

# pt news

NEWSLETTER No 4 – 2008

## PTIA ENGAGES WITH PT SUPPLIERS

PTIA is moving towards a greater involvement of PT suppliers to widen its influence on standards of workmanship and materials in PT construction. A forum was held recently with suppliers of strand, wedges, anchors, hydraulic jacks etc to seek input from these organisations into issues on which PTIA should take some leadership. As a result, PTIA will aim to work with ACRS to promote the certification requirements for strand, and will seek input to Standards Australia on necessary changes to AS4672. PTIA will also be seeking to clarify certain inconsistencies regarding the extent of acceptance of the ACRS strand certification, the present capacity of testing facilities, and the extent of testing required.

## Post-Tensioning : your natural first choice method of construction!

Welcome to the latest newsletter from the PTIA. It is probably timely to remind everybody why Post-Tensioning should be your natural first choice when considering the various methods of building available to you as a Developer/Builder.

Post-tensioned concrete has proven to be a preferred method of construction for commercial and office buildings, high-rise residential apartments, carparks, and mixed-use facilities such as hotels and casinos. Developers and owners who select post-tensioning benefit from longer, thinner slabs, which result in greater design flexibility as the number of columns is reduced. Furthermore, post-tensioning requires less reinforcing steel to achieve the same strength as well as smaller shear walls and column sizes. This results in more durable, lighter structures with longer, clear spans.

The benefits don't stop there. High early-strength concrete allows for faster floor construction cycles and the use of standard design details for post-tensioned elements, minimum congestion of prestressed and non-prestressed reinforcement, and earlier stripping of formwork after tendon stressing can also significantly reduce the floor construction cycle. Greater span-to-depth ratios are allowed for post-tensioned members as compared to non-prestressed members. This results in a lighter structure and a reduction in floor-to-floor height while maintaining the required headroom.

Post-tensioning also provides superior performance of diaphragm action at building irregularities, resisting tensile forces resulting from separation of "wings" at reentrant building corners. Further, post-tensioned slabs span farther than non-prestressed slabs, allowing for wider column spacing and fewer columns. Cast-in-place post-tensioned concrete also greatly reduces the floor-to-floor height when compared to a structural steel option, which also results in significant savings in the façade, HVAC, electrical, plumbing, and vertical transportation systems.

For today's commercial building owner, post-tensioning offers the following benefits:

- Significant reduction in the amount of concrete and reinforcing steel required.
- Thinner structural members as compared to non-prestressed concrete, resulting in lower overall building heights and reduced foundation loads.
- Aesthetically pleasing structures that harness the benefits of cast-in-place structures with curved geometries, and longer, slender members with large spaces between supports.
- Superior structural integrity as compared to precast concrete construction because of continuous framing and tendon continuity.
- Monolithic connections between slabs, beams, and columns that can eliminate troublesome joints between elements.
- Profiled tendons that result in balanced gravity loads (typically a portion of dead load only), significantly reducing total deflection.
- Better crack control, which results from permanent compressive forces applied to the structure during prestressing.
- Reduction in overall building mass, which is important in zones of high seismic activity.

As compared to steel, non-prestressed concrete and precast construction Post-Tensioning offers faster floor construction cycles, lower floor weight, lower floor-to-floor height, larger spans between columns and reduced foundation loads.

**IAN K W STUART**  
Vice-President

# PROJECT REPORT

**Location:** Gateway Upgrade Project

**Client:** Queensland Motorway Limited

**Contractor:** Leighton and Abigroup Joint Venture in Alliance with VSL

**Consultant:** Design Joint Venture between Cardno, Smec and Maunsell.

## The New Gateway Bridge



The \$1.88 billion Gateway Upgrade Project is the largest road and bridge project in Queensland's history. It is a state government initiative being delivered by Queensland Motorways in partnership with the LAJV (Leighton Abigroup Joint Venture). The signature feature of the project is the duplication of Brisbane's iconic Gateway Bridge

The new and the existing bridges owe their design to air traffic control requirements and shipping clearances, restricting their height to under 80 metres above sea level and demanding a navigational clearance below of 55 metres - a narrow envelope in which to construct a long bridge.

It is being built 50 metres downstream from the existing six-lane bridge and matches the same distinctive shape, with the addition of a dedicated pedestrian and cycle way. Like its twin, the new bridge will span 1.63 kilometres across the Brisbane River and will stand 64.5 metres at its highest point, around the same height as a 20-storey building. The main span is 260 metres long.

Requiring 157,000 tons of concrete and 11,600 tons of steel, the project started in March 2007 will be completed in August 2010.



VSL Australia, which was involved in the design and construction of the first bridge in the early 1980s, has joined LAJV in a full alliance partnership to deliver the entire bridge from abutment to abutment. VSL brings to the alliance its local and international engineering and construction expertise as well as the supply of selected temporary works and the design, supply and operation of the specialist plant.

The main span will be constructed using 2 pairs of form travellers to form a cast in situ balanced cantilever. The approach spans are made up of 15 piers and 740 precast segments installed in balanced cantilever, and are being erected by a combination of cranes and an 800 tonne overhead launching gantry.

