Knowledge for Creating and Sustaining the Built Environment

The Predicator

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Portland Chapter - The Construction Specifications Institute

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BUILDING ENVELOPE CONSULTANTS?
Tuesday, April 11, 2006

We don't need no stinkin' consultant waltzing in here telling us how to design/build/ maintain our projects! Or do we? After some thought (not to mention a lawsuit or two), our considered opinion, is more likely, "Yes we do!" A panel presentation featuring renowned envelope experts The Façade Group, Morrison Hershfield and RDH Group will discuss such topics as best practices, coordination, legislation, rainscreens, waterproofing, perimeter seals, back pans, field and laboratory testing, renewability/replacement, maintenance, and the Portland Building Envelope Council, all at the next CSI meeting.

What "***Hot Buttons"*** do the consultants have with regard to design, construction, sequencing, testing, and documentation of the building envelope? What's unique about envelope construction in the Northwest? What materials are used today and why? What are your building envelope "***Hot Buttons"***?

Join us for a lively panel discussion…

Thanks to our sponsors Hoffman Construction & Custom Window Co.

The Princeton Building Ballroom
614 SW 11th Avenue
Social at 5:30 PM
Dinner and Program 6:30 pm

Cost: $30.00 per person with pre-paid reservations by March 9, 2006
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Email: jane@portlandcsi.org for questions or to sign up

Assure your spot for this special event!

PRESIDENT'S MESSAGE

By Dennet Latham, CSI, CCS

Another Opportunity to Voice your Opinion

Currently available on the www.csinet.org website is the initial draft of the proposed update to the SectionFormat document. The CSI SectionFormat/ PageFormat Update Task Team (SPUTT) was given the task to coordinate these documents with the recent revisions to MasterFormat and The Project Resource Manual (PRM). SPUTT is asking for review comments to be returned by May 1st in preparation of the next draft issue. There is no indication when the task team intends to publish a final document. I encourage you to review the new document and add your comments to the Forums/SectionFormat and PageFormat Update Discussion on the www.csinet.org website, SPUTT's official location for presenting your comments.

The first part of the draft document is the Outline of SectionFormat Article Titles, which just lists article and paragraph titles in the proposed order. The second part is the Detailed Description of SectionFormat; this gives a narrative for each article and paragraph to help one understand the content that should be placed in each location. A nice touch of this document is that information that should be coordinated with Division 1 is in italic text.

There are some interesting revisions proposed to SectionFormat in this first draft; revisions that should initiate considerable discussion. The most obvious change is the addition of Part 4 - Utilization. According to the narrative, Part 4 is to include information about the "utilization of the facility once it is occupied". Article titles include Commissioning, Operation and Use, Provisioning (restocking and replenishment of consumables), Maintenance, Ongoing Verifications, Evaluations and Assessment, Repairs, and Facility Information Management. An example of what would be included under Facility Information Management is "requirements for procedures to modify the Record Documents, including when maintenance, verifications, repairs, or replacements occur". Wouldn't it be nice for a project that is an addition to an existing building or for a renovation project of an existing building that there were accurate drawings and specifications available for the existing conditions, including all previous renovations or additions?

The new Part 4 seems to have some good applications that, per the intent of SPUTT, will be coordinated with the new facilities management module of the PRM. On the other hand, Part 4 may have to be edited very closely as to the responsibility for the work results specified in these paragraphs. As much of the tasks described in Part 4 are executed by the Owner or the Facilities Manager, it will be necessary to clearly define scope of work and how this relates to the construction project contract. On many construction projects, except for those that require commissioning services or additional evaluation through warranty period, the Part 4 – TILIZATION title may likely be followed by "NOT USED". Should facility management information be in construction specifications? Let CSI know your thoughts through the Forum discussions.

