

Why Have MCM Panel Systems Become So Popular?

By Ted S. Miller

Back in the early 1990s when we began fabricating metal composite material panels it was rare for a project to have these panels as part of the design.

MCM was considered a new product in North America although it had been widely used in Europe for many years.

It took a huge promotional effort with designers to convince them of the MCM's merits. I can remember many weeks where I would leave on Sunday afternoons and return the following Friday for architectural promotional trips throughout the Southeast. The challenge was this: if you want more projects to bid, go create your market. These were challenging times for the few fabricators involved in the industry.

The best statistics that I could develop back then indicated that MCM panels were designed into about 1 out of every 300 projects. The latest information that I can obtain today indicates that MCM panels are utilized on about 5 percent of nonresidential projects valued above \$5,000,000. That is an extraordinary change in popularity.

Over the next several months we will be looking at the reasons why MCM panels systems have become so popular with designers and building owners. As we analyze the reasons it will give us a good roadmap for how to extend the popularity of this product. The reasons it became popular are great reasons for designers and building owners to continue to use the product.

Some of the areas we will be exploring are:

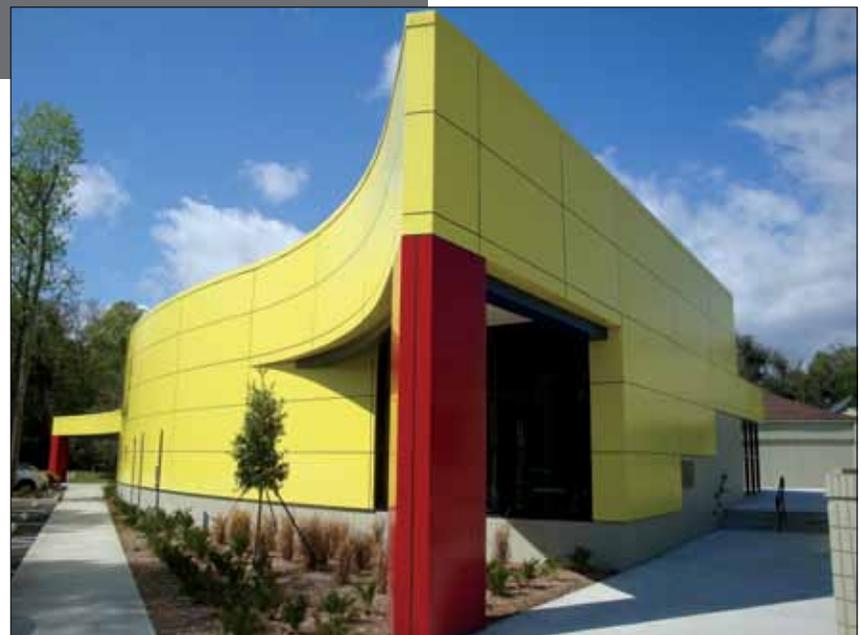
- The ability to form complex geometric shapes
- Finish and color variety
- Applications that are possible because of MCM's light weight
- Comparative cost
- Flatness
- Others

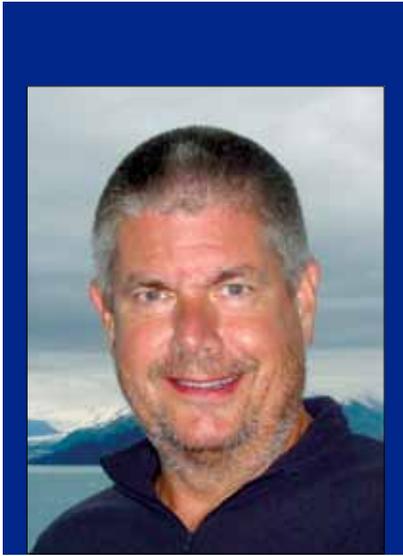
As we explore these benefits please feel free to drop me an email at ted.miller@millerclapperton.com to remind me of others. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.

FROM TOP:

Genesis Center, Davenport, Iowa; Children's Museum of Arts and Science, Daytona Beach, Fla.; Obici Hospital, Suffolk, Va.





Why Have MCM Panel Systems Become So Popular?

Part 2 – The Ability to Form Complex Geometric Shapes

By Ted S. Miller

I have often said that metal composite material has become the 21st century sheet metal. By that I mean that because of its inherent ability to be formed into a large variety of shapes it has become the “go to” product for designers when they encounter difficult “transition points” on buildings.



Puerto Rico Convention Center

For example, look at the photo above. The white and silver surfaces shown on the photo of the **Puerto Rico Convention Center in San Juan, Puerto Rico**, are MCM panels. The panels have the following geometric forms: flat, curved, sloping and varying heights. These shapes could have been formed out of stucco or EIFS but it would have been a several step process and these products could not have delivered the smooth and metallic look desired by the designer.

Also, additional structure may have been required to support the dead load weight of stucco on the large soffit condition. These panels were installed by using mechanical lifts from the ground. With other products a full platform scaffold may have been required to support the process required to “build in the field” their systems.

The photo to the right shows **Obici Hospital in Suffolk, Va.**

This project features many outstanding and challenging geometric shapes. They range from the serpentine wall to feature niches on the pilasters and columns to expert reveals. This variety of shapes adds visual excitement to what could have been a bland and uninspiring hospital.

The final picture to the right shows the **Paramount Building in Orlando, Fla.**

This project develops a distinctive Art Deco look with the use of MCM panels. Very few products can form these complex shapes without expending monumental monies.

