



**Indoor Environmental Quality + Workplace Environment
Second Harvest Heartland HQ and Distribution Center
Brooklyn Park, MN**

**June 2023, Minneapolis, MN
Sustainable Post-Occupancy Evaluation Survey (SPOES)
B3 Guidelines**

Report prepared by:
Liz Kutschke
(kutsc009@umn.edu)
Center for Sustainable Building Research
College of Design, University of Minnesota

1.0 Overview

The purpose of this report is to examine the connection between sustainable design criteria used in the design and construction of the Second Harvest Heartland HQ and Distribution Center and occupants' satisfaction with their work environments located in the facility. This report communicates responses from employees about the overall facility and their workplace (WP). The facility was designed using Version 3.0 of the B3 Guidelines (formerly known as the Minnesota Sustainable Building Guidelines or MSBG). It was completed for occupancy in February, 2020. 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, residence hall, and public library settings in compliance with the B3 Guidelines project tracking requirements. This is a report of occupants' (hereafter called employees) responses from the survey conducted in April, 2023.

This SPOES report focuses on employees' satisfaction with the physical environment as related to indoor environmental quality (IEQ) criteria of both the overall facility (site, building, and interior) and the IEQ criteria of their primary workspace. In total, there are 41 IEQ criteria evaluated (see 2.1 Description of the Questionnaire, below). 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 are also included. Finally, a brief look at employees' physical activity as influenced by the building, commuting behaviors, and demographics are reported. The report provides descriptive information about employees' perceptions of the IEQ of their work 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 workspaces. They also rate the influence of their physical environment on their perception of their work performance and health on a scale from 1 (hindered) to 7 (enhanced).

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 hindered/enhanced. Means that are close to the center of the scale (4) are considered to be neither dissatisfied/hindered or satisfied/enhanced.

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

- 1.00 - 3.50 dissatisfied (or hindered)
- 3.51 - 4.50 neither dissatisfied (or hindered) nor satisfied (or enhanced)
- 4.51 - 7.00 satisfied (or enhanced)

An IEQ Score is also calculated for employees' satisfaction with IEQ criteria in their primary workspaces. This is a statistical combination of all category-level (explained below) 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' demographic, physical activity, and commuting practice data are collected to provide context for the study.

In the SPOES questionnaire, the 31 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 View Conditions 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 desired sounds and their ability to limit undesired sounds. There are 12 category-level and 14 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 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 workspaces. 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

- Amount of daylighting
- Adjustability of daylighting
- Visual Comfort

Overall Electric Lighting Conditions

- Amount of electric lighting
- Adjustability of electric lighting
- Adjustability of task lighting
- Amount of noise generated by fixtures

- Ease of controls for on/off and dimming
- Effectiveness of automatic sensors
- Quality of task lighting

Overall Furnishings

- Function of furnishings
- Adjustability of furnishings

Overall Indoor Air Quality

Overall Privacy

Overall Technology

- Access to electric outlets

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. This study is limited to employees' perceptions.

3.0 Sample Description

3.1 Description of Building

The Second Harvest Heartland HQ and Distribution Center resides at 7101 Winnetka Ave N, Brooklyn Park, MN. The Second Harvest Heartland HQ and Distribution Center facility (see Figure 1) is a two story, 230,000 square foot building. There is one floor above grade with a partial second floor in the office area of the building. The building includes offices and support spaces, warehouse space, a volunteer center, and other spaces as referenced in section 3.3.



Figure 1. Second Harvest Heartland HQ and Distribution Center (Photo credit: David Laskey)

3.2 Project Team

The relevant project team members to the SPOES process for Second Harvest Heartland HQ and Distribution Center was comprised of the owner, the design team, and the general contractor. They are identified below, relative to their capacity and involvement.

Owner	Second Harvest Heartland
Architect	Leo A Daly
Mechanical and Electrical Engineer	Leo A Daly
Interior Designer	Leo A Daly
Lighting Designer	Leo A Daly
Landscape Architect	Leo A Daly
Commissioning Agent	Leo A Daly
General Contractor	PCL Construction

3.3 Description of Respondents

This survey was administered to 243 employees with workspace in the facility during spring of 2023. The response rate to the questionnaire was approximately 35%. Of those responding, 64% were women, 29% were men, 4% were nonbinary, and 3% preferred not to disclose. The mean age of respondents was 37 years within an overall range of 22-66 years.

The Second Harvest Heartland HQ and Distribution Center construction was completed and ready for operation in February 2020. Since that time, 43% of the respondents reported that they worked in Second Harvest Heartland HQ and Distribution Center facility for more than two years, 26% of the respondents reported that they worked at the Second Harvest Heartland HQ and Distribution Center facility for 1-2 years, and 32% of the respondents spent less than one year at this facility. Relating to hours worked during a typical week at the Second Harvest Heartland HQ and Distribution Center, 8% of the employees reported they spend 40+ hours a week in the facility, 22% spend 5-40 hours a week at the Second Harvest Heartland HQ and Distribution Center, 22% spend 3-4 hours per week at the facility, and 48% work there 1-2 hours per week.

Relating to the time employees spend per week in their primary workspace, 27% of the employees reported they spend more than 75% of their weekly time in their primary workspace; 22% spend 51-75% of their time in their primary workspace; 23% spend 25-50% of their time in their primary workspace; and 27% spend less than 25% of their time in their primary workspace. These responses indicate the amount of time employees are exposed to IEQ conditions in their workplace environment.

