RCI Interface JAN 1993

PRESIDENT'S MESSAGE

Richard M. Horowitz AIA CRC
Horowitz & Edwards, Lawrenceville, NJ

A New RCI

In 1993, RCI will be ten years old.

In 1983, a small group of twenty-nine consultants somehow managed to put together an organization whose aim and goals were relatively simple: to introduce a measure of professionalism into the so-called practice of roof consulting, to raise the level of ethics in the profession, and to encourage the dissemination of information among consultants. They wished to encourage continuing education and the exchange of knowledge. There was so much to do and the grand vagueness of their aspirations appears from the vantage of hindsight to be wistfully admirable and romantic. One wonders just how they managed to get started, but they were practical men and they succeeded because RCI was an idea whose time had come.

In its tenth year, RCI has 546 members (at last count) scattered throughout the world and is growing in numbers during a time of financial problems. Its founding fathers would have some difficulty in recognizing their baby.

- RCI's Certification Program is in its sixth year; it has become the standard of the industry. The CRC examination is now given a second time a year at locations remote from the convention. A brush-up course is now offered. There are now 113 CRCs. Some building owners or managers now require that prospective consulting firms have a CRC on staff to qualify for performing roof consulting work; there are indicators that the U.S. General Services Administration may soon so require.
- RCI's Region Directors have become an activist group, promoting regional meetings at which technical presentations are available to many members who are unable to attend the national convention. The Directors also participate in member retention ("What aren't we doing for you?")
- RCI's Information Central, newly inaugurated, continues to expand its data base available to members and to non-members (although at

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PRESIDENT'S MESSAGE

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different billing rates), and offers information (upon inquiry) concerning all subjects related to roof consulting and roofing. John Newark needs your raw data (but he'd prefer that you clean it up a little).

- RCI's newsletter, INTERFACE, is also expanding its format and content and is endeavoring to serve as the Voice of the Roof Consultant.
- RCI's participation in industry-wide research programs, such as RICOWI, supplying data to NIST for its research program, and RCI's own Quick Response Program (weather-related data collection in areas of major storms) is increasing. Chairman Cal Roche has assembled a formidable steering committee comprised of nationally known experts in the field of wind-caused problems, some of whom will participate in the technical program pertaining to Hurricane Andrew at the 1993 convention in Orlando.
- In addition to the Quick Response Program which seeks to collect data for academic institutions to collate and from which to formulate theory, RCI has other research programs. One now coming on line is to assess the effects of insulation on membranes. Additional programs are now under study.
- RCI's National Advertising and Public Relations campaign (to let people know who and where we are) is being expanded to include RCI listings in major U.S. metropolitan phone directory Yellow Pages. This is keyed to RCI's Job Referral Program which refers inquiries for roof consulting services to RCI members in that general area.
- RCI's annual convention has grown in scope (the trade show continues to grow in size). Chairman Barry Krum (one of RCI's little-known toilers in the vineyard) has performed prodigies. Many of the beautifully-orchestrated presentations, facilities, and comforts offered at our annual meetings are the result of his careful planning and continuing labor.
- RCI's Registered Roof Observer Program, thanks to ex-President Jim Magowan, is up and running nicely.
- RCI's membership categories (in addition to Registered Roof Observer) have been expanded to include Affiliate member (so that multiple memberships can be afforded by firms larger than one person) and Government Liaison member (accorded to persons at the state and national level who are involved in positions relating to the practice of roof consulting).
- RCI's Crisis Intervention Program is being formulated under the leadership of Jim Magowan and Don Bush. What other professional association cares enough about members' firms and families which experience troubles due to illness, lawsuit, or death to try to help in times of crisis?
- RCI's Registration Program is proceeding with the imminent publication of the first edition of the International Directory of Roofing Professionals and the establishment of the RRC (Registered Roof Consultant) Program.
- RCI's Educational Program, along with the Registration Program, is under (parallel) development. The Level I Seminar (The Basics of Roofing) was given at various locations throughout the USA (the latest presentation was at the recent Region I meeting at Rome, NY) and was enthusiastically received; a surprising fact is the attendance of many CRCs. Levels II and III are currently under development and are scheduled for presentation in early 1993.
- RCI's overworked professional headquarters staff will soon expand to four persons since our current three staff members are inundated with work as our membership and programs expand. (The last Board teleconference was nearly 3 1/2 hours long). We're not Mom and Pop anymore, folks.

RCI members reading this and asking themselves "Why aren't I involved in any of this?" need not wonder any further.

PRESIDENT'S MESSAGE

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There is much to do, so please call headquarters and become a part of the action. RCI is where it's at. In ten more years, I probably won't recognize the joint.

The late Dr. Herb Busching, FRCI, (those of you who never met him missed knowing a rare person), said that RCI should stand for "Responsibility," "Competence," and "Integrity." Nobody could improve on that.

Some things never change.

RESIDENTIAL ROOFING FAILURES

Dave Siple, CRC,
Ribble & Associates, Clearwater, Florida

Typically, our industry has, for reasons of economics, focused its attentions on commercial roofing. To anyone who saw pictures of Homestead Florida, it is brutally obvious that we must also address the performance of residential roofing systems. I observed hundreds of residences in Homestead, Kendall, Cutler Ridge and Florida City. While some residences sustained extensive damage, adjacent buildings may have received little or no damage. The undamaged structures were not investigated so no conclusion about their construction can be made. I observed, in the damaged and destroyed structures, common modes of failure. I have categorized these failures as follows and propose possible changes geared towards preventing or at least minimizing future occurrences of them.

