

Better places for people: Health and wellbeing measurement methods in workplaces



Brazil Case Study



Organisers:



International Co-owners:



BRAZIL - Sao Paulo city

4th country in the world in the ranking of LEED



12 million people

1228 LEED registered projects
414 LEED certified projects



Organisers:



International Co-owners:



The Why and Global relevance

WGBC Study - Health, Wellbeing & Productivity in offices



Case study in **Brazil** in accordance with **ISO 10551, ISO 28802:2012**
Partnership with **IPT (Technological Research Institute)**



Organisers:



International Co-owners:



The How and Methodology

LEED CI Certified offices – 8 companies more than 300 occupants participating.



- ✓ **Perceptual Method:** human perceptions by an online confidential questionnaire (using Likert scale) applied to the occupants of the buildings;



- ✓ **Physical Metrics:** physical features of buildings related to thermal, acoustic and light comforts, (Air temperature and velocity, Radiant temperature average, humidity, Illuminance on the work plan, Sound pressure level). The measurements provide a diagnosis of the quality of the environment.

Factors evaluated by the Perceptual Method



- ✓ Indoor air quality & ventilation;
- ✓ Thermal comfort;
- ✓ Lighting & Daylighting;
- ✓ Noise & acoustics;
- ✓ Interior layout and ergonomics;
- ✓ Biophilia & views;
- ✓ Look & Feel;
- ✓ Transport;
- ✓ Access to Amenities.

Objective of the study

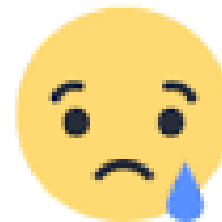


Analysis of Brazilian case studies, in order to **verify**, through perceptual methods and physical measurements **how the sustainable environment in Brazilian offices influences the well-being of employees.**

Wellbeing

Satisfaction with life
+ Positive affects
- negative aspects
Cognitive relationships
Genetics and environment
Emotional aspects

Scientific study of **happiness**



Synesthesia

Human relation with
the built environment

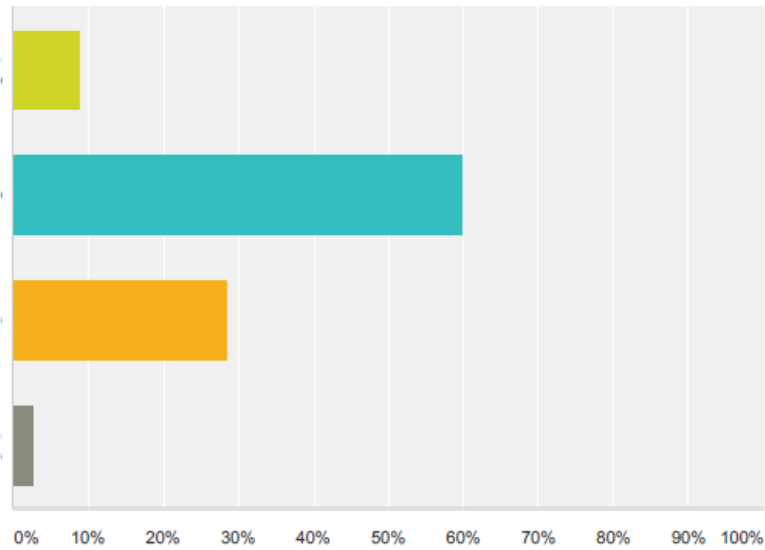
5 senses

Or 6?

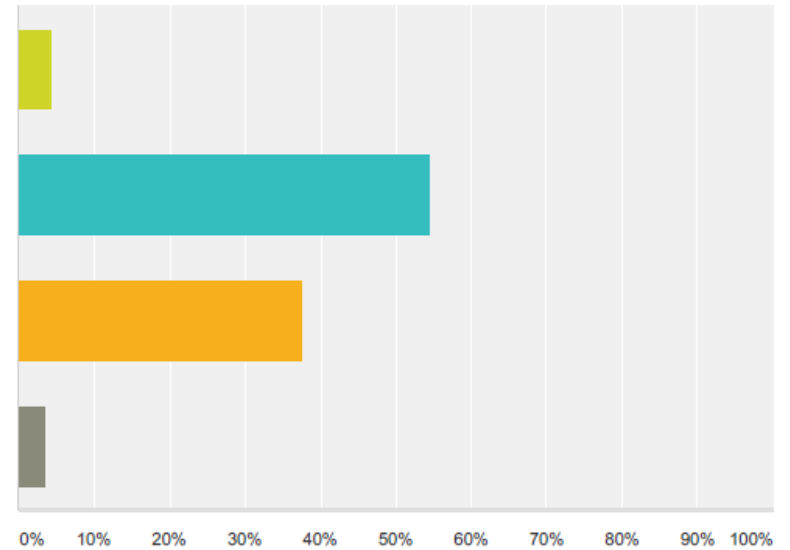
Or 7 senses...