The Second Harvest Heartland HQ and Distribution Center is a workplace with enclosed, private offices, workstations with low partitions, collaborative areas, lobby spaces, break rooms, drop-in rooms, conference rooms, a warehouse, a Volunteer Center, and Neighborhood Services, all serving as primary workspaces. 58% of employees indicated that their primary workspaces were located within 15 feet of an exterior window and 42% of the employees were not within 15 feet of an exterior window or were not sure.

4.0 Findings and Discussion

4.1 Second Harvest Heartland HQ and Distribution Center Facility (Site, Building, and Interior)

In this segment of the report, three segments of the findings will be discussed as they pertain to the overall facility (site, building, and interior). They include overall satisfaction, work performance, and health (see 4.2); satisfaction with Indoor Environmental Quality (IEQ) (see 4.4), and the IEQ Scorecard (see 4.6).

4.2 Overall Satisfaction, Work Performance, and Health

Employees responded to questions concerning the Second Harvest Heartland HQ and Distribution Center 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, which is identified 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). Gray represents the 'neither/nor' range of responses. In cases where there were no dissatisfied responses, the bar may be all green or gray and green. This graph is simply a visual image of the findings from Table 1.

Second Harvest Heartland HQ and Distribution Center - Workplace (Site, Building, and Interior)				
Overall	Mean	SD	N	Interpretation
Satisfaction	6.14	0.84	85	Satisfied
Work Performance	5.58	1.16	85	Enhanced
Health	5.01	1.16	85	Enhanced

Table 1. Second Harvest Heartland HQ and Distribution Center facility - overall satisfaction, work performance, and health

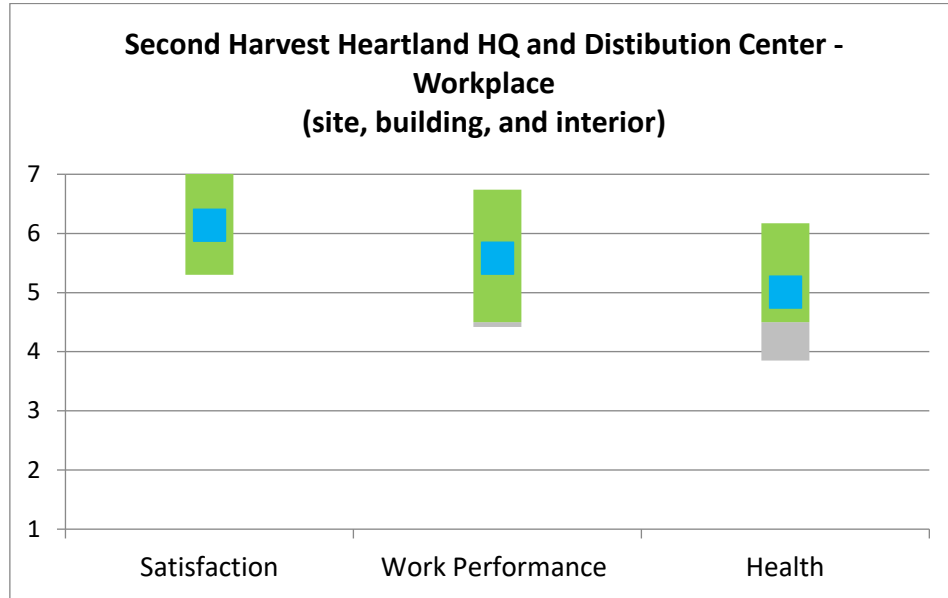


Figure 2. Second Harvest Heartland HQ and Distribution Center facility - overall satisfaction, work performance, and health

Results indicate that employees were **satisfied (M=6.14)** with the physical environment of the Second Harvest Heartland HQ and Distribution Center facility (building, site, and interior) and reported that their overall work performance was **enhanced (M = 5.58)** by the facility. Employees reported that their overall health was **enhanced (M = 5.01)** by the facility.

4.3 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; an explanation of the graph was given for Figure 2.

Second Harvest Heartland HQ and Distribution Center- Primary Workspace				
Overall	Mean	SD	N	Interpretation
Satisfaction	5.48	1.27	85	Satisfied
Work Performance	5.12	1.35	85	Enhanced
Health	5.12	1.09	85	Enhanced

Table 2. Second Harvest Heartland HQ and Distribution Center primary workspace – overall satisfaction, work performance and health

