CONCRETE INSTITUTE of AUSTRALIA

The Scientia, University of NSW Awarded the 2001 Kevin Cavanagh Medal for Excellence in Concrete

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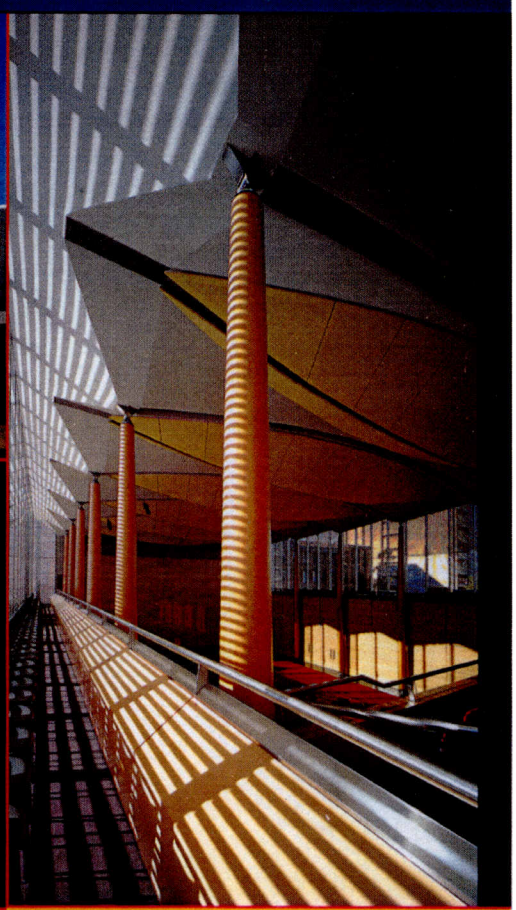

2001 EXCELLENCE in concrete Awards

Official Commemorative Program

Winners and Entries

Federal President's Foreword

The 2001 EXCELLENCE IN CONCRETE Awards are the culmination of two years development of concrete technology and practice in Australia. The Biennial Awards mark improvements made in the standard of concrete construction and publicise the many excellent examples of concrete structures erected nationally each year. The 2001 Awards see the introduction of the International Projects category.

The awards are proudly showcased at the first Concrete Institute Biennial Conference of the new millennium and represent the highest level of progress. The Awards set the standard for future growth and development and will subsequently be given national and international publicity.

The Excellence in Concrete Awards recognise key factors for quality in concrete construction such as design innovation (including aesthetics and detailing), use and function, construction practice, environmental design aspects, durability, weathering potential and economic worth. Winners of the Awards will have demonstrated some or all of these qualities to an extremely high standard. All entrants were evaluated against high industry benchmarks and the winners are considered to have met the standards for excellence and criteria for success.

The Awards for Projects are given for structures that reached substantial completion in 1999, 2000 and 2001. Where possible, entries in this category were examined by the judges, or by delegated members of the Federal Council of the Institute, in each State of Australia. I would like to thank the judging panel for generously giving their valuable time to evaluate entries against top industry standards. I would also like to extend my appreciation to all State Branch Committees and to our Executive Officer who contributed to the record number of entries.

Winners of Technology Awards are individuals, firms, research or educational institutions who have displayed a significant contribution to the competent use of concrete as evidenced by technical publications, patent applications, new pieces of equipment, new techniques, design innovations or educational activity. The economic value of the contribution in this category was also an important consideration.

All National Awards Winners automatically go before the judges for the Kevin Cavanagh Award for the overall winner. Established in 1991 by the Council of the Concrete Institute, this exclusive award recognises an outstanding contribution to quality concrete construction in Australia.

All winners will be invited by the Concrete Institute of Australia to enter the *fib* (Fédération Internationale du Béton) Award for Outstanding Structures. This Award is given every four years at the *fib* Congress to improve international recognition of concrete structures that demonstrate the versatility of concrete as a structural medium.

The growing number of entrants is evidence that the awards are becoming more competitive and are a benchmark for the industry standard. The Concrete Institute greatly appreciates the time taken by entrants to compile their information.

The Concrete Institute takes great pride in these awards and is pleased to encourage standards of excellence in Australian concrete construction where the elements of design, skill and innovation will be evident for years to come.

David Beal
CIA Federal President

CONCRETE INSTITUTE of AUSTRALIA

Awards for Excellence in Concrete

The Concrete Institute of Australia was established to encourage the development of concrete technology and practice in Australia and to foster improvements in the standard of concrete construction.

