



Project 3A

Indoor Environments: Design, Productivity & Health

Project leader: John Bell

Research Team: Robert Bergman, John Mabb, Ned Wales,
Veronica Garcia-Hansen, Nur Demirbilek, Lidia Morawska

Industry Partners: Dale Gilbert (QDPWH),
Haico Schepers (ARUP)



CRC Construction Innovation
BUILDING OUR FUTURE



ARUP





OBJECTIVES

- compile information on the productivity, health and indoor environment available from international studies which are applicable for Australian conditions;
- document the current knowledge, methods and strategies in the areas relevant to this scoping project;





OBJECTIVES

- establish the linkage between lighting, thermal comfort and Indoor Air Quality metrics and perceived air quality and sick building symptom (SBS) prevalence in offices and schools; by
 - identifying the gaps in knowledge **within the Australian context** in relation to the health, productivity and cost impacts of poor quality indoor environments;
 - identifying the primary requirements for further R&D to address these knowledge gaps.





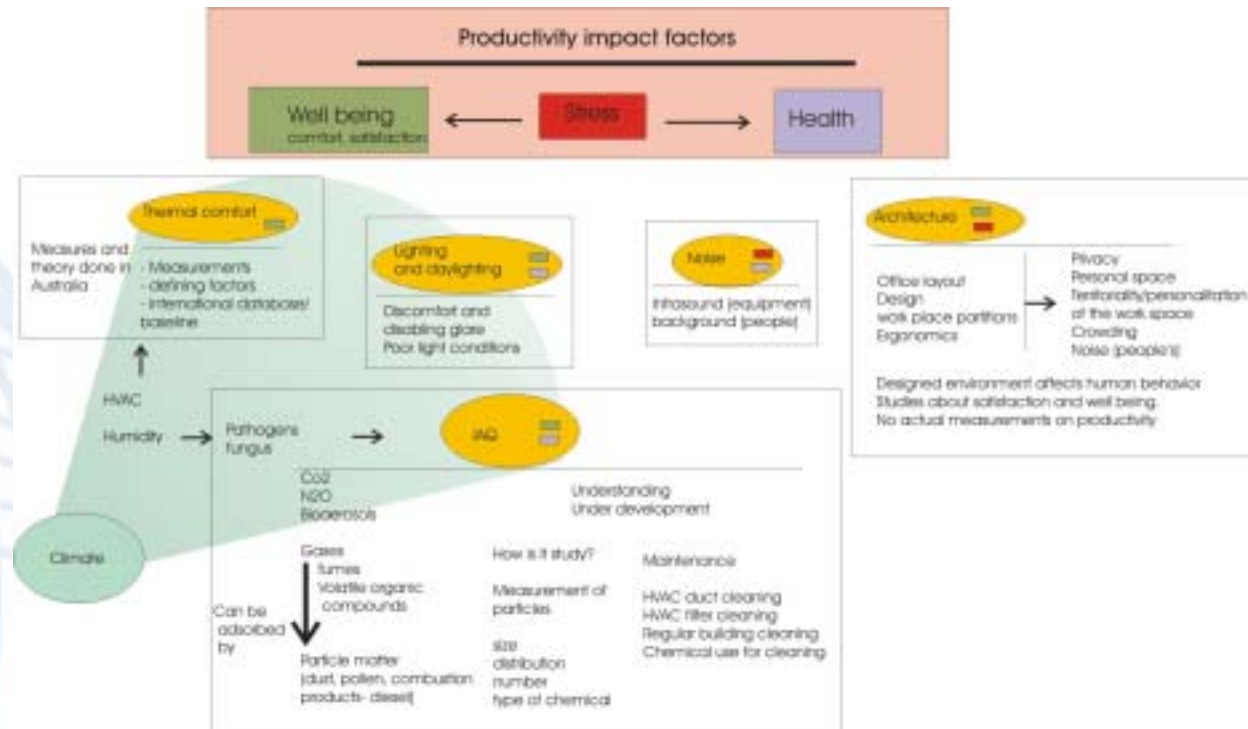
OBJECTIVES

- establish the linkage (continued) ...
 - considering tools and methods by which the impacts on the people affected can be quantified;
 - considering the interactions of ventilation / thermal comfort and energy costs for indoor air conditioning;
 - considering the interactions of lighting/daylighting and energy costs for optimum visual comfort, including lighting controls



