



THE BUSINESS PARTNER
FOR YOUR IDEAS



SECONDARY STIFFNESS DEVICES FOR STRUCTURAL SYSTEMS

MECHANICAL, CIVIL, & ENVIRONMENT

System utilizing steel plates and tension straps to reinforce a buckling restrained brace and reduce structural damage following natural disasters.

TECHNOLOGY TYPE

Infrastructure
Buckling Restrained Braces

STAGE OF DEVELOPMENT

- Proof of concept demonstrated through simulations.
- Ongoing testing to validate performance.

IP PROTECTION

U.S. Utility Patents Pending

Structural Braces and Related Methods

US20160060888A1

Buckling Restrained Brace and Related Methods

US20160237711A1

LEARN MORE

Reference Number: U-5771

Nick Wilkes

Technology Manager
nick.wilkes@tvc.utah.edu
801-587-0515

TECHNOLOGY SUMMARY

In 2017, the National Oceanic and Atmospheric Administration reported over \$300 billion in structural damages caused by natural disasters. Various devices exist to prevent structural damage after seismic events by absorbing load displacements. One such device, a buckling restrained brace (BRB), absorbs energy through plastic deformation and utilizes a stiff sleeve with a metal shell to prevent buckling under compressive forces. The sleeve is prone to fracturing and excessive plastic deformation can cause permanent damage to the system.

The proposed system limits displacement of steel beams during a natural disaster and reduces structural damage by adding additional stiffness to BRBs through reinforced steel sleeves. Steel compression plates attached at the joint where a steel beam connects to the ground and at the steel tube encasing mortar add stability to the system. Secondary tension straps decrease excessive deformation, improving the reliability of the system.

FEATURES AND BENEFITS

- Increases max tension/compression a structure can withstand.
- Reduces structural damage from natural disasters.
- Decreases costs from structural damage and repairs.
- Integrates with existing BRBs easily.

INVENTOR PROFILE

Lawrence D. Reaveley, Professor - Civil & Environmental Engineering

Tyler J. Ross, Ph.D., Explosive Safety Engineer

DATE UPDATED: 7/23/2019