The typical modes of failure found are as follows:

- **Loss of shingles or tiles.**
- **Loss of underlayment felt.**
- **Loss of plywood.**
- **Loss of gable overhangs.**
- **Collapse of trusses.**
- **Collapse of wood framed second stories.**
- **Contributing effect of interior pressurization.**
- **Other failures.**

Loss of Shingles and Tiles.

Typical shingle failure is shown in pictures #1. Asphalt shingles have not been designed, manufactured or tested to meet a 120 mile per hour wind speed. Until they are, we cannot expect them to stay on a roof at this wind velocity. Some of the shingles were blown off taking the nails with them and others had the nails stay in place with the shingles pulling up over the nail heads. If the shingles were all blown off but the underlayment stayed in place, there would be minimal rain damage to the interior. This would allow a measure of protection until new shingles could be installed.

Picture #2 shows typical tile loss/damage. The mud-on tile system is used almost exclusively in this region. The bonding of the tiles to the mortar is where the failure of the system usually occurs. The mortar usually bonds well to the surface of the #90 but not as well to the smooth surface of the back of the tiles. It can be seen that very small beds of mortar were used.

The roof deck must also be considered for holding power of the nails. Plywood seems to have the advantage for both the withdrawal resistance of roof nails and the pullover resistance of the nail heads attaching it to the trusses.

The failures reported by South Florida Building Code Officials of the stapling of shingles, stapling of the decking and the use of wood-chip boards and the almost sure banning of these products, until they can be proven in more rigorous testing, seems reasonable.

Recommendations

Heavier shingles could be used that would resist pulling up over the nail heads.

Six nails could be used to secure down the shingles, but this does present a problem in the offsetting of alternate courses where the shingles abut with the possibility of a nail under the joint.

Larger headed nails might also be manufactured.

Stronger and wider self-sealing strips can be designed.

The development of new products will only come as a consequence of higher code requirements or demands by Roofing Design Professionals.

The almost sure failure of shingles at 120 miles per hour winds should cause a designer to specify the redundancy of the underlayment to provide a secondary waterproofing, if only for a short time.

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Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

The mud-on tile is very time-critical in getting the tiles set and bonded in to the mortar bed. This system seems to have failed in the high winds of this hurricane. The proposed code changes to include nailing of the tile may solve the problem. But if nailing must be done, the question that must then be asked is, "why not go to a total nail-on system?"

In high winds, the tiles are lifted at the bottoms so the use of hurricane clips should be a must for all tiles.

Loss of Underlayment

Picture #1, #4 and #5 shows the loss of most of the underlayment where the shingles were blown off. The code does not require any specific nailing pattern for the underlayment. The purpose of the underlayment has been to provide a secondary waterproofing just in case some water may get under the shingles. It is not intended to provide waterproofing in case the shingles happen to get blown off. In some cases it was observed that shingles were blown off and the underlayment stayed in place. A heavy nailing pattern was observed on the underlayment. In these cases, the roofs may have been dried-in knowing that the shingles would not be installed for a short period of time and the nailing was very heavy to prevent the underlayment from being torn off in light winds.

The failure of #15 underlayment has caused the code change to eliminate its use.

If a shingle roof blows off and the underlayment stays, the massive interior damages would not occur. On the tile roofs where the base sheet and mopped #90 stayed in place, water infiltration through the membrane was not identified as a problem. It would only seem reasonable that what has previously been considered to be a minor system component, and a cheap one at that, should be a major consideration and worthy of additional investment.

Recommendations

A minimum of a #30 asphalt saturated felt should be used and it should have the laps sealed with roof cement. The laps should be nailed with a minimum of 1" nails through tin caps at 6" on center along the laps with 2 rows through the middle of the sheets at 12" on center. This would provide a minimum standard that should be implemented immediately and tested later to see if it is rigorous enough.

The other alternative to assure that a shingle underlayment would stay in place, even if all the shingles were blown off, is the installation of one of the self adhesive, peel-n-stick, underlayments applied directly to the roof deck. This also could be implemented immediately and testing could follow. This is a much more expensive product but it does provide a more substantial underlayment that is fully adhered.

Loss of Plywood

Loss of plywood was observed at the eaves, ridges, in the middle of the roof and especially at the gable ends, once truss collapse occurred. The code for nailing was 6" on center on the edges of plywood and 12" on center in the intermediate support. Plywood was observed on the ground that still had the nails in it, that was nailed to code standards!

Plywood and chipped-board that was stapled has been reported by the South Florida Building Code Officials as failures and they have banned the use of both staples and the chip-board until more rigorous testing will allow its use.

Picture #3 shows the loss of the plywood on the ends of the roof. From ASCE 7-88, the wind uplift on this zone is greater that the field of the roof. The eaves and ridges also have the higher uplifts. No provision is made in the code for these additional forces.

Recommendation

The nailing of the plywood deck should at least meet the ICBO standard of 4" o.c. on the edges & 6" o.c. for the intermediate support and only nails should be used.

Calculations should be made from the ASCE 7-88 for the perimeter zones and additional nailing at these zones should be required. An interim standard might be to require 3" o.c. on the edges and 4" o.c. intermediate for these zones. The cost in labor and nails is minimal, with power nailers, compared to the catastrophic building losses once pieces of plywood come off.

A nailing density inspection should be required by a code official or a Roofing Professional, before the underlayment is installed.

Loss of Gable Overhangs

Picture #4 shows a residence in Homestead that sustained an impact that broke the gable end plywood and had some loss

of shingles and underlayment, but the overhangs stayed in place.

