



**Indoor Environmental Quality + Workplace Environment
Minnesota Senate Building (MN-SEN)
Saint Paul, MN**

**May 2017, 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 Minnesota Senate Building (MN-SEN) facility 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 the B3 Guidelines (formerly known as the Minnesota Sustainable Building Guidelines or MSBG), which were in effect at the time that the renovation and addition were funded. It was completed for occupancy in January 2016. 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, and residence hall 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, 2017.

This SPOES report focuses on employees' satisfaction with the physical environment as related to 26 indoor environmental quality (IEQ) criteria such as lighting, thermal, and acoustic conditions in their primary workspaces, i.e., offices. 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 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 (hinders) to 7 (enhances).

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

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 26 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

Overall Electric Lighting Conditions

- Amount of electric lighting
- Adjustability of electric lighting
- Adjustability 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 MN-SEN is located at 95 University Avenue, St. Paul, MN. The building (see Figure 1) is a five-story (plus a mechanical penthouse), 278,000 square foot building that includes legislative chambers, office space, conference rooms, and main entry lobbies. Only the overall facility and primary workspaces were included in this study. The building serves as the office space for members of the Minnesota Senate and their staff, and other support staff.



Figure 1. MN-SEN. (Photo courtesy of MN Dept. of Administration)

3.2 Description of Respondents

This survey was administered to 324 employees with workspace in the facility during April 2017. The response rate to the questionnaire was approximately 53%. Of those responding, 59% were male, 40% were female, and 1% were other. The mean age of respondents was 41 years, with a range from 20-79 years of age.

The MN-SEN was completed and ready for operation in January 2016. Since that time, 48% of the respondents reported that they worked at the MN-SEN facility for 1-2 years, and 52% of the respondents spent less than one year at this site. Relating to hours worked during a typical week at MN-SEN, 84% of the employees reported they spend 40+ hours a week in the facility, 15% spend 30-40 hours a week at MN-SEN, and less than .5% spend 20-29 hours or less than 20 hours at the facility.

Relating to the time employees spend per week in their primary workspace, 39% of the employees reported they spend more than 75% of their weekly time in their primary workspace; 45% spend 51-74% of their time in their primary workspace; 14% spend 25-50% of their time in their primary workspace; and 2% 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.

MN-SEN is a workplace with private offices; enclosed shared offices; workstations (cubicles) with low partitions, both low and high partitions, and benching (multiple flat worksurfaces divided with low partitions) serving as primary workspaces. Employees indicated that 47% of their primary workspaces were located within 15 feet of an exterior window, 50% of the employees were not within 15 feet of an exterior window, and 3% were not sure how far they were from an exterior window.

It is important to recognize that Senators and their staff do not have permanent office space in the building. Depending on the majority political party elected to office, they may be required to move to other offices before the start of the next legislative session. Also, not all primary workspaces were occupied in January 2016; some were occupied later in the year.

4.0 Findings and Discussion

4.1 MN-SEN Facility (Site, Building, and Interior): Overall Satisfaction, Work Performance, and Health

Employees responded to questions concerning the MN-SEN 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.

Table 1 MN-SEN facility - overall satisfaction, work performance, and health

Overall	Mean	SD	N	Interpretation
Satisfaction	5.05	1.51	172	Satisfied
Work Performance	4.87	1.48	171	Enhanced
Health	4.64	1.38	172	Enhanced

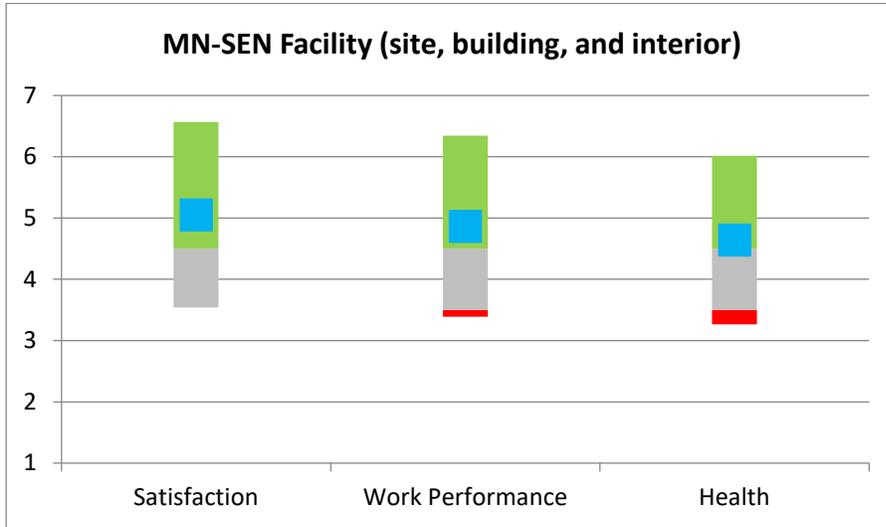


Figure 2. MN-SEN facility - overall satisfaction, work performance, and health

Results indicate that employees were **satisfied (M = 5.05)** with the MN-SEN physical environment of the facility (building, site, and interior) and reported that their overall work performance was **enhanced (M = 4.78)** by the facility. Employees reported that their overall health was **enhanced (M = 4.64)** 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; an explanation of the graph was given for Figure 2.