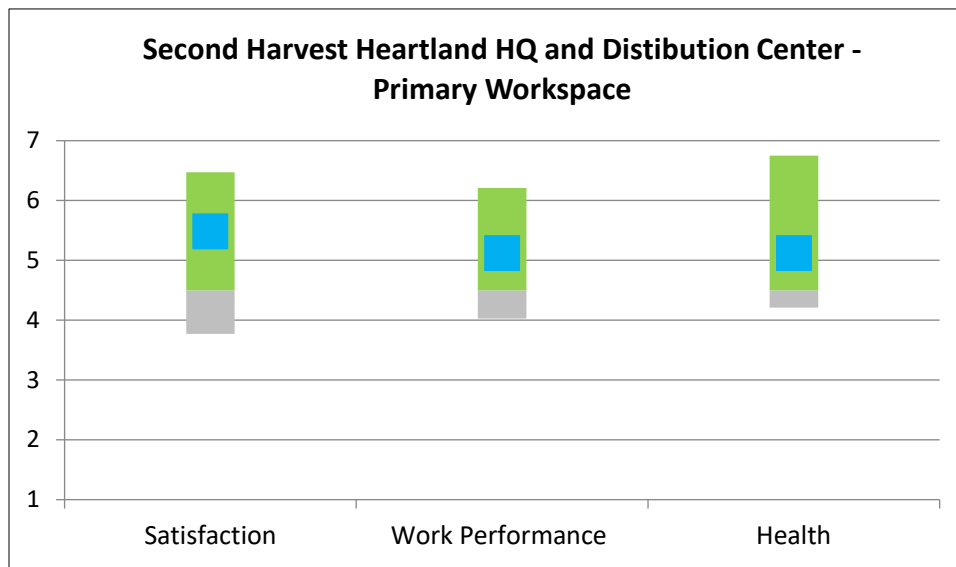


Figure 3. Second Harvest Heartland HQ and Distribution Center primary workspace - overall satisfaction, work performance, and health

Results indicate that employees were **satisfied (M = 5.48)** with their primary workspace, their overall work performance was **enhanced (M = 5.12)** by their primary workspace, and their overall health was **enhanced (M = 5.12)** by their primary workspace.

4.4 Primary Workspace: Satisfaction with Indoor Environmental Quality (IEQ)

Employees responded to questions concerning their satisfaction with IEQ categories (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 from highest to lowest mean, as well as how the responses are interpreted. Figure 4 is a visual image of the findings from Table 3; an explanation of the graph was given for Figure 2.

#	IEQ Criteria (1-26) (Category level criteria are bold face)	Mean	SD	N	Interpretation (D = Dissatisfied) (S = Satisfied)
1	Access to electric outlets	5.92	1.3	77	Satisfied
2	Overall indoor air quality	5.84	1.26	77	Satisfied
3	Overall cleaning and maintenance	5.84	1.46	77	Satisfied
4	Overall furnishings	5.81	1.26	77	Satisfied
5	Overall vibration and movement	5.79	1.28	76	Satisfied
6	Function of furnishings	5.78	1.36	77	Satisfied
7	Overall appearance (aesthetics)	5.78	1.2	77	Satisfied
8	Adjustability of furnishings	5.64	1.52	77	Satisfied
9	Overall daylighting	5.61	1.49	77	Satisfied
10	Amount of electric light	5.52	1.29	77	Satisfied
11	Amount of daylighting	5.47	1.76	77	Satisfied
12	Humidity (dry or moist)	5.44	1.39	77	Satisfied
13	Overall electric lighting conditions	5.39	1.4	77	Satisfied
14	Overall technology conditions	5.29	1.54	77	Satisfied
15	Air velocity (drafty or stagnant)	4.99	1.57	76	Satisfied
16	Ability to hear desired sounds	4.96	1.78	77	Satisfied
17	Adjustability of daylighting	4.8	1.95	76	Satisfied
18	Ability to adjust electric lighting	4.75	1.8	77	Satisfied
19	Overall view conditions	4.6	1.74	77	Satisfied
20	Overall acoustic quality	4.45	1.89	77	Neither S or D
21	Adjustability of your task lighting	4.37	1.76	76	Neither S or D
22	Overall thermal conditions	4.36	1.56	77	Neither S or D
23	Temperature (hot or cold)	4.08	1.65	77	Neither S or D
24	Ability to limit undesired sounds in your primary workspace	3.96	1.92	77	Neither S or D
25	Adjustability of thermal conditions	3.86	1.66	77	Neither S or D
26	Overall privacy (sound and visual privacy) conditions	3.81	1.87	77	Neither S or D

Table 3. Second Harvest Heartland HQ and Distribution Center primary workspace - satisfaction with IEQ criteria

