

**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**

**DRAFT Minutes  
Monday, January 30, 2017  
Las Vegas, Nevada**

***These DRAFT minutes have not been approved and are not the official, approved record until approved by this committee.***

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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, January 30, 2017. Meeting convened at 2:15 pm.**

**Location: Room Roman IV, Caesars Palace Convention Center, Las Vegas, Nevada**

**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

Monday, January 30, 2017 – Las Vegas, NV

### Building Materials and Building Envelope Performance

#### 1. Introductions/Roll Call/Attendance

The Chair, Peter Adams, called the meeting to order at 2:15pm. Roll call and introductions. A total of 38 committee members, corresponding members and guests were present. A quorum was present (13/16 of voting members). Attendance is shown below:

#### Voting Members and Officers Present:

<u>Name</u>	<u>Affiliation</u>	<u>Role</u>	<u>VM</u>
Peter Adams	Morrison Hershfield	Chair	Voting Member
Richard E Peters	TBS Engineering	Vice Chair	Voting Member
Samuel Glass	USDA Forest Products Laboratory	Research Chair	Voting Member
Alejandra Nieto	Roxul		Voting Member
Achilles Karagiozis	Owens Corning		Voting Member
Manfred Kehrer	Just Smart Solutions		Voting Member
Jan Kosny	Fraunhofer/USA		Voting Member
Patrick Noonan	Knauf insulation		Voting Member
Fitsum Tariku	British Columbia Institute of Technology		Voting Member
Hua Ge	Concordia University		Voting Member
Paulo Tabares	Colorado School of Mines	Program Chair	Voting Member
Charles Cottrell	NAIMA		Voting Member
Stanley D. Gatland, II	Certa inteed		Voting Member

**Number of voting members present: 13 (0 non-quorum)**

#### Voting Members and Officers Absent

<u>Name</u>	<u>Affiliation</u>	<u>Role</u>	<u>Notes</u>
Theresa A Weston	Dupont	Standards Chair, 90.2	Voting Member
Laverne Dagleish	ABAA	Handbook Chair	Voting Member
Wahid Maref	ETS		Voting Member
Jonathon Humble	American Iron & Steel Institute	90.1 Liaison	Corresponding Member
Andreas H Holm	Fraunhofer IBP		VM Non quorum
Carsten Rode	Technical University of Denmark		VM Non quorum

## Corresponding/Provisional Members Present (15)

<u>Name</u>	<u>Affiliation</u>
Fiona Aldous (Secretary)	WJE
Marcus V Bianchi	Owens Corning
Michael Blanford	HUD
HuoJun Yang	NDSU
Roderick Jackson	ORNL
Andre Desjarlais	ORNL
Hugo Hens	BWKKlueven
Paul H Shipp	USG Corporation
Diana Fisler	Johns Manville
Charles Cottrell	NAIMA
Stanley D Gatland, II (160 SubC Chair)	Certaineed Corp
Simon Pallin	ORNL
Matt Miles	Innovative Insulation Inc
Carsen Banister	National Research Council Canada
Suda Molleti	National Research Council Canada

## Visitors Present (10)

<u>Name</u>	<u>Affiliation</u>
Chris Schumacher	RDH
Deborah Callaway	PABCO Gypsum
Nitin Shukla	Fraunhofer
Ratnesh Tiwari	UMD
Charlie Petty	Lamtec
Sam J. Taylor	
Michael Ohadi	UMD
Simon Palin	ORNL
Jay Crandell	ARES Consulting
Anthony Fontanini	
Jonathon Carreiro	Schoeck
Stephan Bangerth	UMD
Gordon Hart	ATREK Engineering
Henry Harvey	Clearresult
Eric Werling	DOE

## 2. Review of Agenda/Approval of St. Louis June 25, 2016 Minutes

The draft minutes from the June 25, 2016 meeting in St. Louis, MO were posted on the TC Google Site in December 2016 and the ASHRAE Website for review. There were a few minor editorial changes. Manfred Kehrler moved to approve the St. Louis minutes as amended. Sam Glass seconded.

**VOTE: For 11, Against 0, Abstaining 2, CNV; MOTION CARRIED**

### 3. Report From the Chair/Membership/Roll-on, Roll-off

Review of Rosters: 16 current voting members, 2 non-quorum voting members for a total of 18 members..

Members rolling off at end of meeting: Charles Cottrell Sam Glass, Andres Holm, Carsten Rode, Laverne Daghish & Peter Adams. New Voting members: Paul Shipp, Roderick Jackson, Dave Yarborough, Chris Schumacher, Diana Fisler, Florian Antretter (non-quorum voting member).

Provisions for members attending via phone. RPM - Remote Participation Meetings. Members from TC to connect remotely. Limited lines, but more coming on line. TC will need to book in advance.

