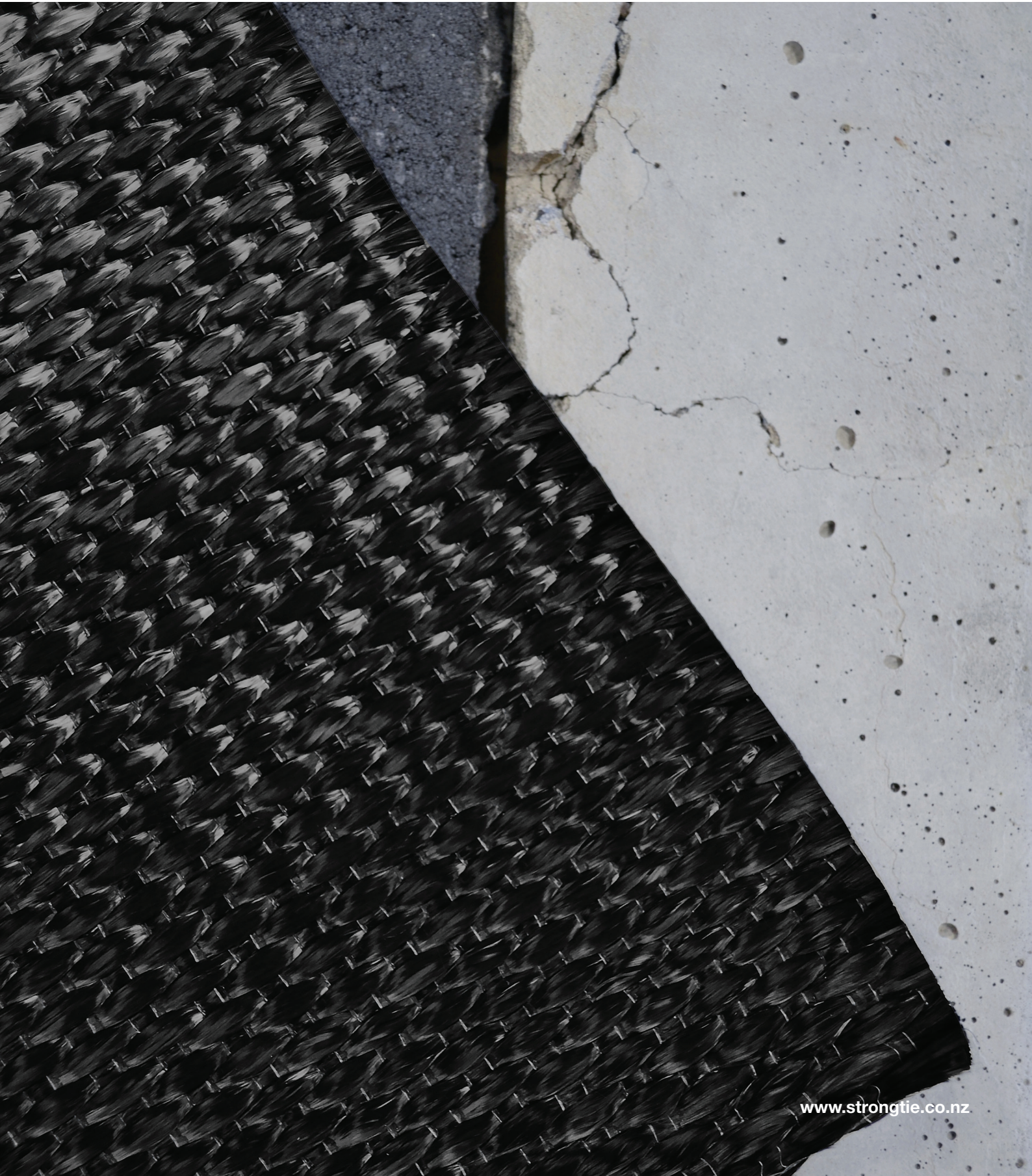


# End-to-End Strengthening Solutions





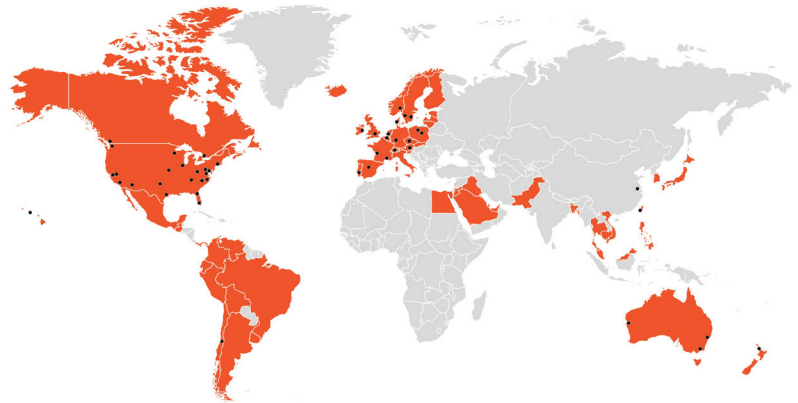
## About Simpson Strong-Tie

Simpson Strong-Tie is the world leader in structural solutions — products and technology that help people design and **build safer, stronger homes, buildings, and communities.**

As a pioneer in the building industry, Simpson Strong-Tie has an unmatched passion for problem solving through skillful engineering and thoughtful innovation. Through structural systems research and rigorous testing, the company can design code-listed, value-engineered solutions for a multitude of applications in wood, steel, and concrete structures. The company's dedication to pursuing ever-better construction products and technology and to surrounding customers with exceptional service and support has been at the core of its mission since 1956.

● Factories, offices, or warehouses in Australia, Austria, Belgium, Canada, Chile, China, Czech Republic, Denmark, France, Germany, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Taiwan, UK and USA.

■ Distribution in Australia, Canada, Chile, Western Europe, part of Eastern Europe, Middle East, Egypt, Japan, Korea and other Asian countries, Mexico, New Zealand, UK, part of South America and USA.

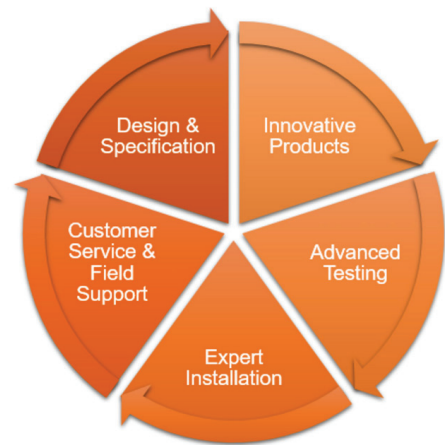