Picture #5 shows a residence just down the street from where the overhang came off, there was a loss of plywood and all the shingles and underlayment came off. Notice the one piece of plywood on the eave that was still in place and the rest of the decking is chip-board!

Pictures #6 and #7 show more severe building damage when the overhangs came loose. Most of the overhangs are constructed of 2x4's and are face nailed to the gable end trusses. The plywood sheeting on top is expected to hold them in place. Usually 3/8" or even 1/4" plywood is used under the overhangs for a finish and the nailing is only to hold it in place and not for structural purposes.

When wind gets under an overhang and lifts it, the plywood nailing fails and the roof failure has started and may progress much further. Buildings with no overhangs sustained less damages but picture #3 shows loss of plywood can still occur without overhangs.

Recommendation

On large gables, a lower gable truss can be ordered. This would allow lookouts to be installed from the adjacent truss, over the gable and out the necessary distance for the overhang. All lookouts should be secured with hurricane straps to the gable truss.

On small overhangs like the entrance in picture #6, a 2x4 extension could be built but additional face nailing should be required. Also a minimum of 1/2" plywood should be used under the overhang and it should be nailed 4" o.c. along the edges.

Some truss manufacturers make overhangs with gang nail fasteners but they are still face nailed to the trusses, so adequate nailing is still the major consideration.

Collapse of Trusses

The most catastrophic failures occur when the plywood comes off and there is no lateral interior bracing of the trusses. Pictures #6, #7and #8 show the progressive collapse of the structures. The usual case is that the overhang is lifted up and pulls up the plywood and the nails holding the gable truss in place. The gable truss then falls into the next truss, bending the nails and that plywood sheet comes up and it progresses as much as shown in picture #8. Many cases were observed where the entire roof truss system collapsed like the left side of the second story roof in picture #6, above the double set of windows.

Picture #9 has a wood framed second story and the trusses in the front yard are from that roof. All but the small portion on the right collapsed.

The code requires lateral bracing of the trusses as specified by the truss manufacturer. In hundreds of observations of partial collapses of trusses, only a very small percentage had any recognizable interior truss bracing. What little was observed was on the bottom chord of the trusses with just a few cases of a 2x4 leg down from the point of the gable to an interior truss. If truss manufacturers had specified bracing, it was not installed. Some observations were made of gable trusses on the lee side of the building where the bottom of the truss was blown out, possibly after the windward gable was blown in. The bottom of the trusses must also be secured but the code only requires it to be secured 6' on center.

Recommendation

Lateral bracing must be required! The nailing of the plywood deck may provide diaphragm bracing but if the gable truss fails, the rest may fall like dominoes. The truss manufacturer must specify the lateral bracing and their plans must be on-site during the construction and inspections. As an interim standard, a minimum of two 2x4's should be nailed to the bottom of the top chords of the trusses on each side of a 24'wide truss. They should be either run down to the top plate of the sidewalls or they could be run back a minimum distance of 8' from the gable truss, straight. If they are run straight back, blocking should be installed between the trusses on top of the bracing, so lateral forces are resisted by the blocks and not the nails. 2x4 bracing should also be installed on the top of the bottom chords of the trusses, with 3 runs on a 24' wide truss and 4 runs for 30' trusses. The 2x4's should be nailed with two 16d nails per truss.

The bottom of the gable trusses should be secured with truss straps 24" on center with the strap wrapped over and nailed with three 16d nails.

continued on page 6

Photo 6

Photo 7

Photo 8

RESIDENTIAL ROOFING FAILURES

continued from page 5

Photo 9

Photo 10

Collapse of Wood Framed Second Stories

The survival of the reinforced concrete block structures with poured concrete tie-beams shows how good design, testing and installation worked. Some wood framed single story residences were observed that totally collapsed whereas neighboring residences of masonry construction had little or no damage.

Most of the failures observed of wood framed structures were with the first story being masonry construction and the second floor being wood framed. Picture #9 had all but a small portion of the second story blown apart.

Picture #10 shows the lee side of the building where the wall was about to fall out. Notice the hurricane clips holding the studs to the plates. But the bottom plate has come loose from the floor deck and the top plate has come loose from the gable truss.

Recommendation

If wood framed structures are to be considered at all for hurricane construction, a thorough review and design using ASCE 7-88 should be proposed and extensive rigorous testing should be performed before construction is allowed. Strapping or bolts from the first floor tie-beam should be considered going all the way up and over the roof trusses to tie the structure together.

Wood framed structures should be considered inferior construction for hurricanes until adequate design and testing are completed.

Contributing Effect of Interior Pressurization on Failures

The most common failure observed was the loss of windows from flying debris. Once the wind entered the structure, it caused interior pressure on the lee side windows and walls, with some of them failing. The interior pressurization also added to the wind uplift on the roof deck and caused loss of the plywood. The more windows broken out the greater the effect.

ASCE 7-88 gives the additional factor for the percentage of the opening for a partially enclosed structure compared to a totally enclosed structure. Normal buildings are always designed using the totally enclosed factor but once the windows are out it becomes a partially enclosed building and the design may not be sufficient to prevent collapse.

In the case of a gable truss being blown in, the wind can enter in the attic apace and lift more plywood and possibly blow out the gable truss on the other end.

Observations were made where hurricane shutters of various construction or plywood sheeting were used. Almost without exception, only minimal structural damage occurred where such shutters were in place. The residence next to the one shown in picture #9 was the same model, with wood framing on the second floor, but it had roll-down hurricane shutters on the 7 windows facing the wind. There was no structural damage, whereas the one next door was totally destroyed.

