Workplace, Wellbeing & Wondrous Sounds

ANC Conference 2016
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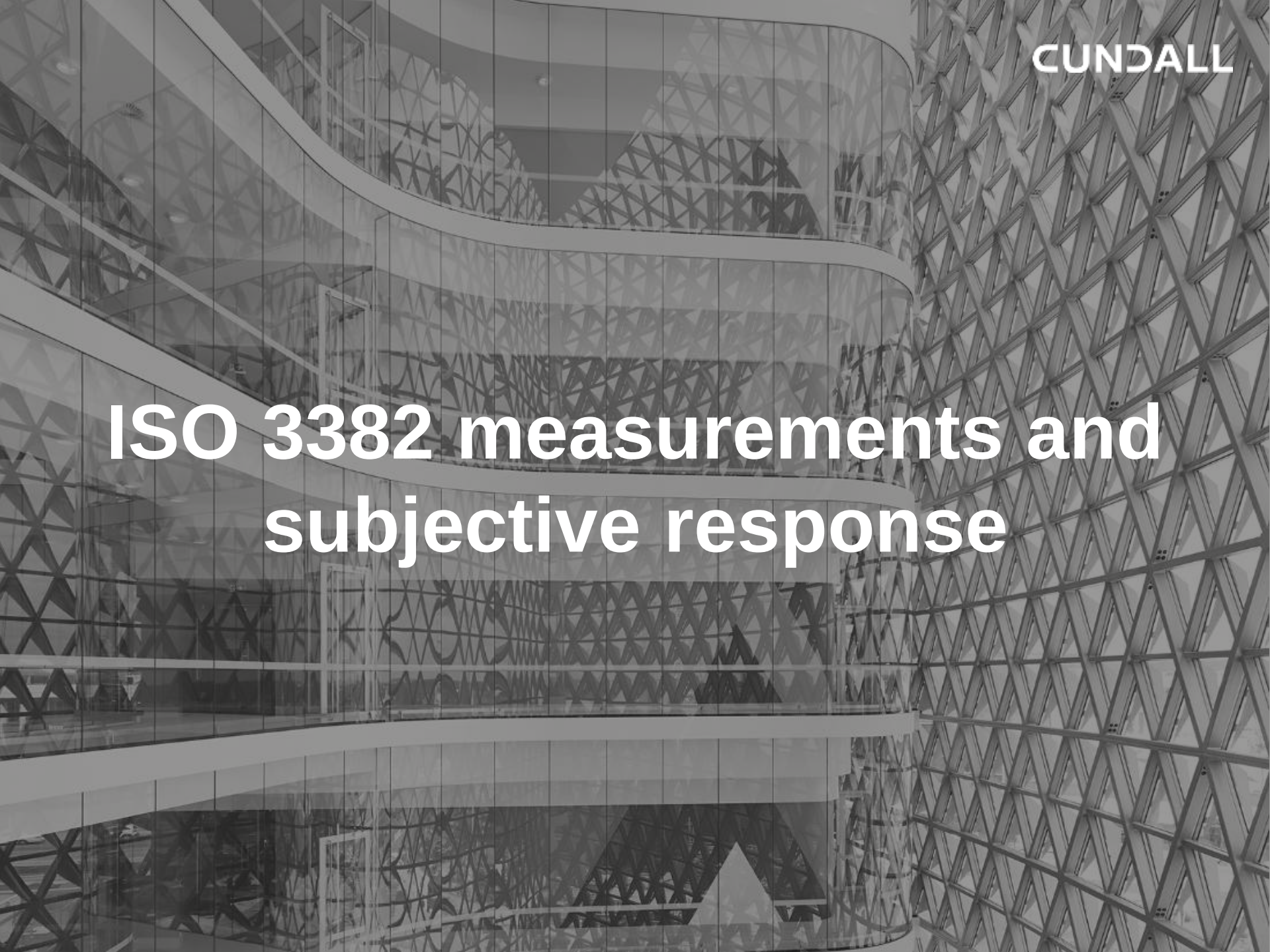
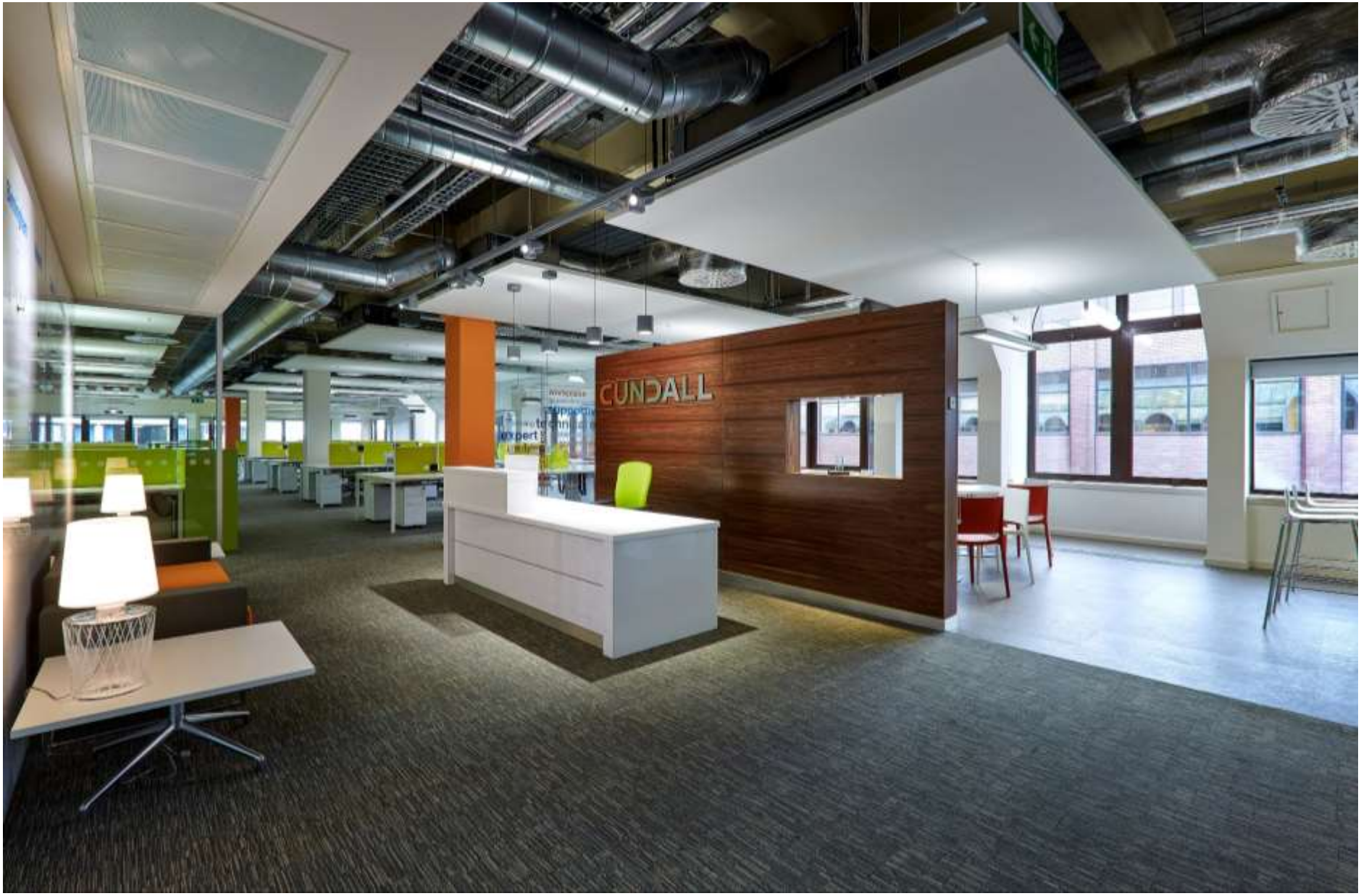


