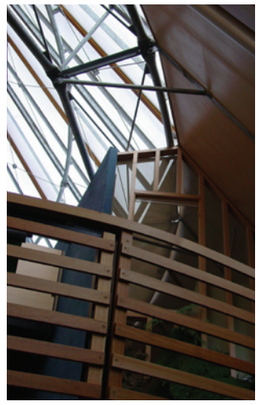
incorporate the wonderful historic environment that we've inherited, along with an increasing understanding of all the environmental issues'. If these two factors can be merged, he notes, 'then these buildings, hopefully, are going to become catalysts to show others what is possible' (GNT Future, 23 June 2004).

below left
teflon fibreglass membrane allowing daylight penetration into the offices
photo - Catriona McLeod

below right
slat detailing with a variety of timbers
photo - Catriona McLeod



Timber Schedule	
Counter top	Celery Pine, *Phyllocladus aspleniifolius*
Back of display unit	Myrtle, *Nothofagus cunninghamii*
Inside panels on walls	Plantation Pine, *Pinus spp.*
Back wall – wooden panel	Leatherwood, *Eucryphia lucida* Myrtle, *Nothofagus cunninghamii* Tas Oak, *Eucalyptus spp.*
Main beams	Radiata pine, *Pinus radiata*
Curved timber wall near rear door	Leatherwood, *Eucryphia lucida* Myrtle, *Nothofagus cunninghamii* Tas Oak, *Eucalyptus spp.*
Exterior wall of offices within the building	Radiata pine, *Pinus radiata,* veneer strips with Madison oil treatment
External walls - upper glazing	10mm thick twin-walled Polycarbonate
External walls – lower half	10mm thick arsenic-free Ecoply, locally produced with a Madison oil treatment
External timber beams	Laminated Frenchpine P/L Ecopine (non arsenic-based, treated pine)

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http://www.ronstan.com/arch/story.asp?story=676&section=gallery

Australian Government
Forest and Wood Products Research and Development Corporation

timber research unit

UTAS
FACULTY OF SCIENCE, ENGINEERING & TECHNOLOGY
School of Architecture

07

Location: Scottsdale, TAS

Building function: Forestry Interpretation Centre, Offices for Forestry Tasmania; community and tourism facilities for local area

Architect: Robert Morris-Nunn and Peter Walker, Morris-Nunn & Associates

Thermal engineers: Advanced Environmental Concepts - Ché Wall and Nicholas Lander

Fire engineers: ARUPS - Per Ollson and Jan Ottosson

Environmental consultant: Advanced Environmental Concepts

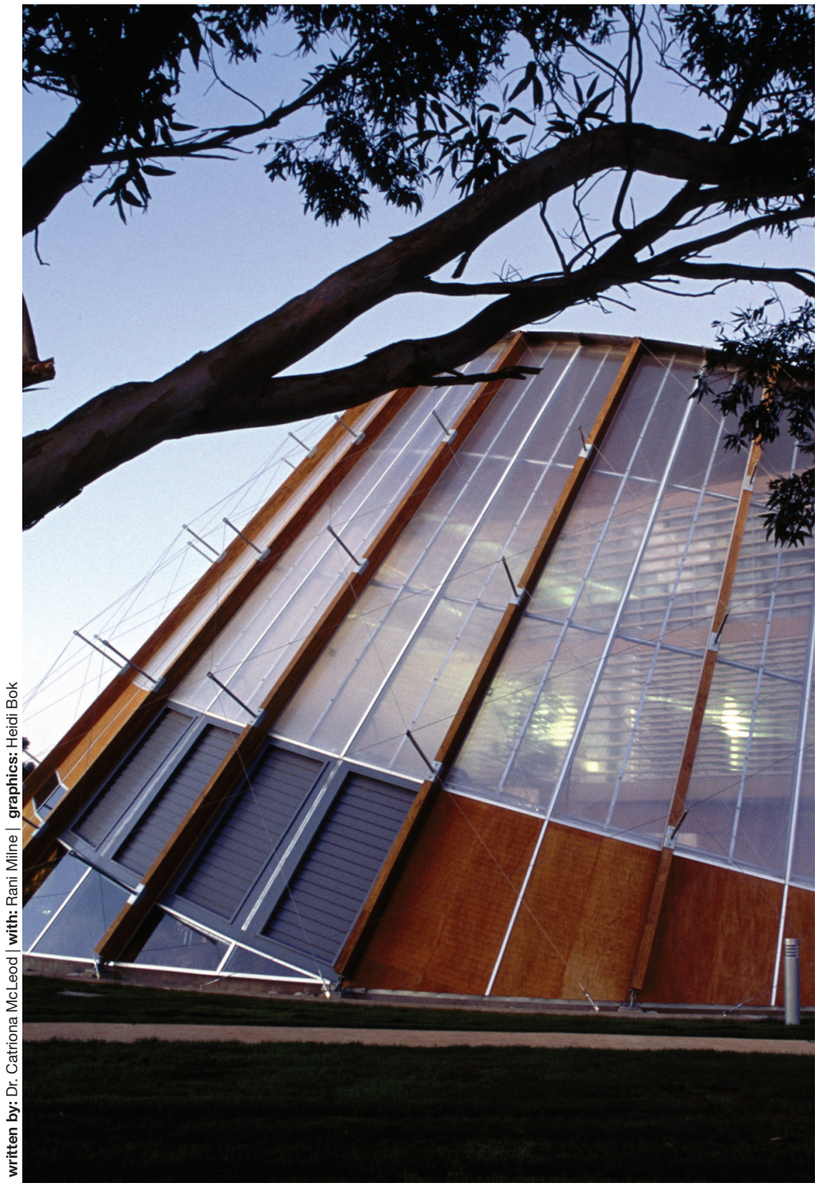
Builder: Fairbrother - Chris Wilson and Brendan Crack