Diana Fisler to be new vice chair. Fiona resigning as Secretary. Manfred Kehrer accepted position as new Secretary and will start taking minutes in Long Beach.

Suggestions for track sessions requested.

Presentations within the TC 4.4 meeting is to be added to the program.

Handbook updates through portal.

Move from google groups to base camp. Alejandra established "test" site for use by TC 4.4 to evaluate software.

#### ASHRAE Code of Ethics

##### **(Approved by ASHRAE Board of Directors January 30, 2013)**

1.140.001.1 As members of ASHRAE or participants in ASHRAE committees, we pledge to act with honesty, fairness, courtesy, competence, integrity and respect for others in our conduct.

- A. Efforts of the Society, its members, and its bodies shall be directed at all times to enhancing the public health, safety and welfare.
- B. Members and organized bodies of the Society shall be good stewards of the world's resources including energy, natural, human and financial resources.
- C. Our products and services shall be offered only in areas where our competence and expertise can satisfy the public need.
- D. We shall act with care and competence in all activities, using and developing up-to-date knowledge and skills.
- E. We shall avoid real or perceived conflicts of interest whenever possible, and disclose them to affected parties when they do exist.
- F. The confidentiality of business affairs, proprietary information, intellectual property, procedures, and restricted Society discussions and materials shall be respected.
- G. Each member is expected and encouraged to be committed to the code of ethics of his or her own professional or trade association in their nation and area of work.
- H. Activities crossing national and cultural boundaries shall respect the ethical codes of the seat of the principal activity.

#### **Peter Adams attended the chairs breakfast on Sunday morning:**

- Suggestions for track sessions was requested from the Chair.
- New TC website format. ASHRAE requested new or recent visitors to comment on new format.
- New method of procedure document: "Method of Procedure". Please read this document.

- TC4.4 has been using Google sites, which ASHRAE has stated will need to stop. ASHRAE will use Basecamp in future. Alejandra to review. ASHRAE will pay Basecamp annual fee, however ASHRAE retains ownership of the documents, & will hopefully improve collaboration.
- RPM – Remote Participation Meeting (retiring ENP). Will allow people to attend the meeting remotely, and can vote. Mike Vaughn is contact for this RPM. Feedback has been positive.
- ASHRAE also offers remote meetings. Able to set up web meetings. Encouraging sub-committee meetings to meet outside of the current format, to meet between the two meetings.
- State of Indiana has almost voted away the need for professional engineering licenses. Review state regulations, several states are looking at removing licensure for practice of engineering. Keep an eye on regulations in your local state.
- CTCC – members may receive a phone call to promote the TC.
- Potential new TC members can click on the “JOIN A TC” button at the top of the TC page ([www.ashrae.org/tcs](http://www.ashrae.org/tcs)) on the ASHRAE website to get started.

### **Upcoming Workshops and Conferences: 2016**

Second International Conference on Energy and Indoor Environment for Hot Climates, Doha, Qatar  
February 26 - 27, 2017

Delivering Resilient High-Performance Buildings, Loughborough, UK April 5-6, 2017

ASHRAE 2017 Building Performance Analysis Conference, Atlanta, GA, September 27 - 29, 2017

### **Upcoming meetings:**

Long Beach, CA Summer 2017 - Tracks and dates are given in the Program Subcommittee Report.

### **Report from Liaison to TC 4,4 - Dennis Wessler**

- CEC apologizes if you sponsored a program, and were not recognized in the conference handbook.

## **4. Research Subcommittee**

### **News**

Sam Glass, Research Subcommittee Chair ([svglass@fs.fed.us](mailto:svglass@fs.fed.us))

### **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

## News

Section 4 RL is Xudong Yang from Tsinghua University.

RTAR form (revised 6/2015) and WS form (revised 9/2016) are available at <https://www.ashrae.org/standards-research--technology/research> (near bottom of page under “Information for TCs/TGs/MTGs Sponsoring Research”). A presentation is posted at same site on “How to Write a Successful RTAR or Work Statement.”

Information conveyed at Research Subcommittee Chairs’ breakfast:

- Current meeting: RAC evaluated 3 RTARs (3 accepted); 4 WSs (1 conditionally accepted, 3 returned); 33 pre-proposals for Innovative Research Grants, of which 6 were invited to submit full proposals.
- Noted that all co-sponsoring TCs should be providing input to the development of the RTAR and WS and should obtain full TC votes on approvals of RTARs and WSs.
- If outside organizations have interest in the proposed research, then provide a letter of support with RTAR/WS.
- PMS training webinar coming in April.
- New WS template has milestone chart and associated costs for each milestone as a percentage of total project cost. PMS will be required to report on status of milestones.