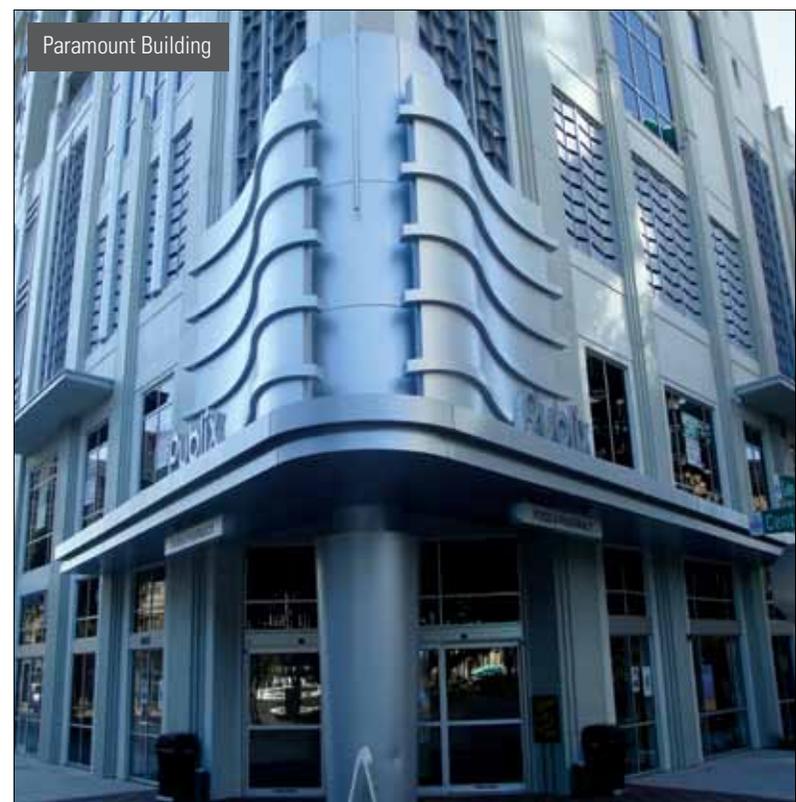
The ability to form complex geometric shapes affordably with a long lasting and colorful finish has become an invaluable tool for designers with MCM.

As we explore these benefits, please feel free to drop me an email at ted.miller@millerclapperton.com to remind me of others. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.

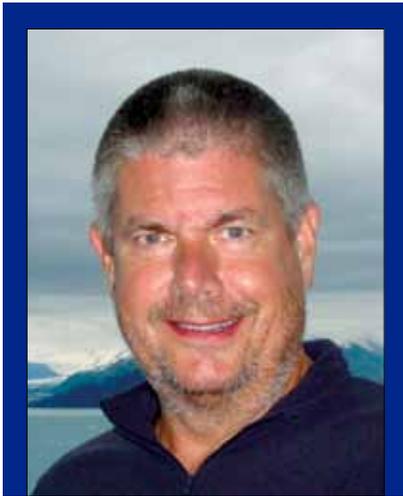


Obici Hospital



Paramount Building

Why Have MCM Panel Systems Become So Popular?



Part 3 – Finish and Color Variety

By Ted S. Miller

When designers want to make a bold statement on a building for very little additional cost, they often turn to color and finish. Metal composite material panel systems make this choice so easy. Whenever, the amount of material to be used is of reasonable quantity (10,000 square feet for some MCM sheet manufacturers), there is virtually no difference in price between a standard color and custom color.

Color can be a defining element whether it is a bold, attention demanding choice or a subtle, differentiating element between two shades of white. Very few exterior cladding materials offer this design flexibility with such ease.

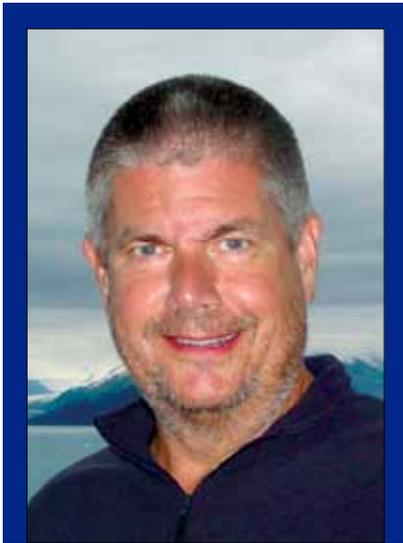
Designers can run the gamut between bold primary colors; like those used on the Children's Museum of Arts and Sciences, to the subtle shades of white on the Deep Run High School that contrasts nicely with traditional masonry construction at its base.

Brilliant white can be paired with a vibrant tropical color that explodes in front of the blue sky on the Ocean Center.

Finish and color are easy to afford and can become bold design elements when MCM is chosen. It can be used abundantly. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.





Why Have MCM Panel Systems Become So Popular?

Part 4—Applications Possible Because of Its Light Weight

By Ted S. Miller

Bob Borson, in a post on his *Life of an Architect* blog, notes that one of the top 10 reasons to be an architect is the ability to express artistic freedom and personal expression.

One of the qualities of MCM panel systems is a powerful tool towards that end. MCM panel systems weigh very little compared to most other wall materials and have a very high strength-to-weight ratio. This quality allows great freedom to architects to produce elegant cantilevered forms and produce feature elements that appear delicate.

MCM panel systems generally weigh less than 2-pounds-per-square-foot.

Compare that to other wall materials:

- Masonry wall (4-inch brick and 12-inch concrete block): **122 lbs/SF**
- Dimensional stone (granite): **30 lbs/SF**
- Glass curtainwall (1-inch double pane insulating glass): **10 lbs/SF**
- Terra cotta panels (34-mm thickness): **10 lbs/SF**
- High-density phenolic resin panels (1/2-inch): **5 lbs/SF**

Imagine the size and weight of the support structure required to support the varying weights of these wall materials in a straight vertical wall. Now, think about the exponentially increasing challenges of designs that require either cantilever shapes or free spanning shapes.

The Florida Community College at Jacksonville utilizes a large cantilevered canopy with the use of MCM panels.