## CSS FRP Composite Strengthening Systems

### A Strong Alliance for Stronger Structures

Simpson Strong-Tie offers one-stop, end-to-end concrete strengthening and repair solutions with the best products, installation and support available.

A leading provider of tested, code-listed, high-performance products and technical services for the construction industry. We offer a uniquely integrated scope of technical knowledge and solutions for concrete and masonry strengthening and repair, that ultimately better serves your needs and helps ensure stronger, safer, longer-lasting structures.



## Products

Simpson Strong-Tie has state-of-the-art composite strengthening systems that utilize lightweight, durable, and high-strength carbon and glass fibers bonded with adhesive resins. CSS products are used to increase or restore the load-carrying capacity, ductility, and seismic resistance to a variety of structures. Significant flexural, axial or shear strength gains can be realized with an easy-to-apply composite without adding significant weight or mass to the structure.



## Carbon Fibre Composites

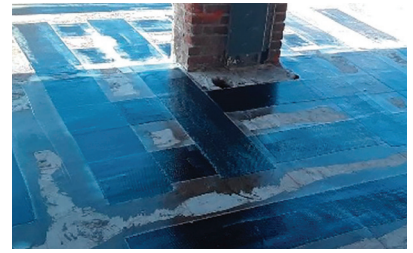
- Carbon Fiber Fabrics
- Carbon Fiber Precured Plates
- Carbon Fiber Grid (Fabric-Reinforced Cementitious Matrix/FRCM)
- Carbon Fiber Bar
- Carbon Fiber Precured Anchors
- Carbon Fiber Anchors
- Carbon Fiber Shear Transfer Bracket

