10

Location: Slippy Downs, Sunshine Coast, Queensland

Owners: Sunshine Coast University

Architect: Clare Design

Engineer: Taylor and Associates

Builder: Hutchinson Builders

Constuction Date: 1996

written by: Bernard Toogood | **with:** Greg Nolan | **design:** Peter Walker

University Clubhouse

The Sunshine Coast - Queensland

The Sunshine Coast University Club, erected in 1996, is intended to be a casual and flexible meeting space for staff, students and the wider community. The building is sited on flat, barren ground between two sports fields. The brief required a building that could provide varied functions such as change rooms, sporting club facilities and classrooms, but could also be expanded in the future.

The brief also required an extremely short building program of 4 weeks for design and documentation and 10 weeks for construction to an extremely tight budget (which was achieved at $855.00 per square metre). The design outcome of this was to prefabricate much of the structure and minimise the use of steel. Rather than the qualities of the building suffering from these strict parameters, architect Lindsay Clare says that the building is "...very direct and expressive", distinguished by its quality of internal light, environmental performance, clever and rigorous detailing and connection to the landscape.

top right
interior of entry foyer / bar

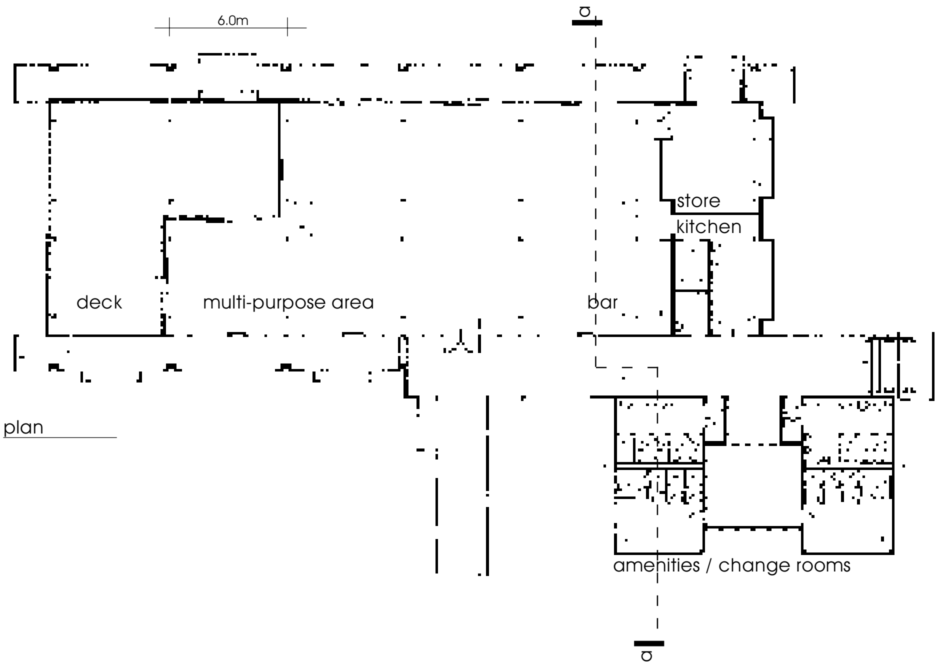
main image
the two pavilions of the
clubhouse on its featureless site
between two sports fields
all photos + drawings - courtesy
of the architects

•**Description** - The complex consists of two buildings separated by a covered walkway. The main building contains a bar/ servery and is used as a meeting room, occasional classroom and club facility. The smaller amenities building contains toilets and change rooms for the various sporting clubs. The two functions were separated to allow each to expand unhindered as future requirements change. To achieve the speed and economy of construction and the need for future expansion required by the brief, the building is extruded from one simple but thoughtfully designed and detailed section. This consistency of the section allowed for the repetition of building elements and helped facilitate the prefabrication of much of the structure. However the section also incorporated detailed considerations for the functional requirements and environmental performance.

Responding to the requirement for clear viewing of sport and the flat treeless plain of the landscape, the design developed as a horizontal transparent structure, with the roof as one element, hovering over the timber platform of the floor. To create transparency in the perimeter walls, the load bearing structure and bracing was pulled back to the centre of the building as a colonnade of hardwood columns that support bracing in the form of longitudinal nail plate trusses and plywood clad lateral trusses. The colonnade gives the space an almost ecclesiastical quality, while the plywood clad lateral trusses break up the monotony of the ceiling scape.

