



Power to the People

USING PRE- AND POST-OCCUPANCY EVALUATIONS TO SHINE A LIGHT ON ACTUAL DESIGN PERFORMANCE.

Harry.Knibb@wsp.com | October 19



Power to the people.

Using pre- and post-occupancy evaluations to shine a light on actual design performance.

BUSINESS CASE

We are in the midst of a wellness revolution. Supported by a growing body of literature linking mental- and physical-health to our built environment; economically savvy businesses are taking note. They have realised that productivity improvements through a healthy and happy workforce can be many times more valuable than efficiency savings in energy and maintenance expenditure alone. As a result, new workplaces are propagating their health benefits, developments are aggressively seeking certification, and the industry is awash with differing yet similar principles of healthy design.

GAP

Often, however, once the design is complete and buildings constructed, little effort is spent assessing the success of these strategies. Clearly, there is a lack of outcome orientated evidence.

Much like ESG sustainability in real estate, which has evolved and matured to a point where greater importance is being placed on actual, rather than predicted, performance; health and wellness outcomes are moving from the aspirational to the more tangible. Post-occupancy evaluations (POEs) or building use studies are a robust way to close this gap.

SOLUTION

In this paper, we call on pre- and post-occupancy evaluation data of over 2,000 respondents to assess the direct and indirect health benefits of two large office consolidation projects in Birmingham and Manchester. In each city three existing offices were consolidated into one larger office during 2018, requiring eight surveys in total. Within the presentation, viewers will learn of the techniques needed to deliver a successful occupancy evaluation, how to assess data and the importance of communication. On top of this, we will present fine grain data comparing perceptions of wellness metrics including but not limited to thermal comfort, views of nature, space needs, acoustic design and air quality; both before and after the relocations. Ultimately concluding with further evidence around the productivity benefits of these new building, an outline business case calculation taking wider determinants into account, and a call for advanced statistical techniques to show causal links between dependent and independent variables.

Our approach

Aim

- ❑ Undertake a 'pre' and 'post' occupancy assessments
- ❑ Define building elements which make us comfortable/ healthy/ productive
- ❑ Track and communicate results
- ❑ Use knowledge to inform future design briefs

Method

- ❑ The Building Use Study (BUS) for surveys – pre and post
- ❑ Additional questions added to align with Fitwel
- ❑ Performance through BUS benchmarking
- ❑ Paper questionnaires
- ❑ Analysis

Building Evaluation

This survey is being conducted to assess the performance of the surveyed building in operation and to help inform future planning and design. The data from the survey is collected by WSP and is then shared with Arup for processing and storage. The data will not be shared with anyone else. It will be processed and anonymised for the use of WSP. Arup also undertakes statistical analysis on all stored data, the anonymised findings of which may be communicated publicly. We appreciate the time taken to respond to the survey, its success relies on data quality and a high response rate. However, responses to all questions are entirely optional.

Please answer for the study building only. Please fill in as many questions as you can. Write any further comments in the spaces provided or on a separate sheet. Thank you for your help.

If you have any questions please contact: info@busmethodology.org.uk

Background Please note: We ask about age and gender because these are both relevant to people's needs in buildings. We ask for names so that we can follow up any matters that may arise.

What is your age...? Please tick Under 30 1 2 30 or over

How would you describe your gender? Please tick Female 1 2 Male In another way 3

Please give your name ... Surname, then first name (at your discretion)

... and Department/Team Department/Team

Is this building your normal base? Please tick if you are a contractor

Yes 1 2 No 3 Normal base if not this building Contractor 4

Is your office or work area ...? Please tick Normally occupied by you alone 1 2 Shared with 5-8 others 3 Shared with 1 other 4 Shared with more than 8 others 5 Shared with 2-4 others 6

Do you sit next to a window at your normal workspace? Please tick Yes 1 2 No 3

How long have you worked in this building? Please tick Less than a year 1 2 A year or more 3

How long have you worked in your present work area? Please tick Less than a year 1 2 A year or more 3

How many days do you spend in the building in a normal working week? Days per week in building

How many hours per day do you spend in the building on a normal working day? Hours per day in building

How many hours per day do you spend at your desk or normal work area on a normal working day? Hours per day at desk

How many hours per day do you normally spend working with a computer screen (VDU)? Hours per day at VDU

The building overall

Building design All things considered, how do you rate the building design overall?

Unsatisfactory 1 2 3 4 5 6 7 Satisfactory

Comments about design overall

Needs In the building as a whole, do the facilities meet your needs?

Unsatisfactory 1 2 3 4 5 6 7 Satisfactory

Comments about needs overall

Space In the building as a whole, do you think that space is used ...?

Ineffectively overall 1 2 3 4 5 6 7 Effectively overall

Image How do you rate the image that the building as a whole presents to visitors...?

Poor 1 2 3 4 5 6 7 Good

Safety How do you rate your personal safety in and around the building ...?

Poor 1 2 3 4 5 6 7 Good

Cleaning How do you rate the cleaning ...?

Unsatisfactory 1 2 3 4 5 6 7 Satisfactory

Availability of meeting rooms How do you rate the availability of meeting rooms ...?

Unsatisfactory 1 2 3 4 5 6 7 Satisfactory

Comments about meeting rooms

Suitability of storage arrangements How do you rate the suitability of storage arrangements ...?

Unsatisfactory 1 2 3 4 5 6 7 Satisfactory

Comments about storage

Your work Please briefly describe the work that you carry out in this building ...?

Work description

Your work requirements Specifically, for the work that you carry out, how well do the facilities meet your needs ...?

Very poorly 1 2 3 4 5 6 7 Very well

Please give examples of things which can hinder effective working ...?

Hinder

... and examples of things which usually work well ...?

Work well

Your desk or work area

Furniture How do you rate the usability of the furniture provided at your desk or normal work area ...?

Very poor 1 2 3 4 5 6 7 Very good

Space at desk Do you have enough space at your desk or normal work area ...?

Too little 1 2 3 4 5 6 7 Too much

Comments about your desk or work area

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Noise from colleagues Too little 1 2 3 4 5 6 7 Too much

Noise from other people Too little 1 2 3 4 5 6 7 Too much

Other noise from inside Too little 1 2 3 4 5 6 7 Too much

Noise from outside Too little 1 2 3 4 5 6 7 Too much

Please estimate how you are affected by unwanted interruptions ...

Unwanted interruptions Not at all 1 2 3 4 5 6 7 Very frequently

Lighting How would you describe the quality of the lighting in your normal work area? This question refers to conditions all year round

Please tick your rating on each scale

Lighting overall Unsatisfactory 1 2 3 4 5 6 7 Satisfactory

Natural light Too little 1 2 3 4 5 6 7 Too much

Glare from sun and sky None 1 2 3 4 5 6 7 Too much

Artificial light Too little 1 2 3 4 5 6 7 Too much

Glare from lights None 1 2 3 4 5 6 7 Too much

Comments about lighting conditions

Details of method: www.usablebuildings.co.uk/WebGuideOSM/index.html

Overall comfort All things considered, how do you rate the overall comfort of the building environment?

Unsatisfactory 1 2 3 4 5 6 7 Satisfactory

Comments about comfort

Please tick your rating on each scale

1 2 3 4 5 6 7 Comfortable

1 2 3 4 5 6 7 Too cold

1 2 3 4 5 6 7 Varies during the day

1 2 3 4 5 6 7 Draughty

1 2 3 4 5 6 7 Humid

1 2 3 4 5 6 7 Stuffy

1 2 3 4 5 6 7 Smelly

1 2 3 4 5 6 7 Satisfactory overall

Comments about overall comfort

about noise and its sources

Productivity at work Please try to evaluate this building with respect to your experience of using buildings in general.

Please estimate how you think your productivity at work is decreased or increased by the environmental conditions in the building?

Productivity Decreased by ... -40% or less -30% -20% -10% 0 +10% +20% +30% or more +40% Productivity Increased by ...

Please tick one point on the scale 1 2 3 4 5 6 7 8 9

Comments about productivity

Health Do you feel less or more healthy when you are in the building? Please try to evaluate this building with respect to your experience of using buildings in general.

Less healthy 1 2 3 4 5 6 7 More healthy

Comments about health

Personal control How much control do you personally have over the following aspects of your working environment...?