Applications like canopies and porte cocheres become doable with the weight of MCM panels (2 lbs/SF) that would be extremely difficult with a material like dimensional stone (30 lbs/SF).

Large free spanning shapes that add an architect's artistic freedom and personal expression to a project become more interesting with the light weight of MCM panels. The wing-shaped forms on the Quad Cities Airport span approximately 30 feet.



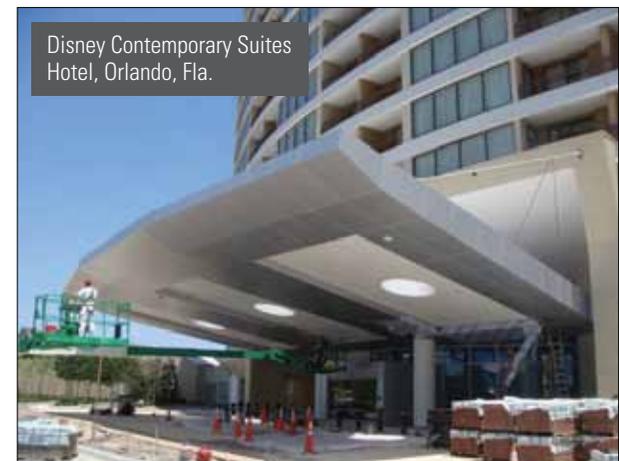
Florida Community College at Jacksonville, Jacksonville, Fla.



Mellon Bank, Pittsburgh



Quad Cities Airport, Moline, Ill.



Disney Contemporary Suites Hotel, Orlando, Fla.

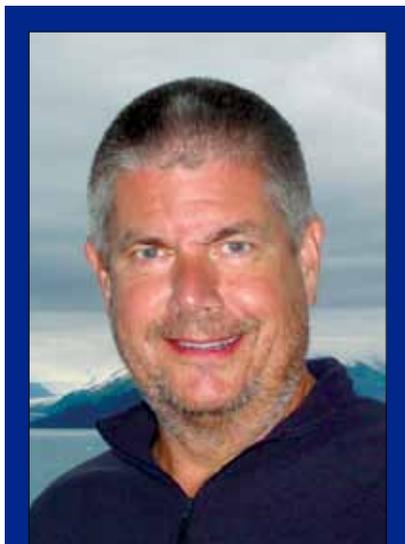
That would be difficult to accomplish with many other materials.

The Mellon Bank in Pittsburgh features both cantilevers and free-spanning elements at the peak of the multistory office building featuring MCM panels.

As we add examples of the benefits that MCM panels add to an architect's design; it is easy to see why it has become one of the "go to" products for modern building design.

As we explore these benefits, please feel free to drop me an email at ted.miller@millerclapperton.com to remind me of others. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.



Why Have MCM Panel Systems Become So Popular?

Part 5 – Comparative Cost

By Ted S. Miller

Let's be honest with one another. No matter how elegant and design friendly a product is, in today's construction market, the product has to be a "good deal" in terms of price if it is going to gain market acceptance. The projects featured in this column are excellent examples of how MCM panels have proven that they are affordable when all of the project requirements are considered.

What are some of the cost considerations that must be considered?

- **First Cost** – MCM panels probably average around \$35 per square foot installed. That is not cheap but it is affordable and compares favorably with masonry, precast concrete, glass curtainwall and dimensional stone.
- **Support Framing Required** – Because of MCM's great strength to weight ratio, the support framing required is usually less than all of its other competitors, so that makes it more affordable.
- **Low Premium for Unusual Shapes** – MCM panels can be fabricated into a variety of shapes: curved, flat, folded, sloping, you name it. Since MCM panels are easily shaped, in comparison to other materials, the premium required for these unusual shapes is less with MCM panels.

MCM panels must be affordable. The variety of different building types on which they are used is impressive. In the four projects featured in this article the following building types are represented: hospital, movie theater, corporate office building and convention center. That is a lot of diverse building types, and MCM was chosen for all of them and many others.

The North Oaks Hospital in Covington, La., utilized MCM panels to form a unifying "front face" to the facility.

The AMC Theatre in Glendale, Ariz., took advantage of the MCM panel's ability to form curved and folded shapes on the entrance to the theatre.



Georgia World Congress Center, Atlanta

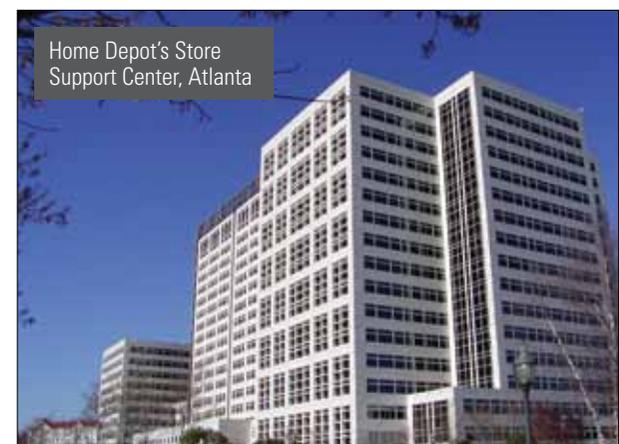
Home Depot's Store Support Center in suburban Atlanta combined MCM panels with an innovative curtainwall system to form large framed units that were installed from the inside floor of the building. This was possible because of the lightweight material. It was also a cost-saving alternative to the original precast concrete panels for the building.

MCM panels are used extensively on the Georgia World Congress Center in Atlanta. Fascias, soffits, stairwell enclosures and column covers are all clad with the panels. Large-scale buildings, like convention centers, choose MCM panels in part because of the affordable first cost and in part because of their very low maintenance costs.

