

# E-SEER UTM WON BRONZE MEDAL AT THE 14<sup>TH</sup> MALAYSIA TECHNOLOGY EXPO 2015

Featuring SEER-iSPRING, Intelligent Earthquake Resistant Beam-Column Connector



*Prof. Dr. Azlan Adnan and Sk Muiz Sk Abd Razak during the presentation of SEER-iSPRING invention to panel of judges.*

**Kuala Lumpur, February 14:** An e-SEER UTM (Engineering Seismology and Earthquake Engineering Research) team from Department of Structural Engineering, Faculty of Civil Engineering, Universiti Teknologi Malaysia led by Prof. Dr. Azlan Adnan, has won a Bronze Medal at the 14<sup>th</sup> Malaysia Technology Expo 2015 held at Putra World Trade Center (PWTC) in Kuala Lumpur recently, from 12 to 14 February 2015. The team comprised of Prof. Dr. Azlan Adnan, Prof. Dr. Abdul Rahman bin Md. Sam, Dr. Mohammadamin Azimi and Sk Muiz Sk Abd Razak.

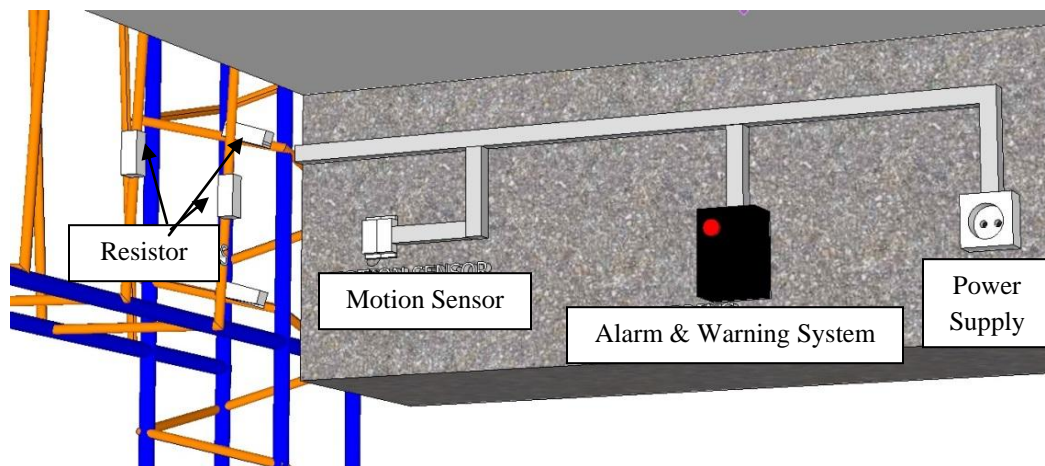


*l-r: e-SEER team; Prof. Dr. Azlan Adnan, Prof. Dr. Abdul Rahman bin Md. Sam, Dr. Mohammadamin Azimi and Sk Muiz Sk Abd Razak.*

Y. Bhg. Dato' Ir. Haji Yahaya Ahmad, President of Malaysian Association of Research Scientists (MARS) handed out the Bronze Medal for the invention, SEER-iSPRING, witnessed by Dr. Wan Manshol Bin Wan Zin, Chairman of the Organizing Committee for MTE2015.

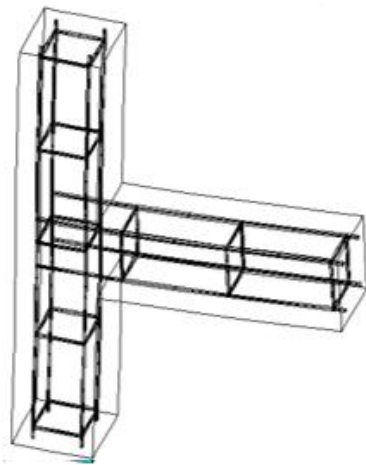
SEER-iSPRING is an Intelligent Earthquake Resistant Beam-Column Connector system in building. This invention has been submitted for intellectual property registration with application number of UTM.J.14.01/27.13/1JLD48 (50). SEER-iSPRING acts as a Shear Reinforcing System in Beam-Column Connection, arranged in certain configuration, in order to reduce damage, crack opening and vulnerability induced by external sources such as earthquake by applying more effective system with high performance in term of the shear behavior opposing the building motion. As a result, damages of the building are reduced and the bearing capacity of Beam-Column Connection in RC structures is increased. This new type of continuous shear resistant system can be used in two different model, first Single Spring Shear Reinforcing System and then, Double Spring Shear Reinforcing System.

A unique, smart motion sensor with special electric circuit is introduced to increase the temperature of the bars during earthquake to increase ductility by reduction of the stiffness. One of the strong point of SEER-iSPRING is the easy manufacturing of rectangular spring for use in shear resistance system against conventional stirrups. The invention can be easily applied and adopted in the construction field. Additionally, the method of erection of SEER-iSPRING in construction is clean and time saving.

