

MINNESOTA



**POST-OCCUPANCY  
EVALUATION**

**Indoor Environment Quality + Residence Hall  
Green Prairie Community Residence Hall  
University of Minnesota, Morris, MN  
Report 1**

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

**Denise A. Guerin, PhD (contact: [dguerin@umn.edu](mailto:dguerin@umn.edu))  
Angelita Scott, MS  
Theresa R. Bauer, MA  
Abimbola Asojo, PhD**

*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 of Green Prairie Community Residence Hall (GPC) on the University of Minnesota-Morris Campus and residents' satisfaction with their living environment. The GPC facility was designed using the B3 Guidelines (formerly known as the Minnesota Sustainability Guidelines or MSBG) and completed for occupancy in Fall 2013. 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 building 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 residents' responses at 18 months post-occupancy. The survey was conducted in March 2015 and is the first of two required survey events for this building.

This SPOES report focuses on residents' satisfaction with the physical environment as related to 23 indoor environment quality (IEQ) criteria such as lighting, thermal, and acoustic conditions in their primary living units. Residents' satisfaction with the facility (site, building, and interior) and the effect of the facility's physical environment on their perceptions of their academic performance and health also are included. Finally, a brief look at residents' commuting practices and physical activities within the building are reported. The report provides descriptive information about residents' perceptions of the IEQ of their resident hall environment (overall facility and primary living unit). In addition, this information serves the broader development of knowledge regarding the influence of IEQ on individuals living in residence hall environments.

## 2.0 Method

SPOES consists of a self-administered, Internet-based, questionnaire submitted to and completed by residents. The SPOES questionnaire has been tested for **validity** (measures what it is intended to measure) and **reliability** (repeatability or replicability of findings). Residents 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 living spaces. They also rate the influence of their physical environment on their perception of their academic performance and health on a scale from 1 (hinders) to 7 (enhances). There were no physical measurements taken of environmental conditions such as temperature or acoustic level. This study is limited to residents' perceptions.

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

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

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

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

## 2.1 Description of the Questionnaire

Residents 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 academic performance and health. Then they respond to questions about their satisfaction with their primary living spaces in relation to IEQ criteria from the B3 Guidelines. Additionally, residents' physical activities and commuting practices are investigated.

In the SPOES questionnaire, the 23 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 residents' ability to hear desired sounds and their ability to limit undesired sounds. There are 12 category-level and 11 attribute level questions. Means are calculated and reported for all category and attribute-level criteria.

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

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

### **Overall Acoustic Quality**

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

### **Overall Appearance (aesthetics)**

### **Overall Cleaning and Maintenance**

### **Overall Daylighting Conditions**

- Adjustability of daylighting
- Amount of daylighting

### **Overall Electric Lighting Conditions**

- Adjustability of electric lighting
- Amount of electric lighting

### **Overall Furnishings**

- Function of furnishings

### **Overall Indoor Air Quality**

### **Overall Privacy**

### **Overall Technology**

### **Overall Thermal Conditions**

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

### **Overall Vibration and Movement**

### **Overall View Conditions**

## 2.2 Limitations

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

## 3.0 Sample Description

### 3.1 Description of Building

The Green Prairie Community Residence Hall is a co-educational facility located on the University of Minnesota – Morris campus. It has accessible rooms on each floor and is an innovative living and learning environment that focuses on environmental sustainability. It is built partially into a hill, which supports the prairie-school architecture with hip roofs and long eaves. Recycled and regional materials were used for construction (see Figure 1). GPC's location connects it to the prairie ecosystem, yet is located in the campus' historic district. The building is powered, heated, and cooled with renewable energy from Morris's onsite wind and biomass community-based energy systems. GPC houses up to 72 undergraduate students in four wings and includes eight single rooms with a bath, eight 4-person suites with shared bath and private bedrooms, and eight 4-person suites with shared bath and shared bedrooms. There are also four floor lounges and kitchenettes, a central lounge, patio, and study space.