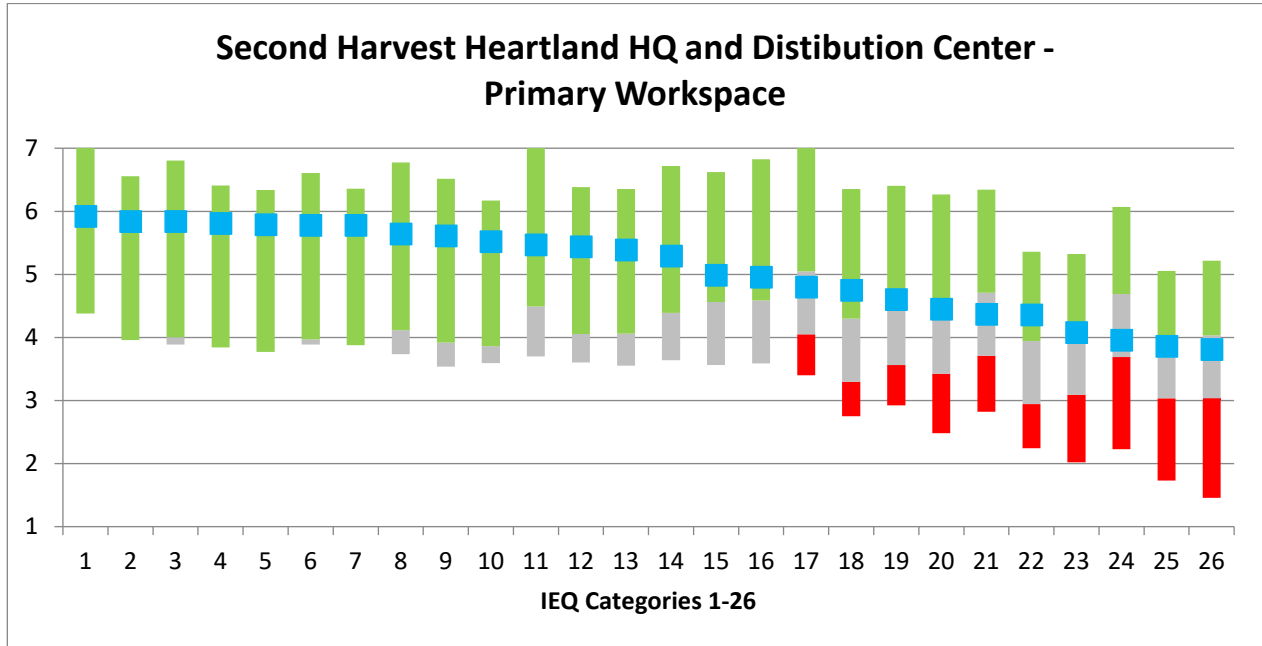


Figure 4. Second Harvest Heartland HQ and Distribution Center primary workspace - satisfaction with IEQ criteria (IEQ 1-26 refer to Table 3)

Results indicate that employees were **satisfied** with 19 of the IEQ criteria in their primary workspaces, i.e., means at or above 4.50. Satisfied means ranged from **5.92** (access to electrical outlets) to **4.60** (overall view conditions). Employees were **neither satisfied nor dissatisfied** with seven (7) IEQ criteria, ranging from a mean of **4.45** (overall acoustic quality) to **3.81** (Overall privacy, sound and visual).

The criteria in the ‘neutral’ satisfaction range should be considered for change in addition to that in the dissatisfied range; together they comprise seven (7) of the 26 IEQ criteria. Potential for change will be addressed in Section 6.2 Recommendations. Further explanation of these scores also can be found in Appendix A. Open-Ended Responses.

Employees also responded to more specific and detailed questions concerning their satisfaction with lighting and daylighting conditions in their primary workspace (e.g., private office, workstation, or other primary workspace). Table 4 shows the means and standard deviations of their responses from highest to lowest mean, as well as how the responses are interpreted. Figure 5 is a visual image of the findings from Table 4; an explanation of the graph was given for Figure 2.

#	Lighting and Daylighting Criteria 1-5	Mean	SD	N	Interpretation (D = Dissatisfied) (S = Satisfied)
1	Amount of noise (humming, clicking, etc.) produced by electric light fixtures	5.85	1.45	73	Satisfied
2	Effectiveness of automatic lighting sensors (speed of sensing, reaction to movement, etc.)	5.66	1.46	73	Satisfied
3	Visual comfort (absence of glare, shadows, flickers) of the electric light	5.58	1.32	73	Satisfied
4	Ease of turning electric lights on and off	5.25	1.62	73	Satisfied
5	Quality of task lighting	4.81	1.74	73	Satisfied

Table 4. Second Harvest Heartland HQ and Distribution Center primary workspace - satisfaction with lighting and daylighting IEQ criteria

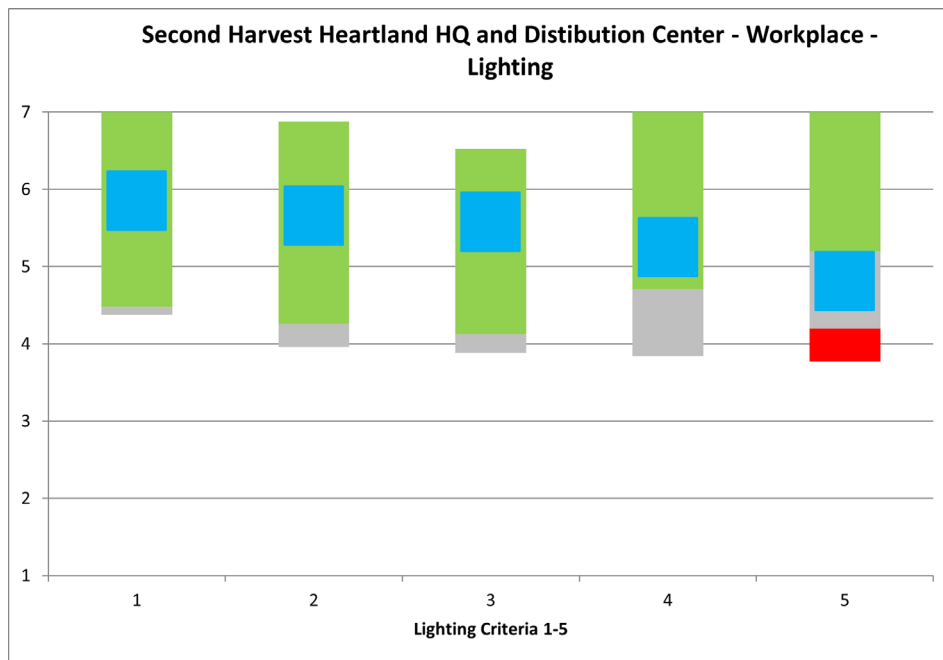


Figure 5. Second Harvest Heartland HQ and Distribution Center primary workspace - satisfaction with Lighting and Daylighting criteria (Lighting Criteria 1-5 refer to Table 4)

4.5 Primary Workspace: Lighting and Daylighting, Work Performance, and Health

Employees responded to questions concerning their overall perceptions of their work performance and health as related to the lighting and daylighting conditions in their primary workspace (e.g., private office, workstation, or other primary workspace). Table 5 shows the means and standard deviations of their responses as well as how the responses are interpreted. Figures 6 and 7 are visual images of the findings from Table 5; an explanation of the graph was given for Figure 2.

