

Post Occupancy Evaluation - Site Summary Report

Szencorp Building 40 Albert Road, South Melbourne

prepared for

Szencorp

prepared by

Monica Vandenberg, Encompass Sustainability

Contact: monica@encompass-sustain.com.au



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1. Executive Summary

Much has been discussed and written about the Szencorp Building at 40 Albert Road. Its refurbishment, located in an infill site in South Melbourne, was completed in 2005. Before the refurbishment, the building was typical of much of the mediocre office accommodation of the 70's and 80's in the area. The building consisted of five floors of office accommodation and a basement which ran along the full 55m length of the site.

The Szencorp Building was Australia's first refurbished 6 Star Green Office Building. The Green Building Council of Australia's Green Star score of 83 points established the building as a world leader.

Currently, around 40 people occupy the building across the four floors with 30 percent of staff working part time. The building's occupancy is generally 33 people and has the capacity to accommodate up to 60 people.

In September 2006, Encompass Sustainability conducted a Post Occupancy Evaluation review of occupants in the Szencorp Building. The objectives of the review were to measure how staff perceived their working environment including satisfaction of the current facilities, compare the responses to the Pre-Occupancy Evaluation conducted the previous year, and to benchmark 40 Albert Road against 45 Australian buildings.

This year Encompass Sustainability was asked to conduct a Post Occupancy Evaluation to review how the building occupants perceive the building is working three years after the refurbishment.

This report summarises the findings of the Post Occupancy Evaluation of the Szencorp Building conducted by Encompass Sustainability in February 2009. This study evaluated the building against 55 Australian buildings and 81 buildings in the green international data set.

The POE process included:

- Coordination of an on-line licensed, quantitative Building Use Study (BUS) occupant survey.
- Szencorp Building benchmarked with a national and international data set.

Key findings from the Post Occupancy Evaluation review highlight similarities with the review undertaken in 2006:

- The building performed well with overall building performance rating the Szencorp Building at the 96th percentile for Australian buildings. Other overall rankings for comfort and satisfaction were also in the top four percent of Australian buildings.
- When benchmarked with the international building data set, the Szencorp Building ranked at the 84th percentile for building performance, 86th for satisfaction and the 78th percentile for comfort.
- Optimal heating, ventilation and cooling is considered the most important feature in contributing to occupant satisfaction. Results indicate that 86 percent of staff were dissatisfied with their level of control over ventilation. Variation in temperature on different floor levels, as reported by staff, reduce employee comfort and can act to reduce perceived productivity.
- Perceived productivity was rated as 8.44 percent, rating in the top 10 percent of the 2009 Australian Benchmark.
- Although the percent of car travel has reduced from the 2006 results, a high proportion of staff (40 percent) still travel to work alone by car.

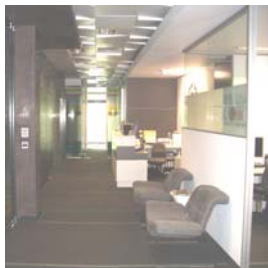
Direct quotes and comments made by individuals are displayed in italics in this report but are not attributed to a person or a team.



Top: 40 Albert Road, original façade.

Above: The Szencorp Building after refurbishment.

2. Building Occupants Survey results



New tenancy layout on Level 1.

Throughout February 2009, personnel working in the Szencorp Building had the opportunity to participate in a building evaluation survey – the Building Use Studies (BUS) Survey. The response rate for the BUS surveys was positive, with 88 percent of staff participating.

Participation in the BUS survey enabled the Szencorp Building to be benchmarked and compared across the norms and best practice of 55 other Australian buildings using the following variables:

- Comfort overall
- Health
- Lighting overall
- Noise overall
- Temperature in summer overall
- Design
- Image
- Needs
- Productivity overall
- Temperature in winter overall

2.1 Understanding the BUS results

The data tables and statistical analysis provided by Building Users Survey results include the mean value for each variable, the histogram or distribution of responses, as well as four main ways of benchmarking building outcomes as outlined below.

Overall Rating Score

A rating score is provided for each building based on 'All variables'. Buildings are rated on a scale of 1-7: 1=Very Poor to 7=Exceptional.

Comfort Index, Satisfaction Index, and Summary Index

Two overall indices are calculated: a Comfort Index, based on the overall comfort, lighting, noise, temperature, and air quality scores; and a Satisfaction Index based on the design, needs, health, and productivity scores. The average of these is termed the Summary Index for the building.