Reviewing the proposal for Parts 1 through 3, other interesting changes include the relocation of many Part 1 articles in the current SectionFormat document to Part 2 and Part 3. For example, Product Options, Substitution Limitations, Delivery, Storage and Handling, Extra Stock, Maintenance Tools, and Source Qualifications (manufacturer and fabricator qualifications) have been moved to Part 2. This makes some sense given these articles are closely related to procedures related to products.

In addition, Part 1 titles including Installer Qualifications, Site Conditions, Field Samples and Mockups, have been moved to Part 3. Again, these revisions also seem appropriate as they better reflect the sequence of events from purchase, fabrication to installation; for example, installer qualifications are related to execution procedures. With the move of these tradition administrative articles to Part 2 and 3, Part 1 becomes limited to Work Results descriptions, Price and Payment Procedures, Administrative Requirements (only specific requirements for the subject section that expand on Division 1 requirements), and Submittal Requirements. In the Submittal Requirements article, Deferred Design Submittals is a new paragraph. Having a specific location for design documents that will not be available at time of plan review should better communicate the timing of these documents to code officials. The rearrangement of the Part 1 titles is interesting in concept, however, it is relatively easy to rearrange article and paragraph titles in a list; revising an entire office master specification will be challenging and the learning curve for the new format will be extensive.

Although the cover letter for the draft document indicates this is an update to both SectionFormat and PageFormat, there is no apparent information explaining proposed revisions to Page Format. Perhaps this is coming in the next draft. Hopefully, the page format of the Detailed Description of SectionFormat document is not an indication of the new direction for page format. Shaded Part Titles, line numbering in left margin, one line footers and headers, and italic text; there should be more options.

There are some good ideas in these revisions. Addition of Part 4, realigning article titles more in the proper sequence of how work results are achieved, and adding new paragraphs titles to coordinate with PRM are steps in the right direction for helping make construction documents address more project delivery types and the full life cycle of a construction project. Make your own evaluation and participate in the coming discussions on *SectionFormat* and *PageFormat* to help make them stronger consensus documents.

Along with reading the forums on the revisions to section and page format, also look at the continuing discussions on MasterFormat 2004; people are starting to use the new format, trying to understand where to locate information; the discussions are more directed to specific topics and may be more useful to you in your own reformatting. Interestingly, several of the comments end with a statement like "I am happy to help in the revision process to make these better documents". One has to wonder…Where have you been?

WHAT DO YOU SAY? .. *News and views from the Specifiers Share Group*

By: Fred Herbold, CSI, CCS

Rain Screen Wall Systems - Effective Solutions to External Moisture Penetration for the Pacific Northwest

Recently the Specifiers' Share Group has enjoyed several presentations about keeping our moist Pacific Northwest climate out of our buildings. Here's the list:

"Single Ply Roof Systems" by Andy Cleveland, CSI, Johns Manville Roofing.

"Weather Barriers for Walls" by Dennis Lunder, CSI, Henry Company.

"Metal Wall and Roof Panels" by Mike Simmons, Fabral & CopperCraft.

"Waterproofing and Roofing Coatings" by Neil Shearer and Gary Felling, CSI, Andek.

"Key Elements in Designing Wall Systems, Meeting Expectations for Pacific Northwest Buildings" by Dave Young, CSI, RDH Building Sciences Inc.

The list shows our concern with preventing moisture infiltration into our buildings. You'll note that the presentation at the next Chapter Meeting is on the same subject – from three experts in the science of keeping buildings dry.

The following is a summary of some of Dave Young's presentation. It is also a primer for the April Chapter Meeting. I hope it will help you better understand this month's program.

Water and Climate and Forces

Three conditions are required to move water through the building envelope:
- A source of water
- An opening or path for the water to follow
- A force to drive the water through the opening.

Remember that water is always either liquid or gas (water vapor) in our climate. So think about water in both states when considering the Forces that move water from one place to another:
- Gravity
- Kinetic (the momentum of wind-driven rain)
- Air pressure gradient (wind or HVAC system)
- Vapor pressure (things like to be equal on both sides)
- Capillary action and surface tension.