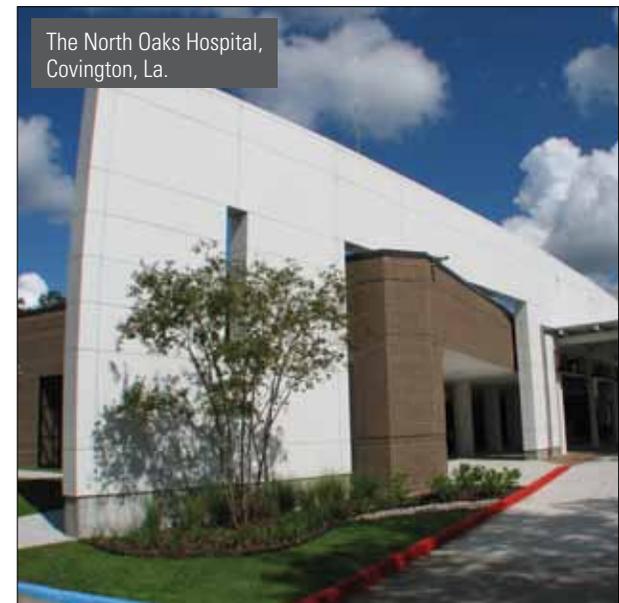
A review of these projects shows many reasons why MCM panels have become so popular and comparative cost is certainly one of the largest reasons.

As we explore these benefits, please feel free to drop me an email at ted.miller@millerclapperton.com to remind me of others. 

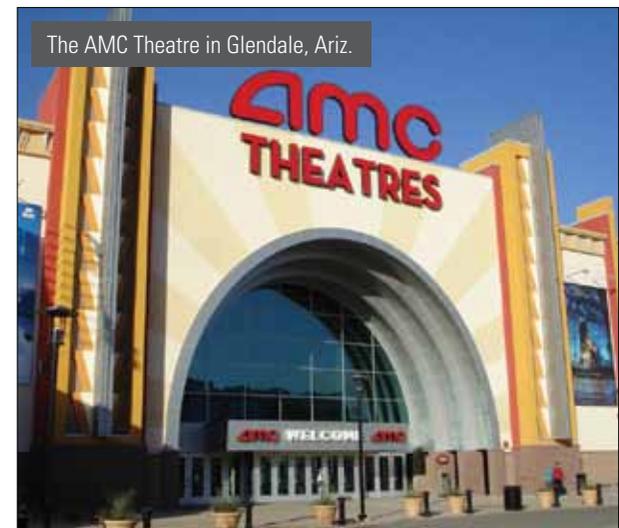
Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.



Home Depot's Store Support Center, Atlanta



The North Oaks Hospital, Covington, La.

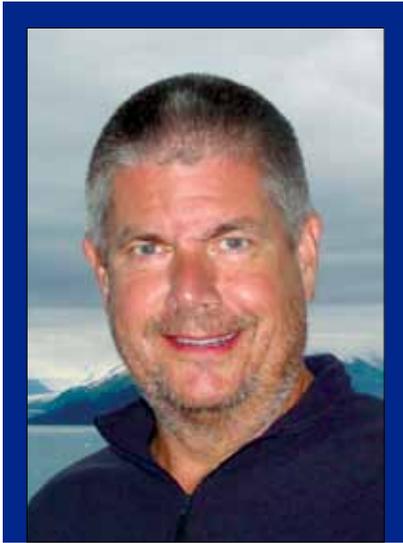


The AMC Theatre in Glendale, Ariz.

Why Have MCM Panel Systems Become So Popular?

Part 6 – Flatness

By Ted S. Miller



Flatness could have been chosen as the first reason why MCM panel systems have become so popular. When it comes to large, monolithic surfaces on building walls; MCM panel systems have no peer. This is no accident; these panel systems are designed to be that flat.

Here is how:

The Metal Sheets

First of all, the metal sheets themselves are selected and processed, with stretcher leveling and other techniques, specifically to make the sheets as flat as possible.

The Production Process

The continuous process by which the MCM sheets are produced is centered on making the sheets flat and remaining flat. They are produced under a tightly controlled combination of heat, pressure and tension.

Heat

The thermoplastic core is extruded in a molten state, through a die, in order to maintain tight controls on the thickness of the material, which is an important component of the eventual flatness of the sheet.

Pressure

The extruded core is bonded to the sheets under pressure that is controlled to a close tolerance to further ensure the structural integrity of the sheets as well as maintain the surface flatness.

Tension

The front and rear sheets of metal are held in tension throughout the production process in tension so that the sheets are at a steady state across the sheets to ensure the MCM sheets are as flat as possible.



Embry Riddle Aeronautical University, Daytona Beach, Fla.

The Fabrication of Panels

MCM sheets are typically formed with computer controlled machining centers that utilize high-speed cutting devices. This type of fabrication does not induce "cold working" into the material unlike the shearing and folding that is used with solid metals. This fabrication method therefore further ensures that the very flat MCM sheets will be formed into very flat MCM panels.

In addition, when necessary for structural deflection requirements, fabricators have developed stiffener systems that do not induce further stresses into the panel systems to maintain the flatness.

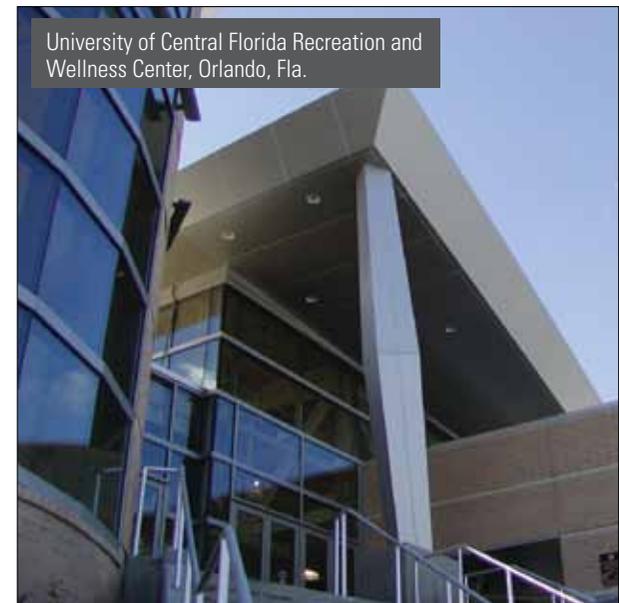
The projects featured demonstrate the flatness offered by MCM panel systems and these projects demonstrate visually one of the reasons MCM panel systems have become so popular.

