

# pt news

NEWSLETTER No 1 - 2009

## MEMBER INFORMATION

PTIA is pleased to announce the appointment of Brad Reed (OneSteel Wire) and Vince Ponzio (Australian Prestressing Services) to the Board of Directors. PTIA offers member organisations the opportunity to submit articles for inclusion in this newsletter. PTIA Board also recently approved a policy on the use of the PTIA logo by members. Details of these can be found on the website. Members are encouraged to visit the PTIA web site regularly for news and technical information updates. The website also contains the PTIA Constitution and Code of Ethics, as well as copies of past Newsletters.

## 2009 A Challenging Year ahead in Post -Tensioning

A warm welcome to all our readers to our first newsletter of 2009. We trust you had a restful festive season.

Clearly 2009 will be a challenging year for the whole of the Construction Industry with the downturn in the world economy. More so than ever Clients will be looking for further economies in design and constructability which save both time and money. The Corporate Members of the PTIA along with its Associate Members believe that post-tensioning offers those opportunities to clients, the architects and the designers. Early involvement at feasibility and design stage on a project by one of our Corporate members is likely to achieve efficient and economic solutions. Post-tensioning has the capability

of providing larger span distances along with thinner slabs and beams without compromising structural strength and slenderness. Furthermore clients are now making decisions in respect of their future structures not just on price alone but also on their Green credentials in terms of material savings, design and efficiency that benefit the environment. This aspect is becoming increasingly relevant and will be a huge challenge to the construction industry. The PTIA believes that post-tensioning can deliver credible sustainable designs and construction methodologies to the industry.

Whilst many might think that associations would choose to consolidate their position in 2009 the PTIA will be expanding its reach with the formation of Branches in Brisbane and Melbourne. The PTIA was always intended to be a National body and the Directors considered that with a growing membership and greater recognition of the PTIA it was important that we had local representation in both Brisbane and Melbourne. Last year the PTIA sponsored a number of events in both these cities and the interest far exceeded expectations. Clearly the message with respect to post-tensioning is reaching its intended audience and the Directors wish to continue to maintain the momentum. It is the Directors' intentions to hold a number of Board meetings in both locations during the course of 2009.

2009 will be challenging, but out of adversity comes opportunity and I urge the construction industry to think outside the square and think Post-Tensioning!



IAN K W STUART  
Vice-President

# PROJECT REPORT

## Westfield Kotara Project

**Location:** Kotara, Newcastle

**Client:** Westfield

**Contractor:** Westfield Design & Construct

**Post-tensioning Specialist:** Structural Systems

**Consultant:** Hyder Consulting

Since 1985 Hyder Consulting have been involved with the Kotara shopping centre in Newcastle. In this time it has undergone significant change with extensive expansion and upgrade of the Centre. The substantial alterations over this period have included both modification to the buildings that formed the original development and more recently modification to structures erected over the last 20 years. The Centre is effectively developed across the full site and any expansion work is constrained by limited contractor storage areas and a busy retail precinct with high volumes of vehicle and pedestrian movements. As such, post-tensioning was the obvious choice for the structural design.

Westfield approached Hyder Consulting in 2005 with a development proposal to build an extension to the existing Shopping centre and create a modern Westfield Shopping centre for the Newcastle area. Construction began in 2006 with the addition of new carpark and retail floors across the entire shopping centre. Typically, for both the carpark and retail decks the slabs were 150-230mm thick post-tensioned concrete spanning 8.5m or less with 1500mm wide band beams. The post-tensioning works were undertaken by Structural Systems.

Post-tensioning in conjunction with Bondek was used throughout the entire project. This combination not only increased the speed of the construction programme but also reduced the amount of additional bottom reinforcement required. The use of post-tensioning and Bondek formwork greatly reduced the amount of labour and materials required to form up the construction decks, and allowed for rapid stripping of propping and earlier access to the retail levels for the services and fitout trades.

The carpark decks built off existing or new retail decks were designed as watertight by providing minimum prestress of 2.0MPa in each direction.

The use of post-tensioning was one of the key drivers for our structural solutions for this ever-changing site and this has allowed a greater flexibility and future-proofing coupled with cost effective and buildable solutions which allowed the works to progress with minimal disruption to its tenants and users.