Please tick each scale Is it important to you? Yes No

Heating No control 1 2 3 4 5 6 7 Full control 1 2

Cooling No control 1 2 3 4 5 6 7 Full control 1 2

Ventilation No control 1 2 3 4 5 6 7 Full control 1 2

Lighting No control 1 2 3 4 5 6 7 Full control 1 2

Noise No control 1 2 3 4 5 6 7 Full control 1 2

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Response rates

High response rates in all locations

Pre

Location		Response Rate (%)
Birmingham	1 Queens Drive	72
	Sutton Coldfield	43
	CEL House	41
	<i>B'ham Average</i>	52
Manchester	St Johns	70
	Victoria	67
	Technology centre	51
	<i>M'chester Average</i>	63
Av Response Rate (all schemes)		56

Post

Location	Response Rate (%)
Mailbox	74
Firth St	67
Av Response Rate (all schemes)	71

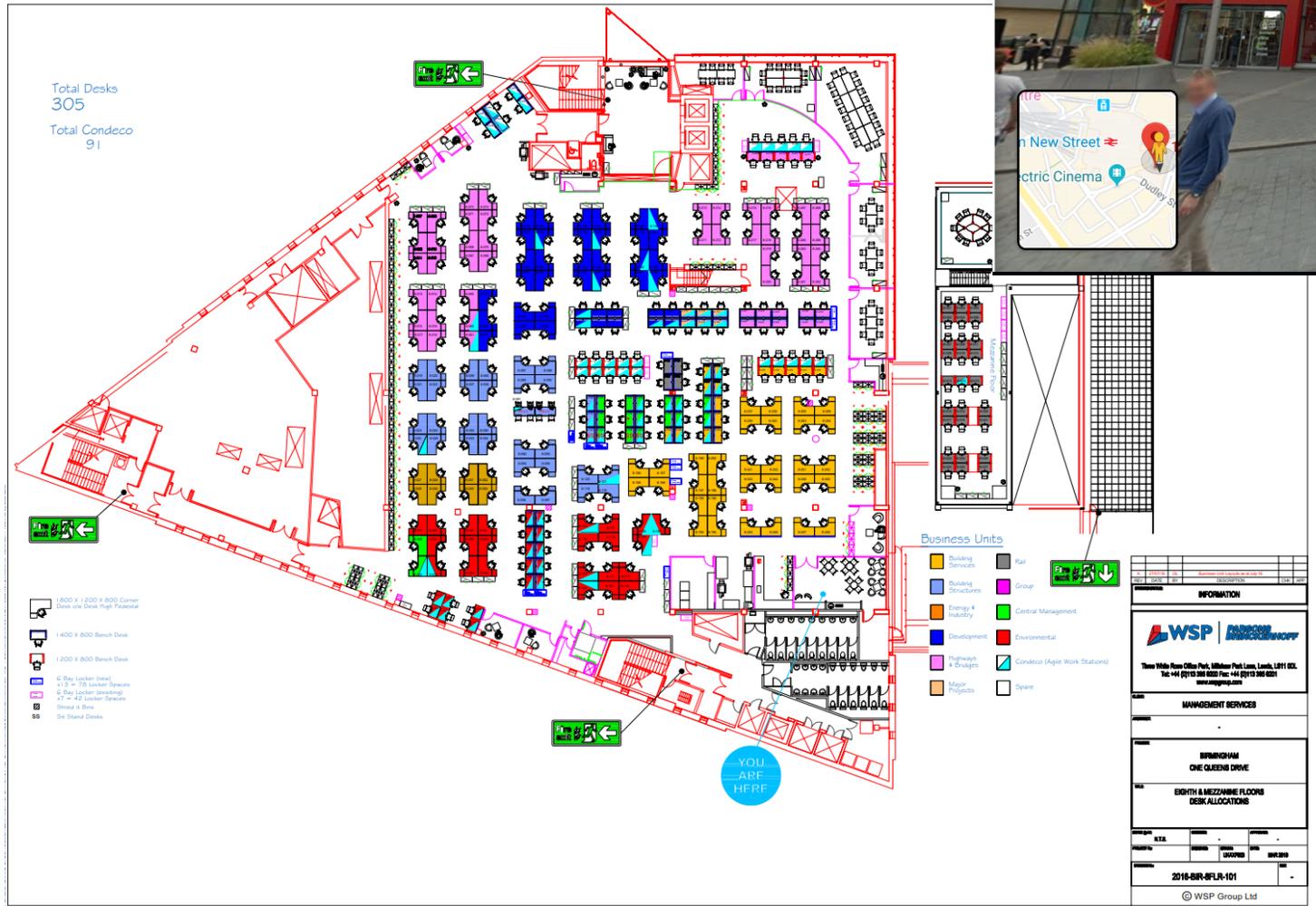


The Buildings

General Arrangements

1 Queens Drive

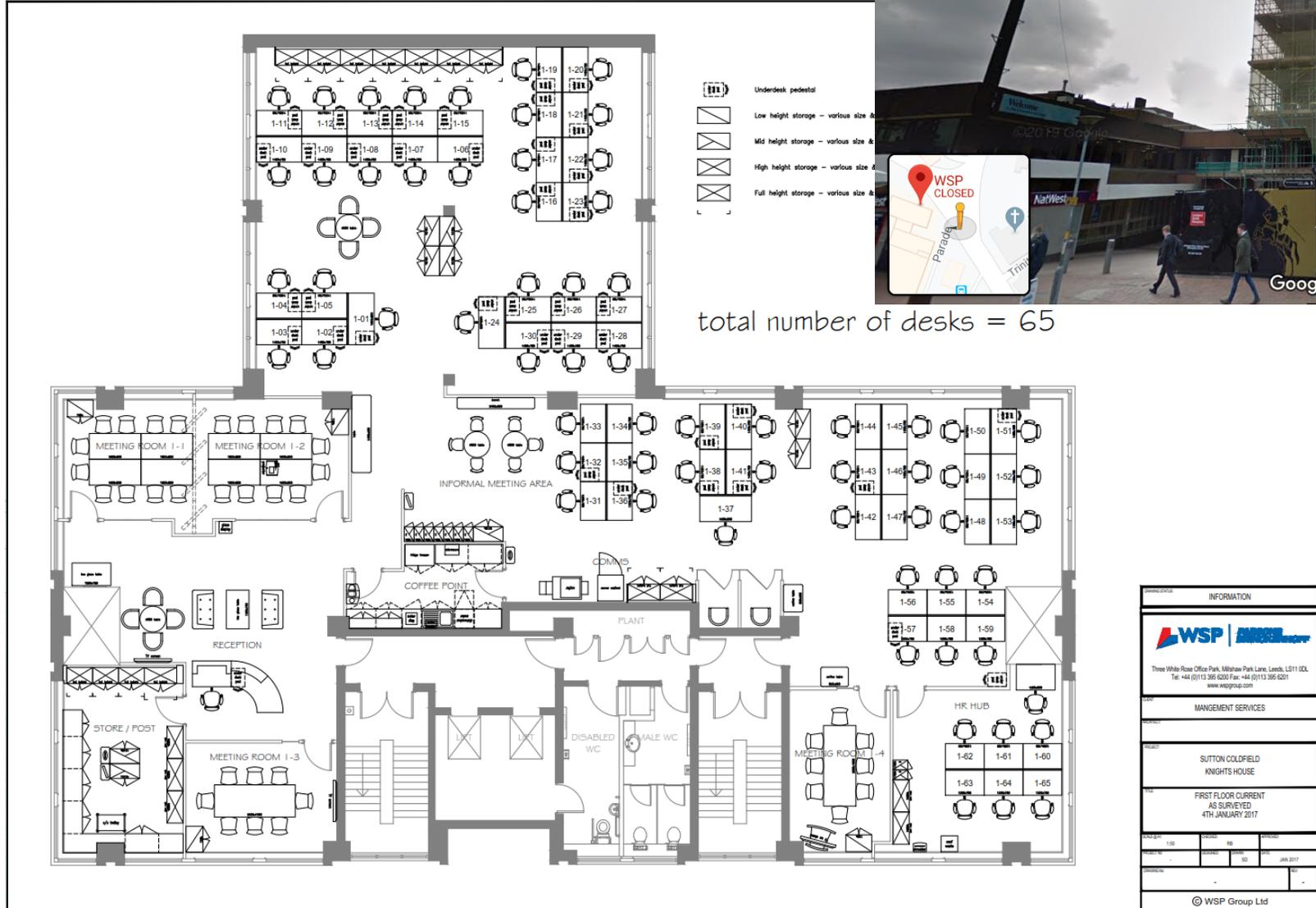
305 desks



INFORMATION	
Three White Horse Office Park, Millhar Park Lane, Luton, LU11 0XL Tel: +44 (0)1525 386 8200 Fax: +44 (0)1525 386 8201 www.wspgroup.com	
MANAGEMENT SERVICES	
BIRMINGHAM ONE QUEENS DRIVE EIGHTH & MEZZANINE FLOORS DESK ALLOCATIONS	
DATE	
SCALE	
STATUS	ISSUED
NO	000000
2016-BIR-BFLR-101	
© WSP Group Ltd	

