

From Stage to Strength: The Mercury Theatre's Seismic Retrofit



PROJECT INFORMATION

Project Category

Seismic Strengthening

Project Name

Mercury Theatre

Engineer

Centraus Structural Consulting

Builder

Seismic Performance Ltd

Architect

Pattersons Architects

Simpson Strong-Tie Products

- HTT4 Tension Tie & Holdown
- E5 Angle Bracket
- Set-XP Anchoring Adhesive

Project Start Date

- April 2023

Recent earthquakes in New Zealand have starkly revealed the vulnerabilities of our built environment, highlighting the importance of rigorous seismic performance requirements in the New Zealand Building Code. New legislation has emphasized the value of seismic resilience in protecting our heritage.

THE CHALLENGE

One of Auckland's most vulnerable heritage buildings, the earthquake-prone Mercury Theatre, is located on Mercury Lane. Originally known as Kings Theatre, the Mercury Theatre was designed by architect Edward Bartley and built in 1910 by John Fuller and Sons. It stands as one of Auckland's oldest surviving theatres. Recognised for its historical significance, the building is registered as a Category II historic place by Heritage New Zealand under the Historic Places Act 1993.

After waiting over a century, the Mercury Theatre has finally received the seismic upgrades it deserves. Leading the project is Seismic Performance Ltd, an Auckland-based earthquake repair specialist. They are collaborating with architect Pattersons Architects and Centraus Structural Consulting to not only strengthen the theatre but also restore it to its former glory.



Exterior of the Kings Theatre 1910s. (www.mercurytheatre.co.nz)



The interior of the theatre 1940s. (www.mercurytheatre.co.nz)

CHALLENGE

To strengthen the theatre's thick brick walls and ensure their secure connections to the ceiling diaphragm-bracing

SOLUTION

Simpson Strong-Tie HTT4 Tension Tie & Holdown Bracket was installed with a 290mm long, 16mm diameter threaded rod, embedded 200mm deep into the walls. This provides a cost-effective and strong connection to the ceiling diaphragms.

RESULTS

The HTT4 solution provides a cost-effective option with superior strength compared to traditional untested holdown brackets. This ensures the building meets the 70% New Building Standard requirements for earthquake resistance.

THE SOLUTION

Some of us from Simpson Strong-Tie NZ were fortunate to visit the Mercury Theatre during its strengthening stage. We were able to photograph and film some of the Simpson Strong-Tie products specified by Centraus for the project. The team from Seismic Performance (SP) warmly welcomed us and offered a rare opportunity to see the project from a unique perspective. They took us high up into the loft and ceiling, where we got a privileged view of the amazing space, including the massive timber trusses originally built on-site by shipwrights (another name for Ship Builders), they also explained the challenges of strengthening the theatre's thick brick walls and ensuring their connections to the ceiling diaphragm bracing.

This is not SP's first-time using Simpson Strong-Tie's products and solutions. They have used Simpson Strong-Tie products and solutions for other seismic upgrade projects. The team were enthusiastic to explain to us that the HTT4 holdown bracket uses 290mm long 16mm threaded rod, embedded 200mm deep into the walls, providing a cost effective strong connection to the ceiling diaphragms. "We are going to upgrade this building to 70 percent NBS (new building standard)" said the project manager with a look of pride on his face.



When asked why the HTT4 heavy-duty tension tie is one of his favorite products, he explained that it offers cost effective exceptional tension capacity over un-tested pre-fabricated brackets. The HTT4 is a single-piece formed tension tie — no rivets, no welding points and a 4-ply formed seat. No washers are required. They feature an optimized nailing pattern which results in better performance with less deflection, it is also easy to install thanks to the Strong-Drive hex-head SD connector screws.

THE RESULTS

The use of HTT4 Tension Ties, E5 Angle Brackets, and Set-XP Anchoring Adhesive in the Mercury Theatre project serves as an excellent case study of Simpson Strong-Tie products in strengthening structures against earthquakes. We are proud to provide products and solutions that contribute to building safer, stronger structures with improved seismic resilience for New Zealand.



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INFO**

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