MARCH 2020

SPECIFICS

THE MONTHLY NEWSLETTER OF THE
CSI MINNEAPOLIS-ST. PAUL CHAPTER

INSIDE THIS ISSUE

Pg. 2
President’s Message

Pg. 3
February Chapter Program – The Ghost Writer

Pg. 7
Platinum and Gold Sponsors

Pg. 8
Important Chapter Announcements!

Pg. 9
Chapter Welcomes New Members

Pg. 10
Chapter’s March Program Announcement

Pg. 11
Chapter CDT Study Workshop Schedule

Pg. 13
New Member Spotlight!

Pg. 14
Chapter Membership Committee THANK YOU

Pg. 15
BuchNotes

Pg. 18
“Did I Say That”

Pg. 22
Evaluating New Products

Pg. 24
Upcoming Events of Local Associations

Pg. 25
Certification Quiz

Pg. 26
Chapter Leaders

Several upcoming Chapter events and opportunities to be involved.

Growing Petals in the Living Building Challenge

Their support enables high-quality programs

April Face-to-Face Technical Event and May Chapter Awards Program

Chapter Welcomes 35 New Members!

Best Practices for Using Enscape with Revit for Real Time and VR

Of interest to ALL CDT Exam Registrants

Say “Hello” to Heidi Lohmann another New Chapter Member!

Chapter thanks all of the members who helped staff AIA Convention Booth

Los Angeles City Hall: An American Icon

Mythquotations: “Did They Say That?”

Innovation or Risk Adavoidance?

Begin the New Year with some new activities!

Test yourself (Answers on Page 27)
From the President...

As we approach spring our Chapter has a great series of events and learning opportunities yet to come. This includes our CDT workshops conducted by our Certification Committee and hosted by HGA. In addition to the option to get in person support, the committee has arranged for Zoom Conferencing so remote participation is possible. For those planning to take the exam in the coming months we wish you the best and thank those who have helped you to prepare. With respect to our last monthly program of the year, our Programs Committee has a discussion focused on “Best Practices for using Enscape with Revit for real time and VR” and has invited host speaker Phil Read, CEO of Read I Thomas. Mr. Read promises to guide the audience on how to quickly satisfy the requirements of architects, engineers, & contractors by using the virtual environment. I encourage members to read the details of this meeting scheduled for March 16th at the Metropolitan and invite guests that would benefit from the presentation.

A little over a month from then we will launch our first “Face to Face” event that matches suppliers with specifiers one on one scheduled to take place April 21st. This will replace the traditional Expo and provide participants with a series of short but effective conversations that both AE and vendor have agreed to in advance. It is a kind of “speed dating” for professionals. The Face to Face Event Committee, formally Expo Committee, has asked that members offer any potential specifiers who would like to participate or should be asked to participate be forwarded directly to them. If interested please see the details on the “Upcoming Events” tab on the website or contact Event Committee Chair Kathrine Barrett at 612-209-8078 or email at khbarrett@activar.com In the following month, on May 21st, we have the Awards Dinner planned to take place at Top Golf. In addition to recognizing members who have given above and beyond the call of duty we will be able to practice for the annual Golf Tournament in the following week to be held at Bunker Hills. Please be sure to nominate any member that deserves recognition by contacting Chair Mike Buchner at 612-366-2045 or email mbuchner@hufcormn.com

My one ask is that each of us invite one other colleague or guest who would otherwise not attend one of the events described above that may be of interest to them.

Respectfully Submitted,

James R. Bergevin, CSI, CCPR, CDT
President, Minneapolis-St. Paul Chapter of CSI
Growing Petals in the Living Building Challenge
MSR Shares Lessons Learned in Transforming Firm Office and Culture

February 10, 2020

February 10, 2020 Project Manager Rhys MacPherson, aka “Cat Herder” (for shepherding so many architects with diverging directions), and Ben Lewis, clean up role in construction, shared with us their growing knowledge within the petals of the Living Building Challenge while designing MSR Design’s new digs.

MSR Design needed a new space because they were bursting at the seams. Their location in the warehouse district had been their identity, and the firm is very attached to place. But there was a desire to come back to downtown Minneapolis, where the heart of activity is. The 510 Marquette building provided an existing 14,000-square-foot shell. It was up to the team to create an innovative new home. They chose to follow the Living Building Challenge (LBC) program, which focuses on the overall impact built environments have on building occupants and the surrounding community.

The seven pedals under LBC are highly aspirational. As this was a Tenant Improvement (TI), MSR Design had limited impact over the larger building and couldn’t affect overall energy or water use from a holistic standpoint. Their biggest hurdle was determining what they wanted to do, and they settled on trying to attempt the hardest thing first, to see if it was even attainable. Three of the seven petals were selected. Their selected petals were:

1. Materials Petal
2. Equity Petal
3. Beauty Pedal

Materials Petal
Anticipating the most difficult to achieve, the materials petal was first. This included selecting Red-list-compliant products, limiting embodied carbon footprint, and not just recycling and diverting from landfill as reducing construction waste but eliminating it entirely. These goals needed a contractor team-member to help with a net positive waste result. They went out for RFP and, due to their commitment to do the right thing and excitement to learn along with the architectural team, selected Stahl Construction.
510 Marquette History – the Pre-Building Audit
First step in the LBC is to do a PRE-building audit, to see what can be re-used. Net positive waste means nothing can be thrown away, as there is no “Away”. Nothing can be sent to landfill. Gypsum wallboard column wraps were salvaged and reused, metal studs were relocated, and ductwork and lighting were readjusted to suit new purposes. The glass entry and sidelight were slid to new locations and the existing glazing and floor remained in-place.

The 1926 Cass Gilbert original Federal Reserve building in neo-classical style was solidly constructed in cast iron, and in the 1950’s grew skyward, adding several stories. The 1970’s removed the new-classical vocabulary and then the building fell into dis-use. 2013 was the rebirth, reopening the spaces for habitation. Their office area features unusual large volumes of column-free space, originally monumental daylight spaces, which were built over with large transfer beams in the 1950’s. The spaces enjoy a connection to the past in the exposed fireclay, limestone, grey granite and cast iron.