Percentile Score and Benchmark plot

A scatterplot of the means of all buildings in the dataset is provided. It includes the mean values of the various buildings in the dataset and shows how the study building compares with the benchmark data set for the variable. (For example, a percentile score of 82 means that the study building score falls in the upper 18 percent of buildings data set).

Traffic light ratings for benchmarked variables

The mean value from the survey is assessed against upper and lower limits compared with the mean value from the BUS dataset benchmark together with its upper and lower 95 percent confidence intervals, and the scale midpoint. This creates the criteria for the green, amber or red results for the test as follows:

- **Green** Mean values significantly better or **higher than both benchmark mean and scale midpoint** (a good score).
- **Amber** Mean values **no different from benchmark mean and scale midpoint** (a typical score).
- **Red** Mean values **significantly worse or lower than benchmark mean and scale midpoint** (a poor score).

Legend for graphs

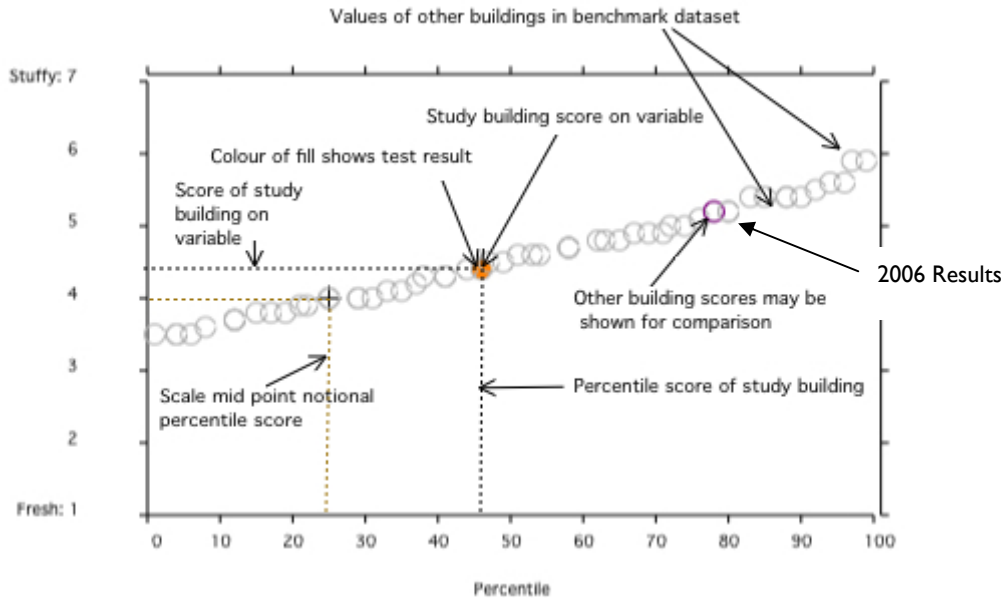
○ = 2006 Post Occupancy Evaluation Results

● = 2009 Post Occupancy Evaluation Results (colour can be red, amber, green depending on the traffic lights rating). Overall rating such as comfort, satisfaction and performance are in blue.

⊕ = scale mid point

See figure 2-1 below which explains how to read a BUS graph.

Figure 2-1 Percentile Graphic Details



The following table summarises the results of key variables for both post occupancy evaluations conducted in 2006 and then in 2009.

Post 06 = Post Occupancy Evaluation Szencorp Building 2006

Post 09 = Post Occupancy Evaluation Szencorp Building 2009

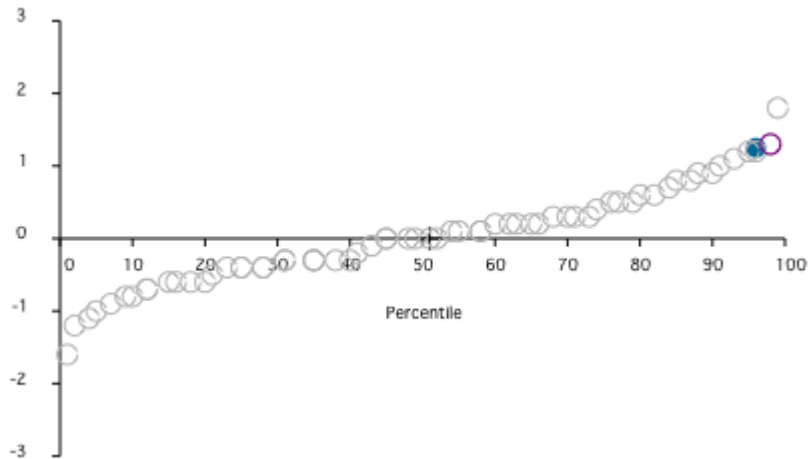
Variable	Above benchmark	No different benchmark	Below benchmark
Image	Post 06 & 09		
Comfort Overall	Post 06 & 09		
Needs	Post 06 & 09		
Noise Overall	Post 06 & 09		
Noise Inside			Post 06 & 09
Noise Colleagues		Post 06 & 09	
Lighting Overall	Post 06 & 09		
Meeting Room availability	Post 06 & 09		
Storage	Post 06 & 09		
Productivity	Post 06 & 09		
Heath	Post 06 & 09		

