

TC/TG/TRG MINUTES COVER SHEET

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

TC/TG/TRG NO.: TC 4.1 DATE: June 24, 2010

TC/TG/TRG TITLE: LOAD CALCULATION DATA AND PROCEDURES

DATE OF MEETING: January 25, 2010 LOCATION: Orlando, FL.

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
<b>Voting</b> Chris Wilkins Glenn Friedman Rolando Legarreta Steve Bruning Curt Pedersen Robert C. Doeffinger, Jr. Jim Pegues Jeff Spitler Larry Sun  <b>Non-Voting</b> Chip Barnaby Som Shrestha Larry Schaefer Brooks Hooper Jordan Fluck Seen Gentry Stephen Roth Bill Murphy Fred Bauman Tom Webster Kwang Hg Lee Doug Hittle Bodh R. Subherwal		<b>Voting</b> Lynn Bellenger  <b>Non-Voting</b>	2006	

DISTRIBUTION:

All Members of TC/TG/TRG

ADDITIONAL DISTRIBUTION:

TAC Chairman: Craig P Wray  
 TAC Section Head: Suzanne LeViseur  
 Chapter Tech Transfer: Stephen Abernathy  
 Program Liason: Carol Lomonaco  
 RAC Research: Hakim Elmahdy  
 ALI/PDC: Kenneth Fulk  
 Special Publications: Mark W Fly  
 Handbook Liason 2009: Douglas Hittle  
 Standard Liason: Jerry W. White  
 Staff Liason: Claire B. Ramspeck  
 Staff (MORTS): Michael R. Vaughn

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

**January 25, 2010**  
**Committee Meeting Minutes**  
**TC4.1 Load Calculations Data and Procedures**  
**Orlando, FL**

1. Meeting called to order at 2:15 p.m. by Chris Wilkins.
2. Roll call: 9 present out of 10 voting members. See Attached Roster.

**Previous Meeting Minutes (Wilkins)**

3. Previous Meeting minutes were not available for review.
4. Past meeting minutes will be bundled for approval in the next meeting (Albuquerque – June 2010).

**Liaison Comments**

5. No Liaison present.
6. Wilkins informed that Programs Liaison was to be removed from the Agenda; since all programs go through the Conferences and Exposition Committee (CEC).
7. Sun informed of discussion held during the reviews on Sunday January 24, 2010; Tracks will be more general; and CEC is still learning the nature of tracks. A committee will be formed to support CEC for changes in the Society.

**Research Sub-committee Report (Doeffinger)**

8. No active research is going on. ASHRAE will release the 2010-2015 Research Strategic plan in June 2010; it will be posted in ASHRAE's website.
9. Everything will be shifted towards sustainability. If not in the strategic plan, it will still be considered.
10. RTARS are due May 15; if one is needed it can be voted Via E-mail ballot.
11. One probable research project that has been discussed is Light and Plug loads. Wilkins did the original research; may need update. The idea is to use the research data with customers when they ask for outrageous loads.
12. Larry Sun expressed the information needs to be well defined.
13. Jeff Spitler expressed that data may have been collected already and may need to be organized.
14. Doeffinger and Wilkins will draft an RTAR for the above.
15. Also another research project will be to update load calculations manual; Jim Pegues will work on RTAR. This one will use E-mail Ballot to be sent to voting members; Pegues will try to complete by April 15<sup>th</sup>.
16. Bruning stated that Updated Load Calculation Manual shall be published at the same time as 2013 Handbook. And all information shall be updated simultaneously on both (Handbook and Manual), including weather data, etc.
17. UFAD loads:

- a. After a long discussion on UFAD and model between load calculations and energy analysis; is it TC4.1 territory? Or “We can add some value to the handbook based on experience without a research project”.
- b. Bill informed that there is an existing project that we all can get some input (RP-1522 by Fred Bauman).
- c. Wilkins expressed that it may not be as necessary as a full project.
- d. It is estimated that this summer a study by Bauman should be finished.
- e. Following recommendations by Sun, of not doing a full research project and as TC give some guidance in our chapter.