MEP Associates worked with MSR Design on reuse of mechanical and lighting fixtures, and Stahl Construction was on board early to help identify what could be reused. They developed a neutral palette of colors and native species (birch) so that the colors and vibrancy come from the work by the architects within the space. Salvage was huge; with 60 people moving from their previous home they reused desks, chairs, and sliding panels repurposed from their previous office. They weighed everything (wait! Put me down!...), which identified and saved a lot of embodied carbon “Why buy new when slightly used could do?” – Gee, that sounds familiar…
Stahl provided excess metal studs from other construction project sites, which changed the way they did their specifications. Instead of specifying new products, they were creative by thinking outside the box. The result: NO new metal studs were ordered.

MSR Design embraced marble wainscoting in elevator lobbies from another project that had been “modernized” with adhered wood paneling. The adhesive caused staining on the Carrara marble, but with effort cleaned it up to “Michelangelo” quality. To reuse the stone they could not use glue or epoxy or adhesives, so details included original old techniques such as copper embeds, wires and anchors to craft a beautiful desk and shelving unit.

Some materials do not have salvage value. What to do with items unable to be recycled right now? They bagged small scraps of gypsum wall board and sawdust to sequester as sound insulation in the walls. It is hard to specify salvaged items as needed to sequester the debris in place. However, the landlord was not thrilled, so they reworked the lease so that when they leave they will take the creatively reused bags of debris with them.

Even shipping containers and wrap found new homes. Cardboard was easily recycled. Receiving some shipped products posed a challenge on-site—what is one to do with shipping wrap? Plastic wrap was both reused as drop cloths for painting, and salvaged for art in the lobby.

Each subcontractor was responsible for what they brought on site and what was installed. No large, communal dumpsters were provided. It was clear each owned their subcontractor work. This is key: where subs are working with metal, plastics, and so forth, appropriate recycling containers were right there. Stahl even posted a large sign reading: “ALL MATERIALS MUST MEET LBC REQUIREMENTS FOR COMPLIANCE AND MUST BE CHECKED IN WITH THE STAHL SUPERINTENDENT ON SITE PRIOR TO YOUR WORK BEING STARTED. You will be responsible for any resulting delays (cost and time) for failure to comply.” That got some attention!

Part of the growth included inviting manufacturers to join them on the journey. LBC requires advocacy into the industry and pushes partners forward to align with their mission. One Material Petal product was the operable door. As the manufacturer’s representative described, the design team introduced an outside-the-box concept, and asked if they could use soybean oil instead of petroleum for the hydraulic fluid. Soybean oil? The manufacturer researched it, found it works and is recyclable. And viola! Another non-conventional and exciting product incorporated in the project.

Carpet tile was used in limited locations, under studio space only, due to its carbon footprint. The team needed to balance carbon with acoustics, and it is friendlier than employing sit-stand desks on hard concrete. However, the manufacturer made the commitment to take back the carpet at the end of its life. Material selection was a balancing act.
Not only were salvaged materials/Zero Waste initiatives part of the Materials petal, so were requirements of locally-made and healthy items not on the banned chemical “red list”. They discovered zero VOC “Declare” stain does not cover the FSC wood very well, so much more labor and many more gallons of stain were required. One tool generated by the design team was the Materials tracking table. Unrolled in printed form, it spans 12’ of glorious color-coded spreadsheet data.

**Equity Petal**
This petal engages spaces that are human scale and humane, provide universal access to nature and place, are an equitable investment and serve just organizations. The staff created the black box space themselves. They had a ‘slat wall” party. Then another. Then another. Ultimately 7 working “parties” gave ample opportunity for all members of the firm to engage, take ownership and feel a part of the larger project.

**Beauty Petal**
This petal encourages spaces filled with beauty and spirit and inspiration and education. Not only do the participants need to find beauty in the results, the public has to find it beautiful. They are monitoring the air, and it is still being monitored, but it actually smells really clean and fresh. Simultaneously metering VOCs both at their new space and their old space that was occupied 15 years old, resulted in the carbon dioxide alarm going off, in the old space, where a back draft damper was not operating correctly. Healthy is beautiful!

LBC certification is based on the actual performance of the space, which can only be awarded after at least one year of occupancy. The team is still finishing up the paperwork, but is excited to share how learned knowledge and team commitment can result in a sustainable workplace. It now feels like HOME.

**Looking Towards Complete Petals**
Just as spring will place the petals on flowers in bloom, April is anticipated to complete the petals at MSR’s new digs for the LBC. MSR plans to have an Open House in mid-April, as part of their outside engagement. This would be a great learning opportunity for the Twin Cities design community. I look forward to seeing you there!
Chapter’s Sponsors

Platinum Partnerships

**W. L. Hall Co.**
www.wlhall.com
763.592.8640

**Hufcor**
www.hufcorminnesota.com
763.544.0365

**Kline-Johnson**
kline-johnson.com
952.854.8723

**Majorskylights.com**
majorskylights.com
888.759.2678

**MG McGrath**
mgmcgrath.com
651.704.0300

**Majorskylights.com**
majorskylights.com
888.759.2678

**Sherwin-Williams**
www.sherwin-williams.com
800.321.8194

Gold Partnerships

**Archcon**
www.archcon.com
763.546.3434

**Intertek**
www.architecturaltesting.com
The 2020 Minneapolis/St Paul CSI Awards Banquet

Will be at
Top Golf
6420 N. Camden Ave.
Brooklyn Center, MN 55430

Please join us Thursday, 5/21/2020, 6 pm – 9:30 pm to honor our Outstanding Chapter Members!

Your registration fee includes buffet dinner, non-alcoholic beverages and golf. There will be a cash bar available. Ample free parking on site.

Member $40/Student $20*

*Student discount will be applied when you register for this event via your CSI Student Member account.
Please join the Chapter in Welcoming
35 NEW MEMBERS
of the Minneapolis-St. Paul Chapter of CSI

July 2019 through December 2019!

NEW! EMERGING PROFESSIONAL MEMBERS

Amy Cathey  Nystrom, Inc.
Marcus Meier  Meier Sales Co.
Mark Merchlewicz  Brock White Co.
Nick Reece  Edwards Sales

NEW! PROFESSIONAL MEMBERS

Timothy Gnitka  M.G. McGrath, Inc.
Robert Hill  Spring Window Fashions
Timothy Matthewson  dormakaba, USA
Kelly McCarty  M3Sixty
Jared Ochs  Snow Larson, and Oakcrest Building Products
John Pederson  TCC Materials
Kristen Radtke  Glass Art Design
Rick Wessling  UrbanWorks Architecture

NEW! STUDENT MEMBERS

23 Student Members at Dunwoody College of Technology
This program will be registered with AIA CES for HSW and LU credit. Pending AIA approval, credits may be granted for attendance. Sign in at the meeting with your AIA number in order to receive credit.

