

2015

# Masonry

Excellence Awards

*The Intersection of Art, Innovation & Endurance*



**ENDURANCE**

*Castillo de San Marcos is the oldest  
masonry fort in the continental  
United States c.1672*





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MASONRY ASSOCIATION OF FLORIDA

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EXCELLENCE AWARDS

JUNE 2015

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# MASONRY

## THE INDY 500, BAJA 1000 & DAYTONA 500 OF CONSTRUCTION MATERIALS

**M**asonry faces another year of uncertainty as we continue to dig out of the “Great Recession.” The residential markets were unexpectedly flat in 2014; however, they are creeping up in 2015. Commercial continues to be rising, but not as fast as expected. There are bright spots around the state: Miami (hitting on all cylinders – residential and commercial), Lee, Collier & Hillsborough show progress with residential. Orange and Seminole non-building construction is getting ready to explode with the airport and Interstate 4 projects. A brighter future for Florida is just around the corner; it is not a matter of “if,” it is a matter of “when”.

The theme of this year’s Brag Book is “Endurance”. Figure it out!

The masonry projects submitted for awards this year are amazing. Check out the Firemen’s Memorial Statue in Gainesville; and the ceiling in a David Nelson Masonry’s private residence; and the 2015 Honor and Design award winner submitted by Moor & Associates in the AIA category. All of these projects are spectacular - beyond words. Additionally, the judges this year voted for two “projects of the year” because of the stiff competition. Check out the winners – David

Nelson Masonry’s private residence project (Naples) and the Plant Street Market commercial project (Winter Gardens). Aside from beauty, these projects are sustainable and resilient projects that will last generations – think ENDURANCE!

Don Beers, our industry’s engineer, has written some great articles about building with masonry. “Florida’s Heart of Stone” article begins with the oldest masonry structure in the state, the Castillo de San Marcos fort built in 1672. Mr. Beers talks about the changing building codes and revisions in design strength in the new masonry code, both important events for building with masonry. He also summarizes why masonry is a “Natural” building product for Florida’s harsh climate - Endurance!

Bill Parsons is recognized as the 2015 “Mason of the Year”. Bill’s accomplishments outlined in his award article highlight his industry and personal achievements. Bill is a true industry professional and hard worker for the masonry cause and ambassador of the trade. .

And lastly, my wife and I, celebrating our 25<sup>th</sup> wedding anniversary, just came back from a pilgrimage to Rome. What a fun, loving and spiritual time in our lives. However, as I

### EXECUTIVE DIRECTOR'S MESSAGE



**PAT M<sup>C</sup> LAUGHLIN**

Executive Director  
Masonry Association of Florida  
pat@floridamasonry.com

stood looking at masonry structures built 500, 1,000 and 2,000 years ago, it made me re-think the endurance examples I initially envisioned for this article – the Indy 500, Baha 1000 and Daytona 500, do not even remotely stand up to the endurance of building with masonry.

**Have a fun and safe convention.**

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# MASONRY

## THE INTERSECTION OF ART, INNOVATION & ENDURANCE

**E**ndurance. When the MAF Masonry Awards committee met to pick a theme for this year's Masonry Excellence Awards publication, the endurance of masonry products and the structures they build seemed a perfect fit.

Tasked to put my own spin on this topic, the first thing that came to my mind is my family. I am married to a third generation mason contractor. As a matter of fact, my husband, Lou Bartolucci and his father, Lou Bartolucci Sr. (Big Lou) have lent their considerable expertise to the awards judging panel for the past several years. Between the two of them, their years in the industry clock in at 110+! Big Lou learned the trade from his father, Primo Bartolucci in the early 1930s. Primo started the "family business" in 1916 in Saint Catherine's Ontario – 99 years ago.

I mention this because not only does the Bartolucci family demonstrate endurance in the masonry industry, but I have spent many vacations, family reunions and winery tours in the lovely Province of Ontario. Not a single trip has gone by that I have not been regaled with stories about Primo, and proudly driven around to see what the family calls "Bartolucci Monuments" in that city.

I can personally attest that Bartolucci Masonry constructed hundreds of "Bartolucci Monuments" - residences and businesses in Saint Catherine's and those structures look much the same today as they did 75, 80 or even 99 years later. Trust me, I have seen them all! These structures all stand as an enduring monument to Primo, and the natural endurance of masonry structures.

Masonry stands the test of time, the true test for sustainability. Masonry supports families and communities, and masonry builds monuments: not just "Bartolucci Monuments", but real monuments such as the City of Gainesville's Firemen's Monument on page 17, this year's winner of the "Creative Use of Masonry Award".

The entries showcased in this year's awards publication represent the best of the Florida masonry industry. These projects typify the dedication and craftsmanship of our masons and contractors and the beauty and endurance of the masonry materials.

Congratulations to all of the award winners and my sincerest thanks to our judges (See page 7) for their time, expertise and talent in reviewing this year's projects.

### FROM THE EDITOR



**DEB BARTOLUCCI**

Marketing & Awards  
Masonry Association of Florida  
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2015

# MASONRY EXCELLENCE AWARDS



## CHRIS BETTINGER

Awards Chairman  
chris.bettinger@oldcastle.com

**D**o you like our 2015 Masonry Brag Book? We had 31 MAF entries this year. Pretty cool!

We had 26 qualifying entries in the 6<sup>th</sup> year of the AIA Masonry award. Even better!

Masonry has proven it is the material of choice in Florida.

If you like what you see in these pages – take care of this book. It can't get wet, don't leave it out in the sun and if it's windy hold on to it. Fire is bad. Bugs – it's a tasty meal. What about a

hurricane, oh \$%\*#. If it's not in a masonry structure – go look for it in the next county over. Ten years from now I wonder how your book will look. Will you still have it? I hope so, because I think it's pretty good.

My point, in 10 years the projects shown will still look like the pictures today. They will have been utilized for a decade... Slept in and lived in. Shown off and bragged on. Admired and envied. Classes taught and lessons learned in them. All of this without a second thought about anyone's health and safety. 50 years from now they will be referred to as; classics, inspirations, landmarks, icons, symbols of the community. Driving by a project I've worked on always makes me smile. Our industry and our work has made a difference. Masonry by all standards is the most sustainable construction material. What does sustainability mean to you? To me; durability without sacrificing beauty, value at a reasonable cost, and long term functionality and efficiency. This book and the projects in it are great examples of the impact we have made in our communities.

How have we affected the construction industry? The Creation of the CMEC (Concrete and Masonry Education Council) has given us the opportunity to improve employment and construction in our state. Training apprentices and educating the public and construction community. Our Masonry Certification/Distance Learning partnership with the AIA of Florida is the first of its kind in the country (See page 18). This book is a learning opportunity for Architects. Don Beers (MAF Staff Engineer) has contributed three articles that are both timely and informative and earn one CEU for Architects...

- "Endurance of Masonry in Florida" pg. 22
- "New Masonry Code Increases Design Strength by 33%" pg. 24
- "Masonry Code Changes in the TMS 402/602" pg. 32
- AIA CEU Quiz for Credit pg. 38

We're stepping up and answering the challenges in the market, improving Florida in so many ways!



2015 MASONRY EXCELLENCE AWARDS

# JUDGES PANEL

**RICK ROWE**

President  
Rowe Architects Inc.  
Architecture &  
Planning



**JEFF BUCZKIEWICZ**

President/CEO  
Masonry Contractor's  
Association  
of America



**MATT SITTER**

Vice President  
Florida Concrete &  
Products Association  
Marketing & Advertising



**LOU BARTOLUCCI**

President  
Bric-Consultants, Inc.  
Journeyman Mason



**THOMAS HARWOOD**

President  
Harwood Brick  
Coastal, an  
Oldcastle Company

*Thank You*



2015

# AIA FL HONOR & DESIGN AWARDS

## Honor Award for Masonry

### "Riverfront Residence"

Peter D. Moor

Moor & Associates, PA

[www.moorarch.com](http://www.moorarch.com)

#### love masonry!"

How could a conversation about Design and Construction start better than that.