Building walls should be designed to close the paths of water that is driven by all of these forces. The climate, location and configuration of the building affect which of these forces will be significant. A high rise is more vulnerable to air pressure (wind) and wind-driven rain than a house. But a house on the coast may be even more vulnerable to these forces.

Approaches to Water Penetration Control

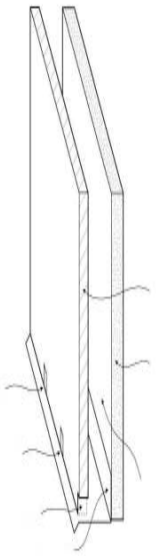
Mass Wall: The historic solid masonry or concrete wall that begins to dry before moisture can move to the interior face.

Mass walls are thick and expensive. Most modern construction employs framed walls. The following are framed wall systems.

Barrier or **Face Sealed**: Stops water at the exterior face, one line of defense, if the face cracks or holes, the wall fails.

Concealed Barrier: Two lines of defense, the face and a moisture barrier over the sheathing. Moisture that penetrates to the concealed barrier is trapped there until it can dry out.

Drained Cavity: The drained cavity wall has aspects of the rain screen approach and addresses some of the forces that cause rain penetration, but should not properly be called a rain screen wall. Two layers are separated by a cavity. An internal layer of free draining material installed in the cavity (the concealed barrier approach) will work in effectively the same way. The outer layer receives the kinetic force of the rain, while the cavity or drainage layer prevents the capillary action of water from reaching the materials of the inner wall. Water penetrating the outer wall must be collected and directed out of the cavity with flashing and weep holes. In this type of wall, either the outer or the inner layer may act as the air barrier to provide resistance to air leakage.



(Continued pg 6)

PERKY'S NOTES

By: Perky Kilbourn, CSI

Lee and I have been traveling again. This time to Kissimmee, Florida to stay with friends for a day before we went to Fort Lauderdale and took a cruise which stopped at St. Martens, Dominican Republic and Nassau, Bahamas. After 8 days at sea, we retuned to Kissimmee for four more days of relaxing with our friends before we flew home to snow!

Our elder daughter called on Thursday, March 9 to advise there was four inches of snow at our house. Laurie said she only had 1 1/4 inches at her house in Lake Oswego.

When we got to Seattle on Friday night, March 10, 2006, Lee decided to drive home rather than spend the night at a motel where we had reservations. Lee was concerned about ice on the roads if we drove back Saturday morning.

Mouse threatens to halt development was the title of a news article in March 2006 issue of **Pollution Engineering**. Paraphrasing and quoting from the article.

> . . . The meadow jumping mouse was identified as a subspecies by Preble in 1954.
>
> . .This mouse has been able to halt plans to develop sections of Colorado and Wyoming. . . A study commissioned by Interior Secretary Gale Norton and conducted by biologist Rob Raney found that the jumping mouse's genetic makeup was the same as the common Bear Lodge meadow jumping mouse. Raney's findings have been called into question. . . . Tim King, a USGC conservation geneticist from West Virginia, concluded that the mouse was a unique creature with a distinct evolutionary lineage. . . . King's genetic samples were collected from over 140 meadow jumping mice across the Northern Great Plains, and included mice in the Bear Lode Mountains and the Black Hills. . . . The mouse has been listed on the federal endangered species list since 1998 and its protected habitat covers nearly 31,000 acres from Colorado Springs, Colorado to Laramie, Wyoming.