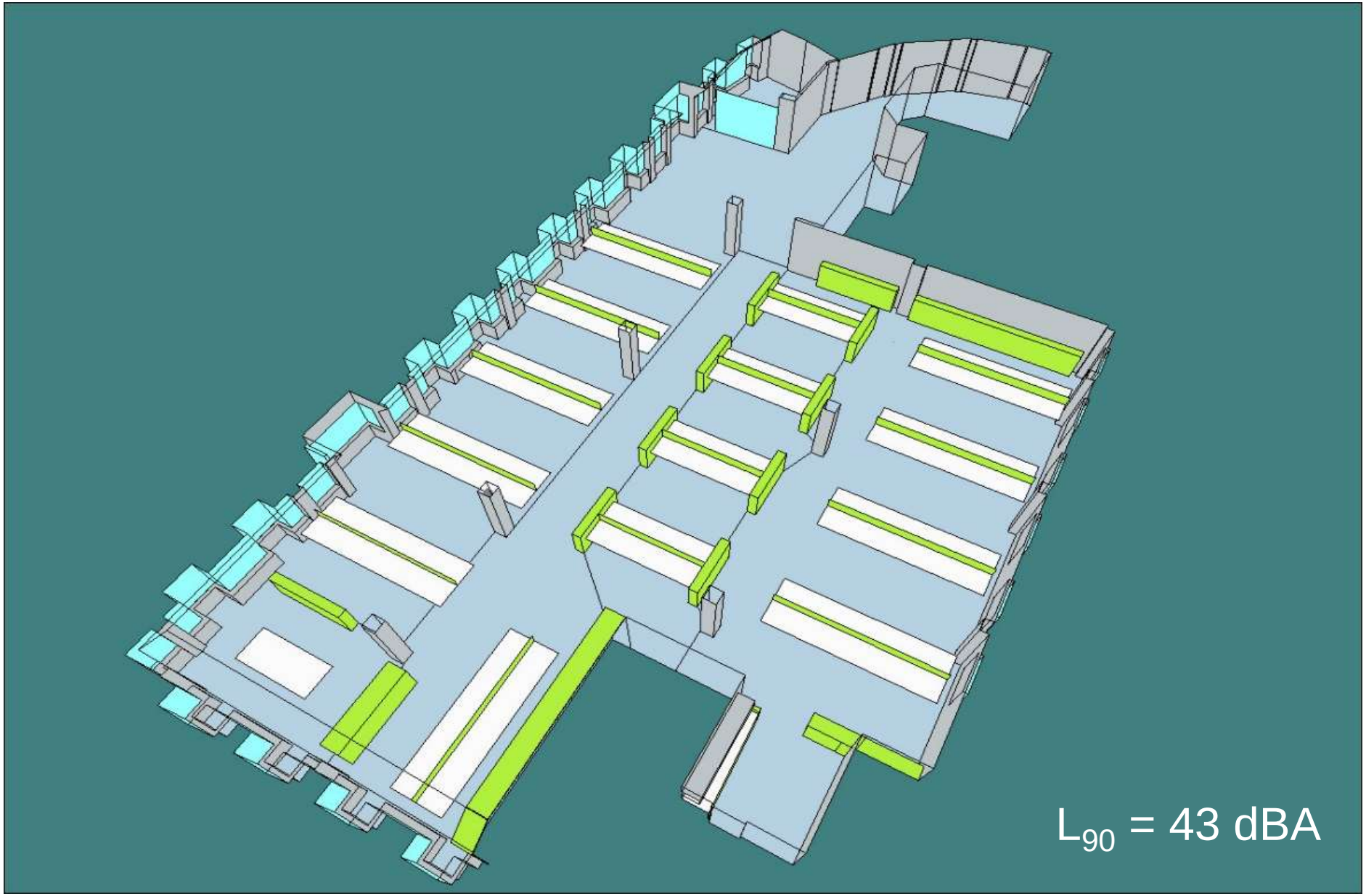
ISO 3382 measurements and subjective response