To recognise the many significant contributions to these objectives and to publicise the many excellent examples of concrete structures erected in Australia each year, the Institute established a Biennial Awards Scheme in 1971. Concrete 2001 sees the introduction of international projects being eligible for an award.

Awards

Awards for Excellence are made for significant contributions to the development of concrete technology and practice or excellence in concrete construction as evidenced by:

- the effective use of concrete in a building or structure that reached substantial completion in 1999, 2000 or 2001.
- research publications, design innovations, material or plant improvements, educational or other activity.

Awards, consisting of citations to members of the team responsible for the achievement, will be presented at the Biennial Conference and will subsequently be given national and international publicity.

A full colour poster display of all complying entries has been mounted for the duration at the Perth Biennial Conference.

Kevin Cavanagh Medal

In 1991, the Council of the Concrete Institute established a new award, the Kevin Cavanagh Medal for Excellence in Concrete which would recognise the overall winner. The award is judged from all winners in both categories on the basis of being an outstanding contribution to the quality of concrete construction in Australia. *(The International Projects group under Category A is excluded from participating in this Award.)*

Category A – Projects

Where a concrete structure is entered, the owner, architect, engineer, builder or specialist contractor, or any of these jointly, can make an application for an Award. Structures include buildings, bridges, tunnels, wharves, liquid-retaining structures, dams and roadworks; or any projects with a substantial concrete component.

Category B – Technology

Entries were sought from individuals, firms, research or educational institutions who made a significant contribution to the understanding or use of concrete as evidenced by research or technical publications, patent applications, new pieces of equipment, new techniques, design innovations or educational activity.

Judging

In assessing entries, the judges took into account:

- The significance of the contribution made by the entry to the development of concrete technology and practice or to the improvement of standards in concrete construction.
- The purpose of the work and its quality. Particular emphasis was given on the appropriateness of concrete construction to the purpose of the structure.

Specific aspects relevant to making an Award included:

- use and function;
- design aspects including aesthetics and design detailing;
- construction practice;
- environmental aspects of the design and its construction;
- durability and weathering potential;
- significant Australian content (International Projects);
- special features;
- excellence.

The weighting given to these aspects by the judges was appropriate to the purpose of the structure and its location. To ensure equitable judging, entries in Category A – Projects were grouped under the following headings:

Building Structures – major/minor
Engineering Structures – major/ minor
International Projects

It will be recognised that the number of Awards made for each period must be limited and hence judges selected entries that excel in the criteria given. In any particular category, awards were made only where this excellence was shown.

Entries in Technology were judged principally on their significance to the development of concrete technology and practice or to the improvement of standards in concrete construction. The economic value of the contribution was an important criterion.

International Projects Winners and Entries

Awards are given in the International category to recognise significant Australian contribution to overseas projects, and the application of concrete technology.

WINNER
International Projects

Malampaya Concrete Gravity Substructure

location: **Subic Bay, South China Sea, The Philippines**
owner: **Shell Philippines**
structural engineer: **Arup Energy**
specialist consultant: **ANCON Beton Pty Ltd**
builder: **The Malampaya CGS Alliance** (John Holland, Arup Energy and Van Oord ACZ)
entrant: **The Malampaya CGS Alliance**

INSTALLATION LOCATION: Off the coast of Palawan Island in the Philippines, submerged in 42 metres of water.

PURPOSE: As part of the Malampaya Deep Water Gas to Power Project, the CGS is the supporting structure and product storage facility for the production topsides weighing 16 500 tonnes, which were installed following the positioning of the CGS on the pre-prepared seabed.

SOURCE MATERIALS: Concrete materials were sourced locally and required rigorous testing to ensure that the necessary quality and concrete characteristics required for the chosen construction method and service life were achieved and maintained.

LABOUR RESOURCES: Labour resources were sourced locally and were trained specifically for the work under the guidance of John Holland management and supervision.

INNOVATION: The Malampaya CGS is the first of its type to utilise concrete storage cells where the gas condensate comes in direct contact with the concrete surfaces thus negating the need for protective coatings.

The CGS is designed to be re-floated when decommissioned to enable removal and environmentally acceptable disposal.

Designed to be installed on an uneven seabed.

Designed for seismic and extreme wave loadings.