When speaking to Peter Moor of Moor and Associates his sentiment is evident. The 2015 AIA of Florida Masonry Honor Award has been given to Moor and Associates for the "Riverfront Residence" in Vero Beach. Constructed of concrete masonry units with a stucco finish, the design utilizes poured concrete to create the numerous details integral to the CMU wall. All of the shapes were formed and poured on site to Moor's design and specification. Moor explained, "The masons were not only craftsmen in their trade but also in carpentry creating all of the forms used. The stucco masonry construction utilizes the plasticity of poured concrete."



## AIA Florida

Sustainability is a term thrown around casually by many in the industry today. This project shows masonry is the choice for sustainable construction. Although wood accents are commonly used to compliment a design; the Riverfront project utilizes poured concrete. Moor feels, "Sustainable design should be sensible. Structural elements need to be both functional and ornate to satisfy the intent." The details shown here are perfect examples of a structural design that is sustainable without sacrificing aesthetics. As intended, the Stucco over CMU and Concrete construction has given the homeowner a low maintenance exterior that will stand up to the elements in Florida for years to come.

When I asked Peter to sum up his goal in residential design he was quick to answer, "Build solid and create something loveable." He went on to say, "My clients love their home!"

**Congratulations to Peter Moor of Moor and Associates!**

## MOOR & ASSOCIATES, ARCHITECTS, P.A.









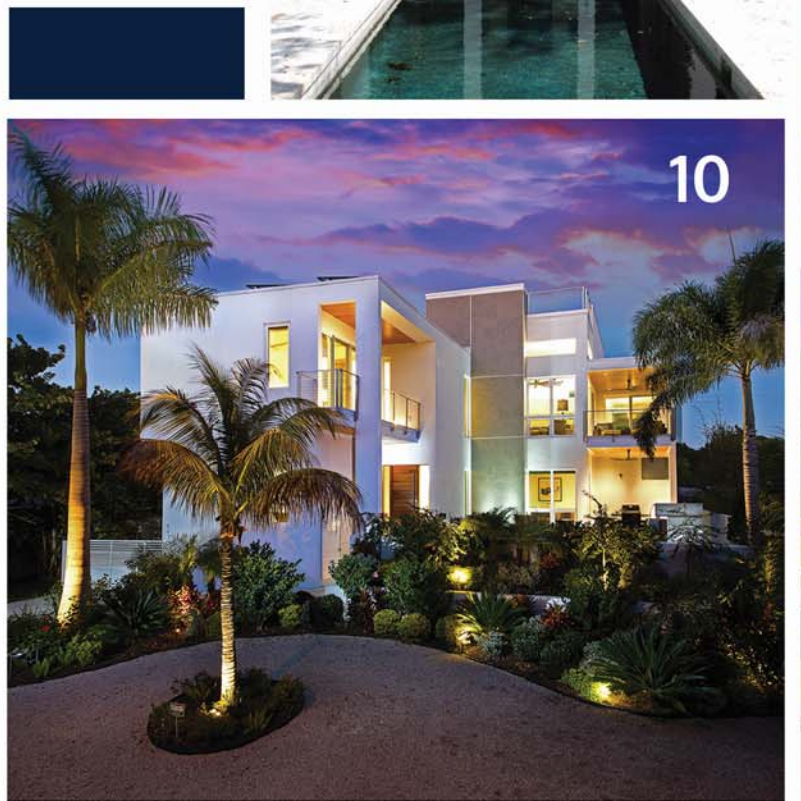


## 2015 AIA FLORIDA MASONRY AWARD SUBMITTALS

The Masonry Association of Florida (MAF) sponsored Florida Association of the America Institute of Architects (AIA FL) Honor and Design Awards Category for masonry is in its 6th year and part of a continued partnership between the MAF and AIA FL. The project has grown over the past six years and, in 2015, an impressive 26 qualifying entries were received for the masonry award. Pages 19-21 showcase other noteworthy projects designed and constructed with masonry. (See page 35 for project credits.)











2015 AIA Florida/Caribbean Honor  
& Design Awards Program  
See page 35 for project / firm credits



2015 COMMERCIAL & PROJECT OF THE YEAR  
**PLANT STREET MARKET**





YEAR WINNER  
MARKET



# Coastal

an Oldcastle® company

Winter Garden, Florida is a community which values it's traditional quaint downtown district. Plant Street Marketplace is on the western edge of downtown. The architecture and choice of materials makes the building fit in nicely with the historic shops and buildings of Main Street. Columbus Brick Company manufactured the red clay brick - "St. Louis Modular" - that was installed using with a white and black slurry.

**Masonry Supplier**

Coastal, an Oldcastle Company  
[www.oldcastle.com](http://www.oldcastle.com)

**Mason Contractor**

Toltec Construction  
Winter Garden, FL  
[www.tolteconstruction.com](http://www.tolteconstruction.com)

**Architect**

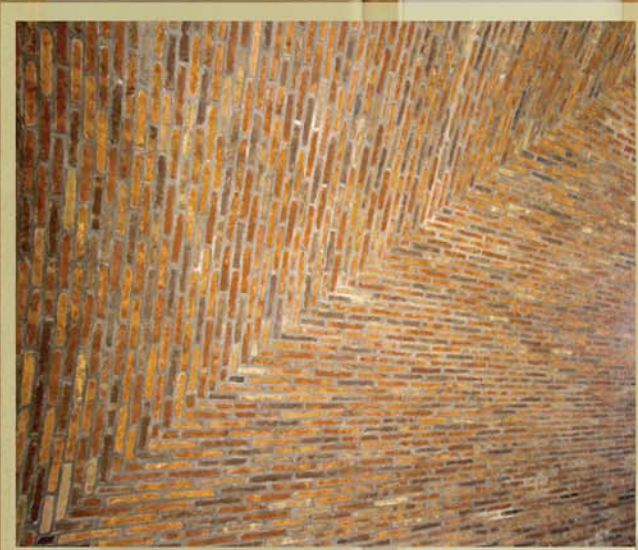
Harter-Adams P.A.  
[www.winterparkarchitecturefirm.com](http://www.winterparkarchitecturefirm.com)

**Architect**

Robin Brosmer Studios, LLC.  
Winter Garden, FL

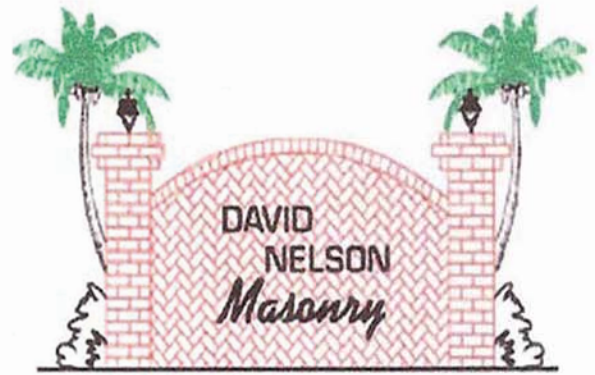


2015 RESIDENTIAL & PROJECT OF THE YEAR  
**PRIVATE RESIDEN**





AR WINNER  
CE



This project by David Nelson Masonry, consists of four arched, open hallways (approximately 300 linear feet) surrounding an open atrium of approximately 3600 square feet and includes one "great hall" west of the atrium which is an extension of the living area and faces the beach.

The great hall and hallway ceilings required 36,000 clay bricks purchased by Ruck Brothers from McNear Brick in California. "Since the bricks were thinner than standard bricks and were double-faced we were able to get two bricks from one, saving on the cost of the project," said David Nelson.

As the pictures show, the ceilings were wood framed, waterproofed and the brick applied with a high quality thin set. The brick then flowed into the stone veneer halfway down the wall.

In addition to the ceiling work, David also built three masonry fireplaces and two pizza ovens in this home. It was a challenging but very rewarding project.

