



**Indoor Environment Quality + Workplace Environment
Health Sciences Building
St. Cloud Technical and Community College
St. Cloud, MN
Report 1**

**April 2015, Minneapolis, MN
Sustainable Post-Occupancy Evaluation Survey (SPOES)
B3 Guidelines**

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1.0 Overview

The purpose of this report is to examine the connection between sustainable design criteria used in the design of the Health Sciences Building (HSB) and occupants' satisfaction with their work environments located in the HSB. HSB is located on the St. Cloud Technical and Community College campus in St. Cloud, MN. The HSB facility was renovated using the B3 Guidelines (formerly known as the Minnesota Sustainability Guidelines or MSBG) and completed for occupancy in 2011. The B3 Guidelines track specific state-funded, B3 buildings as a means of demonstrating real outcomes aimed at the conservation of energy resources, creation and maintenance of healthy environments, and occupants' satisfaction with their work environments. The Sustainable Post-Occupancy Evaluation Survey (SPOES) was developed to assess human outcomes in workplace, classroom/laboratory, and residence hall settings in compliance with the B3 Guidelines project tracking requirements. This is a report of occupants' (hereafter called employees) responses at 3.5 years post-occupancy. The survey was conducted in April 2015 and is the first of two required survey events for this building.

This SPOES report focuses on employees' satisfaction with the physical environment as related to 25 indoor environment quality (IEQ) criteria such as lighting, thermal, and acoustic conditions in their primary workspaces. Employees' satisfaction with the facility (site, building, and interior) and the effect of the facility's physical environment on their perceptions of their work performance and health also are included. Finally, a brief look at employees' commuting and physical activities within the building are reported. The report provides descriptive information about employees' perceptions of the IEQ of their workplace environments. In addition, this information serves the broader development of knowledge regarding the influence of IEQ on employees.

2.0 Method

SPOES consists of a self-administered, Internet-based, questionnaire submitted to and completed by employees. The SPOES questionnaire has been tested for **validity** (measures what it is intended to measure) and **reliability** (repeatability or replicability of findings). Employees rate their level of satisfaction on a **Likert-type scale** (measurement scale) from 1 (very dissatisfied) to 7 (very satisfied) with IEQ of the facility and their primary workplaces. They also rate the influence of their physical environment on their perception of their work performance and health on a scale from 1 (hinders) to 7 (enhances). There were no physical measurements taken of environmental conditions such as temperature or acoustic level. This study is limited to employees' perceptions.

The report provides a descriptive summary of the results stated as a **mean** (average of all responses), **standard deviations** (SD) (how different scores are from each other and the mean), and **number of responses** (N) for each question analyzed. The mean for a 7-point scale is 4.00. Lower or higher means reflect stronger tendencies towards dissatisfaction/satisfaction and hinders/enhances. Means that are close to the center of the scale (4) are considered to be neither dissatisfied/hinders or satisfied/enhances.

When interpreting **mean** responses, the following labels were used:

- 1.00 - 3.50 dissatisfied (hinders)
- 3.51 - 4.50 neither satisfied (enhances) nor dissatisfied (hinders)
- 4.51 - 7.00 satisfied (enhances)

An IEQ Score is also calculated for employees' satisfaction with IEQ in their primary workplaces. This is a statistical combination of category-level IEQ scores, which results in a single IEQ score for all respondents and is reported in an IEQ Scorecard.

2.1 Description of the Questionnaire

Employees first rate their level of satisfaction with the facility (site, building, and interior) and the influence of their physical environment on their perception of their work performance and health. Then they respond to questions about their satisfaction with their primary workspaces in relation to IEQ criteria from the B3 Guidelines. Additionally, employees' physical activities and commuting practices are investigated.

