

Technical Research Paper 02

Workplace Environment



Study Outline

This study outline summaries key points raised in one of the 10 technical papers in the pre-occupancy study series that investigates the City of Melbourne's world leading Council House 2 (CH₂) office building. Each technical paper has been developed by independent authors from Australian universities as part of the CH₂ Commercial Green Building Technology Demonstration Project. To obtain copies of the full technical papers visit www.ch2.com.au

This project forms a major part of the CH₂ Study and Outreach Program – a coordinated effort to consolidate the various opportunities for study, research, documentation and promotion generated by the CH₂ office building. The primary aim of this program is to raise awareness of sustainable design and technology throughout the commercial property sector and related industries.

The target audience for these papers is professionals involved in the design, engineering, construction and delivery of office buildings, which explains the technical detail, length and complexity of the studies. Although these papers may be of interest to a wider audience, readers who possess a limited knowledge of the subjects covered should obtain further information to ensure they understand the context, relevance and limitations of what they are reading.

Significant funding for the technical papers was provided through an AusIndustry Innovation Access Program grant and supported by cash and in-kind contributions from the City of Melbourne, Sustainable Energy Authority Victoria, the Building Commission of Victoria, the Green Building Council of Australia and the CH₂ Project, Design and Consulting Team. The Innovation Access Program is an initiative of the Commonwealth Government's Backing Australia's Ability action plan.



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CH₂

Technical Research Paper 02

Study Outline –Workplace Environment

The design of Council House 2 (CH₂) brings together principles of sustainable building design with contemporary ideas about office space and workplace performance. The following is a summary of the principles of briefing and design explored in the paper on Workplace Environment. The paper explores the relationship between features of sustainable design and the work environment, especially in terms of the fit-out and use of internal space.

CH₂ is typical of a new generation of office designs that take account of both the need to improve the environmental performance of office buildings, and to respond to evolving workplace organisation and behaviour. Likewise, environmental initiatives are rarely correlated with worker performance. Instead, an effective system is usually considered to be one that results in minimal complaints. However, with interest in workplace productivity growing, it is likely that a well-designed office environment will increasingly be seen as having potential benefits for worker performance. A report on the design of CH₂ by Advanced Environmental Concepts suggested possible savings of between one and four per cent of staff salaries due to productivity benefits. Since the rationale for these estimates are largely based on findings from European research, it will be important to monitor CH₂ once the building is occupied in order to confirm design predictions.

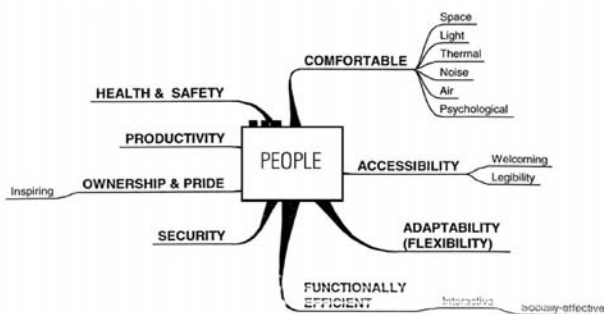


Figure 1: People mind map from the Charette process (Evergen). CH₂ aims to provide a healthy, comfortable, adaptable and stimulating working environment for its primary users (staff) and visitors. The building should be welcoming, accessible and easily navigated, and should provide a positive social environment.

matching buildings to organisations

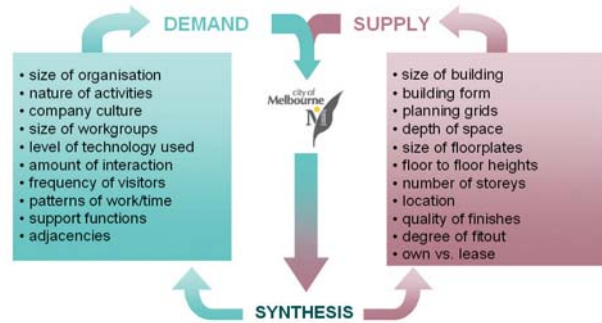


Figure 2: DEGW model matching building to organisations.

Assessing Workplace Needs

One of the first tasks of workplace design firm, DEGW, was to undertake an evaluation of the relationship between organisational structure and the physical environment, in order to inform their design brief. This relationship was then expressed through a 'project vision' that aimed to embrace new ways of working, support cultural change, provide a 'showcase' for environmentally sustainable design, and create a healthy and stimulating work environment.

Surveys and studies were also conducted to evaluate the existing workplace, Council House 1, and to confirm new accommodation requirements. Problems identified with the current workplace included poor environmental conditions as well as limited opportunity for staff interaction and collaboration.

In response to the research carried out by DEGW, architects DesignInc developed a Return Fit-out Brief to ensure the proposed design work was in accordance with the aims and requirements of the City of Melbourne. The major principles of this brief, which was used to drive design decisions, were as follows:

- space allocation proportional to the nature of the work process;
- optimum flexibility for ease of reconfiguration;
- increased opportunities for teamwork, autonomy and interaction;
- shared working environments, informal meeting spaces and increased opportunities for cross-divisional and vertical interaction.

