

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND
AIR-CONDITIONING ENGINEERS, INC.
1791 Tullie Circle, NE, Atlanta, GA
404-636-8400**

**Technical Committee 4.4
Building Materials and Building Envelope Performance**

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.

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TC/TG/TRG MINUTES COVER SHEET

(Minutes of all TC/TG/TRG Meetings are to be distributed to the individuals listed below within 60 days following the meeting.)

TC/TG/SSPC: TC 4.4

TC Title: Building Materials and Building Envelope Performance

Date of Meeting: Monday, June 24, 2019. Meeting convened at 2:15 pm.

Location: Marriott-East, Lobby, Colonial – Kansas City, MO

DISTRIBUTION

All members of TC 4.4 plus the following:

TAC Chair

Committee Liaisons

ADDITIONAL DISTRIBUTION

Manager of Standards

Manager of Research and Technical Services

ASHRAE TC 4.4 MINUTES

Building Materials and Building Envelope Performance

1. Introductions/Roll Call/Attendance

The Chair, Rick Peters, called the meeting to order at 2:15pm, which was followed by roll call and introductions.

Voting Members rolling off June 30, 2019 include Richard Peters, Alejandra Nieto, Achilles Karagiozis, Paulo Tabares, Hua Ge, Stan Gatland and Paul Shipp (retiring).

Voting Members rolling on starting July 1, 2019 include David Finley, Sam Taylor, Chris Schumacher and Fitsum Tariku.

A total of 48 committee members, corresponding members, and guests were present. Attendance is shown below. Quorum has been reached with 16 out of 16 voting members present.

Voting Members and Officers Attended:

<u>Name</u>	<u>Affiliation</u>	<u>Role</u>	<u>VM</u>
Richard E Peters	TBS Engineering	Chair	Voting Member
Diana Fisler	Johns Manville	Vice Chair	Voting Member
Peter Adams	Morrison Hershfield		Voting Member
Alejandra Nieto	ROCKWOOL	Webmaster	Voting Member
Achilles Karagiozis	Owens Corning		Voting Member
Andre Desjarlais	ORNL		Voting Member
Paulo Tabares	Colorado School of Mines	Program Chair	Voting Member
Hua Ge	Concordia University		Voting Member
Florian Antretter	Fraunhofer IBP		VM (Non Quorum)
David Yarborough	R&D Services		Voting Member
Wahid Maref	Ecole de Technologie Superieure		Voting Member
Paul Shipp	USG Corporation		Voting Member
Roderick Jackson	NREL		Voting Member
Laverne Dalglish	ABAA		Voting Member
Sam Glass	USDA Forest Products Laboratory		Voting Member
Stan Gatland	CertainTeed Corporation		Voting Member

Total Number of VM: 16 (1 non-quorum)

Corresponding/Provisional Members Attended:

<u>Name</u>	<u>Affiliation</u>
Fiona Aldous	WJE
Fitsum Tariku	British Columbia Institute of Technology
Philip Boudreaux	ORNL
Danko Davidovic	Huber Engineered Woods
Leslie Scheppelmann	WJE
Dave Finley	WJE
Mika Salonvaara	Owens Corning

Sam J. Taylor	Retired
Jonathan Humble	American Iron & Steel Institute
Marcus Bianchi	Owens Corning
Charlie Curcija	LBNL
Neil Freidberg	Owens Corning
Craig Marden	Owens Corning
Michael Blanford	US Dept. of Housing & Urban Development
Deborah Callaway	PABCO Gypsum
John Davis	University of Wisconsin
Anthony Fontonini	NREL
Dolaana Khovalyg	Swiss Federal Institute of Technology Lausanne
Patrick Noonam	Knauf Insulation
Houjun Yang	North Dakota State University
Andrea Watts	Dupont
Ellen Thorp	EPDM Roofing
Keith Nelson	ECS
Chris Schumacher	RDH Building Science Laboratories

Total number of CM, PCM: 23

Guests Attended

<u>Name</u>	<u>Affiliation</u>
Zain Anjum	SGH
Jay Crandell	ARES Consulting
Charlie Petty	LAMTEC Corp.
Shayne Spence	LAMTEC Corp
Jon Kamies	True Engineering
Glen Clapper	National Roofing Contractors Association
Anil Parekh	NRC
Gary Nelson	Energy Conservatory
Michael Schmeida	Gypsum Association

Total number of guests: 9

2. Report From the Chair

The current status of the re-organization was discussed (see below):

June 2019- TC Reorganization Update

We would like to thank everyone who took the time to submit feedback for our proposed plan- it has given us a lot of information to process! The biggest take-away for the Ad hoc, is that each functional group (FG - includes TCs, TGs, MTGs, and TRGs) is not in the same place. While there are some groups that would benefit from restructuring, others are very productive and could be used as best-practice models for other groups. So, we will be slightly redirecting our focus to be a little more all-encompassing.