Sutton Coldfield

65 desks

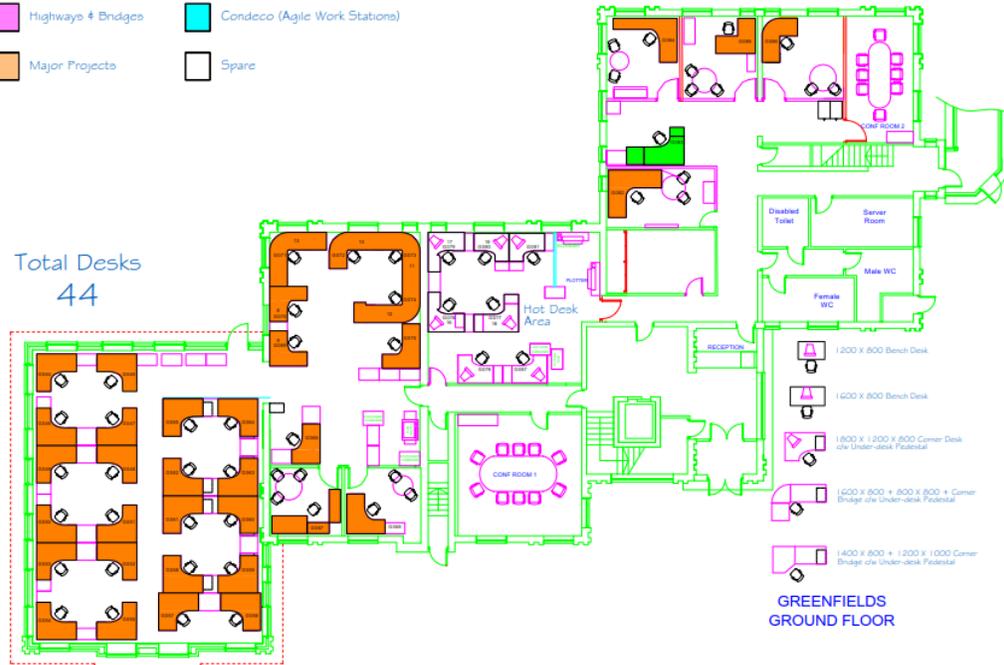


CEL House

44 desks

- Building Services
- Building Structures
- Energy & Industry
- Development
- Highways & Bridges
- Major Projects
- Rail
- Group
- Central Management
- Environmental
- Condeco (Agile Work Stations)
- Spare

Total Desks
44



GREENFIELDS
GROUND FLOOR

- 1 200 x 800 Bench Desk
- 1 600 x 800 Bench Desk
- 1 800 x 1 200 x 800 Corner Desk
c/w Under-desk Pedestal
- 1 600 x 800 + 800 x 800 + Corner
Bridge c/w Under-desk Pedestal
- 1 400 x 800 + 1 200 x 1 000 Corner
Bridge c/w Under-desk Pedestal

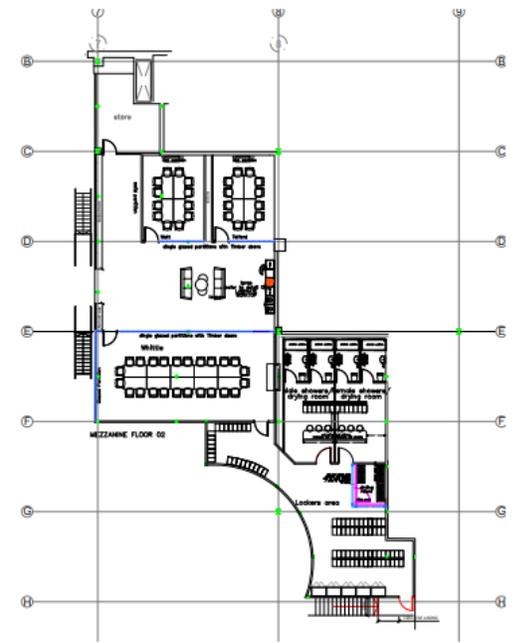


NO	REV	DATE	BY	APP	
INFORMATION					
Three White Rose Office Park, Milliner Park Lane, Leeds, LS11 0DL Tel: +44 (0)113 265 2222 Fax: +44 (0)113 265 2261 www.wspgroup.com					
MANAGEMENT SERVICES					
COVENTRY GREENFIELDS					
GROUND FLOOR DESK ALLOCATIONS					
DATE	1/18	VERSION	-	APPROVED	-
PREPARED BY	WSP	DATE	APR 2018	BY	-
2018-COV-GF-101					
© WSP Group Ltd					