**Programs and Standards (Friedman)**

18. Larry Sun expressed thanks to the programs chair for picking a topic that fits the CEC Program.

19. Future Programs should attempt to be in line with CEC plan.

20. Proposed Topic for Next Meeting: How to use BIM data to accomplish a load calculations.

- a. Bentley and/or Autodesk. Bruning to get an architect to prepare a Building Model in Revit or a GMS/XML compatible Export file and send to Bentley and/or Autodesk, HAP, etc. and compare results. Bruning stated that it will be more complex using a real world example. Have an architect to produce an architectural BIM model and then generate calculations and designs
- b. Motion by Friedman to approve; Second by Doeffinger.
- c. Additional Discussions: Have a total of 3 presenters; run in a moderator/discussion panel. Two consultants and someone from the software development side using a real world experience without disclosing vendor names.
- d. Pegues expressed the idea of exporting to some external tool to compare interoperability.
- e. Called for Vote: Motion Approved (8-0-1) Chairman Wilkins not voting.
- f. Glenn will submit February 12 its redline list of speakers at programs central.

21. Las Vegas (January 2011) Tracks theme Zero Energy design; Nothing is needed to be voted for Vegas without pressing for conference papers due. Leave any pending brainstorming for next meeting.

22. Standard 183-2007 is due for revisions.

- a. Discussion: 183 was originally issued in 2007, and it has to be updated every five (5) years but updates are required sooner every 3-4 years in order to carry the ANSI Standard; Documents to be in both units; Standard 183 actually does not contain any units; It is required for this committee to vote on No Significant Changes.
- b. Motion by Friedman, Second by Pegues; with no other discussion.
- c. Motion approved 8-0-1; Chairman Wilkins abstaining from Vote.
- d. Chairman Wilkins signed copy of periodic maintenance.

23. Proposed Standard: Method of Test for Determining Heat Gain for Equipment Used in Buildings.

- a. TC4.7 has interest on it as well

- b. Limit the standard to office equipment that contribute to plug loads (Sensible Only).
- c. Motion by Friedman to Vote on a New Standard/Guideline as stated above.
- d. Second by Bruning.
- e. Motion Approved 8-0-1; Chairman Wilkins abstained.
- f. Friedman will forward copies to TC 4.7 for their vote.
- g. For this information to be included in the next Handbook chapters information has to be provided by April of 2012; any Research needs to be completed in order to have a chance to be included in chapter.

### **Handbook (Bruning)**

#### 24. New Schedules:

- a. June 2012: Final Chapter has to be approved in full by TC
- b. For Reviewers: Form will be emailed to people that have shown interest; Bruning to email such form.

25. Bruning volunteered to review residential chapter.

26. First week of June, review comments to be returned to Bruning; Comments don't have to be corrections.

27. No votes are required by handbook sub-committee.

28. Fred's Bauman UFAD tool may be more appropriate to be published in CD+.

### **New Business**

29. None.

30. Spitler Motioned to Adjourn Meeting

31. Friedman Second the Motion.

32. Meeting ended at 4:15 PM

#### Attachments:

Cover Sheet

Discussed and Recommended Modifications to Form for Proposing Standard (Method of Test for Determining Heat Gain for Equipment Used in Buildings).

Handbook Subcommittee Report

Standards Subcommittee Report

Programs Subcommittee Report



® E American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.

**TC4.1 Load Calculation Data & Procedures**

**Orlando, FL**

**January 23-27, 2010**

**Handbook Subcommittee Report**

**Sunday, January 24, 3:00 PM to 4:00 PM**

**Shingle Creek Hotel, Panzacola H1&2**

1. **Handbook Committee Liaison Comments: Peter Simmonds, Liaison to TC4.1.**
  
2. **Schedule for 2013 HoF Chapters:**
  - 2010 January – Discuss review process – Assign reviewers
  - 2010 February 1 – Deadline CD+ Content Additions/Revisions for 2010 CD+
  - 2010 June – Complete Review of Chapters – Identify Improvements – Assign revisers
  - 2011 January – Revisers report progress – provide draft individual revisions
  - 2011 February 1 – Deadline CD+ Content Additions/Revisions for 2011 CD+
  - 2011 June – Rough draft overall chapters
  - 2012 January – Full draft overall chapters reviewed by Handbook subcommittee
  - 2012 February 1 – Deadline CD+ Content Additions/Revisions for 2012 CD+
  - 2012 April – Deadline for new research results to be incorporated in chapters
  - 2012 June – Final chapters approved by full TC**
  - 2012 July 12 – Chapter 17 submitted to Simmonds/ASHRAE
  - 2012 July 19 – Chapter 18 submitted to Simmonds/ASHRAE
  - 2013 February 1 – Deadline CD+ Content Additions/Revisions for 2013 CD+
  - 2013 June – HoF Published
  