**Mason Contractor**

David Nelson Masonry, Inc.  
[www.davidnelsonmasonry.com](http://www.davidnelsonmasonry.com)

**Architect**

Kukk Architecture & Design, PA  
[www.kukkarchitecture.com](http://www.kukkarchitecture.com)

**Supplier**

Ruck Brothers  
239-334-8022

**General Contractor**

Newbury North  
[www.newburynorth.com](http://www.newburynorth.com)





The featured product in this project is an integrally colored Versa-Lok Standard Retaining Wall - it displays a natural split-face texture that is perfect for today's contemporary designs. Because of Versa-Lok's uniquely engineered design, it enabled the creation of multi-angular curves and corners, stairs, columns, and freestanding walls. A matching cap was also implemented to attractively finish off the walls;- the perfect finishing touch.

This project site required an extremely tight space with which to install a true retaining wall. The Versa-Lok Retaining Wall System was an ideal match for such a challenging project.

The base of the walls are single faced split. As the walls become exposed from both sides, the product is double split – both the front and the back are split, providing a beautiful aesthetic option and visual. This magnificent home is situated on lovely Loxahatchee River in Tequesta, Florida, and is a perfect place for entertaining friends and family throughout the year. The Versa-Lok system has allowed the home to open up its doors and continue the theme both inside and out.

HARDSCAPES  
**FULLWOOD  
RESIDENCE**



**Masonry Supplier:**

A1 Block Corporation | [www.A1Block.com](http://www.A1Block.com)

**Mason Contractor**

Jeff Wildes | Wildes Builders | [www.wildesbuilders.com](http://www.wildesbuilders.com)

**Architect**

Marianne Griffiths | CadScape Design | 561-281-1282

**Structural Engineer**

T. E. Lunn, PE, LLC | [www.telunnpe.com](http://www.telunnpe.com)

**General Contractor**

James Fullwood, Inc. | Tequesta, Florida



CREATIVE USE OF MASONRY

# FIREMEN'S MEMORIAL



The Gainesville Firemen Memorial Sculpture was placed at the Gainesville Fire Rescue Headquarters to honor all fallen firefighters. While the initial drawing called for the piece to be filled with chert. In order to preserve the monument's longevity it was built using horizontal joint reinforcement, vertical rebar, and grout.

A sand blasted brick plaque was added to the base of the sculpture with emblem and mission statement. It quotes designer, Charles Partin, explaining his thought process as follows: " 'Stairway', is an obelisk shape creates a false perspective, giving a visual cue that the four ladders climb far into the sky. Each fireman has a firehose leading down to the base, which maintains a metaphoric tie to earth. At the same time the individual firemen are focused on their climb upward, which refers both to ascent into afterlife and to the department's 'relentless pursuit' of their mission."

**Mason Contractor**

Painter Masonry, Inc.  
352-378-7511

**Architect/Sculptor**

Charles Sharrod Partin  
[www.partinstudios.com](http://www.partinstudios.com)

**Owner**

City of Gainesville  
Gainesville, Florida







This massive project combined a concrete block and steel structural system with a brick and real limestone exterior façade.

This project, located on the corner of NW 13th Street and University Avenue, provides the gateway and signature project for the University of Florida as evidenced by the special entrance gate located on the SW corner.

This project took UF back to one of its original materials - limestone. Over the years architects have substituted concrete or precast in an attempt to mimic the original limestone featured gothic architecture, but somehow it always fell a little shy of the mark.

This combination of brick and limestone, custom crafted with some very intricate details, hails to an earlier era when this combination of materials was the norm on campus.

The University is proud to have the Heavener Business School as the signature building as students, faculty, and visitors approach campus, stating the importance and the grandeur of this institution.

INSTITUTIONAL WINNER

## HEAVENER HALL



**Coastal**

an Oldcastle® company

**Masonry Supplier**

Coastal, an Oldcastle Company | [www.oldcastle.com](http://www.oldcastle.com)

**Mason Contractor**

MPC Construction | Tallahassee, FL

**Architects**

SchenkelShultz Architecture | [www.schenkelshultz.com](http://www.schenkelshultz.com)  
Robert A. M. Stern Architects | [www.ramsa.com](http://www.ramsa.com)

**Structural Engineer**

Walter P. Moore & Assoc, Inc. | [www.walterpmoore.com](http://www.walterpmoore.com)

**General Contractor**

Ajax Building Corporation | [www.ajaxbuilding.com](http://www.ajaxbuilding.com)





Peter Burg 2014



**P**alladio is a luxury mixed use three-floor building with multiple units plus a penthouse suite. The exterior is Modular Brick with Carved Natural Stone and Cast Stone accents. The masonry includes traditional stone quoins, and Asian/Middle Eastern details and patterning.

**Masonry Supplier:**

Coastal, an Oldcastle Company | [www.oldcastle.com](http://www.oldcastle.com)

**Mason Contractor**

Seminole Masonry, Inc. | [www.seminolemasonry.com](http://www.seminolemasonry.com)

**Architect**

Nasrallah Design Group | [www.nasrallah.com](http://www.nasrallah.com)

MULTI-FAMILY WINNER

**PALLADIO**



**Coastal**

an Oldcastle® company

**Structural Engineer**

Devlin Engineering | [www.devleneng.com](http://www.devleneng.com)

**Photography**

Burg Photographix, Inc. | Peter Burg | [www.burgphoto.com](http://www.burgphoto.com)



# ARCHITECT | ENGINEER | CONTRACTOR

## ONLINE MASONRY CERTIFICATION



The Masonry Association of Florida (MAF) is in the 6<sup>th</sup> year of our partnership with the AIA of Florida. We've presented countless seminars and issued over 3,000 CEU's. The AIA Masonry Excellence Award has recognized two Honor Designs and five Merit Designs. Our goal from the beginning was to develop a close relationship with the AIA of Florida and establish the MAF as a resource to the architectural community. We have accomplished this resulting in many benefits to both the AIA and the MAF.

One of the first programs created by the Florida Concrete & Products Association (FC&PA) was the Masonry Certification Program. The program was very successful, training over 5000+ industry professionals –

architects, engineers, contractors and building officials. The MAF acquired the program in 2009, and began offering the course through the Masonry Education Foundation (MEF). Over the life of the Certification Program technology has changed dramatically. Accessibility to information through the web has altered the way people learn. We've taken the certification program from a four-inch binder to a flash drive with minimal supporting documents. The next step is going from an "in-person" course over two days to on-line learning, which offers flexibility and convenience for the participants.

This fall we will complete recording 15 hours of classes and will have the full course available on-line by 2016. The AIA of Florida's on-line "Distance Learning Program" has been recognized by the National AIA for its accessibility and diversified subjects. Once completed, architects can access the program through the AIA Distance Learning site and others in the construction industry (engineers, contractors and building officials) will access the program via the MAF.

This commitment to the masonry industry by both the MAF and the AIA of Florida will ensure quality masonry projects from design to completion and well beyond.

### MASONRY CURRICULUM

General Review of Specifications for Clay Brick Masonry (1 Hour)

General Review of Specifications for Concrete Masonry (1 Hour)

General Review of Specifications for Mortar and Grout (1 Hour)

Advanced Considerations of Concrete Masonry, Mortar and Grout Specifications (1 Hour)

Sustainability and Masonry (1 Hour)

Reducing Cracks and Delamination in Direct Applied Stucco to Masonry (1 Hour)

Preventing Water Penetration Through Masonry Walls (1 Hour)

Review of Changes to TMS 402/602 (National Masonry Code) (1 Hour)

Advanced Review of the TMS 402/602 Code (2 Hours)

Structural Considerations of Masonry Structures (1 Hour)

Mason's Perspective (1 Hour)

Cost Effective Design with Masonry (2 Hours)

Research on Energy Efficiency of Masonry (1 Hour)





## ENDURANCE

# FLORIDA'S HEART OF STONE

By Don Beers, PE, GC

For the past 70 years concrete masonry has been the predominant building material for exterior walls in Florida. This popularity has nothing to do with advertising or promotion, the means that most products attain universal use (think Coca-Cola & Pepsi). Rather, masonry (stone) has attained acceptance through the ages and across the world by simply being the best product for a broad range of environmental factors. In Florida, those factors converge to make it far and away superior building material of choice. It is at the heart of Florida's construction housing industry, thus, the title of this article – Florida's heart of stone.