Can't Log the Forest for the Trees? Is a report in the March-April 2006 issue of **American Scientist.** There has been a long-running dispute between loggers and "tree hugging" environmentalists in the United States. The middle ground which is being reached in the United States is "selective logging". I understand a little bit of how it is done because my Mother's cousin, Ward Richardson, had a Tree Farm in Polk County. Richardson obtained the property because framing the property was not profitable after it had been logged. Richardson experimented with this logged over land and nurtured the best trees with selected cutting. When Oregon State University received the Richardson Family Tree Farm, they were able to sell it for a significant amount of money. This money was used to build Richardson Hall for the OSU Department of Forestry, fund several Faculty Chairs and provide numerous students with scholarships. What works successfully for the forest composed of Douglas Fir Trees may not work for the Amazon rain forest. Quoting Greg Asner (from Carnegie Institution) in the article "The scientific and forestry knowledge regarding how to do low-impact logging in the field now exists. The barriers now are thus political and economic."

Low impact logging is needed to reduce the logging's effect on tropical rain forest's carbon absorbing capacity. The tropical rain forest's carbon absorbing capacity is related to global carbon dioxide levels. The global carbon dioxide levels seem to be related to the "Green House Effect" which is also known as "Global Warming."

States take on environmental issues was another topic of the March, 2006 issue of **Pollution Engineering**. The article reports that a number of politically liberal states are working around the federal government to make environmental policy because not enough is being done by the federal government. Some states with Republican governors, such as California and Connecticut, are making their own rules. Gina McCarthy. the commissioner of Connecticut's Department of Environmental Protection is quoted in the article as saying

> "If we can't get the federal government to act, then we have to take action in any way we can."

Michele St. Martin, a spokeswoman for the White House Council on Environmental Quality is quoted as saying that the Bush administration welcomes the efforts of the states "as long as they do not put Americans out of jobs or move emissions from one state to another or one country to another."

In general, the industry has supported the concept of obtaining energy generated from renewable sources. Power plant emission restrictions are opposed to by the electric generating industry. The electric generating industry believes restriction on power plan emission will results in more job losses in manufacturing to other countries, where energy costs are lower.

Discovering Knowledge Through Literature Mining by Ramon Alonso-Allende and Christian Blaschke appeared in the February 2006 **American Biotechnology Laboratory.** Text mining refers generally to the process of extracting relevant and non-trivial patterns or knowledge from unstructured text documents. Key information is obtained without reading the entire text. The relevant biological concepts and entities can be linked to biological data. The user can change from superficial overview to specific information gathering. A new way to access the literature is through visualization of biomedical conceptual maps. Could the same mining techniques be used by Contractors and Specifiers?

MARCH MEETING RECAP

By: Perky Kilbourn, CSI

Best Practices to avoid and resolve changes, delays, claims was the title of a very thought provoking presentation by Steve Pinnell of Pinnell/Busch. Everyone was provided with a copy of his slides as well as his resume which I found very impressive. He started with a B.S. in Civil Engineering from U of Arizona in 1964 followed by a M.S.C.E. in Construction Management from Stanford U in 1965. He formed Pinnell Engineering, now Pinnell/Busch, Inc., in 1975 and specializes in project management. In 1998 McGraw-Hill published his book HOW TO GET PAID *For Construction Changes.*

His presentation was divided into three parts, changes, delays and claims:

1. Changes

The Cause of Changes in Owner's view were discussed.

Scope Change was greatest at 32%. This could be reduced with a better scope definition during programming and predesign. In addition the cost and scope management should be done during design. Have the user groups/operations and maintenance be involved in design reviews.

Differing Site Condition followed at 19% and could be solved by better as-built of new projects and a risk analysis of site investigation i.e. the cost versus benefits.

Design Errors at 18% can be reduced by selecting a well qualified designer with project management skills. Don't overemphasize design fees – if you pay more you get more. Evaluate performance and use for future selection. Use constructability reviews and value engineering. Give the designer enough time to do a good design which covers all bases and this reduces the percentage of changes. Fast Track Projects do work but need good scheduling because if have a lot of changes then it costs money. The cost of changes is great because of what the contractor has to do to provide what the owner has decided the owner wants.

Owner Delays are not as significant but have a far reaching effect because "If you want it bad, you'll get it bad."