The brief also recognised the City of Melbourne’s aim for an A Grade commercial building with a focus on ecologically sustainable design that could act as an example to property developers.

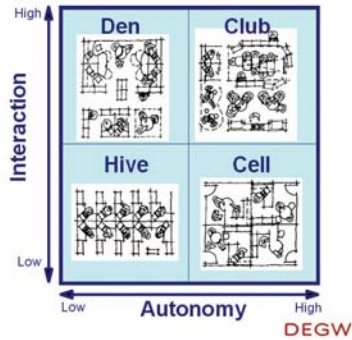


Figure 3: Description of user needs within work space (DEGW).

An Open Plan Model

The use of internal space in CH₂ is based on an open plan model which avoids hierarchical personal offices in favour of a democratic overall structure, with all staff sharing the same workspace and prestige window space set aside for common areas such as meeting rooms or temporary work spaces. This is achieved by dividing the long east-west floorplate into various zones.

The northern edge of the space, with access to natural light from windows, is reserved as shared open space. The southern edge is allocated for meeting rooms, separated from the workstations by a circulation corridor. Services and other common areas are located in the cores at the eastern and western ends of the floor plate, with external staircases providing vertical connection between floors. Work areas are designed on the basis of work processes rather than worker hierarchy, with flexible spaces that can easily be reconfigured to suit particular tasks. The design is also intended to provide a high level of spontaneous interaction between staff in different divisions through staircases and informal gathering spaces. The overall environment is also flexible, allowing staff a greater degree of choice about how and where to work, with individual workstations complemented by informal work areas.

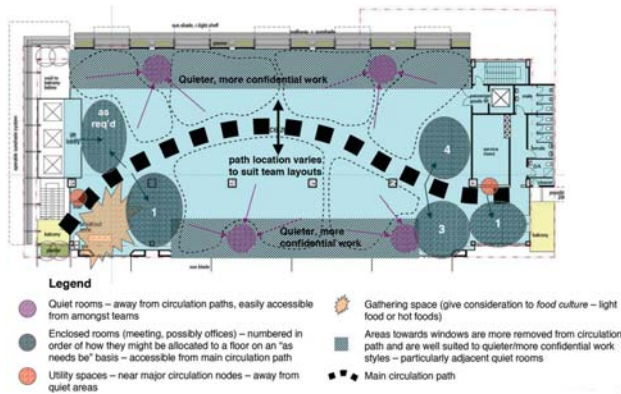


Figure 4: Developing the open plan office design concept for CH₂

Changing Workplace Culture

The process of designing, constructing and adapting to a new building often occurs in association with organisational change. For example, a shift away from hierarchical management structures can be facilitated by a new open plan office environment. For this reason, it is important for the design of a workplace to support the intended organisational structure, and accommodate ongoing change to work tasks, work teams or technologies. CH₂ is intended as an interactive, highly functional working environment that allows for better productivity, greater space efficiencies and an effective public interface. Instead of emphasising corporate status, CH₂ has been designed to improve worker morale and attitude, with a high level of indoor air quality and an emphasis on sustainability that clearly demonstrates a commitment to workers’ health and the environment.

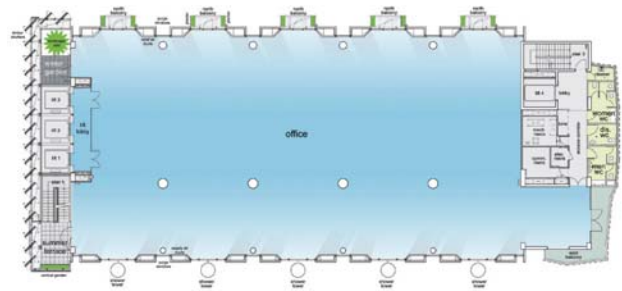


Figure 5: Typical floor plan provides open plan office layout.

The overall fit-out of CH₂ has been designed according to sustainability principles, including:

- design for disassembly;
- material selection criteria;
- recycling and recyclability;
- innovation;
- dematerialisation;
- reuse;
- indoor air quality;
- indoor landscape;
- flexible planning;
- glare reduction;
- lighting management;
- user education; and
- waste management.

In contrast to most new office buildings, which use high level finishes to emphasise status, the approach in CH₂ involves a ‘dematerialisation’ where finishes are reduced to a minimum and readily removed to facilitate recycling. This approach results in a kind of ‘industrial aesthetic’ where applied finishes are deleted, and functional and structural elements are exposed.