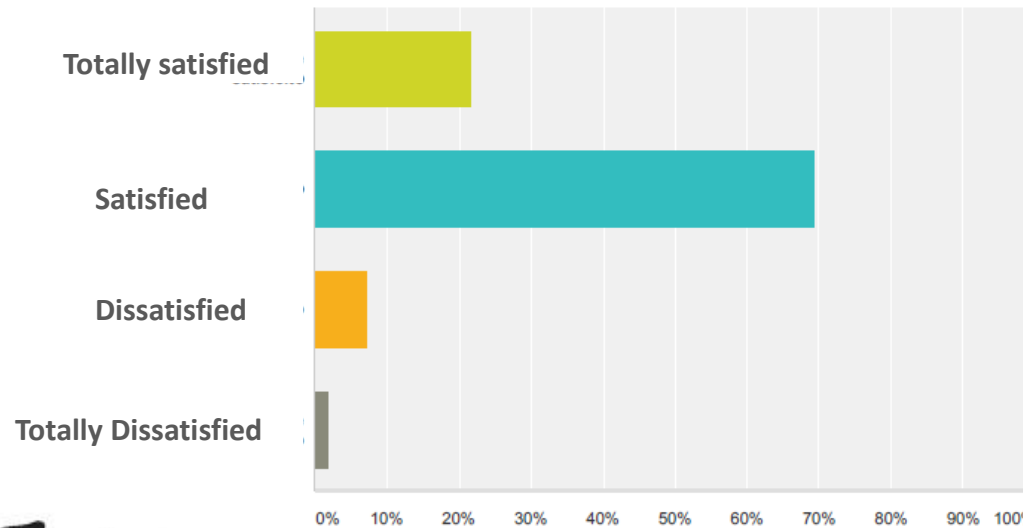
1- Air quality and ventilation



2- Thermal comfort



3- Daylighting and lighting



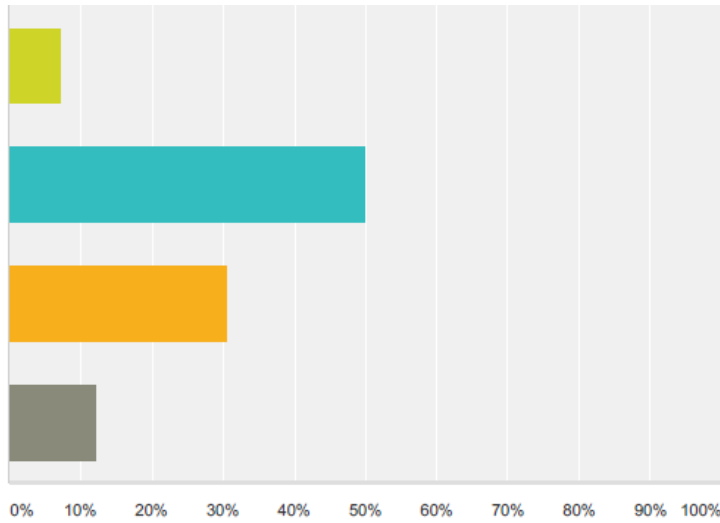
Organisers:



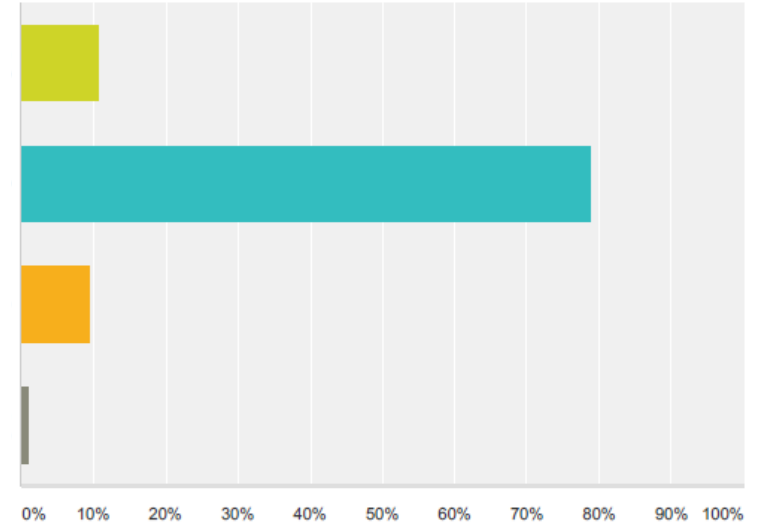
International Co-owners:



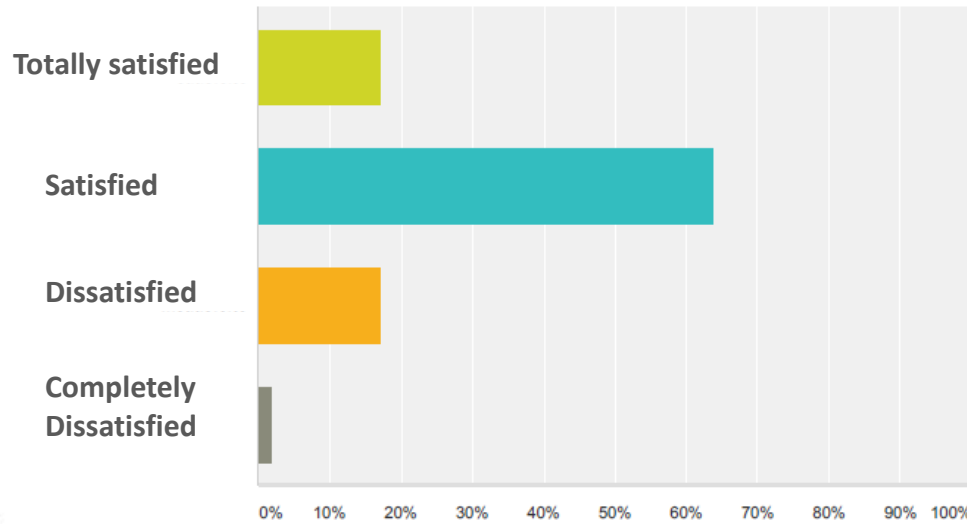
4- Acoustics quality



5- Interior layout and Ergonomics



6- Green area and views- Biophilia



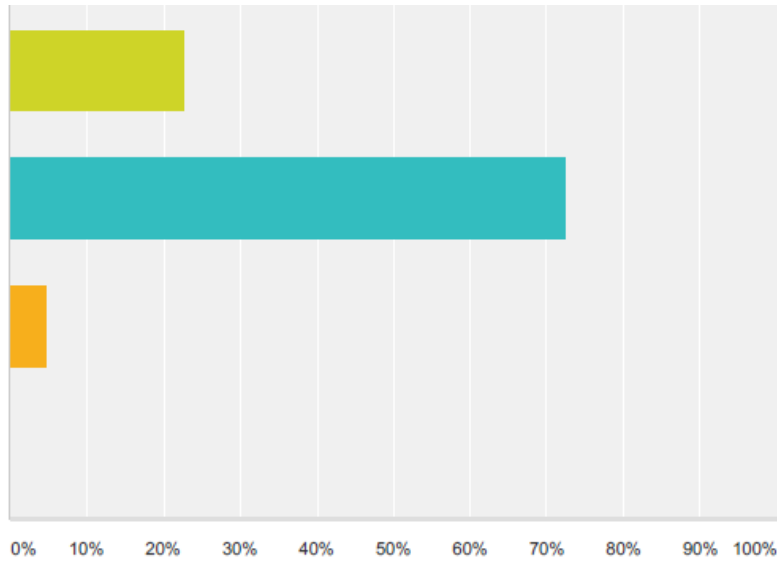
Organisers:



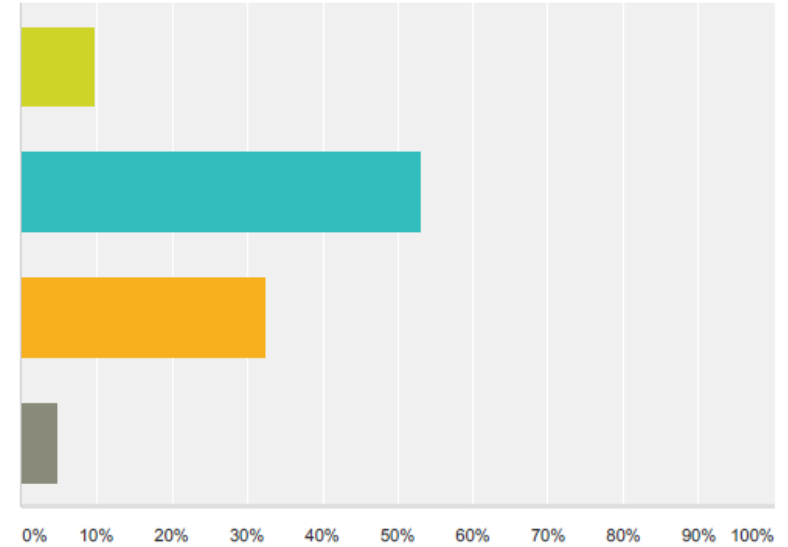
International Co-owners:



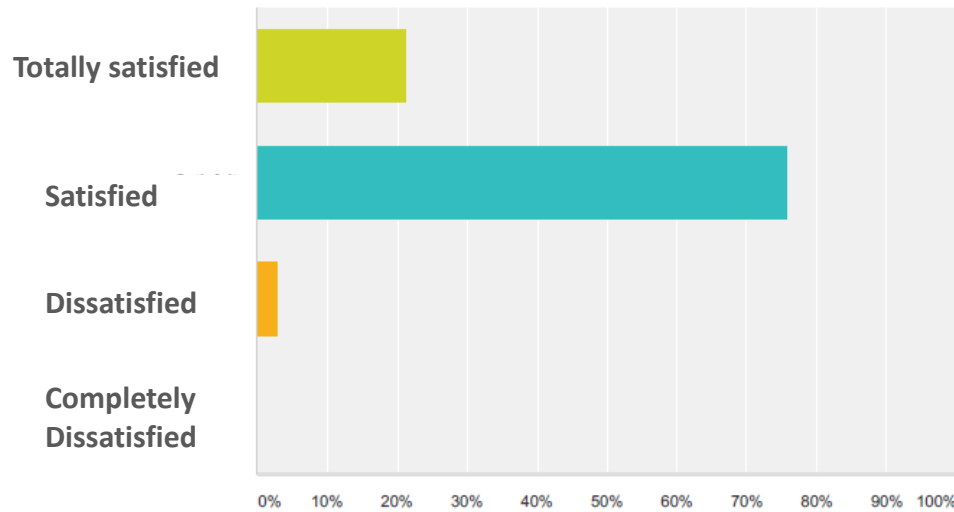
7- Look and feel



8- Transportation



6- Green area and views- Biophilia



Organisers:



International Co-owners:



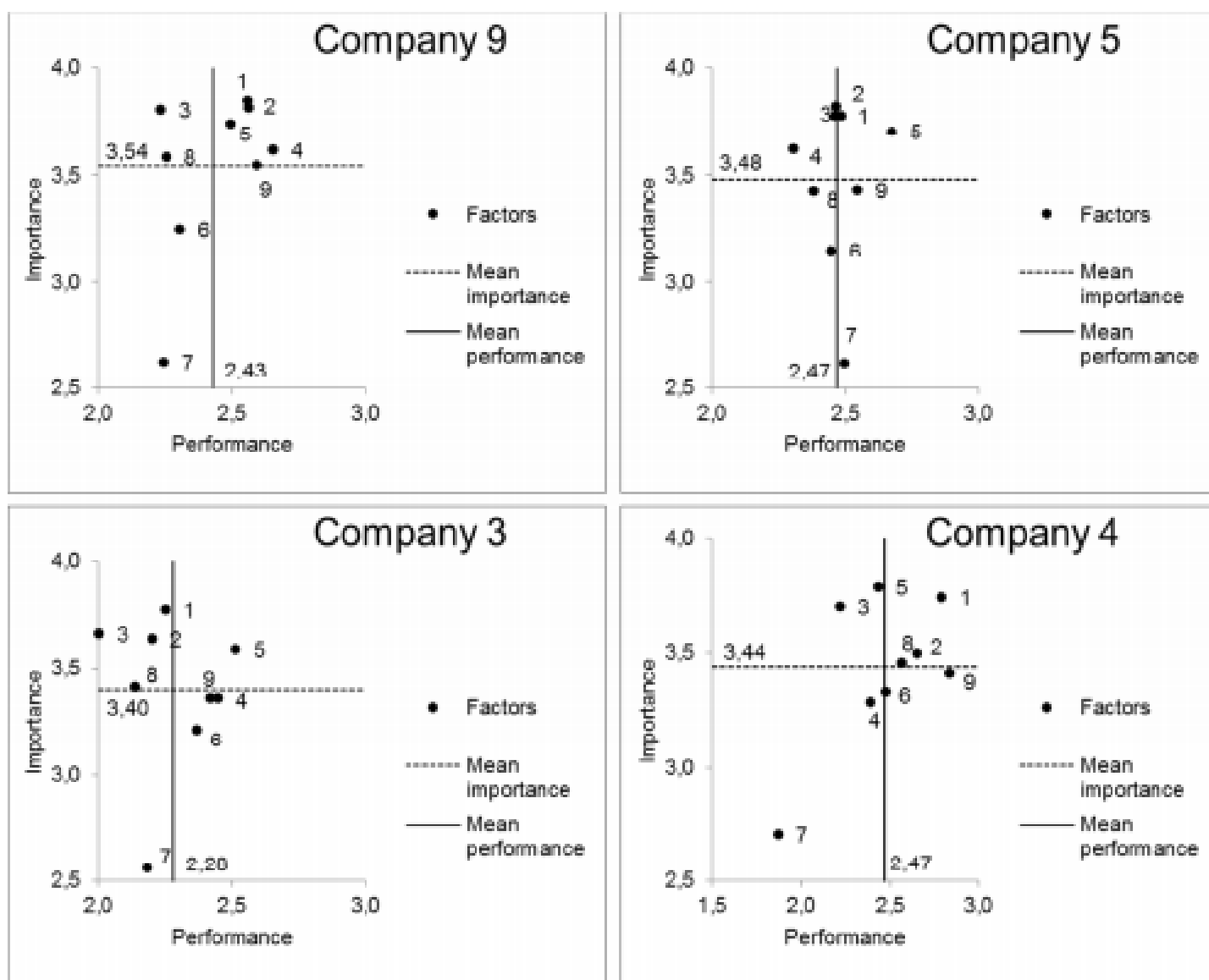
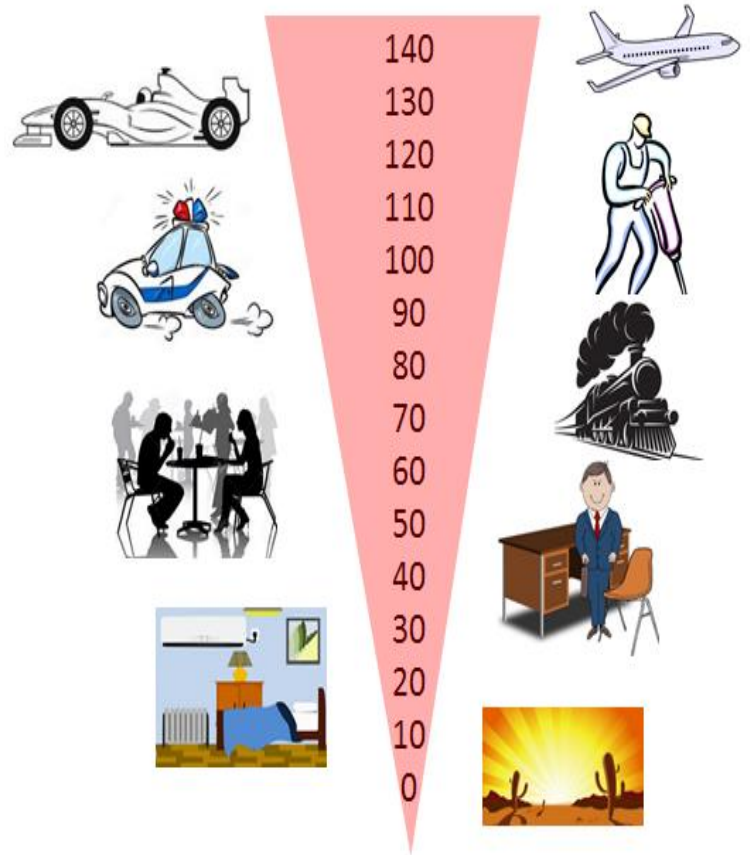