# Apples for Apples & Horses for Courses: AS/NZS4672

As indicated in pt news No 4 2008, the PTIA has committed to increasing its involvement with PT suppliers to widen its influence on standards of materials used in PT construction. This is a critical step forward to ensure that strand customers in Australia receive superior and consistent quality product.

## What is AS/NZS4672?

Prepared by Standards Australia and New Zealand, AS/NZS4672 superseded AS1310, AS1311 and AS1313. The objective of this new Standard was to provide a single specification for materials such as strand, intended to be used in prestressed concrete structures.

AS/NZS4672 dictates that a quality manufacturer should follow a testing regime for prestressing steels including compliance testing of the key parameters like Breaking Load, Proof Test, Elongation, Young's Modulus and Isothermal Relaxation testing, the results of which should be continuously monitored and regularly examined internally to ensure that processes are in control and the product is maintained at consistent high quality.

## What relationship does ACRS have to AS/NZS4672?

Third Party certification bodies such as the Australian Certification Authority for Reinforcing Steels (ACRS) regularly undertake audits of accredited suppliers' Manufacturing and Testing processes to independently ensure compliance with AS/NZS4672.

OneSteel's Newcastle plant was the first Manufacturing plant to be successfully accredited to the recently published Standard AS/NZS 4672 and become certified by the ACRS.

## Who else plays a role in the maintenance of Standards in Australia?

Comparative testing of prestressing steels are also undertaken regularly with an independent National Association of Testing Authorities, Australia (NATA) accredited laboratory ensuring confidence with regard to processes and results obtained through internal testing at Newcastle's Wire Mill Testing facilities.

OneSteel's Newcastle Mechanical Testing laboratories are audited regularly by NATA to AS/ISO/IEC 17025 which identifies the general requirements for the competence of testing and calibration laboratories.

Not only does NATA seek evidence of compliance with the above Standard, but also audits practices as detailed in the organisation's documentation and applicable Standards such as AS/NZS4672.

The outcomes of independent third party assessments are evidence of compliance with Standards, documented procedures and practices which are a reflection of commitment to quality, supply of superior product to the market place and ultimately, customer satisfaction.

According to the "Acceptance Criteria of Strand to MRS 11.73" test results are sent to the Queensland Government Department of Main Roads (QGDMR), for their assessment also and for annual re-certification of test equipment and strand.

OneSteel's Quality Management Systems are audited yearly by SAI Global to AS/NZS ISO 9001 to ensure compliance with the Standard and that the processes and methods are followed by the organisation.

OneSteel is proud of its 17 years of continuous certification.



## What does all this mean for the end user?

Manufacturers' compliance with standards provides the end user with a safer, more reliable and fit for purpose product that mitigates risk, lost time and expense in the construction process.

## What does all this mean for the construction customer?

Whether a bridge, residential building, car park or shopping centre, the construction customer in these projects can have renewed confidence in the quality and life of structures that are built using materials compliant to AS/NZS4672.

## Usha Martin Australia Pty Ltd joins PTIA as an associate member

Usha Martin has been operating in Australia for over 4 years and in the past focussed mainly in steel wire ropes. With the expansion of their manufacturing facilities for PC strands in India last year, the company has started selling PC strands in large volumes in the international market including Australia.

The Usha Martin Group also manufactures galvanized PC strands and polymer-coated galvanized/ bright PC strands (both bonded and unbonded). The accessory equipment of single and multi-pull jacks, anchors and wedges can also be made available from their own facilities.

Complimentary to this range also available from the Usha Martin Group are the cables for suspension bridges, cable stayed bridges, and ropes and strands for suspended roof structures.

The focus of the organisation is on quality, and the company has ISO 9001 accreditations and approvals of Lloyds Register of Shipping, American Bureau of Shipping (ABS), and Det Norske Veritas (DNV) for its plants. They also received the TPM Award from the Japanese Institute of Plant Maintenance for the

systems at the plant. NATA Accreditation is being organized and ACRS certification is also planned.

**The Hegigio George Pipeline Suspension Bridge in Papua New Guinea pictured here used the Usha Martin Galvanized PE coated (bonded) PC strands!**

**Contact details:**

Usha Martin Australia Pty Ltd  
(Office and Warehouse)  
2/468-470 Victoria Street,  
Wetherill Park, 2164, NSW

Tel 02 9609 4971  
Fax 02 9756 6516

[www.ushamartin.com](http://www.ushamartin.com)



## Benefits of PTIA membership for Consulting Engineering firms

During the second half of 2008, the Board of the PTIA reviewed the benefits of membership for Consulting Engineering firms and membership fees.