Our affair with masonry here in the Sunshine State began with our oldest structure, the Castillo de San Marcos. Designed by Spanish engineer, Ignacio Daza, construction began in St. Augustine in 1672. By the end of the 1800's brick masonry had obtained considerable popularity, even though their production was labor intensive and their uniformity poor. The most beautiful and enduring structures in Florida were created from brick masonry. These include buildings such as Elizabeth Hall (1897) and Sampson Hall (1908) at Stetson University in Deland. Both are still



[above] Castillo de San Marcos C. 1672



### LEARNING OBJECTIVE:

To better understand why masonry is so heavily used in Florida walls systems.

in use to the present day – well over 100 years after their original construction. This is the meaning of "Sustainability"!

As we progressed into the early 1900's brick production was increasing in sophistication. The Medora brick plant, opened in 1906 in Indiana, produced around 54,000 brick per day with 50 employees. These mass produced brick were cheaper and more uniform making it possible for brick masonry structures to not

only be enduring but also more cost effective.

Production of concrete masonry was also improving in the first half of the 1900's but a break-through technology was presented at the 1943 World's Fair. Besser Company unveiled an "automated" 3-at-a-time block machine that could produce 5000 high quality & uniform concrete masonry units daily with only a fraction of the labor previously required. Almost overnight concrete masonry became the building material of choice in South and Central Florida. Publix built its first store in Lakeland out of concrete masonry in 1945. Masonry was recognized as possessing every trait needed in the harsh Florida environment. It had the strength to resist hurricanes,





[above] Sampson Hall c. 1908 Stetson University - Deland, Florida

the impenetrable durability of concrete AND it was cost effective to build with.

Today, the cost of masonry construction continues to come down. Modern automated brick plants produce 200,000 brick/day and block plant produce 60,000 units per day – with a tiny fraction of the labor. This huge increase in productivity extends right through production of the raw materials (aggregate and cement) and onto the construction site. Lulls and forklifts efficiently move heavy products to every corner of the job. This balance, where decreasing material cost offsets the increasing cost of labor, is a big part of the popularity of concrete masonry. It is one of the many reasons why Publix, 70 years after construction of their first store, still build concrete masonry wall systems.

There is more to the story than first cost. Estimates of termite dam-

age in Florida range around 1/2 billion dollars per year<sup>1</sup>. The percentage of Florida termite damage that involves concrete block is \$0/year. The fire insurance premium for a typical masonry structure is 15-20% less than the same structure built out of wood frame (Go Figure?). Mold damage in leaky wood walls is becoming a huge problem (concrete is not a food source for mold – nor does it support mold growth). And in the economic area, concrete block is a 100% Florida produced product from a Florida based industry.

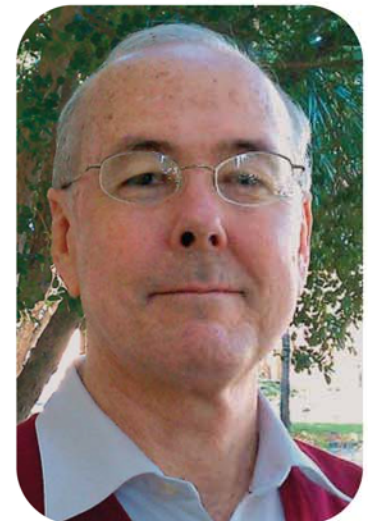
All of this taken together would explain Florida's love affair with block. But there is still more! In addition to these benefits new technical research on energy efficiency shows concrete masonry, with nominal added insulation, comparing favorably with expensive exterior wall systems containing much heavier levels of insulation<sup>2</sup>. Floridians already knew this from experiencing the

comfort of their masonry homes. Now we have definitive proof that masonry's energy efficiency compares favorably to any wall system, even those with much higher R values.

Why do we know that masonry holds the natural advantage over all competitive systems in Florida? – because of its dominance in an intensely competition market. A dominance that is maintained with virtually no marketing. Concrete masonry is naturally superior – truly Florida's "Heart of Stone".

<sup>1</sup> U of F Termite Expert: New Building Code Will Help Stop Pest (Published 2/15/2002 – U of F News)

<sup>2</sup> Florida Review of PNNL Research [www.floridamasonry.com/resources](http://www.floridamasonry.com/resources)



**DON BEERS, PE GC**  
MAF Engineer  
don@floridamasonry.com





# NEW MASONRY CODE INCREASES DESIGN STRENGTH

By Don Beers, PE, GC

## New Masonry Code Increases Design Strength by 33%

The *Building Code Requirements and Specification for Masonry Structures* contains two standards and their commentaries: *Building Code Requirements for Masonry Structures* (TMS 402, ACI 530, ASCE 5) and *Specification for Masonry Structures* (TMS 602, ACI 530.1, ASCE 6). These standards are produced through the joint efforts of The Masonry Society (TMS), the American Concrete Institute (ACI), and the Structural Engineering Institute of the American Society of Civil Engineers (SEI/ASCE) through the Masonry Standards Joint Committee (MSJC). The mission of the MSJC is to develop and maintain design and construction standards for masonry for reference by or incorporation into model building codes regulating masonry construction.<sup>1</sup>

For the purposes of this article we will refer to *The Building Code Requirements and Specification for Masonry Structures* as TMS 402 and the *Specification for Masonry Structures* as TMS 602. These are the most common designations for the code and specification. TMS 402/602 form the basis for masonry design in both the ICC and FBC and have for many years. For the purpose of this article it is important to note that the latest edition available of TMS 402/602 is routinely adopted by the ICC and FBC. TMS 402/602 is considered as the authoritative base code for masonry design in the United States.

The 2008 edition of TMS 402/602 forms the

basis of the current Chapter 21 of the 2010 FBC. The 2011 edition of TMS 402/602 forms the basis of Chapter 21 of the FBC 5<sup>th</sup> Edition, which will become the legal Florida Building Code on July 1, 2015. The 2011 edition of TMS 402/602 was used simply because it was the latest edition of TMS 402/602 available at the time the masonry Chapter 21 of the FBC 5<sup>th</sup> Edition was locked into Florida’s code development process.

Significant changes to the allowable compressive strength of masonry were introduced in the 2013 edition of TMS 402/602. These changes were the result of extensive research conducted by NCMA. This research was not completed in time for inclusion in the 2011 edition of TMS 402/602 and thus was not able to be included in the FBC 5<sup>th</sup> Edition.

This article focuses on how the increased code values of masonry compressive strength can be utilized on projects immediately and how these valuable provisions of the 2013 TMS 402/602 may become more readily usable in the near future. These increases are summarized in the following Table 1 below and can be found in TMS 602-13 Section 1.4 B.2. Table 2 (see Attachment 1 on page 26).

ASTM C90 is the national standard that tells us what criteria a concrete masonry unit must meet. It requires that all concrete masonry units must have an average net area compressive strength of 1900 psi and that no individual block tested has a net area compressive strength less than 1700 psi.



### LEARNING OBJECTIVE:

How to utilize the latest masonry codes in designing the most efficient masonry walls.

The Unit Strength Method outlined in TMS 602 Section 1.4 B.2 ((see Attachment 1 on page 26)) allows us to determine what the *f*<sub>m</sub> design strength (the value used by engineers and architects in design) is based on this C90 net area strength. As shown in the table above, this *f*<sub>m</sub> design value is increasing from 1500 psi to 1900 psi.