Table 2. MN-SEN primary workspace – overall satisfaction, work performance and health

Overall	Mean	SD	N	Interpretation
Satisfaction	4.88	1.64	168	Satisfied
Work Performance	4.92	1.57	168	Enhanced
Health	4.78	1.41	168	Enhanced

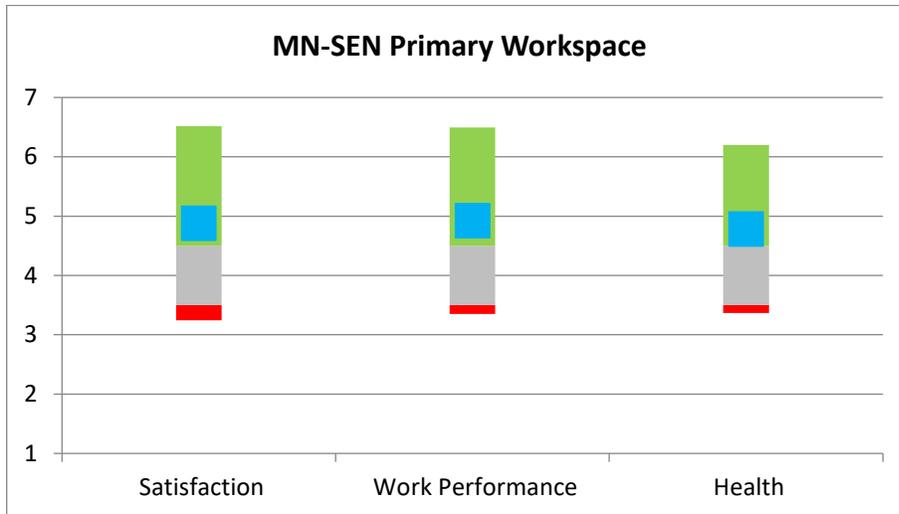


Figure 3. MN-SEN primary workspace - overall satisfaction, work performance, and health

Results indicate that employees were **satisfied (M = 4.88)** with their primary workspace, their overall work performance was **enhanced (M = 4.92)** by their primary workspace, and their overall health was **enhanced (M = 4.78)** by their primary workspace.

4.3 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.

Table 3. MN-SEN primary workspace - satisfaction with IEQ criteria

#	IEQ Criteria (1-26) (Category level criteria are bold face)	Mean	SD	N	Interpretation (D =Dissatisfied) (S = Satisfied)
1	Overall cleaning and maintenance	5.28	1.89	163	Satisfied
2	Overall vibration and movement	5.13	1.53	164	Satisfied
3	Amount of electric light	5.05	1.67	163	Satisfied
4	Ability to hear desired sounds	4.95	1.60	164	Satisfied
5	Function of furnishings	4.95	1.69	164	Satisfied
6	Adjustability of furnishings	4.94	1.74	164	Satisfied
7	Overall technology	4.89	1.60	164	Satisfied
8	Overall indoor air quality	4.88	1.65	163	Satisfied
9	Overall electric lighting conditions	4.80	1.83	163	Satisfied
10	Overall appearance (aesthetics)	4.77	1.78	162	Satisfied
11	Overall furnishings	4.73	1.74	164	Satisfied
12	Humidity (dry or moist)	4.70	1.66	164	Satisfied
13	Adjustability of task lighting	4.58	1.90	164	Satisfied
14	Air velocity (drafty or stagnant)	4.57	1.69	164	Satisfied
15	Access to electric outlets	4.50	1.97	163	Satisfied
16	Adjustability of task lighting	4.50	2.09	162	Satisfied
17	Overall acoustic quality	4.29	1.85	162	Neither S or D
18	Overall privacy (sound and visual privacy)	4.27	1.94	162	Neither S or D
19	Overall daylighting conditions	4.24	2.08	161	Neither S or D
20	Amount of daylighting	4.14	2.18	162	Neither S or D
21	Overall view conditions	4.13	2.11	163	Neither S or D
22	Overall thermal conditions	4.04	1.76	165	Neither S or D
23	Temperature (hot or cold)	3.90	1.79	164	Neither S or D
24	Adjustability of daylighting	3.80	2.15	162	Neither S or D
25	Ability to limit undesired sounds	3.76	1.94	164	Neither S or D
26	Adjustability of thermal conditions	2.96	1.86	162	Dissatisfied