BASIC STATISTICS:

34 000 m^3 of concrete
12 000 tonnes of reinforcing steel
750 tonnes of prestress
112 m x 83 m plan area of CGS
16 metres to top of storage caisson
56 metres to top of shafts
Towing weight 91 000 tonnes
Towing distance 200 nautical miles
Largest caisson pour 2300 m^3
Largest shaft pour 567 m^3
Storage capacity 385 000 barrels.

2001 EXCELLENCE in concrete

HIGHLY COMMENDED
International Projects

MSAS GLOBAL LOGISTICS WAREHOUSE FLOOR

location: **Penang, Malaysia**
owner: **MSAS Global Logistics Properties SDN BHD**
architect: **Arkitek Lla SDN BHD**
structural engineer: **M.E.I. Project Engineers SDN BHD**
specialist consultant: **ANCON Beton Pty Ltd**
specialist contractor: **Zacklim Industrial Works SDN BHD**
builder: **Syarikat Success Construction SDN BHD**
entrant: **ANCON Beton Pty Ltd**

In early 2000 ANCON Beton Pty Ltd won a contract with its Malaysian partner, Zacklim Industrial Works SDN BHD to construct a high quality very flat burnished floor in Penang.

The project was 16 000 m² and the principals required a burnished floor (not normal practice for Asia) and achieve a TR34 Category 1 class.

ANCON did this by completing a design review and preparing methodology in conjunction with the local engineers and architects.

The floor was constructed by the ANCON/Zacklim team with five expatriates from Australia as the concrete specialists. The result was that the floor met the client requirements and was finally tested by the use of the BT Reach Truck and it passed well.

The hardness met the most severe requirement of BS8204/TR34 with a Chaplin Abrasion resistance of <0.05 mm. The 16 000 m² construction was completed in 34 days.

KEY FLOOR DETAILS

- 16 000 m²
- Slab on piles – 300 mm thick
- Two layer DA 10 BRC
- TR34 Category 1 floor
- Schedule of pouring 34 days
- Completion target 13 June 2000.

Leading
Practical
Concrete
Technology

ANCON Beton Pty Ltd

CONCRETE and CONSTRUCTION CONSULTANCY
Australia, Asia and New Zealand

ANCON offers a comprehensive service and advice on any aspect of concrete and specialises in:

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- Durability
- Product and market development
- QA and training
- Precast
- Formwork and surface finishes
- High performance concrete
- Inspection and Repair
- Research and development
- Construction with concrete
- Heat of hydration
- Quarrying

EXCELLENCE IN FLOOR CONSULTANCY AND CONSTRUCTION

MSAS Penang 16,000 m²

Services include:

- Design
- Construction
- Supervision
- Measurement

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ENTRY
International Projects

CHISWICK BUSINESS PARK

location: **London, UK**
owner: **Stanhope PLC**
architect: **Richard Rogers Partnership**
structural engineer: **Ove Arup & Partners Pty Ltd**
specialist consultant: **StrongForce Pty Ltd**
builder: **Bovis Lend Lease**
entrant: **StrongForce Pty Ltd**

▪ Chiswick Business Park will ultimately comprise 11 office blocks between 4 to 15 storeys in height. Stage One comprised 3 blocks containing approximately 39 000 m² of suspended concrete slabs.

During the tendering process for the structural frame, O'Rourke Civil Engineering submitted the successful alternative design proposal based on post-tensioning concrete flat slabs, precast concrete columns and a steel-framed central core. The successful redesign and construction of the slabs was carried out by StrongForce Pty Ltd and their UK partners. The flat slab solution for the 9 x 9 m grid offered significant time and cost savings to the client and contractor alike.

Unique construction features of the project included:

- The use of precast concrete edge units in lieu of edge formwork. Anchorages and anti-bursting reinforcement were cast into the units in factory conditions resulting in faster installation times and reduced risk of anchorage failure.
- The use of precast columns with dowel connectors (no starter bars) allowed casting and concrete placement with mechanical screeding. This resulted in significantly less labour for concreting.
- The use of a steel-framed lift core allowed faster commissioning of lifts as the entire structure of the core was erected in a few days prior to concrete casting for the suspended slabs. The steel framing also reduced edge formwork requirements at the core and allowed last minute core replanning and mechanical/electrical co-ordination due to these internal slabs being cast after the suspended floors.

In summary, the implementation of the post-tensioning system of the Chiswick Business Park Development in lieu of alternative steel and reinforced concrete solutions, provided the client, contractor and architect with multiple benefits.

StrongForce Pty Ltd were instrumental in proposing, designing and ultimately assisting to construct the concrete solution.