Nanyang Technological University

School of Civil and Environmental Engineering
Division of Structures & Mechanics

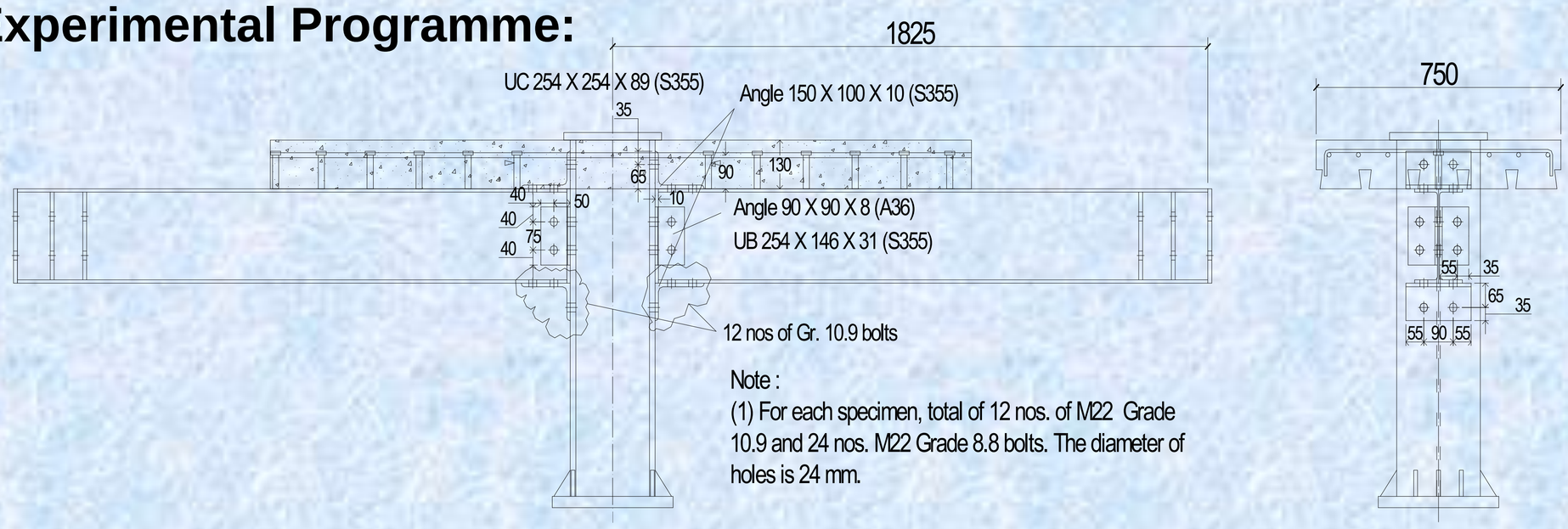
Influence of semi-rigid joint characteristics on the behaviour of composite steel-framed structures under fire conditions

Yuan Z. and Tan K.H.

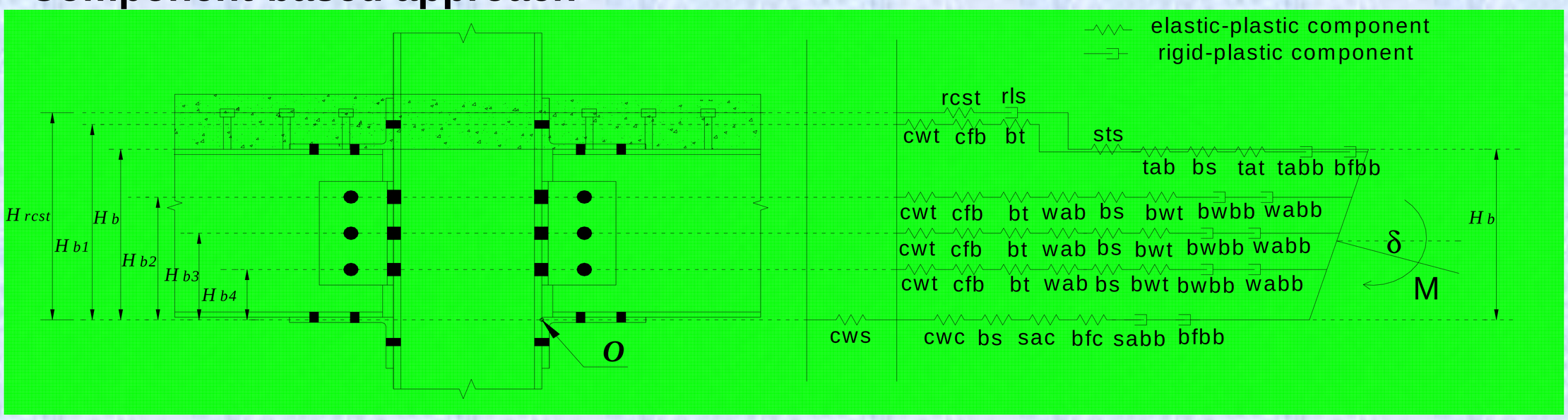
Introduction:

To incorporate a new component model representing the RC slab in tension so as to generate more accurate M-ϕ characteristics of composite beam-to-column joints at ambient and elevated temperatures.