2.2 Szencorp Building performance against Australian benchmark

The BUS benchmarking system allowed an assessment of individual buildings against norms and best practice. The survey allows benchmarking and comparisons across different building types.

The benchmark sample for Australian buildings surveyed by Building Use Studies for 2009 is 55. Figure 2-2 below, indicates the Szencorp Building ranked at the 96th percentile for building performance. Other overall rankings for comfort and satisfaction were also in the upper four percent of the Australian dataset.

Figure 2-2 Aust. Benchmark – Szencorp Building summary performance plotted against Australian benchmark data set

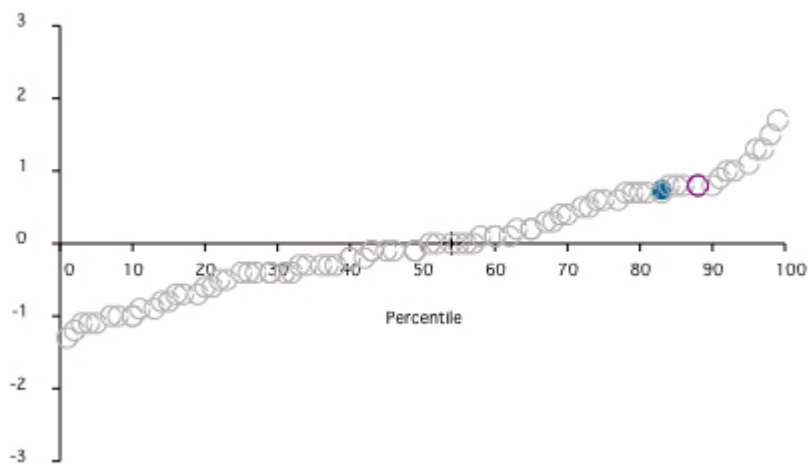


2.3 Szencorp Building performance against international benchmark

Building Use Studies have established a benchmark data set based upon its database of international buildings that have undertaken a BUS occupant survey. The total number in the International building data set is 81.

When benchmarked with the international data set the Szencorp Building ranked at the 84th percentile for building performance, 86th for satisfaction and the 78th percentile for comfort.

Figure 2-3 Summary Index: Szencorp Building summary performance plotted on the International benchmark



2.3.1 Overall rating score

The building is rated on the basis of 45 variables. On a scale of 1 = Very Poor to 7 = Exceptional, the building achieved a rating of 6 = Good Practice.

Table 2-1 Overall Ratings for the Szencorp Building

Szencorp Building	Australian benchmark	
	Post 2006	Post 2009
Score out of 100 scale 0-100	76	80
BUS Classification	6 = Good Practise	6 = Good Practise

2.4 Traffic Light snapshot

The movement with the variables provides a good opportunity to see where the buildings’ performance has improved and where it has decreased. Overall there was a modest change.

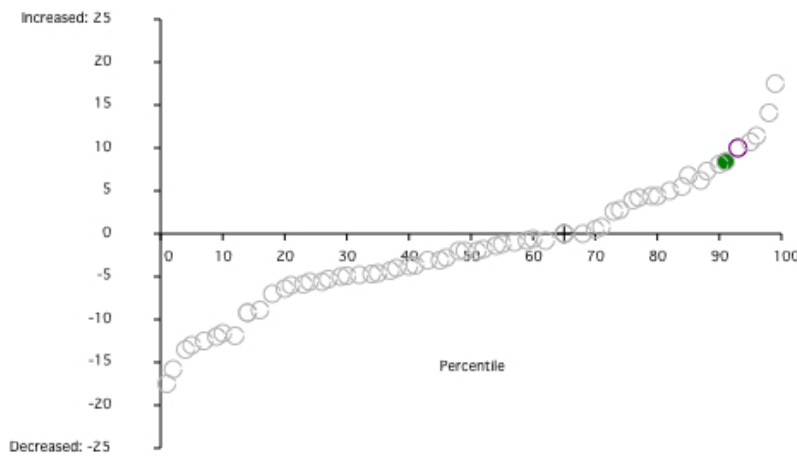
Appendix A highlights the changes in traffic light variables between the evaluation conducted in 2006 and 2009. Of the 45 comparative variables, four red variables remained red and three moved from red to amber in 2009. Two variables, initially ambers became red and one variable (natural light) initially green became red.

