IMPLEMENTING SUSTAINABILITY PRINCIPLES
IN AGED CARE FACILITIES

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Abstract

The concept of sustainability, usually defined as the positive impact of a project on its environment, must, we believe, also embrace the social and cultural acceptability of the project. Transition from independence to aged care accommodation can be a confronting time, with separation from family and home bringing stress and depression.

Placing a facility close to where people have previously lived is clearly desirable. However, this is becoming increasingly difficult for many reasons, not least the requirement and demand for larger facilities and the application of town planning laws, which continue to force facilities on to cheaper land in fringe locations. In easier times, it nevertheless took us 5, 7, and 10 years respectively to acquire land for our facilities in suitable inner city locations.

The aim of our projects has been to make the aged person’s transition from home to facility as stress-free as possible by providing a familiar and supportive environment with environmental stimulation. The projects discussed are: Wintringham Port Melbourne Hostel, Gilgunya Village, both low care facilities, and Atkins Terrace for independent living.

The principal innovations in our projects concern the dignity and comfort of residents, space control and materials. Innovations include (1) the application of ‘Universal-design’ principles which take individual frailty into account; (2) narrow buildings, usually one room deep, for light penetration and controllable cross ventilation; (3) grouping rooms in clusters of 5, 6 or 7 residents, each cluster with its own kitchen, dining and lounge rooms, to generate a supportive environment and reduce travel distances; (4) the use of verandas for circulation, to enable contact with the outside and facilitate orientation; and (5) extensive use of timber for structure and wall cladding using, where possible, plantation timbers.

All projects employ cost-effective principles suitable for temperate and subtropical environments.

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Introduction

While sustainability in building projects is predominantly thought of in terms of the positive impact of the project on the natural environment we believe that the social and cultural acceptability of the project is of equal importance. The success of a project cannot be measured solely in terms of energy efficiency and environmentally benign material choices. The impact of those choices should also be considered within the psychological and social requirements of users and occupants of the project.

In the case of frail elderly they have particular physical, mental and emotional abilities that need to be addressed. The transition from being fully independent to entering and Aged Care Facility can be a confronting time full of powerful emotions for the person, partner and family. The more gradual the move the better for everyone involved.

Ageing milestones are usually gradual, however the dramatic upheaval of moving from home to supported accommodation cause stress and repercussions we are just beginning to accommodate. These moves are often accompanied by the loss of a life long partner and or separation from family and familiar environment. Depression is a major issue.

In the past aged care facilities have been institutions with building and management style reinforcing each other producing an environment that, inadvertently, was effective in alienating and depressing the resident.

![Familiar neighbourhood, familiar buildings are important for well being of elderly residents. Port Melbourne Hostel, Swallow Street, Victoria.](image)

Location

Having a facility available close to where people have lived their lives enables maintenance of community connections and a familiar environment. This is, however becoming more difficult for providers due to a number of factors. Staffing, economic necessity because of funding levels, hostility to development by local communities and potential expense associated with town planning processes.

The community demands for greater amenity in facilities. Regulatory and economic desires create the need for larger facilities making the technical town planning issues more difficult. These factors serve to drive facilities to fringe locations where land is cheaper, there are fewer neighbours and less potential town planning issues.

Commonwealth funding remains the same wherever the facility is located. The projects shown here took 5, 7, and 10 years, respectively, to acquire land and develop in suitable inner city locations. The planning processes, at that time, were relatively simple in comparison to the processes of today.
Regulations

The introduction of a base level Australia-wide certification and accreditation system covering building quality, emphasising fire safety and privacy, has seen wholesale upgrading of the building stock and change in management style. The reform focuses on the more measurable qualities of the building and care structure of: fire safety, light and ventilation, heating, cooling, privacy and management procedures. Intangible quality factors, such as ‘homelike quality’ are acknowledged as important but are removed from the certification document because of the difficulty in providing consistent marking between assessors.

The certification document, while in its infancy and a great step forward in providing assistance to managers and designers beyond those included in the Building Code of Australia, still has room for refinement when considering some of the environmental performances. For example - natural light – ‘Ability for an occupant to be able to distinguish between night and day is essential.’