Example 1: Cundall Birmingham

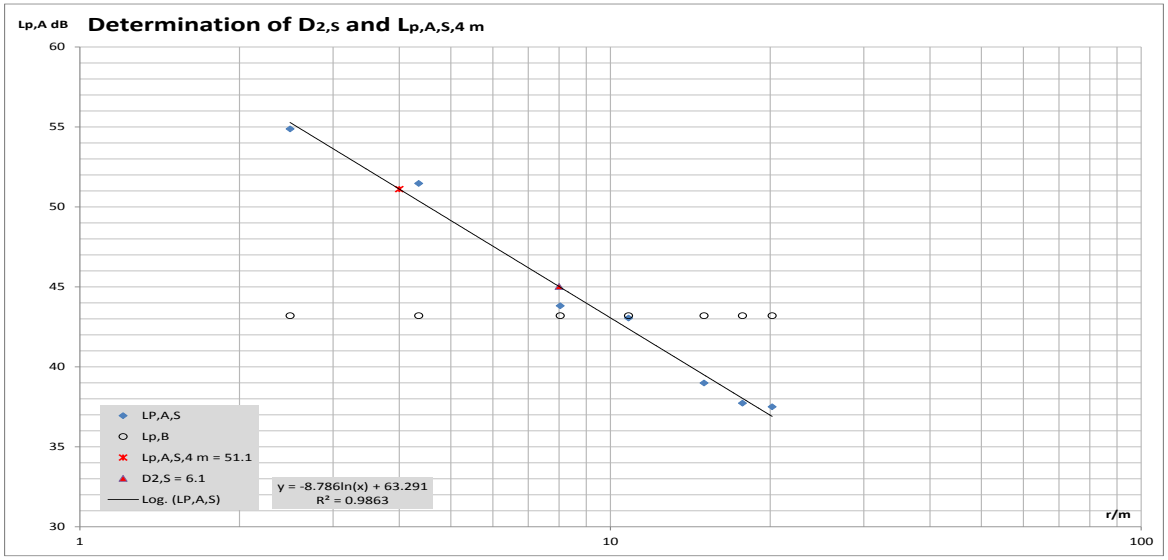
CUNDALL

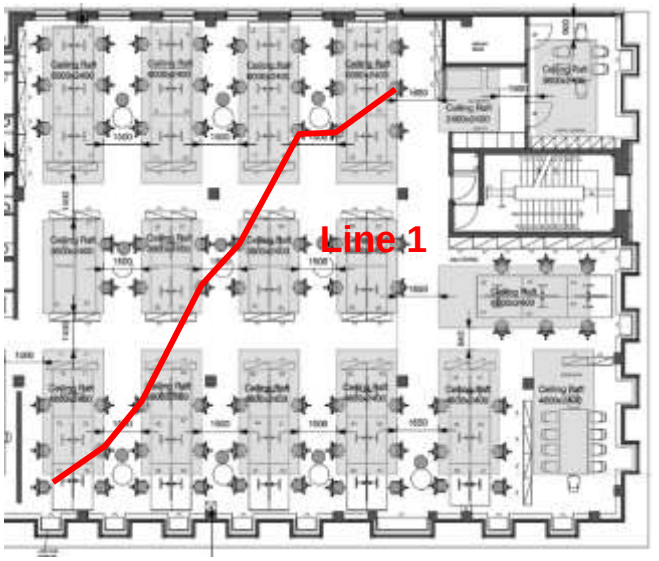


Example 1: Cundall Birmingham



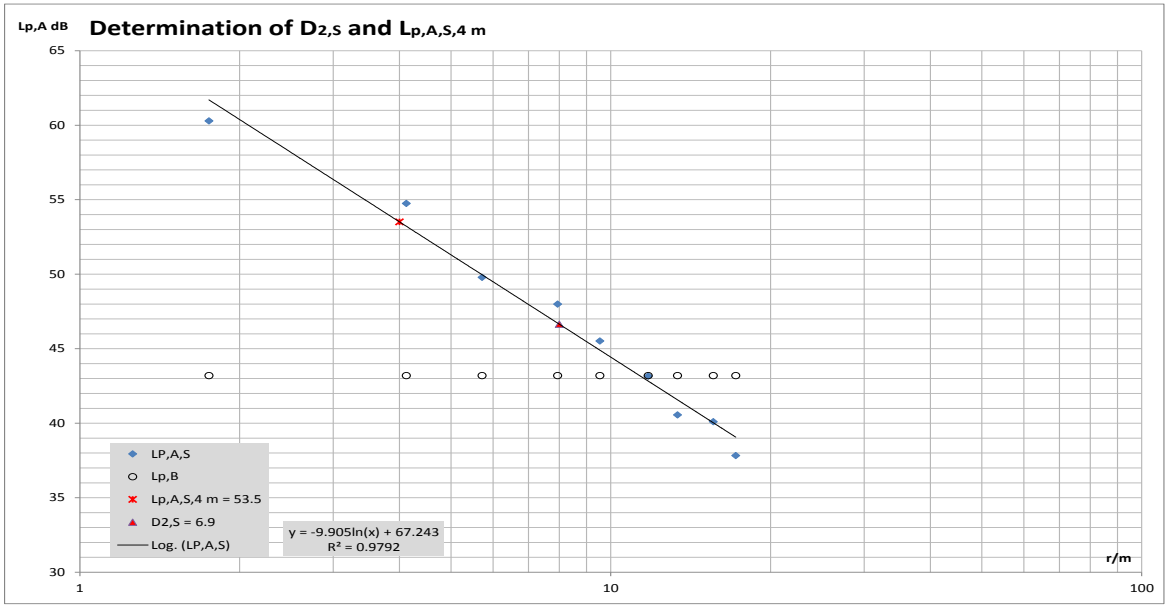
$D_{2,s}$, $L_{p,A,S,4\ m}$ and $L_{p,B}$: Line 1

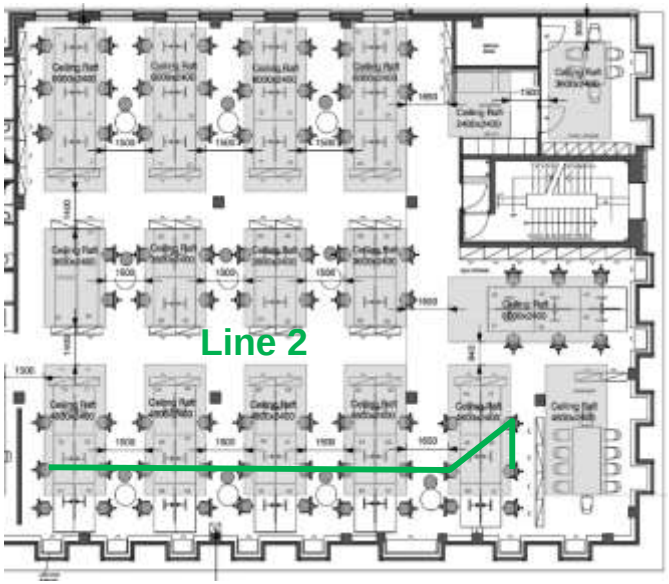




Parameter	Definition	ISO 3382 target	Measured	CATT Raft	CATT Class A	CATT Class D
$D_{2,S}$	Rate of spatial decay of A-weighted sound pressure level of speech per distance doubling	≥ 7 dB	6.1	4.9	5.7	5.4
$L_{p,A,S,4\ m}$	Nominal A-weighted sound pressure level of normal speech at a distance of 4.0 m from the sound source	≤ 48 dB	51.1	49.3	48.5	50.2

$D_{2,s}$, $L_{p,A,S,4\ m}$ and $L_{p,B}$: Line 2





Parameter	Definition	ISO 3382 target	Measured	CATT Raft	CATT Class A	CATT Class C
$D_{2,S}$	Rate of spatial decay of A-weighted sound pressure level of speech per distance doubling	≥ 7 dB	6.9	6.2	6.0	6.1
$L_{p,A,S,4\ m}$	Nominal A-weighted sound pressure level of normal speech at a distance of 4.0 m from the sound source	≤ 48 dB	53.5	54.7	48.9	50.7