**Monday, March 16, 2020**
11:30 a.m. - 1:00 p.m.

**COST**
Members - $0.00  
Non-Members - $45.00

**ITINERARY**
- 11:30 a.m. - 12:00 p.m. - Registration  
- 12:00 p.m. - 1:00 p.m. - Lunch and Presentation

Real-Time is more than photo-realism. It’s about effective communication. For one audience this means beautiful imagery. But another audience requires effective and even life-saving coordination. This session is a multi-discipline panel presenting innovative and real-world best practices for architects, engineers and builders using Enscape.

When it comes to real-time exploration, one size doesn’t fit all. While the architect may want beautiful visualization of lighting, materials and graphics the engineer needs to satisfy health, safety and welfare issues in complex mechanical plant and process projects. At the same time the builder needs to discover coordination and fit / finish issues that waste time and money if only discovered in the field during construction. This is far more subtle than mere ‘ clash detection ’ and clash reporting. Many problems do not clash in many clashes are not problems. Exploring real-time environments at full-scale is also limiting on large and complex projects. This is because exploring the design at real-world scale can impose long travel times and distances which cause project meetings to go over time. Not to mention the inability to see large patterns and design issues. In these cases, exploring the virtual environment at scale is far more efficient. How do we quickly and easily satisfy the requirements of multiple stakeholders without over complicating workflow? These real world best practices will present elegant and time-saving solutions from an architect, engineer and builder that use Enscape to quickly and easily communicate design problems based on the differing needs of the audience reviewing the project.

**SPEAKER : Phil Read- CEO, Read | Thomas**

Phil is the co-founder of Read | Thomas - a BIM/VDC consulting company focused on connecting designers, builders and owners through cross-discipline technologies. He has over 20 years’ experience in Architecture and Engineering including 18 years implementing Autodesk Revit. Read | Thomas has been working with Enscape team and globally supporting Enscape customers since the summer of 2015.
CDT Study Workshops

This is a series of 7 study workshops for the upcoming CDT Exam. The course format is for individuals who plan to take the Construction Documents Technologist Exam (CDT), and is based on CSI’s *Project Delivery Practice Guide*.

**Dates and Times**

**Intro Session**
Wednesday, February 4, 2020
6:00 PM – 7:00 PM

**Session 1**
Wednesday, February 18, 2020
6:00 PM – 8:00 PM

**Session 2**
Wednesday, February 25, 2020
6:00 PM – 8:00 PM

**Session 3**
Wednesday, March 3, 2020
6:00 PM – 8:00 PM

**Session 4**
Wednesday, March 10, 2020
6:00 PM – 8:00 PM

**Session 5**
Wednesday, March 17, 2020
6:00 PM – 8:00 PM

**Session 6**
Wednesday, March 24, 2020
6:00 PM – 8:00 PM

Sign-in starts at 5:30 pm

**Location**

HGA
420 N 5th St, Minneapolis, MN 55401

**Parking**

HGA Lot
Please sign-in @ guard station
Located @ entry

**Method of Enrollment**

For easy on-line registration, please refer to the Minneapolis – St. Paul Chapter of CSI website at: [www.csi-msp.org](http://www.csi-msp.org)

Construction Specifications Institute
c/o IntrinXec Management, Inc.
5353 Wayzata Blvd., Suite 350
St. Louis Park, MN 55416
Phone: 952-564-3044

**Cost**

Students: FREE
CSI Members: $60.00
Non-Members: $90.00

Multiple Attendee Discount:
$60.00 if 5 or more are attending from the same company (at least one must be a CSI member)

**HGA Employees:**
Please contact Gerhard Guth

Program cost includes snacks, beverages, and course handouts

Registration deadline is February 3, 2020
CDT Study Workshops

Session 1 – Introduction/ Project Conception
Understand the purpose of the Project Delivery Practice Guide.
Understand the composition and responsibilities of four Project Teams who come together as a single Team.
Gain an insight into:
- the definitions of the various stages of the Life Cycle of a facility
- activities and documents produced during each stage
- team member responsibilities
Understand the activities and documents produced during the first project stage, Project Conception.

Session 2 – Project Delivery
Moves a project from Concept to Completion.
Contractual relationships for Design and Construction of a project.
Six Project Delivery methods.
Management services used for Design and Construction.
Variations in contract payments, scheduling and the number of contracts.

Session 3 – Design
Understand the process of converting an Owner’s program into written and graphic documents for Schematic Design and Design Development.
Gain an insight into how quality is established for a Project.
Identify the considerations that influence the design of a Project.
Introduce the basic concepts of Life Cycle costs and value analysis.
Identify the attributes that should be included in the evaluation and selection of products.

February & March, 2020

Session 4 & 5 – Construction Documents
Understand how Contract Documents (contract requirements, drawings, specifications, modifications, etc.) define the rights of, responsibilities of, and relationships between the parties.
Gain an insight of the benefits of using standard documents created by professional associations.
Introduce the definitions, purposes, and content of each of the Procurement and Contract Documents.
Understand the distinctions between Procurement and contracting requirements.
Become familiar with the procedures for soliciting pricing for the Work.

Session 6 – Bidding/Negotiating/Purchasing
Understand the transition from design to construction through the procurement process.
Understand the basic concepts of pricing.
Identify the pricing considerations for the various Project Delivery Methods.
Explore the various components of Owner-Contractor Contracts.
Become familiar with the procedures for handling substitutions during bidding.
Gain an insight into the distribution and control of Project information.
Heidi Lohmann is employed by Sun Control of Minnesota, a family owned business for over forty years as a sales representative for commercial window films, safety films, decorative films and graphics. Her expertise lies in construction and commercial projects.

In 2000, Heidi entered the glazing industry by working for Harmon, Inc in the Service Division until the division was sold to Brin Glass in 2012, where she joined Brin Contract. In 2016, Heidi transitioned into her current position at Sun Control of Minnesota for a change of pace while staying involved with the construction industry.

