truss to Truss Connectors	Truss to Wall Connectors	Erection Bracing Materials	Permanent Bracing (Web Plane)	Permanent Bracing (Top Chord)	Permanent Bracing (Bottom Chord)	Permanent Bracing Diagram	Hip, Ridge & Valley Plate	Other	Total Truss Package
A	\$75,000	\$500	\$750	\$2,000	\$1,000	Sheathed	\$800	\$1,500	\$400	\$375	\$82,325
B	\$68,000	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	Sheathed	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	N/A	Who Knows!
C	\$70,000	\$400	\$600	\$1,750	Omitted	Sheathed	NOT INCLUDED	\$3,000	\$250	\$7000 (Extra Engineering)	\$83,000
D											
E											



By Steve Detter,
National Sales Manager

Effective March 1, 2005 Steve Detter was promoted to National Sales Manager for Aegis Metal Framing. All Aegis field sales personnel now report directly to Steve.

Many of our Ultra-Span™ fabricator partners know Steve quite well. For those who don't, Steve has served as Regional Manager, Central and West, for the past two and a half years. He has more than eighteen years experience in the building components industry and brings a wealth of knowledge in the design and manufacturing aspects of our business. He is well suited for this new role, in which he will guide and assist Aegis' sales force in supporting our customers' growth initiatives.

Steve is planning to visit as many Ultra-Span fabricators as possible over the next several months to help determine specific product, service, and technology needs to enhance our customers' overall competitive position. Steve, and the entire Aegis team remain committed to keeping Ultra-Span fabricators the most competitive light gauge truss producers in the market. He will also be focusing on the educating the design community on the great benefits and features of Aegis' complete line of structural light gauge systems.

Steve can be reached at (314) 422-7057, or sdetter@aegismetalframing.com

Cutting That "Measures" Up

In this issue of *Steel Notes*, let's look more closely at the complete cutting process. Is there a way that your sawyer can be more productive and eliminate some of the labor cost associated with cutting?



The initial step is to examine how you determine the cutting order of material. Are you cutting on a truss-by-truss basis or is there a form of batch cutting you are utilizing? The most important thing you can do to speed up the cutting phase is to eliminate or at least reduce the number of different lengths that have to be measured. Not only can the truss design itself help with this but using batch cutting will reduce these numbers. There is no debate on the fact that to batch cut very many trusses at one time requires a large amount of space to be able to stage material to the fabrication table. That does not keep you from making a small batch of just a few designs that are manageable with respect to space for staging. Most likely, the web material will see the greatest variation in piece length and this is where you can save the most time. Determine the order in which you plan to build on the table(s) and make smaller batches of those designs based on available space.

Next, you might consider looking into the possibility of using a measuring device that will work with your saw. There are a couple of manufacturers of devices that are fairly inexpensive and can return a rapid ROI in labor savings.

MangoTech makes a measuring stop attachment that can be connected to roll cases. They have both a fully computerized



model that can be networked or the cut list can be copied to a disk that is inserted at the saw. This model is a little more costly than some others. Mango has recently come out with the same measuring stop but the sawyer manually enters the length of the piece from the cut list. This model is fairly inexpensive and eliminates the need to measure and mark each piece.

The Hain Company from California makes a system that is similar to the old SpeedCut setup.

There is a one-foot increment stop and dial for inches and sixteenths. The system uses a small motor to adjust the material bed to the correct length. The price of the Hain system is a little higher than the manual Mango system but still not too costly.



The bottom line of any measuring system and your saw setup is to cut as accurately and quickly as possible. The measuring device is certainly one way to speed up the process and reduce labor in this area of production.

Contact your Aegis Metal Framing representative at (866) 902-3447 if you would like further information or assistance in determining whether your company has a cutting process that "Measures Up".