Distraction and Privacy

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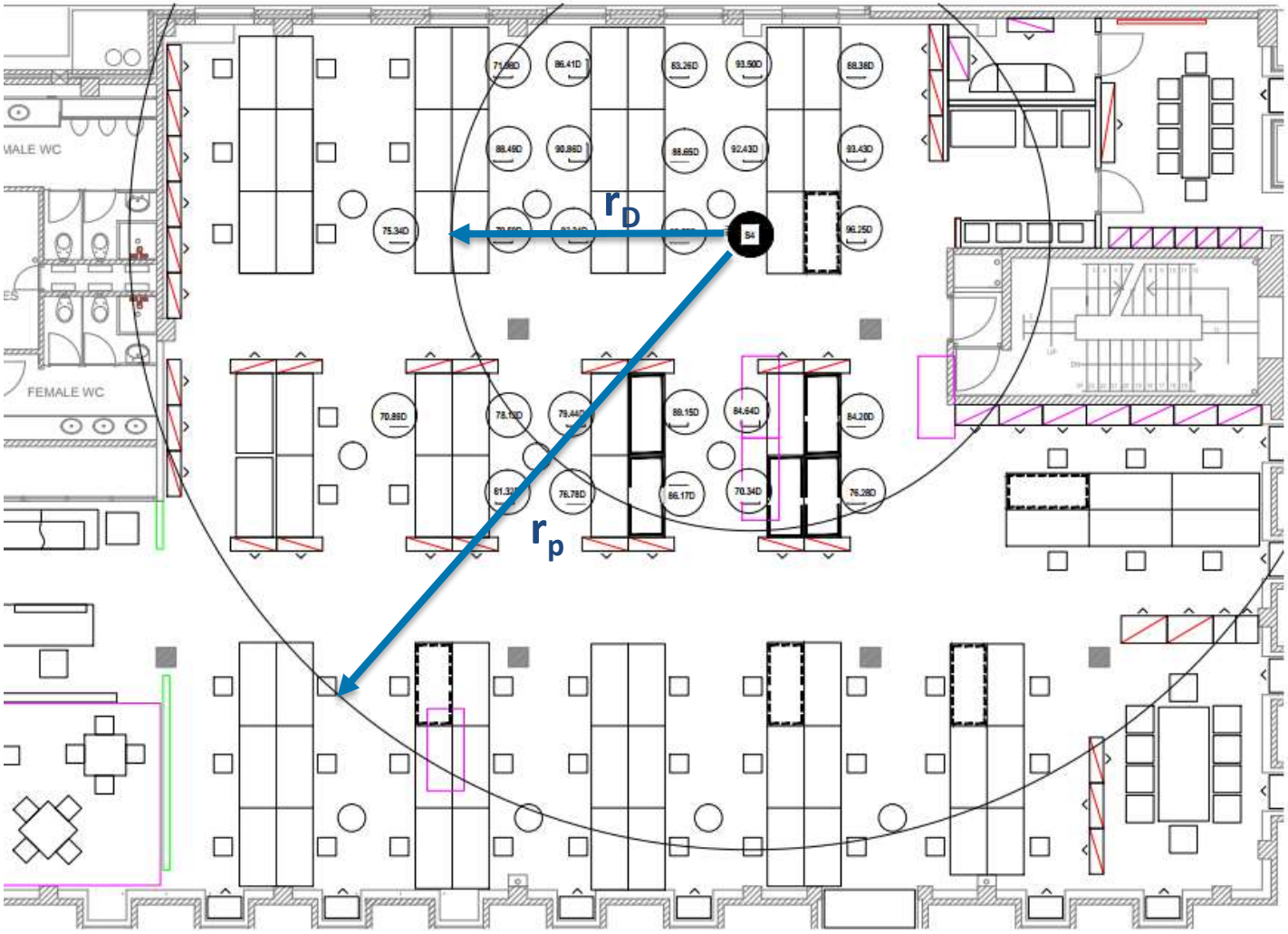

Line 3	
r_D	6.5
r_P	13.5

r_D	Distraction distance	Distance from speaker where the speech transmission index falls below 0.50 Target values in ISO 3382 for good conditions within an open plan office are ≤ 5 m
r_P	Privacy distance	Distance from speaker where the speech transmission index falls below 0.20