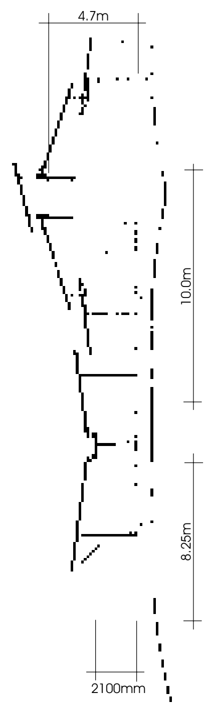
The forced north south orientation of the building exposed the long walls to the low angles of morning and afternoon sun. Sun control and ventilation therefore became critical issues in this non-airconditioned building. Cooling drafts are brought into the building through the operable walls around its edge. Hot air rises up and is expelled out through louvred clerestory widows above the colonnade structure. This sets up a stack effect so that air constantly circulates through the building.

It was also important to achieve a balanced level of light inside the building. Too dark an interior would have created a contrast with the strong outside light and the resulting glare would have made viewing out onto the playing fields impossible. Light enters the building in a controlled manner from the top through the clerestory windows, and through strip windows, just in from the perimeter walls, where it is reflected off a light shelf and dissipated onto the ceiling surfaces. Large roof overhangs and verandahs shade the glazed perimeter walls from direct light.



plan

elevation

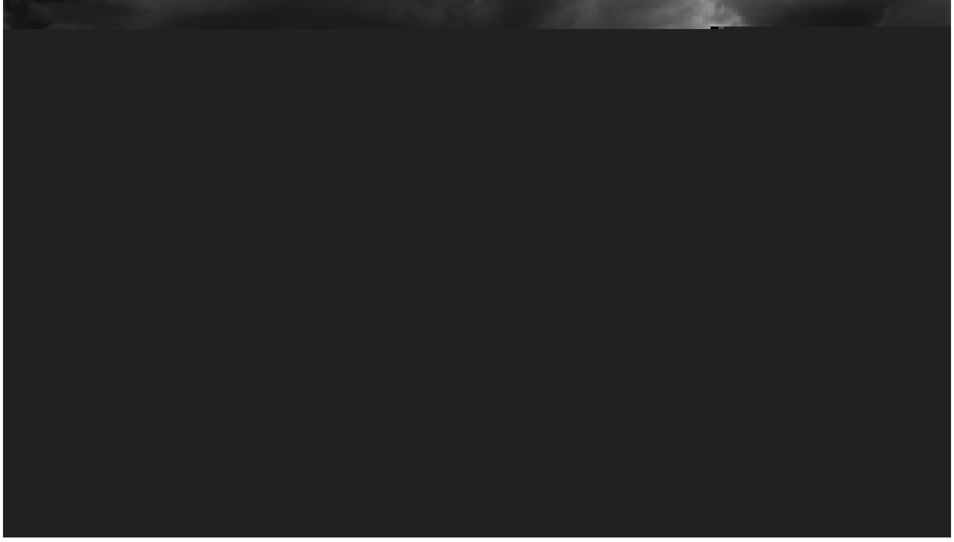


section a-a

above left
floor plan of university clubhouse

left
side elevation

above right
section a-a through main volume and service pavilion

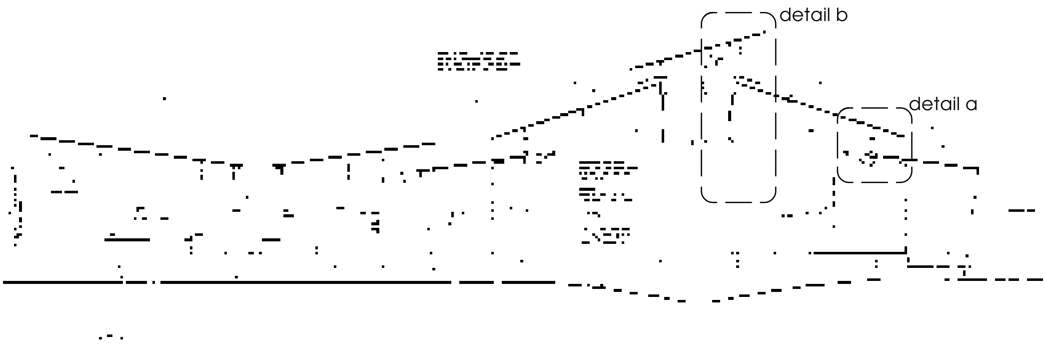


• **Structural Description** - In plan, the building adheres to a rigorous grid of a 6000mm module longitudinally. The section is then extruded in accordance with this grid. The floor of the building is a simple, and economic to construct, timber platform of hardwood decking on timber joists supported on steel bearers.

The centralised structural and bracing colonnade is a series of columns 2000mm apart and at 6000mm centres corresponding to the overall grid. The columns are hardwood posts cantilevered through the floor from the pad footings. The columns are topped with a steel cap and stub column that then supports an **open web nail plate truss** spanning longitudinally, and tapered plywood clad trusses spanning transversely to columns just in from the wall. This transverse truss is not a true plywood box beam but a timber nail plate truss faced with non-structural hoop pine. As well as supporting the roof, these trusses provide bracing for the structure. The centralised colonnades of posts and trusses were fabricated off site, adding to the speed and economy of construction. The walls, infill panels of windows and doors, were also fabricated off site.