As we explore these benefits, please feel free to drop me an email at: ted.miller@millerclapperton.com to remind me of others. 

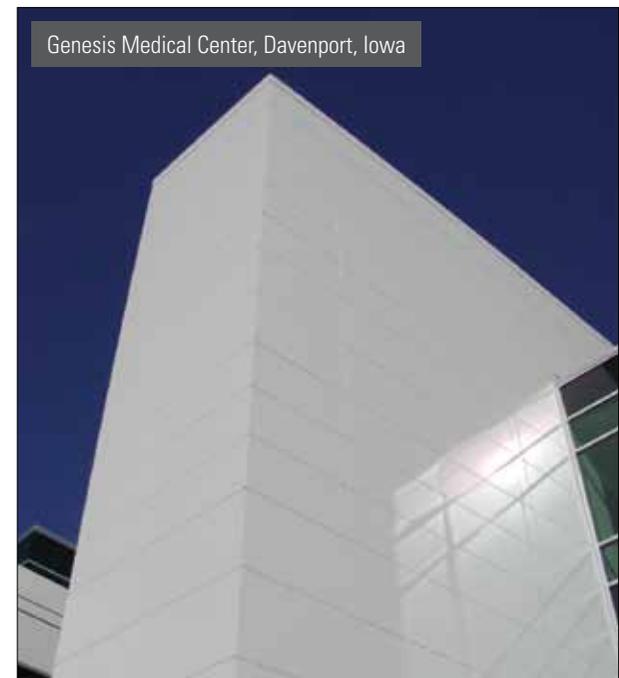
Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.



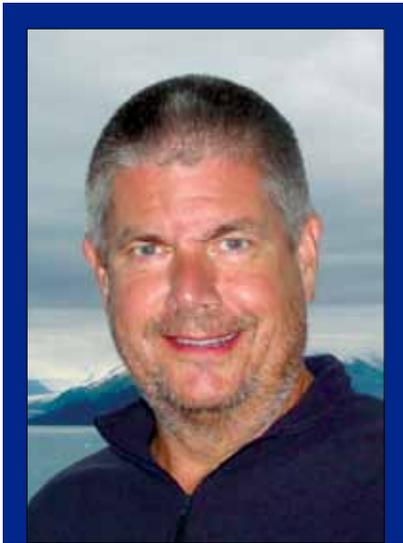
Georgia International Convention Center, College Park, Ga.



University of Central Florida Recreation and Wellness Center, Orlando, Fla.



Genesis Medical Center, Davenport, Iowa



Technology and MCM Panel Systems

By Ted S. Miller

There are very few systems in the construction products industry that has benefited more from the introduction of technology over the last 20 years as much as metal composite material panel systems. Over the next few months we will be looking at some of the technological innovations in the area of MCM panel systems and the methods used to penetrate the market for these systems.

Some of the areas of technological innovation we will address are:

- Computer Aided Machining
- Use of AutoCAD for Approval Drawings
- Lead Tracking
- Procurement of Contract Documents
- Field Dimensioning

This month we will take a look at Computer Aided Machining.

When we began fabrication of MCM panels back in 1989-1990, we purchased "state-of-the-art" machining equipment. At the time, that was a vertical panel saw for cutting the MCM sheets to size and a vertical panel saw with a solid backboard for routing the folding flanges of the sheets to form panels.

These pieces of equipment for machining the sheets were very accurate and did a great job; for rectangular panels only.

However, whenever we had parts that had to have a radius panel in plan, we had to become innovative. For example, when we had a very large radius to duplicate:

1. We would clear out a large area on the production floor.
2. Assemble a series of long extrusions that was as long as the required radius.
3. Strike an arc with a marker on the production floor of the required radius.

4. Transfer the required radius to a flat piece of wood.
5. Make a wooden template of the required radius.
6. Then with the wooden template and a jig saw; cut the MCM sheet to the proper size.
7. Then use another wooden template to cut the notches in the curved folding flanges with a plunge router.

Excellent quality panels can be made this way, we have the completed projects to prove it, but it takes an extraordinary amount of planning, time and energy to accomplish what has been now made simple by the introduction of technology.

Around 1994 we worked with a machinery broker and, to our knowledge, were the first company to utilize a Three Axis-Computer Aided Machining Center for the machining of MCM panels. The machinery that we chose was originally developed for the woodworking industry, and working with the machinery broker we were able to adapt the equipment for the machining of MCM Panels.