Appendix B provides a graphical representation of the results of key variables.

2.5 Perceived productivity

Self-assessed productivity is significantly associated with perceptions of control in buildings. Perception of control is measured by the average of five variables for perceived control over heating, cooling, lighting, ventilation and noise.

Figure 2-4 Perceived Productivity for the Szencorp Building



The Szencorp Building currently lies in the top 9 percent of buildings with a perceived productivity score (vertical axis) of 8.44 percent, this is a 1.5 percent decrease from the 2006 results. The recent 2009 study indicated a large proportion of staff, 62 percent, rated their productivity in the building as positive with 15 percent rating their productivity as a negative. Building Use Studies research shows that approximately 30 percent of buildings have positive productivity ratings.

2.6 Levels of personal control

Building design is improved when staff have greater control over their environment. Figure 2.5 below shows the importance of having control of the following variables. Within the Szencorp Building 86 percent of staff are dissatisfied with their level of control over ventilation with 70 percent and 79 percent respectively dissatisfied with their level of control over cooling and heating.

“Fixed floor layouts restrict/inhibit flexibility to change – very expensive to do so.”

“Shower facilities and lockers should be bigger.”

Meeting Rooms
“Exceptionally good space of Level 4.”
“Board room on Level 1 gets quite hot when in there for long periods of time.”

Figure 2-5 Importance of Control



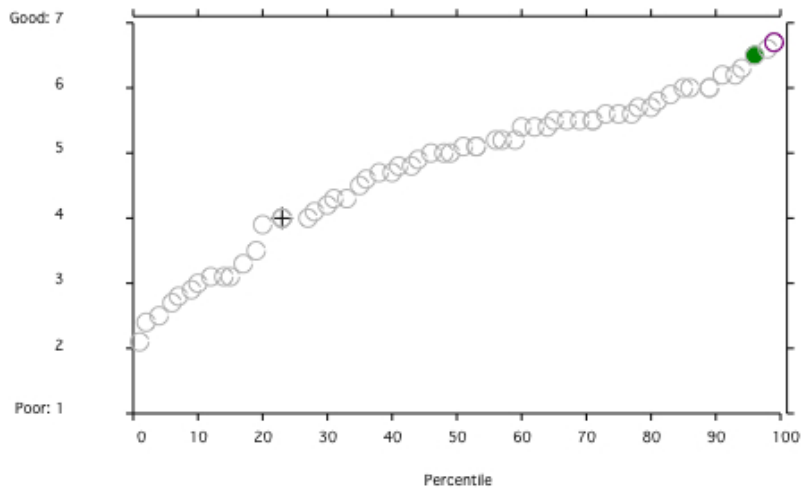
Items are individual variables so percentages do not add up to 100.

There was a 23 percent increase in the dissatisfaction with lighting control. This result is surprising when a large proportion of staff are able to fully control the artificial lighting levels in their areas. Further analysis indicates that the placement of some desks mean that staff have the light behind them and therefore work in a shadow. This issue could be balanced with the strategic placement of desk lamps for some staff. Energy issues can arise when lamps are left on when the staff member leaves their desk.

2.7 Site image and design

The BUS Survey asked respondents to rate the image that the building presents, as a whole. Staff feedback towards the image and design was very positive. Since the last Occupancy Evaluation a significant number of staff are new to the building with two additional tenants.

Figure 2-6 Szencorp Building – Image



“Air quality is excellent and clean. Not subjected to colleagues ill health either.”

“Great to know that this building is green friendly and therefore not affecting our health.”

“Excellent inside, can be nicer outside design.”
 “Excellent design - lots of natural light for its orientation & layout constraints.”

The building ranked in the top 10 percent and is placed fourth in the 2009 Australian data set for image. This ranking is considered a good result considering the building has now been in operation for over three years and a large proportion of staff surveyed had not been part of the building’s refurbishment history.

“Design is inappropriate for needs.” “Looks great, lovely building to be proud of.”

“Not designed for flexibility as staff and workspace requirements change.”

2.8 Ventilation

Perceived productivity is closely associated with thermal comfort so it is crucial that a stable, comfortable, controllable thermal environment is provided. This is the single most important factor in helping to improve occupant satisfaction.