In Heidi’s spare time, she enjoys spending time with her family and friends. She is actively involved with her church, belongs to book clubs, and enjoys gardening in the non-winter months of Minnesota.
The Chapter Membership Committee wishes to THANK the following CSI Members for official staffing of the Membership Booth at the recently completed 2019 AIA Convention in Minneapolis:

Tohnya Adams  Andy Marolt
Theo Agler  Mark McPherson
Chris Anderson  Sarah Meier
James Bergevin  Joel Meyer
Steve Carlson  Teri Nagel
Jerry DeZelar  Rick Nichols
Todd Garner  Dave Rassmussen
Marcus Hulmer  Nick Reece
Dylan Johnson  Adrienne Rulseh
Susan Lee  Murray Shomburg
Doug Lingren  Kevin Slattery
Heidi Lohmann  Todd Thoma
Cynthia Long  Bill White

And for all other CSI Members and industry friends who stopped by to say "Hello" and spend some time with us, THANK YOU too!

For all of the above members, who are not serving on one of the Chapter Committees, the Chapter welcomes you to contact our current President, Jim Bergevin, to see where you might find a @home@ to help with some of the activities of the Chapter, so that we can fulfill our Membership=s expectations.

We appreciate your efforts to promote CSI, by informing others about the benefits of CSI membership, and we hope you had an opportunity to visit with colleagues and friends as well.

It is important to have Chapter members present at this event to help promote CSI and we feel the time spent advertising the strengths of CSI and our Chapter is of utmost importance to the growth of your Minneapolis-St. Paul Chapter.

THANK YOU once again for helping.

Doug Lingren, on behalf of the Membership Committee
Los Angeles City Hall: An American Icon

By Stephen Gee

Los Angeles City Hall: An American Icon is really the story of three projects. First is the history of the City Hall completed in 1928, the second is the story of what is known today as City Hall East located across Main Street along with its adjacent shopping mall completed during the administration of Mayor Sam Yorty in the 1970s. And last is a description of the seismic strengthening and damage repair project at City Hall following the 1994 Northridge earthquake. The book is loaded with rich photos, historical drawings, and offers details, not only on the design of these projects, but also of the architect selection process in each case. Architects will appreciate this part of the book if for no other reason than to read that not much has changed in this aspect of architectural practice on public projects.

The need for a new city hall arose in the first decade of the 20th Century. The population of Los Angeles had been growing rapidly and the existing city hall was too small. By 1920 the city’s population was 600,000 and the population would double by the time a new city hall would be completed in 1928. With Mayor George Cryer’s support, voters approved a municipal bond issue in 1923 providing $7.5 Million for constructing a new city hall including $2.5 Million for purchase of the land. The location was to be between Spring and Main Streets, at the east end of the new civic center proposed by landscape architects Wilbur Cook and George Hall. This is the present-day location of City Hall at the east end of our Grand Park.

Architect selection began in late 1923 as a tug of war between the Los Angeles City Board of Public Works and the City Council. It would take the resolution of a lawsuit filed by the Board of Public Works against the City Council, and the firing of another architect that had been hired by the City while the dispute over architect selection was being resolved, before the architect selection process was completed. The Board of Public Works favored the selection of the Allied Association of Architects, comprised of nearly 95% of Los Angeles architects, while the City Council initially favored holding a design competition. The City Council soon gave up on the idea of a competition and advocated instead hiring the firm of Associate Architects comprised of architects A. C. Martin, John Austin, and John Parkinson, three of the most distinguished and capable Los Angeles architects. Austin, the “politician” in the group, had designed Griffith Observatory, the Shrine Auditorium, and several schools and churches. A.C. Martin was the engineer in the group in addition to having been the architect of St. Vincent’s Catholic Church. He held several patents for reinforced concrete construction and had supervised the construction of the Los Angeles County Hospital, the Hall of Records, the Orpheum Theater, and other important buildings. John Parkinson had the most significant experience of nearly any architect in Los Angeles having designed over $200 Million of projects including downtown office buildings, Bullock's Wilshire, the Los Angeles Memorial Coliseum, and Union Station.
On their merits, Associated Architects seemed to be the logical choice in the first place but it wasn’t until July 1925 that issues were resolved enough for their contract to be signed. It included an architect fee of 6% of the $4.5 Million construction budget.

Architect John Parkinson’s first sketches for City Hall bore a striking resemblance to the Nebraska State Capitol building designed by architect Bertram Goodhue in 1920. And the final design for city hall varies only slightly from the early sketches. (Goodhue had recently completed his design for the Los Angeles Central Library that was also influenced by his design in Nebraska.) The city council wanted an “efficient” building and both the city council and the architects wanted a modern, “forward looking” building. Parkinson achieved this by following the approach Goodhue used on the Central Library. The design of both buildings wasn’t done in a single historical style as was the practice on other governmental buildings of the day. Both buildings had a monumental central tower at the heart of their designs, and surface embellishments were mostly non-existent except in locations where they could be seen and appreciated by the public. The focus of these embellishments at City Hall is the exterior doors and windows, especially at the main entrance court on the Spring St. side of the building, and the more ceremonial public spaces on the interior of the building. Local artists were commissioned to design the decorative wall and ceiling tiles, the bronze entry doors and window grillwork, the stone carving, and the stone pattern on the floor of the rotunda on the main floor. The architects designed the light fixtures throughout.

Before construction could begin in March 1926, a city ordinance limiting building heights to 150 feet had to be repealed since the city hall tower would be 28 stories tall, or 452 feet high. The height limit had to do with earthquake and fire safety concerns. (You may recall the deadly building fires in the late 19th and early 20th Centuries such as the Iroquois Theater fire of 1903 in Chicago that took 700 lives and the Triangle Shirtwaist Factory fire of 1911 in New York City that took 141 lives. Building codes were only in their infancy at this point. Even though the National Fire Protection Association was established in 1896 its codes were in their first generation and the first Uniform Building Code did not appear until 1927.)

City Hall construction was awarded to the local contractor, C.J. Kubach. Steel erection began in July 1926 and construction was completed in January 1928. At the dedication ceremony in April 1928 over 200,000 attended the day-long event that included a 16 city-blocks-long parade. The culmination of the ceremony was the lighting of the Lindbergh aircraft beacon at the top of the tower. This was done by President Coolidge remotely from his office in Washington, DC. City Hall remained the tallest building in Los Angeles until 1966 when the Union Bank Square was built at a height of 516 feet.