Figure 1. Green Prairie Community Residence Hall, University of Minnesota-Morris (Photo credit: <http://www.morris.umn.edu/newsevents/view.php?itemID=12671>)

### 3.2 Description of Respondents

This survey was administered to approximately 61 students, and the response rate to the questionnaire was approximately 28%. Of those responding, 41% were male and 59% were female. The mean age of respondents was 19.8 years with a range of 18 to 22 years.

The GPC Residence Hall opened for occupancy in August of 2013. Respondents reported that 69% of them have lived in the residence hall one to two semesters, 31% have lived there for more than semesters. Relating to the percentage of time (including sleep) residents spend in their primary living unit, 12% of the respondents reported they spend more than 75% of their time during the week in their primary living unit; 44% spend 51-75% of their time in their primary living unit; 38% spend 25-50% of

their time in their primary living unit, and 6% spend less than 25% of their time in their primary living unit.

The GPC has suites as primary living units available to student residents with three different room types: a single room with a bath, double room with a bath, and two-bedrooms with a bath. Results indicated 24% of the residents have a single room with a bath, 6% have a double room with bath, 65% have a two-bedroom suite with a bath, and 5% have ‘other.’

**4.0 Findings and Discussion**

**4.1 Green Prairie Community Facility (Site, Building, and Interior): Overall Satisfaction, Academic Performance, and Health**

Residents responded to questions concerning the GPC facility, (site, building, and interior) and their overall satisfaction with the facility, overall perceptions of their academic 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 as a blue mark. The standard deviation is shown by the vertical bar that runs from 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 will be all grey and green. This graph is simply a visual image of the findings from Table 1.

Table 1. GPC Facility - overall satisfaction, academic performance, and health

Facility (site, building, and interior)	Mean (1-7)	SD	N	Interpretation
Overall satisfaction	5.29	1.72	17	Satisfied
Overall academic performance	5.06	1.60	17	Enhances
Overall health	4.94	1.48	17	Enhances

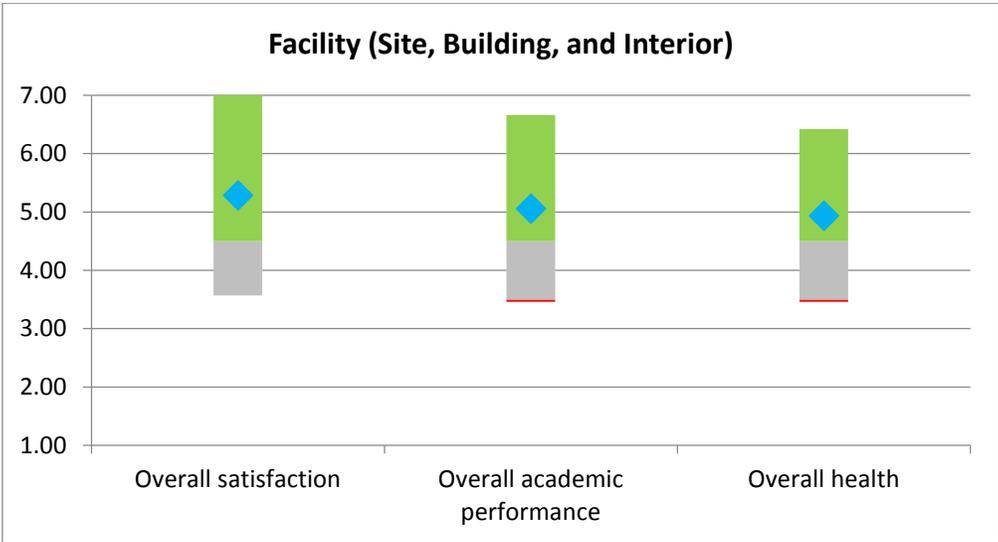


Figure 2. GPC facility - overall satisfaction, academic performance, and health

Results indicated that respondents were **satisfied (M = 5.29)** with the GPC facility (building, site, and

interior). Further, they reported that their overall academic performance was **enhanced (M = 5.06)** and their overall health was **enhanced (M = 4.94)** by the facility.