Many single wide garage doors survived even though they were badly dented from impacts. The double wide garage doors had a much higher failure rate. Picture #11 shows a garage door in the foreground that was braced horizontally with 2x4's and it is laying in the street!

Recommendation

Protection of the windows is a must! Preventing the wind from entering the building may be the difference between the structure sustaining no damage and a total failure.

Roll-down, fold-down and clip-on shutters can all be effective in most cases. Pieces of broken tile traveling a 100 miles per hour will destroy most shutters. 3/4" plywood boarded over the windows might be more effective in a neighborhood with all tile roofs.

Double wide garage doors should have vertical bracing from the concrete floor up to the ceiling at least in the middle and possibly in two places.

Other Material and Construction Failures

Blow-off failures occurred to many non-structural elements. Thin aluminum fascia and soffit trim were totally stripped away. This type of trim uses a minimum number of small nails for its attachment so they do not detract from the trim's appearance. Painted wood trim did not blow off!

Aluminum patio coverings with minimal attachment of the pans to the aluminum framing and the framing to the building and concrete slab were also totally blown away.

Roof extensions over entrances or patios also failed when the winds lifted them

RESIDENTIAL ROOFING FAILURES

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and supporting posts fell out because they were not attached well to the ceiling beams or to the concrete. Once the supporting posts were gone and the winds subsided, the weight of the roofing structure sagged down these extensions.

Recommendation

Attachment is essential! Whatever fascia and soffit materials that are used must be securely fastened. Wood is recommended as soffits. If aluminum or vinyl products are used they must show testing results and the methods and fasteners needed.

All extensions of the roof structure should be designed according to ASCE 7-88 for the wind uplift forces for the supporting post attachment to the ceiling beams and the concrete slab or footings.

Hurricane Resistant Roof Construction

This report has explored the failures beyond the usual area covered by Professional Roof Consultants, only because most of the roofing failures were in a neglected area of study: the structure. If the plywood and trusses don't stay together, it is of little consequence to focus on roof covering failures.

The ANSI A-58.1 Standard for Model Building Codes has been taken over by the ASCE and is designated as 7-88. This is the design code to start from in calculating wind loads on structures and roof coverings. Local building codes try to use 7-88 and simplify it for their residential construction codes.

More complicated structures and commercial buildings require Design Professionals to develop the structural and roofing systems. They may start with the local building code but may have to go back to ASCE 7-88 and other standards developed by UL, FM, SPRI, ARMA, etc...to design a structure and roof cover that will stay together and also provide the properties of being watertight, economical, long service life, etc...

This report has explored the modes of roof failure and some of the remedies possible. Input from Code Officials, Roofing Manufacturers, Roofing Professionals and Roofing Contractors will be valuable in the process of making changes that will prevent the type of failures observed from "Andrew."

The key elements are Good Design, Good Materials, Good Construction and Good Inspections. Those whose espouse the popular notion that "it will just be too expensive to do all this", have not taken the time to total up the billions of dollars that will be expended and the human suffering caused by this one storm.

Photo 11

* Attention * CRCs and RROs

Renewals for **all** those who are **Certified Roof Consultants** are due at three-year intervals, the next renewal occurring in 1995. This means that everyone who obtained certification prior to or during 1992 must renew it by December 31, 1995 in order to maintain his status.

Renewals for **Registered Roof Observers** are due every two years. Everyone who obtained registration prior to or during 1992 must renew it by December 31, 1994 in order to maintain his status.

Requirements for Renewal:

1. You must remain a member in good standing with RCI.
2. Pay the renewal fee: $100 for CRCs; $50 for RROs. You will receive an invoice from Headquarters along with your membership dues.
3. For CRC renewal, provide evidence of obtaining at least **three** Continuing Education Units (CEUs) pertaining to roofing, building design or construction, business practice or a closely related field during the 3-year interval. For RRO renewal, provide evidence of obtaining at least **2.5** Continuing Education Units (CEUs) pertaining to Q.A. observation activities during the 2-year interval. **IT IS THE RESPONSIBILITY OF EACH CRC OR RRO TO SUBMIT THE REQUIRED CEU DOCUMENTATION TO HEADQUARTERS.**

DON'T BE CAUGHT UNPREPARED IN '94 AND '95.
Start working on your CEUs NOW!

CRCs and RROs

EDUCATIONAL &PROMOTIONAL OPPORTUNITIES

Jeanette Bottitta
RCI Headquarters

Like Our Membership, the Institute Is Growing

RCI Offers New Educational and Promotional Opportunities

RCI has more members now than ever before. You come from diverse backgrounds, covering a broad range of education and experience,and it is this diversity which makes the Institute strong.

Yet, as RCI members, you have at least two things in common: your drive for ever more excellence and your desire for new opportunity. Specifically, you want more opportunity to learn and to advance yourselves.

At RCI these go hand in hand. That's why we've developed a whole new program that integrates education, professional registration, and listing in an international directory.

Education Series/Choose your own level of mastery

Registered Roof Consultant Program/Gain recognition for what you've learned

International Directory of Roof Consultants/Promote yourself to potential clients

Education

Whether you're someone with years of roofing experience or whether you're new to the field and simply want to learn a few things, our education series is designed for you. The Level I course covers the basics of roofing, focusing on roofing history, design principles, surveys, non-destructive moisture testing, and other general information about good roofing practice.

For those of you who want more advanced technical information, RCI's Level II course offers three days and two nights tackling such problems as wind, drainage, fire, thermal and moisture migration, steep roofing, product testing, roofing chemistry, core cuts, forensic investigations and asbestos handling.

