

OCCUPANT COMFORT & SATISFACTION

Points available: 4

AIM OF CREDIT

To encourage the assessment of building occupants' comfort as it relates to thermal comfort, acoustics, indoor air quality, lighting comfort and any other comfort issues.

CREDIT CRITERIA

Occupant Satisfaction Survey **1 point** at least one occupant satisfaction survey must be carried out during the performance period, for any points to be claimed in this credit.

Occupant Satisfaction Levels **3 points** are awarded where at least 80% of survey respondents indicate satisfaction during the performance period.

COMPLIANCE REQUIREMENTS

Occupant Satisfaction Surveys have been used successfully to evaluate the degree to which buildings enable users to fulfil their intended goals. A comprehensive satisfaction survey method, one that includes assessments of occupant well-being and interactions with their indoor environment, is intended to complete the feedback loop that is essential for the successful management and improvement of operational practices of high-performing buildings.

The Occupant Satisfaction Survey, for purposes of this credit, must be delivered to the regular occupants of all primary spaces as defined in the Definitions section of this credit. A space may be excluded from the survey, if its use justifies specific comfort conditions.

OCCUPANT SATISFACTION SURVEY

At least one Occupant Satisfaction Survey ('the survey') must be delivered to regular occupants during the performance period, for any points to be claimed in this credit.

The Green Building Council of Australia has joined the Management Committee for BOSSA, the Building Occupants Survey System Australia currently being developed by the University of Sydney and other partners.

"BOSSA is a POE system for Australia's office buildings. As the BOSSA database grows with each additional building surveyed during this project, it will underpin an ongoing program of architectural science research aimed at improving occupant health, comfort and productivity outcomes from sustainable office buildings. The BOSSA POE questionnaire is comparable to existing international benchmarking systems of Building User Survey (UK) and Centre of Built Environment Berkeley (USA).

Preferably, the survey will be delivered through BOSSA, which will enable building owners to make comparisons between buildings. Where the survey is not delivered through BOSSA, it must be a third party peer reviewed survey that addresses at a minimum:

- indoor air quality (fresh air, stuffiness)
- thermal comfort (indoor temperature, air speed or drafts, access to controls)
- acoustics comfort (noise levels from HVAC, noise from outside)
- lighting comfort (brightness, access to controls)
- building cleanliness (cleanliness, odours)

Other issues specific to a workplace, facility or occupancy type may be included in the survey. The survey must, for each survey question, present the answer choices must be on a 7-point scale ranging from very satisfied (+3) to very dissatisfied (-3), with the midpoint (zero) signifying neutrality. Answers must be anonymous, but allow respondents to identify their location by building zone or section, so that corrective action can be taken.

Responses must be collected from a representative sample of building occupants. The total number of responses must be determined by the number of full-time equivalent (FTE) people who work at the premises (regular occupants only, not visitors), as described in the 'Sample Size' section of this credit. There is further guidance regarding minimum response rates, depending on the size of the total population, in the 'Sample Size' section of this credit.

For this point to be achieved, applicants must:

1. Deploy the survey
2. Achieve the response rate for at least 10% precision rate
3. Share the responses with the GBCA

SAMPLE SIZE AND RESPONSE RATES

Survey sample sizes and related response rates can be determined utilising standard published tables developed to facilitate the delivery of surveys such as these. These published tables may be used for any population size bigger than 100. For population sizes smaller than 100, response rates must be at least 75%,

For all population calculations, the number of regular occupants should be the maximum number of occupants that will regularly work at the premises during the performance period. Population sizes can be estimated where there is no access to more precise figures, by using typical occupancy per meter square.

These tables have been reproduced below. Please note these sample sizes reflect the number of obtained responses and not necessarily the number of surveys emailed or interviews carried out.

Note to stakeholders:

This is a suggestion on how to address Sample Size selection for surveys in general. The GBCA invites feedback on this approach.

Table 1: Sample Size for $\pm 5\%$, $\pm 7\%$ and $\pm 10\%$ Precision Levels where Confidence Level is 95% and $P=0.5$.

Size of Population	Sample Size (n) for Precision (e) of:		
	$\pm 5\%$	$\pm 7\%$	$\pm 10\%$
100	81	67	51

125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76
325	180	125	77
350	187	129	78
375	194	132	80
400	201	135	81
425	207	138	82
450	212	140	82

Table 2: Sample Size for $\pm 3\%$, $\pm 5\%$, $\pm 7\%$, and $\pm 10\%$ Precision Levels where Confidence Levels 95% and $P=0.5$.