Second Harvest Heartland HQ and Distribution Center Workplace (Lighting)				
Overall	Mean	SD	N	Interpretation
Daylighting:				
Work Performance	5.62	1.38	73	Enhanced
Health	5.55	1.60	73	Enhanced
Electric Lighting:				
Work Performance	5.18	1.23	73	Enhanced
Health	4.84	1.31	73	Enhanced

Table 5. Second Harvest Heartland HQ and Distribution Center lighting and daylighting in primary workspace – impact on work performance and health

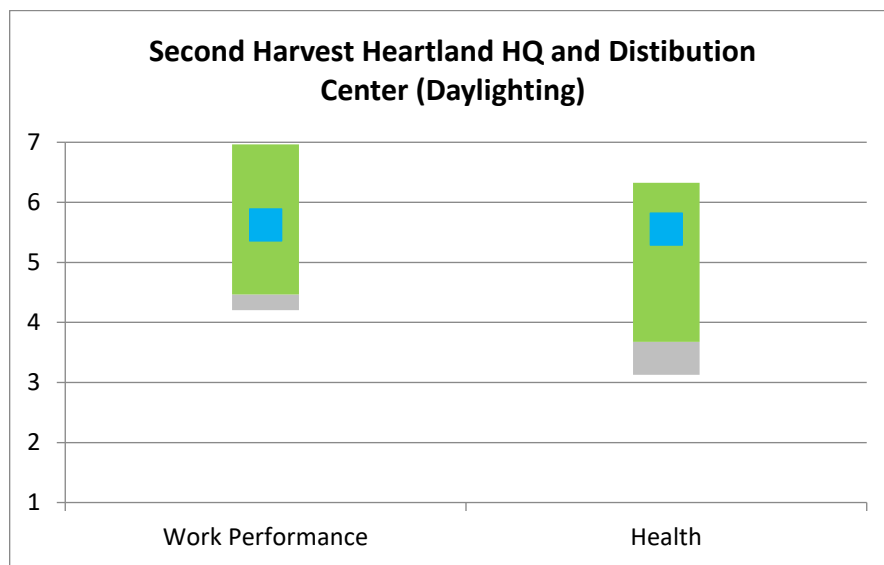


Figure 6. Second Harvest Heartland HQ and Distribution Center primary workspace –daylighting impact on work performance and health

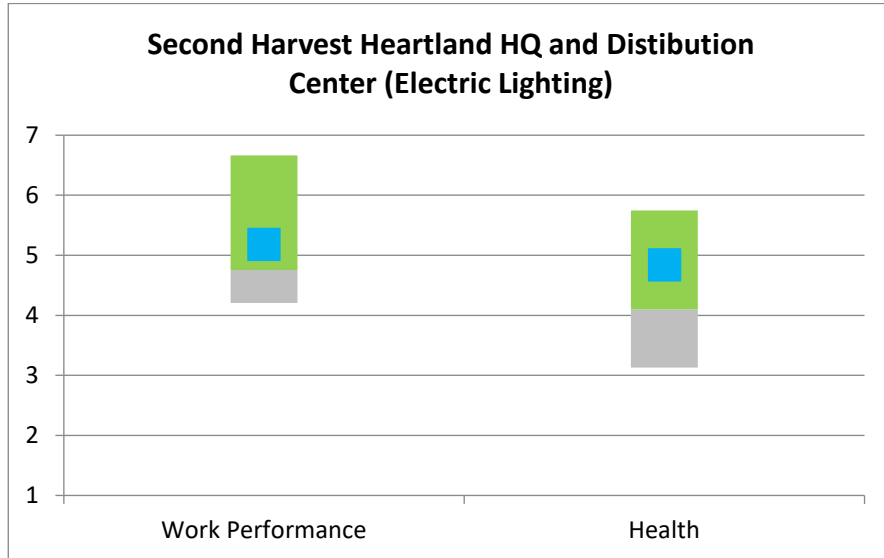


Figure 7. Second Harvest Heartland HQ and Distribution Center primary workspace – electric lighting impact on work performance and health

4.6 IEQ Satisfaction Scorecard

The IEQ Satisfaction Score is determined by calculating a mean of the 12 ‘Overall’ category level IEQ criteria. At this time, 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 the Second Harvest Heartland HQ and Distribution Center is **5.21**, in the **satisfied** range.



Figure 8. Second Harvest Heartland HQ and Distribution Center primary workspace - IEQ Satisfaction Score

As shown in Table 3, satisfaction with the Access to electrical outlets, Overall indoor air quality, Overall cleaning and maintenance, and Overall furnishings were the categories with the highest satisfaction scores. Nine (9) additional categories had scores of 5.37 or higher, in the satisfied mid-range. In combination with the remaining six (6) somewhat lower mean scores (5.26 – 4.60), the satisfied scores were successful in pulling the IEQ Satisfaction Score in a positive direction. The remaining seven (7) mean scores were in the neutral range, (4.5 – 3.51). No category scores fell into the dissatisfied range (less than 3.5). Please note that the IEQ Satisfaction Score only uses the category level criteria (those labeled ‘Overall’; see section 2.1, paragraph 3 for explanation).

