

Fachbereich:	Risk and Safety, Institute of Structural Engineering
Leiter der Projektarbeit:	Prof. Dr. Michael. H. Faber
Betreuer der Projektarbeit:	Harikrishna Narasimhan
Titel der Projektarbeit:	Evaluation of Structural Robustness for Steel Framed High Rise Buildings
Beschrieb:	<p>The awareness of the significance of the robustness of structures has gradually intensified over the years due to experiences with failure and collapse of several structures. However, despite many significant theoretical, methodical and technological advances over the recent years, structural robustness is still an issue of controversy and poses difficulties with regard to its interpretation as well as regulation.</p> <p>A risk based framework has been recently proposed for the assessment of robustness. The direct risk, which is associated with the direct consequences arising from potential damages to components of a structural system and indirect risk, which corresponds to consequences resulting from loss of system functionality or failure are evaluated. The robustness of the structural system is then assessed by the ratio of the direct risk to the total (direct and indirect) risk.</p> <p>Some past applications of this framework include:</p> <ul style="list-style-type: none">• the assessment of robustness for a highway overpass structure for vehicular impact• the investigation of robustness for a highway bridge considering the effect of deterioration caused damage states such as corrosion and cracking and• a quantitative evaluation of structural robustness for a high rise building structure for an explosion event. <p>The envisaged project work involves the evaluation of structural robustness for a steel framed high rise building structure. Two design configurations typically used for high rise buildings - the framed tube system and the core with outrigger truss system (see Figures 1a and 1b) are considered. The structure is subjected to an explosion event. This is considered to cause damage to columns at the lower storeys of the structure. The modeling of the resulting failure scenarios for the structure and the associated consequences is then carried out. Finally a comparative study involving the evaluation of risk and assessment of robustness is performed for the two considered design configurations in order to identify the most favourable</p>

alternative.

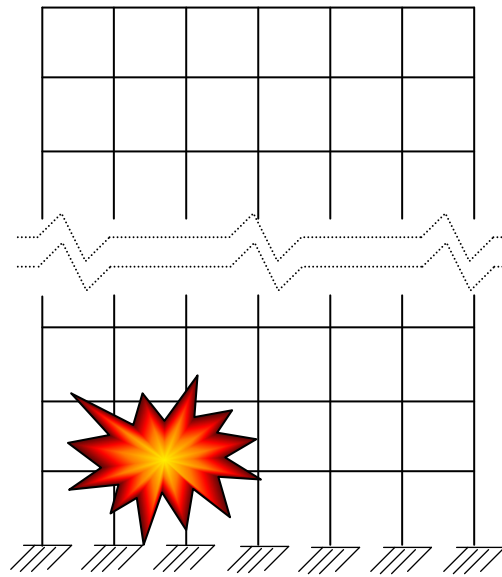


Figure 1a Framed tube system

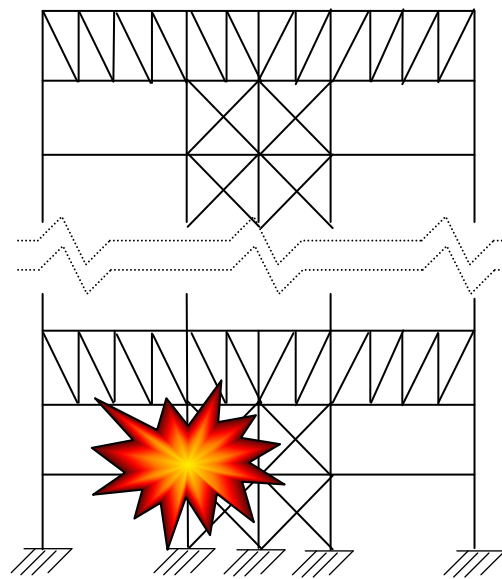


Figure 1b Core with outrigger truss system

**Empfohlene
Lehrveranstaltungen:**

Risk and Safety in Engineering

Besonderes:

The project work would be in English. Group work is possible. All necessary software tools required for the analysis would be provided.