**4.2 GPC Facility Common Spaces and Suite Common Space: Overall Satisfaction**

Residents responded to questions concerning the GPC facility (site, building, and interior) and their overall satisfaction with the shared common/public spaces. They also reported on their satisfaction with the common living room within their suites. Table 2 shows the means and standard deviations of residents’ responses as well as how the responses are interpreted. Figure 3 is a visual image of the findings from Table 2.

Table 2. GPC common spaces - overall satisfaction

Common spaces	Mean	SD	N	Interpretation
Living Room / Lounge (w/in suite)	5.47	1.62	17	Satisfied
Laundry room	5.41	1.66	17	Satisfied
Kitchen	5.12	1.69	17	Satisfied
Study room	5.00	1.46	17	Satisfied
Living Room / Lounge (main floor)	4.59	1.81	17	Satisfied

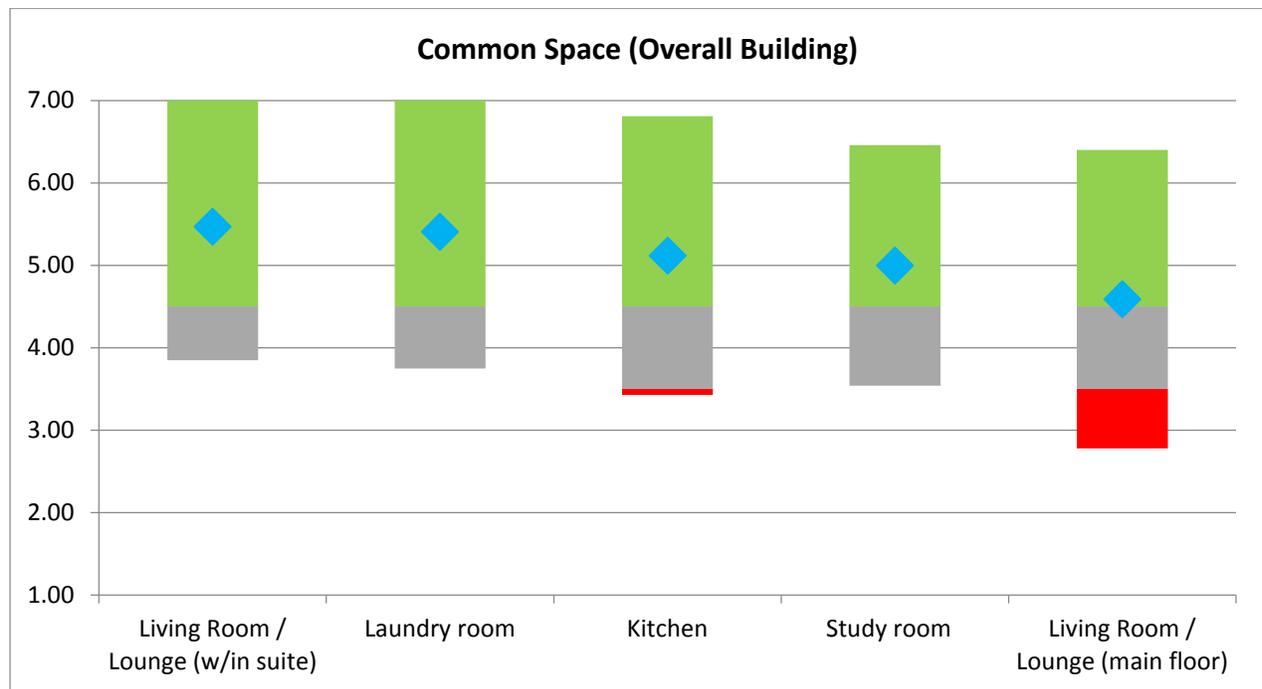


Figure 3. GPC common spaces - overall satisfaction

Results indicated that residents were **satisfied** with the shared living area within their suites (**M = 5.47**), the laundry room (**M = 5.41**), the kitchen (**M = 5.12**), the study room (study, collaboration, conference) (**M = 5.00**), and the main lounge (living room) (**M = 5.47**) at the GPC.