In the SPOES questionnaire, the 25 IEQ criteria listed below are evaluated. There are two levels of criteria, categories and attributes. As shown in the list, the 'overall' criteria are boldfaced and called 'categories' or 'category level' criteria. A category is broader or more general such as Overall Appearance or Overall Indoor Air Quality. Some categories have 'attributes' or 'attribute level' criteria and provide greater detail about the category. For example, Overall Thermal Conditions is a category level question, and there are four attribute level questions related to thermal conditions such as adjustability, air velocity (draft), humidity, and temperature. Overall Acoustic Conditions is a category with attributes of employees' ability to hear presentations and the extent of background noises. There are 12 category-level and 13 attribute level questions. Means are calculated and reported for all category and attribute-level criteria.

An IEQ Satisfaction Score is also calculated for employees' satisfaction with IEQ in their primary workspaces. This is a mean statistical combination of the 12 category-level criteria only and results in a single, mean IEQ Satisfaction Score for all employees' satisfaction with the physical conditions of their primary workplaces. Attribute-level criteria are not included in the IEQ Score because unequal weight would be given to criteria that have both category and attribute-level questions.

In the following list, **category (boldface)** criteria are listed in alphabetical order. If a category has attributes, they are listed with the category.

Overall Acoustic Quality

- Ability to hear desired sounds
- Ability to limit undesired sounds

Overall Appearance (aesthetics)

Overall Cleaning and Maintenance

Overall Daylighting Conditions

- Adjustability of daylighting
- Amount of daylighting

Overall Electric Lighting Conditions

- Adjustability of electric lighting
- Adjustability of task lighting
- Amount of electric lighting

Overall Furnishings

- Adjustability of furnishings
- Function of furnishings

Overall Indoor Air Quality

Overall Privacy

Overall Technology

Overall Thermal Conditions

- Adjustability of thermal conditions
- Air velocity (drafty/stagnant)
- Humidity (dry or moist)
- Temperature (hot or cold)

Overall Vibration and Movement

Overall View Conditions

2.2 Limitations

Employees' participation is voluntary, and responses are self-reported. As is true with all survey research, the responses indicate employees' perceptions. There were no physical measurements, e.g., temperature, humidity, or lighting levels, of the environment taken.

3.0 Sample Description

3.1 Description of Building

The HSB is located at 1245 15th St. North, St. Cloud, MN. It is in a walkable community that is in close proximity to other campus buildings, open green space, and limited public transportation. The building was formerly a Health Partners clinic; its interior was renovated to serve as a teaching facility for the Health Sciences program. It is 53,000 square feet and contains classrooms, clinic spaces, laboratories, exam rooms, offices, and other supporting work spaces for students, faculty, and staff. The renovation was completed in August 2011 (see Figure 1).



Figure 1. Health Sciences Building, St. Cloud State University (photos courtesy of SCTCC)

3.2 Description of Respondents

The HSB – SCTCC had approximately 53 employees (faculty / staff) with assigned workspace in the facility during the spring semester period and administration of the survey event. The response rate to the questionnaire was approximately 32%. Of those responding, 25% were male and 75% were female. The mean age of respondents was slightly over 42 years, with a range of 28 to 55+ years.

The HSB facility was renovated and completed for occupancy in August 2011. Since that time, 47% of respondents reported that they have worked at the HSB – SCTCC for more than 3 years, 20% have been there 2-3 years, 20% have been there for 1-2 years, and 8.3% of respondents have spent less than 1 year at this site. Relating to hours worked during a typical week at SCTCC - HSB, 18% of employees reported they spend 40+ hours a week in the facility; 53% spend 30-40 hours a week at SCTCC - HSB; 12% spend 20-29 hours at SCTCC - HSB; and 18% spend less than 20 hours in the HSB – SCTCC facility.

Relating to the percentage of time employees spend per week in their primary workspace, 53% of employees reported they spend more than 32% of their time in their primary workspace; 25.6% spend

51-75% of their time in their primary workspace; and 16% spend 25-50% of their time in their primary workspace.

HSB – SCTCC is an educational facility with offices, workstations (cubicles), and laboratories serving as primary workspaces. Results indicated 59% of the employees have private offices, 6% of the employees share private offices with other people, 6% have desks in an open office area, and 29% have a primary workspace in a laboratory setting. Employees also indicate that 75% of their primary workspaces are located within 15 feet of an exterior window and 25% of the employees are not within 15 feet of an exterior window.