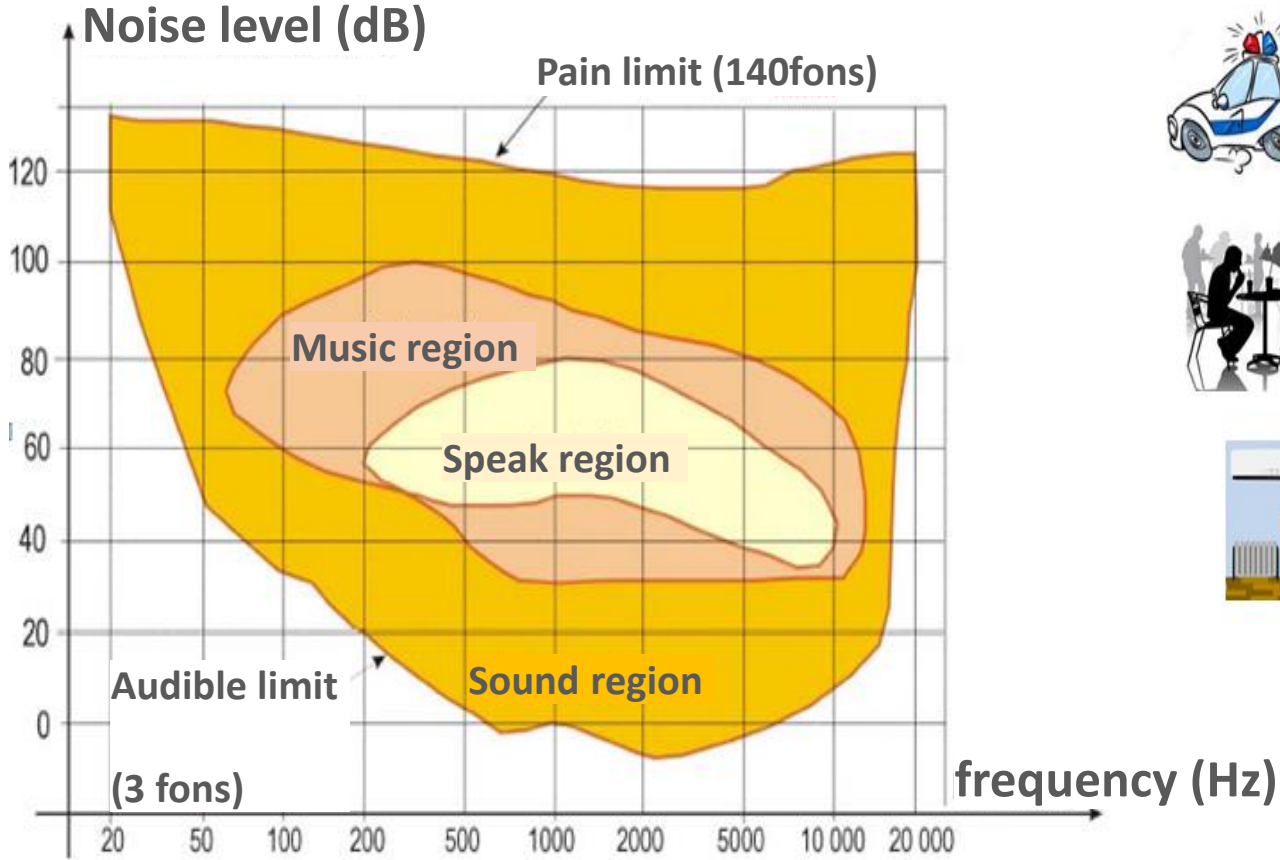