Size of Population	Sample Size (n) for precision (e) of:		
	$\pm 5\%$	$\pm 7\%$	$\pm 10\%$
500	222	145	83
600	240	152	86
700	255	158	88
800	267	163	89
900	277	166	90
1,000	286	169	91
2,000	333	185	95
3,000	353	191	97
4,000	364	194	98
5,000	370	196	98
6,000	375	197	98
7,000	378	198	99

8,000	381	199	99
9,000	383	200	99
10,000	385	200	99
15,000	390	201	99
20,000	392	204	100
25,000	394	204	100
50,000	397	204	100
100,000	398	204	100
>100,000	400	204	100

Source: Determining Sample Size, <http://edis.ifas.ufl.edu/pd006>

OCCUPANT SATISFACTION LEVELS

Survey responses are to be documented and collated for analysis, during the performance period. For the purposes of the credit, a precision rate of at least **10% must be chosen**. Where less than 80% of respondents indicate satisfaction with a particular indoor environment issue, corrective actions must be undertaken to address occupant dissatisfaction during the performance period.

For the purposes of this credit, respondents who answer +1, +2 or +3 on the 7- point scale used in the survey are considered satisfied.

Points are awarded depending on these 5 areas:

- indoor air quality (fresh air, stuffiness)
- thermal comfort (indoor temperature, air speed or drafts, access to controls)
- acoustics comfort (noise levels from HVAC, noise from outside)
- lighting comfort (brightness, access to controls)
- building cleanliness (cleanliness, odours)

At least 3 indoor environment areas achieve 80% satisfaction or greater. No single indoor environment area achieves satisfaction levels below 50%.

'Corrective actions' may included, for instance, HVAC control adjustments (i.e. temperature bands, operating modes), airflow adjustments, acoustical modifications (noise from HVAC), lighting modifications or further investigations to identify the best way forward. These corrective actions must be documented and implemented during the performance period.

Note to stakeholders:

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“BOSSA is a POE system for Australia’s office buildings. As the BOSSA database grows with each additional building surveyed during this project, it will underpin an ongoing program of architectural science research aimed at improving occupant health, comfort and productivity outcomes from sustainable office buildings. The BOSSA POE questionnaire is comparable to existing international benchmarking systems of Building User Survey (UK) and Centre of Built Environment Berkeley (USA).”

The study is funded by the Australian Research Council and Industry Partners, and is being conducted by Professor Richard de Dear, Head of Architectural & Design Science, and his research team at The University of Sydney.”

GUIDANCE

Alternative Compliance Methods

A Credit Interpretation Request may be submitted to the Green Building Council of Australia when an applicant wishes to advocate for an alternative yet equivalent method of meeting Compliance Requirements. It is a formal process to adding different compliance pathways, which are reviewed by the GBCA or independent external assessors depending on the complexity of the issue.

Standards and guidelines

Building Occupants Survey System Australia (BOSSA) - is a post occupancy evaluation system for Australia’s office building occupants. The survey generates feedback on the indoor environment performance of buildings from their occupants’ perspective. The study is funded by the Australian Research Council and Industry Partners, and is being conducted by Professor Richard de Dear, Head of Architectural & Design Science, and his research team at The University of Sydney.

Definitions

Performance Period

‘Performance period’ relates to the continuous time period during which a credit is measured or data is collected. For initial Green Star – Performance certification, the ‘performance period’ is the most recent period of operations preceding the submission for certification (at least 12 months in most cases).

Primary space

All areas where a person is expected to work, or remain for an extended period of time, including, but not limited to:

- Offices, either open plan or private;
- Classrooms, laboratories, computer labs;
- Ward rooms, nurse's stations, clinic rooms;
- Commercial kitchens and preparation areas where food is being sold;
- Retail / sales floor, exhibition halls, galleries (unless exclusion is justified), multi-purpose rooms (as a general setting); and,
- Industrial spaces, warehouse areas, shop floors, work stations.

These examples are indicative, and the predominant use of the space determines the space type classification. Where the functional requirements of the space demand specific lighting conditions, (e.g. laboratories, auditoriums, cinemas, or archives) exclusions may be justified in a Credit Interpretation Request.

SUBMISSION DOCUMENTATION REQUIREMENTS

1. Complete 'Submission Template'
2. Provide required documentation, as requested within 'Submission Template'. This may include:
 - Copy of Occupant Comfort Survey Results