Protecting Yourself and Your Computer

The following article does not deal with light gauge steel framing. Instead, we have chosen to give you some useful information outside the light gauge steel industry. –Editor



By Ray Wagner,
Information Systems-
Technical Services

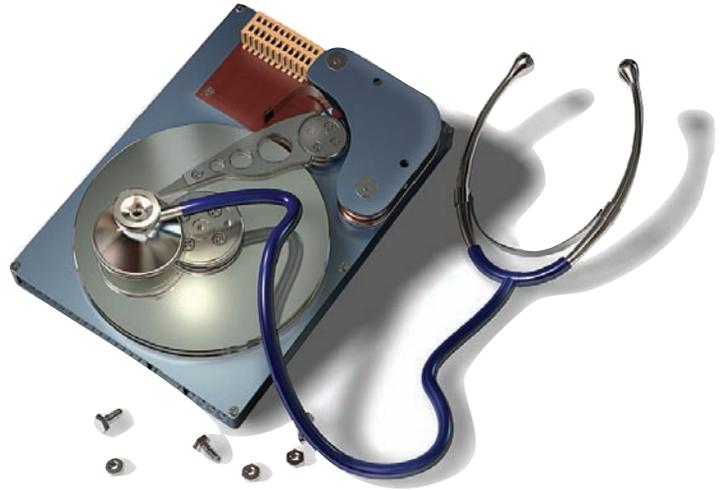
Protecting personal information and your computer has become an increasing necessity over the past few years. Viruses and hackers have become more widespread and destructive. In 2004, according to the Computer Industry Almanac, there were approximately 290 million people in the United States. Almost two-thirds of them were online in one way or another. That translates to a lot of people that could potentially hack into your computer. With that said there are some easy ways to minimize the risk of intrusion or damage to computer and the data within.

Shielding the threat could be a troublesome task if you don't know what options are available to you. Understanding that threats exist and how they work will put you one step closer to preventing the attacks. Many people think that by loading a few programs on their computer, they are protected from dangers they heard about from colleagues or on the news. This is true to an extent. However, you still may be vulnerable. Keeping up on the new threats and exposures can be automated! You can do this by understanding the four most important ways to protect your computer or your data on the computer.

4 Steps to Secure Data

1. Back it up
2. Use Firewalls
3. Computer Updates
4. Anti-Virus Software

The first step is backup your data! This cannot be stressed enough. I have spoken to so many people who ask me, "What is the best way to back up my computer?" First, determine what is important to you if your computer becomes inoperable. This is just a starting point. Most programs can be reinstalled but the personal setting and information within will be lost. You need to look into what is valuable to you. I use a computer to complete my taxes. I was able to backup one file that held the previous year's returns. That one file was the only file I had to backup for that program. The other important item regarding backups is the duration between them. This should be done often enough to maintain the most recent data. The duration is simple to determine. Just ask yourself if the file or files would be missed if the latest version is lost.



In addition to backing up data, security should be part of your protection plan. For instance, if you use your computer for personal things like calculating your federal and state taxes, you should be very interested in protecting your data. The best way to protect your computer is to block access from the outside world. Currently, the most effective method is to use a firewall. By doing so, you can stop potential hackers from gaining access to your data. Another alternative is to remove data files from your computer when you back them up. However, most of us prefer to leave them on our computer keeping them easily accessible.

There are two kinds of firewalls that may be used. One includes additional hardware. The other is software-based. Each has its own advantages and disadvantages. Hardware firewalls are very secure. Unfortunately, they also involve additional costs and can be complex to set up correctly. Software-based firewalls are a cheaper and more readily available alternative. However, as we have previously mentioned, "You get what you pay for." Several are distributed with the newer operating systems. Some are even free and easy to use. The free versions are also free to the hackers who make games out of breaking the code and gaining access to data thought protected by the same free program. The best thing to do is determine the benefits and risks of each choice and simply use something. Just be sure to understand why you should use them.