4.0 Findings and Discussion

4.1 HSB – SCTCC Facility (Site, Building, and Interior): Overall Satisfaction, Work Performance, and Health

Employees responded to questions concerning the HSB – SCTCC facility (site, building, and interior) and their overall satisfaction with the facility, overall perceptions of their work performance in relation to the facility, and their overall perception of their health in relation to the facility. Table 1 shows the means and standard deviations of their responses as well as how the responses are interpreted. Figure 2 is a graph that shows the mean for each question with a blue mark. The standard deviation is shown by the green/red, vertical bar with green representing satisfied (or enhanced) and red representing dissatisfaction (or hindered). In cases where there were no dissatisfied responses, the bar will be all grey and green. This graph is simply a visual image of the findings from Table 1.

Table 1. HSB – SCTCC facility - overall satisfaction, work performance, and health

SCTCC HSB Facility (Site, Building, and Interior)	Mean	SD	N	Interpretation
Overall Satisfaction	4.65	1.46	17	Satisfied
Overall Work Performance	4.35	1.66	17	Neither Enhances / Hinders
Overall Health	4.29	1.16	17	Neither Enhances / Hinders

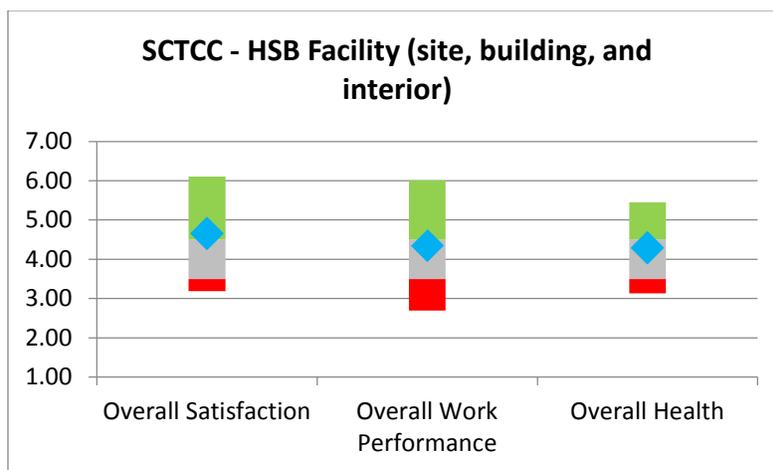


Figure 2. HSB – SCTCC facility - overall satisfaction, work performance, and health

Results indicate that employees were **satisfied (M = 4.65)** with the HSB – SCTCC facility (building, site, and

interior) and reported that their overall work performance was **neither enhanced nor hindered** (M = 4.35 by the facility. Employees reported that their overall health was **neither enhanced nor hindered** (M = 4.29) by the facility.

4.2 Primary Workspace: Overall Satisfaction, Work Performance, and Health

Employees responded to questions concerning their overall satisfaction and overall perceptions of their work performance and health as related to their primary workspace (e.g., private office, workstation, or other primary workspace). Table 2 shows the means and standard deviations of their responses as well as how the responses are interpreted. Figure 3 is a visual image of the findings from Table 2.

Table 2. Primary workspace – overall satisfaction, work performance and health

HSB SCTCC Primary Workspace	Mean	SD	N	Interpretation
Overall Satisfaction	4.71	1.40	17	Satisfied
Overall Work Performance	4.53	1.42	17	Enhances
Overall Health	4.53	1.37	17	Enhances

