



## **Smart Self-Centered Shear Wall (SSCSW) System**

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### **HIGHLIGHTS**

- Increases energy dissipation capacity.
- Improves recovery of structures after removing the loads compared to current steel plate shear wall (SPSW).
- Potentially improves the lifespan of a building under various loading conditions, particularly earthquakes.

### **OPPORTUNITY**

Current steel plate shear walls (SPSW) have disadvantages such as permanent deformation, and low energy dissipation capacity. In order to improve current SPSW system, University of Alberta researchers have developed a Smart Self-Centered Shear Wall (SSCSW), which is a shape memory alloy-based shear wall system that restores the original form of a building's structural frame after exposure to extreme environmental forces such as strong winds or earthquakes. In SSCSW system, shape memory alloy (SMA) is combined with steel plate shear wall (SPSW) to improve the structure's dynamic behaviour, by providing further energy dissipation capacity, damping, and re-centring of structures.

In this system, pre-straining is applied to SMAs to eliminate the residual deformation that happened in long-term use and provides a self-centering, energy absorber, re-useable and affordable steel plate shear wall. Both new and existing buildings can use this system, without changing their structural elements, as a way to make buildings less vulnerable to extreme environmental loading. The SSCSW system can be utilized in different types of steel, concrete, timber buildings, or high-rises to make them more stable during exposure to ground movements with different intensities, frequency contents, and magnitudes.

### **COMPETITIVE ADVANTAGE**

- Allows the structures to comply with the building codes while using remarkably lower amount of construction materials.
- SMA can recover its original shape after undergoing large deformation (strain) up to 14% of the initial length.
- Potentially save the lives of people and preserve the buildings in areas located in seismic zone.

### **STATUS**

- Patent Pending.

### **INVENTORS**

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### **MORE INFORMATION**

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