We want to stress that there is nothing different that has to happen to take advantage of this increase in design strength of approx. 27%. Modern methods in the uniform production and testing of masonry units have simply resulted in a better understanding of the allowable *f*<sub>m</sub> design strength of concrete masonry materials. This is not something that is going to happen in the future – it is already part of the national code. The Masonry Society, the American Concrete Institute and the American Society of Civil Engineers have determined that the allowable compressive design strength of any standard concrete masonry unit, produced according to ASTM C90, is now 1900 psi.

However the Florida Building Code, which governs the use of concrete masonry in the

TMS 402/602 Code	Net Area Block Strength (psi)	Design Strength <i>f</i> <sub>m</sub> (psi)
2008 and 2011 Editions	1900 psi – Current Min Block Strength per C90	1500 psi – Historic <i>f</i> <sub>m</sub> Design Value
2013 Edition	1900 psi – Current Min Block Strength per C90	1900 psi - New Standard Min <i>f</i> <sub>m</sub> Design Value



State of Florida, does not acknowledge this increase because of the offset timing in the development and release of the FBC. In most cases overcoming this glitch in the Code acceptance cycle is quick and straightforward for any designer wishing to take advantage of the increased allowable strengths by using the 2013 edition of TMS 402/602.

Any architect or structural engineer wishing to design according to the criteria of the 2013 edition of TMS 402/602 would need the local building official to approve the use of said standard as an "alternate design" in accordance with Section 104.11 of the 2010 Florida Building Code (a sample form is available on [www.floridamasonry.com/resources](http://www.floridamasonry.com/resources)). This approval would apply to a specific job and would have to be obtained for any specific job the designer was working on. However, once the Building Official approves the use of the 2013 TMS 402/602 there should be no reason to refuse approval on subsequent jobs. The use of the standard should be specified on the plans along with wind loads and other critical and required structural information. The Masonry Association of Florida is available to assist in explaining the latest 2013 TMS 402/602 standard to the local Building Official in the case that he has reservations concerning its use.

Although the increased design strength of CMU was approved by the MSJC and published in the 2013 TMS 402/602, the use of the increased design values is not related to any other provision of the 2013 Code. An example of this would be where other safety factors and design equations in the 2013 TMS 402/602 were modified to work in conjunction with the increased design strengths. **This is not the case.** The increased design values are "stand alone". They are a true increase in allowable f'm design strength and can be applied to design equation and procedures in the 2008 or 2011 TMS 402/602 as well.

For this reason, in order to take advantage of the increased values a designer may also choose to simply state the design f'm used in his project and then include a statement such as "Determined by Unit Strength Method per TMS 602-13 Section 1.4 B.2. Table 2" as the justification. This, again, would have to be ap-

proved by the local Building Official having jurisdiction over the project being designed. Obviously, this approval by the Building Official should be in advance of actually doing the design to ensure that the increased design values from Table 2 will be accepted. A sample letter is attached to this article that can be used to submit a project to your local building official for use of TMS 402/602-13.

As can be seen in Table 2 (see Attachment 1 on page 26) the correlation between net area strength and the f'm design strength remains 1 to 1 up to 2000 psi. The option is available for the designer to specify a net area strength of 2000 psi thus attaining an f'm of 2000 psi rather than 1900 psi. Most blocks manufactured in Florida will meet the 2000 psi net area requirement with no modification to the production process. You can quickly determine if there would be any additional cost for 2000 psi block rather than 1900 psi block by making a call to any of your local block suppliers. The block supplier would provide a certificate stating the net area strength of his block at 2000 psi.

**Again, the 2000 psi is being recommended because most CMU in Florida already meet 2000 psi. If not, the added cost of production to increase the strength from 1900 psi to 2000 psi should be very minimal<sup>2</sup>. Additionally, the 2014 edition of ASTM C90 has increased the minimum strength of concrete masonry from 1900 psi to 2000 psi (the Florida Building Code 5<sup>th</sup> Edition references ASTM C90-11b which sets the minimum strength at 1900 psi).**

Net area strengths greater than 2000 psi are readily available across the State from all manufacturers. Increasing the strength can be a very cost effective alternative to decreasing steel spacing, increasing wall thicknesses or including pilasters in the design. The 2013 TMS 402/602 code allows for higher values of f'm for all net area strengths. Thus, we recommend using the 2013 TMS 402/602 Unit Strength Method for the determination of your f'm for high strength masonry also.

The current 2010 FBC and the soon to be published FBC 5<sup>th</sup> Edition contain modifications to specific sections of the TMS 402/602 code. The modified sections of the TMS 402/602 code are unchanged in the 2013 Edition and are un-

affected by the code allowed increase in f'm design strength. The most important of these modifications involves the gamma factor in the development length equations. These factors were modified to remove the effects of earthquakes from the Florida lap calculation as required by the Florida legislature. The lap equation, factors for calculations and use of this equation are unaltered in the 2013 TMS 402/602. We would hope that the building official would allow continued use of the Florida factors in calculating laps from the 2013 TMS 402/602.

Increasing your f'm design strength from 1500 psi to 2000 psi can have a significant impact on the cost and materials required for your masonry structure. It is the hope of the concrete masonry industry that all engineers and architects reading this paper will be encouraged to immediately begin using the best design values currently available in the 2013 TMS 402/602. Currently, all that is required to do this is the approval of the local Building Official.

The masonry industry is currently working with the Florida Building Commission to get this straightforward update to the referenced TMS 402/602 code recognized across Florida. There are several way in which this might be accomplished and we are currently exploring the best options. We fully expect that by mid 2015 TMS 402/602-13 will be recognized by the Florida Building Commission as the governing masonry design code in Florida.

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<sup>1</sup> *Wording from 2013 Building Code Requirements and Specification for Masonry Structures – Abstract*

<sup>2</sup> *The strength of CMU is generally governed by the rate of breakage rather than a necessity to meet the requirements of ASTM C90. CMU are cubed and transported to the block yard via forklift usually within 16 hours of manufacturing. Within this 16 hour window the block must gain enough strength to survive this process. The strength required to keep the rate of breakage to an acceptable threshold during cubing and transport is generally what governs the ultimate 28 day strength. This strength is generally above 2000 psi.*



# TMS 602-13 SECTION 1.4 B.2. TABLE 2

**SPECIFICATION**

**COMMENTARY**

**1.4. B.2 Unit strength method (Continued)**

b. *Concrete masonry* – Use Table 2 to determine the compressive strength of concrete masonry based on the strength of the unit and type of mortar specified. The following Articles must be met:

- 1) Units are sampled and tested to verify conformance with, ASTM C90.
- 2) Thickness of bed joints does not exceed 5/8 in. (15.9 mm).
- 3) For grouted masonry, the grout conforms to Article 2.2.

b. *Concrete masonry* - Prior to the 2013 Specification, the standardized correlations between unit compressive strength, mortar type, and resulting assembly compressive strength of concrete masonry were established using prism test results collected from the 1950s through the 1980s. The result was a database of prism compressive strengths with statistically high variability, which when introduced the Specification, drove the lower bound design values between unit, mortar, and prism to very conservative values. The reasons for the inherent historical conservatism in the unit strength table are twofold: 1) when originally introduced, the testing procedures and equipment used to develop the prism test data were considerably less refined than they are today. Changes introduced into ASTM C1314, particularly requirements for stiffer/thicker bearing platens on testing equipment, produce more consistent, repeatable compressive strength results. 2) Previous testing procedures either did not control the construction, curing, and testing of masonry prisms, or permitted many procedures for doing so. As a result, a single set of materials could produce prism test results that varied significantly depending upon how the prisms were constructed, cured, and tested. Often, a field-constructed and field-cured prism would test to a lower value than a laboratory-constructed and laboratory-cured prism. Consequently, the compressive-strength values for concrete masonry prisms used to develop historical versions of the unit strength tables are not directly comparable to the compressive-strength values that would be obtained today.