Level III follows with four days and three nights of instruction and problem solving in the following areas: wind, drainage, thermal and moisture migration, specific roof systems, decks and insulations, flashings, waterproofing, walls and windows, plans and specifications, QA and QC, warranties, roofing chemistry, ethics, product information and practical considerations. Both Level II and Level III courses conclude with an examination.

Registered Roof Consultant (RRC) Program

Registration documents your commitment to the industry and is often the key to professional advancement. Our new Registered Roof Consultant Program - offered to RCI members and non-members alike - puts this goal within your reach. It also puts you one step closer to obtaining Certification, which remains open only to RCI members. The Certified Roof Consultant designation is recognized by most organizations as the pinnacle of achievement in the profession, and those who successfully complete the RRC program are encouraged to become RCI members and apply for Certification.

Who is eligible to become registered?

- All RCI Certified Roof Consultants in good standing.
- All IRWC Certified Professional Roof Consultants in good standing.
- Anyone who has accomplished all of the following:
  I. Completed RCI's Levels I, II and III Educational Courses and/or passed qualifying exams for these three levels.
  II. Completed home study requirements.
  III. Presented evidence of completing relevant Continuing Education Units.

IV. Provided to RCI three work/character references, all of whom must be either a Registered Architect, Professional Engineer, a CRC or a CPRC.

RCI offers an official Registered Roof Consultant (RRC) Seal to all those who successfully complete this program.

International Directory of Roof Consultants

As an integral part of its registration program, RCI publishes the *International Directory of Roofing Professionals*, listing all Certified Roof Consultants, Registered Roof Consultants, Registered Roof Observers, and others who wish to be identified with its classification process. This directory not only lists all RCI members, but also classifies them and others so that potential users or purchasers can better decide whom to contact. The directory also provides a convenient way to advertise yourself regionally, nationally, and overseas.

Ensure your future by taking advantage of RCI's education, registration, and promotional opportunities!

1993 Calendar of Courses

Level I: The Basics of Roofing

Shaumburg, IL	**February 4**
National Convention	**April 1**

Level II: Basic Roof Consulting

Raleigh	**Feb. 19, 20, 21**
	Oct. 1, 2, 3
Chicago	**Feb. 26, 27, 28**
	Oct. 8, 9, 10
Los Angeles	**Mar. 5, 6, 7**
	Oct. 15, 16, 17

Level III: Advanced Roof Consulting

Raleigh	**May 6, 7, 8, 9**
	Nov. 4, 5, 6, 7
Chicago	**May 13, 14, 15, 16**
	Nov. 11, 12, 13, 14
Los Angeles	**May 20, 21, 22, 23**
	Nov. 18, 19, 20, 21

If you'd like more information about any of these program, call Headquarters at 919-859-0742.

EDUCATIONAL & PROMOTIONAL OPPORTUNITIES

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1993 - 1 994 Calendar of Events

REGION II
FLORIDA CHAPTER
January 28, 29, 30, 1993
Orlando, FL

REGION III
February 5, 1993
Shambourgh, IL

REGION IV
January 28, 1993
Houston, TX

REGION VI
(1) February 1, 1993
Sacramento, CA
(2) June 7-9, 1993
Las Vegas, NV
WSRCA
(3) September 13, 1993
Los Angeles, CA
(4) November 8, 1993
Phoenix, AZ

1993 RCI CONVENTION
March 28 - April 1, 1993
Orlando, FL

1994 RCI CONVENTION
April 9 - 14, 1994
San Antonio, TX

CONVENTION UPDATE

Jeanette Bottitta
RCI Headquarters

Question: *"What's So Great About RCI's National Convention?"*

Answer: *"You are!"*

What Is a Great Convention?

One example of a great convention might be "an assembly of the finest roofing professionals in the land, convening to examine and evaluate their representative goods and services and to put forth, through intelligent discussion, ideas which are of such value as to influence the future course of events."

Sound like RCI's National Convention?

It sure does, with the addition of entertainment and all the attractions of Orlando. But aside from fun and frivolity, our convention has the elements that matter. Take, for example, the concept of intelligent discussion and important ideas.

We're Not Trying to Drop Names, But . . .

When you've got speakers and topics like ours, it's hard to keep quiet. Take a look at the technical sessions to be presented at our Convention.

Wind Designs That Work - Or Pass the Test!
James P. Sheahan, CRC,
J.P. Sheahan Assoc.

Fastening Examined as a Science
Lyle Hogan, PE, CRC,
Trigon Engineering

A Realistic Approach to Prescriptive Specification
Richard Canon, PE, CRC,
Canon Consulting

Life-Cycle Costing
Edward Riley & Robert Nicoll
J.P.S. Elastomerics

Roofing Considerations on High Temperature/High Humidity Buildings
Thurman "T" Freeman, CRC,
Dow U.S.A.

What Does a Specifier/Designer Need From the Consultant?
Barry Donaldson, AIA, Exec V.P.
Tishman Research Corp.

Liquid Membranes-Hot and Cold: Where, Why and How
Neil F. Thomas, President
Thomco, Inc.

Architectural Sheet Copper
David Hunt, Mgr. Archt. Serv.
Revere Copper Products Inc.

Hurricane Andrew
Among the speakers:
Dr. Peter Sparks
Clemson University

Single-Ply Seams
Dr. Walter Rossiter, Jr.
NIST, Center for Bldg Tech.