The office spaces at 40 Albert Road are designed to operate within a temperature range of 19-25°C during occupied hours – a range that has been optimised on a zone-by-zone basis. The building’s Building Management System (BMS) controls a mixed mode of operation, combining

natural ventilation when ambient conditions permit and mechanical ventilation for periods where heating or cooling is required.

Each floor is separated in zones. Temperature, humidity, daylight and lighting levels, air quality and occupation are all monitored by the BMS. Each zone has its own metering system, with a zone thermostat display in each zone. Staff are encouraged to wear appropriate dress for the climate and if they are uncomfortable, check the temperature on the metering system.

It was identified that the tenants on one of the floors have been given control of their thermostats. This does raise concern about the operability of the building going forward in how to accommodate different needs within a balance of energy use.

The 2009 Post Occupancy Evaluation identified:

- a proportion of staff find the temperature in summer too cold which is making them feel uncomfortable.
- Staff feel the ventilation system hinders their work, and was identified as the key issue for requests for changes.

“BMS controls heat, cool, is adjusted if we complain enough. Light is fully controllable - yippee!”

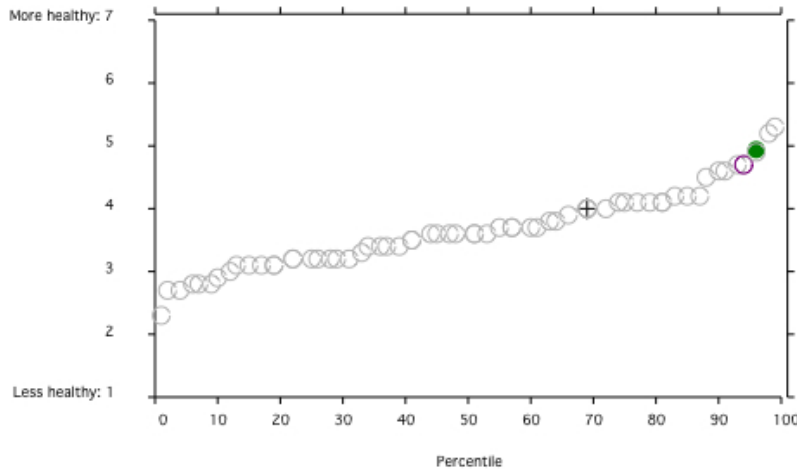


2.9 Health

The 2006 results indicated staff felt healthier in the building than the Pre Occupancy Study of 2005. Three and a half years since the 2006 Post Occupancy Evaluation there has been an increase in staff numbers and new staff interacting the building. Despite this, the Szencorp Building rating for health score increased in 2009, with 54 percent of staff saying they felt ‘more healthy’ in the building. See Figure 2-7.

“There has been consistent / persistent complaints from staff especially during winter.”

Figure 2-7 Health – 2006 and 2009 Results



2.10 Meeting user needs

New tenants may have different needs and the building must be adaptable to those needs. The majority of staff, 82 percent, are very satisfied that the building meets their needs.

Ten percent of staff indicated that the building did not meet their needs, with the building ranking in the top 20 percent of the Australian data set.

The speed of response in meeting user needs is another crucial factor affecting perceived control and perceived productivity.

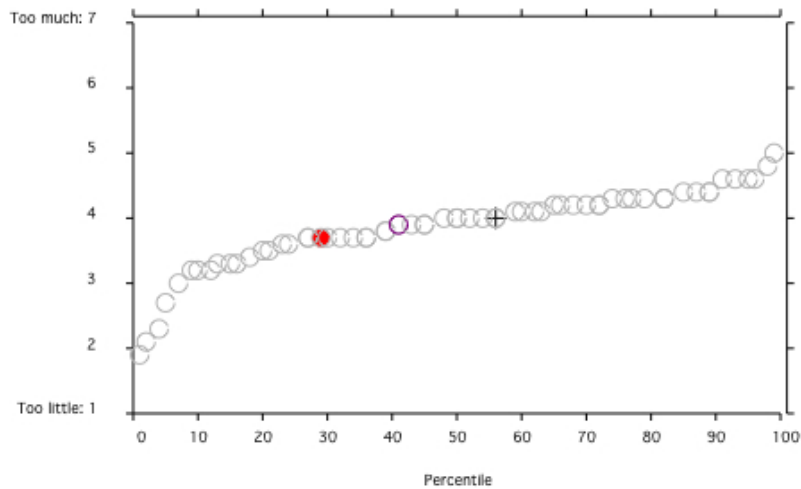
The speed of response to problems was lower (better) than the national benchmark, however one quarter of staff are dissatisfied with the speed and effectiveness of the response to their requests. Nearly 60 percent of staff were confident that their requests would be met. A review of the qualitative data highlights that staff requests were mainly concerned with the building’s temperature.