The Mailbox

538 desks



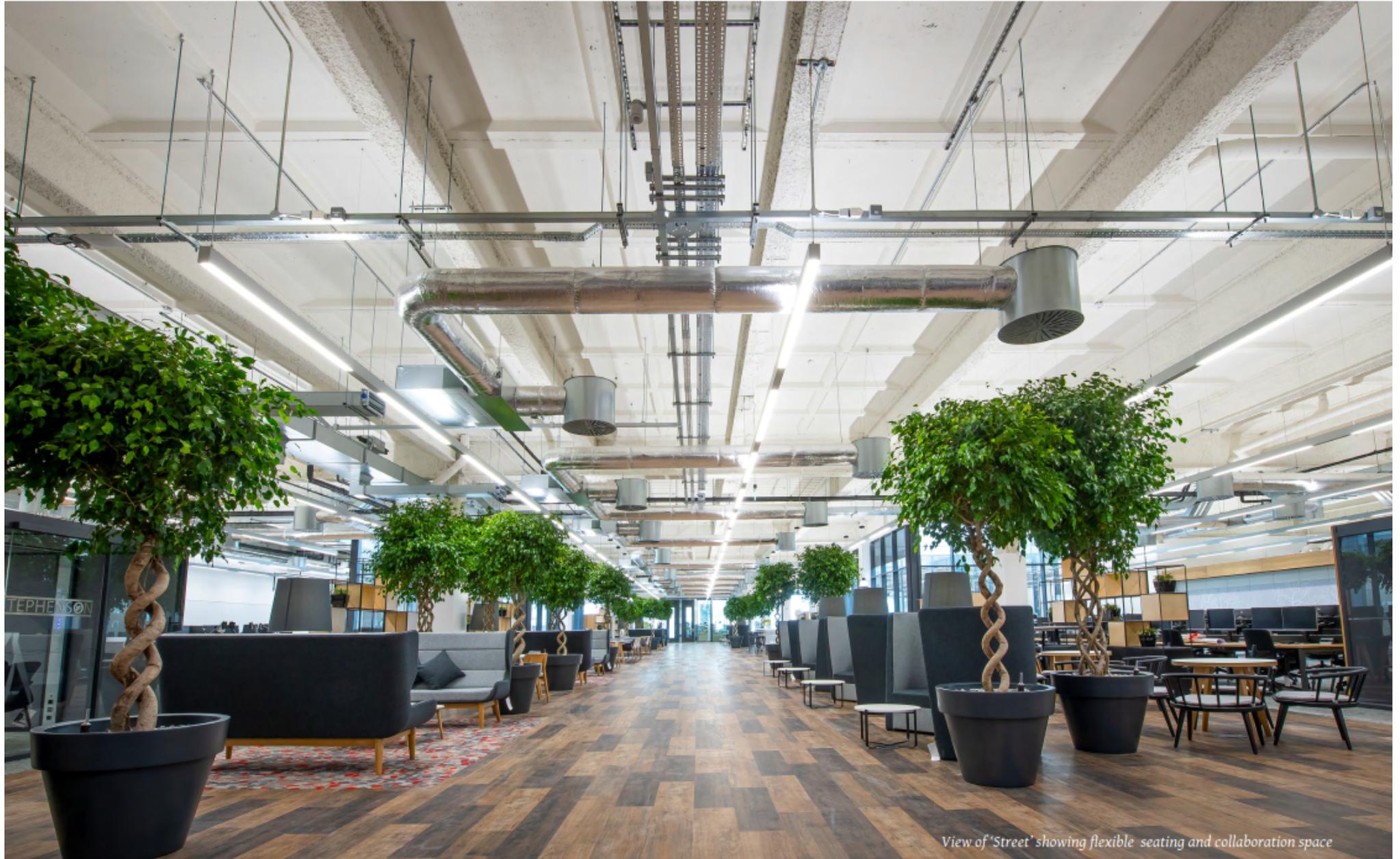
Birmingham - Legend 1

- Property & Building - Total 67
 - Structures - 35
 - Services - 39
- Energy & Industry - Total 71
 - Industry - 59
 - Water - 12
- Planning & Advisory - Total 138
 - Development - 60
 - PCS - 10
 - Environmental - 69
- Transport & Infrastructure
 - Rail - 38
 - CBG - 53
 - ITS - 12
 - Highways - 58
- HS2 P2b - Total 40
- HS2 CxS - Total 20
- Hotdesks - Total 17
- Management Services - Total 16
- Birmingham Height Adjustable Workstations

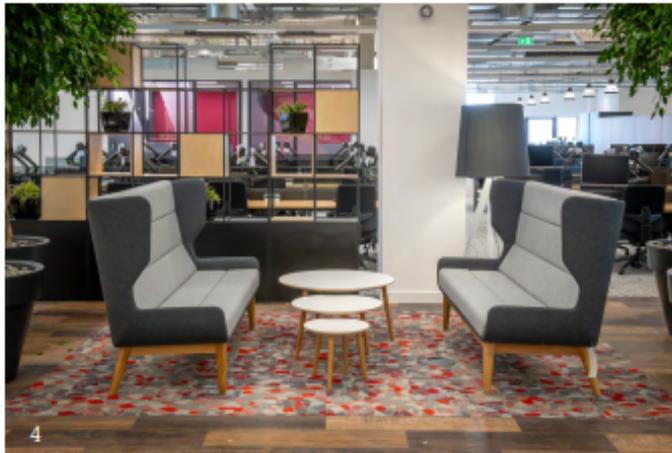
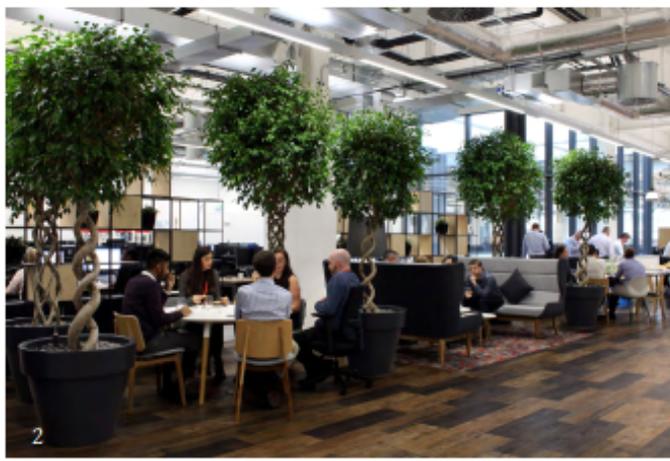
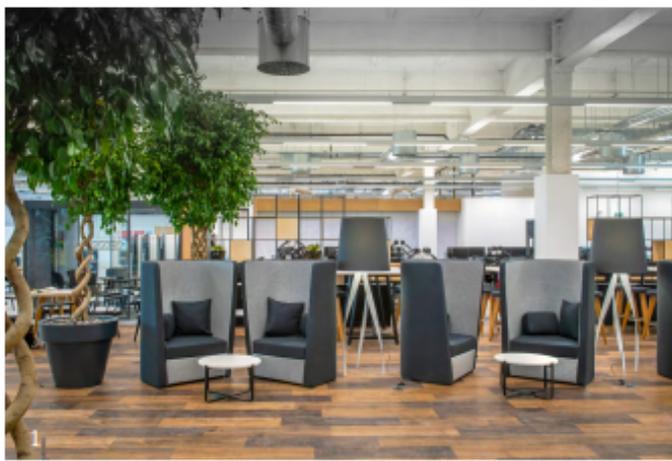




Top and Bottom: Before refurbishment commenced. The premises had been vacant for circa 2 years prior to our occupation.



View of 'Street' showing flexible seating and collaboration space



1. Seating on 'the street' for one-to-one conversation
2. Staff using different varieties of informal space for collaboration
3. Cafe bar on 'the street' acts as a social hub for the office
4. Informal seating/meeting space
5. 'Snug' style meeting spaces for privacy
6. WSP Young Professionals using Townhall meeting room for a presentation from New Zealand colleagues
7. Formal meeting space featuring advanced AV and flexible dividers
8. Kitchen/dining space



2018



buildings matter for health

HEREBY CERTIFIES THAT

WSP Birmingham - The Mailbox
Birmingham, United Kingdom

has achieved a Fitwel 2 Star Rating. This building incorporates a number of evidence-based design and policy strategies that support the physical, mental, and social health of its occupants.

Certification Date: 6/21/2019

JOANNA FRANK
President & CEO, Center for Active Design

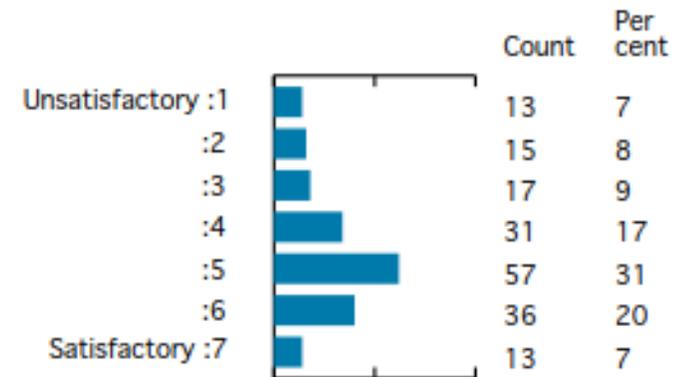
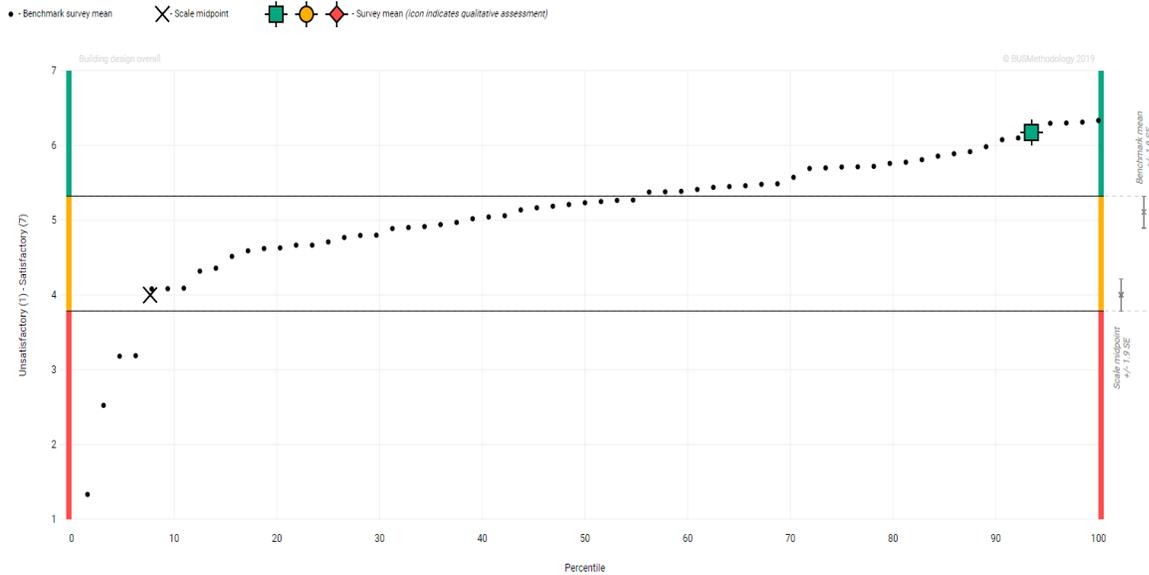
REENA AGARWAL
Chief Operating Officer, Fitwel