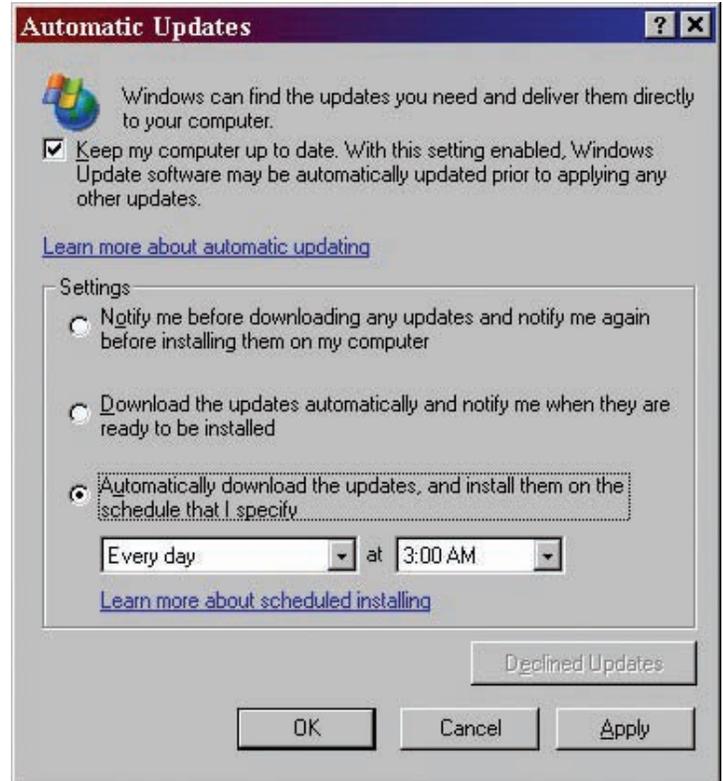
Keeping up on service packs and operating system updates is another way to protect yourself and your data. The updates are not only to fix bugs in programs but also to change some of the security issues that have been exploited by hackers. By loading the latest service packs and updates, you can minimize the Spy-ware and Ad-ware that is anonymously and maliciously added to your computer. For those Windows 95, 98 and NT users out there, updates are no longer offered for your operating systems. Microsoft has stopped support on them. If you are using one of those systems, you may not be able to take advantage of the latest technology in protecting your computer.

New security holes are discovered and repaired every month. Manually keeping up with them can be cumbersome. If you are using Windows 2000 Service Pack 3 or newer, there is a solution. Go to Control Panel and find the Automatic Updates icon.



This will launch a dialog box as shown to the right. Within the dialog box, you will notice that you can automatically have your computer check the Internet for any updates at regular intervals. You can also choose to confirm and load each update as it is found. This will help tremendously with the prevention of viruses, worms and other threats as they are discovered and exploited.

Another way to prevent the malicious programs from gaining access and damaging your computer or its data is to use Anti-Virus software. Most people know then concept behind anti-virus software. Many even receive it as a standard program that comes on new computers. You may receive a trail version that is free for a short time. Unfortunately, what is not understood is that the anti-virus software becomes useless if it is not up to date. If you choose to not license the software, you may not be able to download updates as they are released. Each brand of software works differently so it is important to find out from the vendor what is included and how to keep receiving updates. Most new software has an update feature that will allow the user to check for virus definition up-dates automatically or manually. For those who still depend on



a dial-up connection, remember to manually update at least once a week. If your computer is not connected to the Internet, it will not obtain the updates automatically.

If you take the time to understand what can be done to prevent intrusion to your computer, it will continue to be a safe and reliable tool. The time and money you spend to protect your data and its environment will pay off in the end. Computers are attacked daily by viruses and hackers who want nothing more than to cause problems. By taking the time to protect and back up your information, you will be better prepared to handle these attacks.

Pre-Engineered Ultra-Span™ Trusses— The Contractor's Best Choice (cont.)