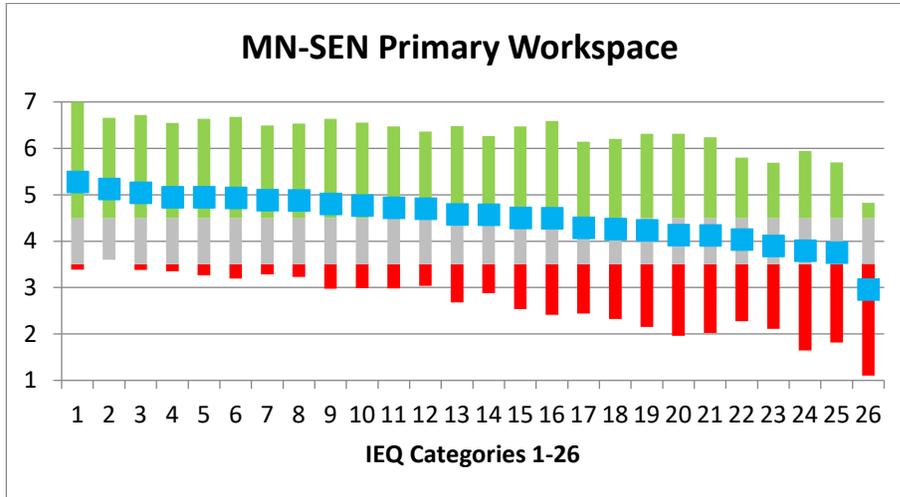


Figure 4. MN-SEN primary workspace - satisfaction with IEQ criteria (IEQ 1-26 refer to Table 3)

Results indicate that employees were **satisfied** with 16 of the IEQ criteria in their primary workspaces, i.e., means at or above 4.50. Employees were **neither satisfied nor dissatisfied** with 7 IEQ criteria, ranging from a mean of 3.76 (ability to limit undesired sounds) to 4.29 (Overall acoustic quality). Employees were **dissatisfied** with adjustability of thermal conditions with a mean of 2.96; IEQ criteria within the dissatisfaction range have mean scores at or below 3.75. In addition to the criteria in the dissatisfaction range should be reviewed with those criteria in the ‘neutral’ satisfaction range and considered for change. 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.

4.4 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 MN-SEN is **4.62**, which falls in the lower end of the satisfied range (4.51-7.0). The widely distributed (5.28 to 4.04) criteria scores contributed to this moderately satisfied IEQ Score.

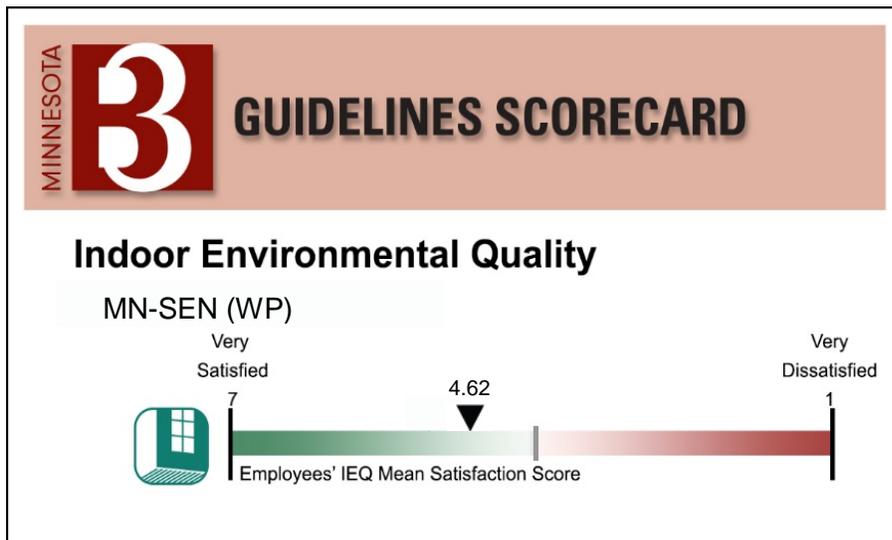


Figure 5. MN-SEN primary workspace - IEQ Satisfaction Score

As shown in Table 3, satisfaction with the Overall cleaning and maintenance and Overall vibration and movement were the categories with the highest satisfaction means (5.13 or higher) and pulled the IEQ Satisfaction Score in a positive direction. However, five mean scores below 4.5 out of 12 category-level criteria pulled the IEQ Score down. 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 MN-SEN (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 MN-SEN facility

MN-SEN facility (site, building, and interior)	Mean	SD	N	Interpretation
Overall physical activity (walking, stair use, etc.)	4.61	1.68	148	Enhanced

Results indicate that employees felt that MN-SEN **enhanced (M = 4.61)** their physical activities (walking, stair use, etc.).

5.2 Commuting Practices

MN-SEN is part of the Capitol Complex and is located at the corner of University Avenue and Park Street. Public access is at the front entrance on corner of Park Street and University Avenue. There are three (3) Light Rail stations located in the Capitol Complex including the Rice Street Station, just west of the State Capitol Building and there are many parking facilities on the complex that include pay stations for visitor parking. Long term parking contracts are also available.

Table 5 provides results on employees' primary mode of transportation; Table 6 summarizes commuting distances between home and the MN-SEN 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.