3. **Chapter 17 Residential Loads:**
  - Identify Reviewers:
    - Doug Hittle
    - Rolando Legarreta (new engineer)
  
4. **Chapter 18 Non-Residential Loads:**
  - Identify Reviewers
    - Jim Pegues
    - Bob Doeffinger (new engineer)
    - Rolando Legarretta (new engineer)
    - Amirt Bhansali

5. **Review Process:**

Steve Bruning will copy review for to reviewers. Reviews to be completed by first of June and returned to Steve to compile master list for June meeting

6. **Handbook CD+ Enhancement:**

Handbook Committee has asked each TC to provide bonus enhancement items for each new CD+. TC 4.1 will submit the custom CTS and RFT calculation spreadsheets developed for the Load Calculation Manual. Due by February 1, 2010 for the 2010 CD+.

TC4.1 Load Calculation Programs  
TC 4.1 Meeting, Orlando, January 25, 2010

Glenn Friedman, Program Chair

1. Current Programs

- a. Orlando, January 23 to 27, 2010, Theme: Humidity and Sustainable Indoor Environments
  - i. Seminar 11 - Background on Load Calculations Methodologies (Past and Present), Sunday, January 24, 11 AM to 12:30 PM, Panzacola F3
  - ii. Seminar 33 - Recent ASHRAE Research on Load Calculations: Cooling Load Methodologies for Under Floor Air Distribution Equipment, Monday, January 25, 11:00 AM to 12:30 PM, Panzacola F3
  - iii. Seminar 76 – Load Calculation Methodologies for Unique Construction Types, Wednesday, January 27, 9:45 AM to 10:45 PM, Panzacola F4

2. Future Programs

Future meetings have themes. Programs shall run through assigned topic tracks. There shall also be an unassigned track.

- a. Albuquerque, June 26 to 30, 2010

*Theme: Energy Efficient System Design for High Elevations and Dry Climates*

- i. Track 2: Energy Facts and Simulation Track ✓  
Track Organizer: Julia Keen, [jkeen@ksu.edu](mailto:jkeen@ksu.edu)

As building design criteria changes to include sustainability and energy use, it is important that consideration be given to building energy use simulation methods. This track is intended to include topics that address this particular issue including but not limited to: current and future tools for modeling energy use, the importance of building energy simulation, the influence and incorporation of energy models on the design process, the accuracy of energy use models, etc. This track will also explore the use of an energy model as a tool to provide energy savings opportunities.

*OR IF BIM <sup>AS</sup> <sub>WEEK</sub> IS CHASING*

- 1. SEMINAR #1 and #2: BIM HVAC load calculations based on the Handbook example of the ASHRAE Headquarters building.

Abstract: BIM modeling is a tool to enhance the efficiency of integrated building design including HVAC design. This seminar looks at two different examples of creating building HVAC load calculations using current BIM technology; the barriers and success.

Speaker #1: Steve Bruning

Speaker #2: Chris Wilkins

Session Chair or Moderator of Roundtable: Glenn Friedman

- 2. SEMINAR #3: Using BIM for HVAC load calculations for building space comparisons and diagnostics.

TC4.1 Load Calculation Programs  
TC 4.1 Meeting, Orlando, January 25, 2010

Speaker #3: Tracy Cornish, Molly McGuire or Gwelen Paliaga  
Session Chair or Moderator of Roundtable: Glenn Friedman

- b. Las Vegas, January 29 to February 2, 2011  
*Theme: Zero Energy Design*

i. Tracks are not yet posted.

1. SEMINAR #1: What happens if the climate changes due to global warming? Beyond Design Load Calculations: What happens when we design for zero energy with critically sized HVAC systems and the weather reality is beyond the design load?
  - a. What happens to the space temperature if the cooling is undersized due to climate change?
  - b. What happens to the space temperature if the heating is undersized due to climate change?