**Table 2 – Compressive strength of masonry based on the compressive strength of concrete masonry units and type of mortar used in construction**

Net area compressive strength of concrete masonry, psi (MPa)	Net area compressive strength of concrete masonry units, psi (MPa)	
	Type M or S mortar	Type N mortar
1,700 (11.72)	---	1,900 (13.10)
1,900 (13.10)	1,900 (13.10)	2,350 (14.82)
2,000 (13.79)	2,000 (13.79)	2,650 (18.27)
2,250 (15.51)	2,600 (17.93)	3,400 (23.44)
2,500 (17.24)	3,250 (22.41)	4,350 (28.96)
2,750 (18.96)	3,900 (26.89)	
3,000 (20.69)	4,500 (31.03)	

<sup>1</sup> For units of less than 4 in. (102 mm) nominal height, use 85 percent of the values listed.



# 2015 MASONRY EXCELLENCE AWARDS INDUSTRY RECOGNITION

June 25, 2015, the Masonry Association of Florida (MAF) membership came together for an evening of celebration and tribute to the best in the Florida Masonry industry. This year, the membership presented one award as recognition of exemplary service to the masonry industry—Mason of the Year, Bill Parsons.

**Mason of the Year** is awarded to the individual contractor member for his/her outstanding contributions to the masonry association.



**ROBERT CARLTON**

Industry Recognition  
Awards Chairman

Capital Concrete &  
Masonry Solutions

## 2015 MASON OF THE YEAR AWARD RECIPIENT

### BILL PARSONS



**BILL PARSONS**

Florida Regional Vice President  
Pyramid Masonry, Inc.

The 2015 Masonry Association of Florida (MAF) Mason of the Year recipient is Bill Parsons. Bill is the Florida Regional Vice President for Pyramid Masonry in Orlando. He received his Bachelor of Science degree in Construction Engineering & Management from Purdue University in 1985 and has worked in the masonry industry for over 27 years.

Bill has been a member of the MAF for 20 years. He is in his second term on the MAF State Board of Directors as the Central Chapter Trustee and is also an officer on the board serving as the current treasurer.

In addition, Bill has been an active member of the Associated Builders & Contractors since the 1990's, serving on various committees as well as belonging to the Knights of Columbus.

On a personal note, Bill is married to Sheila Parsons and they have six children, two granddaughters and one grandchild on the way. Bill enjoys hunting and has a mini-farm raising animals.

Bill really "fits" the description of Mason of the Year with his commitment to the Masonry Industry, his outstanding leadership at both the MAF State and Chapter levels, his support of the apprentice programs and his participation in our industry events.

**Congratulations and thank you Bill for your dedication!**





## MASONRY EXCELLENCE MERIT AWARD WINNERS

- 1 | Orion Jet Center, Central Broward Construction
- 2 | Smith Residence, David Nelson Masonry
- 3 | Dr. Phillips Performing Arts, Pyramid Masonry
- 4 | Eatonville Gateway, Coastal
- 5 | Sheetz Residence, David Nelson Masonry
- 6 | Dunedin Fire Station, Coastal
- 7 | Daytona State College, Coastal
- 8 | Zephyrhills Public Library, Coastal
- 9 | Santa Fe State College, Argos-US
- 10 | Steelhouse, Coastal











AIA Florida





2015

# AIA FL HONOR & DESIGN AWARDS

**Merit Award for Masonry**

**"Ferguson Alley House"**

**Guy Peterson**

**Guy Peterson, Office for Architecture**

**[www.guypeterson.com](http://www.guypeterson.com)**

In the early 1990's, Guy Peterson was commissioned to design a photography studio for a client on a dense urban street in downtown Sarasota. Nearly 20 years later the client commissioned the firm to design a new residence for him behind the existing photography studio. The existing footprint for Ferguson Alley House is slightly larger than a standard two-car garage.

Due to the limitations of the site footprint, a vertical residence was designed to provide the required 2500 sq. ft. residential. Evaluating potential views from the upper levels, this award-winning design incorporates a series of roof gardens to allow the owner beautiful views to the downtown harbor and out into Sarasota Bay and beyond to the Gulf of Mexico.



FERGUSON ALLEY HOUSE

**GUY PETERSON OFFICE FOR ARCHITECTURE**





# CODE NEWS YOU CAN USE

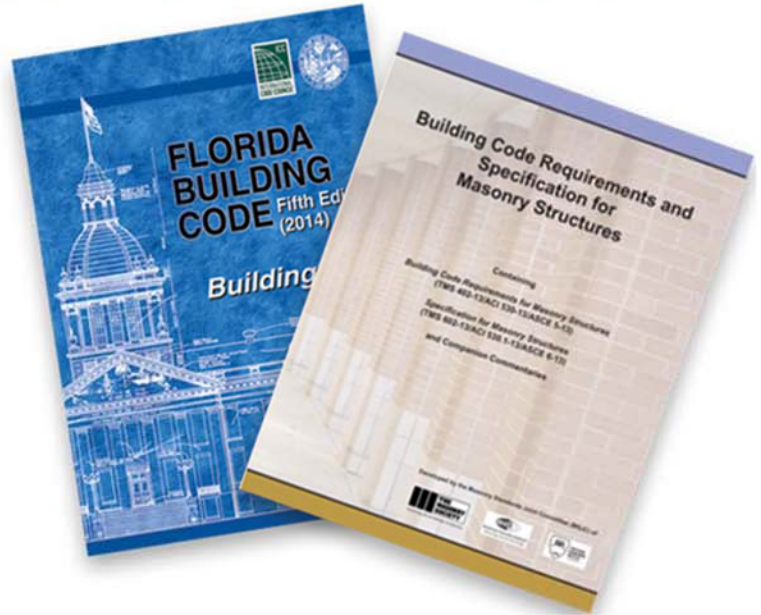
By Don Beers, PE, GC

**O**n July 1<sup>st</sup>, 2015 the Florida construction industry wakes up with a new building code. There have been significant changes in every area – including concrete masonry. The code change cycle is currently three years and it is amazing how quickly time flies. In fact, the code change cycle is now going so fast that the industry standards are having a hard time keeping up. This is exactly the problem with our national masonry code, TMS 402/602, and the Florida Building Code (FBC).

The new incoming FBC, 5<sup>th</sup> Edition, adopts the 2011 edition of TMS 402/602 while the latest edition of TMS 402/602 is 2013. Our industry has worked very hard in making sure that important technical changes were captured in the 2013 Edition. The changes, in some cases, increase the design strength of masonry by 33%. This is a BIG DEAL for concrete masonry, allowing us to build taller, thinner walls with less reinforcement. These “out of sync” code problems are somewhat complicated so we have included a short article, New Masonry Code Increases Design Strength by 33%, explaining in detail how to use the latest codes to design the most efficient masonry walls possible.

Another area of the codes that seem to be giving designers a fit is lap lengths. For as long as most of us (even the gray oldsters like me) can remember, lap lengths were simple. For Grade 40 steel you multiplied the diameter of the bar times 40 and for Grade 60 steel you multiplied the diameter times 48. The lap length of a ½" dia Grade 60 bar was 24" and the lap length of a #5 bar (5/8 " Dia) was 5/8" x 48 = 30" – easy-peasy! Unfortunately, everything today tends to gravitate towards complexity. The Florida Building Code now sports two methods for lap calculation, the method used in the International Building Code (IBC) and the method used in TMS 402/602 with Florida specific factors.

With the IBC method you are pretty much stuck with 72 bar diameters. The TMS method is not as bad with small bars but with larger diameter bars, such as a 1" dia bar in 8" block, your lap would be 92" or 7'-8" in length, unworkable in many job site situations.



## LEARNING OBJECTIVE:

How to discern what codes govern masonry design in Florida.