Table 5. Commuting Practices – MN-SEN Primary mode of transportation

Primary Mode of Transportation (N=149)	Drive Alone (or w/children <16)	Van or Carpool	Public Transit	Walk	Other
Commuting to MN-SEN	83%	9%	5%	2%	1%

Related to primary modes of transportation, 83% of employees drive alone (or with children under 16), 9% carpool or vanpool with others, 5% use public transportation, 2% walk, and 1% walk or use another mode of transportation.

Table 6. Commuting Practices – MN-SEN Commuting distance traveled

Miles Traveled (N=149)	0-5 miles	6-15 miles	16-30 miles	31-45 miles	46-60 miles	61+ miles
Home-to-MN-SEN (One-way)	28%	38%	23%	14%	3%	<1%

Results indicate that 28% of employees commuted 0-5 miles one-way between home and the MN-SEN, followed by 38% who commute 6-15 miles, 23% who commute 16-30 miles, 14% commute between 31-45 miles, 3% who commute 46-60 miles, and less than 1% who commute 61+- miles to the MN-SEN facility. Note that results do not add up to 100% due to rounding error. All of these are one-way miles.

Table 7. Commuting practices – MN-SEN location and alternative commuting behaviors

Alternative Commuting	Mean	SD	N
Ability to commute in alternative ways	4.46	1.86	147

Results indicate that location of the MN-SEN **neither hinders nor enhances** (M = 4.46) 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 MN-SEN at approximately 15 months after it was first occupied. This MN-SEN facility is used as the office and hearing space for the Minnesota Senate. This survey reports responses from employees and their satisfaction with the physical environment of the facility and their primary workspace. Results indicate that 99% of employees spend more than 30 hours per week in the MN-SEN facility, and 84% of employees spend more than 50% of their time at MN-SEN in their primary work space.

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 = 5.05**); they found the facility **enhanced** their work performance (**M = 4.87**) and **enhanced** their health (**M = 4.64**). In addition, similar results were reported when employees were asked these same questions about their primary workspaces (private office, shared office, cubicles, etc.). They reported **satisfaction** (**M = 4.88**) with their primary workspaces, that their work performance was **enhanced** (**M = 4.92**), and their health was **enhanced** (**M = 4.78**) by their primary workspace. As the range of scores was from 1-7, scores showed a moderate level of satisfaction and enhancement.

Most of the survey questions related to employees' satisfaction with the IEQ criteria in their primary workspaces (private office, cubicles, etc.). Employees' responses showed they were **satisfied** with the 16 of the 26 IEQ criteria. The mean satisfaction scores ranged from **4.04** (Overall thermal conditions) to **5.28** (Overall cleaning and maintenance). Again, this shows a moderately low positive level of **satisfaction**. Employees responded **neither dissatisfied nor satisfied** to 9 IEQ criteria. The mean satisfaction scores ranged from **3.76** (ability to limit undesired sounds) to **4.29** (Overall acoustic quality). Employees were **dissatisfied** with adjustability of thermal conditions, with a score of **2.96**.

From employees' responses, an IEQ Score was developed and shows respondents' satisfaction with the IEQ of all category level criteria. For MN-SEN, the IEQ Satisfaction Score was **4.62**. This score reflects the influence of the moderate satisfaction level of 7 of the 12 categories as well as the neither satisfied nor dissatisfied level of the remaining 5 of the 12 categories. Finally, employees reported that MN-SEN **enhances** (**4.61**) 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 'dissatisfied' and 'neither dissatisfied nor satisfied' 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 moderate 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 'dissatisfied' and '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 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, 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 ASHRAE Standard 55-2004 or *Human Factors Design Handbook* (see B3 Guidelines).

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. MN-SEN employees raised specific concerns about the following themes: accessibility; acoustics and privacy; aesthetics; amenities; daylighting/electrical lighting and controls; furnishings, fixtures, and equipment; indoor air quality/ventilation; operations and cleaning/maintenance; spatial layout; technical/electrical; thermal conditions and control; vibration; and wayfinding/signage and movement throughout the building. Though these qualitative responses overall appear as if the employees are dissatisfied; it does not mean they represent the overall sentiment from employees. However, the comments do give insight into specific issues that should be addressed by building management. The comments from the employees are provided below.

Overall Positive/Negative

- Overall this is a great building, but I do think there are adjustments that could greatly improve the usability.
- The working spaces in the hearing rooms make it much easier to do the staff work necessary for hearings. This is a big improvement over the Capitol and the State Office Building and helps to reduce stress.
- The 'wave to open' feature on some of the bathroom doors is nice and enhances health.
- I hear complaints every day multiple times per day about the poor design and flow of the building.
- Whoever designed this building should find a different career.
- Let the record reflect that vital Senate staff were left out of the design and planning process of the MSB.
- This is why you don't let Political hacks be in charge of building something like this. It's an absolute disgrace that this is the building we got for the price. Haphazardly pushed through, NO consulting was done with staff who actually use the building or workplace.
- The building suffers from a lack of consultation before building. Due to politics of the building it was done in the dark. Exercise equipment and room would have been nice but was politicized so couldn't be done. It is a shame when a new building is put up it is so deficient in meeting basic needs.
- Some very simple architectural design flaws in the MSB throughout all public rooms and private offices.
- It is ludicrous that this building cost so much, yet is not a functional space for public or workers.
- Basically, this is the worst building in the Capitol complex, is very unfriendly to users, and did not plan for anyone to use the office in the future besides its original occupant.
- The furniture is cheap.
- Poor traffic circulation pattern to the Capitol. Main route for employees/members crosses traffic in the Senate garage. Someone's going to get hit some day.