Speaker #1: ?

Session Chair: Glenn Friedman

2. SEMINAR #2: Evaporative cooling is a useful cooling tool in drier climates for achieving Zero Energy Design. This requires using different weather design data. Why wetbulb design day data should be used for HVAC load calculations and equipment selection? Simulate a traditional drybulb design day approach to a wetbulb design?

Speaker #2: ?

Session Chair: Glenn Friedman

- c. Montreal, Quebec, Canada, June 25 to 29, 2011  
*Theme: Net-Zero Buildings*

3. Research Projects for Possible Future Programs

- a. 1363 Also a 4.2 project. Weather project. 4.2 project and we will co sponsor.
- b. Project 1416-RP Development of Internal Surface Convection Correlations for Energy and Load Calculation Methods, co-sponsor with TC 4.7  
Steve Bruning to advise. Was awarded to UT at Austin.
- c. 1453 Design Data  
Compiling weather data for Handbook. Run by TC 4.2(?). Includes a new clear sky model. Currently under review to be finalized.
- d. 1482-RP Update to Measurements of Office Equipment Heat Gain Data  
Chris Wilkins to advise. Co-funded by CIBSE.

*WAS A BLM  
PROPOSED*

*WETBULB?  
US 4.2*

*CALCULATIONS  
FOR  
EVAP.*

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Albuquerque will be the first time this goes through everything in the new technical program process.

**TC4.1 Load Calculation Standards**  
**TC 4.1 Meeting, Orlando, January 25, 2010**

Glenn Friedman, Standards Chair

1. ANSI/ASHRAE/ACCA Standard 183-2007, Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings

Standard 183 is up to be revised, reaffirmed or withdrawn.

Glenn Friedman moves this standard be reaffirmed with minor updates. The updates are:

- a. Change the reference to the 2005 ASHRAE Handbook—Fundamentals, to the current version, 2009 ASHRAE Handbook—Fundamentals
- b. Change the name of appendices A and B from Appendix to Informative Appendix.

See the attached Cognizant Technical Committee Periodic Maintenance Recommendation to SRS with edits to reflect this motion.

2. Method of Test (MOT) for Determining Heat Gain for Equipment Used in Buildings

Glenn Friedman moves this standard MOT be created by ASHRAE. See the attached FORM FOR PROPOSING STANDARD/GUIDELINE PROJECT.



# Cognizant Technical Committee Periodic Maintenance Recommendation to SRS

Note: Pages 1, 2 and 3 of this form shall be completed by the cognizant TC and forwarded to SRS through the applicable TC Liaison from the Standards Committee. An electronic version of this form is available on the ASHRAE website at <http://www.ashrae.org/template/TechnologyLinkLanding/category/1638>.

**Date Completed:** January 25, 2010

**Standard/Guideline Reviewed:** ANSI/ASHRAE/ACCA Standard 183-2007, Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings

In accordance with the requirements of Normative Appendix N2 to the *Standards Committee Manual of Procedures (MOP)* TC 4.1 Voted Yes (8-0-0)

**(Yes-No-Abstain-Absent)**

### The following statement must be completed for Standards Only:

In accordance with the requirements of PC MOP 6.1.2, which states "all standards shall be written in mandatory language," TC has determined that the above standard is  or  is not written in mandatory language. If the above standard is not written in mandatory language, the TC **cannot** recommend reaffirmation below.

### The following statement must be completed for Guidelines Only:

In accordance with the requirements of PC MOP 6.1.2, which states ".....all guidelines shall be written in informative language," TC has determined that the above guideline is  or  is not written in informative language. If the above guideline is not written in informative language, the TC **cannot** recommend reaffirmation below.

### TC Recommendation (select one):

#### TC Recommends Revision:

**Revise the above document.** This may include, but is not limited to, updating the normative references and incorporating alternate rational units in accordance with Normative Appendix N4 of the *StdC MOP*. (Please provide a Units Format Plan – Reference Annex C of *PC MOP*.)

Units Format Plan \_\_\_\_\_

TC Recommended \_\_\_\_\_ to chair project committee, and the following four (4) people have expressed an interest in being a part of the revision project committee:

- 1.
- 2.
- 3.
- 4.