The roof deck is almost entirely made up of "Ritek" prefabricated roof panels, a proprietary building item. This enabled a simple, fully insulated roof structure, with a speedy and economic construction process.

Exterior walls not glazed were clad in plywood with aluminium battens. This also acts as bracing, providing **shear panels** to work in conjunction with the bracing trusses. Plywood was also used for some internal finishes.



top
eastern elevation showing the linear and transparent nature of the building

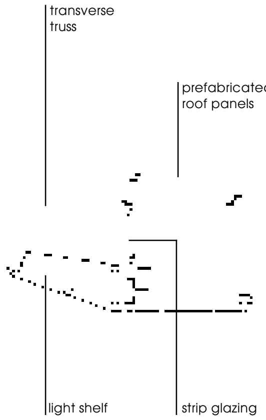
above left
interior of the dining/multipurpose room with the central colonnade of posts supporting series of trusses

above centre
truss detail

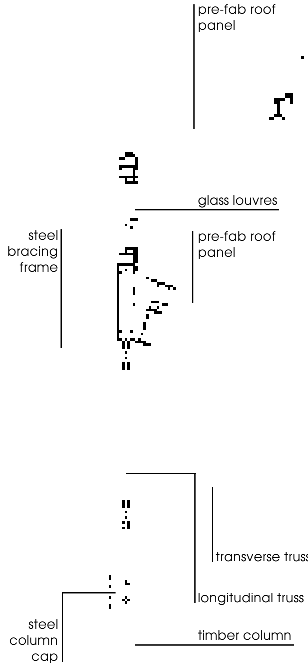
above right
outside of the line of windows the veranda on both sides steps down to form a mini grandstand for the sports fields

right
detailed cross section of the pavilion

left
view of the bar area - high level clerestory windows and light shelves work with ground level glazing to ensure a balanced level of lighting



detail a



detail b

A Strategy for Design in Timber

•**Environmental Performance** - From an environmental point of view, good design does not just involve the selection of materials. It is not enough just to use environmentally friendly products; the designer has to think about the overall environmental impact of the building, right throughout its life. For architects to achieve good environmental outcomes, they have to start with a good design, then choose appropriate materials. An uninsulated timber building in a cold climate could use so much energy throughout its life in heating as to cancel out the environmental benefit of using timber. Similarly, a building in a hot climate that has inappropriately positioned and unshaded windows, and poor ventilation may be unusable without expensive and energy consuming air conditioning systems.

Lindsay and Kerry Clare appreciate timber as a low energy sustainable material, and have a commitment to using it in their designs. But they also realise that the materials chosen must be appropriate for their use and within a building that performs well from an environmental point of view. The University clubhouse is not mechanically cooled by energy consuming air-conditioners, but instead relies on passive cooling principles to promote a constant airflow through the building. The ceiling is also well insulated.

The clubhouse uses low energy materials in much of its construction, but it is also low energy in its performance, and fulfils its function well. The more designers recognise and achieve goals such as these, the lower will be the environmental impact.

•**Design for expansion** - An important part of the brief for the University Club was to allow for future expansion. The rhythmic construction system of the University Club, based on one section extruded along a grid, not only created a building that was economic and quick to build but it provided for ease of expansion in the future. When the need for more space arises, all the builder will have to do is fabricate one more set of columns, trusses, roofing, glazing, extend the flooring and add another bay onto the building. As the basic section has all the appropriate elements to fulfil the function and for climate and sun control, the new bay will perform as well as the rest of the building. The planning of the building reinforces this, clustering key functions together. In the main building, the complex kitchen and bar are grouped at one end, leaving the other free to be extended as required. Similarly, in the amenities building, the rooms are clustered around a central entry area and are free to expand in either direction away from it.

•references

Hockings, J. 1998, 'Clubland', Architecture Australia, Jan/Feb, pp 64-69

Hyatt, P. 1998, 'Learning Curves: Sunshine Coast University Queensland', Steel Profile, Nº 64, Jun, pp 86-93

•glossary

clerestory window: a small window, or row of windows, in the upper part of a room where it can admit light from above an adjacent roof

light shelf: horizontal element below a window that reflects direct sunlight up onto a ceiling surface.

nail plate truss: a truss where the node joints are joined with nail plates

open truss web: a truss where the webs are open and visible

shear panel: a section of wall designed to resist lateral forces acting in, or parallel to, the plane of the wall

•on the internet

download pdf:
http://timber.org.au/education/architecture/

this and other timber projects:
http://oak.arch.utas.edu.au/projects/