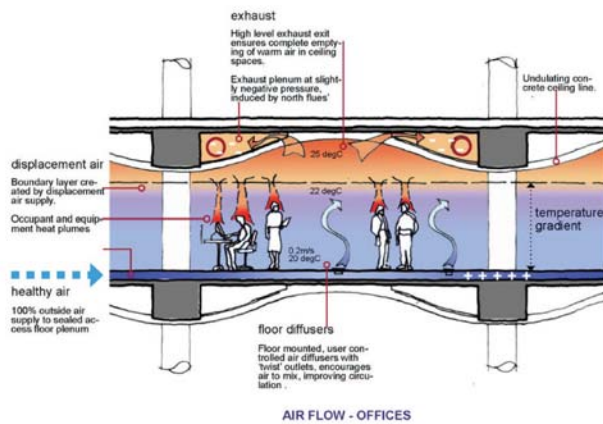


Figure 6: Air flow in the office space is designed to improve occupant comfort and health (DesignInc.).

It's all about creating a sustainable work environment... that's been the focus... The great thing about this project and the way the City of Melbourne have done it – it is a building for the people... it has been the prime driver through everything no matter what the idea is...

Stephen Webb, DesignInc.

Adaptability and Comfort

The interior of CH₂ has been designed to provide flexible, adaptable spaces with a strong relationship to inner Melbourne and a focus on sustainability. Providing a healthy and stimulating work environment for staff was also a major priority. Acoustic issues within CH₂, especially in relation to the exposed concrete ceilings and the lack of 'white noise' from standard ducted air-conditioning, were also carefully considered. Chilled ceiling panels have been designed to incorporate sound absorbent materials, and the curve of the ceiling is intended to provide some acoustic isolation between different parts of the work space.

Detailed consideration was also given to the effective use of technology within in CH₂ to allow maximum flexibility and minimise disruption to staff. This has led to the widespread use of access-floor wiring and modular furniture systems.

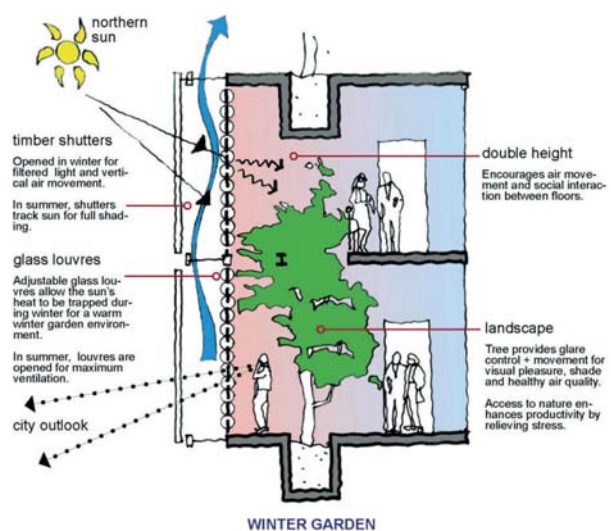


Figure 7 Winter garden enhancing internal environment

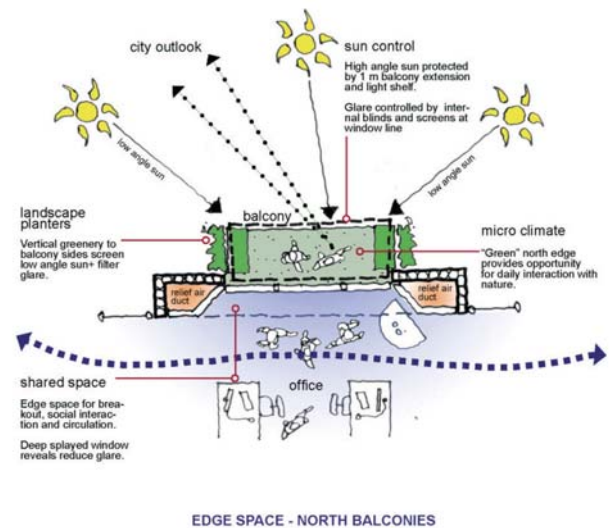


Figure 8 Vertical greenery, north balcony

By examining CH₂ in terms of the 'workplace environment', we see how a wide range of aspects of building design have come together to maximise workplace performance. While CH₂ boasts a range of innovative environmental features, what is particularly important is how those features help to improve the motivation, welfare, and productivity of staff who occupy the building. The long-term success of the design will only be known once CH₂ is complete and in use.

Other Studies in this Series:

1. **Nature and Aesthetics in the Sustainable City** – form, function, flora, fauna and art;
2. **Workplace Environment** – people, the built environment, technology, and processes;
3. **Lighting and Physiology** – artificial and natural lighting and its relation to the human body;
4. **Air and Physiology** – internal air quality in relation to what the human body needs;
5. **Cooling, Heating and Physiology** – radiant, convective and conductive heating and cooling in relation to the human body;
6. **Energy Harvesting** – economic use and efficiency;
7. **Water** – reducing consumption and increasing harvesting;
8. **The Building Structure and the Process of Building** – engineering, transport, construction and structural elements;
9. **Materials** – selection based on an eco-audit that factors in embodied energy, process toxicity and off-gassing considerations;
10. **The Business Case for Sustainable Design** – economics, payback, productivity and efficiency.

For more information and access to a complete set of studies, visit the CH₂ Web site at:

www.CH2.com.au

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This rating represents World Leadership

CH₂