Presenting Our Special One-Day Seminar

State-of-the-Art Metal Roofing
SPONSORED BY THE AMERICAN IRON AND STEEL INSTITUTE

Speakers:

Paul Nimtz, AIA,
PDN Associates, AISI

Robert Gardner
Knauff Fiberglass, NAIMA

Harold Schroth
Akzo Coatings Inc., NCCA

Gill Harris
MBMA

Topics include:

Hi-tech Coatings, Avoiding Leaks and Failures, ASHRAE Requirements, Wind-related Issues

The Basics are Back

RCI's Level I course, *The Basics of Roofing,* has been widely praised by members and non-members alike, and will be presented again on Thursday, April 1. Read more about RCI's educational program in this issue.

Just For Fun

Banquets, entertainment, dancing . . . these are some of the nice things you'll find at our convention.

Spouses will enjoy our Hospitality Suite, open Monday through Wednesday; a place to relax, snack and socialize. And this year's spouse program events are just as pleasing: scenic boat cruise through the beautiful lakes

and canals of historic Old Winter Park; guided tour of Morse Art Museum, known for its Tiffany glass, pottery, paintings, metal work and furniture; lunch at the award-winning Park Plaza Garden; and a relaxed browse along Park Avenue, Orlando's most exclusive shopping promenade. ***(Space is limited, so make your reservations now.)***

Whether you like amusement parks, theme restaurants, relaxed dining or fast action, you'll love Orlando. You'll also love the Hyatt Orlando Hotel, comprising clusters of "mini-hotels", each with its own adult swimming pool, children's pool, playground and recreational facilities, all surrounding a spacious lobby filled with variety shops and dining, ranging from elegant to relaxed and informal, with special children's rates. The Hyatt is within minutes from all the action in Orlando, and has another special feature: your stay at the Hyatt helps the Institute financially. So take advantage of our special discount rates and reserve your room with the Hyatt before **February 27, 1993.**

On the Serious Side

For those who want more from life than fun, stimulating lectures and cutting edge technology, here's the chance to earn your CRC or RRO title. Both exams will be given on Sunday, March 28. Sorry: only those lucky few whose applications have been approved may sit for the tests, but . . .

The rest of you can come to the CRC Review Session and learn from the experts a little more about this exam. The review is open to anyone interested, and offers CEUs.

Goods and Services on Display

We can't overlook the heart of our Convention: the Trade Show. Our exhibitors are too numerous to mention here, and it wouldn't be fair to single out only a few. But anyone can tell you that our exhibitors represent the finest contributions made to the roofing industry. Come and visit our exhibit hall, see the latest products and technologies, exchange ideas with the best companies and organizations, and share your enthusiasm for one of the most important inventions since the wheel (before the wheel?). Whether you're an expert in the field or someone who'd just like to learn a little more, you'll come away feeling that you received much more than your money's worth.

CONVENTION UPDATE

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What Makes Our Convention So Great?

It's simple: people like you who come to learn, to teach, to show, and to meet other people. You are what makes our Convention so great. Because the best Convention is the one you all attend.

THE YELLOW BRICK ROAD

John Newark
RCI Headquarters

The Yellow Brick Road

(or RCI at work for its Members!)

I thought that might get your attention (sorry, this isn't really an article on Dorothy, Toto, Kansas, the Scarecrow or even the record by Elton John). What this article is about is a new program launched by the Executive Committee.

During the November teleconference, the Executive Committee established a "National Yellow Pages Advertising Campaign." This effort will list RCI in the yellow pages of directories for 51 municipalities across the U.S. The goals of the program are twofold; one, to increase the recognition of the Roof Consultants Institute across the country and two, to stimulate calls for referrals to members.

The chosen directories were selected from the National Yellow Page Publishers Association list of the top 100 markets (based on population) and from our review of the geographic distribution of RCI members.

We've selected "Ads/Plus: National Yellow Pages Agency," as the professional agency for the program. They will help us manage the program and assist us in our efforts to identify the "right" markets. Ads/Plus works on a commission arrangement with the publishers (similar to a travel agency); RCI pays the actual cost of the listing only.

Obviously, we couldn't afford to be listed in all the directories across the country, but our effort is aimed at obtaining maximum "bang for the buck." A complete

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THE YELLOW BRICK ROAD

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list of the 51 directories is yours for the asking. I know many of you will be disappointed, but the Institute will not be listed in either the Lizard Lick or Spivey's Corners, NC directories (yes, these are real places!).

This program represents a positive action on the part of the Executive Committee to increase awareness of Roof Consulting as a profession and to direct individuals in need of roof consulting services to our members. We at Headquarters will monitor the program to evaluate its effectiveness at reaching these goals.

I RESOLVE...

John Newark
RCI Headquarters

It isn't too late to expand your list of resolutions for 1993. In fact, I've got a suggestion that will provide you with a resolution that is well within your ability to accomplish and will therefore add to your sense of self-esteem. It goes something like this: "I resolve to make one contribution to the Information Central program in 1993."

This really shouldn't be a tough resolution to keep. You've got twelve months to get it done, you don't have to give up anything to which you've become addicted, and it won't require a substantial investment of your time. If resolutions aren't for you, don't let that stop you. Just consider the contribution as a gift. In fact, you could consider it a gift to yourself, because you may, one day, have a question for the program.

A contribution from each member to Information Central's catalog would represent a great stride forward for the program and would enhance our ability to provide this unique service to our industry. If all 546 members contribute, there is a markedly greater chance that we'll be able to find the information that you need.

Contributions of all types are welcome. It needn't be something of your own creation; we're looking for information from all sources. Send in your back-issues of RSI, Roofing Spec, Roofer, Western Roofing, The Specifier, FM or UL information (old or new), code books (old or new), handouts from presentations, company newsletters-any of these or similiar materials may contain the information that another person needs. Getting all this "stuff" off of the shelves in your office may give you a whole new outlook on work! Please rest assured that **no contribution is insignificant**. A single handout from a meeting or seminar you attended in 1989 may prove invaluable to someone else.