By 1960 city offices had outgrown City Hall. This led to the construction of City Hall East designed by architects Stanton and Stockwell during the administration of Mayor Sam Yorty. This project also included the Los Angeles Mall adjacent to City Hall East and the much maligned sculpture, “Triforium”. The project had a difficult start. The Municipal Arts Commission complained that the design was too “monotonous” and wasn’t complimentary to City Hall. The Fire Department wasn’t happy either since they thought it should be named the Fire Administration Building. The mayor wanted it to be larger and added eight floors to the original seven-story design. Meanwhile in October 1969 a construction contract was awarded to Montgomery-Ross-Fisher for $17,640,000, not including the additional eight floors requested by the mayor. This work added another $8,000,000 to the construction cost. And to make the design of the building more aesthetically pleasing to the Municipal Arts Commission, the well known California artist Millard Sheets was retained to create ceramic murals for the east and west facades of the building at the ground level. The building was dedicated in 1972 and the installation of the Triforium sculpture was completed in 1976.
The third project in the story of City Hall began in 1990 with the passage of ballot Measure “G” that allocated $112 Million for seismic strengthening and damage repair at City Hall resulting from the Whittier Narrows earthquake of 1987. Initially architect Edward H. Fickett was awarded the design contract for the work but by March 1993 he was supplanted by the firm of A.C. Martin Partners. This became a family project for the Martins since the grandfather of the current generation of Martins, A. C. Martin Sr., was involved in the original City Hall project. Following the Northridge earthquake of 1994, the scope of the project expanded and the budget grew to $273 Million. The mayor of Los Angeles at the time, Richard Riordan, argued that spending such an amount on an out-of-date City Hall building didn’t make economic sense since a new, modern city hall could be built for $300 Million. His argument was unsuccessful and in 1998 Clark Construction was awarded the contract that included a seismic base isolation system in addition to repair of damage to the building from years of wear and tear and the 1987 and 1994 earthquakes. In this process a significant amount of historic restoration to interior finishes and fixtures took place under the guidance of architect Brenda Levin. In 2001 the historic Lindbergh beacon was relit after a $250,000 restoration and the rededication of City Hall took place in April 2002.

Los Angeles City Hall: An American Icon was published in 2018 by Angel City Press. It has 215 pages and includes a treasure of current and historic photographs and many copies of original architectural drawings.

Ed Buch, FCSI, CCS, AIA, LEED AP
Los Angeles, CA
Feb. 24, 2020

P.S. If you’re interested in more information on some of the topics mentioned above, please refer to the following:


2. Iconic Vision, John Parkinson Architect of Los Angeles, by Stephen Gee. See BuchNotes #60.


4. Tinder Box, The Iroquois Theatre Disaster 1903, by Anthony P. Hatch. See BuchNotes #3.
Myths have a way of persisting, even after they’ve been proven false. For example, one so-called rule of “proper” English writing is that sentences should never end with a preposition. Well, it’s not a rule; it’s a myth. No reputable guide to English writing supports it. It’s been debunked many times, yet it persists in misleading writers into building clumsy, unnatural-sounding sentences. Perhaps the most famous debunker of this myth was Winston Churchill, a master of crafting superb English sentences. After an editor had “corrected” one of Churchill’s books by revising all the sentence-ending prepositions, Churchill wrote back, “This is the sort of pedantry up with which I will not put.” Churchill’s response has all the elements of a great story—it’s pithy, funny, and sarcastic. Unfortunately, it never happened. It too is a myth. Yet countless books on English writing repeat what Churchill supposedly wrote [1]. Myths persist, as do mythical quotations, about which this article is.

“Mythquotations” are often repeated by well-meaning writers unaware that the famous people they are quoting probably never said the quoted statement. Lest you think I’m being all high and mighty about this, I confess to having fallen more than once into the mythquotation trap. Most embarrassingly, in my book about writing I wrote the following about the word very: “I just happen to have Mark Twain here to back me up: ‘Substitute “damn” every time you’re inclined to write “very”; your editor will delete it and the writing will be just as it should be.’” I thought it was a nice joke, recalling Woody Allen’s Marshal McLuhan gag in Annie Hall, and it illustrated an important point. Just one problem: As I later learned, Twain most likely never said any such thing about very. I believed the source where I found the quote because it sounded like something Twain would have said. [2]

That’s what happens with many mythquotations: They sound like what some famous person would have said, and over time they become attached to that person. And certain famous people, such as Mark Twain, Abraham Lincoln, Albert Einstein, Mohandas Gandhi, and Benjamin Franklin, along with the King James Bible, are like magnets that attract quotes of uncertain origin.
Sometimes, a quote’s origin can be quite murky. A famous example: “If I had more time, I would have written a shorter letter.” The earliest documented use of this statement (or at least something close to it) is in a 1657 letter (in French) by the mathematician Blaise Pascal. Numerous later writers, including John Locke, Henry David Thoreau, and quotation magnets Twain and Franklin wrote versions of the statement; whether they were repeating what they had read elsewhere or were independently inventing something clever may never be known. The Roman orator Cicero and the German theologian Martin Luther may have made the statement before Pascal, but this is based on references in books written many years after Cicero and Luther died.

Fortunately, many of the quotation magnets have authoritative collections of their written and spoken words. Albert Einstein, for example, has the Princeton University Press’s The Ultimate Quotable Einstein. Thus, we can be fairly certain he never said or wrote, “Insanity is doing the same thing over and over again and expecting different results” [3]. Of course, we can’t be 100% sure he never said it; for all we know, he may have sung it in the shower. But researchers have not found any evidence that he said or wrote the statement.

Sometimes a quotation is correctly attributed to a famous person, but what gets lost is that the famous person never claimed to have originated the statement. For example, Mark Twain actually said, “Wagner’s music, I have been informed, is really much better than it sounds,” and because it’s something that sounds like what Twain would have said, everyone ignores that he preceded his statement with “Bill Nye said” [4].

Many quotations are attributed to the wrong person so often, in print and online, that the misattributions sound authoritative just by the number of references. For example, type “Winston Churchill preposition quote” in Google and you’ll find far more sites that repeat the myth than debunk it [5].

Another form of myth quotation is what Ralph Keyes calls bumper-stickering, in which an actual quotation is revised over time into a shorter, pithier, and, well, more quotable quotation. For example, Churchill (again) is often credited with saying, “blood, sweat, and tears.” Close, but no cigar (as Churchill, an avid cigar smoker, might have said, but probably didn’t). What he actually said was “I have nothing to offer but blood and toil, tears and sweat.” Not nearly as catchy, and certainly not a good name for a rock band [6].

