HEFFERNAN BUTTON VOSS

An unusually elegant and evocative industrial shed in Tasmania's south won the national COLORBOND® Steel Award in 2008, in a triumph for the many individuals who contributed to its successful realisation. **Rachael Bernstone** spoke to the key players.

The making of architecture is always a collaborative process, but the dialogue that underpins its creation can range from perfunctory to enthusiastic. When all the parties come to the table with a willingness to solve the architectural problem together, extraordinary buildings can result.

Aurora Energy's Operations Facility at Cambridge is one such project. It was designed by a team of three directors of Heffernan Button Voss Architects (HBV) – James Jones, Paul Newman and Charles Voss – with crucial input from 'creative genius' and structural engineer Jim Gandy, and unflagging support from Aurora's facilities manager Gerard Gowans. Their shared vision was brought to life by the building contractor Fairbrother Group, with steel fabrication by Crisp Bros, both Tasmanian companies.

Aurora Energy provides and maintains electricity services for domestic customers in Tasmania, following the disaggregation of the state's Hydroelectric Commission into three separate entities. In 1999, Aurora's facilities management team engaged HBV Architects to review its accommodation as part of a continuing reorganisation of their facilities. HBV was then commissioned to design the Southern Maintenance and Operations Centre at Cambridge, near Hobart, to accommodate employees involved in core maintenance, operations and logistics.

The brief called for a building to accommodate storage and workshop functions. For safety and security reasons, the operational and administration area and staff amenities were located in a separate building. In the storage precinct, forklifts and mobile cranes are used to process equipment, spare parts and electricity poles through receiving, unloading, storage, packing, loading and despatch.

According to Charles Voss, the longstanding association between client and architect meant that, in some ways at least, this was a seamless project from start to finish. "Aurora Energy has been a most supportive and receptive client to work with on the project. It was proactive in the concept and realisation of the final solution, and made the whole process an enjoyable and rewarding experience," Voss says. "Working with them on previous accommodation projects since 1999 had established a confident working relationship, and the ability for us to have an intimate knowledge of their organisational structure and their goals."

Coming up with the initial concept – for a long narrow building – was relatively straightforward, according to HBV director and co-designer James Jones. "There was a decision taken early in collaboration and discussion with Aurora to make a long rectangular plan, facing east," he explains. "The floor plate was a product of racking layouts, and the orientation provided a wind break for the store building entries and shelter for line trucks. For efficiency of layout and storage, the main store building required a 38 metre clear span with a building length of approximately 148 metres, enclosing 5,500 square metres of internal space on one level. The roof extends with a 12 metre overhang toward the logistics platform, allowing all-weather loading and protection for power-line trucks."

Having established the parameters, translating them into a build-able structure was somewhat more complicated. "Once it was determined that the width was nearing 40 metres, with a required overhang of 12 metres, the renowned

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RAY JOYCE

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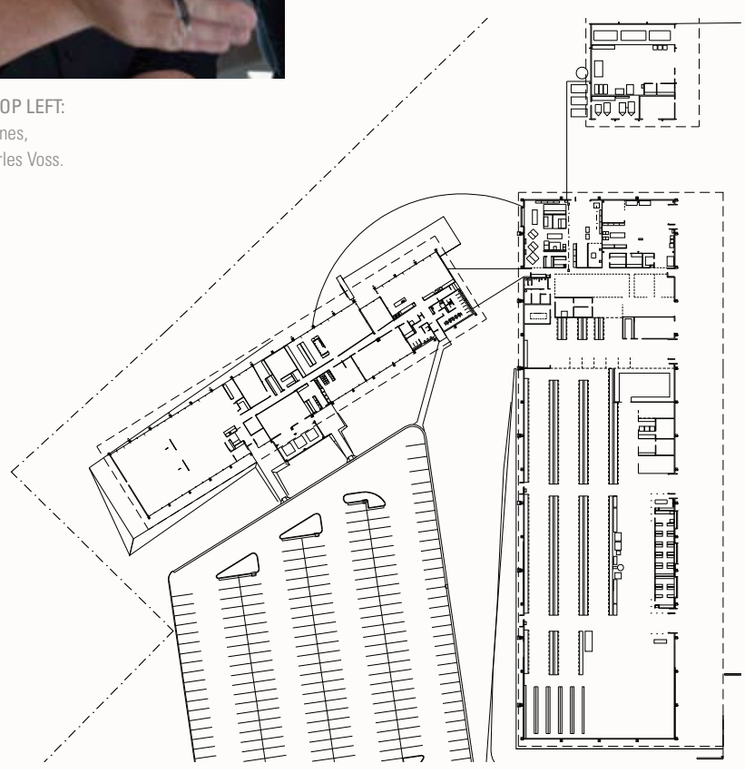
PETER WHYTE

THIS PAGE: Heffernan Button Voss Directors James Jones, Paul Newman, Charles Voss and John Button

LEFT: The 2008 AIA National COLORBOND® Steel Award winner, Aurora Energy Southern Operations Facility in Cambridge, Tasmania

PETER WHYTE

CLOCKWISE FROM TOP LEFT:
John Button, James Jones,
Paul Newman and Charles Voss.



