CASE HISTORY

YARRALUMLA BRICKWORKS CHIMNEY S3

The Yarralumla brickworks was established in 1913 soon after the founding of Australia's national capital, Canberra, and was the source of most of the bricks used for the city's buildings for more than 60 years. Important historic buildings such as Old Parliament House (1927) and the Kingston Power Station were among the many large buildings built using the bricks.

Until 1950 the kilns used short brick chimneys with forced draft, following the design guidelines of Canberra's designer, Walter Burley Griffin, which required such structures to be shorter than the pine trees that were being planted throughout Canberra. However the post-war building boom required a large capacity increase and it was decided to equip the new kiln with a 150 ft (46 m) tall natural-draft chimney.

Following the closure of the brickworks, the land was partly subdivided for housing and new residences were built, including some only a short distance from the tall chimney. Subsequently the chimney was recognized as having heritage significance, being the only such one built in Canberra, but it was allowed to deteriorate, the lightning protection system was vandalized and lightning strikes shattered brickwork at the top.

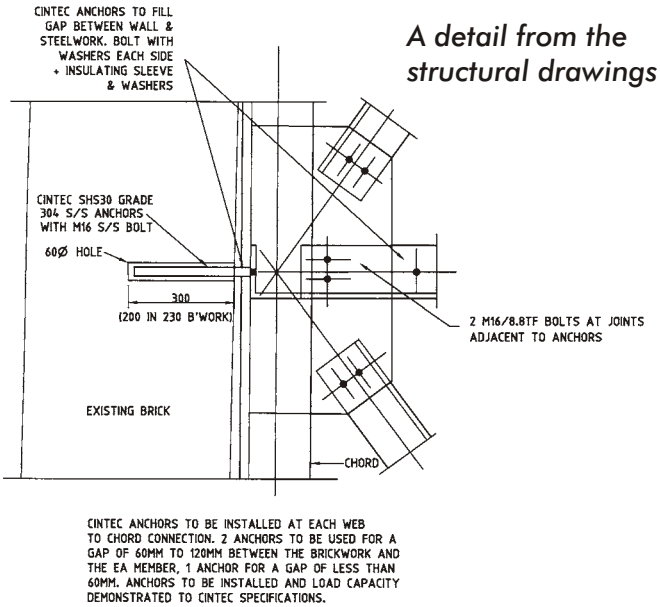
Cintec's Australian representative, Bill Jordan, was engaged to provide conservation advice and structural analysis for the chimney.

In the first phase of work the lightning protection was repaired and upgraded and the lightning damaged brickwork at the top of the chimney was stitched together using Cintec CHS10 anchors up to 2.2 m long. The chimney was fully scaffolded for this operation and the opportunity was taken of testing the brickwork to provide data for the subsequent strengthening.

Analysis showed that the intact chimney was strong enough to resist design wind actions but not earthquake actions. The risk of earthquakes in Canberra, whilst low, is still significant especially when the consequences of structural failure on the nearby buildings are recognized. A

number schemes of strengthening were considered, including drilling and Cintec anchor installation for the full height. In the end the adopted scheme used an internal steel frame. Tolerances in steel fabrication and the difficulties of accurately measuring the chimney meant that the frame had to be designed to be clear of the structure by up to 120 mm. Structural continuity between the steelwork and chimney was accomplished by using Cintec 30x30 mm SHS anchors which had sufficient moment and shear capacity to effect the force transfer. The frame was designed to form its own scaffolding as it rose, so saving the very large costs involved.

A detail from the structural drawings



CINTEC AUSTRALASIA

Tel: 02 4929 4841
Fax: 02 4929 7933
E-mail: solutions@cintec.com.au
Website: www.cintec.com

Securing the past for the future

Tried & Tested