**4.3 Primary Living Unit: Overall Satisfaction, Academic Performance, and Health**

Residents responded to questions concerning their overall satisfaction and overall perceptions of their

academic performance and health as related to their primary living unit (e.g., single and double rooms with and without a bath). Table 3 shows the means and standard deviations of their responses as well as how the responses are interpreted. Figure 4 is a visual image of the findings from Table 3.

Table 3. Primary living unit - overall satisfaction, academic performance, and health

Primary Living Unit	Mean	SD	N	Interpretation
Overall satisfaction	5.65	1.77	17	Satisfied
Overall academic performance	5.06	1.84	16	Enhances
Overall health	5.13	1.71	16	Enhances

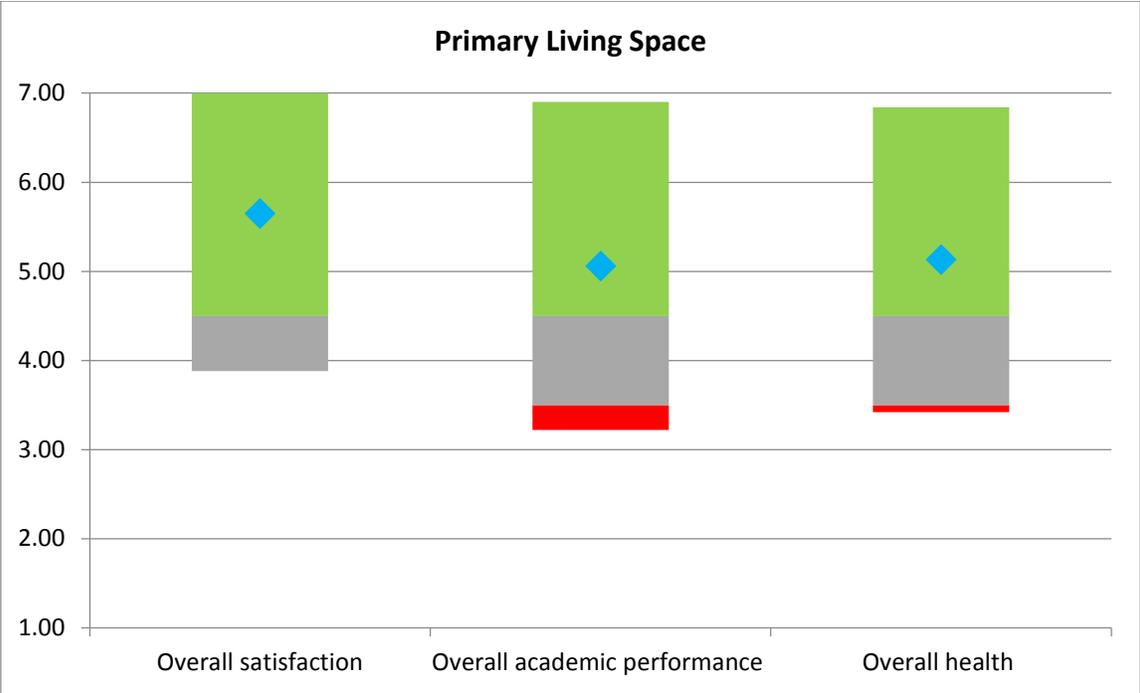


Figure 4. Primary living unit - overall satisfaction, academic performance, and health

Results indicated that residents were **satisfied (M = 5.65)** with their primary living unit and reported that their overall academic performance (**M = 5.06**) and overall health (**M = 5.13**) were **enhanced** by their primary living unit.

**4.4 Primary Living space: Satisfaction with Indoor Environment Quality (IEQ)**

Residents responded to questions concerning their satisfaction with IEQ criteria (thermal conditions, indoor air quality, acoustic conditions, etc.) related to their primary living unit (e.g., single and double occupancy spaces with or without bathrooms). Table 4 shows the means and standard deviations of their responses as well as how the responses are interpreted. Figure 5 is a visual image of the findings from Table 4.