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Results

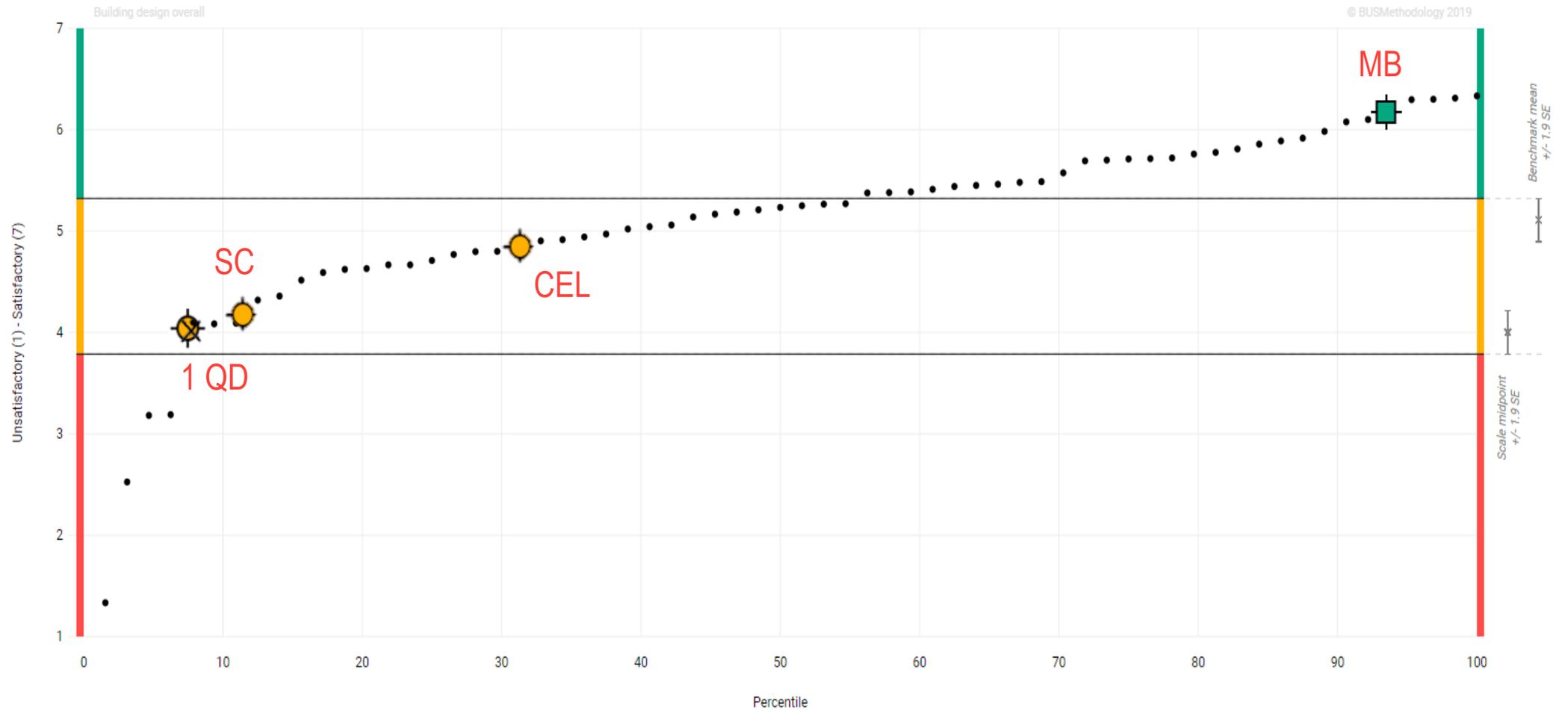
Getting under the skin of a snappy image

Understanding the results



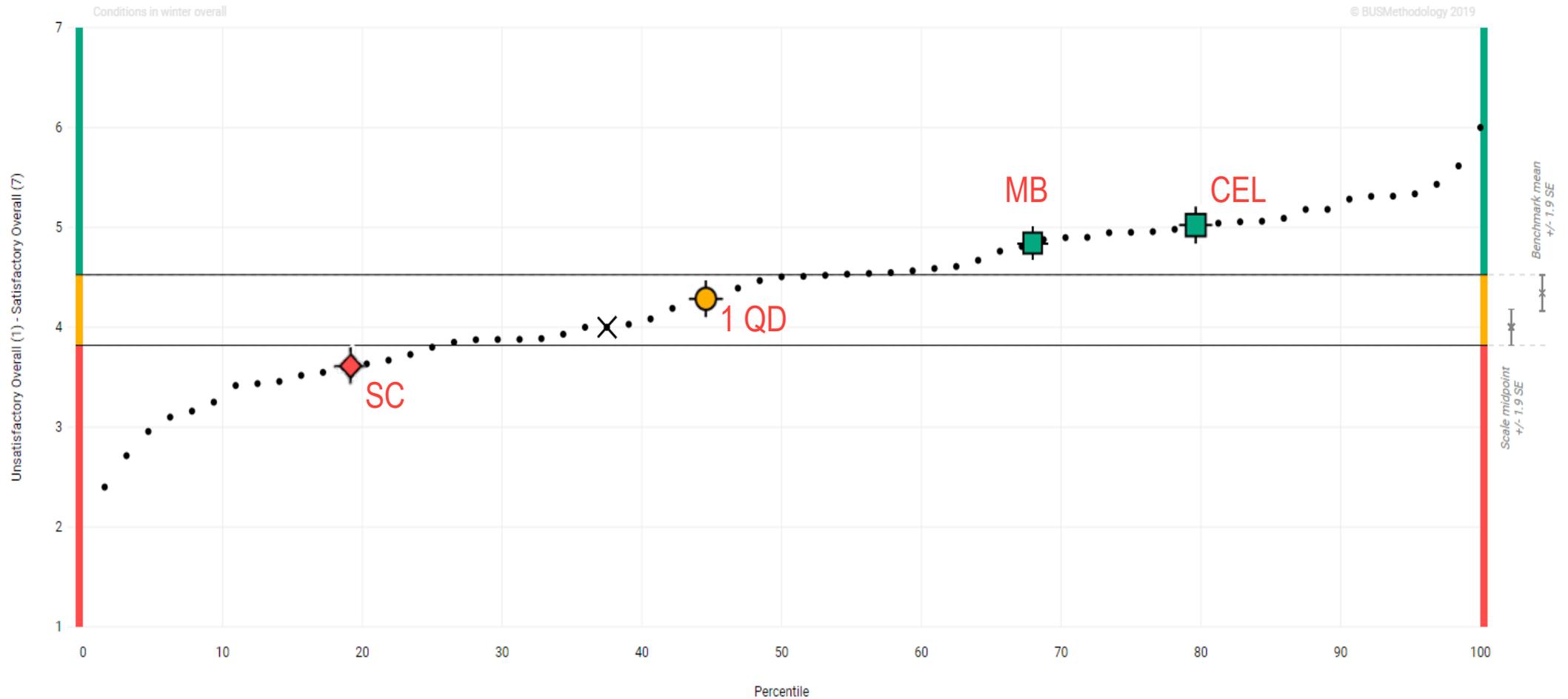
Building design overall

● - Benchmark survey mean ✕ - Scale midpoint ■ ● ◆ - Survey mean (icon indicates qualitative assessment)