## Resins/Coatings

- 770 Epoxy Saturant
- PF Putty Filler
- FPS UL-Approved Fire Protection System
- WCS Watertight Coating System
- PCS UV Protective Coating System

## Glass Fibre Composites

- Glass Fiber Fabrics
- Glass Fiber Bar
- Glass Fiber Anchors



Slab Flexural Strengthening



Slab-to-CMU Wall Joint Shear Strengthening

## Applications

Simpson Strong-Tie offer a variety of repair and strengthening products, design support expertise, providing value-added solutions for owners. Our line of products provide structural strengthening solutions for:

- Change in Code
- Seismic Upgrade
- Increased Loads
- FRP Reinforcement
- Missing or Misplaced Reinforcement
- Deterioration
- Low Concrete Strength
- New Penetrations & Openings
- Force Protection
- External Post-Tensioning
- Post-Tensioned Structural Modification
- Concrete Repair
- Concrete Section Enlargement
- Steel Bar Corrosion
- Structural Steel
- Supplemental Steel
- External Steel Plates



Diaphragm Strengthening



Wall Strengthening with FRP Anchors

## Key Features

**Versatile.** Utilized on a variety of structural elements including columns, beams, walls and slabs to increase load-carrying capacity applications with limited access and/or complex geometries, while improving ductility and seismic performance.

**Code Reports and Compliance.** CSS products have been evaluated for code compliance by ICC-ES (ESR-4930), meeting or exceeding industry standards for long-term durability. Additional approvals on select products include IAPMO, ANSI/NSF-61, and UL.

**Low Impact.** Composites have a very high-strength-to-weight ratio, allowing for structural enhancement using a low-profile system, minimizing aesthetic impact.

**Environmentally Compliant.** Our systems are ANSI/NSF-61 compliant and meet local, state, and federal environmental regulations. With 0% VOCs, CSS materials can be installed in active construction environments.

## Solutions for Commercial and Public Infrastructure

We develop and integrate products, engineering support, and repair and maintenance services to make new and existing structures stronger and last longer.

- Parking Structures
- Office Buildings
- Retail Buildings
- Hospitality
- Multi-Family Residential
- Historic Structures
- Healthcare Facilities
- Government Buildings

## Support

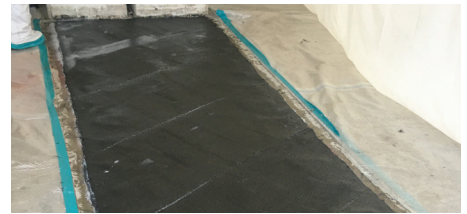
For **existing infrastructure** our products repair deterioration or damage and protect structures to extend life or comply with change of use requirements.

For **new construction** our products and solutions can improve the performance and durability of structures, as well as correct construction defects.

### Engineering and Design Solutions

Our staff of engineers and technical support specialists provide comprehensive design support services for our products. Our services include investigation support, application engineering for our products, design-assist, as well as cost and constructability consulting.

- Investigation Support
- Solution Development
- Budget Development
- Specification Assistance
- Constructability Consulting
- Application Engineering
- Quality Control Programs
- Means & Methods
- Material Development
- Project-Specific Design-Assist



Tying Building Structures Together



Near-Surface-Mounted FRP Reinforcement

## Integrated Design-Build Solutions

Clients can be reassured that our combination of products, design support, engineering and contracting partners allow us to deliver fully integrated design-build solutions from initial problem investigation through to final installation.



Column Shear Strengthening



Large Aspect Ratio Column Confinement



Collector Strengthening

### Application Specific Testing

The Tyrell Gilb Research Laboratory is the hub of Simpson Strong-Tie research and product development activities. Accredited by IAS for various ICC-ES acceptance criteria (AC) and ASTM test standards, our lab is equipped with a seismic shake table, two cyclic/static test rigs and a 3D-testing area so that our products can be rigorously tested and load rated. We have the ability to perform full-scale application testing to provide project-specific solutions. This enables us to model real-world, as-built conditions to make sure our products perform as intended on your structure.



Project-Specific Testing



Boundary Element Confinement



Slab Penetration Flexural Strengthening

