



**HARVARD UNIVERSITY DIVINITY SCHOOL  
ROCKEFELLER HALL**

**EQ Credit 7.2 – Thermal Comfort: Verification**

**USGBC REVIEW - CONSTRUCTION APPLICATION**

The LEED Submittal Template has been provided explaining a thermal comfort survey that will be distributed to building occupants within the first 6 to 18 months of occupancy. The narrative includes an appropriate corrective action plan if the survey results indicate that 20 percent or more of the building occupants are dissatisfied with thermal comfort based on the environmental variables outlined in ASHRAE 55-2004. However, this credit is contingent on the achievement of EQc7.1.

**USGBC TECHNICAL ADVICE**

Please respond to all issues raised in EQc7.1.

**RESPONSE**

The issues raised in EQc7.1 have been responded to and uploaded to the LEED online website.

Thank you for considering this re-submittal,

Jesse Foote  
Manager, Green Campus Building Services



(Responsible Individual)

(Company Name)

I, **Jesse Foote**

, from

**Harvard Green Campus Initiative**

verify that the information provided below is accurate, to the best of my knowledge.

### CREDIT COMPLIANCE

**Provide a narrative describing the survey planned for the validation of the thermal comfort conditions for the project. Include a specific description of the provisions for creating a plan for corrective action.**

Please see the uploaded document, "Rockefeller-ThermalComfortSurveyAndPlan.pdf" for a narrative describing the survey and corrective action plan.

Project Name: Harvard Divinity School Rockefeller Hall

Credit: EQ Credit 7.2: Thermal Comfort: Verification

Points Documented: **1**

**READY TO SAVE THIS TEMPLATE TO LEED-ONLINE?** Please enter your first name, last name and today's date below, followed by your LEED-Online Username and Password associated with the Project listed above to confirm submission of this template.

|            |           |            |                          |          |
|------------|-----------|------------|--------------------------|----------|
| Jesse      | Foote     | 2009-01-23 | jesse_foote@harvard.edu  |          |
| First Name | Last Name | Date       | Username (Email Address) | Password |

**SAVE TEMPLATE TO LEED-ONLINE**

**PRINT TEMPLATE**

Letter Template Version A1 . 10000440



## **Rockefeller Hall – Harvard Divinity School Thermal Comfort Survey Plan**

In complying with LEED New Construction v2.2 credit 7.2 *Thermal Comfort, Verification*, the Harvard Divinity School (HDS) facilities team in Rockefeller Hall plans to administer occupant surveys and adjust HVAC parameters to respond to comfort issues. This Thermal Comfort Survey Plan (TCP) addresses occupant surveys, the scheduling of surveys, and how HDS will respond to survey results.

### Occupant Thermal Comfort Survey

The HDS survey is based on requirements of the LEED New Construction version 2.2 Reference Guide credit 7.2 *Thermal Comfort, Verification* as well as section 7.6 of the 2004 version of ANSI/ASHRAE Standard 55-2007, *Thermal Environmental Conditions for Human Occupancy* and modeled after the ASHRAE 55-2007 Informative Appendix E, *Thermal Environment Survey*. The survey addresses the comfort experience in the offices and meeting rooms, the layers of clothing that the occupants are wearing, and asks causes of discomfort, if applicable.

### Administration of Survey

These surveys will be administered online via an icommons poll tracker. This service allows poll takers to anonymously submit their answers to the poll questions. An HDS staff person will email a link to the poll to the occupants of the building along with a cover letter explaining the intent of the survey. Results will be compiled and analyzed by HDS staff.

### Responses to Survey Results

The operations team will view survey results for each residence floor. If greater than 20% of the survey respondents are dissatisfied, then the team will identify problem areas within the building. The team will identify the cause of discomfort in each situation and choose from a variety of options to correct the discomfort. For the purposes of this survey, “dissatisfied” will be defined as any responses of “somewhat dissatisfied,” “dissatisfied,” or “very dissatisfied” to question number 7, “General thermal comfort.”