Table 4. Primary living unit - satisfaction with IEQ conditions

Green Prairie Community Residence Hall					
#	Primary Living Space IEQ Criteria (1-25) (Category level criteria are bold face)	Mean (1-7)	SD	N	Interpretation (D = Dissatisfied) (S = Satisfied)
<b>1</b>	<b>Overall daylighting conditions</b>	<b>5.76</b>	<b>1.48</b>	<b>17</b>	<b>Satisfied</b>
2	Amount of daylighting	5.76	1.44	17	Satisfied
3	Adjustability of daylighting	5.35	2	17	Satisfied
<b>4</b>	<b>Overall indoor air quality</b>	<b>5.18</b>	<b>1.47</b>	<b>17</b>	<b>Satisfied</b>
<b>5</b>	<b>Overall cleaning and maintenance</b>	<b>5.06</b>	<b>1.82</b>	<b>17</b>	<b>Satisfied</b>
6	Function of furnishings	5.06	1.71	17	Satisfied
7	Ability to hear desired sounds	5.06	1.71	17	Satisfied
8	Amount of electric light	5.06	1.44	17	Satisfied
<b>9</b>	<b>Overall appearance (aesthetics)</b>	<b>5</b>	<b>1.37</b>	<b>17</b>	<b>Satisfied</b>
<b>10</b>	<b>Overall view conditions</b>	<b>5</b>	<b>1.84</b>	<b>17</b>	<b>Satisfied</b>
11	Air velocity (drafty or stagnant)	4.88	1.57	17	Satisfied
<b>12</b>	<b>Overall furnishings</b>	<b>4.82</b>	<b>1.19</b>	<b>17</b>	<b>Satisfied</b>
<b>13</b>	<b>Overall electric lighting conditions</b>	<b>4.76</b>	<b>1.48</b>	<b>17</b>	<b>Satisfied</b>
<b>14</b>	<b>Overall technology</b>	<b>4.59</b>	<b>1.66</b>	<b>17</b>	<b>Satisfied</b>
15	Temperature (hot or cold)	4.47	1.7	17	Neither D/S
<b>16</b>	<b>Overall thermal conditions</b>	<b>4.24</b>	<b>1.77</b>	<b>17</b>	<b>Neither D/S</b>
<b>17</b>	<b>Overall privacy (sound and visual privacy)</b>	<b>4.24</b>	<b>1.99</b>	<b>17</b>	<b>Neither D/S</b>
18	Adjustability of electric lighting	4.18	2.04	17	Neither D/S
<b>19</b>	<b>Overall vibration and movement</b>	<b>4.17</b>	<b>1.96</b>	<b>17</b>	<b>Neither D/S</b>
20	Adjustability of thermal conditions	4.12	1.87	17	Neither D/S
21	The humidity (dry or moist)	3.82	2	17	Neither D/S
22	Ability to limit undesired sounds	2.88	2.51	17	Dissatisfied
<b>23</b>	<b>Overall acoustic quality</b>	<b>2.76</b>	<b>1.95</b>	<b>17</b>	<b>Dissatisfied</b>