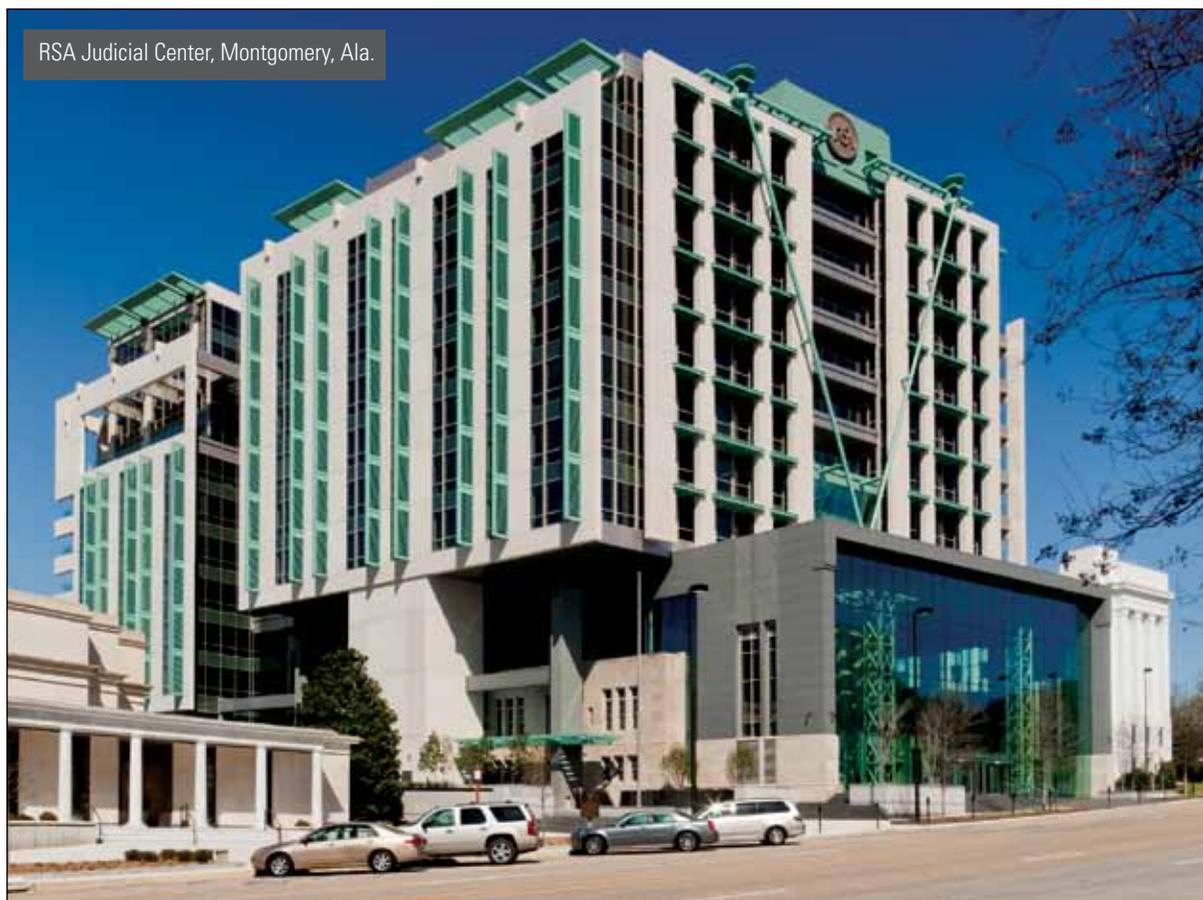
This was a major investment for our firm and at the time this machinery cost about a quarter of a million dollars. However, from this point forward we were able to produce panels with complex geometry almost as easily as rectangular panels.

After a few years there were other entries in the Three Axis-Computer Aided Machining Center industry and the cost of the machines dropped dramatically and therefore the barriers to entry into MCM Fabrication were diminished substantially and created many competitors in the field.

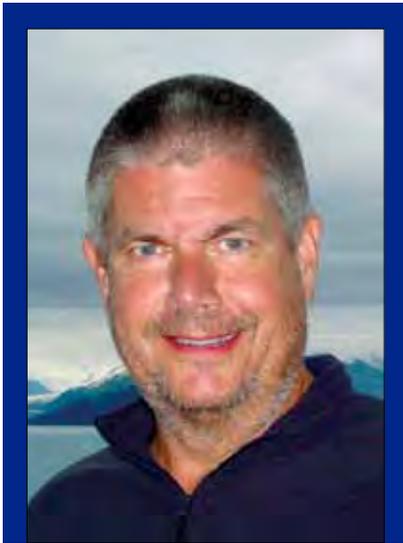
These technological innovations, and the others we will be studying in upcoming months, have gone a long way to make MCM Panel Systems one of the most technologically advanced building materials in the construction industry.

As we explore these benefits; please feel free to drop me an email at: ted.miller@millerclapperton.com to remind me of others. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.



RSA Judicial Center, Montgomery, Ala.



Technology and MCM Panel Systems

By Ted S. Miller

Part 2 – Use of AutoCAD for Approval Drawings

When our firm started in the metal composite material (MCM) panel industry back in 1989 the conventional method was to create approval drawings with paper and pencil on an actual drawing board, and if you had the very best equipment available you had a 90-degree “drawing machine” rather than a parallel bar or T-Square.

The draftsmen that were particularly proficient for this type of drawing were an interesting blend of craftsman, knowledgeable builder and artist. In order for their drawings to be the best method to convey the information, they needed to have a “good hand” that portrayed a drawing style that was very readable and had a consistent style from sheet to sheet.

When the information on the approval drawings was presented in an easy-to-read format it gave the person reviewing the drawings a feeling of confidence in the drawings, and by extension, a feeling of confidence in the company that produced the drawings and the materials that would eventually be supplied.

However, this method of drawing preparation took a great deal of time and many “off the board” calculations to determine necessary dimensions that needed to be placed on the drawings.

With the advent of AutoCAD, and other computer-aided drawing programs, several things changed:

- A person that did not have a “good hand” for drawing could still produce a very readable set of drawings that had a consistent style of line width, density and consistent font type for labels from sheet to sheet because the computer was reproducing these important elements consistently.
- The computer-aided drawing program had many tools that could expedite the production of drawings. For example, circles, arcs, rectangles and other shapes could be created simply with tools. They could be expanded and contracted by dragging the shapes, and the resulting dimensions could be calculated by the program.

- Once the basic floor or roof plan was created, multiple copies of the original could be saved and re-used for other floors without having to re-draw the basic shape.