Structural consultant: Gandy and Roberts - Jim Gandy

Constuction Date: 2001

Awards: 2003 RAIA Tasmanian Architecture Awards: Winner of the Commercial Architecture Award, Winner of the Environmental Steel Award, Winner of the BHP Colorbond® Steel Award for the most innovative use of steel in architecture, Jury Citation for Sustainable Architecture.

written by: Dr. Catriona McLeod | **with:** Rani Milne | **graphics:** Heidi Bok



Forest EcoCentre

Scottsdale, Tasmania

This tensioned, glazed structure, in its semi-rural setting of Scottsdale in Tasmania's north east, has been compared with many other greenhouse-styled projects. These include the 'Biosphere II' project in Oracle, Arizona, the great, conceptual city-domes of Buckminster Fuller, and Thomas Herzog's use of the transitory space between inner and outer skin in his houses at Regensburg. Each of these is generally conceived, or built, at a larger scale than Robert Morris-Nunn's Forest EcoCentre; however, a second key difference may be seen in the building's demonstrated effectiveness in climate control, through clever positioning, appropriate applications of material, and passive energy use. This effectiveness has been recognised through a wide range of awards for excellence in building, environmental architecture, structural innovation, and steel construction.

The Forest EcoCentre is a joint project between the (local) Dorset Council and Forestry Tasmania, and is supported by the Tasmanian State Government. The internal building contains three floors of Forestry Tasmania offices, which are not publicly accessible. The

main image
conical external structure
photo - Chris Wilson

outer shell encloses the ‘greenhouse style’ interpretive centre on the ground floor, which contains displays that focus on local forest history, hardwood and softwood plantations, a café and retail outlet, and a Tasmanian Visitor Information Network (TVIN) point.

The visitor moves internally through the interpretative centre in a circular, clockwise direction, from the impressive Celery Top Pine bench at reception, past the café, through a lit tunnel (an ecologically-based ‘animal walk’), to a series of timber framed display panels, and then back to the retail outlet at the reception point. For the visitor the journey is economical, easily navigated and repeated, informative and distinctly atypical in terms of tourist sites. Unlike the experience of most tourist buildings and interpretative centres, here the visitor is made aware of structure, environment and materials through transparency of design intent. Private and public zones are clearly articulated and very few visual clues are required to complete the journey through the interpretive centre.

The conical external structure uses plantation pine softwood ribs – Morris-Nunn is doggedly specific when seeking timber from renewable resources, whether it is for cabinetry or framing. The inclined ribs of 300mm x 70mm glued-laminated pine are treated with a non-arsenic based preservative. The walls are clad externally with 10mm thick arsenic-free Ecoply (locally produced with a Madison oil treatment) and 10mm thick twin-walled translucent polycarbonate sheet. The polycarbonate acts as double-glazing to reduce heat loss in winter, without the weight of conventional glazing. Stretched over the conical frame is a tension membrane made of fireproof ‘Teflon’ coated fibreglass, also with a twin skin to minimise winter heat loss. A central flying mast holds this membrane taut and apart.

Externally, the tension to the membrane roof is provided by an exposed system of ‘laced’ stainless steel wires in a double spiral pattern (inspired by the ‘Fibonnaci series’ spirals within a *Pinus radiata* cone). Rigidity is imparted to the exterior through galvanised steel strip pipes fastened at intervals of 90˚ to the ribs and braced with the steel tension wires that are anchored to exposed concrete footings. This lacing forms a highly aesthetic ‘corset’ that serves to constrain the ribs of the conical outer shell.