First, our number one goal is still to utilize our members' time more efficiently and effectively. To this end, we will be looking at two logistical items:

1. Adjusting meeting times into a block schedule. We currently have many meetings happening at non-standard times which leads to conflicts in people's schedules and a very inefficient use of meeting space.

2. Looking into moving subcommittee meetings into a time slot on the same day, and maybe immediately before the main group meeting. This way, if someone can only attend for a few days, they can attend all meetings for a functional group.

In addition, functional groups will be working with their Section Heads in TAC to determine how to make their work more effective- what will it take to go from good to great? This may look like many things, including:

1. Possible mergers- many great ideas were suggested from TCs.
2. Possible joint subcommittee meetings
3. Holding interim meetings online
4. Updated mailing lists/ communications structures

Starting in Kansas City, we will be rolling out a new TC Chair/ Section Head Breakfast meeting structure, but it will continue to be at 6:30am on Sunday. Instead of having each section meet in its own room, we will be meeting in one of the larger ballroom-type rooms. Chairs and Vice-Chairs as well as program/ handbook subcommittee chairs will be invited to come. Participants will be seated by section. The agenda will include:

- Celebrations (Best Practice Highlights)
- Training
- Liaison Reports (Pub Ed Council, Members Council, RAC, Handbook, CEC)
- Section Discussions

We are hoping that this format will help us communicate more clearly, give us more time for training, and still allow both formal discussion time with our sections, as well as the opportunity to facilitate informal discussions.

Overall, we want you to know that TAC and the Section Heads will be looking at multiple ways to offer continuous leadership toward a more effective and efficient future. Stay tuned for more updates as we figure out the details, and reach out to your section head if you have any ideas for consideration . While some minor changes may roll out sooner, the earliest any major changes would occur would be in conjunction with the society year, at the annual conference in Austin, June 2020.

Best Regards, Sarah Maston, Chair (sarah@greenfootprintsco.com)

Victor Goldschmidt, TAC (creating2@earthlink.net)

Barbara Minor, TAC

(Barbara.H.Minor@chemours.com)

Thom Justice, TAC Chair (justfilter@yahoo.com)

Larry Smith, TAC (LarryS@li-hvac.com)

Tom Lawrence, TAC BOD ExO

Bill McQuade, Planning (BMcQuade@ahrinet.org)

(lawrence@engr.uga.edu)

Email Aliases → The current ASHRAE email alias list can be found at:

<https://www.ashrae.org/File%20Library/Technical%20Resources/Technical%20Committees/2018-2019-Email-Alias.pdf>

The list will be updated for 2019-20 after the KC meeting.

Basecamp is ASHRAE's preferred method of communication for the TC. The TC membership was reminded to verify their access to basecamp and that most communication will come via basecamp and not via direct email.

Remote Participation Meetings (RPM's) are available for use but there is a limited amount of equipment. Requests need to be made to headquarters at least 6 weeks in advance. TC's that want to use their own equipment may do so. ASHRAE providing a Go-To-Meeting link is not a viable alternative at this time because of additional seats and bandwidth. -

CEC is looking for volunteers from every TC to provide quality control and peer review. If you are interested in adding your name to the list of volunteers, please contact the chair.

3. Approval of last meeting minutes, Atlanta, January 14, 2019

The draft minutes from the January 14, 2019 meeting in Atlanta, GA were posted to the ASHRAE Website for review. A motion has been raised by Diana Fisler and seconded by Peter Adams to approve the Atlanta, GA meeting minutes with an update on attendance (Roderick Jackson was present).

VOTE: For 12, Against 0, Abstaining 3; CNV, MOTION CARRIED

4. Program Subcommittee

Seminar: Orlando, FL - January 2020

Back to the future on High Efficiency Design and Operation

Chair: Fitsum Tariku

Speaker 1: Ron Judkoff, Craig Christensen, ex-DOE now in NREL

Broad overview on building energy consumption over 20 years. Focus on large commercial (ICI, multi-family).