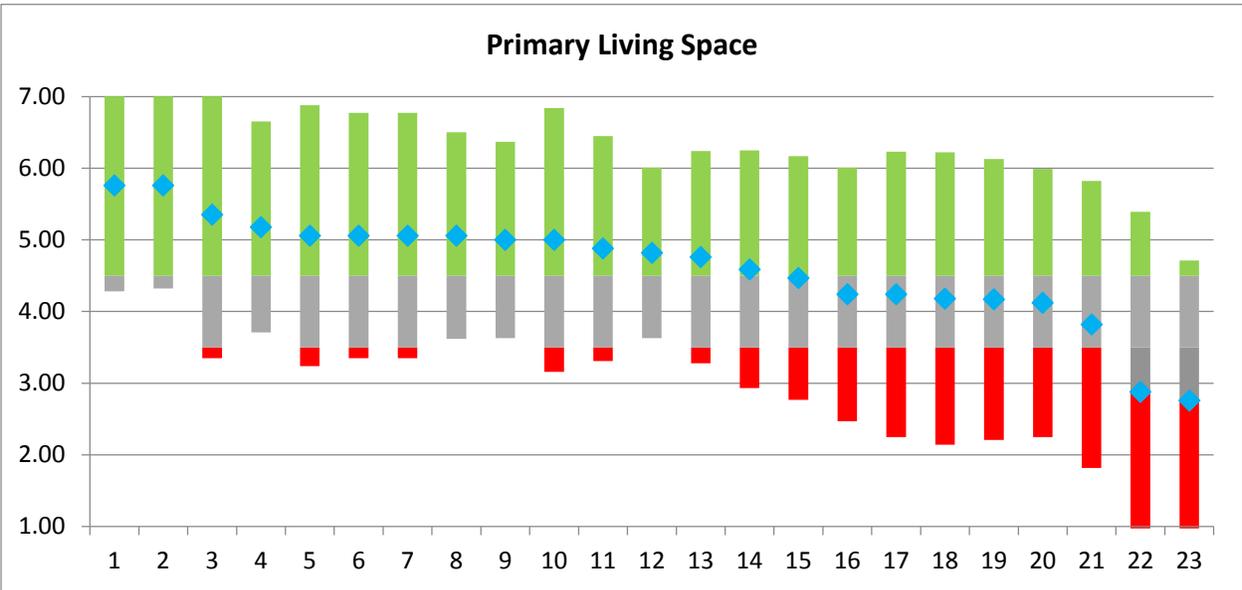


Figure 5. Primary living unit - satisfaction with IEQ conditions (IEQ 1-23 are listed in Table 5 above)

Results indicated that residents were **satisfied** with 15 of the IEQ criteria in their primary living spaces, i.e., means at or above 4.50. They were **neither dissatisfied nor satisfied** with seven IEQ criteria, and were **dissatisfied** with two IEQ criteria. The mean satisfaction scores are at the low to moderate satisfaction levels, therefore, there is room for improvement. It is interesting to note that the three IEQ criteria showing the highest satisfaction were related to daylighting, and the lowest two were related to acoustics. Ways to improve residents’ satisfaction with their primary living spaces will be addressed in Section 6.2 Recommendations. Further explanation of these scores also can be found in Appendix A. Open-Ended Responses.

#### 4.5 IEQ Satisfaction Scorecard

The IEQ Satisfaction Score is determined by calculating a mean of all overall category level IEQ criteria. At this time, all variables are weighted equally in this calculation as little evidence exists that provides rationale for weighting some variables heavier than others. The IEQ mean is representative of a fair overall IEQ score and can serve as a benchmark of residents’ satisfaction with the physical environment of their primary living space. As shown in Figure 6, the **IEQ Satisfaction Score** for primary living spaces at the GPC is **4.63**.



Figure 6. Primary living unit - IEQ Satisfaction Score

Overall, the residents showed a relatively low level of satisfaction with IEQ as indicated by the mean score of **4.63**. As shown in Table 4, satisfaction with the Overall daylighting conditions and Overall indoor air quality were the categories with the highest satisfaction and pulled the IEQ Satisfaction Score in a positive direction. The lowest rated category, Overall acoustic quality (2.76), pulled the IEQ Score down. Any of the IEQ criteria can be addressed by building management to increase residents’ satisfaction. Recommendations to assist with this process are noted in Section 6.2 Recommendations. 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, residents responded to questions regarding their overall physical activity while at GPC facility (site, building, and interior) and their commuting practices.

### 5.1 Physical Activity Engagement

Providing residents with opportunities for alternative paths of travel around the residence hall facility, 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 residence hall can be associated with healthier lifestyles.

Table 5. Overall physical activity (walking, stair use, etc.) affected by the GPC

GPC Facility (site, building, and interiors)	Mean (1-7)	SD	N
Overall physical activity (walking, stair use, etc.)	4.35	1.54	17

Results indicated that residents felt the GPC facility **neither hindered nor enhanced** ( $M = 4.35$ ) their physical activities (walking, stair use, etc.). Further, of the 17 residents responding to this question, 42% said they were **satisfied** with the facility's influence on their overall physical activity; 29% said they were **neither dissatisfied nor satisfied**; and 29% were **dissatisfied**.