**Potential future research topics** compiled at a previous brainstorming session were distributed at subcommittee meeting with instructions for attendees to check their five highest priorities. Glass will notify TC by e-mail regarding the highest ranking topics. Volunteers to develop RTARs will be sought.

## Project Status Updates

### 1696-RP

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

- PMS: Alex McGowan (chair), Sam Glass, Achilles Karagiozis, Theresa Weston
- Three-year project (Sep. 1, 2015 – Aug. 31, 2018)
- Contractor: RDH Building Science Labs, Waterloo, ON, Canada; PI: Chris Schumacher

Properties to be measured include thermal conductivity, specific heat, density, air permeance, water vapor permeance, liquid diffusivity, moisture storage function, saturation moisture content, solar absorptance, and thermal emittance.

PMS met Jan. 29, 2017. Contractor owes ASHRAE two progress reports for Oct. 1, 2016, and Jan. 1, 2017. Contractor does not anticipate issues with project timeline or budget. Contractor presented summary chart of material groups with number of samples and set points for each property as well as preliminary results for particle board, medium density fiberboard, and high density fiberboard. Contractor reported that almost all proposed materials are currently being tested, except for stucco specimens and roofing membranes. Proposed to have a single applicator construct several specimens of each material, rather than having several contractors build several samples and thus increasing the variability of the results due to workmanship issues. PMS accepts this approach. Contractor requested PMS verification of data reduction methods for water absorption and water vapor permeance. Requests from PMS include:

- Documented test methods, and especially where it was necessary to depart from standard test protocols
- Gantt chart or similar to indicate progress of the work, and to anticipate any no-cost extensions well in advance of their occurrence (not that we encourage a no-cost extension, but better to know ahead of time)
- Presentation of raw data in appendices to the report, which would include specific data (e.g., density, thickness, and test results) for each specimen. Variability in results may be linked to variability in specimen dimensions or density in some cases: it would be useful to have the raw data to identify those cases.
- Discussion of the methods used to reduce the raw data into a more usable tabulated form, where those methods are not intuitive; and a discussion about the variability in the data for each category, and the resultant level of confidence in the reported results. In many cases this variability of results (and consequent lack of confidence in the reported results) could in itself be a useful outcome of the research, and may inform recommendations for further study.

Contractor and PMS will hold interim web meeting to be scheduled for end of February 2017.

### **1759-TRP**

#### **Impact of Air-Flow on Thermal Performance of Airspaces behind Cladding (Phase 1 of 2)**

(Authors: Jay Crandell, David Yarbrough, Jonathan Humble; SSPC 90.1 envelope subcommittee).

TC voted to accept WS at 2016 annual meeting in St. Louis; submitted to MORTS 2016-8-15.

Notification letter from MORTS 2016-10-26: RAC voted 10-0-1-3 CNV to conditionally accept it for bid provided that RAC approval conditions were addressed to the satisfaction of RL. Authors made slight revisions and responded to RAC comments. RL approved 2017-1-19. Revised WS submitted to MORTS 2017-1-20. Draft RFP under final review by WS authors and TC chair.

Possible release for bid spring 2017. PES members: Jan Kosny (chair), Jay Crandell, André Desjarlais, Hua Ge.



### 1718-WS

**Development of a Method to Determine the Moisture Transport Properties of a Roof Shingle System under Real Conditions** (WS author: Manfred Kehrer; cosponsored by TC 1.12 and SSPC 160). TC voted to accept WS by letter ballot 2015-8-14. Notification letter from MORTS 2015-11-20: RAC reviewed the subject WS and voted 3-0-0 CNV to return with comments. Main issues and concerns to be addressed include 1) identify potential co-funding; 2) supply list of bidders; 3) WS should cover ASTM E96 and how it relates to this project; 4) barely a majority of the TC in favor; 5) provide more guidance on test method for task 2. If co-funding cannot be secured, efforts should be documented in response to RAC comments when WS is resubmitted. Letters of support from interested parties encouraged by RAC. Revised WS needs to be approved by TC vote prior to re-submission to RAC. Kehrer to revise WS and draft cover letter responding to RAC comments by June 1, 2017, for TC review prior to annual meeting.

### 1730-WS

**Research to Determine the 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). TC voted to accept RTAR by letter ballot 2014-5-14. Notification letter from MORTS 2014-7-23: RAC voted to conditionally accept RTAR. WS should be submitted to RAC by 2018-7-1 or will be dropped permanently. Draft WS distributed and discussed 2017-1-29 at research subcommittee. Further comments requested by March 1, 2017. Authors to revise WS and draft cover letter responding to RAC comments by June 1, 2017, for TC review prior to annual meeting.

### 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 4.4 discussed at the 2016 annual meeting in St. Louis and voted to co-sponsor. Paul Shipp reported that Ken Roy will be retiring and Erik Miller-Klein will be taking the lead on this RTAR for TC 2.6. TC 2.6 is expected to vote on this RTAR in Las Vegas.