Rockefeller Hall can be monitored via the building management system (a Siemens direct digital control system) which is tied into temperature sensors in each floor. VAV boxes can be adjusted to affect supply air velocity and cooling. Heating of the offices is provided by fancoil units.

### Schedule of Surveys

Because different seasons activate different HVAC systems in the building, the survey will be administered once per season. HDS staff will target especially cold winter days, mild spring days, and hot summer/fall days at the beginning of the fall semester when choosing survey dates. Should HDS determine corrective action is required to improve occupant comfort, the survey may be issued an additional time within the same season to ensure the effectiveness of the corrective action.

|  |          |
|--|----------|
| <b>Thermal Environmental Survey</b>  |          |
| To Be Filled By Occupant   |          |
| 1. <b>Occupant's Room Number (Optional):</b>   |          |
| 2. <b>Date:</b>  |          |
| 3. <b>Time:</b>  |          |
| 4. <b>Occupants Clothing</b><br>Please refer to Table 1. Place a check mark next to the articles of clothing that you are currently wearing as you fill out this sheet. If you are wearing articles of clothing not listed in the table, please enter them into the space provided below<br>Article: |          |
| Article:   |          |
| 5. <b>Occupant Activity Level</b> (Check the one that is most appropriate)   |          |
| 1. <input type="checkbox"/> Reclining  |          |
| 2. <input type="checkbox"/> Reading Seated, Keyboarding or other light physical activity   |          |
| 3. <input type="checkbox"/> Standing, Relaxed  |          |
| 4. <input type="checkbox"/> Light Activity, Standing   |          |
| 5. <input type="checkbox"/> Medium Activity, Standing  |          |
| 6. <input type="checkbox"/> High Activity  |          |
| 6. <b>Equipment</b> (Equipment adding or taking away from the heat load.)  |          |
| Item (copiers, fans, etc.)   | Quantity |
|  |          |
|  |          |
|  |          |
| 7. <b>General Thermal Comfort</b> (Check the one that is most appropriate)   |          |
| +3 <input type="checkbox"/> Very satisfied   |          |
| +2 <input type="checkbox"/> Satisfied  |          |
| +1 <input type="checkbox"/> Somewhat satisfied   |          |
| 0 <input type="checkbox"/> Neutral   |          |
| -1 <input type="checkbox"/> Somewhat dissatisfied  |          |
| -2 <input type="checkbox"/> Dissatisfied   |          |
| -3 <input type="checkbox"/> Very dissatisfied  |          |
| General Environment Comments:  |          |
|  |          |
|  |          |

**TABLE 1  
Clothing Ensembles**

| Description  |  |
|--|--|
| Trousers, short-sleeve shirt/blouse  |  |
| Trousers, long-sleeve shirt/blouse   |  |
| Trousers, long-sleeve shirt/blouse plus suit jacket  |  |
| Trousers, long-sleeve shirt/blouse plus suit jacket, vest, T-shirt   |  |
| Trousers, long-sleeve shirt/blouse plus long sleeve sweater or other 2 <sup>nd</sup> top layer, T-shirt  |  |
| Trousers, long-sleeve shirt/blouse plus long sleeve sweater or other 2 <sup>nd</sup> top layer, T-shirt plus suit jacket, long underwear bottoms |  |
| Knee-length skirt/shorts, short-sleeve shirt/blouse (sandals)  |  |
| Knee-length skirt/shorts, long-sleeve shirt  |  |
| Knee-length skirt/shorts, long-sleeve shirt, long-sleeve sweater or other 2 <sup>nd</sup> top layer  |  |
| Ankle-length skirt/shorts, long sleeve shirt, suit jacket  |  |
| Athletic sweat pants, long-sleeve sweatshirt   |  |
| Other:   |  |
|  |  |
|  |  |