Figure 1: Matrix Importance/Performance of seven factors separated by company

Noise level (dB) and Frequency (Hz)



Brazilian Code



DEZ 1987

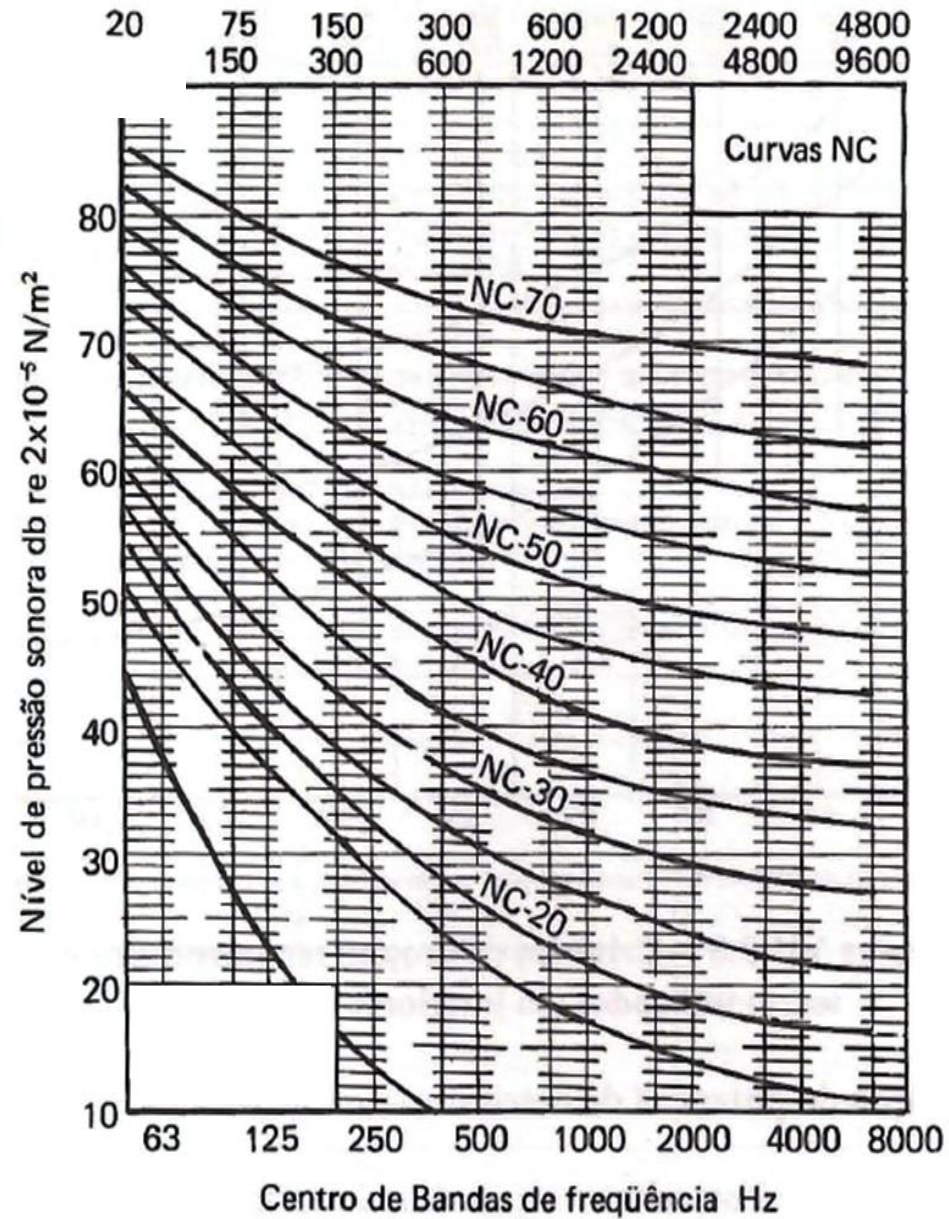
NBR 10152

Níveis de ruído para conforto acústico

Residências		
Dormitórios		35-45
Salas de estar		40-50
Auditórios		
Salas de concertos, Teatros		30-40
Salas de conferências, Cinemas, Salas de uso múltiplo		35-45
Restaurantes		40-50
Escritórios		
Salas de reunião		30-40
Salas de gerência, Salas de projetos e de administração		35-45
Salas de computadores		45-65
Salas de mecanografia		50-60
Igrejas e Templos (Cultos meditativos)		40-50
Locais para esporte		
Pavilhões fechados para espetáculos e atividades esportivas		45-60



NR-17 (65 dB)