Further, the climate definitions that place Melbourne, Brisbane and Alice Springs within the same climate zones give maximum score to the fully air conditioned facility, with the option to convince the assessor that an alternative arrangement will provide suitable climate control.

The climate control can be considered in two categories, first the building fabric and second the active systems. Building Code of Australia covers building fabric for heat gain and loss natural light and ventilation, while the Aged Care Certification Instrument (ACCI) refers to the suitability of control of windows and doors and provision of mechanical systems. Some Town Planning guidelines cover energy ratings in more depth and in Victoria aged care facilities are currently excluded from the “First Rate” HERS star rating system.

The BCA requirements are simple well known and clear. The ACCI document allows for alternative arrangements with out providing any indication of what may be suitable with the implication that a fully air-conditioned building will provide the best outcome. We are in a learning curve with regards to creating a system that allows the flexibility to achieve good outcomes for different situations.
Difficulties occur with in the planning system when individual planners or councillors are able to apply their own definitions of concepts like amenity, sustainability in order to justify their individual desired outcomes.

In a NSW project our aged care facility was considered to be a Hospital under planning criteria. The local planner chose to measure the building performance, in all ways, as though it is a multi residential housing development. Even while acknowledging that the residential regulations do not apply to facility recommends refusal on the basis that it does not meet the requirements for single houses and multi-residential buildings and their personal assessment of amenity and sustainability.

What does provide good amenity for an aged care facility? Is it the same as an individual house or an apartment? What qualities are achievable? What are benchmarks? The Commonwealth sets the standards in aspects of the buildings and staffing management requirements, however, the Commonwealth acknowledges that the planning process takes precedence over all their guidelines. This means that there are variable cost implications for developers over usual differences in site conditions. Sometimes even to the extent of local planners dictating the internal management processes of facilities, to the point where a facility will be inoperable. For instance changing a two level 45 bed facility to a facility over six split levels.

Let’s look at temperature as one aspect of amenity. What is a suitable temperature for a facility? Is it a universal 21°C? Or is it actually a temperatures range? Is it the same for Brisbane Alice Springs and Melbourne? The Commonwealth Certification Instrument does not specify temperature range but requires the occupants to be able to adjust the temperature of their own room temperature to suit themselves.

For one of our recent projects we simulated the building performance over the year using the Apache thermal modelling programme and real weather data. In its passive state the building achieved minimum annual temperature of 18 degrees and maximum temperature of 28°C. The 28°C occurred on three days during the year. To cater for those 3 days full air conditioning to the whole facility was estimated at $550,000. The client elected to air-condition all of the common areas instead to give residents the option through the day to be in a cooler area. This saved $300,000 in capital costs and reduced the running costs.

Apart from the capital and running cost factor, there are concerns over maintaining residents in a homogeneous building environment with little or no response to daily or seasonal recognition. Greater physical contact with the external environment is an acknowledged form of sensory stimulation.

Amenity, therefore, is a very complex area and regulations as a rule do not try to achieve the best results, but try to achieve reasonable standards.
Design Aims

In our projects we have focussed on –

1. Enabling the transition from old home to new
2. Providing familiar and supportive environment
3. Quality of environmental stimulation.

The projects discussed are: Wintringham Port Melbourne Hostel\(^5\), Gilgunya Village\(^6\), both low care facilities and Atkins Terrace\(^7\) is for independent living.

The principal innovations demonstrated are in the areas of resident dignity and comfort, space control and materials.

![Figure 5. Gilgunya Village, Atkins Terrace, Port Melbourne Hostel](image)

Design Principles

The design concept is to provide the circulation on the outside of the building by means of veranda. The veranda allows for a number of outcomes: maintains a sense of independence, allows the buildings to be small scale and familiar, generates an everyday contact with the outside, and enables orientation.

Designing circulation on the outside the building reinforces and supports of the individual in terms of control over personal or shared spaces. This contributes to creating a successful living environment a feeling of ‘my front door’ versus ‘the door in the corridor.’