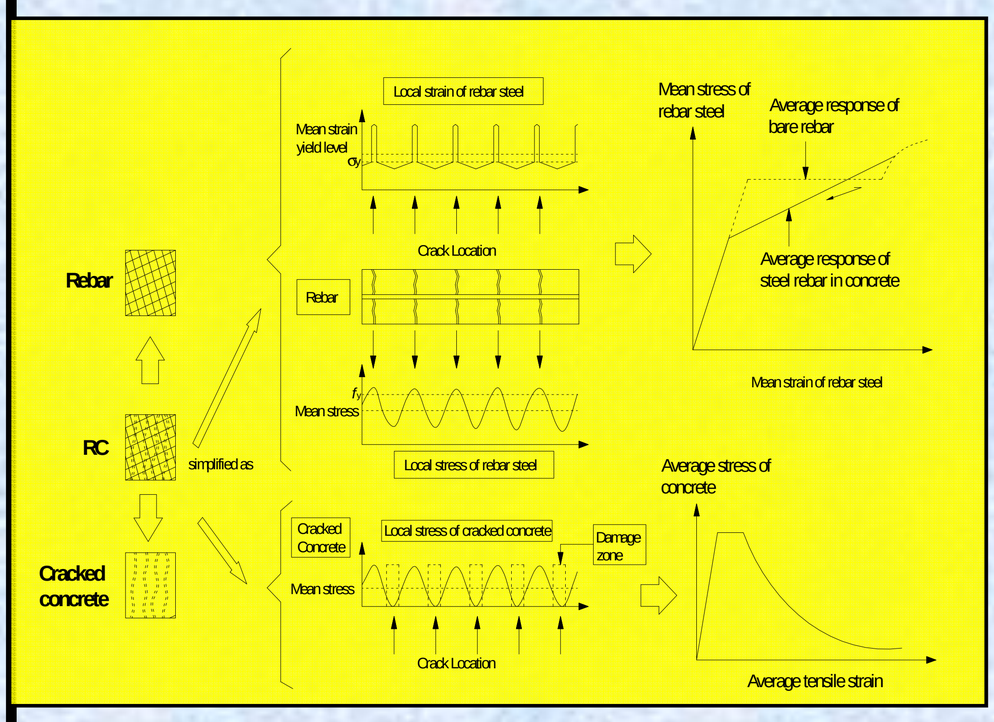
Experimental Programme:



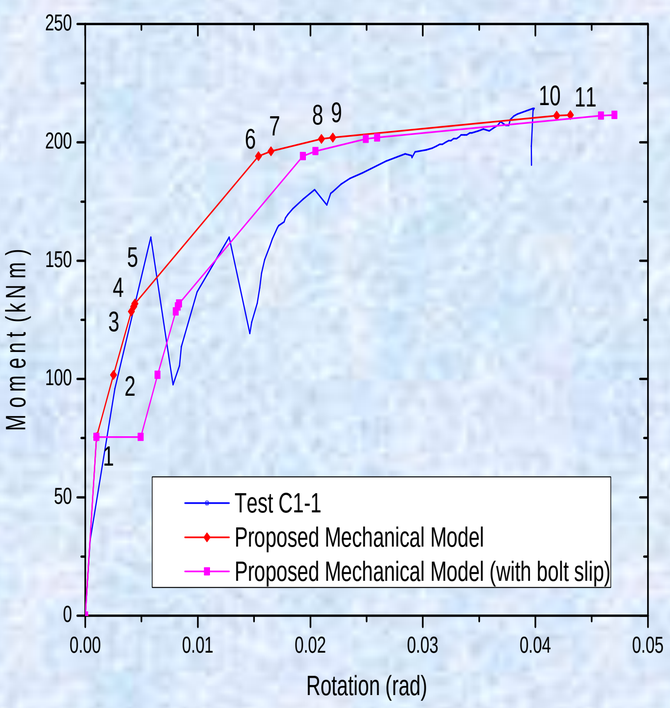
Component-based approach



New component for RC slab



Tracking failure of a composite joint



1. Reinforced slab reached elastic limit.
2. Shear studs reached elastic limit.
3. 2nd row of bolts reached elastic limit.
4. Beam flange (comp) reached elastic limit.
5. 1st row of bolts reached elastic limit.
6. Reinforced slab reached yield.
7. Beam flange in (comp) reached yield.
8. 1st row of bolts reached yield.
9. 2nd row of bolts reached yield.
10. 3rd row of bolts reached elastic limit.
11. Beam flange (comp) reached ultimate.
12. The joint reached “failure”.