Recent, contributions to Information Central include:

- "The Science and Technology of Traditional and Modern Roofing Systems," Volumes I and II, by (and from) **Dr. Heshmat O. Laaly**
  (n.b., be sure to read Lyle Hogan's book review on this work elsewhere in this issue of ***INTERFACE***.)
- Back issues of "Construction Counsel" from **David Huff-MAGUIRE, TOGHIA & ORBACH Attorneys**
  (n.b., **David Orbach**, is an associate member of RCI),
- "One Consultant's Opinion: The Roofing Foreman vs. The Roofing Inspector" by (and from) **Sam Huff, CRC**. This article was in the January/February 1990 issue of "Western Roofing".
- "The South Carolina Examiner" from **Phil Dawson, PE, CRC, HDH Associates.**
- "Hurricane Andrew-A Collection of News Items" from **Joe Hale, HDH Associates.**

Additionally, we've received Technical Manuals/Product Catalogs from:

- ABC-Architectural Building Components
- Cedar Shake and Shingle Bureau from **Marty Obando**
- Cooley Roofing Systems-**John Heathcote (member)**
- GS Roofing Products from **Pat Neuhaus**
- NESTE-Thermo from **Dick Bauer**
- StaFast Roofing Products Company from **Richard Deakins**
- Tarmac from **Gordon Amhaus**
  (n.b., Tarmac was recently acquired by GS Roofing Products. The catalog submitted by Gordon represents the last one from Tarmac. Thanks to Gordon for thinking about RCI and contributing the Tarmac catalog before they disappeared! This is a great example of why Information Central exists.)

I don't want the request for information to be heard only by RCI members either. I ask all of you on our mailing list to also consider a contribution to this endeavor. You may, in fact, have an item not generally available to our members that may prove to be an outstanding addition to the library. Indeed, we have recently received contributions from:

AAA: American Arbitration Association, and

SPI/PFCD: Society of the Plastics Industry, Inc./Polyurethane Foam Contractors Division.

Gifts such as these, from outside our membership, are indicative of the value of the program. Participation by these organizations help to secure Information Central's position as the industry's "Institutional Memory". In this program, information is valuable, appreciated and accessible to all.

Your resolution to contribute is also a commitment to your profession. Your support will be appreciated by the professionals of today and tomorrow.

Thanks to everyone who helped get this program off the ground. I look forward to your continued support in the years to come. Best wishes for a happy, healthy and prosperous 1993! See you in Orlando!

I RESOLVE...

continued from page 12

HOW CAN WE HELP?

Robert Boessen CRC,
All-Spec-Inc., Jefferson City, MO

How can RCI members help to put more emphasis on the roof assembly as a crucial part of the design / build process?

In October of this year, a local university sent a request to our Building and Trade Organization asking for people to give a one-hour class on their specialty or trade for the University's Building Design class. After much arguing with myself, I finally raised my hand to do a presentation on the history and development of roofing.

Loaded down with a small dog and pony show, a small booklet I put together, and some samples of the different types of roofing available in the marketplace today, I showed up for my first day of class. Needless to say, I was a little nervous. However, my fears were soon quelled by the interest shown by the class.

A time frame of ten minutes was set up for questions; however, after 30 minutes had passed, the professor had to stop the class so another group could use the room. There were 17 students in the class, ages 22 through 38. Everyone had questions; everyone seemed amazed how detailed a roofing assembly could get. The professor was so impressed with the attention and curiosity of the class that he asked if I would consider giving the same presentation next semester.

This article is not being written to toot the writer's horn but to share some thoughts I had after the presentation. After my presentation, I evaluated my experience. Did I receive any personal satisfaction? Did I learn something from my efforts? I concluded that in the process of preparing for this presentation, I did as much service to myself as to the students. All of this research helped to sharpen my attention to some small details so often left out or overlooked when putting together proposals for clients.

I know I made an impression on the students that roofing technology is not something to take lightly. Hopefully, enough seeds were planted that when they become designers, property owners or are workers in related fields, they will put forth the extra effort to make sure all of the bases are covered when it comes to designing the roof system. Suppose we take this one step further. Suppose each member of RCI volunteers two hours a year to teach a class at local universities, trade schools, tech schools, etc? What better way to achieve one of RCI's objectives: to be properly represented to the roofing industry, related professional communities, and to its members' clients through accomplished tasks, good communications and public relations programs. Think about it; this might be a good New Year's resolution!

RICOWI MEETING

Phil Dregger
Technical Roof Service
Pleasant Hill ,CA

Andrew Dominates RICOWI Meeting

Discussions at the October 1992 meeting of the Roof Industry Committee on Winds Issues (RICOWI) focused on recent Hurricane Andrew. Phil Dregger, Region VI Director, represented RCI (RCI is a sponsoring member). The two-day meeting was held at Colorado State University in Fort Collins, Colorado, and opened with a tour of their wind tunnel research laboratories. Research at CSU has provided data on uplift pressures beneath loose laid pavers, on the mechanics of shingle tab uplift, and on the distribution of pressure coefficients based on wind direction.

Several special reports by RICOWI member organizations addressed Hurricane Andrew and other wind topics. Phil Dregger described how RCI's Disaster Response Team mobilized to the Dade County area and the recent special issue of INTERFACE focusing on Andrew.