#### TC Recommends Withdrawal:

**Withdraw the above document.** (Please provide justification)

**TC Recommends Reaffirmation:**

**Reaffirm the above document with no changes in the main text of the standard.** Reaffirmations shall be processed without any substantive change to the main text of the standard. A standard undergoing an update of references needed to implement the standard (normative references) shall be processed as a revision unless the references being updated are themselves reaffirmations. If all the references being updated are themselves reaffirmations, then the references can be updated and the standards processed as a reaffirmation.

**Note:** When a TC recommends reaffirmation of a Standards Committee Document (SCD), and it is determined by staff or SRS that normative references are out of date or are themselves revisions, then SRS shall consult the TC/TG/TRG Chair to determine if updating the normative references will cause a substantive change to the SCD. (Reference StdC MOP N2.1)

**Note:** SRS will act as the revision project committee consensus body when the following conditions are met:

1. the cognizant TC/TG/TRG recommends reaffirmation of an existing standard or guideline with updated references, and
2. the cognizant TC/TG/TRG has reviewed the updated references and determined that updating them will not make a substantive change to the standard or guideline.

(Reference StdC MOP 7.2.7e)

If it is determined that updating the normative references causes a substantive change, then SRS will recommend the formation of a project committee to revise the standard or guideline.

TC acknowledges that all references in the Standards Committee Document (SCD) have been reviewed and that updating the normative references will not cause a substantive change to the SCD.

Units Format Plan Not applicable since no units are referenced in the Standard 183 document.

**Please complete the following:**

**This TC vote was taken at a TC meeting.**

Meeting Location: Orlando, FL Meeting Date: January 25, 2010

**This TC vote was taken by letter ballot.** Date of letter ballot:

**Project need:** (Provide a brief explanation of the need for the project.)

**Identify the stakeholders** (e.g, telecom, consumer, medical, environmental, etc.) **likely to be directly impacted by the standard:**

HVAC Engineers and HVAC Contractors

1. Is the text of the draft provided in electronic form?

Yes:  No:

Check format:

- WordPerfect
- Microsoft Word
- ASCII Text
- Other: \_\_\_\_\_

2. Supporting artwork is (Please check as applicable)

- Included on disk in format checked above.
- Taken from previous version of published standard.

- Provided in hard copy original only.
- Request development by ASHRAE Headquarters.

3. Which ASHRAE Handbook chapter is relevant to this standard/guideline?

**Fundamentals Chapters 29 and 30**

4. Has the relevant ASHRAE Handbook chapter been reviewed?

Yes:  No:  N/A:

5. Do any conflicts exist between this standard/guideline and its corresponding ASHRAE Handbook chapter?

Yes:  No:  N/A:

*(If yes, please identify these conflicts in an attached document.)*

6. Will the TC evaluate the conflict in the next review of the Handbook chapter?

Yes:  No:  N/A:

7. Has the TC reviewed all official interpretations of the current standard (if any) and voted in each instance that the text of the revised draft standard has been clarified so that automatic withdrawal of the interpretation will not create a problem?

Yes:  No:  N/A:

8. Is this a Test Standard/Guideline?

Yes:  No:  N/A:

*If this is a Test Standard/Guideline, please check as appropriate below*

- Describes, in detail, preparation of the test sample and sample selection
- Prescribes the reporting format for the test results
- Criteria for acceptable performance is clearly defined

9. Does this standard/guideline comply with ASHRAE's Patent Policy?

Yes:  No:  N/A:

*See Annex F of PC MOP.  
(If no, additional public review is required.)*

10. Does a need exist for educational materials to support this standard/guideline?

Yes:  No:  N/A:

*If yes, please attach an explanation identifying educational materials needed and whose responsibility it should be to develop this material. State whether these materials are currently being developed, by whom, and an expected date of completion.)*

11. If software is included for use with the standard, is the software copyrighted?

Yes:  No:  N/A:

TC Chair: Chris Wilkins Signature: \_\_\_\_\_

ORIGINAL  
SIGNED  
BY CW 1/25/10





**® FORM FOR PROPOSING STANDARD/GUIDELINE PROJECT**

**Name:** Glenn Friedman  
**Address:** Taylor Engineering  
1080 Marina Village Parkway, Suite 501, Alameda, CA 94501  
**Phone:** (510) 263-1542  
**Fax:** (510) 749-9136  
**Email:** GFRIEDMAN@TAYLOR-ENGINEERING.COM