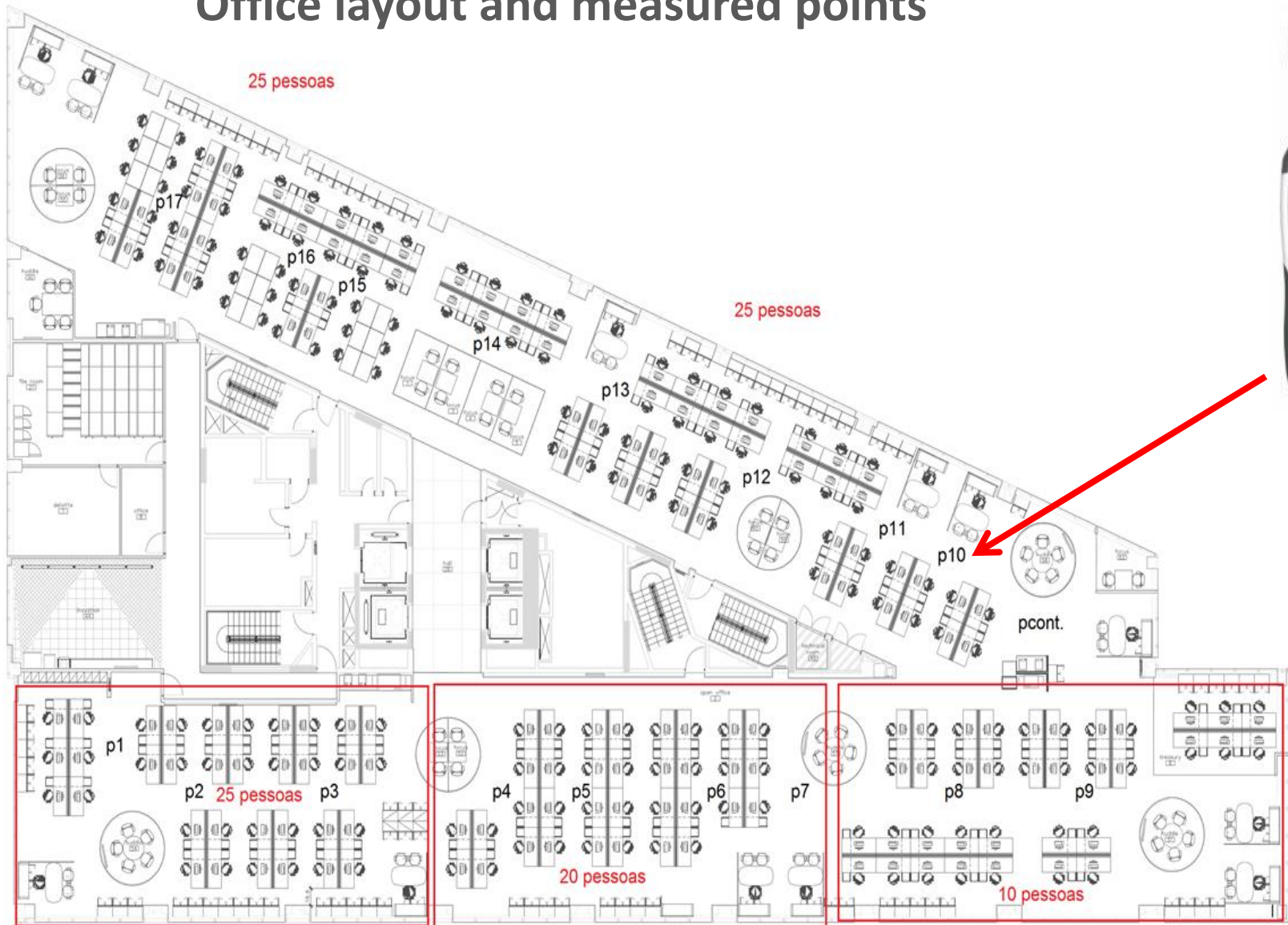


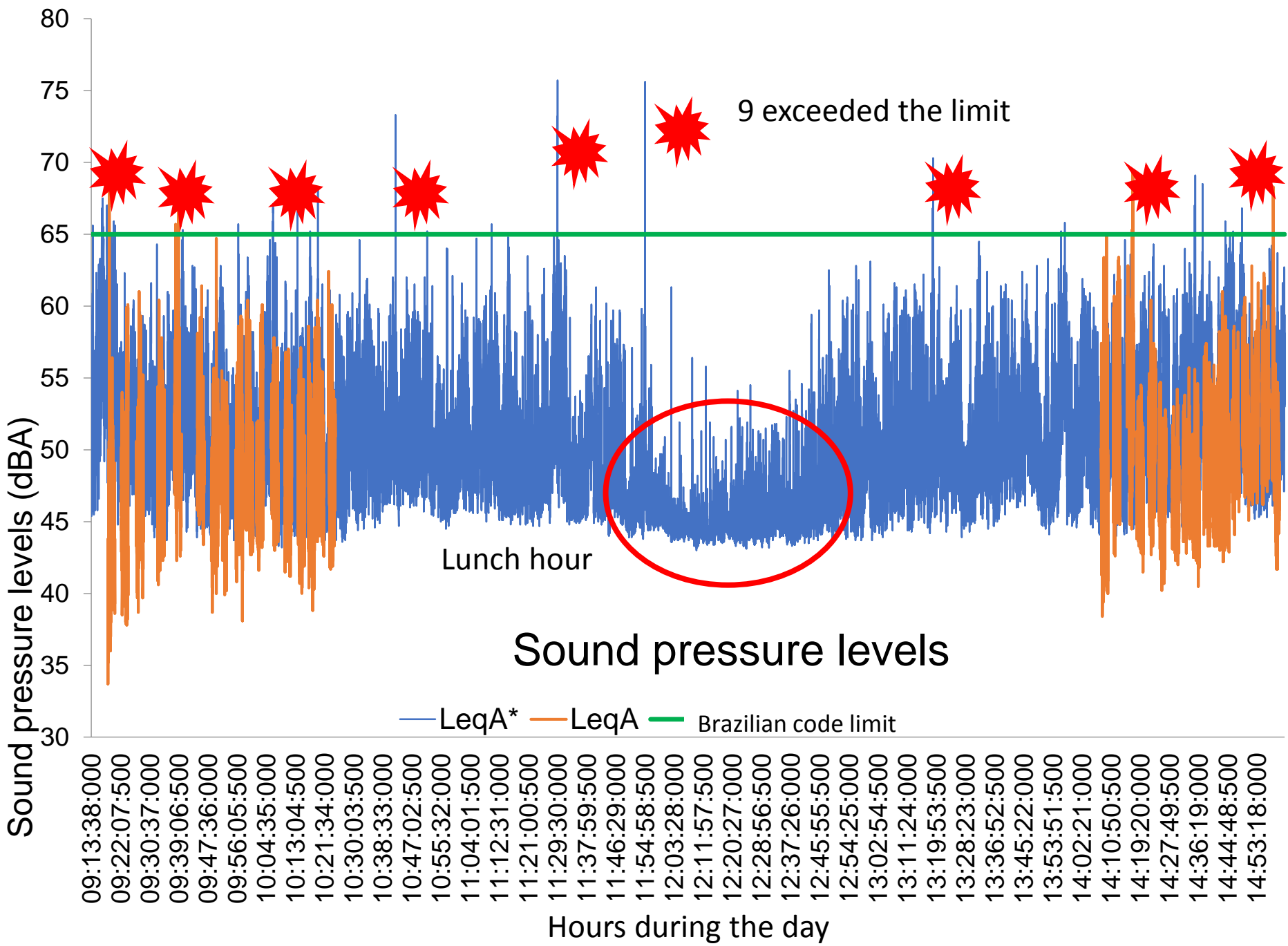
People complained at questionnaire

	Never (%)	Sometimes (%)	Many times (%)	Always (%)
I feel distracted/ annoyed by noise from phones, printers, computers, keyboards and other equipment.	12,96	42,59	24,07	20,37
If windows are opened, there is too much street noise.	61,54	12,09	10,99	15,38
I feel distracted/ annoyed by machine noise from outside.	78,79	17,17	3,03	1,01
I can hear vibration noise	64,42	28,85	2,88	3,85
I feel distracted/ annoyed by speaking people noise at office.	8,41	29,91	28,97	32,71
I feel distracted/ annoyed by air conditioning vibration noise.	56,19	34,29	6,67	2,86