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 Second Harvest Heartland HQ and Distribution Center (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.

Second Harvest Heartland HQ and Distribution Center (site, building, and interior)	Mean	SD	N	Interpretation
Overall physical activity (walking, stair use, etc.)	5.4	1.36	72	Enhanced

Table 4. Overall physical activity (walking, stair use, etc.) affected by the Second Harvest Heartland HQ and Distribution Center facility

Results indicate that employees felt that Second Harvest Heartland HQ and Distribution Center **enhanced (M = 5.40)** their physical activities (walking, stair use, etc.).

5.2 Commuting Practices

Second Harvest Heartland HQ and Distribution Center is located in Brooklyn Park, just north of Interstate 94 and east of Highway 169. The building is in a light industrial area, surrounded by other warehouses. This location is ideal for the mission and operation of the organization, allowing quick and efficient distribution of food from the warehouse to the food shelves served in southern Minnesota and eastern Wisconsin.

Table 5 provides results on employees’ primary mode of transportation; Table 6 summarizes commuting distances between home and the Second Harvest Heartland HQ and Distribution Center 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 insight into employees’ commuting behaviors and opinions. These data can provide important information about commuting practices that can reduce transportation energy consumption.

Primary Mode of Transportation (N=73)	Drive Alone (or w/children <16)	Carpool	Tele-Commute	Other
Commuting to Second Harvest Heartland HQ and Distribution Center	92%	1%	4%	3%

Table 5. Commuting Practices – Second Harvest Heartland HQ and Distribution Center Primary mode of transportation

Related to primary modes of transportation, 92% of employees drive alone (or with children under 16), 1% carpool, Telecommuting employees constitute 4% of the occupants, while 4% use modes of transportation other than those listed. No employees use public transportation, or either bicycle or walk.

Miles Traveled (N=73)	0-5	6-15	16-30	31-45	46-60	61-75	75+
Home-to- Second Harvest Heartland HQ and Distribution Center (One-way)	10%	38%	40%	7%	1%	1%	3%

Table 6. Commuting Practices – Second Harvest Heartland HQ and Distribution Center Commuting distance traveled

Results indicate that 10% of employees commute 0-5 miles one-way between home and the Second Harvest Heartland HQ and Distribution Center, followed by 38% who commute 6-15 miles, 40% who commute 16-30 miles, 7% who commute 31-45 miles, 1% who commute 46-60 miles, 1% who commute 61-75 miles, and 3% who commute more than 75 miles. These are one-way miles.

Alternative Commuting	Mean	SD	N
Ability to commute in alternative ways	2.32	*1.72	73

Table 7. Commuting practices – Second Harvest Heartland HQ and Distribution Center location and alternative commuting behaviors

Results indicate that location of the Second Harvest Heartland HQ and Distribution Center **hinders (M = 2.32)** employees' ability to commute to work in alternative ways, e.g., walk, bicycle, public transit, van or carpool, etc. *Note: the higher standard deviation (SD) indicates more variation in employees' perceptions about this factor (greater dispersal of data points).

6.0 Conclusions

6.1 Summary

A post-occupancy evaluation was conducted of employees of the Second Harvest Heartland HQ and Distribution Center at approximately 37 months after its initial occupancy in February 2020. About 35% of faculty and staff responded to the survey, reporting their satisfaction with the physical environment of the facility and their primary workspace.

The survey included questions related to employees' satisfaction with the facility (site, building, and interior) and influence of the facility on their work performance and health. Employees were **satisfied** with the facility (**M = 6.14**); they found the facility **enhanced** their work performance (**M = 5.58**) and **enhanced** their health (**M = 5.01**). In addition, similar results were reported when employees were asked these same questions about their primary workspaces (private offices, shared offices, workstations, etc.). They reported **satisfaction** (**M = 5.48**) with their primary workspaces, that their work performance was **enhanced** (**M = 5.12**), and their health was **enhanced** (**M = 5.12**) by their primary workspace. As the range of scores was from 1-7, the majority of scores showed a high level of satisfaction with the facility and a moderate level of satisfaction with the primary workspace. (The satisfaction/enhancement range is 4.51-7.00, whereas the neutral range is 3.51-4.50.)

Most of the survey questions related to employees' satisfaction with the IEQ criteria in their primary workspaces (private office, workstations, etc.). Employees' responses showed they were **satisfied** with 24 of the 31 IEQ criteria. The mean satisfaction scores ranged from **5.92** (access to electrical outlets) to **4.60** (Overall view conditions). Again, this shows a moderate positive level of **satisfaction**. Employees responded **neither dissatisfied nor satisfied** to seven (7) IEQ criteria, with mean satisfaction scores ranging from **4.45** (Overall acoustic quality) to **3.81** (Overall privacy, sound and visual)

From employees' responses, an IEQ Score was developed and shows respondents' moderate satisfaction with the majority of all IEQ category level criteria. For Second Harvest Heartland HQ and Distribution Center, the IEQ Satisfaction Score was **5.21**. This score reflects the influence of the moderate satisfaction level of 10 of the 12 categories, neither dissatisfied nor satisfied level of two (2) of the 12 IEQ categories. Finally, employees reported that the Second Harvest Heartland HQ and Distribution Center **enhanced** (**5.4**) their physical activity, which is one of the sustainable design criteria that influences occupant behavior.