DELIVERABLES

- A comprehensive literature and occupant survey on the impact of thermal comfort, acoustics and lighting on occupants perceptions of environmental quality and performance in Australian offices and schools





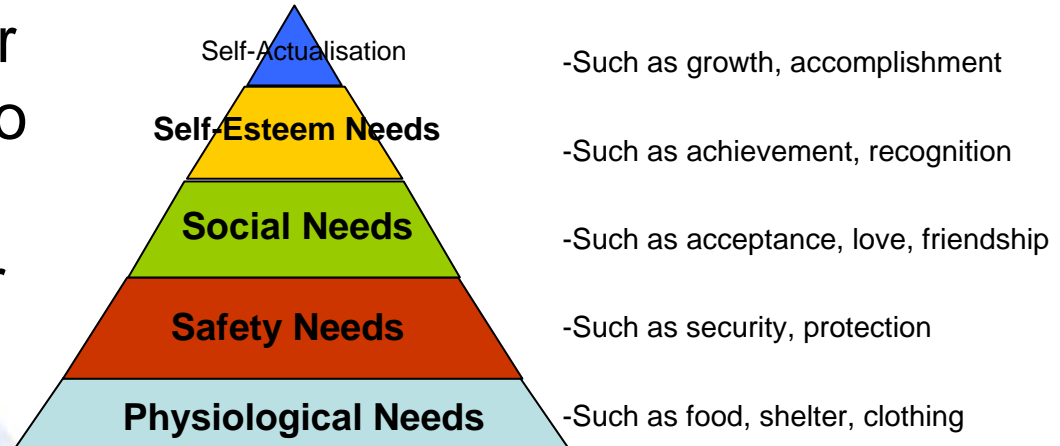
DELIVERABLES

- A full report detailing further research needed to fill information gaps identified, and to develop the framework for cost estimation into a methodology acceptable to and usable by the industry.
 - **Key gap:** lack of detailed studies
 - **Proposal:** undertake a comprehensive study monitoring all aspects of Indoor Environment
 - **Methodology:** Involvement of psychologists AND THE CLIENT in assessing productivity



DELIVERABLES

Maslow's Model of Motivation



- A model framework for estimating costs due to lost productivity and health impacts of poor quality indoor environments
 - Framework must be holistic
 - Build on fundamental theories of motivation (Maslow – above)
 - Low level needs met by Building – necessary but not sufficient for productivity, and lower cost to provide
 - High level needs can not be ignored in costing- more expensive





IMPACTS

- The survey does demonstrate a link between the indoor environment and productivity – therefore will be used to promote improved Indoor Environmental Quality
 - Impact on Construction Industry through raising awareness



CRC Construction Innovation
BUILDING OUR FUTURE



IMPACTS

- The CRC is considering a proposal for a major project including a productivity study
 - Impacts of CONDUCTING the study will be significant: improved KNOWLEDGE of Indoor Environment metrics in Australia; improved understanding of business drivers relating to employees
 - Will enable full potential of improved Indoor Environments to be demonstrated: physically and financially.





CONCLUSION

The holistic nature of this research has the potential to significantly increase our understanding of how people interact with the built environment.

Improvements to a companies built environment may increase a workers' health and productivity which will impact upon the companies profit margin.

Contact Details:

ASPRO John Bell QUT Ph: 07 3864 5107 or 0419 803 424 j.bell@qut.edu.au

John Mabb QUT Ph: 07 3864 2451 or ja.mabb@qut.edu.au