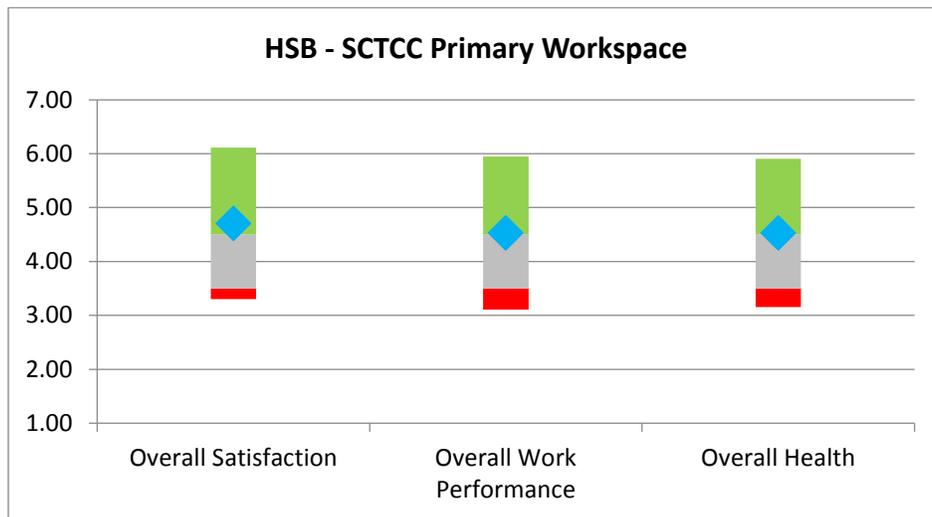


Figure 3. Primary workspace - overall satisfaction, work performance, and health

Results indicate that employees were **satisfied** (M = 4.71) with their primary workspace, their overall work performance was **enhanced** (M = 4.53) by their primary workspace, and their overall health was **enhanced** (M = 4.53) by their primary workspace.

4.3 Primary Workspace: Satisfaction with Indoor Environment Quality (IEQ)

Employees responded to questions concerning their satisfaction with IEQ criteria (thermal conditions, indoor air quality, acoustic conditions, etc.) related to their primary workspace (e.g., private office, workstation, or other primary workspace). Table 3 shows the means and standard deviations of their responses as well as how the responses are interpreted. Figure 4 is a visual image of findings from Table 3.

Table 3. Primary workspace - satisfaction with IEQ criteria

#	IEQ Criteria (1-25) (Category level criteria are bold face)	Mean	SD	N	Interpretation (D = Dissatisfied) (S = Satisfied)
1	Amount of electric light	4.94	1.48	17	Satisfied
2	Overall electric lighting conditions	4.94	1.48	17	Satisfied
3	Adjustability of task lighting	4.71	1.61	17	Satisfied
4	Adjustability of the electric lighting	4.71	1.45	17	Satisfied
5	Overall cleaning and maintenance	4.65	1.62	17	Satisfied
6	Ability to hear desired sounds	4.47	1.62	17	Neither S or D
7	Overall furnishings	4.44	1.09	16	Neither S or D
8	Function of furnishings	4.41	1.33	17	Neither S or D
9	Overall vibration and movement	4.35	1.58	17	Neither S or D
10	Adjustability of furnishings	4.29	1.21	17	Neither S or D
11	Overall privacy (sound and visual privacy)	4.24	1.68	17	Neither S or D
12	Overall appearance (aesthetics)	4.18	1.59	17	Neither S or D
13	Overall acoustic quality	4.18	1.74	17	Neither S or D
14	Ability to limit undesired sounds	4.06	1.56	17	Neither S or D
15	Overall view conditions	3.94	2.05	17	Neither S or D
16	Overall daylighting conditions	3.94	1.85	17	Neither S or D
17	Overall technology	3.88	1.80	17	Neither S or D
18	Amount of daylighting	3.88	1.93	17	Neither S or D
19	Adjustability of daylighting	3.75	2.11	16	Neither S or D
20	Overall indoor air quality	3.75	1.84	16	Neither S or D
21	Air velocity (drafty or stagnant)	3.71	1.96	17	Neither S or D
22	Overall thermal conditions	3.29	1.93	17	Dissatisfied
23	Humidity (dry or moist)	3.24	1.95	17	Dissatisfied
24	Temperature (hot or cold)	3.18	1.94	17	Dissatisfied
25	Adjustability of thermal conditions	2.71	1.90	17	Dissatisfied