It seems obvious that employees' satisfaction can be improved by addressing the categories that had 'neither dissatisfied nor satisfied' or 'dissatisfied' scores. However, the rest of the criteria would benefit from some attention as well. The following recommendations can help address change in these criteria to further improve employees' satisfaction. Exploring these areas in more detail and making adjustments may increase overall satisfaction at the primary workspace. It must be noted that the expense of building and operating a facility is second only to employee-related expenses over the life of the building. Therefore, maintaining or improving employees' satisfaction is a sound investment, which, in turn affects their performance and their health.

This study investigated employees' satisfaction with the facility and primary workspaces. IEQ satisfaction is individual, but the results of the survey show a central tendency of moderately lower satisfaction with the facility and most of the IEQ categories. 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.

6.2 Recommendations

Several IEQ criteria satisfaction scores are in the positive direction, however, improvement on the 'neutral' criteria may be possible. For IEQ categories that can be physically measured (e.g., thermal, acoustic, and lighting), it is recommended that these measurements be taken in the primary workspaces. Specific recommendations for the most common areas of occupants' concern 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 workspaces 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.
- Calibrate and adjust sound masking systems in place to ensure they are functioning as desired for privacy, and determine need for any additional masking equipment and/or visual screening depending on the nature of any complaints.
- Measure acoustic performance onsite with full building systems (heating, ventilation, and air conditioning) 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 level and quality of lighting 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 what 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 a 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 the applicable version of ASHRAE Standard 55, or Human Factors Design Handbook (see B3 Guidelines). For additional information, consider reviewing Human Factors and Ergonomics Design Handbook, Third Edition (2016), by Barry Tillman, published by McGraw-Hill, NY.

Appendix A. Open-Ended Responses

Employees had the opportunity to raise specific concerns on the overall facility and their primary workspaces. Important information can be gleaned from the open-ended survey responses. The Second Harvest Heartland HQ and Distribution Center employees raised many general and very specific concerns and positive comments related to acoustics and privacy, daylighting/electric lighting and lighting controls, furnishings, cleaning/maintenance, spatial layout, and thermal conditions and control. Generally, the comments are shown exactly as written.

Overall Positive/Negative

- I appreciate the beauty and functionality of the building as a whole. Thank you for the investment in us.
- The general working environment is great.
- Overall I think we have a beautiful, functional building--although the temperature throughout is often cold or fluctuating strangely.
- Overall, it is a great space to work in. A few minor fixes could make it even better. But, overall one of the better spaces I've worked in!
- Overall I love the building and the workspaces.

Acoustic Quality and Privacy

- Office door style does not allow for completely confidential conversations; cubes can hear conversations with door closed & can hear neighbor office conversations.
- For making calls with HIPAA protected information, the office feels too open and noisy to make calls there consistently. If I make calls at the office, I usually try and go into a huddle room, but then I am only limited to my one laptop screen.
- Overall, not enough space for privacy if needed. It feels weird that the only people with offices are director-level. It should be more for the people who need privacy in discussions rather than rank.
- The Volunteer Center is really echoey, which makes it harder for the volunteers to hear directions when they are spread out. That is just the nature of the beast but at the same time if there was a way to add some sound dampening panels to the walls to stop the echo it might help with the echoing and ability to hear instructions.
- When I work at the office, there are a lot of distractions- it's too easy for someone to just drop by and interrupt my work flow. This is something I welcome at times. I do like talking to others and having occasional face to face time, but when there are tight deadlines or mountains of work, I'll opt to stay home to avoid distractions.
- Not a lot of privacy in Neighbor Services area (SNAP, CSFP, FoodRx). We are all making calls to neighbors and asking about personal/private info and it is very easy to overhear.
- I would say the noise from the open floor plan is the biggest factor that hinders my work, and the lighting would be second.
- I often have to find a drop-in room for privacy for phone calls that may contain discussions of confidential information. I often do this for any and all phone conversations - I can't have phone/meetings at my workspace out in the open. Sometimes I'll just opt to stay home so I don't have to switch my workspace for a phone call.

Appearance (Aesthetics)

- The design is beautiful.