### 5.2 Commuting Practices

The GPC is located on a generally residential campus in Morris, MN. Therefore, 100% of the respondents said they walked to class or other campus activities.

## 6.0 Conclusions

### 6.1 Summary

A post-occupancy evaluation was conducted of residents of GPC facility at approximately 18 months after it was first occupied. About 24% of the residents responded to the survey.

The survey included questions related to residents' overall satisfaction with the facility (site, building, and interior) and influence of the facility on their overall academic performance and health. Residents were **satisfied** with the facility ( $M = 5.29$ ); they found the facility **enhances** their overall academic performance ( $M = 5.06$ ) and **enhances** their overall health ( $M = 4.94$ ). In addition, similar results were reported when residents were asked these same questions about their primary living spaces. They reported overall **satisfaction** ( $M = 5.65$ ) with their primary living spaces and that their overall academic performance was **enhanced** ( $M = 5.06$ ) by their primary living spaces. Additionally, their overall health was **enhanced** ( $M = 5.13$ ) by their primary living space. As the range of scores was from 1-7, scores that showed satisfaction are moderate to moderately high levels of satisfaction.

Most of the survey questions related to residents' satisfaction with the IEQ criteria in their primary living spaces). Residents' responses showed they were **satisfied** with 15 of the IEQ criteria. The mean satisfaction scores ranged from **4.59** (Overall technology) to **5.76** (Overall daylighting conditions). Again,

this shows a moderate to moderately high level of **satisfaction**. Residents responded **neither dissatisfied nor satisfied** to seven criteria, and **dissatisfied** with two criteria, Ability to limit undesired sounds (**M = 2.88**) and Overall acoustic quality (**M = 2.76**).

From the residents' responses, an IEQ Score was developed and shows respondents' satisfaction with the IEQ of all category level criteria. For GPC, the **IEQ Satisfaction Score was 4.63**. This score reflects a satisfaction level that is just above neutral. Finally, residents reported that the GPC facility **neither hindered nor enhanced (M = 4.35)** their physical activity, which is one of the sustainable design criteria that influences occupant behavior.

## 6.2 Recommendations

The satisfaction scores are certainly in the positive direction, however, improvement 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 living units. 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 (study rooms adjacent to noisy spaces).
- Develop specialized acoustical performance requirements to support functional programming residents' tasks (e.g., sources of recurrent noise that need to be controlled, special user populations that may have distinct auditory performance limitations, or multiple uses of building spaces that may have different acoustic criteria). Identify and apply appropriate acoustics modeling software for the project.
- Measure acoustic performance onsite with full building systems (heating, ventilation, air conditioning; HVAC) running.
- Identify residents' privacy concerns via focus groups and/or log complaints relative to acoustical conditions for further evaluation.
- Consider residents' tasks within shared spaces to determine if spatial layout changes can be made for increased acoustic control.

### Lighting Conditions

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

**Personal Adjustability**

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

**Privacy Conditions**

- Identify residents' 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 residents' task areas differ now from original layout to determine if air flow is meeting systems design intent.
- Review conditions that affect thermal comfort using ASHRAE Standard 55-2004 or *Human Factors Design Handbook* (see B3 Guidelines).

It seems obvious that residents' satisfaction can be improved by addressing the categories that had 'neither dissatisfied nor satisfied' and 'dissatisfaction' scores. The above recommendations can help address change in these criteria. However, addressing some of the other criteria before they become an issue is recommended and can further improve residents' satisfaction. Exploring these areas in more detail and making adjustments may increase overall satisfaction with the primary living space. It is a good investment to improve residents' satisfaction, which, in turn affects their academic performance and their health.

This study investigated residents' satisfaction with the facility and primary living spaces of the GPC. IEQ satisfaction is individual, but the results of the survey show a central tendency toward a moderate level of satisfaction with the facility and moderate satisfaction with many of the IEQ categories. The results can be used as a diagnostic tool to aid in improving IEQ conditions for residents and to set the benchmarks from which improvement can be measured in the future.