Mythquotations can also result from a distortion of an actual quote that changes its meaning. For example, in 1946, Brooklyn Dodgers’ manager Leo Durocher was asked by a sportswriter, “Why can’t you be a nice guy?” Durocher pointed to his opposing team, the New York Giants, and said something like, “Look over there. … Why, they’re the nicest guys in the world. And where are they? In seventh place. Nice guys! I’m not a nice guy, and I’m in first place.” In other words, he was talking about a specific team, which happened to consist of nice guys, but wasn’t in first place. He wasn’t expressing a general philosophy of life, as the often-repeated myth quotation “Nice guys finish last” would suggest. [7]

Not all famous quotations are myths, however. For example, Frank Lloyd Wright did say, “The physician can bury his mistakes, but the architect can only advise his client to plant vines” [8]. And speaking of architecture, Winston Churchill (we keep coming back to him) actually said, “We shape our buildings, and afterwards our buildings shape us,” in a 1943 address to the House of Commons.

One more important point: Just because a clever and quotable statement wasn’t said by a famous person doesn’t mean it’s not clever or quotable. Einstein may never have defined insanity, but “his” definition is still a good one.
How can we determine if a quote is valid? Few of us have the ability or the time to track a quote to its source, so we need resources we can trust. Here are a few I rely on:

*Bartlett’s Familiar Quotations* organizes its quotations by author (at least in the Kindle version), and only includes quotations it has verified, so it won’t tell you if a quote is not by a particular author.

*Merriam-Webster’s Dictionary of Quotations* organizes its quotations by subject, making it somewhat more useful, but it doesn’t talk about quotations of suspect origin.

Ralph Keyes’s book *The Quote Verifier* organizes its quotations by subject, and tries to verify the source of each. It has sections devoted to specific quotation magnets, or what Keyes calls “flypaper people.” He also gives this useful piece of advice: “It is generally safe to assume that when two parties are thought to have said something, the lesser-known party said it first.”

The book *They Never Said It*, by Paul Boller and John George, debunks several hundred famous mythquotations.

*The Internet Movie Database* includes thousands of lines of dialogue from movies. So far, I’ve found it reliable.

David Crystal’s book *Begat: The King James Bible & the English Language* verifies (or not) 260 well-known quotations from the most famous (and quotable) version of the Bible.

Garson O’Toole’s book *Hemingway Didn’t Say That: The Truth Behind Familiar Quotations*, and his website, *The Quote Investigator*, verify or debunk hundreds of quotations. His research seems thorough and he identifies all his sources.

The website *Wikiquote* is probably as reliable as *Wikipedia*, so a little caution is required, but it may be the largest collection of quotations available to us.

This article’s take-away is simple: To quote *The X-Files*, “Trust no one.” If you plan on quoting someone, particularly someone famous, do your best to verify the quotation. Verification takes more effort, but who said writing is easy? Probably no one, but don’t quote me on that.

**Bill Schmalz, CSI, CCCA, FAIA**

**Footnotes:**

[1] A tip-off that Churchill never made the statement is the many variations of the quotation. Another version I’ve encountered: “This is the sort of bloody nonsense up with which I will not put.”

[2] To the nitpickers out there who insist that *quote* can only be a verb, and that the noun is *quotations*, I say, chill out. *Quote* as a noun is accepted for all but the most formal uses by such authorities as the Merrim-Webster and American Heritage dictionaries and *Garner’s Modern English Usage*, and is an example of English’s flexibility. Older verbs-turned-into-nouns that no one frets about anymore are *regret* (verb: late 1300s; noun: 1530s) and *talk* (verb: early 1200s; noun: late 1400s). Another old example that has taken on new life in the digital age is *invite* (verb: 1530s; noun: 1650s), saying “I’ll send you an invite” will annoy many of today’s nitpickers.


[5] In this case, despite seeing the Churchill quote in at least a dozen books on writing, I resisted the temptation to use it in my own book, not because I suspected it might be a mythquotation (I learned this later), but because I was tired of reading about it.

[6] For you youngsters, Blood, Sweat & Tears was a jazz-infused rock band popular in the late ’60s and early ’70s.

[7] Many years later, Durocher claimed he had said, “Take a look at them. All nice guys. They’ll finish last. Nice guys. Finish last.” In his version, which should be taken with a large grain of salt, the last two sentences were combined to change the quote’s meaning.

[8] Quote Investigator traced it to a 1931 published lecture of Wright’s. Bartlett’s also credits Wright with the quotation, but claims it was published in the New York Times Magazine on October 4, 1953. Given the likelihood that Wright often repeated his Wittiest statements, I suspect both sources are correct, but that QI has found the earliest known instance.

[9] IMDB debunks many well-known movie mythquotations. For example, in the movie The Treasure of the Sierra Madre, the character Gold Hat doesn’t say, “We don’t need no stinking badges.” Instead, what he says is, “Badges? We ain’t got no badges. We don’t need no badges. I don’t have to show you any stinking badges.”

[10] Crystal confirms many King James Bible quotes, such as “How the mighty have fallen,” “Be fruitful and multiply,” “the skin of our teeth,” and “Woe is me.” On the other hand, he finds many mythquotations, such as “Pride goes before a fall,” “The writing is on the wall,” “Faith can move mountains,” and “Cast the first stone” (in each case, the KJB expresses the meaning of these mythquotations, but with somewhat different wording).


[12] For example, if you want to confirm the exact wording of opening line of Douglas Adams’s novel The Long Dark Tea-Time of the Soul (which I’ve needed to do more than once), Wikiquote is the place to go: “It can hardly be a coincidence that no language on Earth has ever produced the expression ‘As pretty as an airport.’”

[13] Which, according to the Internet Movie Database, is an actual X-Files quote.

Follow the author on Twitter @bill_schmwil. He is also the author of The Architect’s Guide to Writing.
Evaluating New Products: Innovation or Risk Avoidance?
Michael D. Chambers FAIA FCSI CCS

In my opinion one of the critical issues in the design profession today is making appropriate construction product choices. Whether to select innovative products and systems to meet design goals or to go with tried and true products for an often less than stellar design outcome is a constant quest of design professionals.