Example 2: Cundall London

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Example 2: Cundall London

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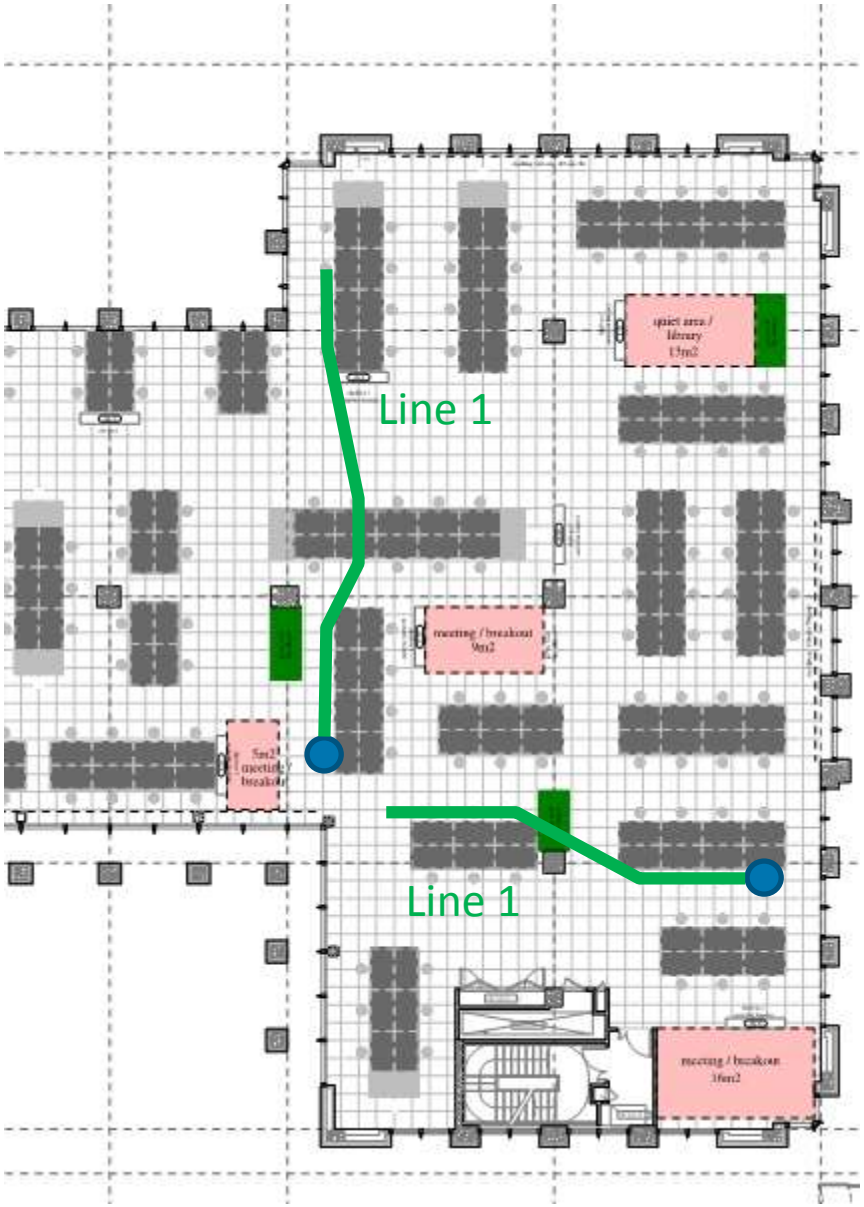
L_{90} = 39 dBA

Example 2: Cundall London



Parameter	ISO 3382 target	Line 1	Measured
$D_{2,S}$	≥ 7 dB	7.3	7.5
$L_{p,A,S,4\ m}$	≤ 48 dB	56.1	54.1

Comparison of results

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Location	Description	Ave. $D_{2,s}$	Ave. $L_{p,A,S,4\ m}$
Birmingham	Exposed soffit (4 m), Ecophon Solo rafts (2.7 m) to 30% floor area, 600 mm fabric upstands, 1800 mm storage units, carpet	6.5	52.3 [95.3]
London	SAS Class A metal perf. ceiling (2.7 m), plants and full-height shelving, bolon	7.4	55.1 [94.1]

Observations:

- Full ceiling gives slightly better loss over distance
- Rafts show bigger L_p drop at 4 m!?!
  - Diffraction over desk dividing screens?
  - Hit/miss arrangement of rafts?
- Higher L_{90} in Birmingham subjectively better privacy
- Small data set, more needed!
- Staff love both spaces!