2. Claims

If claims have not been prevented, about 88% can be settled with negotiation. Mediation is the next choice for settling claims followed by Arbitration. The claim goes before a dispute resolution board, which is a neutral body that reviews the problem. This is really a tool to illuminate the dispute. If Arbitration fails then Litigation follows. With Litigation the attorney is now in control and the contractor and owner loose control. One way to help reduce the number of claims is by partnering and 93% of 20 respondents felt it did help.. With weekly and daily meetings between the various partners the project goes more smoothly and there are fewer or no claims.

3. Delays

Owners feel that Scope Change is major reason for delay followed by Differing Site Conditions and Design Errors and Poor Scheduling. Most owners are satisfied with their scheduling specification especially if it requires monthly updates. Owners are neutral about requiring narrative reports, electronic schedules and impact analysis if a delay. About half the contractors always request subcontractor input, prepare monthly updates and submit narrative reports. Very few prepare time impact analysis and the conclusion was that 75% of the Contractors felt happy with their scheduling procedures and results. When owners evaluated the contractor scheduling practice most of them felt contractors did submit monthly updates, and review their schedule updates and if delayed, submitted a recovery schedule so can finish on time. Owner evaluation and subcontract opinion of contractors' scheduling skills were almost evenly divided between good, fair and poor.

A schedule review and acceptance process helps reduce claims. A joint meeting with Contractor's Scheduler and Superintendent helps by answering any questions. review critical path in sequence and check work quantities, productions rates and duration. In addition need to check for critical crew chases (crane, equipment fleet,) etc. When done, brainstorm for improvements and work together and explain why something is rejected. Require re-submittal by a specific date and offer to discuss the reason for rejection to ensure you get what you need.

Schedule management is best down with good record keeping which includes start and finish dates, delays and the reason why, crew sizes etc. Enforce the contract and require corrective action. Meet and discuss delays, impact or claims. Promptly respond to questions and notices. Also promptly and fairly resolve issues such as time extension and change order requests. In summary the owner should continue to partner with the contractor.

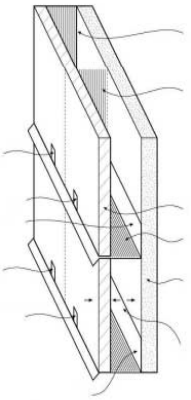
Good record keeping helps keep track of construction costs and contractor knows for sure not over budget. Similarly Pinnell showed a Comparison Bar Chart with a delay early in the construction process and its effect on the construction which followed. The graphic representation showed that all the following construction was delayed. This kind of a report clarifies relationships and can be followed by a time impact analysis which points up float time. Pinnell then showed a Pivot Table with the relationship between planned and as built clearly marked.

(Continued pg 6)

WHAT DO YOU SAY (Cont)

Open Rain Screen: In this wall type the outer or "screen" layer is intentionally vented to the exterior, while the air barrier is located at the inner layer or backup wall. Since the inner surface is the most airtight, it bears the brunt of wind pressure loads. This relieves the pressure gradient across the outer wall, which would otherwise tend to draw moisture inward. However, since the air pressure difference now exists at the backup wall, and since some water should still be expected to pass through the vented outer layer, the inner wall requires a second line of defense against moisture. This should be a layer of water-shedding material, such as sheathing, building paper, or a waterproof membrane, and a flashing and drain at the base of the wall.

Pressure Equalized Rain Screen: The Pressure-equalized rain screen wall employs additional features in the design of the cavity to improve performance over a simple rain screen wall design. Theoretically, the outer cladding of a pressure-equalized rain screen wall is not subject to any wind load, as wind forces are transferred to the air barrier at the backup wall. This would allow design of the cladding to be as light as possible. In reality, wind forces are dynamic and variable, and pressures applied to the wall are constantly changing.



Recommended approaches for Pacific Northwest framed walls, windows and curtain walls are the last three. All have an open cavity. The cavity should be wide enough to prevent capillary action across the furring.