Speaker 2: Wahid Maref

Review of approaches of building envelope design; past, existing and new

Speaker 3: TBD

HVAC → Paulo to contact Co-sponsor with 9.1 (large building system) 9.8 (applications), 7.6 (building energy performance)? Peter to also reach out.

Motion to vote for approval of proposed seminar for Orlando, FL – Back to the Future on High Efficiency Design and Operation.

Motioned by Laverne Dagleish; second by Diana Fisler.

VOTE: For 13, Against 0, Abstaining 2; CNV, MOTION CARRIED

Seminars: Austin, TX - June 2020

1. Grid Interactive Building Envelope

Chair: Paulo Tabares

Speaker 1: ORNL - Grid modernization initiative

Speaker 2: ORNL (Florian)

Speaker 3: NREL (Roderick and Chioke)

Speaker 4: NRC (TBD – Anil as option)

2. Resilient buildings: Envelope-HVAC interaction considerations (Request co-sponsorship by TC 2.10)

Chair: Florian (request to avoid Tuesday 8am)

Speaker 1: University of Toronto (Alejandra to contact) - Thermal Autonomy

Speaker: Lisa White (Passive House) - Relationship between grid and passive house

Speaker 3: NRC TBD (Mehdi to help find speaker) - Recovering/resilience climate change

Speaker 4: Achilles K. - Whole building performance

3. Building envelope recover to wind and flood

Chair: Andre Desjarlais

Speaker 1: Pete Consigli (RIA) - Restoration industry association.

Speaker 2: Baskaran (NRC) - Post-disaster for roofing.

Speaker 3: TBD (Andre to find third speaker)

4. All paths lead to zero: Toward Zero Energy Building Initiatives

Chair: Wahid

Speake 1: Peter, Everybody needs a TEDI bear...

Speaker 2: status of passive house

Speaker 3: NRC (TBD)

Additional Discussions:

Program Chair noted that timeline for seminar planning will commence 1 year in advance.

5. Research Subcommittee

Abbreviations

MORTS = Manager of Research and Technical Services
PES = Proposal Evaluation Subcommittee
PMS = Project Monitoring Subcommittee
RAC = Research Administration Committee
RFP = Request for Proposals
RL = Research Liaison
RP = Research Project
RTAR = Research Topic Acceptance Request
TRP = Tentative Research Project
URP = Unsolicited Research Proposal
WS = Work Statement

Research Chair breakfast:

- Section 4 RL congratulated 4.4./4.3 on having the most research projects
- New: Research Strategic Plan under development. Approach RL with suggestions.
- New: Updated Work Statement Template that includes a requirement for a maximum 100 word project abstract written in “Plain English”. This is to support distribution and marketing of produced documents at end of project.
- New: PTAR (Publication Topic Acceptance Request) → similar to RTAR but for publication efforts
WSP (Work Statement for Publications) → proposed table of contents vs WS scope & approach.
- REQUIRED: RAC requires that all new PMS members participate in training webinar. First one was held on April 25, 2019. Second one should be announced this fall (TC 4.4 had at least 5 participate). Recorded version may be made accessible on demand. RAC is also developing a PES training webinar.
- Mike Pouchak will be moving from Section 4 RL to RAS Chair
David Claridge is coming on as new Section 4 RL
- Keep in mind submission dates for consideration by RAC: miss these and you might be “MAAD” the 15th of **March, April, August, and December**

Project Status Updates

1696-RP

Thermal, Moisture and Air Transport Property Values for New Building and Insulating Materials (WS authors: Alex McGowan, Steve Cornick).

Chris Schumacher presented the progress and interim results to PMS members. No cost extension requested via email prior to meeting (see ballot results below).

1759-TRP

Impact of Air-Flow on Thermal Performance of Airspaces behind Cladding (Phase 1 of 2) (WS authors: Jay Crandell, David Yarbrough, Jonathan Humble).

Paulo Tabares presented the progress and interim results to PMS members. No cost extension requested via email prior to meeting (see ballot results below).

1718-WS

Development of a Method to Determine the Moisture Transport Properties of a Roof Shingle System under Real Conditions (WS author: Mika Salonvaara; cosponsored by TC 1.12).

Author changed from Manfred Kehrer to Mika Salonvaara

The WS has been conditionally accepted by RAC with minor changes. Changes to be submitted to RAC for their Spring 2020 meeting.

1730-WS

Mass Flow Rate Correlations for Standard Venting Strategies and Components in Attic Spaces with Sloped Roofs (Authors: Anthony Fontanini, Dave Roodvoets; cosponsored by TCs 4.3 and 4.7).