### Draft RTAR

**Evaluating the Accuracy of Whole Building Energy Simulations by Comparison with Field Measurement Data** (Author: Sean O'Brien). Topic discussed at research subcommittee 2017-1-29. Suggested that RTAR should be updated to reflect recent research and that TC 4.7 should take the lead.

### Draft RTAR

**Hygrothermal Properties of Aged Construction Materials** (Author: Steve Cornick). Topic discussed at research subcommittee 2017-1-29. Noted that this topic was identified in the brainstorming session. Will await outcome of prioritization.

## Draft RTAR

**Moisture Transfer in Building Materials at High Temperatures** (Author: Sam Glass). Topic discussed at research subcommittee 2017-1-29. Overlaps somewhat with 1718-WS on moisture transfer in roof shingle systems. Suggested that this RTAR be held while 1718 moves forward.

## 5. Handbook Subcommittee

Update provided by Peter Adams. Laverne Dalglish, Handbook Subcommittee Chair not in attendance.

**For Handbook related items go to the following website:**

<https://www.ashrae.org/resources--publications/ashrae-handbook-central>

### Handbook Training Report:

- TC 4.4 encouraged to keep revisions on-going via electronic version.
- Alex McGowan stepping down as Principal Revisor of Chapter 26. Hua Ge has agreed to take over as PR.
- Chair is looking for volunteers to assist with Chapter revisions. Next meeting will review Chapter 44.

## 6. Program Subcommittee

Update was presented by Program Subcommittee Chair Paulo Tabares.

- Subcommittee meeting proposed different programs.
- Three submitted for Long Beach meeting:
  - Passive Haus vs. Net Zero. Achilles to chair.
  - Building Science Holistic Approach - Achilles & Florain to chair.
  - U-Values & Code - Marcus to chair. Diana Fidler, and Owens Corning speaker suggested
  - Submissions must be made by February 6, 2017.
- Three proposed for Chicago meeting:
  - Perfect Envelope - Joe or John Straube as speaker. DOE speaker, for example Eric Werling.
  - Numerical Hygrothermal tools - Simon
  - Achieving High Performance Air Barriers systems in Residential - Laverne, Chris Schumacher
- Upcoming ASHRAE meetings:
  - Summer 2017 meeting Long Beach, CA. Long Beach has some Tracks including the "Envelope"
  - Winter 2018 meeting, Chicago IL

## 7. Standards Subcommittee

Updates were presented by Peter Adams, and Liaisons to the subcommittees on the behalf of the Standards Subcommittee Chair, Theresa Weston.

**Std.90.1: (Jonathan Humble Liaison absent.)** No update

**Std. 90.2: (Theresa Weston Liaison)** No update

**Std. 160: (Stan Gatland Liaison)** available for purchase. Changed conservative approach to mold growth risk, now parallels the mold indices from Europe. Scale documented by VTT. Looking to incorporate weather into the standards. Presentation by Jay Crandell tomorrow morning regarding durability of materials. Possibility to develop user guide for 160. Possibly add something to the appendix.

**Std. 169: (Steve Cornick Liaison).** No update

**Std. 189.1: (Diana Fisler Liaison)** New date in 2017. 12 addenda approved. Two relevant issue not included, 5% over base line and vegetated roofs. Will include resilience.

**GPC34P “Energy Guideline for Historical Buildings and Structures”:** (Bill Rose) No update.

**Std. 100 “Building Dampness”:** (Rick Peters) Damp building NTG, headed by Lew. Rick - coming up with definition of a damp building. Can identify, but not define. New guideline proposed to ASHRE, regarding assessing health relevant damp buildings.

## 8. Old Business

Nothing to report.

## 9. New Business

Sam Taylor:

Handbook just completed. Applications chapter 44 under revision. Graphics to be improved.

Request on behalf of US DOE, building science education center, is looking for slides to communicate with professors and students.

Hugo Hens:

Hugo will stop attending ASHRAE. Hugo noted he has attended for 22 years, and 33 meetings. Hugo encouraged attendees to: “Don’t be silent. Surprising you are so nice. Meeting is only 3/4 hour. Past meetings went 2 hours long. Handbook is very important as they are used world wide. Please try to do as good as possible research - lots of research worldwide. Look to the literature first - many times it has been done before. Program is another thing. Very important what you are doing.”

Peter Adams:

Thank you Hugo for all the years of friendship and input to the committee.

Thanks you Fiona for service as secretary.

## 10. Adjournment

Manfred Kehrler moved to adjourn the meeting at 3:15.

**Fiona Aldous – Secretary, TC 4.4. Next meeting Long Beach CA, June 26, 2017**