In accordance with its stated mission, PTIA is keen to continue to improve standards of design, materials and construction in the post-tensioning industry. Recently, PTIA formed a specialist sub-committee to develop a full set of standard QA procedures for the post-tensioning industry. Grouting procedures and grouting records are just some of the issues being reviewed by this committee. The input to such procedures from consulting engineers is crucial, as is the distribution of the resulting outputs to consultants.

PTIA has also decided to establish Branches in Queensland and Victoria early in 2009, thereby providing for greater input from the industry around Australia, and for greater interaction on a local level between industry participants. Consulting engineering members of PTIA will be welcomed to interact with their local Branches.

The membership application process for consulting engineering firms has been simplified, and the following benefits are offered -

- a subsidy of \$300 per registration for the PTIA sponsored "Prestressed Concrete Design Workshop" conducted by Cement and Concrete Services. If four staff members registered nationally this would lead to a saving of \$1200, essentially offsetting the cost of membership
- reduced rates for all staff to attend PTIA seminars in conjunction with the Concrete Institute of Australia

- the member company's name on the PTIA website with a link to their website
- access to the PTIA Technical Committee comprising key specialists in PT, as well as opportunities to contribute to the development of industry standards through the PTIA representation with other technical organisations
- access to technical material on post-tensioning and related concrete information in the "Members Only" section of the PTIA website
- a quarterly newsletter containing up to date project reviews and technical information, and listing of current members and their company logos. Opportunities exist for members to submit articles about their organisation and their projects and services
- voting rights and nominations for the PTIA Board
- opportunity to network with other members at the various PTIA functions held throughout the year

Cost of membership for consulting engineering firms is \$1,250 plus GST. There is no joining fee. For firms joining between 1 January and 30 June, the initial membership fee is reduced by 50% to \$625 plus GST. Annual membership fees are due for renewal on 1 July each year.

For further information, view the PTIA website at [www.ptia.org.au](http://www.ptia.org.au) or contact the PTIA as shown on the back page of this newsletter.

# Prestressed Concrete Design Workshops – a CCS and PTIA joint venture

In 2007 the relatively newly formed Post-Tensioning Institute of Australia (PTIA) embarked on a mission to raise the quality standards and profile of prestressed / post-tensioned concrete in Australia to both engineering and technical personnel.



Part of this drive entailed an education of the practising structural design engineers from offices throughout the Australian engineering industry. It was therefore decided to join forces with an existing

organisation which had been conducting prestressed concrete design workshops throughout Australia for over 9 years, namely Cement & Concrete Services (CCS) under the guidance of Paul Uno.

In 2008 the PTIA and CCS jointly pushed forward with design workshops presented by CCS and sponsored by PTIA. These courses comprised two full days of lectures and tutorial sessions on the theory of prestressed concrete design via lectures given by Emeritus Professor Ken Faulkes (UTS and UNSW) and Adjunct Senior Lecturer Paul Uno (Sydney University and UNSW) plus a lecture by a PTIA Director on the practical aspects of post-tensioned concrete design, construction and economics gained from involvement in the marketplace. A third optional day was provided to course attendees who wished to extend this knowledge into quick design by means of computer software. The third day was presented by Gil Brock the designer of the well known post-tensioned design program RAPT.



Topics that were addressed in this two/three day workshop were concrete and steel materials used in post-tensioned concrete (to AS3600), basic principles of prestressed and post stressed

concrete such as load balancing and deflection control. The sessions then went further into details addressing such areas as prestress losses, strength at transfer, ultimate moment strength capacity, shear strength, anchorage block design principles. The final theoretical session then looked at the complete design of a prestressed concrete element of rectangular shape then T-shaped.

The last session of day 2 presented by a PTIA Director, covered practical rules of thumb such as L/D ratios, minimum stress levels, minimum curing periods, practical thickness of PT slabs, appropriate spacing of tendons on site, prestressing units and their capacities, costs of reinforced vs post-tensioned systems, then actual projects where valuable lessons were gained in honing the skills required to become an efficient structural designer of post-tensioned structures.

The optional third day looked at the various shortcut design processes provided by the use of advanced software design using the RAPT program. Each attendee with laptop in hand worked through the various key strokes of the program thereby improving their understanding and speed of design in this specialised area.