Accessibility

- Handicap people are forced to travel long hall ways to locate an elevator to the next floor.
- Moving around the building and access to the Capitol is not conducive for people with mobility challenges. I on many occasions have had to ask permission to drop my daughter off on the North end of the capitol. Removing a close drop off to the capitol is a mistake and I would like to

see the front of the capitol reverted back to easy close drop off. I am saddened that this was not thought of in a universal approach.

- The buttons to have doors automatically open in the Senate Building were an afterthought. Putting benches that would accommodate others was an afterthought.
- The doors within the structure and the bathrooms are not completely barrier free.
- The furniture is not completely barrier free and/or accessible.

Acoustics and Privacy

- The public hearing rooms are an issue. Audio systems do not accommodate all members of the public when they come to participate. As the legislative branch we need to be accessible to the people of Minnesota!
- Hearing rooms are not equipped with enough mics at testimony tables nor seem set up for handicapped.
- I have trouble hearing in the conference rooms. The sound system has an amazingly clear quality, but it's not amplified enough. If the person next to you moves some paper around or a door opens/closes or any extraneous sound is made, you can't hear the people speaking over that sound.
- Walls too thin, hear everything.
- There is no possible way to reduce noise from the public standing in the wide hallways in front of my desk.
- The nature of area for the public means there are frequently loud and distracting conversations right outside my door, and I don't like to close my door to staff wanting to come in.
- Too noisy during the day with our LA desks in the hallway.
- Very, very noisy place to work. There is absolutely no way to get around this as we are surrounded by offices and people standing and talking in the hallway that is only two feet in front of me. Very disruptive and annoying. Obviously, when planning our office, you know who had the least consideration.
- Sounds outside of my office are extremely loud and there is no sound barrier.
- I can hear conversations next door and around the corner from my office.
- There is no privacy, the walls are super thin and you can hear conversations in nearby offices even when they speak in their regular voices

Aesthetics

- This building is the least inviting of all buildings in the Capitol complex (including the ones that are under construction or in a state of great disrepair). Whoever designed this building should never work in the industry again.
- This building reminds me of a hospital and is very gloomy and neutral and has no character.
- I have taken some steps to make my office a bit more aesthetically pleasing, but at the end of the day, it's pretty sterile and sad.
- Building is very sterile with no character, no color—drab.
- How about some artwork on the walls or something?
- No art or design in the building or offices.
- Much of this space is a windowless room.
- No view of the outside from my workspace.
- The floors are noticeably uneven, the walls as well.

Amenities

- No space for a break room to eat lunch in. We are forced to eat at our desks. Very unprofessional
- There needs to be more breakroom access for all employees.
- We don't have access to a kitchen to wash our dishes and when we use the one next to our area, we are told we aren't allowed in this area by other employees.
- My office suite does not contain a kitchenette like many of the other areas in this building. A sink for washing hands or cleaning dishes would add to the quality of the physical environment.
- There needs to be more and larger bathrooms.
- It feels cheap (doors don't shut all the way, for example).

Daylighting/Electrical Lighting and Lighting Controls

- Not enough natural light.
- I wish there were more windows, or the lighting was warmer and less fluorescent.
- The windows are let in a lot of light, but with an interior office, I rarely get much natural light.
- There are no windows for daylight.
- I have no natural light (or outdoor views) and there is none within the office area unless you are a senator. The overhead fluorescent lighting is way too harsh and I get migraines, so I had to bring in lamps to use instead.
- There are no windows in my office (which is different from all of my previous work spaces both in the Capitol and SOB). The electric lighting in my office usually makes my eyes hurt and I end up with headaches, so I have added lamps to my office so that I have some warm lighting that does not hurt my eyes.
- There is not enough natural light in any of the staff offices in the MSB. The building should have been constructed with more windows and accessibility of staff to natural light in the private office areas.
- I get zero natural light from my perspective, and since moving into this office space, I've had my doctor recommend 2,000 IU daily to boost my vitamin D, which had been normal, but dropped to very low levels this year.
- This is probably an architectural problem that can't be easily fixed - but almost all of the staff in our office work with little or no access to daylight in our office, while the wonderfully large exterior windows are enjoyed by very few individuals. Many studies show that access to natural light promotes good health.
- There is one window for the entire suite, and the lights will often turn off so we work in the dark until someone comes in. We've added our own lamps to try to help.
- My primary workspace is windowless. I find this to be awful.
- Too much fluorescent lighting,
- There isn't any additionally (task) lighting, only overhead lights.
- Occasional headaches due to lighting.
- Poorly designed for lighting control.
- The lights are too bright - there is no ability to dim them. This is very frustrating.
- The lighting is terrible. It feels like a hospital or doctor's office. The lighting can't even be dimmed which is a pain. With the LA cubicles the ones that have natural lighting are great and the ones that don't are far from it.
- It is difficult to work on the weekends as lights don't stay on and I can't figure out how to keep lights on and often just work in the dark with my desk lamp.