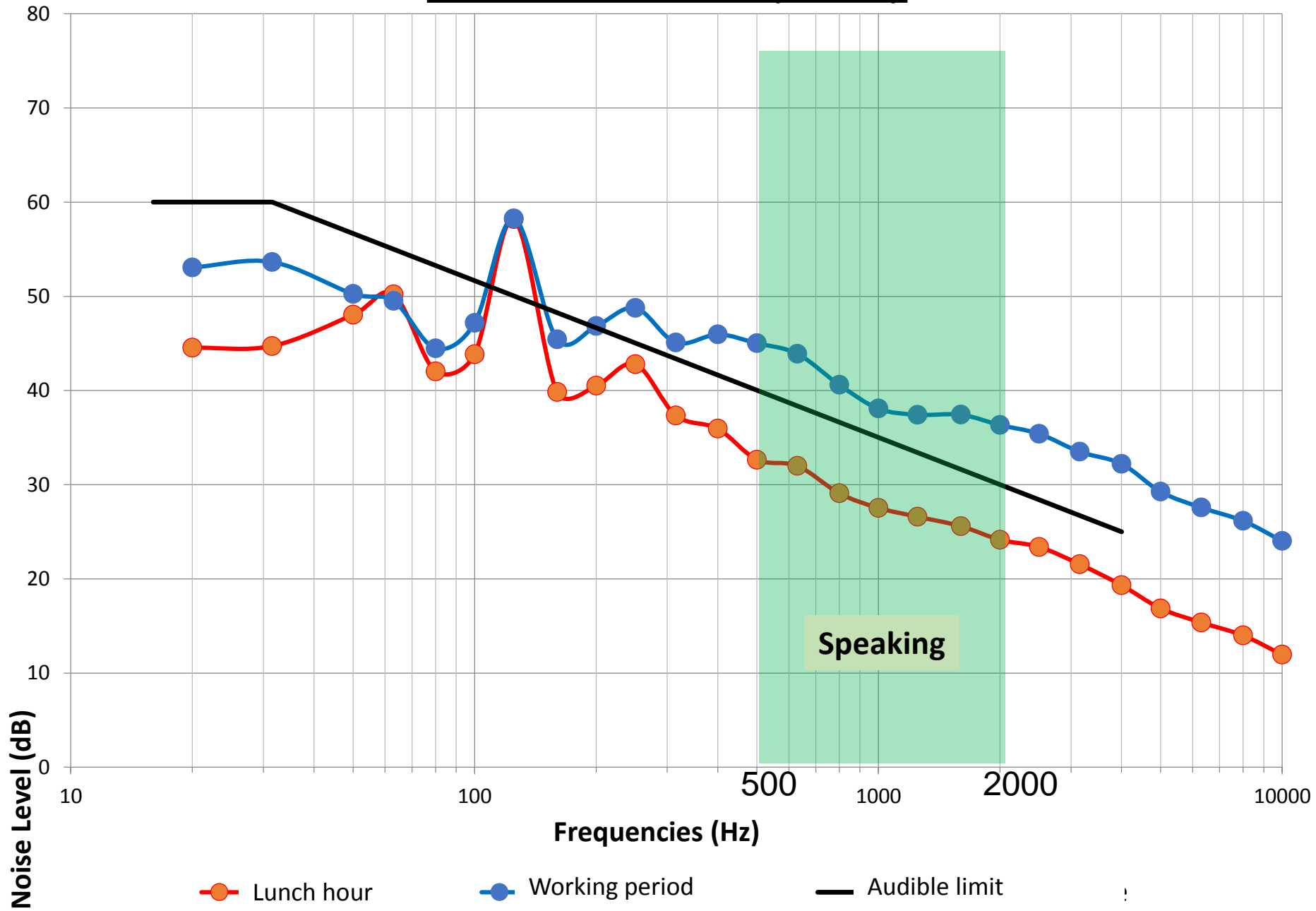
Table 1: Noise level perceptions at workplace

Office layout and measured points





Noise level x frequency



Conclusions

- Physical measurements proved occupants' dissatisfaction evidenced in the perceptive method,
- LEED certified building facades isolate the external noise. Noise that generates dissatisfaction is internal.
- Need balance behavioural habits and cultural issues to work in open offices.
- Green buildings should focus on people and human beings, because human resources are the most important assets.
- Brazilian sustainable facility managers really need to integrate with human resources managers to benefit all, **planet, people and profit.**



Thank you

If you have any doubts, please write an email to:

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Organisers:



International Co-owners:



Sustainable Buildings
and Climate Initiative
Promoting Policies and Practices for Sustainability