The WS was reviewed at the June Pre-meeting and Returned with Comments. Anthony (with support from others) to revise for resubmittal to RAC for Spring 2020 meeting.

Draft RTAR

Characterization of Residential Indoor Moisture Generation based on Survey and Laboratory Measurements (Authors: Simon Pallin and Fitsum Tariku, TC 1.12).

Authors have decided to not continue with RTAR.

Draft RTAR

Development of Material Moisture Tolerance Criteria and Evaluation Methodology for Hygrothermal Analysis of Building Enclosures using ASHRAE 160 (Author: Jay Crandell, SSPC 160).

APA has some concerns with the focus on the RTAR. Sam Glass to reach out to APA for further clarification and possibly to facilitate APA participation in writing revised RTAR.

Draft RTAR

Hygrothermal Properties of Aged Construction Materials (Authors: Steve Cornick/Neal Holcroft).

Email from Neal Holcroft indicates he still hopes to complete and submit this RTAR but has not made recent progress. Anyone interested in assisting should contact Holcroft / Schumacher

Draft RTAR

Develop Performance Metric, and a Process for the Measurement, Evaluation and Prediction of Speech Privacy in High Performance Buildings (Author: Kenneth Roy, TC 2.6).

TC has withdrawn support.

Draft RTAR

Moisture Transfer in Building Materials at High Temperatures (Author: Sam Glass).

No Update.

Electronic Ballots:

Email Ballot - #1: 1696-RP No-Cost Extension

Date: June 10, 2019

VOTE: For 10, Against 0, Abstaining 0; CNV, MOTION CARRIED

Email Ballot - #2: 1759-RP No-Cost Extension

Date: June 10, 2019

VOTE: For 10, Against 0, Abstaining 0; CNV, MOTION CARRIED

Additional Discussions:

Andre request to move PMS meetings to another time due to conflict.

Schumacher and Tabares to organize another Research Topic Brainstorming session for 1 hr at the Winter meeting in Orlando FL (Feb 2020)

6. Handbook Subcommittee

The work for the 4.4 Handbook Sub-Committee is to update Chapters 25,26 and 27 of the ASHRAE Handbook of Fundamentals. The Lead Reviewers for these chapters are;

Chapter 25 – Marcus Bianchi

Chapter 26 – Hua Ge

Chapter 27 – Charles Cottrell

The schedule for this work is;

All chapters are to be revised by February 1, 2020. The chapters then need to be; 1) Send revised chapter to TC for review, 2) TC approves chapter and 3) Send chapter to HBC liaison by July 31, 2020.

Some basic changes to the Chapters were discussed at the 4.4 Handbook Sub-Committee meeting that could be incorporated into the Chapters such as adding the functions of the building enclosure to Chapter 25 and the new data on material properties to Chapter 26. All the Lead Reviewers asked the members of TC 4.4 to provide comments on the Chapters in any format including just identifying something that is missing or something that needs to be changed. The detailed technical wording does not need to be provided.

Discussion was held on how best to provide revisions to the Chapters. It was recommended that using Basecamp is the most convenient way. Chapters 25 and 26 are posted on Basecamp and Chapter 27 will be posted by the end of the week. Each 4.4 member is encouraged to communicate with the Lead Reviewer on any comments, edits or changes they would like to propose.

The Lead Reviewers may want to enlist a small group of 4.4 members to help them review the proposed comments and determine the modifications to the Chapters.

For the next 4.4 Handbook Sub-Committee meeting, additional time will be requested so that the documents can be projected and the whole Sub-Committee can review the close to final document on the screen and make comments/revisions. The Lead Reviewers will lead the discussion on the documents.

Additional Discussions:

Basecamp reminders will be set up (monthly) leading to February 1, 2020 for comments on Chapters 25, 26, 27 from Handbook of Fundamentals.

Working files for chapter reviews can be downloaded from Basecamp. Upload new documents with revisions/comments in “comment” area. Chapter reviewers to be responsible for consolidation.

7. Standards Subcommittee

Updates were presented by the individual Liaisons to the TC as the Standards Subcommittee Chair Theresa Weston was not present.

SSPC 160 - Criteria for Moisture-Control Design Analysis in Buildings Report (Achilles Karagiozis):

Currently working on (1) Corrosion, (2) Freeze/Thaw , (3) probalistic assessment.

The Addendum for weather years going to public review.

Chair requests interested TC4.4. members to participate.

