

Measuring Health and Wellbeing

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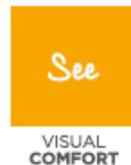
Global assessment and overview



Sensorial comfort criteria



Indicators		Definition		New built		Renovation	
				Must have	Nice to have	Must have	Nice to have
TC1	Global comfort	(Top, RH)	% of time inside the hydrothermal zone	>95%	100%	>95%	100%
TC2	Local comfort	V	Air velocity (m/s)	<0,15 (winter); <0,25 (summer)		<0,15 (winter); <0,25 (summer)	
		TRA	Radiant asymmetry (°C)	<5 (winter); <14 (summer)		<5 (winter); <14 (summer)	
		DeltaT	Air temperature stratification (°C)	2 - 3	<2	2 - 3	<2



VC1	Light quality			Artificial lighting (lux)				Required level for each room depending on use ¹			
VC2	Light quality	DA		Daylight Autonomy (%) ²		>60%		Optimize existing openings through glazing specification	>60%		
		UDI		Exceeded Useful Daylight Illuminance (%)		<10%			<10%		
		Offices only	sDA	Spatial daylight autonomy (% of floor surface)		65 - 75%	>75%		>75%		
			ASE	Annual Sunlight Exposure (% of floor surface)		7 - 10%	<7%		<7%		
VC3	Views			Opening to floor ratio ²		>20% ³		>20% ³			
				Quality of the view (rating 0 - 3)		2	3	3			
VC4	Space quality			Space quality assessment (rating 0 - 3)		2	3	3			



AC1	Sound level	LAeq,15mn		Equivalent sound pressure level		30 ⁴	25 ⁴	30 ⁴	25 ⁴
		NR		Noise Rating		NR30 ⁵	NR25 ⁵	NR30 ⁵	NR25 ⁵
AC2	Room Acoustic	Tr		Reverberation time		Required level for each room depending on use ⁶			
		STI		Speech transmission index ⁷		0.65	0.8	0.65	0.8
		Open space office only	rd	Distraction distance (m)		6	≤4	6	≤4
			D2,S	Spatial decay of weighted sound pressure level of speech per distance doubling		D2,S>7dB	D2,S>9dB	D2,S>7dB	D2,S>9dB



IAC1	Stiffness	CO ²		CO ² content in the air (ppm)		<800	<600	<800	<600
IAC2	Chemical pollutants	TVOC		TVOC (µg/m ³)		All pollutants below specific levels defined by local health regulations, but not higher than respectively:		<1000	
		Formaldehyde		Formaldehyde (µg/m ³)				<30	
IAC3	Particulate	PM10		PM10 (µg/m ³)				<20	
		PM2.5		PM2.5 (µg/m ³)				<10	

The Health and Wellbeing Story:

Housing

- Better sleep
- Improved health
- Reduced stress
- Wider social / community benefits (such as NHS costs)
- Reduced financial burden (rental, bills, benefit for housing providers)



The Health and Wellbeing Story:

Offices

- Productivity
- Staff sickness
- Retention
- Morale
- Cost



The Health and Wellbeing Story:

Education

- Student attainment
- Behaviour
- Absenteeism
- Health
- Cost



The Health and Wellbeing Story:

Healthcare

- Recovery times
- Cost
- Staff morale
- Available bed space
- Patient wellbeing



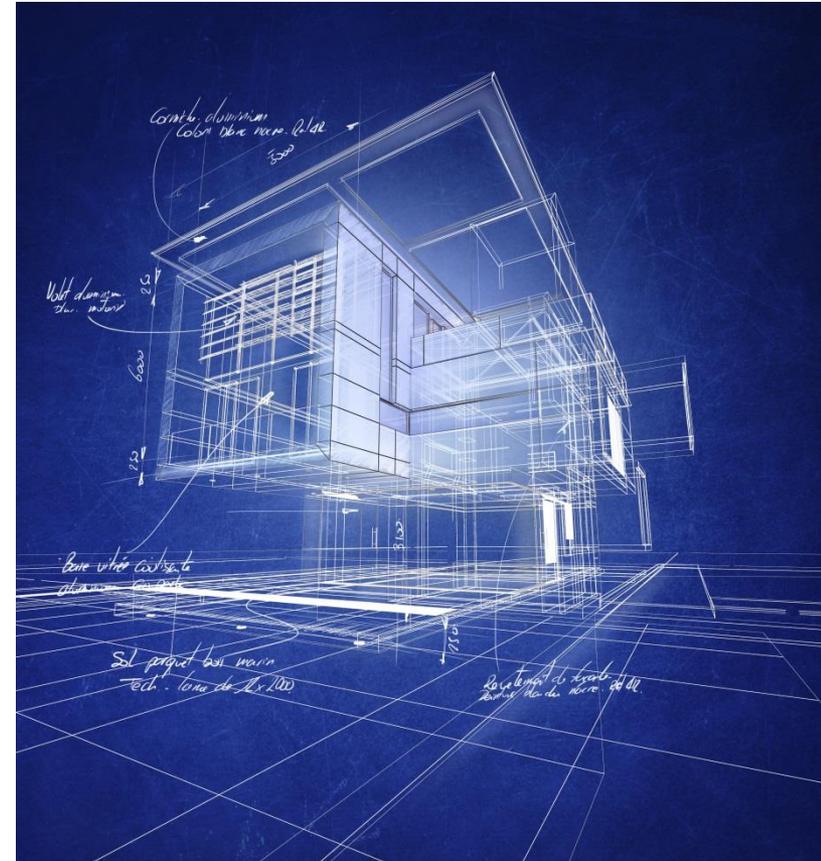
Ingredients for measurement of a project:



- **Suitable projects** – building type, occupants, activities, comparison with existing
- **Collaboration** – project team, building owner, building occupants (FM, HR, Staff), researchers/academics
- **Benchmarking** – national, local, project specific
- **Sample analysis** – categorisation, understanding external variables
- **Monitoring and testing** – existing v's new
- **Data** – qualitative and quantitative (historic, existing, future)
- **Evaluation and interpretation** – what was achieved, could it be better, can we change things or learn for next time?

Tools to enable meaningful evaluation:

- Modelling software
- Sensors and monitoring strategy (environment & occupants)
- Regular planned (and unplanned) spot tests (environment & occupants)
- Record keeping
- Continued post-occupancy study



The interpretation and challenges:



- What environment are these people going home too, or working in?
- What other variables could be influencing the results?
- Is existing research giving us a true picture of what impacts us?
- Are we just excited by new toilets and a coffee machine?
- Can we validate measured improvements and relate this directly to the change in indoor environmental quality?

What are we doing?



The Cave
(Copenhagen)



Saint-Gobain Research Centres



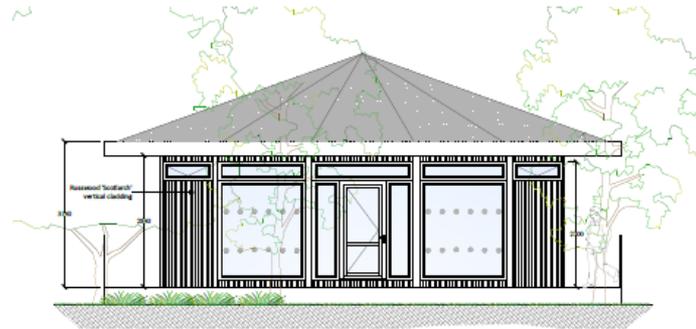
Domolab
(Paris)

What are we doing?

Multi Comfort reference projects



Housing



Palliative care



Education

Finish

- This is still new!
- Are we even monitoring to show what environment we actually providing?
- Proving health and wellbeing benefits is difficult and open to interpretation
- We need to work together to deliver more projects and collate more data to try and demonstrate a trend to build the business case