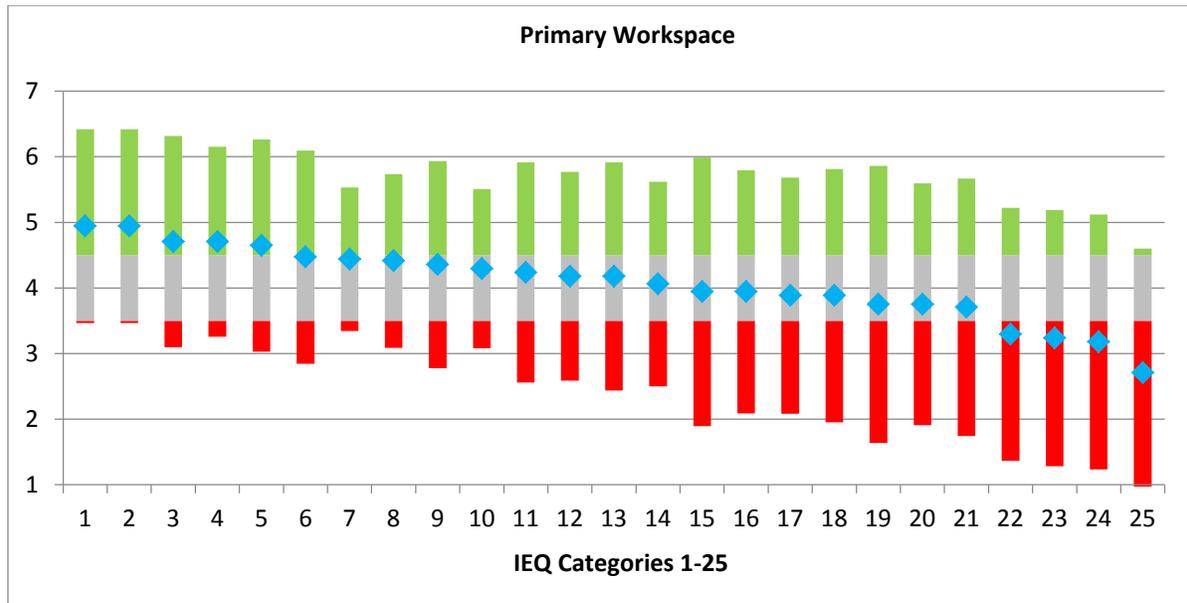


Figure 4. Primary workspace - satisfaction with IEQ categories (IEQ 1-25 are listed in Table 3 above)

Results indicate that employees were **satisfied** with only five of the IEQ criteria in their primary

workspaces (# 1-5), i.e., means at or above 4.50. They were **neither dissatisfied nor satisfied** with 16 IEQ criteria (#6-21), and **dissatisfied** with four IEQ criteria (#22-25). All IEQ criteria below 4.5 are ripe for change to improve employees’ satisfaction with their primary workspaces. Strategies to improve IEQ conditions in the workplace will be addressed in Section 6.2 Recommendations. Further explanation of these scores also can be found in Appendix A. Open-Ended Responses.

4.4 IEQ Satisfaction Scorecard

The IEQ Satisfaction Score is determined by calculating a mean of all overall category level IEQ criteria. At this time, all criteria are weighted equally in this calculation as little evidence exists that provides rationale for weighting some criteria heavier than others. The IEQ mean is representative of a fair overall IEQ score and can serve as a benchmark of employees’ satisfaction with the physical environment of their primary workspace. As shown in Figure 5, the **IEQ Satisfaction Score** for HSB – SCTCC is **4.15**



Figure 5. Primary Workspace - IEQ Satisfaction Score

Overall, the employees showed a neutral range of dissatisfaction / satisfaction with IEQ as indicated by the mean score of **4.15**. As shown in Table 3, satisfaction with **Overall electric lighting (4.94)** and **Overall cleaning and maintenance (4.65)** were the only criteria that pulled the IEQ Satisfaction Score in a positive direction. Dissatisfaction with one category level IEQ criterion, **Overall thermal conditions (3.29)**, pulled the IEQ Score down. This low IEQ score can be addressed by building management to increase employees’ satisfaction. Please note that the IEQ Satisfaction Score only uses the category level criteria (those labeled ‘Overall’; see section 2.1, paragraph 3 for explanation). There were neutral and dissatisfied mean scores with other criteria that must be addressed as well. These will be noted in Section 6.2 Recommendations.