- I like that the lights turn off automatically, but it's weird and irritating that they don't turn back on in response to motion.
- Light timers turn lights off much too quickly.
- When I am working late it is very disconcerting to have the hall lights turn off since they are on a sensor and no one is walking around.
- When I work alone in the office, the lights will shut off automatically and I have to walk around to get them back on. It would help if there were a manual switch.
- Lights go off on the weekends and the motion sensors don't work.
- Would like to be able to adjust overhead lights. They are too bright
- A problem we have in our office is that during the legislative session we often work many long hours into the night and on weekends, but the main light switch for our office is timed to go out after 5 pm. We have "fixed" this problem by bringing in an extra floor lamp, but it provides relatively little light and we feel we are working in a cave-like atmosphere after 5 and on weekends. The alternative is to keep going to the door to turn on the light, which lasts a relatively short time, and wastes our time. Or we could buy more lamps. Or, someone could fix the timer on the main light switch so it stays on like it does during the day.
- I wish the overhead lights were on a different system - it is frustrating that they all seem to be linked together so I can't turn off or on just the lights around my area. It often seems wasteful to have them all on when there are only a couple people in the whole hallway or in the mornings when my area is more than well-lit with natural light.

Furnishings, Fixtures, and Equipment

- The ergonomic furniture is very helpful.
- My adjustable standing/sitting desk and adjustable computer monitor are of significant help to my chronic back/neck and headache pain.
- Adjustable desk is supreme.
- The new desks and furniture are a benefit to the primary workspace.
- This is the most dysfunctional work space I had ever encountered. There is not enough usable counter space to work on.
- The pieces in my office are not easily moved.
- The work space is the worst workspace I have ever worked in. We have very little desk space, the filing in the cubicles have are all letter size when we use legal size.
- Desks and cupboards are flimsy and drawers cannot be opened at the same time. Cupboard doors are limited in accessibility.
- Drawers and cupboards are not big enough to store standard office or storage supplies (i.e., legal folders or coat hangers in a closet).
- My desk is chipping where my chair hits the edges. I have to put tape on the edge of the desk to prevent me from snagging my sleeves.
- Toilets should be automatic flush.

Indoor Air Quality/Ventilation

- The air quality is atrociously bad and is making us sick.
- There is no fresh air.
- It stinks. Literally the intern space smells like a locker room. I feel sorry for those interns.

- Air becomes unbreathable with heavy printing and copying going on and the air does not clear. As a result, most everyone in the office develops a cough or severe congestion during periods of heavy work, negatively affecting performance during the most critical times.
- Bathroom air is stagnant and unpleasant. Please invest in automatic air fresheners in the restrooms.
- Air is very stuffy as well and lacks ventilation.
- The air is so stale and dry. My lips, eyes, and mouth will become dry and irritated from just walking around the building.
- I sneeze a lot when I'm at work and so do my colleagues.
- Air flow is terrible.
- Smells come in from the loading dock.
- Conference rooms are very stuffy.
- In my personal office, there is little to no air circulation.

Operations and Maintenance/Cleaning

- There was an ash tray outside the exit doors. We asked for it to be removed as because the smoke comes directly into our office space. Also, there is an ordinance about no smoking closer than 20 feet of building. The ash tray was removed, but people that work at the Capitol continue to smoke in this hidden spot and throw their butts on the ground and the smell continues to come into our office space. It is disgusting!
- Must call Plant Maintenance to adjust thermostat with an explanation every time about how they set it at the perfect temperature, which for January and February we had no heat.
- The elevators get stuck between floors with people in them, which negatively impacts my health. The elevators that lead up to multiple floors on the north side of the building are really slow.
- Wait times for the elevators can be tough.
- The elevators are very slow.
- Also the elevators are too few and slow.
- The elevators are ridiculously slow, particularly when there are crowds in the building.
- The elevator situation is infuriating -- they are too slow when so many people are in the building.
- The water takes a long time to get warm.
- Admin Plant Management does not clean the building to the required standards. Rarely if ever vacuum office areas. Bathrooms smell at times, especially on Monday after a weekend. The janitorial staff does not seem to be equipped to clean a high traffic volume building. Not a good thing with a new building.
- It would be nice if vacuuming was done more frequently, and soap and toilet paper in the MSB bathrooms were always fully stocked.
- There is no maintenance of the office unless I do it myself.
- My work space is not cleaned--especially dusting.
- I wish my office could be vacuumed on a regular basis.
- The office suite I work in has a cleaning person, but she only walks through the suite and takes the main garbage. I never see her actually clean even though she does walk into each office, which seems odd. Sometimes she picks large pieces of debris or garbage off the floor - why not just vacuum instead? The carpets really need to be vacuumed and the suite and the individual offices get very dusty.
- What's the point of having cleaning staff visit each office suite if they don't empty individual garbage cans, vacuum, dust, or perform other cleaning tasks?