(Continued from page 1)

truss systems require many more elements than just the trusses themselves. That is why profit-minded contractors must resist the urge to "carry" the lowest truss bid without fully evaluating the scope of it and all other truss proposals. More often than not, that "low" bid with the list of exceptions and exclusions longer than John Gotti's rap sheet will prove to be a lot less attractive than at first blush.

Please be sure to visit the "Fabricators" section of our web site, www.aegismetalframing.com, to identify the multiple experienced fabricators that can bid your next project with light gauge trusses. Remember, many of these truss professionals also offer installation services, relieving contractors of one more "head ache" in coordinating materials and trades.

PROJECT PROFILE

The Whole Package

Aegis Metal Framing was created in 2002 with the goal of creating a technology-driven, turnkey light gauge steel-framing package for building component manufacturers. Although many firms in and around the steel framing industry have claimed a similar end game, Aegis' development efforts have created a truly integrated, one-stop shopping experience for light gauge pre-fabricators. This comprehensive package includes:



- Integrated layout and design software for Ultra-Span® trusses, TradeReady® floor joists and WallSolutions™ steel panels. Unlike other providers, Aegis puts these tools in the hands of our fabricator customers to allow them ultimate speed and flexibility for bidding and pre-design.
- Comprehensive technical support and professional engineering services to facilitate the design of the entire light gauge steel shell, from the "slab up".
- A complete line of light gauge steel framing materials—every element necessary to manufacture a fully componentized structural steel shell.

This issue's Project Profile offers an excellent representation of how all the elements of the Aegis package can be brought together for the benefit of all members of the building team.

Superior Steel Components (SSC) is one of the nation's largest and most successful suppliers of light gauge steel trusses and installation services. With manufacturing facilities in Michigan and North Carolina, SSC has supplied thousands of diverse commercial and institutional projects since its inception in 1993. Now, utilizing WallSolutions software and services, SSC has launched into the structural light gauge panel market.

The Gardens of Western Reserve is a new, 55,000 sq ft assisted living complex located just outside Cleveland, OH. The building owner, Western Reserve Developers, was looking for a qualified firm to install the structural frame for this newest development. SSC stepped in with a comprehensive scope of light gauge and structural steel component design, fabrication and installation services.

Although originally specified as field framed light gauge walls, Fred Patten of SSC was able to convert the project to pre-fabricated pan-

Project:	Gardens of Western Reserve Cuyahoga Falls, OH
Building End Use:	Assisted Living
Developer and Construction Manager:	Western Reserve Developers North Ridgeville, OH
Steel Truss & Panel Fabricator & Installer:	Superior Steel Components Marne, MI

els in order to meet the aggressive construction schedule. Working closely with WallSolutions Product Manager Doug Rassel, PE, Superior designed the more than 350 individual panels in the WallSolutions software. Doug provided full engineering support including member selection, lateral stability design, and full shop drawings.

On site, SSC Project Manager Gary Raterink was responsible for coordinating the delivery and installation of the completed panels, as well as more than 1,000 Ultra-Span steel trusses. From first contact with Western Reserve Developers to the arrival of the first pan-



els on the job site, only eleven weeks had passed. This extremely aggressive construction schedule necessitated close communication between SSC's design, manufacturing, and site supervision personnel, as well as Aegis.

Supplying and installing a package as comprehensive as SSC provided on The Gardens is rarely a seamless process. Last minute design changes and shifting job site conditions can wreak havoc on manufacturing and installation schedules. Rick Fiest, Vice President of Manufacturing for SSC-Marne probably summed things up best: "The Gardens of Western Reserve was the most complete panel project we had tackled up to that point. Although it was a very successful project for us, it wasn't without its challenges. However, we learned a lot from those challenges, and we have subsequently furnished and installed a five story project, and have several other nice panel projects on the horizon."

Perhaps the best news of all is that Terry Keenan, owner of Western Reserve Developers, was truly pleased with finished product. "I am very happy with SSC's performance," commented Keenan. "I will certainly use them again on my future projects."