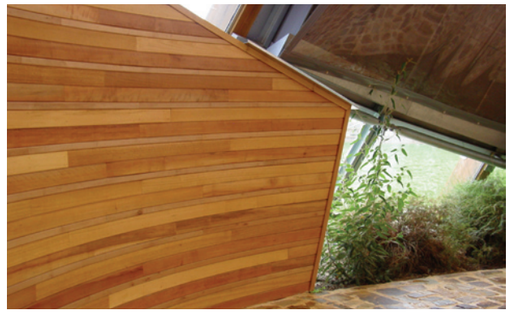
The rectilinear secondary three-storey structure is constructed from an exposed primary frame of steel and hardwood flitch beams, laminated timber floor framing and cruciform flitch columns. In here are the offices, including a ‘roof’ terrace. Much like a normal office building, this internal structure has fixed glass walls. These walls are set with sliding glass vents that open into the forested buffer zone. Set parallel to the glass vents are panels of timber slats, for privacy from below. However, unlike most office buildings, the spaces are comfortably and naturally ventilated. Built at an equivalent cost to a more conventional building with a similar function, the Forest EcoCentre is designed to use 50% of standard operating energy.

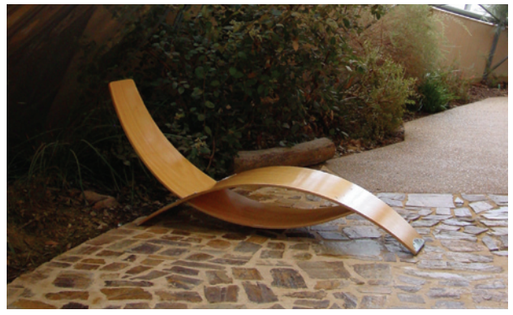
Morris-Nunn has used locally grown plantation timber for the structural components of this building, and recycled endemic forest species for feature cabinetry, such as the reception desk, shelving and the frames of display panels. The life of the timbers in this building is extended with the use of preservatives and sealants. This practice, in addition to the planted buffer zone, serves to ensure good indoor air quality. The base of the curved internal wall is clad in the warm tones of Leatherwood, Myrtle and Tasmanian oak. Timber details are subtly employed throughout the interpretive centre, reinforcing the two central tenets of this project and its progenitors: acknowledgement of the long tradition of the timber industry in this region; and the need to responsibly and sustainably manage the production of timber and to rebuild and maintain Tasmanian forests and ecosystems.

top right
looking skyward from the buffer zone
photo - Chris Wilson

middle right
laminated eco-pine inclined ribs
photo - Catriona McLeod

above right
timber footing detail
photo - Catriona McLeod





top left
incorporation of timber slats and glass in internal structure
photo - Catriona McLeod

middle left
native trees planted in buffer zone acting as ‘biomediators’
photo - Catriona McLeod

above left
internal walls clad in timber
photo - Catriona McLeod

above right
timber seat in ply
photo - Catriona McLeod

In Scottsdale, where winter temperatures frequently fall below zero (and frosts are common) and rise in summer to 20-30°C, this ‘building within building’ employs an internal buffer zone within the truncated oblique cone which comprises the outer shell. Rather than having a glasshouse next to a building, Morris-Nunn designed a glasshouse that surrounds the building, ‘so the office building is actually immersed within this cocoon. So it’s … an environmental envelope’ (GNT Future, 23 June 2004), or what Johnston refers to as the ‘thermal-onion approach’ (2001, p. 89).

The buffer zone contains native trees, shrubs and grasses that act as ‘bio-mediators’ – for passive oxygenation, cooling and heating, and for improving indoor air quality; notwithstanding the obvious attraction to tourists of experiencing a forest by proxy, while learning about it. This planting of species from the major forest communities of north east Tasmania is well advanced and healthy in its enclosed environment, three years since construction.

The building is naturally ventilated (no mechanical system is employed), through the ‘stack effect’; whereby hot air rises and escapes, drawing up cool air, in each case through high and low metal louvres (in banks of about 30 sq. m). The movement of air through the building is specific to the season. The secondary office structure contains a thermal chimney (enclosed as a fabric ‘tunnel’) which punctures the three floors and which allows warm air (in winter) to be directed downwards from a top mounted low-velocity fan. In summer, cool external air is sucked in through the low level louvres, across the ground floor and up the centre of the office building through the fabric chimney. The chimney also draws up unwanted warm air through ceiling-level vents and directs it to escape through the higher louvres.

External vents open only when fresh air is required; the external louvre vents are partly sensor-operated – all sensors are wired to a central computer which measures temperatures and rate of airflow at various levels internally – and partly occupant-controlled. Electrical heaters can be pre-set by occupants to turn on in the internal offices on cold winter mornings, until the sun warms the buffer zone; the same pre-set option exists for lighting within the work spaces.

This building is a best practice exemplar of what can be achieved if consideration of passive cooling and heating systems is done from the initiation of the project rather than as a secondary and token effort. The building has many experimental aspects: the testing of these ideas and materials in a ‘real-world’ setting will provide valuable data for successive designers and builders, particularly in terms of building in cooler climates, where the automatic response is to heat non-passively.

The motivation behind this project is best summed up by Robert Morris-Nunn who acknowledges ‘the future must be creating new buildings that