WELL Building Standard

WELL Building

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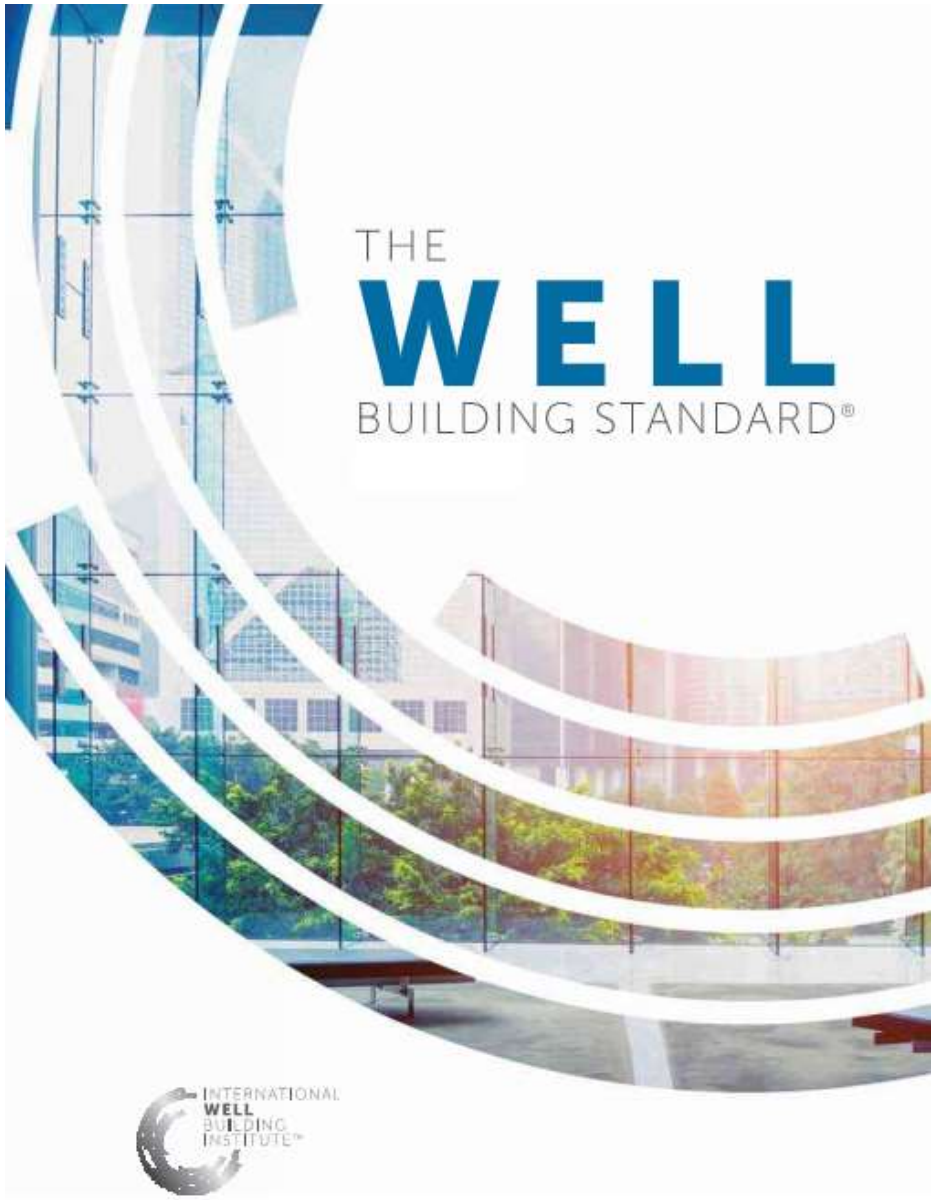
- Research pioneered by Delos Living
- Administered by the International WELL Building Institute
- Third party certified through GBCI
- Focuses on Health & Wellness
- Research based standards for health and comfort



People are our greatest asset

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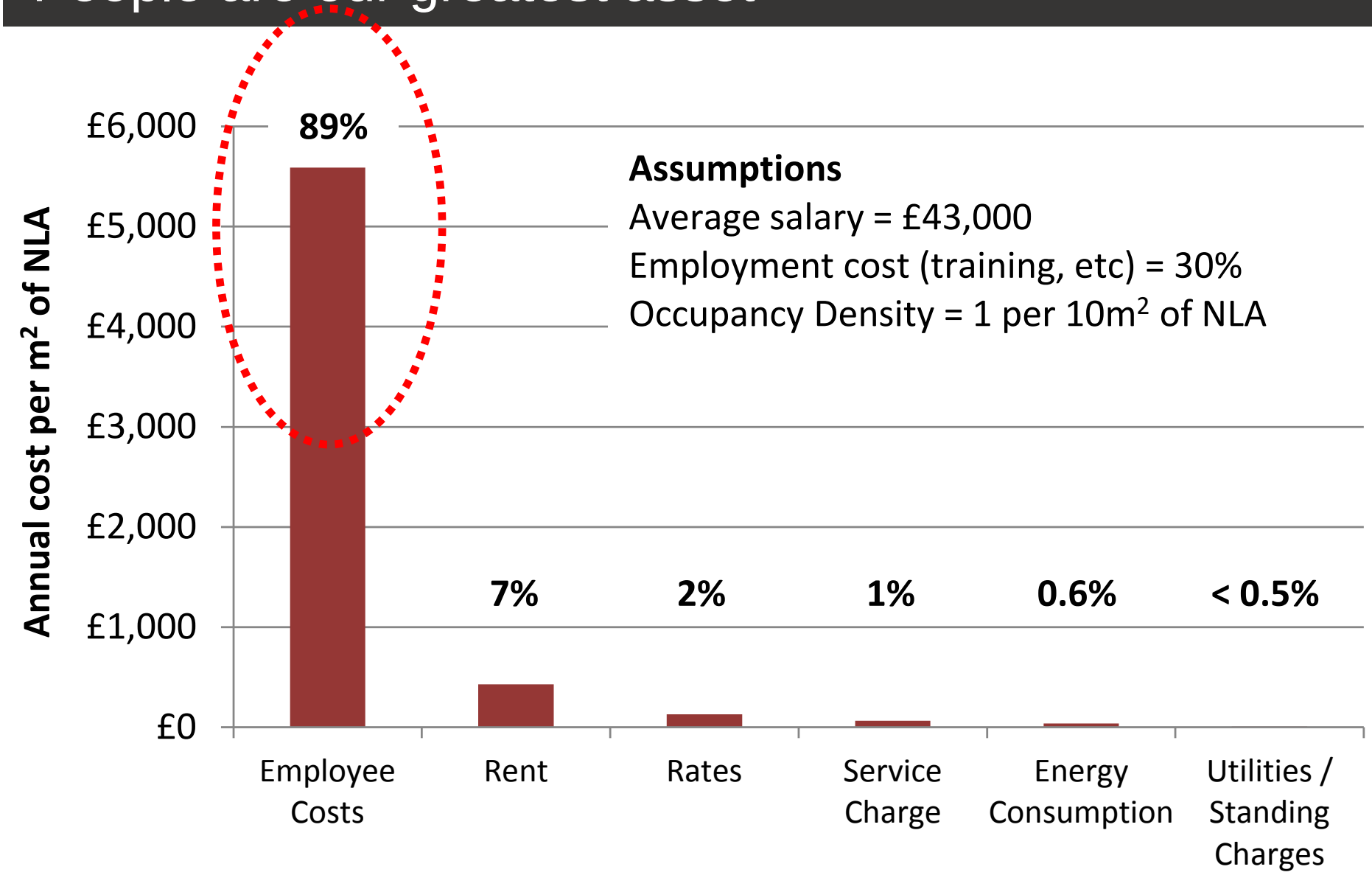