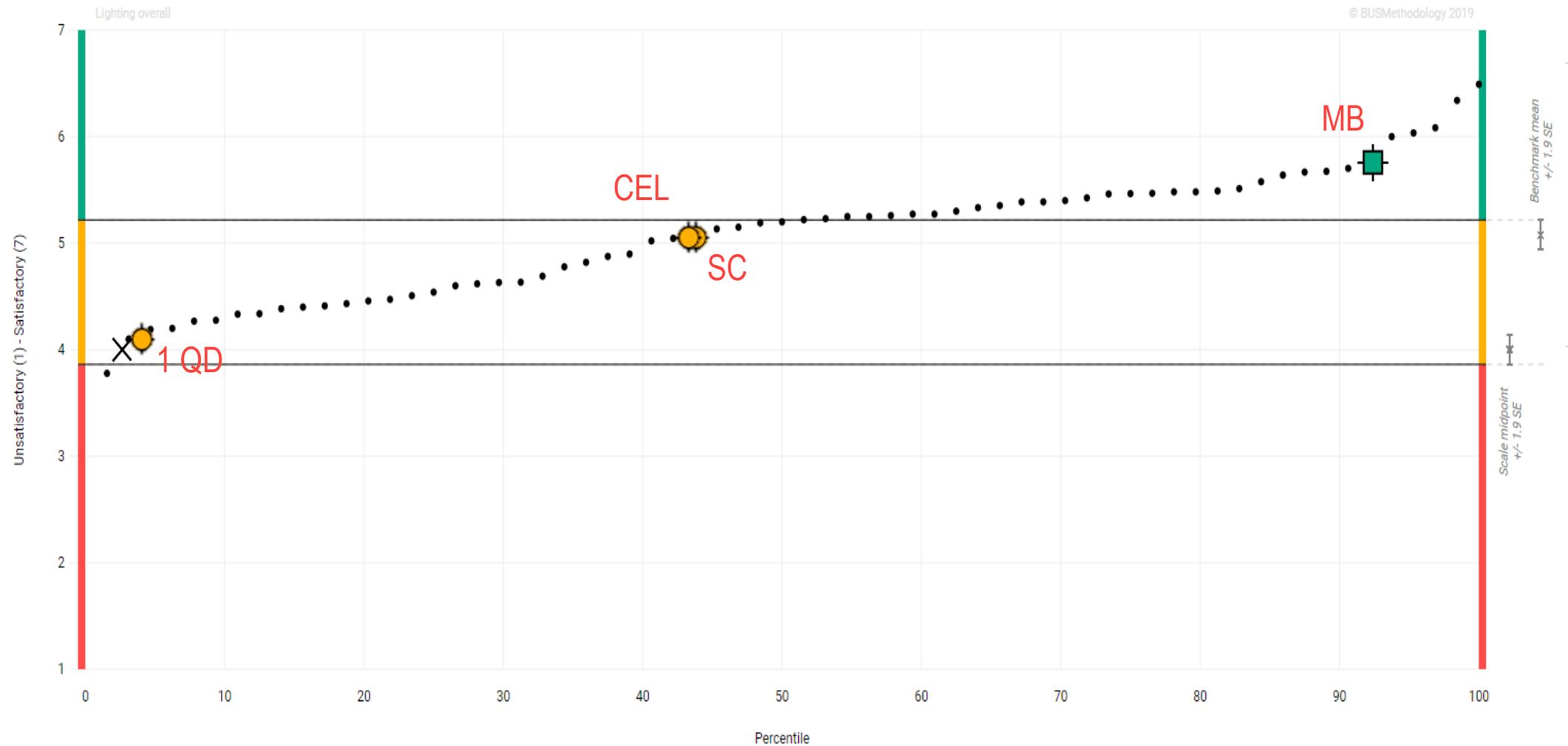
Conditions in winter

● - Benchmark survey mean ✕ - Scale midpoint ■ ● ◆ - Survey mean (icon indicates qualitative assessment)



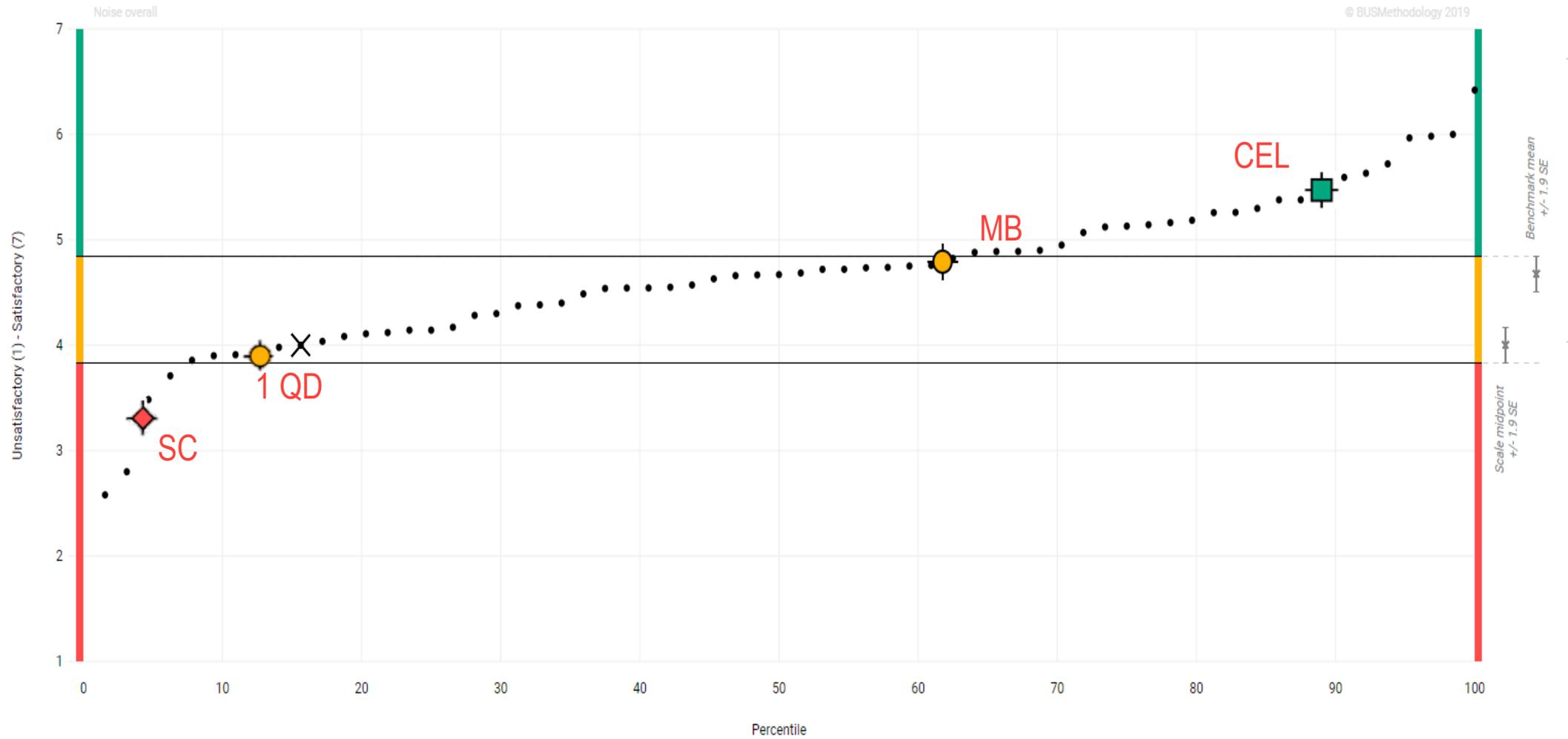
Lighting

● - Benchmark survey mean X - Scale midpoint ■ ● ◆ - Survey mean (icon indicates qualitative assessment)