2.11 Lighting

The orientation of the Szencorp Building and its narrow floor plate has created design challenges in bringing natural light into the building. The main stairwell was remodelled to include a skylight on the roof, open riser stairs and internal glazing to adjoining office areas on each floor. The brightly painted stairwell serves both as a lightwell and a thermal stack.

In the 2006 survey lighting was rated above benchmark with staff commenting that they liked the way the lighting and lighting levels worked automatically; interacted with their presence. The 2009 survey indicated that a greater proportion of staff felt that there was 'too little' natural lighting. Natural lighting rated below benchmark, see Figure 2-8, and was rated a red variable. Artificial lighting by contrast was rated above the benchmark, see Figure 2-9, with over 60 percent of staff satisfied with the artificial lighting levels.

Figure 2-8 Lighting - Natural

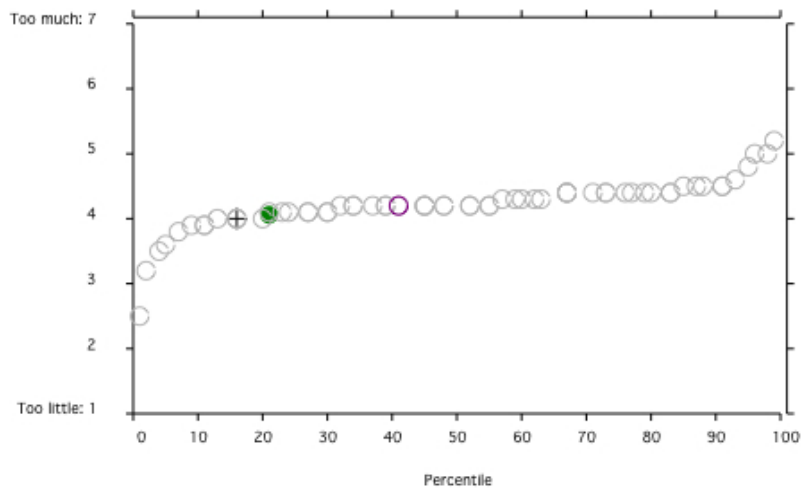


“Only rarely too loud.”

“Office glass doors don't keep out noise effectively.”

“Still getting used to the noise and disruptions that occur with open plan.”

Figure 2-9 Lighting - Artificial



“Dividers between desks are too low.”

2.12 Noise

In 2009 the BUS rating for overall noise scored significantly better than the 2006 benchmark. Sixty percent of staff were highly satisfied with the overall noise levels although 46 percent suggested there was too much unwanted interruptions.

The 2009 results indicate that unwanted interruptions have decreased, despite more people coming into the building. This could also be because a number of staff in areas work part time and/or people are more settled into work routines (such as using meeting rooms for meetings).

2.13 Tolerance/Forgiveness

Building Use Studies has developed a measure of tolerance or 'forgiveness'.

'Forgiveness' helps quantify the tolerance occupants have for the shortcomings in a building ¹. If the forgiveness score is greater than 1.0, then the occupants may be said to be more tolerant: that is, although they may have detailed criticisms about some of the conditions, they are prepared to overlook them.

The forgiveness factor for the Szencorp Building 2009 occupancy evaluation was 1.06 a very slight decrease from the 2006 results. This suggests that users are relatively forgiving about shortcomings in individual aspects such as summer and winter temperatures, air quality, lighting and noise. Of note the two tenancies that have come into the building are not part of the Szencorp Building history, development or profile yet staff have rated a high forgiveness factor of the building.

Research has shown that people can be more forgiving of individual variables of a building when they have more control over the environment or when users understand the working and design intent of their environment better.

"[Users can be] more tolerant if actual performance does not quite live up to expectations. In studies of buildings which have occupants who are themselves designers, we find that the occupants also tend to be even more tolerant, while one might have expected them – knowing how the design might have been better – to have been more critical of under-performance ²".

With this in mind it is recommended that the Szencorp Building management continue to work closely across all the tenancies to assist in informing staff how systems operate and how staff can facilitate in the correct operations of the building.