Daylighting/Electric Lighting and Lighting Controls

- My office is on the "inside" part of the building so no natural light, unfortunately.
- Lighting auto-shut off can be annoying when in online meetings with limited movement; awkward when talking and the lights go out!
- Understand why there aren't windows in offices. Just miss natural light!
- The fluorescent lighting can sometimes trigger migraines, especially when they are all on and the sun is coming through the window that I face (the blinds on the windows do not fully block the sun). It has been improved since some of the lights have been taken out, but there isn't a way to adjust the lighting in our specific area- it's for the entire lower office space.
- Some cubes have excellent access to natural daylight/windows, and others are very far away.
- I do not like the overhead lighting, it gives a headache and there are not alternative options to folks who do not like florescent lighting.
- There's no day lighting so that makes it hard during winter months. (I suffer from seasonal affective disorder.)
- Electric lighting works but the "sensor" drives me nuts. It oftentimes click off in the middle of meetings so I have to wave madly to bring it back on.
- No task lighting in my private office.
- Do not see natural daylight unless exiting my office, which is by design but also unfortunate.
- Appreciate the ability to dim overhead lights as needed!
- I prefer natural lighting and we have plenty of it. I dislike the overhead florescent light situation.
- Full electric lights really trigger my migraines. Its nice that we have the option to dim the lighting, but it dims it for a large portion of the building, so sometimes I don't feel comfortable adjusting the lighting for that many people, even if I end up getting a migraine from the bright lights.
- We have great natural lighting on my side of the building, so a lot of times there is not a need for electric lighting, so when the electric lights are on and its a nice sunny day out, its way too bright.
- Prefer and enjoy the daylight except when the sun is directly coming through the window that I face and the shades do not block it. The fluorescent lighting is harsh and can trigger migraines. Maybe a warmer color would be better?
- Overall happy with the amount of windows in the space that allows for natural light.
- The lighting is very bright and often gives me a headache. We have a lot of natural light upstairs - sometimes I wish we didn't need every overhead light on as well.
- It depends on which drop-in room I end up in. Some have good lighting, some could benefit from additional light sources.
- If my desk had daylighting it would enhance my work and health/mood, but it's quite far away from windows.
- I have no control over electric lighting, but it's not an issue. I tend to prefer the lights out in the workspace on the 1st floor.
- I prefer less fluorescent and warmer lighting. It is more pleasant to be in all day and much less harsh/hard on the eyes.

- Need more natural light in warehouse and warehouse office area.
- My space is right by a window and this certainly is a contributor to my wellbeing.
- Improvements in the overhead lighting are needed.

Furnishings

- Love the standing desk, chair is comfortable & adequate seating options for a guest.
- White board feature is great!
- It would be ideal to have a small table and two chairs in my office to facilitate working meetings.
- Very nice seating and sit stand desks - good ergonomics.
- Some drop in rooms are difficult to use for work or calls if they have a low table instead of one at normal desk height.
- I love the physical space at Second Harvest Heartland and the ability to stand and work.

Operations and Maintenance/Cleaning

- Wish the carpets would get vacuumed regularly (at least weekly).

Spatial Layout

- I wish that the printers and safe shred boxes were a little closer to my work station.
- It is very difficult for me to make calls, have virtual meetings at work due to the open floor plan. I often overhear conversations across the room. Sometimes it is difficult to get a quiet or enclosed space for virtual meetings. It also makes it very hard to concentrate.
- It's an open workspace so sound travels and it is not conducive to deep work I spend a lot of time with my headphones on. Also, there are not enough drop-in rooms on certain days. I don't want to disturb others when I have to do a meeting but it can be hard to take them at my desk depending on the discussion. I do appreciate my space though and I love the standing and sitting desk. It is great for collaborative work. I enjoy having the flex schedule to be able to do work from home and then more collaborative work while in the office.
- One other item of note is that for those working in the office getting outside requires a bit of a walk from one side of the building to the other. It, unfortunately, doesn't allow for eating outside on nice days most of the time due to the time it takes to get out there and back. I wish that we had access to the outdoors easier.
- The proximity to the offices entrance makes for louder conditions and more drive-by questions/comments that can be distracting.
- Feels like we are growing past the amount of space allotted for our teams.
- Love that it takes a good walk to get from parking to my office & back at the end of the day. Appreciate ability to utilize meeting spaces on another level.
- I do think the offices are too small, and without appropriate furniture for storage.

Site Design and Location

- Parking is also a bit packed recently after COVID. Might be nice to have access to other places to park as well.
- The hardest part is the lack of outdoor walking space and noise pollution when we are outside. But that's life with a distribution center. But more outside spaces to have walking meetings.

- It's all but impossible to bus to the office, but there isn't an easy solution to that. It's in a location that makes sense for being such a large warehouse. I wish it had more transit options, but I understand that's difficult to accommodate.
- It's location does make it nearly impossible for me to bike to work. I had spent most of my life as a bike commuter, but have now had to buy a car so I could work at SHH.

Technology

- Technology always seems to be an issue. I hope that we can get more of our conference rooms always working with technology - seems like there is always an issue. I never know what I am walking into.
- Work computers tend to be very slow.
- Technology in Cargill rooms for video calls is ALWAYS difficult and disruptive to meetings when the sound doesn't work correctly (which is common).

Thermal Conditions and Control

- No idea how to control the temps in our office. There's been contradictory explanations, and either it's freezing or too hot.
- Temperature hard to regulate with sharing thermostat with neighbors.
- It often feels a bit cold.
- Adjustability of thermal conditions work but the setting is not what it gets set to. The number is always different from what is desired same with heating and cooling mode.
- Thermostat doesn't seem to work in my office. Cool air will come through during the winter and hot air during the summer (at times). I try changing from heat to cool or vice versa and the system automatically changes it back shortly after, so rather pointless.
- Sometimes the huddle or meeting rooms are very cold or very hot. This doesn't necessarily bother me like the sounds and lighting, but can be uncomfortable. I've had other staff and volunteers remark on the temperature of these rooms often.
- Temperatures are all over the place in the office space. You could have a meeting in a room that is very hot or freezing. It seems to be off somehow at least on the second level of the office. Sometimes the air conditioning is on in the winter.
- Temps are difficult to adjust.
- It is pretty chilly in the office space at times.
- My primary work station is far away from all natural light and the AC is often blasting right on me. Makes it a bit gloomy and inhospitable.
- I have a thermostat for temp control, but it often seems to revert back when I make changes.
- Office is so cold most of the year.

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 is 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).