Product Risk Management

So, what do we do? Accept risk, transfer risk, avoid risk, or insure the risk? Probably some of each, but before we make any choices or decisions, it is critical to have a consistent product evaluation process. This process must reflect the type of design projects undertaken and the level of risk acceptable to the design professional and client.

Problem Identification

Effective design solutions do not necessarily require innovative products nor do innovative products generate effective design solutions. That is why it is so important to search out solutions rather than products in the design and problem seeking process.

Any competent problem identification process requires in-depth investigation and analysis. It is incumbent on designers to demand real, industry standard, information from manufacturers. Avoid "features and benefits" at any cost. It is nearly impossible to adequately assess the risks inherent in the design process using a manufacturer's marketing hype and fluff. Features and benefits should never be a deciding factor in the problem identification and risk assessment process.

Product Application Risks

There are several issues to consider and review to determine the acceptable level of application risk in selecting products and systems. “Fitness for use” is both a legal notion and good analysis tracking.

Environmental factors
Quality of installers
USA compatible vs. imported products
Scheduling, delivery, lead times

Critical Product Evaluation Process

There are a series of critical questions and issues that must be addressed in the evaluation process.

- Are primary systems, such as, structural, MEP, or envelop affected by the selected product?
- Health or Safety Issues
- Integration, connections
- Installation quality
- Sustainability, life cycle cost
- Warranty vs. quality installation
- Product data binders and website
- Product manufacturer representative relationship

Warranties

Warranties are not a risk management tool. Warranties are drafted by attorneys to limit the risk of product manufacturers. They do not provide any significant protection to the client or architect. Warranties are important, they are required as part of the Uniform Commercial Code, and in general, are part of good business practice.
Warranties do not avoid or reduce risk; they do not prevent roofs from leaking or sealants from failing. Only good design and installation practice can reduce or avoid the risks inherent in the use of construction products and assemblies. In some cases, warranties may increase perceived risk of an installation due to unreasonable expectations for performance on the part of the client.

Finally, longer warranties are never a justification for a lower first quality in products or assemblies. The practice of resolving bad value engineering judgments with longer warranties is not just bad practice it is unethical and poorly serves our clients.

Warranties have their proper place in the construction process but rarely as a part of a product evaluation.

**Evaluation Tools**

There are a number of key tools that can help design professionals in the product evaluation process. First and foremost is asking questions. In particular, asking the right questions to obtain real industry information so that appropriate decisions can be made from it incredibly important.

Using the outline of topics found in CSI’s SectionFormat™ can be a very useful tools ensuring that information topic is covered, and the right questions asked.

Mock ups are a significant evaluation tool, though somewhat after the fact. However, mock ups are excellent for resolving integration and interface issues that may not be clearly understood during the evaluation process.

Understand and investigating testing processes and procedures can often be a useful tool in determining adequacy and quality of new or innovative products. Be cautious, because it just because it passes tests does not mean that it is the right product for the project. A good example is door closers. Manufacturers love tell you that their closer passed a 100K cycle test. The interesting fact is that closers rarely fail by weaing out. They fail because they are not adjusted correctly or sized incorrectly for the size of door.

Manufacturers’ installation instructions and installer warnings are another great source of product evaluation material. For some reason, manufacturers will not misrepresent their products to the installers like they will to design professionals. Pays to read the installation instructions lots of very interesting information about “fitness for use” can be found there.

Checklists are another useful tool to keep product evaluations organized. A couple of checklists that I have developed follow this article.

Risk avoidance in product selection and innovative design practice is a simple, discipline that can provide significant benefits to clients and design professionals. Ask questions, demand industry standard responses, and look for manufacturers that provide excellent products rather than unreal warranties.

* * * * *

**Michael D. Chambers FAIA FCSI CCS** is Senior Project Specifier/AVP at HGA Sacramento and principal of MCA Specifications.
### UPCOMING EVENTS FROM LOCAL CONSTRUCTION ASSOCIATIONS

Check websites for complete listings

<table>
<thead>
<tr>
<th>DATE</th>
<th>EVENT</th>
<th>ORGANIZATION</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/3/2020</td>
<td>No Events Listed</td>
<td>Contact Office</td>
<td>Building Enclosure Council - MN</td>
</tr>
<tr>
<td>3/12/2020</td>
<td>R. Rapson Traveling Study Competition</td>
<td>AIA Minnesota</td>
<td>aia-mn.org</td>
</tr>
<tr>
<td>3/19/2020</td>
<td>AIA-Minneapolis Luncheon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/19/2020</td>
<td>Society for Design Admin. Meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4/2020</td>
<td>AGC Economics Summit</td>
<td>AGC of Minnesota</td>
<td>agcmn.org</td>
</tr>
<tr>
<td>3/11/2020</td>
<td>ASHRAE Day on the Hill (Capitol)</td>
<td>ASHRAE-MN</td>
<td>mnamashrae.org</td>
</tr>
<tr>
<td>3/10-11/2020</td>
<td>ACI Adhesion Anchor Install Training</td>
<td>Aggregate Redi Mix Association - MN</td>
<td>armoofmn.com</td>
</tr>
<tr>
<td>3/10-11/2020</td>
<td>Disaster Mgmt for WTP &amp; WWTP Fac’s</td>
<td>American Public Works Assoc. - MN</td>
<td>apwa-mn.org</td>
</tr>
<tr>
<td>3/18/2020</td>
<td>General Mtg. SW Light Rail Project</td>
<td>BOMA Bldg Owners &amp; Mgrs – MPLS</td>
<td>bomampls.org</td>
</tr>
<tr>
<td>3/9/2020</td>
<td>Ford Site Development Project</td>
<td>BOMA Bldg Owners &amp; Mgrs – St. P.</td>
<td>bomasaintpaul.org</td>
</tr>
<tr>
<td>3/19-20/2020</td>
<td>2020 Workshop and Awards Banquet</td>
<td>Concrete Paving Assoc of MN</td>
<td>concreteisbetter.com</td>
</tr>
<tr>
<td>3/16/2020</td>
<td>Using Enscape with Revit for RT &amp; VR</td>
<td>MSP - Const. Specification Institute</td>
<td>csimsp.org</td>
</tr>
<tr>
<td>3/5/2020</td>
<td>Jackson Leadership Lecture Series/First Thursday – See Website for Topic</td>
<td>Dunwoody Institute</td>
<td>dunwoody.edu</td>
</tr>
<tr>
<td>3/12/2020</td>
<td>Choice Awards &amp; Bell Museum Tour</td>
<td>MN Construction Association</td>
<td>mnconstruction.org</td>
</tr>
<tr>
<td>4/1/2020</td>
<td>Gensler – No More One Size Solutions</td>
<td>IFMA International Facility Mgmt.</td>
<td>msp-ifma.org</td>
</tr>
<tr>
<td>3/10/2020</td>
<td>See Website or subscribe to newsletter</td>
<td>ASLA - Am. Soc. of Landscape Arch.</td>
<td>asla-mn.org</td>
</tr>
<tr>
<td>3/24/2020</td>
<td>Risk re. Diversity &amp; Inclusion Practices</td>
<td>MN Society of Professional Engineers</td>
<td>mnspe.org</td>
</tr>
<tr>
<td>3/26/2020</td>
<td>Q &amp; A with a General Contractor!</td>
<td>ASID – Am. Soc. of Interior Designers</td>
<td>mn.asid.org</td>
</tr>
<tr>
<td>3/5/2020</td>
<td>Tech Talk Tuesday – ACI Repair Code</td>
<td>Minnesota Concrete Council</td>
<td>mncnc.tceaucouncil.com</td>
</tr>
<tr>
<td>3/26/2020</td>
<td>Network Social, Location TBD</td>
<td>NAMC-UM - National Association of</td>
<td>namic-um.org</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minority Contractors – Upper Midwest</td>
<td></td>
</tr>
<tr>
<td>3/1-7/2020</td>
<td>Women in Construction Week</td>
<td>NAWIC- Nat’l Assoc. of Women Constr.</td>
<td>nawicmnp.org</td>
</tr>
<tr>
<td>3/202019</td>
<td>Joel Sanders: Inclusive Design-Race/Gender, Religion, etc.</td>
<td>U of MN – College of Design &amp; Arch Landscape and Interior Design</td>
<td>arch.design.umn.edu</td>
</tr>
</tbody>
</table>
1. If the construction budget of a 50,000 square foot is $5,000,000 based on $100 per square foot, it is an example of which method of preparing the budget?
   