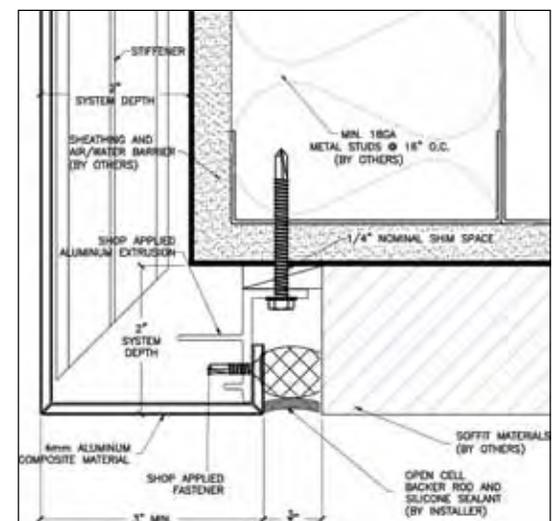
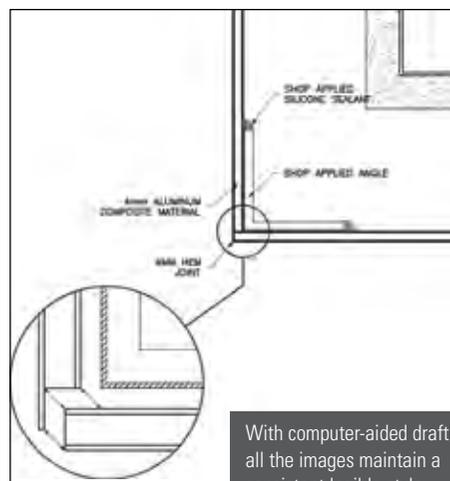
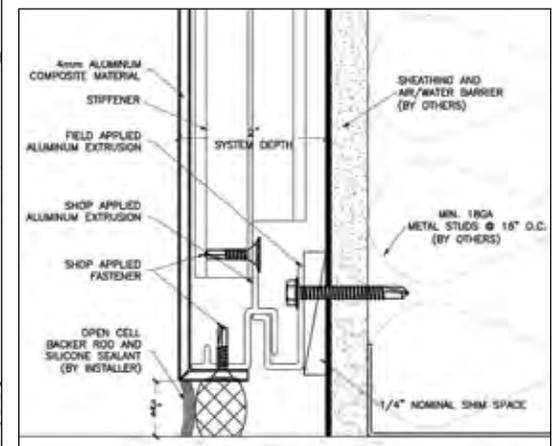
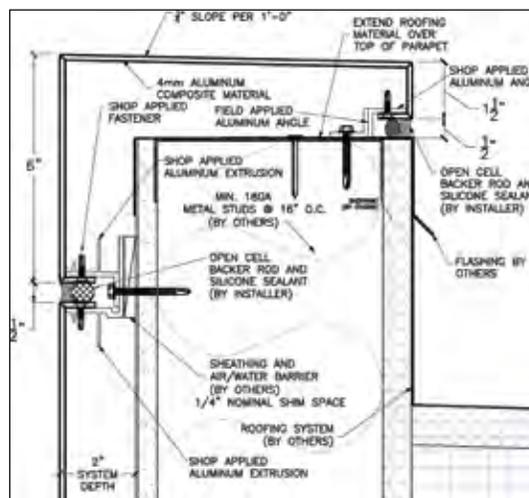
Subsequent developments have allowed drawing technicians to produce virtual representations of buildings in 3-D. With these drawings, intersections between materials can be studied and better solutions can become obvious when you see a graphic 3-D representation of material intersections.

There are also programs available now that can “pick” the machined shape of a panel from the 3-D approval drawings. These elements can then become the virtual part drawing that can be downloaded to the computer-controlled machining center.

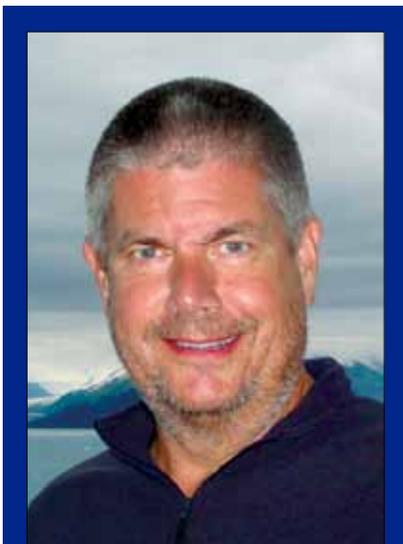
There is no software available yet that can take the place of industry experience on how the building components should go together on a project. However, in the hands of an experienced industry professional, computer-aided drawing programs can certainly expand the capacity of that professional to produce great approval drawings for MCM panels. And this technology allows for the use of very complex shapes of panels as well.

As we explore these benefits, please feel free to drop me an email at ted.miller@millerclapperton.com to remind me of others. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.



With computer-aided drafting, all the images maintain a consistent legible style.



Technology and MCM Panel Systems

By Ted S. Miller

Part 3 – Use of Technology for Lead Tracking and Selling

When we started our company back in 1979, the standard method of learning about a project was either:

- You had been working with the architect for months on the design development of the project and writing the specification for the architect.
- A former customer called you and asked you to bid.
- You found the project at the “builders exchange” or local plan room.

After learning of the project, you obtained the drawings by either:

- Purchasing the plans from a blueprint company and many times they cost \$500.
- Begging for a set of the plans from a general contractor.
- Hanging out in the plan room until they were available and doing your takeoff.
- Or if the plan room was “member owned” their policy might allow you to borrow them overnight, but you had to have them back in the plan room by 7 a.m.