SITE PLAN AURORA OPERATIONS FACILITY, CAMBRIDGE . RAIA TASMANIA AWARDS 2008

structural engineer Jim Gandy advised that we were outside the normal parameters and efficiency of a portal frame," Jones recalls.

"The architects wanted a slim structure and they also wanted a flat skillion roof," says Jim Gandy, engineer and director at Gandy & Roberts. "That resulted in a twofold problem: deflection and ponding of water on the roof. The site plan meant that from the carpark, visitors would look straight along the skillion roof, and deflection may have caused them undue concern.

"Deflection control was very important in achieving a slimline structure that was stiff," Gandy adds. "That meant the portal frame member sizes would be governed by deflection, not strength considerations, and large welded beam sections would have been required." As an alternative, Gandy proposed a post and rod design, and put the scheme to the quantity surveyor for costing. "We were keen to deliver a column-free storage space for flexibility of use, and using a tension structure in this way suddenly brought the building alive," Jones says. "So there was a flurry of emails and facsimiles between HBV and Gandy & Roberts, investigating whether this structural type was economical, given that steel is generally costed by weight."

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"The QS said that the savings we would achieve by using 460UBs instead of 800 UBs would pay for the extra labour required to construct it," Gandy explains, "so that we could give the client an iconic structure for the same price as an ordinary one."

Gandy further refined the engineering solution to accord with the architects' vision for a delicate structure. "The original design called for posts on top of every rafter, but James suggested we use posts on every second rafter with diagonal rods to the intermediates," Gandy says. "I found that this configuration also worked structurally and it was adopted, which resulted in a good mix of architecture and engineering."

HBV director and co-designer Paul Newman refined the structural system in terms of its component parts, build-ability and the utilitarian structure. "Paul produced a very detailed set of junctions and connections that further sharpened the embedded ideas we had developed earlier," Jones says.

The 12m roof overhang protects vehicles from inclement weather during loading and unloading.

BELOW: The additional labour costs associated with building the post-and-rod roof were offset by savings in structural steel, enabling the project team to "give the client an iconic structure for the same price as an ordinary one."

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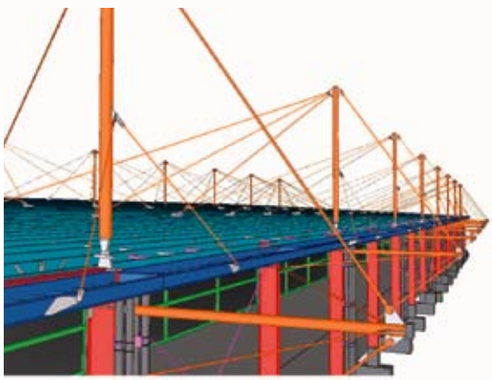

ABOVE: Tekla 3D interactive structural model of the building prepared by Crisp Bros.

Jones credits the building contractor, Fairbrother Pty Ltd, with outstanding coordination and management of the construction phase, and steel fabricator Crisp Bros, for its crucial role in the project. The company produced a Tekla 3D interactive structural model of the project based on Jim Gandy's structural design, before fabricating the steel and erecting it on site.

"Crisp Bros, who also worked on the steel structure for Southern Cross Station in Melbourne, has an outstanding shop drawing capability using Tekla," Jones says. "This led to a smooth fabrication and steel erection process with no site welding or issues on site."

The protruding masts and suspension rods that support the mid-spans and cantilevered overhang of the roof play the dual role of enlivening the building's structure while referencing Aurora's core business: energy transfer through poles and suspended wires.

According to Gandy, the 7000m^2 roof – which is suspended from 16 columns – presented a unique set of challenges. He has overseen the construction of larger spans and tensioned structures, "but this is the biggest combination of the two that I've worked on". Earlier projects that contributed to the realisation of this one include the Hobart Mall,

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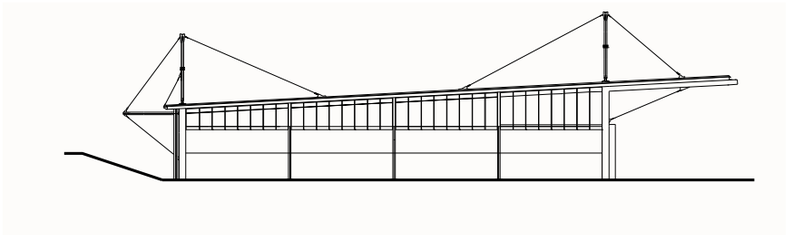
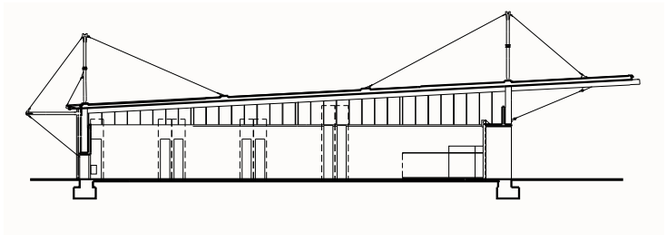
ABOVE: The iconic roof encloses 5,500m^2 of column-free space where forklifts and mobile cranes are used to move equipment, spare parts and electricity poles through storage and workshop facilities

BELOW: The simplicity of the design complements the building's rural fringe surrounds, reflected in this precast window

JAMES JONES





"We have achieved what we set out to do, which was to build a structure to complement its rural-fringe surrounds, and the simple steel post and mast cantilevered design masters this"

where the steel grid was entirely suspended from six columns, and the atrium roof at Hobart's Henry Jones Art Hotel in the former IXL building.