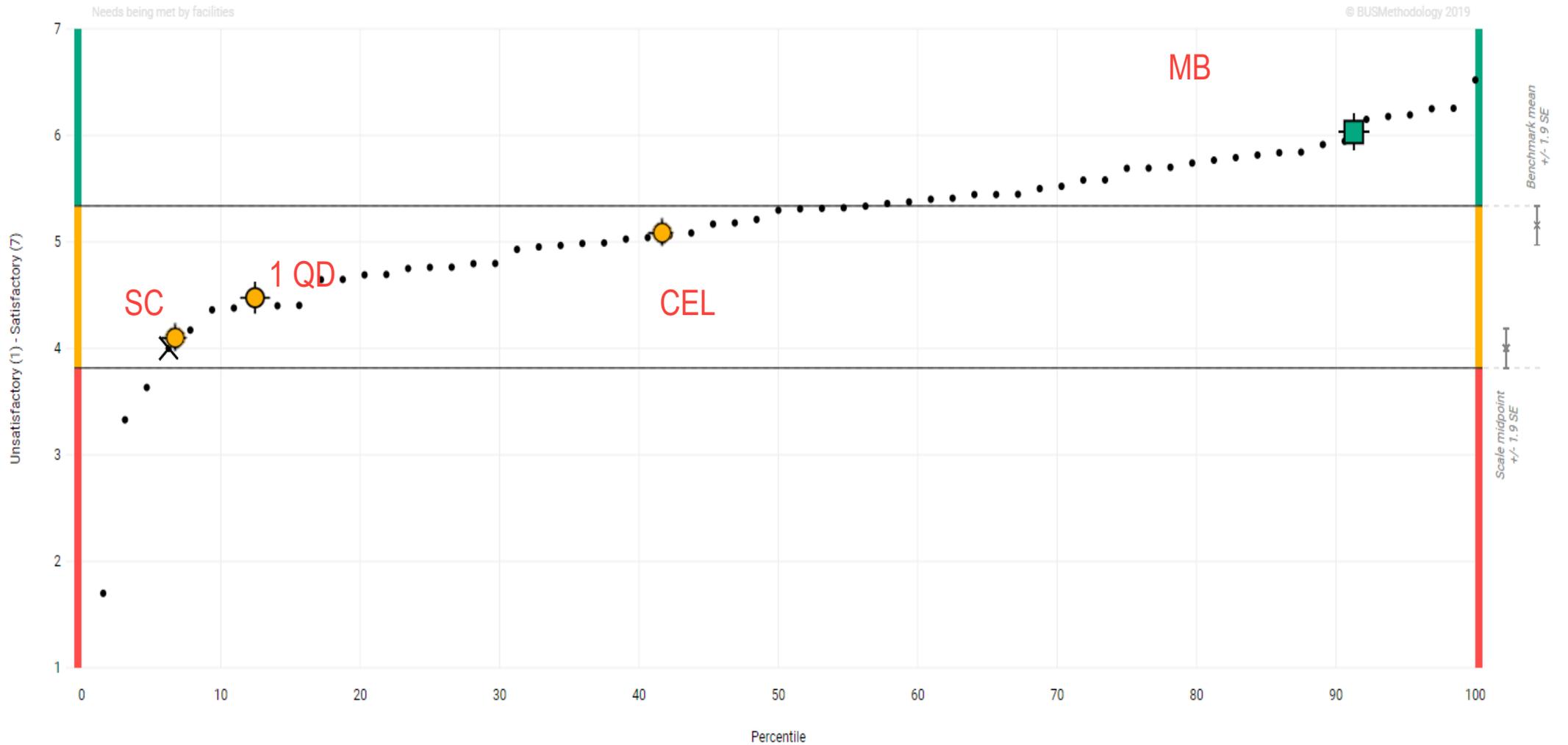
Noise

● - Benchmark survey mean ✕ - Scale midpoint ■ ● ◆ - Survey mean (icon indicates qualitative assessment)



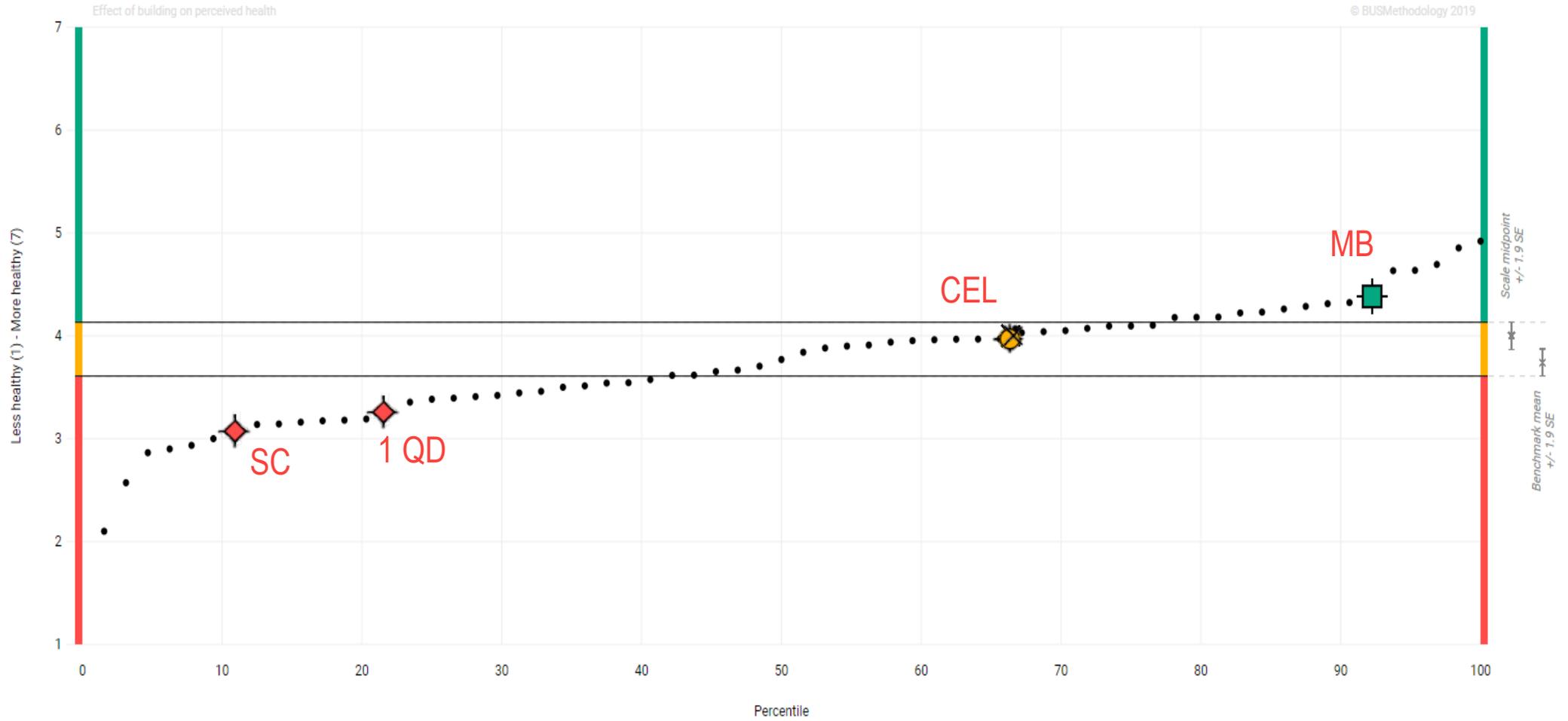
Needs

- - Benchmark survey mean
- ✕ - Scale midpoint
- ● ◆ - Survey mean (icon indicates qualitative assessment)