Nearly 200 engineers attended these workshops in 2008 with glowing feedback sheets comments such as those listed below:

- *"Excellent Overview – both Design Lecturers Very Knowledgeable"*  
Martyn Illingsworth - Lambert and Rehbein
- *"Practical & Well Structured"*  
Eoin O'Donovan - ARUP
- *"Very Nice Worked Examples – Great Speakers"*  
Nilesh Prasad - MWH
- *"Very Knowledgeable and Experienced Presenters, Excellent Venue, Excellent Slides and Notes"*  
Tim Priebbenow - The Horizon Alliance
- *"Practical Information for Design and Detailing"*  
David Cartwright - connell wagner
- *"I liked the worked examples and tutorials which complemented the preceding lectures"*  
Sam Patane - SKM

Due to the resounding success of these courses, CCS and the PTIA will be conducting these courses again in 2009. Visit either the CCS website [www.cementandconcrete.com](http://www.cementandconcrete.com) or the PTIA website [www.ptia.org.au](http://www.ptia.org.au) early in 2009 for details regarding the dates and venues for these courses. Generous fee subsidies for course registrants at the standard two day workshop will be provided if those attendees are from companies who are current associate members of the PTIA.

# COURSES AND EVENTS 2009

## PRESTRESSED CONCRETE DESIGN WORKSHOPS

PTIA sponsored Prestressed Concrete Design workshops are 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 workshops – 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.

City	Venue	Dates
Sydney	Stamford Grand Hotel, North Ryde	Mar 31, Apr 1 & 2
Brisbane	Mercurie Hotel	May 11, 12 & 13
Melbourne	Hotel Grand Chancellor	Jun 15, 16 & 17
Sydney	Stamford Grand Hotel, North Ryde	Aug
Brisbane	Mercurie Hotel	Oct
Melbourne	Hotel Grand Chancellor	Nov

## SEMINARS AND OTHER EVENTS SCHEDULE

PTIA will not be conducting a seminar series with Concrete Institute in 2009 but hopes to have a number of papers accepted for presentation at Concrete 09 in Sydney from 17-19 September.

Some PTIA seminars may be held in regional locations and details will be announced in future newsletters and on the PTIA website.

## PTIA SKILLS TRAINING COURSES SCHEDULE

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 (General Safety & Installation) as a one day course, and modules 3 & 4 (Stressing & Grouting) as a second day, advanced course. Course fees are \$220.00 (inclusive of GST) per attendee – this fee is a one off payment, covering any or all of the modules.

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. A fee for the annual reassessment is yet to be established.

Following the first round of courses in all states in 2008, 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).

The following dates and states have been scheduled for January to June, 2009. In each set of dates, the first day covers Modules 1 & 2, the second day covers Modules 3 & 4, and the third day is a course for Senior Personnel.

VIC	NSW	QLD	WA
Jan 20, 21 & 22	Feb 3, 4 & 5	Feb 24, 25 & 26	Mar 24, 25 & 26
Mar 11, 12 & 13	Mar 3, 4 & 5	Mar 17, 18 & 19	May 26, 27 & 28
Apr 7, 8 & 9	Mar 31, April 1 & 2	Apr 21, 22 & 23	-
May 12, 13 & 14	May 5, 6 & 7	May 19, 20 & 21	-
Jun 10, 11 & 12	Jun 2, 3 & 4	Jun 16, 17 & 18	-

## Member Companies

### Corporate Members

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



### Associate Members - suppliers

Ajax Foundry Pty Ltd  
 Bluescope Lysaght  
 Cement Australia Pty Ltd  
 Cemex Pty Ltd  
 CMC (Australia) Pty Ltd  
 Haggie Reid Pty Ltd  
 OneSteel Wire Pty Ltd  
 Refobar Australia  
 Sanwa Pty Ltd  
 Severs Technical Systems Pty Ltd  
 Usha Martin Australia Pty Ltd



### Associate Members - consulting engineers

Bentley Systems Pty Ltd  
 Costin Roe Consulting Pty Ltd  
 Hyder Consulting Pty Ltd  
 Taylor Thomson Whitting



### PTIA welcomes the following new Associate Members

- Bentley Systems
- Bluescope Lysaght
- Cement Australia
- Costin Roe Consulting
- Sanwa
- Usha Martin Australia
- Severs Technical Systems

### 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.