The reason for all of this was SEISMIC. The academics in block design around the country that had to deal with seismic events wanted to make sure that any lap was strong enough to develop a plastic hinge as the earth rocked back in forth. Fortunately for Florida - we don't do seismic! If the earth starts-a-shakin in Orlando you might want to check see if King Kong got loose from Universal Studios – but it's NOT an earthquake. The Florida legislator, in a rare moment of clarity, even outlawed the inclusion of seismic provisions in the FBC - just to prevent the heaped on cost of



unnecessary provisions. Thus MAF, with the help of the National Concrete Masonry Association, was able to back out the seismic provisions of the national code and replace them in the FBC with "non-seismic" factors adopted specifically for use in Florida. This has greatly improved our required lap lengths. I have included two lap charts in this article that should give a pretty fair idea of what you should be seeing on job sites. If you encounter laps on the job in excess of these please feel free to contact the Masonry Association of Florida for technical assistance.

To learn more about these and the rest of the code changes

coming your way in masonry design, sign-up for our Masonry Certification Workshop<sup>1</sup>.

The FC&PA, Masonry Association has held this workshop around Florida for almost 30 years. It gives the "Big Picture" of Florida masonry with a lot of detail on Florida specific Problems. Our changing codes are a key part of this year's workshop agenda.

See you there!

<sup>1</sup> For information on the Masonry Construction & Inspection Certification Workshop, please visit [www.masonryeducation.org](http://www.masonryeducation.org)



Phone: (954) 491-2772  
Justin@cbcfl.com

**Florida Specific Bar Lap Table (inches) for f'm=1500psi and Grade 60 Steel (Bar Centered in Cell)**

Bar Size	40 Bar Dia (Min Lap Allowed in the FBC)	48 Bar Dia (From on Old - Gone Forever - RIP We Love You)	72 Bar Dia (Max Lap Required in the FBC)	Required Lap Lengths for 8" CMU	Required Lap Lengths for 12" CMU
3	15.0	18.0	27.0	15.0	15.0
4	20.0	24.0	36.0	20.0	20.0
5	25.0	30.0	45.0	25.0	25.0
6	30.0	36.0	54.0	34.2	30.0
7	35.0	42.0	63.0	47.4	35.0
8	40.0	48.0	72.0	72.0*	45.5
9	45.0	54.0	81.0	81.0*	58.3

\*Use of #8 and #9 bars not recommended for 8" masonry

**Florida Specific Bar Lap Table (inches) for f'm=2000psi and Grade 60 Steel (Bar Centered in Cell)**

Bar Size	40 Bar Dia (Min Lap Allowed in the FBC)	48 Bar Dia (From on Old - Gone Forever - RIP We Love You)	72 Bar Dia (Max Lap Required in the FBC)	Required Lap Lengths for 8" CMU	Required Lap Lengths for 12" CMU
3	15.0	18.0	27.0	15.0	15.0
4	20.0	24.0	36.0	20.0	20.0
5	25.0	30.0	45.0	25.0	25.0
6	30.0	36.0	54.0	30.0	30.0
7	35.0	42.0	63.0	41.1	35.0
8	40.0	48.0	72.0	63.2*	40.0
9	45.0	54.0	81.0	81.0*	50.5

\*Use of #8 and #9 bars not recommended for 8" masonry

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**BROWARD COUNTY COURTHOUSE**

**FORT LAUDERDALE AIRPORT**



# MASONRY & THE FLORIDA CLIMATE

By Don Beers, PE, GC

A small sign at the entrance of my home town in South Florida announces "Where The Tropics Begin!". Considering the heat, humidity, rainfall and bug life in Florida you could stick that sign at the Georgia border. So... how do you build structures to survive in a swamp? Easy – build them out of concrete masonry.

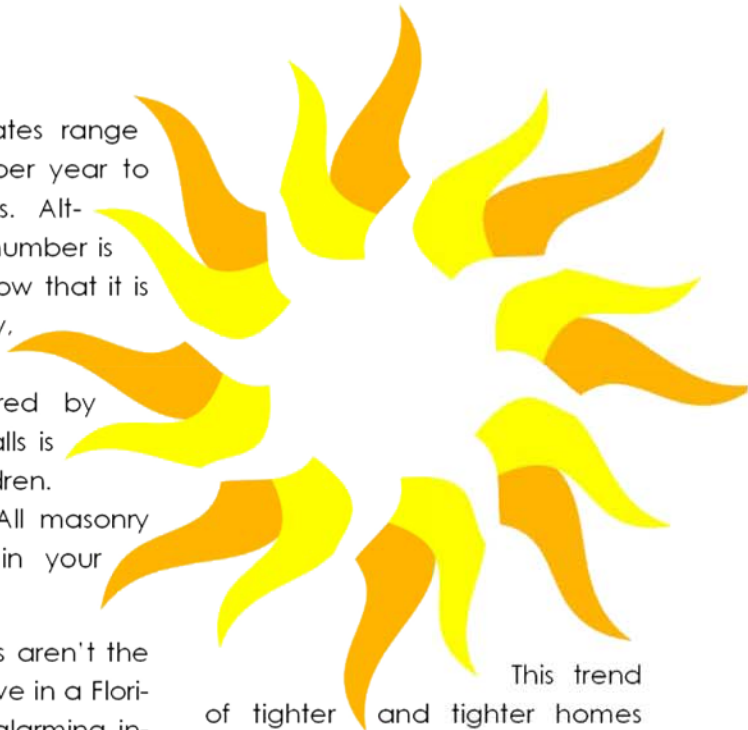
Whether fighting off swarms of mutant termites, stomping ½" long carpenter ants or choking on toxic mold spores, concrete masonry walls are the answer.

According to a 2002 article published by UofF<sup>1</sup>, termite damage and control in Florida exceeds \$500 million annually. Since our housing and building stock has probably increased by 20% since 2002, that number is certainly on the low end.

Across the US estimates range from 5 to 40 billion per year to feed the pesky insects. Although the exact \$\$ number is not clear – we do know that it is extensive. Conversely, the amount of termite damage suffered by concrete masonry walls is known to school children. That's right – Zero. All masonry means no termites in your walls.

Unfortunately, termites aren't the worst thing that can live in a Florida wood wall. An alarming increase in mold growth is starting to rival termites as woods biggest problem.

Experts are unsure of the exact reason for this moldy trend. With the current surge in residential construction there are a number of factors working in favor of mold. First, Florida is a wet state. The past rainy season has been one of the wettest on record. Thus the high levels of Lake Okeechobee. In addition, the National Association of Homebuilders (NAHB) tells us that homes are 50% more energy efficient than they were just 30 years ago and that this has been accomplished largely by tightening the building envelope.



This trend of tighter and tighter homes has continued with each new iteration of the building code. Small amounts of water leak or condense inside the wall and cannot find a pathway out. This potential build-up of moisture combined with an increased use of moisture sensitive materials such as paper-faced drywall and fiber insulation provides an ideal setting for mold growth.

Another possible reason for the rise of mold problems is the universal use of centralized HVAC systems. Besides becoming breeding grounds for mold, leaky ducts and exhaust fans can depressurize the house pulling in unwanted moisture through exterior walls and windows.

Finally, as residential construction in the State ramps up under the pressures of tight construction







## LEARNING OBJECTIVE:

Environmental conditions to consider when picking a wall product in Florida.

and production schedules, there is always the potential for increased design and workmanship flaws.

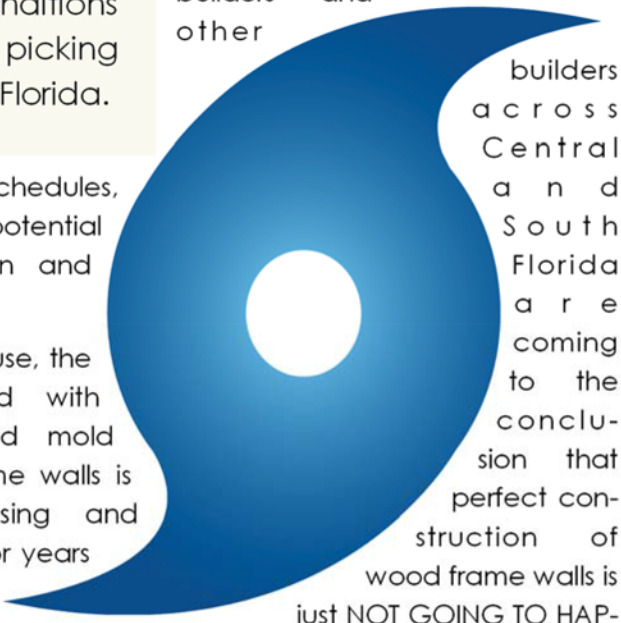
Regardless of the cause, the problems associated with water damage and mold growth in wood frame walls is dramatically increasing and may not be visible for years after construction.