2.14 Travelling to work

Transport is an area that people tend to overlook when considering the effect of their workplace on the environment. Workplaces can be heavy users of transport, both in commuting and business travel. Company cars, free fuel and parking are commonly linked to remuneration. Cars contributed 8 percent of national emissions with the fuel used by cars increasing by 19 percent from 1990 to 2003 and their related emissions increased by 25 percent in the same period.³

The 2006 results highlighted the high percentage of staff, 77 percent who drove to work by themselves. Nearly 42 percent of staff travelled under 30 minutes to work.

The results are different for 2009 with an increase in the proportion of people travelling by bike and tram. Over 50 percent of people still travel by car. See Figure 2-10.

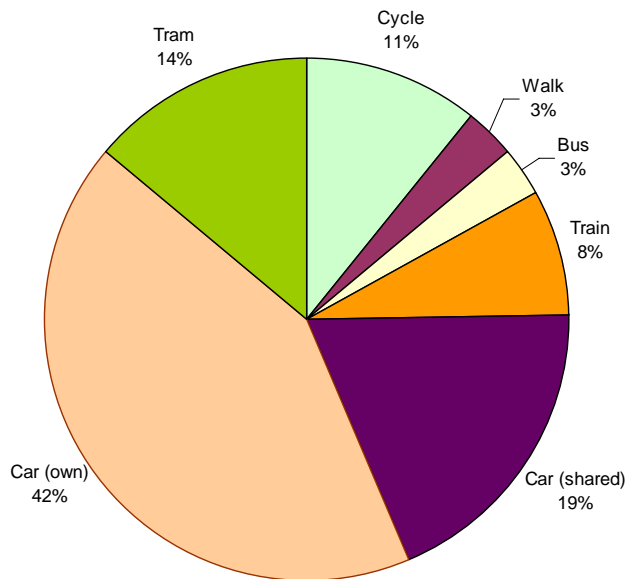
Staff suggested increased car parking spaces that were cheaper. Considering the access to the Szencorp Building by tram, bus and train such an action does not seem warranted. Car pooling needs to be actively encouraged as 42 percent of staff are still travelling solo by car.

¹ Forgiveness is a derived score obtained by dividing the score for the summary variable "comfort overall" by the average of the summary variables for temperature in summer and winter, ventilation/air in summer and winter, noise and lighting. Values normally are in the range 0.5 to 1.5.

² Leaman A & Bordass B 2005, Productivity in Buildings: the Killer Variables, downloaded 12 June 2006, <http://www.usablebuildings.co.uk/Pages/Protected/KillerUpdate2005.pdf>

³ Source: www.travelsmart.gov.au/about

Figure 2-10 Journey to work Szencorp Building survey results



2.15 Office Greening

It was positive to see away-from-home recycling efforts that staff across the organisation have implemented. Staff have identified that there are still areas of improvement including the implementation of new signage. It is recommended that the facility manager provide consistent, best practice recycling signage. Sustainability Victoria’s Public Place Recycling and Away from Home Signage Guidelines provides access to best practice, consistent office signage.⁴

Conclusion

After nearly three years of operation the Szencorp Building continues to provide occupants with a healthy and comfortable work environment. There is still an excellent opportunity to improve comfort, lighting and noise levels and perceptions of control over the work environment.

- Improved effectiveness (where possible) and feedback to staff in resolving building related issues
- Increased education and understanding of the building controls, and staff’s ability to influence the controls in their environment.

To view the results of the Szencorp Building 2009 Post Occupancy Evaluation go to:

Szencorp Building National Results:

<http://homepage.mac.com/aleaman2/990/index.html>

Szencorp Building International Results:

<http://homepage.mac.com/aleaman2/9901/index.html>

⁴ See Sustainability Victoria’s away from home signage guidelines, http://www.sustainability.vic.gov.au/resources/documents/afh_guidelines_web-11.pdf

Appendix A - Traffic Light Comparison Post 2006 and Post 2009

Szencorp Building (2006)

Air in summer: dry/humid
 Air in summer: fresh/stuffy
 Air in summer: odourless/smelly
 Air in summer: overall
Air in summer: still/draughty

Air in winter: dry/humid
 Air in winter: fresh/stuffy
 Air in winter: odourless/smelly
Air in winter overall
Air in winter: still/draughty

Comfort: overall
 Control over cooling
 Control over heating
 Control over lighting
 Control over noise
Control over ventilation

Design
 Furniture
 Health (perceived)
 Image to visitors

Lighting: artificial light
 Lighting: natural light
 Lighting: overall
Lighting: glare from sun and sky
 Lighting: glare from lights

Meeting rooms: overall

Needs

Noise: noise from colleagues
 Noise: other noise from inside
 Noise: unwanted interruptions
Noise: noise from outside
 Noise: overall
 Noise: noise from other people