- The cleaning crew does not have access to our offices to clean, so unless you ask specifically to have them vacuum; it does not get done.
- When the heat is on, it blows out dirt and dust out of the heating element all over the office.
- Much preferred having Plant Management empty the trash.
- The new trash recycling isn't functional.
- It would be better if the trash was picked up from my office.
- The men's restrooms are not cleaned frequently during the day and they smell like urine late in the day. There are often puddles of urine on the floor.
- Bathrooms are smelly.
- The janitors do not clean the bathrooms well or the kitchen area at all.

Spatial Layout

- Whoever built this building didn't think through the fact that their might not be an even amount of Republicans and Democrats. I don't like having a bi-partisan wing when I need to share confidential information with my colleagues.
- The layout is awful, everybody is separated; it's not conducive to building a cohesive team
- Due to building layout, I'm away from the staff I manage and my own supervisor for most of the day. It doesn't lend itself to the important relationship building that needs to happen to operate effectively as a team.
- Layout was poorly done for staff areas--no thought given to use of staff areas and too much outer hallway area with great windows and natural lighting.
- The size of the work area gives us little space to work in.
- Our work space was designed to face the wall with our backs to those coming to our cubicles. Horrible arrangement. I don't believe there was much thought put into this, as if anyone would have tried to sit like this--it is just not smart. People can be looking at your computer before you even know they are there--and many times you don't want them to know what you are working on--some bills are not for every person's eyes. We did make changes after a while, to face those coming to our cubicles, but the space is so small that I have to push my chair out into the walkway to use most of my desk area. Really tiny space--the hallways are bigger than our cubicle areas--and with all the nice big hallways--we could have used another foot of cubicle without having to redesign the spaces. No I'm not happy with my tiny cubicle--it reminds me of those tiny houses they have for sale. On a positive note, I am able to get my work done!
- My work day is in a small cubicle space with a very limited area for movement. Managed to have part of the desk moved so I could face forward without people in the back of me watching me work.
- You can't actually adjust the desk so it works better for me because of the wiring and where it is situated.
- When I moved in, I could not conform the furniture layout to my own personal preferences for work space.
- Wasted space with some stupid sitting area in the intern area.
- Bathrooms are located in very public areas in the office space.
- The layout is not productive and does not encourage stair usage.

Technology/Electrical

- Cell coverage is terrible within the building
- Cell phones and radios do not always get reception.

- There are not enough outlets or TV accessibility.
- There are only two electrical outlets in my office, additional outlets that are more evenly spaced would be nice.
- There are not enough electrical outlets for anything I do (including adding the lamps with warmer light bulbs, because the building lighting gives me headaches), so I have to use multiple power strips.
- The lack of outlets is just a problem. We just have stuff that needs to be plugged in and having too few outlets doesn't change that. It just means we have added power strips and run extension cords.
- I am surprised at the poor electrical outlet placement in offices.
- Poor placement of outlets for electricity.
- My staff work in a television production environment, consisting of two television production control rooms, master control room, edit suite and studio. That survey would require additional conversations separate from this survey.

Thermal Conditions and Control

- Poorly designed for temperature control.
- Many times the office is too hot. And there is no adjustment.
- Conference rooms have lack of temperature control.
- The temperature is difficult or impossible to regulate in enclosed offices.
- There is no way to adjust the temperature and no two days are the same--one day it's cold, the next day it's hot, etc.
- I find it ridiculous that we cannot adjust the temperature of the building or the offices. Every Monday, my office suite feels like a sauna: hot and humid. Even the main floor areas feel that way.
- The temperature is not controllable in my office and it can be either freezing cold or blistering hot in my office, depending on the temp outside and if facilities manager decides to change the temperature.
- I would like to be able to open windows but that isn't an option. Some offices seem to have better ability to adjust the temperature within the office than other offices.
- It's too cold in our offices, all year long. Please save some energy in the summer by not cooling it so much, and use that energy in the winter to warm our space a couple degrees. So many of us are working wrapped in blankets. Also, it's too dry all year.
- It is super humid in some areas and super dry in others, no consistency.
- The air seems very dry to me.
- The temperature is very irregular and there is no way to control it office by office. Three offices are connected by the same thermostat which no one has control over except maintenance.
- Individual offices have issues with heat/cooling due to windows and sun. It is difficult to keep it comfortable due to sun conditions.
- Difficult to monitor temperature in our work space.
- The shared thermostat for several offices with different configurations/HVAC needs is unrealistic, and efforts to fix have been unacceptable.
- On days where there are a lot of people in the building it is humid and smelly.
- The humidity in the building is generally too high for comfort.
- The building is about as warm as the MSP terminal.
- There is excessive heat in offices when sun is shining.

