

Artistic Engineering...



Jokes aside, when you step back from both fields to view the bigger picture, it becomes readily apparent that most of the great achievements of civilization have hefty doses of art mixed with science/engineering. The great craftsmen of old were both artist and engineer, creating works which were at once beautiful and well designed, timeless in both fashion and longevity.

A recent meeting of members of these two differing fraternities occurred in Perth last year, in preparation for a project to be located in the remote town of Port Headland. In mid-2009, artist Jahne Rees of Scape-ism approached Reid's Western Australian office with drawings for an "Entry Statement" sculpture comprised of two rings; one of steel, the other of reinforced concrete.

The brief described the concrete ring being poured on its' side in Perth then transported to Port Headland, and requested advice on how this could be done, what lifting devices would be required, and where the lifting systems should be located so as to avoid damage to this slender, curved 16 tonne reinforced concrete element.

...or Engineered Art?

The work captured the imagination of Brian Craig (Principal Engineer / Reid State Manager – WA) and Petar Uscumlic (Senior Design Engineer), who accepted the challenge and began a collaborative effort across the Nullarbor to produce a lifting design that was art in itself. Supply of Swiftlift lifting anchors, architectural form release agents, and most importantly the lift design, sling set-up, and rotational procedure, enabled Jahne Rees' vision to become reality.

Reid & Scape-ism: Master craftsmen working together to produce engineered beauty. In the tradition of the picture telling a thousand words, the following images capture the journey.

The words "Art" and "Engineering" do not often appear together in the same sentence. Some would say there is a fair degree of ignorance, distrust and skepticism between the two schools of thought. No better example of this is the rather unfair joke circulating around engineering lecture theatres: "What did the Arts graduate say to the Engineering graduate?" Answer – "Do you want fries with that?"



NPCAA Reid-up on engineering

On 26th May 2010, members of the National Precast Concrete Association of Australia (NPCAA) met for a technical discussion centred around the interpretation of and testing to AS3850-2003. The meeting, held at Reid's head office in Croydon in Melbourne's outer east, also included physical "in-concrete" destructive testing in Reid's testing facilities.



The main theme of the meeting was to discuss AS3850-2003, and in particular, the ambiguities surrounding its interpretation. A number of specific points were examined in

the context of AS3850-2003, and it was demonstrated that a variety of interpretations are possible, leading to different Working Load Limits (WLL) being determined and claimed to be in accordance with the standard. This ambiguity, and the consequent different interpretations, has resulted in the publication of performance numbers which are not based on the same assumptions. This has proven to be a sure path to confusion and uncertainty in the precast industry, where the performance of similar items cannot be compared accurately in an impartial "like for like" manner.

Examples demonstrated included the determination of Working Load Limits and Limit State Factors relating to lifting and bracing inserts, the importance of applied loads, the use of dynamic and suction factors during lifting of precast panels, and the often ignored science of sling angles in lift design.

To demonstrate the inherent ambiguities within the standard, destructive physical tests of bracing and lifting anchors were conducted in the testing laboratory, the results measured, and the data analysed. After witnessing the physical testing, NPCAA members returned to the meeting room to dissect their findings. The analysis highlighted the discrepancy, where the same set of data can be used to derive differing hypotheses from different interpretations of AS3850-2003. This further confirmed the widespread view that AS3850-2003 needs to be reviewed, and that the NPCAA should take an active and leading role in the revision.



Members of the NPCAA who attended the meeting left with a greater appreciation of AS3850-2003, the issues the industry faces in the revision of the standard, and the importance of a consistent, controlled, and well defined methodology in the testing and analysis of engineering test data to confirm theory.

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