Source: What Colour Is Your Building, David Clark, RIBA Publishing 2013

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The route to WELL

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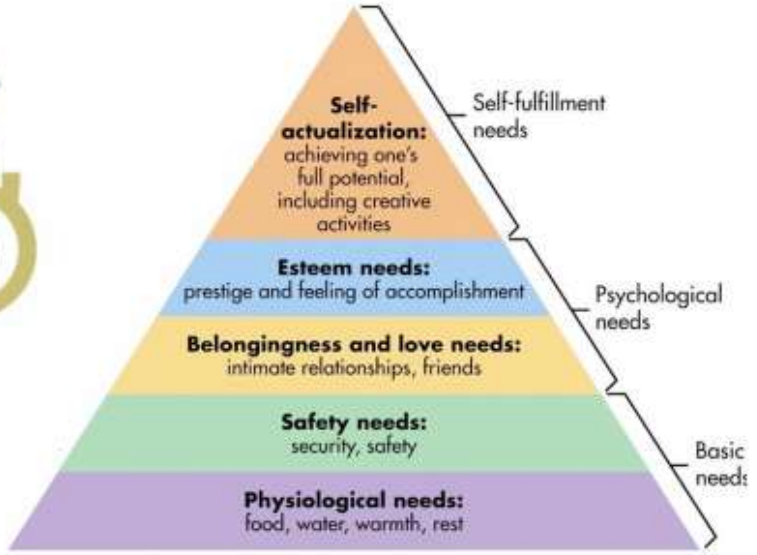

WELL and Acoustics

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- **Credit 74: Exterior Noise Intrusion**
  - Noise break-in ≤50 dBA
- **Credit 75: Internally Generated Noise**
  - Planning loud and quiet zones
  - Controlling HVAC noise (no minima!)
- **Credit 79: Sound Masking**
  - Sound masking use and limits

WELL and Acoustics

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- **Credit 80: Sound Reducing Surfaces**
  - Ceilings (0.8, 0.9 etc.)
  - Walls (panels to cellular and open plan offices)
- **Credit 81: Sound Barriers**
  - Sound reduction of partitions
  - Doors


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Auralisations

Internal sound insulation

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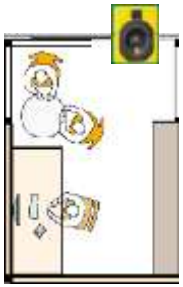
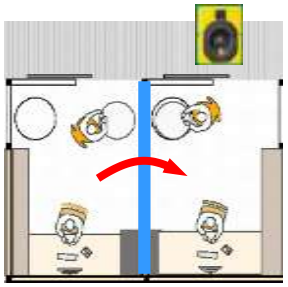
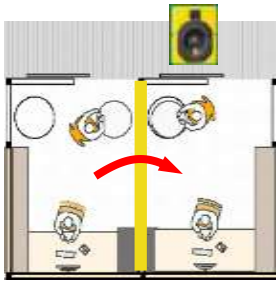
Listen to the sound insulation performance of the walls:



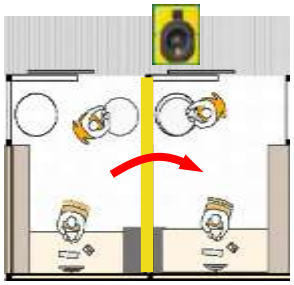
Typical Office Conversation



POOR (Glazed) (R_w 25)



FAIR (Solid) (R_w 35)



GOOD (Solid) (R_w 45)

Instructions:

1. Click the loudspeaker icon for **typical office conversations**.
2. Adjust your volume controls so that typical office conversations are at a comfortable listening level.
3. Then play audio files from left to right without adjusting volume controls.

Get inside the model

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Internal Soundscaping

Soundscaping experiment

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Soundscaping Experiment

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