- Turn the heat off when it's 50-60 degrees outside! Too hot and stifling in here with these doors closed, no air movement.
- The air humidity seems to swing drastically in the areas I work in.
- I am cold 90% of the time and need to use a space heater and blanket.
- The temperature is generally chilly in my personal office
- My office is often cold and I have purchased a space heater.
- At times, some people are very cold in their offices. I usually just put a throw on my legs if I'm cold, but others have space heaters in their office. It is difficult to control individual office temperatures and discussions with maintenance have been frustrating. That said, I would rather have a cooler office than a warm, stuffy office.
- I really enjoy being right by a window and getting lots of natural light. However, I do feel like it makes my work area drafty and often a bit too cold in the winter.
- In the fall, the AC was too high and some of the conference rooms are far too warm. I have to dress in multiple layers to make sure I am a comfortable temperature all day, which is a bit frustrating.
- There is a strong draft in my office that comes from a vent just outside the door, so I often keep my door closed even though I would prefer to leave it open.
- The MSB is always very cold and the air is dry. The cold temperature affects my work productivity. I often wear a hat and/or jacket in my office. Additionally, I put lotion on my hands several times a day to combat the dry air's effect on my skin.
- The fact that the temperature fluctuates throughout the day is a little annoying and distracting.

Vibration

- The garage exhaust system and large blower fans and duct work are next to a non-insulated wall in my office and frequently are running which causes very loud noise and vibration. This has been an issue that has caused me to go to the doctor several times.
- Parking garage creates tremendous amount of vibrations. Walls shake.
- My office is next to the loading dock. I hear every noise from the loading dock, and the movement in the loading dock causes my entire office to vibrate (literally, the things on my desk shake).
- The rumbling of car traffic in the parking ramp is very concerning.

Wayfinding/Signage and Movement throughout the Building

- This building operates a lot differently than an average office building. We serve the public yet the public cannot even find the elevators to the top floors most of the time.
- Visitors are constantly roaming and asking for directions. I have encountered dozens of visitors this session that are lost and cannot find the appropriate elevator (since one only takes you up 2 floors).
- The signage is a big problem -- it is too small (especially the sign listing Senators' offices -- it's microscopic, especially for the amount of older visitors we get).
- Spaces and directions are not clearly marked. For example, a few big signs on the ground floor pointing to the main elevator shaft would be hugely helpful. Same with restrooms, and the need for signs outside each office suite clearly listing who offices where. I work here and I still need to look in the green book to remind myself half the time.
- Extremely confusing layout for staff and visitors; no signage makes the confusing layout worse. Should have more signs, maps, information stations, possibly guides to help public navigate.

- Need better signs for the public coming to visit their senators. I answer numerous questions a week on how to get into certain wings of the building.
- Locking all the entrances except for the main door on University is a problem. You know how many times people go to the East door? Or go out on the front lawn, only to find out you're locked out and have to walk a city block to get back in. Yes, a building for the people!
- Route for general public requires going down a floor to tunnel by elevator or stairs. Poor design for an otherwise great building.
- It would be better if they designed it so all the elevators and all the stairs went to every floor. The layout is quite confusing.
- Physically moving around the building could have been greatly improved if the staircases were more thoughtfully designed. I don't like that there are only stairs from the MSB garage to the ground floor on one side of the building. It's silly to take an elevator up one floor, but we have to in order to go see the Sergeant's office. Also, having the front elevator at the entrance only go up one floor is weird. Seems kind of pointless.
- The lack of a central staircase makes it a bit disorienting.
- No center staircase in building. The lack of a central staircase means I hardly use the stairs to go up or down more than one floor.
- The fact that there isn't a central staircase that goes all the way up and down was very poor planning.
- The ability to move from floor-to-floor via staircase (without using the elevator) is abysmal. There should be a continual staircase that creates ease of movement, from the parking ramp on up.
- The staircase design is limiting to use as it does not go through the entire building from parking level to third floor. This causes too much use of elevators and forces use of elevators from parking garage.
- The staircases that do exist for the public are difficult to find and do not take direct paths. As a result, I no longer regularly use stairs at work because the elevators are more convenient.
- No interior staircase from ground or even 1st floor to 3rd! We get the "healthy" part of making us walk a full city block to get from one floor down but it did not help productivity or finding your way around—I hear this daily.
- The stairs from floor to floor (particularly if you want to access the garage) are inconvenient.
- There is no staircase that will take you from the underground parking all the way up the building.
- The location of the staircases is frustrating and almost discourages stair usage.
- Wish there was a stairway that went to the ground level from the middle bay.
- Stair locations are stupid, took forever to find them on the second floor.
- Stairs are located in very odd locations. Bathrooms locations are problematic. Long distances to get to one on many occasions.
- Ease of moving from floor to floor (without using the elevator) is terrible.
- The placement of the elevators is the number one complaint I hear from the public.

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).