a. Unit price.
b. Cost premeasured unit.
c. Systems.
d. Component cost.

2. Products can be categorized into the following types:
   
a. Standard products, custom products, natural products, manufactured products.
b. Materials, commodities, products, assemblies, equipment.
c. Materials, standard products, custom products, assemblies, equipment.
d. Standard products, custom products, commodities, equipment.

3. An affirmation of fact or promise made by the seller to the buyer that relates to the goods and become a part of the basis of the bargain creates:
   
a. An implied warranty.
b. A full warranty.
c. An express warranty.
d. A guarantee.

4. The direct acquisition of materials and equipment by an Owner:
   
a. Procurement.
b. Bidding.
c. Purchasing.
d. Solicitation.

5. Inspections are done by the AHJ to determine if the construction complies with?
   
a. Codes and Regulations.
b. Plans and Specifications.
c. Rights and Easements.
d. Forms and Surfaces.

6. Which father and son have won the Medal of Honor?

**Answers Are Provided on Page 27**
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>Awards Committee</td>
</tr>
<tr>
<td>James Bergevin, CSI, CCPR, CDT</td>
<td>Matt Strand, CSI, CDT, Chair</td>
</tr>
<tr>
<td></td>
<td>Rick Nichols, CSI, LEED AP, AIA Allied</td>
</tr>
<tr>
<td>Immediate Past President</td>
<td>Certification Committee</td>
</tr>
<tr>
<td>Cynthia Long, CSI, CDT</td>
<td>Gerhard Guth, CSI, CCS, CDT, AIA, LEED AP</td>
</tr>
<tr>
<td></td>
<td>Jerrilyn O'Brien, CSI, CDT, EIT, Co-Chair</td>
</tr>
<tr>
<td>President-Elect</td>
<td>Communications Committee</td>
</tr>
<tr>
<td>David Rasmussen, CSI</td>
<td>Jerry Putnam, FSCI, CCS, CDT, Chair</td>
</tr>
<tr>
<td>Vice President</td>
<td>Expo Committee</td>
</tr>
<tr>
<td>Kevin Slattery, CSI</td>
<td>Kathrine Barrett, CSI-EP, CDT, LEED GA</td>
</tr>
<tr>
<td></td>
<td>Noah MacMillan, CSI, Co-Chair</td>
</tr>
<tr>
<td>Vice President</td>
<td>Membership Committee</td>
</tr>
<tr>
<td>Andy Marolt, CSI, CCS, LEED AP</td>
<td>Susan Lee, CSI, CDT, AIA, CID, NCARB, Chair</td>
</tr>
<tr>
<td></td>
<td>Gary C. Patrick, CSI, AIA, RRC, Co-Chair</td>
</tr>
<tr>
<td>Vice President</td>
<td>Programs Committee</td>
</tr>
<tr>
<td>Mark McPherson, CSI, CDT</td>
<td>Brien DuRouche, CSI, Chair</td>
</tr>
<tr>
<td>Vice President</td>
<td>STEP Committee</td>
</tr>
<tr>
<td>Rick Nichols, CSI, LEED AP, AIA Allied</td>
<td>Hannah Fleischaker, CSI, Chair</td>
</tr>
<tr>
<td>Secretary</td>
<td></td>
</tr>
<tr>
<td>Tohnya Adams, CSI</td>
<td>Adrienne Rulseh, CSI-EP, Co-Chair</td>
</tr>
<tr>
<td>Treasurer</td>
<td>Chapter Administrator</td>
</tr>
<tr>
<td>Adrienne Rulseh, CSI</td>
<td>Jordan Grote, IntrinXec Management, Inc.</td>
</tr>
<tr>
<td></td>
<td>Madison Silva, IntrinXec Management, Inc.</td>
</tr>
<tr>
<td></td>
<td>Website Administrator</td>
</tr>
<tr>
<td></td>
<td>Jerry Putnam, FSCI, CCS, CDT</td>
</tr>
</tbody>
</table>
CERTIFICATION QUIZ ANSWERS

1. - b [PDPG 8.2.2.7*]

2. - c [PDPG 16.10.1*]

3. - c [PDPG 16.10.1*]

4. - c [PDPG 13.6 *]

5. - a [PDPG 14.5*]