**Representing:**

- Self
- TC/TG TC4.1, *LEAD*, *TC 4,7 SUPPORTER*
- ASHRAE Committee \_\_\_\_\_
- Other Standards Writing Organization \_\_\_\_\_

**If this is the recommendation of the TC/TG, the following must be completed:**

TC/TG Vote Yes (Yes-No-Abstain-Absent)

This TC/TG vote was taken at a TC/TG Meeting:      Date: 1/25/2009 Location Orlando, FL

This TC/TG vote was taken by Letter Ballot:      Date: \_\_\_\_\_

TC/TG Recommendation for Chair: Glenn Friedman

TC/TG Vote for Chair: Yes (Yes-No-Abstain-Absent)

This TC/TG vote was taken at a TC/TG Meeting:      Date: 6/25/2010 Location Orlando, CA

This TC/TG vote was taken by Letter Ballot:      Date: \_\_\_\_\_

**Please complete the following:**

1. I would like to propose a  Standard       Guideline
2. What type of a document is required? Method of Test
3. Is research required on this project before the standard or guideline can be written?  
 Yes       No
4. Proposed Cognizant TC/TG (if known): TC4.1
5. Does the document need ANSI accreditation?  Yes       No
6. Can another group produce the document more effectively?  Yes       No
7. What is the likely frequency of revision of the document? 5-10 years
8. Can the topic be addressed through revision of an existing document?



**FORM FOR PROPOSING STANDARD/GUIDELINE PROJECT**

Yes  No

9. Is there sufficient need or impact associated with the creation of the document?

Yes  No

10. Are there any known negatives associated with the document being proposed?

Yes  No If yes, please explain:

11. Identify Stakeholders (i.e. telecom, consumer, medical, environmental, etc) likely to be directly impacted by the standard or guideline:

- Computer and electronic equipment manufacturers
- Computer and electronic equipment accessory manufacturers
- Appliance manufacturers
- Energy engineers
- HVAC engineers

12. What is the purpose of this standard/guideline? Please give a brief explanation of the need for the project. (Also see Item 6 of Procedures for Requesting a New Standard/Guideline)

ASHRAE has funded TC4.1 research projects to provide information for the Load Calculations section of the ASHRAE Handbook, Fundamentals volume, including RP-885 and the recently approved RP-1482 to determine the heat gain from common office equipment. The equipment heat gain is not provided by the equipment manufacturers. If there were an ASHRAE Standard for the manufacturers to follow, the belief is the future testing would be performed and funded by the equipment manufacturers. This standard will save ASHRAE funds and result in more current load calculation data being more readily available.

13. Is this a consumer product? (A consumer product is generally any tangible personal property for sale and that is used for personal, family, or household purposes.)  Yes  No

14. List at least five people (the recommended chair plus four others) who have expressed an interest in being part of the committee (with contact information if possible)

1. Glenn Friedman → PHILIP MAYER
2. Chip Barnaby
3. Mohammed Hosni
4. Chris Wilkins
5. Steve Bruning
6. Rolando Legarreta

**Title, Purpose, Scope** (See Guidelines for Preparation of a New/Revised Title, Purpose & Scope)

**Title:** Method of Test for Determining Heat Gain for Equipment Used in Buildings

**Purpose:** This standard establishes an ASHRAE standard for methods and procedures for determining heat gain for equipment used in buildings.

IN ALL MODES OF OPERATION



® FORM FOR PROPOSING STANDARD/GUIDELINE PROJECT

*ALL MODES OF OPERATION of F&I office*

*sensible*

**Scope:** This standard sets minimum requirements for test methods for the determination of heat gain radiant/convective fractions for equipment used in buildings. Examples of equipment included in this scope are computers, printers and medical equipment.

**Return Form to:**  
Attn: Procedures Administrator  
ASHRAE  
1791 Tullie Cir, NE  
Atlanta, GA 30329  
Telephone: 404.636.8400  
Fax: 404.321.5478  
Email: [procadm@ashrae.net](mailto:procadm@ashrae.net)

*BUILDING*

*→ LEAVE MEDICAL*

*SENSIBLE HEAT GAIN OF*