SIKA AT WORK

AUCKLAND TOWN HALL, AUCKLAND, NZ.

QUAKE STRENGTHENING A HERITAGE BUILDING USING Sika® Carbodur®

BUILDING TRUST

STRUCTURAL STRENGTHENING WITH Sika CarboDur®

PROJECT DESCRIPTION
The Auckland Town Hall is a prominent civic landmark in pride of place on Queen Street in Auckland's CBD. It was specifically designed to fit the wedge-shaped piece of land acquired for it, by Melbourne architects JJ and EJ Clark. it was opened in 1922, and is now Protected as a Category A heritage building.

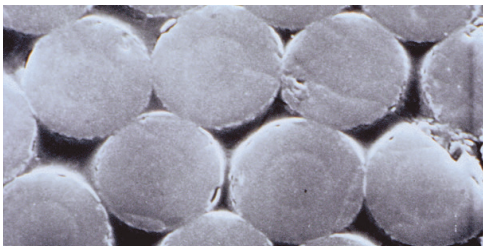
Constructed from Oamaru limestone, this historic five-storey building with its distinctive clock tower, has many special features including kauri floors, decorative pressed metal ceilings and plasterwork, stained glass windows, cast iron balustrades, porcelain and glazed ceramic tiling, and hand blown chandeliers. When the building's restoration started in 1994, these distinctive features and characteristics where to be preserved and maintained in order to re-establish the building's standing as a multi-functional venue and world class performance hall.

PROJECT REQUIREMENT
The two concrete mezzanine floors in the main entrance area were found to have insufficient reinforcement to comply with current NZ Standards. A solution was required which would strengthen the floors to the required standards, while still respecting and maintaining the historic character and structure of the building.

SIKA SOLUTION
There was an existing 6mm layer of plaster on the underside of the concrete mezzanine floor slabs. BBR Contech were able to install the thin, lightweight, yet ultra strong Sika CarboDur carbon fibre reinforced plates to the concrete surface to increase the flexural strength. Sika CarboDur has an installed thickness of 3mm and was therefore able to be "hidden" in the plaster – adding strength while still keeping the heritage.

REFURBISHMENT
Sika Carbodur · Auckland Town Hall

CFRP PLATES
Carbon fibre reinforced plates produced by pultrusion process with precise material properties. Mostly used for flexural strengthening of dynamic and static loaded structures such as bridges, beams, ceilings or walls.



Carbon Fibres in CFRP Plates
Magnification 1:2000
Fibre volume content > 70%

CFRP PLATES - SYSTEM COMPONENTS

Sika® CarboDur® CFRP plates		**Type S**	**Type M**	
	Elastic modulus:	165 ,000 N/mm²	210 ,000 N/mm²	
	Tensile strength:	2,800 N/mm²	2,900 N/mm²	
Sika® Prestressing Systems	Prestressing of **Sika CarboDur®** plates with **Sika CarboStress** prestressing system.			
Sika® CarboHeater Heating device	Fast application (2 – 3 hrs) of **Sika CarboDur** plates			
Sika® CarboShear® L-shaped CFRP plates	**L Min. tensile load:**	126 kN/40 mm width		
	Elastic modulus:	150 ,000 N/mm²		
Sikadur® Epoxy adhesives and mortars	**Sikadur Product:**	**Sikadur-30**	**Sikadur-31 LP**	**Sikadur-41 CFN**
	Application temp.:	8 – 35°C	25 – 55°C	10 – 30°C
	Elastic modulus:	11,200 N/mm²	10 ,000 N/mm²	9,000 N/mm²
	Bond strength:	> 4 N/mm² (concrete failure)	> 4 N/mm² (concrete failure)	> 4 N/mm² (concrete failure)
	Use:	Plate adhesive	Plate adhesive	Repair mortar

AUCKLAND TOWN HALL, AUCKLAND.

PROJECT PARTICIPANTS

Product Specifier:	Kingston Morrison Ltd
Main Contractor:	Downer Construction
Specialist Contractor:	BBR Contech (Construction Techniques Ltd)
Date of Project:	November 1997

If you would like more information on Sika's seismic strengthening solutions, phone Paul Tanner at Sika NZ on 021 607 894.

Scan the following QR Codes for technical information and video demonstrations:

Sika FRP Structural Strengthening system information

Demonstration and overview video on SikaWrap®

Demonstration video on Sika® Carbodur®

Demonstration video on Sika® Carbodur® (Beam)

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