5.0 Physical Activity Engagement and Commuting Practices

In the final section of the survey, employees responded to questions regarding their overall physical activity while at HSB – SCTCC (site, building, and interior) and their commuting practices.

5.1 Physical Activity Engagement

Providing employees with opportunities for alternative paths of travel around the workplace, e.g., taking stairs as opposed to the elevator, provides opportunities to engage in additional types of physical activities. Engaging in physical travel throughout the work environment can be associated with healthier lifestyles.

Table 4. Overall physical activity (walking, stair use, etc.) affected by the HSB – SCTCC facility

HSB – SCTCC Facility (Site, Building, and Interior)	Mean	SD	N	Interpretation
Overall physical activity (walking, stair use, etc.)	4.41	1.46	17	Neither Enhances / Hinders

Results indicate that employees felt that HSB – SCTCC **neither enhanced nor hindered (M = 4.41)** their physical activities (walking, stair use, etc.). Further, of the 17 respondents to this question, 53% said the facility’s influence on their overall physical activity was enhanced; 29% said they were **neither enhanced nor hindered**; and 18% were **hindered**.

5.2 Commuting Practice

HSB – SCTCC is located in St. Cloud, MN, on a walkable campus that is in close proximity to other campus buildings, open green space, and limited public transportation. SCTCC provides several parking facilities, bike paths, and sidewalks throughout the campus and adjacent to the HSB – SCTCC facility.

Table 5 provides results on employees’ primary mode of transportation; Table 6 summarizes commuting distances between home and the HSB – SCTCC facility; and Table 7 summarizes employees’ ability to commute using alternative choices (walk, public transit, bike, van, or carpool, etc.). These results, although not related to IEQ, do offer SCTCC insight into employees’ commuting behaviors and opinions. These data can provide important information about commuting practices that can reduce transportation energy consumption.

Table 5. Commuting Practices – HSB – SCTCC Primary mode of transportation

Primary mode of transportation	Drive alone (or with children < 16)
Primary mode of transportation	100%

Related to primary modes of transportation, the results indicate that 100% of employees drive alone (or with children under 16) to work. They were no results for public transit, motorcycles or mopeds, bicycles, or a combination of commuting options (e.g., driving and biking).

Table 6. Commuting Practices – HSB – SCTCC Commuting distance traveled

Commuting distance / miles traveled	0-5 miles	6-15 miles	16-30 miles	31 + miles
Home-to-HSB - SCTCC(One-way)	24%	35%	24%	18%

Results indicate that 24% of employees commuted 0-5 miles one-way between home and the SCTCC - HSB, followed by 35% who commute 6-15 miles, 24% commute between 16-30 miles, and 18% commute between 31 + miles. All of these are one-way miles.

Table 7. Commuting practices – HSB – SCTCC location and alternative commuting behaviors

HSB - SCTCCF (SBI) Location	Mean	SD	N	Interpretation
Ability to commute in alternative ways	3.65	1.73	17	Neither Enhances / Hinders

Results indicate that the location of the HSB – SCTCC **neither enhanced nor hindered (M = 3.65)** employees ability to commute to work in alternative ways, e.g., walk, bicycle, public transit, van or carpool, etc.

6.0 Conclusions

6.1 Summary

A post-occupancy evaluation was conducted of employees of HSB – SCTCC at approximately 3.5 years after it was first occupied. About 32% of the employees responded to the survey.

The survey included questions related to employees’ overall satisfaction with the facility (site, building, and interior) and influence of the facility on their overall work performance and health. Employees were **satisfied** with the facility (**M = 4.65**); they found the facility **neither enhances nor hinders** their overall work performance (**M = 4.35**) and **neither enhances nor hinders** their overall health (**M = 4.29**). Slightly higher results were reported when employees were asked these same questions about their primary workspaces (private office, shared office, laboratory, etc.). They reported overall **satisfaction (M = 4.71)** with their primary workspaces and that their overall work performance was **enhanced (M = 4.53)** by their primary workspaces. However, their overall health was **enhanced (M = 4.53)** by their primary workspace. As the range of scores was from 1-7, scores that showed employees’ satisfaction is in the neutral to low range of satisfaction.