Productivity (perceived)

Space in the building
Space at desk
 Storage space: overall

Temperature in summer: hot/cold
 Temperature in summer: overall
 Temperature in summer: stable/varies

Temperature in winter: hot/cold
 Temperature in winter: overall
 Temperature in winter: stable/varies

Work Requirements

Szencorp Building (2009)

Air in summer: dry/humid
 Air in summer: fresh/stuffy
 Air in summer: odourless/smelly
 Air in summer: overall
Air in summer: still/draughty

Air in winter: dry/humid
 Air in winter: fresh/stuffy
 Air in winter: odourless/smelly
 Air in winter overall
Air in winter: still/draughty

Cleaning
 Comfort: overall
 Control over cooling
 Control over heating
 Control over lighting
 Control over noise
Control over ventilation

Design
 Furniture
 Health (perceived)
 Image to visitors

Lighting: artificial light
Lighting: natural light
 Lighting: overall
Lighting: glare from sun and sky
 Lighting: glare from lights

Meeting rooms: overall

Needs

Noise: noise from colleagues
Noise: other noise from inside
 Noise: unwanted interruptions
Noise: noise from outside
 Noise: overall
 Noise: noise from other people

Productivity (perceived)
 Safety

Space in the building
Space at desk
 Storage space: overall

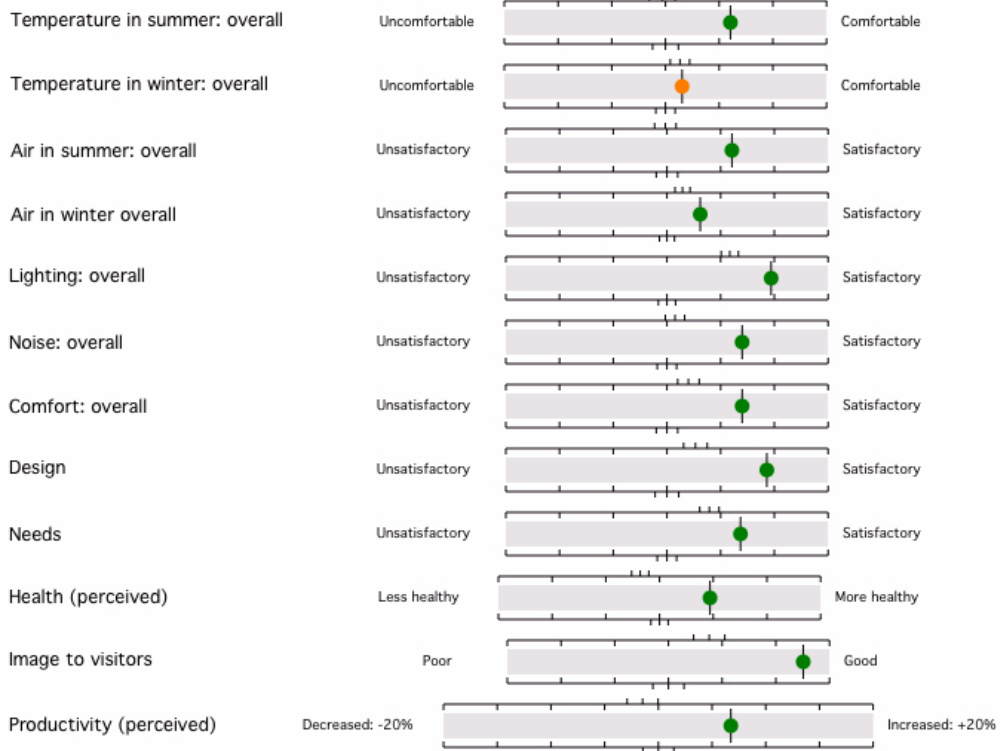
Temperature in summer: hot/cold
 Temperature in summer: overall
 Temperature in summer: stable/varies

Temperature in winter: hot/cold
 Temperature in winter: overall
 Temperature in winter: stable/varies

Work Requirements

Appendix B - Australian Traffic Light Indicators-Overview

Summary (Overall variables)



Key to Summary Chart

These are summaries of some of the variables used in Building Use Studies building occupant assessments.

Scales: All variables except Perceived Productivity use a 1 to 7 scale. Perceived Productivity has a minus 20 percent to plus 20 percent scale.

Green circles represent mean values significantly better or higher than both benchmark and scale midpoint (a good score).

Amber (orange) circles are mean values no different from benchmark and scale midpoint (a typical score).

Red circles are mean values worse or lower than benchmark and scale midpoint (a poor score).