Standard 90.1 (a.k.a. Commercial minimum compliance energy standard) Energy Standard for Buildings Except Low-Rise Residential Buildings

Purpose: To establish the minimum energy efficiency requirements of buildings other than low rise residential buildings for

a. design, construction, and a plan for operation and maintenance; and

b. utilization of on-site, renewable energy resources.

Report (Jonathan Humble):

- Completed addendum in preparation for publication in October 2019.
- Completed just under 200 addendum for this next edition.
- 2019 updates include fenestration U-factors, revisions to air barrier provisions, insulation updates, a new commissioning appendix, and a new verification of construction set of provisions.
- Does not include thermal bridging, as focus is 2021. A 1st draft Addendum received 188 comments, and the envelope subcommittee working on responses. Will be producing a 2nd draft for public review, which is anticipated to occur the Fall of 2019.
- SSPC 90.1 Co-effort with RP-1759 (Jay Crandell the SSPC 90.1 representative on PMC)
- Mr. Humble continues to report on TC 4.4 activities.

Standard 90.2 (a.k.a. Residential above code energy performance code)
Energy Efficient Design for Low-Rise Residential Buildings

Purpose. *The purpose of this standard is to establish the minimum whole-building energy performance requirements for energy efficient residential buildings.*

Report (Jonathan Humble):

- Published 2018 edition this year.
- Based on RESNET 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units Using an Energy Rating Index (HERS rating)
- Designed as an above code document.
- Marketing to International Energy Conservation Code as above code option (ICC Code change RE224-19).
- Beginning work to market to jurisdictions who wish to have above code energy requirements.
- Back on continuous maintenance pursuant to ANSI requirements.
- PC working on updates for next edition.
- Revisiting energy metrics in preparation for the next edition.

Standard 189.1 (a.k.a. Green and sustainable standard, not a minimum)
Standard for the Design of High Performance Green Buildings, Except Low-Rise Residential Buildings

1. PURPOSE

1.1 The purpose of this standard is to provide minimum requirements for the siting, design, construction, and plans for operation of high-performance green buildings to reduce emissions from buildings and building systems, enhance building occupant health and comfort, conserve water resources, protect local biodiversity and ecosystem services, promote sustainable and regenerative materials cycles, enhance building quality, and enhance resilience to natural, technological, and human-caused hazards; ...

Report (Jonathan Humble):

- This is a joint venture project with ASHRAE, IES, AIA, ICC, and USGBC,
- Business agreement between ASHRAE and International Code Council to create one high performance green code for North America,
- Recently published 2018 document entitled the International Green Construction Code which combines the technical requirements of Standard 189.1 and the ICC International Green Construction Code,
- Agreement was also to create a minimum high performance standard that could be a benchmark for USGBC LEED program,
- Topics include site sustainability, water conservation, indoor air quality, energy conservation, materials and resources, operation and maintenance, and commissioning,
- SSPC 189.1 is working on updates in preparation for 2021 edition,
- Energy updates use Standard 90.1 as the benchmark from which to increase stringency.
- Working on marketability of document by creating a system within of “core” and “non-core” provisions to allow jurisdictions who adopt the choice to choose what provisions are best suited for their region.

SPC 227P Passive Building Design Standard

Currently under the ASHRAE approval process to become an SPC.

SPC 228P Standard Method of Evaluating Zero Energy Building Performance

Currently under the ASHRAE approval process to become an SPC.

TC 7.9 – Building Enclosure Commissioning

TC 4.4 was contacted for possible new guideline. Options are to either adopt ISO standard or create a new ASHRAE standard.

TC 2.5: Climate Change

Developing new chapter for Handbook of Fundamentals. Requested input from all TC committees.

8. Old Business

Basecamp update – Reminder for those who want access to sign up as official TC 4.4 PCM.

9. New Business

Next meeting (Orlando 2020) a research brainstorming session will be scheduled in between research and program subcommittee meetings.

TC will institute a Membership Chair. Volunteers are welcome.

TC 4.4 would like to thank Paul Shipp for all his work on the TC and congratulate him on his retirement.

Definitions project from AIA has been uploaded to Basecamp by Sam Taylor. Feedback is requested by July 5.

Buildings XIV Conference December 8-12 – invitation to attend by Andre Desjarlais.

Universities seeking new resources on building science. Contact Sam Taylor if you have anything to share.

Wahid Maref moved a motion to adjourn the meeting at 4:10. Second by Alejandra Nieto.

Minutes by Alejandra Nieto – Acting Secretary, TC 4.4. Next meeting: Orlando, FL – February 3, 2020.