![Figure 6. Typical veranda](image)
For care facilities the rooms are grouped into small clusters of 5, 6 or 7 residents for staffing each cluster with their own to kitchen dining and lounge rooms. The small clusters also generate a familiar supportive environment keeping the rooms to domestic scale and the travel distances short less than 15 m encouraging independence amongst the residents. Even with the trends to larger facilities these smaller cluster facilities are economically viable. The veranda system provides very effective protection of the building from rain and sun allowing a large range of materials for external cladding and great protection for the timber window frames. A deep veranda connected living area provides strong connection to outside an additional social space and opportunity for social contact.

Linking buildings via external veranda meant that the essential paths of travel needed to be protected by the building layout providing a sheltered path through all weather. Sometimes, on windy, rainy days some paths are uncomfortable, but is accepted because the uncomfortable times are vastly compensate for by the many other positive outcomes achieved because of the veranda system.

The veranda system allows for effective cross-ventilation ensuring suitable fresh airflow into the building improving the indoor air quality.

Residents living in these facilities exhibit lower use of non-prescription drugs than residents of conventional facilities. In a recent national depression survey, residents in these facilities exhibited a negligible rate of depression in comparison to national average of around 50% of residents in aged care having some level of depression.

### Universal Design and impact on Sustainability

‘Universal Design’ is a concept that reaches beyond designing for someone who uses a wheel chair and relates to providing access for all people irrespective of ability and incorporate features that meet the needs of as many users as possible.

Atkins Terrace and Gilgunya Village are houses that are for independent living. These provide all the same level of environmental support as the aged care facilities. This allows a resident to ‘age in place’ utilising the service systems available within the community. It is notable that the accessibility issues do not add to the size of the units or to costs.

By designing in features that assist, from the outset, people are able to better accommodate changing needs either permanent or temporary.

Occupational therapists may define their job as the adapting of environments to make them suitable for habitation. That definition by itself should say something to building designers, architect and regulators. Many occupational therapists are at a loss to understand why buildings are built as they are, when simple features incorporated at the design stage could save the future resident time, money and anxiety.

Suitable design allows older residents to age in their own home without the need to be relocated in a time of stress. Wintringham manages the units at Atkins Terrace, which provides care to residents through various services available through state and local government agencies and Wintringham outreach workers. In the almost-four years that the housing has been operating, only four residents have died. Three were managed right through to the end at Atkins Terrace and the fourth requiring heavy nursing care and was transferred to a Nursing Home.

An additional point is the impact of occupational health and safety (OH&S) issues on the ability of the District Nursing Association and other care workers to provide home
help. The visited home is now being considered as a workplace for the nurse, who will require supports and spatial requirements according to Work Cover guidelines. District Nurses have advised they now refuse to work in unsafe conditions.\textsuperscript{13}

**Safety**

Safety is a sustainability issue. Slips and falls cost the community more than $1.8 billion dollars\textsuperscript{14} a year and that figure only refers to those people who require hospitalisation. This figure does not include the community costs of a person requiring extra help at home to get around and further flow-on costs. A broken hip in an older person very often leads to death. Something that designers should keep in mind as they specify flooring materials in their designs.

Sustainability is about how we can construct a built environment that more effectively caters for the needs of the community. Application of Universal Design principles saves resources and contributes to sustainability.

**Kitchens**

The combination of cluster house model planning and multi skill staff system at Port Melbourne and Gilgunya allow them to have individual decentralised kitchens. The result is that each house group of residents chose their own menus and the food is prepared within the house kitchen giving a strong domestic atmosphere reinforcing the position of the kitchens the centre of the home. The food is prepared fresh. Options for eating times are possible. The meals become an integral part of the daily activity where the cook has direct and personal contact with the residents for whom they cook. What is important about food and food preparation is it really just how cheap the meals can be produced?

**Construction**

The construction makes extensive use of timber throughout the projects both for structure and wall cladding. The verandas provide weather protection to wall cladding and timber windows and doors, enhancing the familiarity and softness of the building.