The structure will utilize the world's best in terms of engineering products and techniques, with over 3,000 tons of internal and external post tensioning and optimized grouting to achieve a life span of 300 years.

# PTIA TAKES TRAINING SERIOUSLY

Post-Tensioning installation is a specialist labouring field and should be treated as such. For employees to produce a quality product it is vital that they have the knowledge. By training them with the Industry's "Best Practice" procedures it also ensures they have the capabilities to perform the work safely.

The PTIA's commitment to ensuring a safe and well trained workforce for their Corporate Member companies is evidenced by the resources committed to the research and development of a comprehensive Training Package. A dedicated Training Manager has been appointed to ensure that high standards and integrity are maintained during the training process.



The PTIA has been running its revised Training Package in NSW since the 18th of June with 123 employees from the Corporate Member companies being trained and assessed.

The training has been widely accepted with positive feedback from all comers. The most common comments from senior personnel have been "something like this has been a long time coming" or "I wish there was something like this when I started". Some of the most satisfying feedback has come from new starters in the industry with one employee commenting that "I feel better about going back to site tomorrow, learning what I have".

Giving employees the knowledge to carry out their work in a safe and competent manner benefits all involved. The companies are producing a reliable product while the employee gains a higher degree of satisfaction from the work they are doing.

NSW was the first state to benefit from the PTIA Training program. Over the coming months, member companies in all Australian states will be able to include their employees in the Training. During August, Victoria and Western Australia began Training with some 42 employees completing the course. During September South Australia and Queensland will begin their training.



It is estimated that by the end of 2008, approximately 300 PTIA Member company employees would have benefited by taking part.

Once an employee has been assessed as competent, they are issued with a PTIA Skills Training Card with a unique trainee number. It states what subjects they have completed, and will carry their name and photo so it will be easy to identify them and the competencies for which they have been trained.



The PTIA would like to thank all of the employees who have attended the courses because it is your feedback and co operation that will continue to improve this training program.

## COURSES AND EVENTS

Courses, seminars and other events for 2009 are currently being developed. They will be shown in our first Newsletter of 2009, but can also be viewed on our web site [www.ptia.org.au](http://www.ptia.org.au)

### Prestressed concrete design workshops - 2008

PTIA is sponsoring a series of Prestressed Concrete Design workshops to be presented by Cement and Concrete Services (CCS). For consulting engineering firms who are Associate Members of the PTIA, there are significant subsidies on the fees for these courses – details are available from CCS at [www.cementandconcrete.com](http://www.cementandconcrete.com). Registrations for workshops are to be made through CCS.

These two day workshops are developed for engineers who are familiar with reinforced concrete but who have little experience with prestressed concrete and who wish to gain an understanding of the principles of analysing and designing statically determinate prestressed beams. An optional third day workshop on computer aided design for prestressed concrete is also available.

### SEMINARS AND OTHER EVENTS SCHEDULE - 2008

City	Venue	Dates
Sydney	Stamford Grand Hotel, North Ryde	15 & 16 October, 2008
Brisbane	Mercure Hotel	12 & 13 November, 2008

### PTIA Skills Training courses schedule - 2008

PTIA offers Corporate Member companies a comprehensive Skills Training course which is presented by a dedicated and fully accredited training manager. The courses are offered in all states of Australia, subject to sufficient numbers. The course offers four modules, with modules 1 & 2 as a one day course, and modules 3 & 4 as a second day, advanced course.

On successful completion, course attendees are provided with a Skill Training Course card which is current for 12 months. Annual reassessment is required after that.

Following a first round of courses in all states, and covering several hundred Corporate Member employees, the PTIA Skills Training Course is now offered as required. For details about course dates and locations, contact the PTIA Training Manager, Brad Parkinson on 03 9296 8100 or mobile 0437 439 573, or by email to [bradp@structural.com.au](mailto:bradp@structural.com.au).

### 2009 Courses and Events

The schedule of courses and events for 2009 is presently being developed. It will be published in the first newsletter of 2009, and also on the PTIA web site.

## Member Companies

### Corporate Members

Australian Prestressing Services Pty Ltd  
(founding member)  
Austress Freyssinet Pty Ltd (founding member)  
Structural Systems Group (founding member)  
VSL Australia Pty Ltd (founding member)



### Associate Members – suppliers

Ajax Foundry Pty Ltd  
Cemex Pty Ltd  
CMC (Australia) Pty Ltd  
Haggie Reid Pty Ltd  
OneSteel Wire Pty Ltd  
Refobar Australia



### Associate Members – consulting engineers

Hyder Consulting Pty Ltd  
Taylor Thomson Whitting



### PTIA welcomes its new members

• Dr Des Nortje as an individual member

### Post-Tensioning Institute of Australia Limited

ABN 86 121 218 228  
PO Box 861, Five Dock NSW 2046  
Phone 02 8765 6199  
Fax 02 9743 4013  
Email [info@ptia.org.au](mailto:info@ptia.org.au)

Please visit the PTIA web site [www.ptia.org.au](http://www.ptia.org.au) for details about membership, membership benefits and membership application forms. If you have questions about membership, please contact PTIA through this web site and our office will contact you to discuss your questions.



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