"There have been harder architectural challenges I suppose, but Aurora is up there, and it was good fun to solve," Gandy says. "I've been doing this for 37 years and this is one of the best ones I've done. It looks terrific, especially at night when you can see through it. The roof is so slender, and there is a band of windows on top of the precast that makes it float above the building."

The client and other architects agree: the project won two awards in the Tasmanian AIA awards last year – the COLORBOND® Award for Steel Architecture and a Commercial Architecture Award – and it also collected the national COLORBOND® Steel Award in October 2008.

Aurora Chief Executive Officer, Dr Peter Davis said that the facility, which houses 300 employees, has become the company's major resource centre for Southern Tasmania and has contributed to improvements in operations management.

"The national award represents months of planning, innovative design and construction to deliver a first class facility, which is an absolute credit to Tasmania's HBV Architects and Aurora's planning managers," he said. "We have achieved what we set out to do, which was to build a structure to complement its rural-fringe surrounds, and the simple steel post and mast cantilevered design masters this."

The operations facility was tested in March 2008 when storms brought down hundreds of power lines across Tasmania, leaving more than 35,000 homes without power, with the southern part of the state the worst affected area. "Coordinating an emergency response from a single point meant that Aurora's people were able to restore power as safely, quickly and efficiently as possible," Davis said.

Since the completion of Aurora, members of the project team have applied lessons learned in its construction to create even larger steel roof spans. Gandy recently devised a column-free 57m by 200m roof structure for Te An Veneers at Smithton, Tasmania, where he matched the cost-per-square-metre of a comparable facility that is bisected by columns.

"The brief was clear span at minimum cost," Gandy says. "I started out with the idea of a utilitarian version of Aurora, but it didn't work: it wasn't possible to have outriggers on both sides because of roadways and a boiler on one side. So I devised a truss and tailored the roof shape to maximise the efficiency of the truss while keeping component sizes transportable."

HBV Architects has since designed a logistics facility for another energy sector client. "The success of a project such as the Aurora facility inevitably leads to other projects and we want to ensure that we can continue to develop and apply our corporate knowledge of logistics facilities, which we believe are important building types that should not be devalued," Jones says. "Much can be improved in terms of making intelligently composed industrial operations and logistics facilities. Structural and spatial efficiency can then save money, time and expended energy."

The new project is in construction and due for completion later this year. "It investigates the idea of a roof hanging below its structure in order to reduce wall heights, so that material use and cost are reduced," Jones says. "A 54 metre span is entering the realm of a bridge, and so the building structure has become a set of eight bridge trusses, each spanning 54 metres. The eight trusses provide up to 5,000 square metres of column free space."

And so it becomes apparent that the award-winning Aurora project is part of an ongoing exploration of ideas that the team at HBV Architects, and their clients and consultants, embrace wholeheartedly. "Amid the current debate in Australian architecture concerning buildings generated by a 'form and surface' versus 'tectonics and a response to place', HBV is pursuing an expression through the utility and economy of structure by the use of minimum materials for maximum spatial enclosure," Jones explains. "The Tasmanian economic context is a little different from other states. In our region, office rents are still quite low and the budgets set for most buildings and major projects are well below the other eastern states.

"Over a sustained period of architectural practice, this engenders an approach to designing buildings that are by definition economical and utilitarian" he continues. "If we can also make buildings delightful, useful, and meaningful to their inhabitants and the general public, we achieve guaranteed satisfaction." SP

2008 COLORBOND® Steel Award

PROJECT Southern Operations Facility **CLIENT** Aurora Energy Pty Ltd **ARCHITECT** Heffernan Button Voss Architects **DESIGN TEAM** Charles Voss, Paul Newman, James Jones **STRUCTURAL & CIVIL ENGINEER** Gandy & Roberts **ELECTRICAL MECHANICAL HYDRAULIC ENGINEER** Johnstone McGee & Gandy **BUILDING CONTRACTOR** Fairbrother Pty Ltd **STEEL FABRICATOR** Crisp Bros **PRINCIPAL STEEL COMPONENTS** LYSAGHT SPANDEK® roofing made from COLORBOND® steel in the colour Shale Grey™, with gutters, pipes and soffit linings made from COLORBOND® steel, also in the colour Shale Grey™; Steel columns, beams and tension rods painted with Dulux P39A8 blue charcoal; VSL galvanised steel rigging to storage building; Post tensioned slab reinforcement **BUILDING SIZE** 5,500m²