Most of the survey questions related to employees’ satisfaction with the IEQ criteria in their primary workspaces (private office, laboratory, etc.). Employees’ responses showed they were **satisfied** with the only five of the IEQ criteria. The mean satisfaction scores ranged from **4.56** (Overall cleaning and maintenance) to **4.94** (Amount of electric light). These results show a low level of **satisfaction**. Employees responded **neither dissatisfied nor satisfied** to 16 IEQ criteria with scores ranging from **3.71** (Air velocity) to **4.47** (Ability to hear desired sounds). Lastly, employees were **dissatisfied** with four IEQ criteria, Overall thermal conditions (3.29), Humidity (3.24), Temperature (3.18) and Adjustability of thermal conditions (2.71). These four criteria are all related to the thermal environment.

From employees’ responses, an IEQ Score was developed and shows their satisfaction with the IEQ of all category level criteria. For SCTCC - HSB, the IEQ Satisfaction Score was **4.15**. This score reflects a low satisfaction level with the IEQ categories. Finally, employees reported that HSB – SCTCC **neither enhances nor hinders** their physical activity, which is one of the sustainable design criteria that influences occupant behavior.

6.2 Recommendations

The satisfaction scores range from dissatisfied to a low level of satisfaction; most are in the neutral zone. It is important to maintain a high level of employees’ satisfaction as the building continues to age. It is

appropriate to consider a continuing assessment, and recommendations below can assist in this plan. For IEQ categories that have physical measurement possible, e.g., thermal, acoustic, and lighting, it is recommended that these measurements be taken in all workplaces. Recommendations follow:

Acoustic Conditions

- Identify acoustic criteria for overall requirements.
- Determine if any task areas differ now from their original spatial layout/use (i.e., collaborative work spaces now located adjacent to focused work areas, individual workstations).
- Develop specialized acoustical performance requirements to support functional programming employees' tasks (e.g., sources of recurrent noise that need to be controlled, special user populations that may have distinct auditory performance limitations, or multiple uses of building spaces that may have different acoustic criteria). Identify and apply appropriate acoustics modeling software for the project.
- Measure acoustic performance onsite with full building systems (heating, ventilation, air conditioning; HVAC) running.
- Identify employees' privacy concerns via focus groups and/or log complaints relative to acoustical conditions for further evaluation.
- Consider employees' tasks within shared spaces to determine if spatial layout changes can be made for increased acoustic control.

Lighting Conditions

- Identify employees' lighting performance criteria that are to be met to achieve goals by conducting onsite measurements of existing illumination and compare them to standards for employees' tasks as identified by the Illuminating Engineering Society (IES).
- Determine if any task areas differ now from original intent to be sure illumination quantity and quality are not impeded by physical changes to the space (i.e., walls, ceilings, furnishings, fixtures, or equipment).
- Develop additional quality lighting criteria as needed for special facility (e.g., influence of daylight quality or quantity) or employee (e.g., age, task duration) issues.
- Log complaints related to lighting conditions for further evaluation.
- Identify poor lighting conditions in the workspace caused by a lack of control over daylighting, which can cause glare and eyestrain.

Personal Adjustability

- Determine if adjustability issues arise with temperature, lighting, or furnishings via a focus group.
- Identify personal, individual problem areas and relate them to other IEQ issues via log of complaints relative to adjustability.
- Provide education to employees about any existing/achievable adjustment options, e.g., furnishings, air diffusers, lighting, temperature control, etc.

Privacy Conditions

- Identify employees' privacy concerns via focus groups or log complaints relative to privacy to determine if visual or audio privacy is most affected.
- Determine if any task areas or responsibilities differ from original intent and develop alternatives or modifications.
- Consider adding noise masking equipment and/or visual screening depending on the nature of the complaints.