Chuck Goldsmith,AIA, National chairman of RICOWI and Florida Coordinator for RCI's Disaster Response Team, gave a slide presentation illustrating wind damages and previewed some changes in reroofing requirements proposed by the City of Homestead, Florida (e.g. no 1/2 inch plywood, no staples, no particle board). Highlights of other presentations include:

- Wind Engineering Research Council preliminary efforts to determine the fastest mile wind speed experienced during Andrew, presently estimated at between 110 and 125 mph (information since the RICOWI meeting indicates a higher range but the "jury is still out").
- Asphalt Roofing Manufacturers Association plans research to measure the differences in uplift resistance provided by pneumatic verses hand nailing of shingles.
- National Roofing Contractors Association observations that much of the damage sustained by tile roofs and by mechanically attached single plies was by missiles or airborne projectiles.
- Metal Building Manufacturers Association efforts to simulate both dynamic and non-uniform wind forces on metal roofs using electromagnetically applied loads.
- Single Ply Roofing Institute observations that air infiltration below roof membranes sometimes makes the difference between roofs that survive and ones that blow-off.

The meeting concluded with a presentation by Kishor Mehta, Ph.D., with Texas Tech University describing a research proposal to obtain measurements of wind pressures generated by natural winds on metal edge flashings on a full scale building. The results of this research would be used to provide guidelines for determining metal thicknesses, cleat configurations, and fastener load required to resist specified wind speed. The RICOWI Executive Committee endorsed the research concept and encouraged member organizations to strongly consider funding the project. RCI's Board of Directors voted in its December meeting to contribute funding to the RICOWI-sponsored research at Texas Tech University.

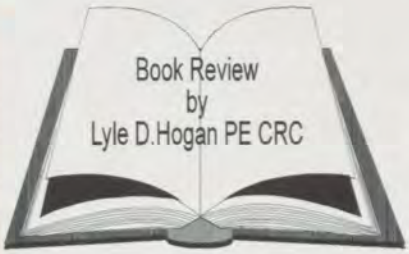
FLORIDA CHAPTER MEETING

William J. Schultz PE
Law Engineering, Tampa, FL

The Florida Chapter of RCI held its quarterly meeting on November 12, 1992 at the GAF Manufacturing Plant in Tampa, FL. A plant tour was given which included the manufacturer of GAF's No. 75 base sheet. Following the plant tour, Mark Shetler of GAF provided an outlook for the roofing industry.

At the chapter meeting, the following officers were elected:

President	D. B. Young, Jr. CRC
Vice President	William J. Schultz PE
Secretary	David H. Siple CRC
Treasurer	C. Richard Allen



THE SCIENCE AND TECHNOLOGY OF TRADITIONAL AND MODERN ROOFING SYSTEMS

(Published 1992) by Dr. Heshmat O. Laaly, RCI.

A remarkable compilation is now available for roof technologists - a work which could be described as an encyclopedia of our discipline. The two volumes which constitute Dr. Laaly's project contain 80 chapters (3154 pages) with topics ranging from thatched roofs to thermoplastics; asbestos to accessories; chemistry to copings; and warranties to walk-ways. There is a particularly useful chapter on available computer software and data organization. The works of several RCI members are referenced at one or more places within the text. Each chapter concludes with a comprehensive bibliography affording the reader the opportunity to pursue any topic in further detail.

There is a feeling of accomplishment just from finishing the two volumes; however, there is an attendant humbling effect, recognizing that one person centralized and produced a study of this magnitude.

Dr. Laaly's unique style permeates the work, making for entertainment as well as education. Those who have observed this sage in his element (during a stage presentation) would expect nothing less than the same energy in his writing. In this, you will not be disappointed.

You will be treated to some crystal ball prophecy about future trends, some of which are rapidly becoming reality. Recycling, water-based adhesives, and restructuring of warranties are becoming prevalent when just a few years ago these topics were rarely mentioned.

To say that this is the pinnacle of Dr. Laaly's career risks downplaying his other accomplishments such as developing and patenting of the photovoltaic single ply roofing membrane. A liberal discussion of that topic is contained in Chapter 79.

The work could benefit from an appendix. As is necessarily the case in a collection of this magnitude, there is a convergence of related topics in different chapters. For example, discussion about reinforcements is found in Chapters 15 and 36. A reader researching the former only would have missed some good reading in the latter. An excellent discussion of wind influence is contained in Chapter 54, titled "Wind Effects on Roofing"; however, a particularly helpful supplement is also found in Chapter 60.

The glossary of terms and abbreviations (Chapter 80) is first rate, consolidating the best 3 you could find. It combines polymer chemistry, asbestos, sheet metal features, and a dozen other scattered glossaries.

In summary, this work represents the greatest density of roofing science per pound of document that this writer has seen. Every research topic, forensic study, bidding package, engineering report, or mundane roof survey could somehow be enhanced by referencing Dr. Laaly's treatise.

Perhaps the strongest statement introduces Chapter 79, "Future Trends in Roofing": "in fact, scientific progress and, to a larger extent, the survival of human-kind depend upon our ability to synthesize information and adapt." If you desire to synthesize a comprehensive dissertation related to our trade, you will find no better single benchmark. For more information, contact Dr. Laaly at: Roofing Materials Science & Technology; 9037 Monte Mar Drive; Los Angeles, CA 90035. Telephone: 310-559-6090.

SPEED DIAL

Call 1-800-VBT1Z0C.

Okay, so we weren't able to get some great 800 number like "1-800-RCI-ROOF" or "1-800-WE-R-GOOD" but we do want you to know we now have an 800 number. You won't be able to remember it, so write it down: 1-800-828-1902 ("that's 1-800-VAT-1-Z0C or something!).

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*Above text supplied by sponsor.

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