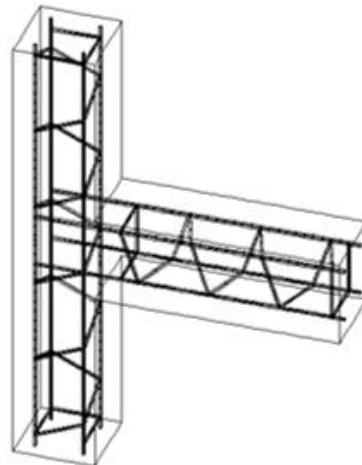


*SEER-iPLAT invention which won the Bronze Medal at Malaysia Technology Expo 2015. The motion sensor detect the ground motion and activate the resistor which apply heat to the double continuous shear link at the beam-column connection. The alarm and warning system will be triggered once the safety threshold is about to be breached, to enable safe evacuation of the structure occupant.*

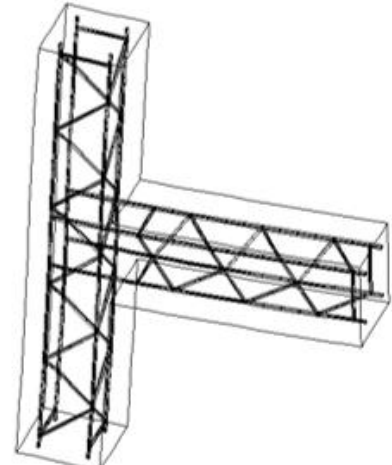
Normally, conventional connections in structures used common discontinuous shear reinforcement system named stirrups. The common connections in reinforcement concrete structures have shown weak performance when earthquake occur. By using two effective and applicable techniques, the invention significantly improves seismic performance of reinforced concrete structures. First, in SEER-iSPRING, single rectangular continuous and double rectangular opposing continuous shear reinforcement are used instead of discontinuous conventional shear reinforcement in order to improve general performance and ductility and energy dissipation capacity of RC beam-column connections. Secondly, local behaviour of continuous shear reinforcement system is improved by using a smart electric circuit in order to heat up the shear reinforcement system under a certain amount of temperature, exactly when earthquake occur automatically. SEER-iSPRING significantly improves structural performance in all regards using the combination of these two novel techniques.



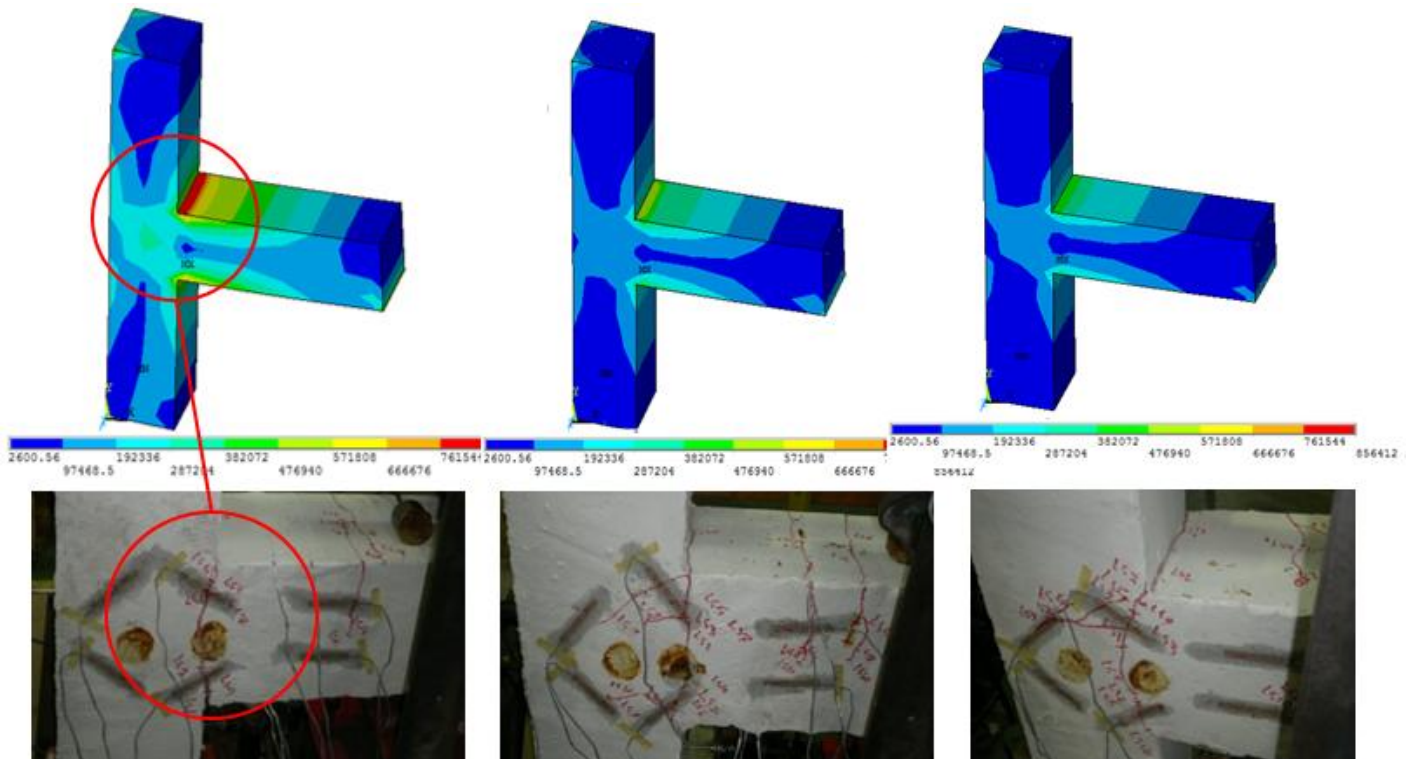
CONVEN



SINGLE



DOUBLE



*SEER-iSPRING name was derived from the continuous shear link utilized in the invention. Double continuous shear link provides higher earthquake resistant and structural ductility compared to the conventional shear link and single continuous link.*

In term of commercialization, SEER-iSPRING will benefits the manufacturing industry, which produces structural member, Precast industry for Industrial Building System (IBS), Construction industry, as well as Government and Public sectors. The invention has great potential and it is hoped that SEER-iSPRING would be able to contribute to a more efficient and safer building structures in the future, especially against the earthquake ground motions.