## Appendix A. Open-Ended Responses

Residents had the opportunity to raise specific concerns on the overall facility and their primary living spaces. Important information can be gleaned from the open-ended responses. GPC facility residents raised specific concerns about acoustic conditions, thermal conditions, and concern about the general degradation of the facility. There were positive comments as well. Following are qualitative responses to the criteria. Generally, the comments are shown as written.

### Overall

- The Laundry room is awesome.
- A lot of the outlets in our room have shifted as the building has settled and are now unusable along with the Ethernet ports. There is a crack on the bottom of the bathroom wall through which the water that escapes from the shower stall because of the lip not working well and the provided mops do not work on the bathroom floor because of the tiling and the fact that the drain is not the lowest point of the bathroom...the paint is also really, really easy to scrape off the wall.

### Acoustics

- The design of my room is absolutely horrible. It was a poor decision to install concrete floors in the bedrooms and not offer students carpets with their furnishings. I can't even count the number of times I've woken up at all hours of the night by the screeching (like nails on chalkboard) of the furniture (chairs and beds) against the concrete floor above me or in the room next to me. It is absolutely unacceptable and negatively impacts my health, academic ability, and overall life. I understand there will be some noise in buildings like thumbs and bumps but I did not expect the high pitched nails-on-a-chalkboard sounds these concrete floors would make. Also, the felt pads on the bottom of the furniture (to prevent this noise) either does nothing or comes off because it is cheap quality. I noticed that I rarely make the screeching noises myself because I put a carpet in my room with the chairs and desk on top. We need carpets with our rooms to stop this noise. I've complained about noise issues countless times and I don't feel like it's going to be resolved that is why I'm choosing to live elsewhere next semester.
- The design of room itself is bad. Two of my walls have doors so I cannot put my bed against them, lest I'll block the doors. One of the remaining walls has a huge window but that means its drafty when I put my bed up against (especially in winter). The final wall is the same wall that all the kitchen appliances (sink, stove, cabinets) are attached to so that means when my bed is against this wall I get to hear cabinets slamming, the sink turning on and off, and the screeching of chairs against the concrete floor. Wonderful. I chose to put my bed on the wall with the window to get my head as far away from the noise as possible. Ironically, if the architects or designers of the building had placed the kitchen appliances on a different wall some of the noise issue for me would have been alleviated. And funny enough the other wall in the kitchen that is shared with another suite is that suite's lounge. Way to go design team, pick the wall to put the kitchen appliances that is shared with someone's bedroom instead of another suite's lounge. Overall, from my experiences living here it is not a good place to live because of the noise. I can't study that well here let alone sleep that well here. (I've even resorted to earplugs to reduce the sound and I still get woken up. Great.
- It would be nice if more carpets were provided for suite hallways so sound doesn't echo down them as much.

- It is hard to eliminate noise from outside my room. Even with all of our doors closed, people walking/talking in the hallway outside sound as if they are inside the suite. This is usually not a problem though because Green Prairie is generally a pretty quiet place.
- Noise echoes very loudly down hallways.

#### **Electric Lighting**

- In the main lounge, the overhead lights are set to deactivate every few minutes. This prevents me from using this space for late-night studying.
- Overall everything was well done, my only real suggestion would be that the lights in the rooms are super bright. It might be nice to have different modes or like a dimmer option on them. But then again I guess I could buy a lamp too.

#### **Indoor Air Quality**

- Look at finding ways to improve overall air quality in the building/rooms? Overall though it's a great place to live.

#### **Spatial Layout**

- There should be a main lounge on the lower level too. We want space.
- My bedroom window is very visible from the main lounge, that's a little weird.

#### **Thermal Conditions**

- The air conditioning does not always adjust accurately to what it is set to.
- The heating and cooling is terrible and not consistent.
- I think the air is kind of dry in GP.
- Air is always very dry.
- The air is consistently very dry.

## Appendix B. Glossary

### **Descriptive statistics**

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

### **Frequency**

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

### **Likert-type scale**

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

### **Mean**

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

### **N**

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

### **Reliability**

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

### **Standard deviation**

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

### **Validity**

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