The mold problem is NOT increasing in block homes. Concrete block is not a food source for mold nor does it support mold growth in any way. Additionally, if mold begins to grow on something attached to block, like dirt, the mold and dirt can be easily and permanently removed by simple, inexpensive cleaning methods. Many of masonry's competitive building materials cannot be cleansed of mold - Period - and require complete removal and replacement. This can lead to big problems becoming HUGE problems.

KB Homes recently has reserved over \$43 million (approx. \$51,000 per home) to repair damage caused by leaky wood frame walls<sup>2</sup>.

The two top builders of two-story homes in Florida have both recently switched to masonry sec-

ond floors. All of the top three builders in Florida are nearly 100% first floor masonry. These mega-builders and other



builders across Central and South Florida are coming to the conclusion that perfect construction of wood frame walls is just NOT GOING TO HAP-

PEN and are switching to block construction as a solution to the liability of moisture damage and mold.

So we circle back around to the original question - how do you build in a swamp? How do you get a structure to endure the tough climate of Florida? Concrete block construction is no more than a 1 - 2% cost increase over wood frame construction. It not only offers you protection against mold, concrete block is the Florida choice in every dimension of beauty, comfort and security. Mold, hurricanes, fire, termites - you name it - block walls are the answer.

<sup>1</sup> U of F Termite Expert: New Building Code Will Help Stop Pest (Published 2/15/2002 - U of F News)

## AIA FLORIDA PROJECT SUBMISSIONS

(Featured on pages 19 - 21)



AIA Florida

- 1 David M. Harper, Architect, FA IA, LEED AP Domus Alba
- 2 Sweet Sparkman Architects Sarasota County Fire Station #1
- 3 Mitchell O'Neil, AIA, PA L&L House
- 4 Touchstone Architecture St. Peter's Anglican Church
- 5 Clemens Bruns Schaub Architect & Associates Naples Residence
- 6 Moor & Associates, Architects, P.A. Private Residence
- 7 Solstice Architects Light Box House
- 8 Guy Peterson | OFA Inc. Ashridge House
- 9 Harvard Jolly Architecture Gulf Gate Library
- 10 Solstice Architects Tip Top Haus
- 11 Haas Modern Architecture + Design Lake Retreat
- 12 MATEU Architecture Casa Grove II & III
- 13 Solstice Architects Light Box House





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**Want to learn more? Visit us online at [www.FloridaMasonry.com](http://www.FloridaMasonry.com)**





To receive one AIA/CES credit, read Florida's Heart of Stone (p.22); New Masonry Code Increases Design Strength (p.24); Masonry Code News You Can Use (p.32); Endurance: Masonry & the Florida Climate (p.34) then complete the questions below.

**DIRECTIONS |** Select one answer for each question in the exam and circle the appropriate letter. A minimum score of 80% is required to earn credit.

**1| What development allowed concrete masonry to be mass produced at a drastically reduced cost?**

- a) Electricity
- b) Besser's automated block machine
- c) Kiln curing of block
- d) Improved mix designs for concrete used in masonry

**2| A modern high production concrete block manufacturing facility can produce how many units /day?**

- a) 10,000
- b) 20,000
- c) 40,000
- d) 60,000

**3|What is happening in the Florida Construction Industry July 1<sup>st</sup>, 2015?**

- a) New Rules from OSHA
- b) New Construction Tax Credits
- c) A New Florida Building Code
- d) New ACI Guidelines on Hot Weather Construction

**4| What Edition of the TMS 402/602 masonry code is referenced in the 2010 Florida Building Code?**

- a) 2002
- b) 2005
- c) 2008
- d) 2011

**5| What is the reinforcing lap length for masonry specified in the Florida Building Code, 5<sup>th</sup> Edition?**

- a) 40 bar diameters
- b) 48 bar diameters
- c) 72 bar diameters
- d) Depends on a number of variables

**6| MSJC stands for what?**

- a) Mechanical Steel Joint Connections
- b) Masonry Standards Joint Committee
- c) Masonry Seismic Joint Connections
- d) Masonry Structures Joint Committee

**7| A standard ASTM C-90 block must have what minimum average compressive strength?**

- a) 1800 psi
- b) 1900 psi
- c) 1950 psi
- d) 2000 psi

**8 | The f'm design strength for a minimum strength C-90 block is increasing to what value in the 2013 TMS 602 Code?**

- a) 1400 psi
- b) 1500 psi
- c) 1700 psi
- d) 1900 psi

**9 | An accepted National Code, that is not specifically referenced in the current edition of the Florida Building Code, can be used if approved by the Building Official in charge of that jurisdiction as an "alternate method of design"?**

- a) True
- b) False

**10 | U of F estimates the damage caused by termites in Florida to be approximately ½ billion dollars per year. What portion of that is from damage to concrete and concrete masonry?**

- a) 20%
- b) 10%
- c) 5%
- d) 0%

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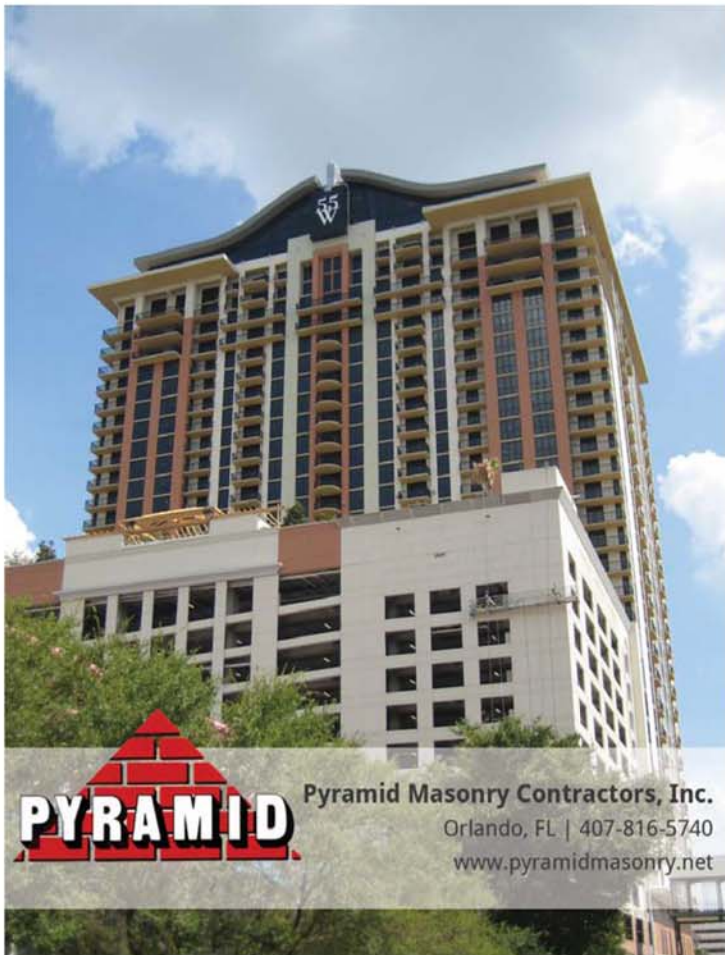
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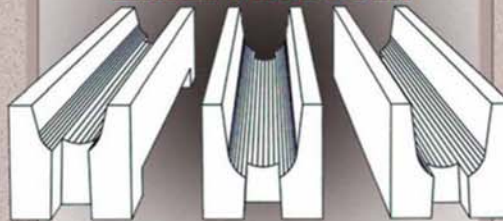
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