The three projects utilise conventional timber stud frame construction methods with timber truss roof structure, timber windows, deep verandas and highlight windows in places to achieve a high level of natural light.

Plantation timbers, a renewable resource and a sustainable industry are used as first preference. Light Organic Solvent Preservative treated timber is used when in exposed situations such as veranda beams, posts or other detailing.

**Cladding**

Pine or cedar weatherboards were used as external cladding. These are not generally materials used in aged care for two reasons: first, their use is limited by the building codes and, when they are allowed, client preference tends towards brick for its perceived low maintenance qualities.
Timber floor structure provides a resilient floor to walk on, subfloor access for retrofit of services and maintenance. Timber truss roofs provide service space and good protection from heat gain and loss.

Use of timber creates a carbon sink, reducing the Greenhouse effect and reducing the embodied energy of the building.

Narrow buildings mostly one room deep gives great opportunity for sunlight and daylight penetration to the rooms and excellent controllable cross ventilation. Indoor air quality further enhanced by careful selection of material to reduce pollutants and off gassing within the buildings.

Life Cycle

At Port Melbourne we undertook a study of life-cycle costing, comparing the extra costs of brick walls and the associated footings against the costs of maintenance of timber cladding. Because we had already a commitment to the deep verandas, the walls were already protected from weather all around the building. This means that bricks were shown to be only marginally more cost effective over a 40-year cycle, provided the money saved was placed in a maintenance sinking fund. The timber walls were then preferred on aesthetic grounds as creating a non-institutional feel and a building that fitted into the context of Port Melbourne.

Flooring

Port Melbourne utilised tongue and groove radiata pine floors, which were finished with Tung Oil which gave a good level of protection to wear, a reasonable level of slip resistance and a simple cleaning and maintenance routine. In the higher-wear areas
such as kitchens and office entry areas, a more solid timber was required and we eventually covered these areas with a vinyl floor finish.
At Atkins and Gilgunya, flooring such as ‘Comcork’ (a cork and rubber product) and linoleum were used.
We were able to use these alternative products because the buildings were classed as 1a, which has fewer restrictions under the BCA than Class 3 or 9a.

**Materials selections - Cleaning and maintenance**

Concern with cleanliness and cross infection means that cleaning is a critical issue within facilities. The choice of materials not only has an impact during the manufacture and construction process but also on a day-to-day basis during the cleaning of the facility. We have chosen material with the simplest cleaning processes. Bathroom cleaning chemicals can be very severe to the extent they can strip paint from fittings and harm health.

**Storm water**

Gilgunya re-uses all the storm water in the feature pond system. The pond serves the practical purpose of utilising and retaining storm water for use, and the pond also has become the main feature for orientation on the site and a passive activity centre, giving residents a reason to go out and linger in the gardens or look at and feed the fish.
We have at each project contemplated a more active use of recycling storm water and grey water. The concerns within the management are the perceived health effects and the cost of maintaining an extra water system. Capital costs are not necessarily the issue. When even a standard garden irrigation system comes under scrutiny as a potential Legionella source, clients do not want add another level of difficulty to the facility management. The general feeling is they will wait until these initiatives are in common use within the general community before incorporating them into their sites.

**Heating and cooling systems**

Within the building system adopted we use conventional gas fired hydronic boilers. Each room has individual thermostatic control and switch off when the external temperatures are above designated range.
The efficiency is in the smaller areas to be heated within a heavily insulated lightweight construction.

**Future challenges**

These projects all work using simple cost-effective principles that are very suitable for implementation in temperate and subtropical environments. We have found further initiatives are difficult to achieve within the benchmark range construction costs for the facilities.
The questions I have are:

- How will suitable sites be found given location is a highly significant consideration?
- Communities object to the building of facilities near them and complain that it is difficult to find access to suitable facilities.
- With community standards and desires rising how can they be paid for?
- Why do we keep building places that we don’t like?

It is clear to me that the human response to the built environment is not neutral and must be considered in our environmental design choices.

References

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