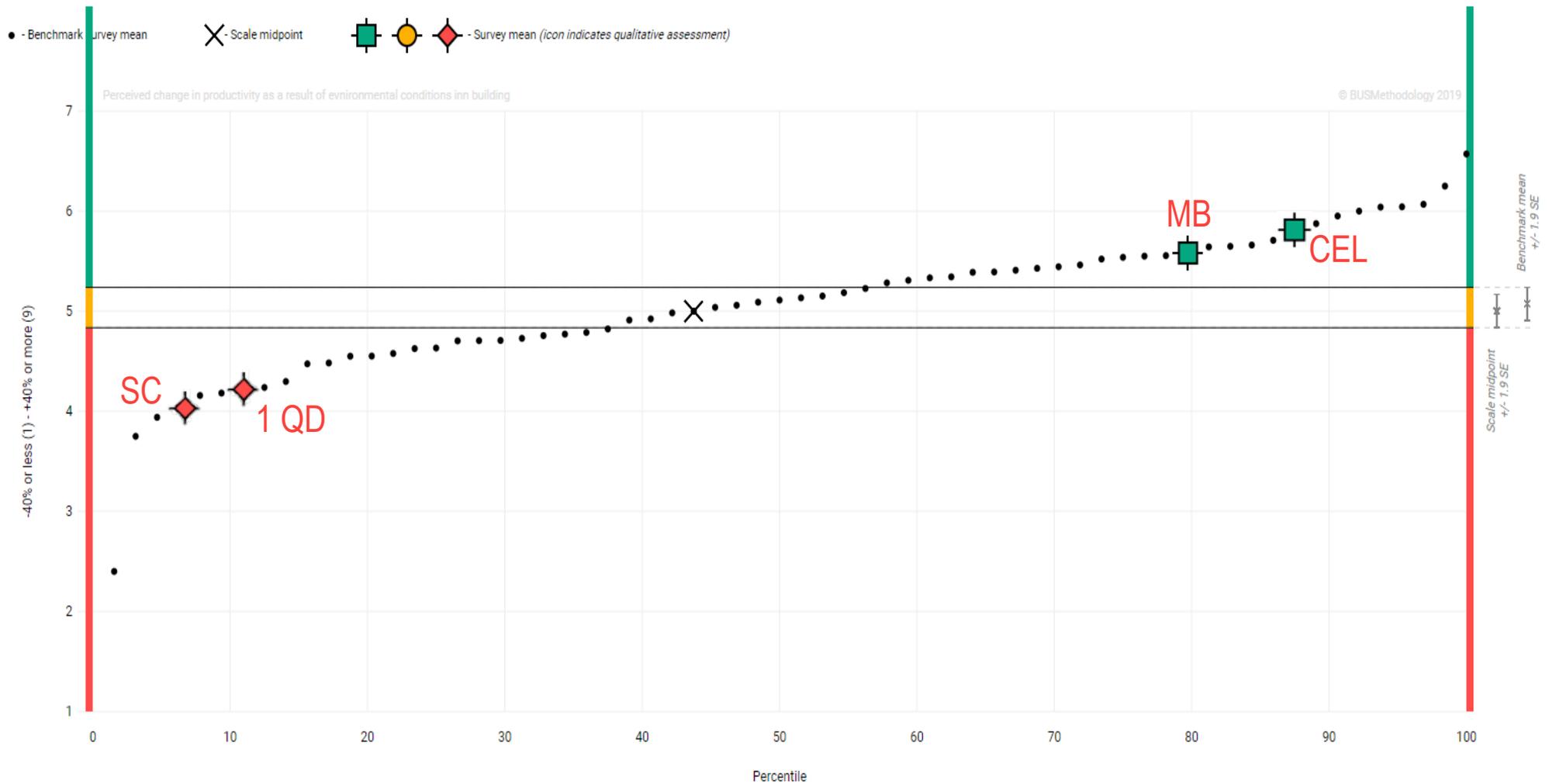


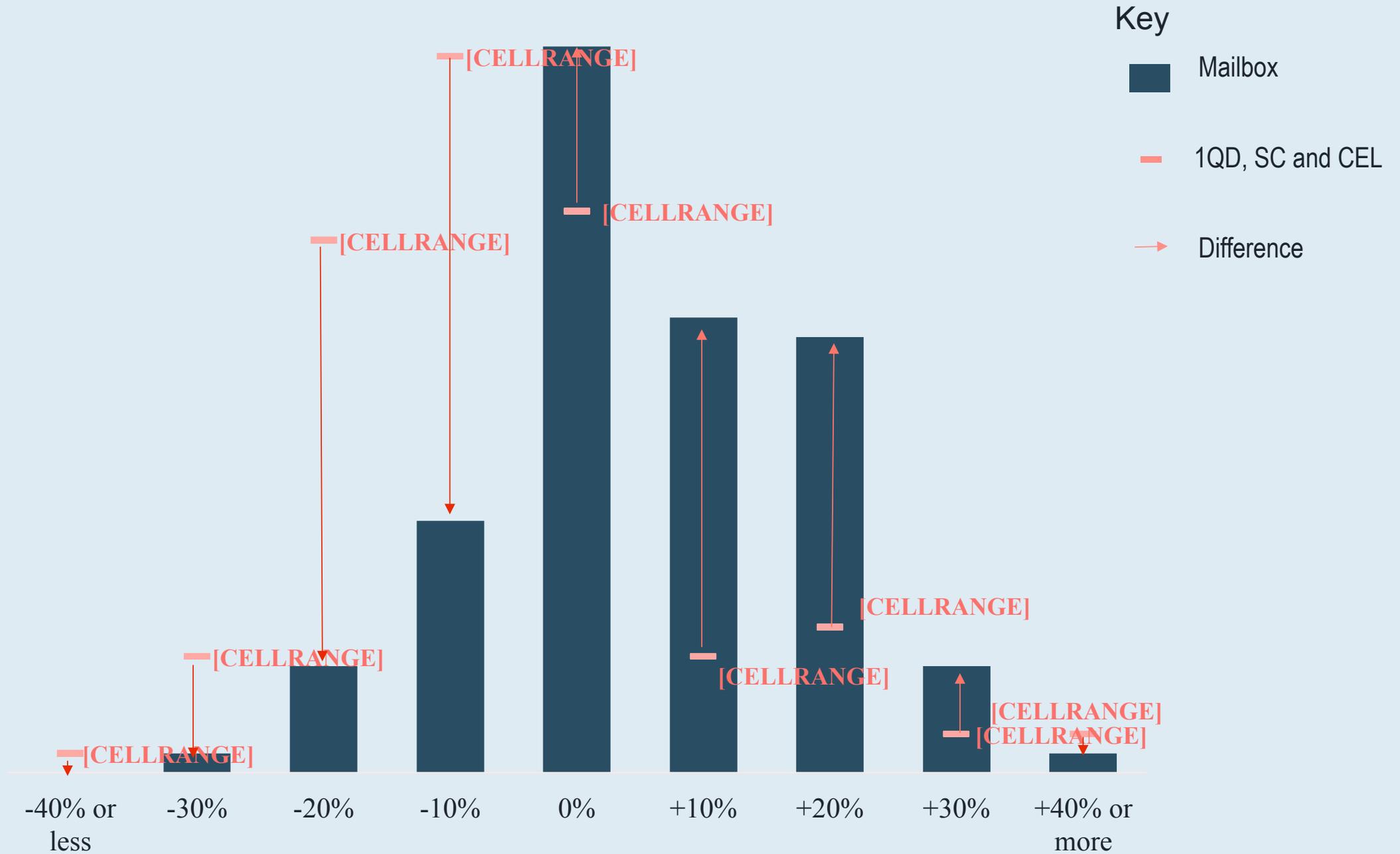
Health

● - Benchmark survey mean ✕ - Scale midpoint ■ ● ◆ - Survey mean (icon indicates qualitative assessment)



Perceived productivity





Comments about productivity

“Feels good walking in to the office in the morning unlike 1QD”

“Generally good, but I get too many technical questions from staff (part of my remit, but I also have a national remit)”

“Daylight is very welcome”

“Better set up and better environment than previous”

“Compared to previous office, more productive in Mailbox”

“Happy to spend more time in office, enjoy facilities available and opportunities to get away from some home working, free from interruptions and distractions”

“Get headaches from being too warm”

“Have found I get sore eyes and occasional headaches”

“Noise”

“Prefer quiet, calm conditions and cooler temperatures”

“When too hot it makes me feel tired”

Summary of results

Table showing change between average combined scores for IQD, SC and CEL vs Mailbox

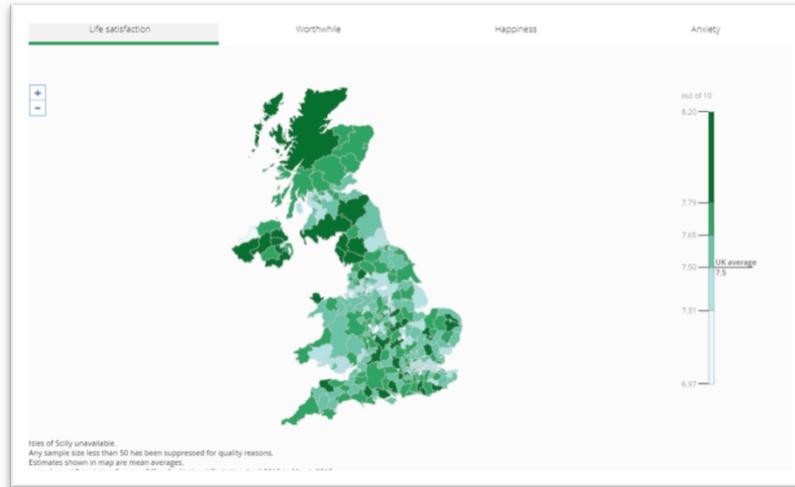
Element	Trend	% change
Building design overall		+21%
Conditions in winter overall		+6%
Effect of building on perceived health		+11%
Lighting overall		+14%
Needs being met by facilities		+15%
Noise overall		+8%
Overall comfort within the building environment		+12%
Perceived change in productivity as a result of environmental conditions		+14%
Thermal comfort in winter		+5%

Future Applications

THINK BIG *development scale*



THINK BIGGER *national scale*



Conclusions

1. Look at completed project
2. Learn from the social sciences
3. This is just the beginning