- Document and compare acoustic privacy problem areas with acoustic measurements to pinpoint specific problem areas.

Thermal Conditions

- Measure thermal performance conditions on site.
- Log complaints related to thermal conditions for further evaluation.
- Determine special thermal comfort requirements or problems that may be encountered in the building due to physicality of work activities, duration of sitting, or design/layout considerations. Focus groups can be useful in identifying problem locations.
- Determine if any employees' task areas differ now from original layout to determine if air flow is meeting systems design intent.
- Review conditions that affect thermal comfort using ASHRAE Standard 55-2004 or *Human Factors Design Handbook* (see B3 Guidelines).

It seems obvious that employees' satisfaction can be improved by addressing criteria that had "dissatisfied" or "neither dissatisfied nor satisfied" scores. The above recommendations can help address change to these criteria. The criteria employees were dissatisfied centered on thermal conditions, which can be addressed by the above recommendations. However, as the mean satisfaction scores for many criteria hovered at 'neutral,' it is reasonable to begin addressing some of these criteria to further improve employees' satisfaction. Exploring these criteria in more detail and making adjustments may increase overall satisfaction at the primary workspace. It must be noted that employee expense is second only to the cost of the actual facility in most business operations. It is a good investment to improve employees' satisfaction, which, in turn affects their performance and their health.

This study investigated employees' satisfaction with the facility and primary workplaces of HSB – STCTC. IEQ satisfaction is individual, but the results of the survey show a central tendency of neutral to low satisfaction with the facility and all IEQ criteria. The results can be used as a diagnostic tool to aid in improving IEQ conditions for employees and to set the benchmarks from which improvement can be measured in the future.

Appendix A. Open-Ended Responses

Employees had the opportunity to raise specific concerns on the overall facility and their primary workplaces. Important information can be gleaned from the open-ended responses. HSB – STCTC employees raised specific concerns about thermal conditions. Following are open-ended responses to the criteria. Generally, the comments are shown as written, i.e., only spelling or grammar were corrected.

Thermal Conditions

- Cold in the winter, hot in the summer. Very humid.
- Very cold in the basement of HSB. Especially during the winter.
- Temperature is not the greatest. It usually seems colder by the administration assistants' desks where they are rather still mostly, but the classrooms tend to be too warm where we are doing a lot of classroom skills and are more mobile.
- The windows are very drafty in winter. At times students have to wear their coats, hats, mittens and scarfs to stay warm until the heat catches up from the weekend.
- Very cold in the winter and hot/humid (papers curl) in the summer.

Acoustical Conditions

- Not very sound proof.
- It's very loud with students all day

Building Services and Amenities

- We have no break room or staff lounge

Daylighting / View Conditions

- My window is a cement window that is elevated.

Appendix B. Glossary

Descriptive statistics

Statistics used to summarize large sets of data (i.e., means, frequencies, medians). Descriptive statistics describe only the sample under consideration and are not intended to infer results to the larger population.

Frequency

A descriptive statistic that provides information about how many of a particular response or measurement are observed.

Likert-type scale

A measurement technique, employed in questionnaires and interviews, that utilizes a range of standardized response categories such as strongly agree, agree, etc.

Mean

The average score of a set of data calculated by adding all scores together, then dividing by the number of scores.

N

The number of subjects or participants responding to the questions, or a single question, in the study.

Reliability

The repeatability or replicability of findings; the same results are produced each time. Instruments and procedures should produce the same results when applied to similar people in similar situations, or on a second occasion.

Standard deviation

A statistic used to measure the variability of a group of scores (how different scores are from each other and the mean). For example, if the range of scores is 1-7 and the mean (average) is 5.0 with a standard deviation of 1.0, then the scores are closely clustered around the mean, i.e., there is one unit of variation among all scores. If the mean was 5.0 and the SD was 3.0, there is a broader range of variation among the scores...a smaller SD means the scores are similar and the mean score is likely to be more accurate and more useful (this is better!).

Validity

The extent to which an instrument or procedure measures what it is intended to measure (internal validity). The generalizability of results to another population (external validity).