Further Reading

Descriptions and illustrations of the cavity walls came from Canada Mortgage and Housing Corporation's "The Rain Screen Wall System". Google them with "CMHC rain screen" and click this or other downloadable PDFs.

For air barrier and weather barrier information go to the Air Barrier Association of America site at www.airbarrier.org. the site includes downloadable ABAA-master specifications.

Not all our Northwest Region CSI members who represent weather resistive barriers list themselves in the "Directory" under 07 25 00 – Weather Barriers. Perhaps next edition will have a more complete listing. But you can be sure to get information from the SSG presenters listed above.

See you at the Chapter Meeting.

MEETING RECAP (Cont)

Owner defenses and counterclaims include Lack of Entitlement

- Concurrent Delay
- Failure to Re-Sequence
- Faulty Scheduling
- Erroneous Analysis
- Liquidated or Consequential Damages
- Defective Work – out of spec work product.

Ideal is a good design followed by a contractor with a schedule. The contractor should have cost control of construction. When there are fewer changes in the work for the contractor and a tighter control then everyone benefits.

A summary slide showed the traditional project phases
I. Exultation
II Disenchantment
III Confusion
IV Burn Out
V Search for the Guilty
VI Punishment of the Innocent
VII Distinction for the Uninvolved
VIII Long-Term Employment for Attorneys and Experts

NW REGION CONFERENCE

Last years region conference in Spokane was titled "The Journey" in reference to Lewis and Clark's historic journey. September 2006 is the bicentennial of Lewis and Clark's return to St Louis. October 2006, "The Journey" continues in Portland as we take "CSI to the MAX" to explore what's new in Portland and the wealth of fun and diversions that Portland has to offer.

The long awaited conference agenda is near completion with a host of activities that is certain to have something for everyone. Over a year in it's planning the line up of continuing education offers a wide variety of opportunities also certain to have something for everyone. The best conference ever is about to become available on line. Don't miss it. Space is limited and will fill up fast. Sponsorship opportunities are already limited and going fast. "CSI to the MAX" don't miss the train, call Jane, and make your reservation today!

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Cook Inlet, Anchorage, AK *(Third Tuesday)*
Dan Graham, CSI, CDT.....907-261-9203

Puget Sound, Seattle, WA *(Second Tuesday)*
Andrew Estep, CSI.....206-382-3393

Mt. Rainier, Tacoma, WA *(First Thursday)*
Jerry Litwin, CSI,CCCA.....253-584-5207

Spokane, WA *(Second Thursday)*
Eric Rieckers, CSI…….. (509) 535-0301

Portland, OR *(Second Tuesday)*
Jane Phifer, CSI.....503-805-2500

Capital, Salem, OR *(Third Thursday)*
LaVone Clausen, CSI.....503-371-2070

Willamette Valley, Eugene, OR *(Last Thursday)*
Rodd Hansen, CSI-I.....541-687-9600

Idaho, Boise, ID *(First Tuesday)*
Jon Farren, PE, CSI, CDT.....208-429-1307

April 2006

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4/3 CSI Education Committee Mtg, *Noon, Blue Moon Tavern*
4/4 CSI Board Meeting, *Noon, AIA Office*
4/11 **CSI Chapter Meeting,** *Building Envelope Consultants?*
4/13 CSI Specifiers Share Group Meeting, *Noon, ZGF*
4/18 CSI Membership Committee Meeting, *Noon, Russell Street BBQ*
4/27 CSI Specifiers Share Group Meeting, Noon, *ZGF*

May 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
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5/1 CSI Education Committee Mtg, *Noon, Blue Moon Tavern*
5/2 CSI **Portland Products & Services Fair**
5/9 CSI Board Meeting, *Noon, AIA Office*
5/11 CSI Specifiers Share Group Meeting, *Noon, ZGF*
5/16 CSI Membership Committee Meeting, *Noon, Russell Street BBQ*
5/25 CSI Specifiers Share Group Meeting, Noon, *ZGF*

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Address Service Requested