Then after you completed your takeoff, estimate and quotation:

- You had to mail the blank (without the price) quotation to the general contractor, which meant you had to have the quotation, with all of your scope outlined, clarifications stated and terms and conditions listed, at least three days in advance. Remember at this point in time all of this was being performed on typewriters and paper and pencil. There were very few personal computers available and those available were not very user friendly.
- On large projects, it was customary that the general contractors and subcontractors would gather at a downtown hotel in the city of the project and you would have a “walk the halls” meeting with the contractors to review your quotation.

- Then on bid day you would call in your “street price” and attempt to get feedback on where your price was in relationship to your competitors.
- Then you would attempt to “skate under” the low bid and “get low.”

With the available technology today, most of these steps have changed dramatically and make it possible for MCM fabricators/subcontractors to be much more efficient.

A typical project today goes something like this:

- You learn of a project just days before the bid day from one of your electronic lead sources on your computer.
- The contract documents (only the sheets you need) are downloaded from the customer’s FTP site.

- You make your takeoff, prepare your estimate and quotation utilizing standard templates that are housed on your computer.
- Then you email your quotation to the customer and because there are more projects to bid, you await the announcement of who was the low GC before you track down how your quotation did.

Because of these technological enhancements, MCM fabricators/subcontractors are able to bid many more projects than were possible in the past.

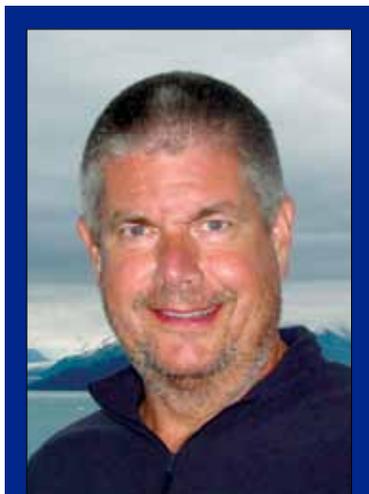
As we explore these benefits, please feel free to drop me an email at ted.miller@millerclapperton.com to remind me of others. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.



CLOCKWISE FROM LEFT:

AMC Theatres, Glendale, Ariz.;
Valencia Community College,
Orlando, Fla.; Ocean Center,
Daytona Beach, Fla.



Technology and MCM Panel Systems

By Ted S. Miller

Part 4 – My Wish List of Product Developments

This month's issue of Ted's MCM Corner completes our series on technology and MCM panel systems. For the most part, all of the developments I have highlighted in previous months have been initiated by MCM fabricators. This month we turn the tables around and challenge our valued suppliers of MCM sheets, the MCM manufacturers.

Outlined below is a "wish list" of product and policy developments that would be helpful to expand our industry further. The policy changes on the "wish list" may not strictly be a function of technology. However, increased product quality through better technology may ultimately be the catalyst that gives the MCM manufacturers the confidence to make policy changes.

THE WISH LIST

Develop a technique or product enhancement that would allow "double curvature" of MCM.

One of the chief reasons that MCM has become more popular is its ability to form challenging geometric shapes. We can: bend the panels in multiple directions, curve the panels to a variety of radii, combine flat and curved surfaces into a trimless condition, form truncated cone segments, etc.

The one form that we cannot do currently is double curvature. If one of the MCM manufacturers would develop a technique or product enhancement that would allow for double curvature it would be a specifiable differentiator and make MCM panels even more valuable to designers.

Develop a program to produce orders of small quantities of custom colors more economically.

We fully understand why small quantities of custom colors cost more as they are currently produced on coil coaters. However, it is still a problem.

One of the distinct benefits of MCM panels is their ability to offer long lasting finishes with vibrant custom colors. Designers want to make their projects vibrant and it would be very helpful to the industry to be able to offer multiple custom colors, in small quantities at more affordable pricing.

Establish a clear and concise policy on pricing and delivery dates that fits with the industry.

This may take some explanation. The normal process of a project goes something like this:

- Fabricators bid a project to general contractors.
- General contractors often award projects in about 90 to 120 days after the bid date.
- Then it often takes six to nine months for fabricators to produce approval drawings and field dimensions to be able to place orders with MCM manufacturers.

Often the quotations we receive from MCM manufacturers are good for 90 days from the date of the quotation. Now I must tell you that most of the time our valued suppliers have held their pricing firm until we are able to place the order but that is not guaranteed and that leaves the MCM fabricator at risk for price increases with no ability to obtain pricing relief from our customer.

If the MCM manufacturers would establish a policy that protects the MCM fabricator it would be greatly appreciated.

Establish a clear and concise policy that protects the MCM Fabricator on product problems.

First, let me say that the number of times that there have been any product problems with MCM is very, very few. And to this point, when there have been product problems our valued suppliers of MCM have been actively engaged in the resolution of the problem and have helped financially to mitigate our losses.

However, it would be very comforting to have a policy that clearly and concisely outlines that if the MCM sheets are defective, then the MCM manufacturer will make the MCM fabricator whole financially.

Develop one core that can be used anywhere on a building that is no more expensive than standard polyethylene core.

We have a great product in MCM panels. It would be an even better product if we had one core that would meet all of the fire resistive concerns that was no more expensive than standard polyethylene core. This would help in several ways:

- Designers and building owners could utilize the product with even more confidence because they know that it is safe to use anywhere on the building.
- MCM manufacturers could simplify their production schedules, purchasing processes and delivery schedules if there was only one core.
- MCM fabricators could simplify their engineering, production and installation processes if they did not have to be concerned over which core goes where with the advent of one core does it all.

There may be other items that you would like to put on the "wish list." Feel free to drop me a note and we can add them to the list.

As we explore these issues, please feel free to drop me an email at ted.miller@millerclapperton.com to remind me of others. 

Ted S. Miller is the CEO of The Miller Clapperton Partnership Inc., Austell, Ga. For more information, visit www.millerclapperton.com.

The Georgia Aquarium, Atlanta

