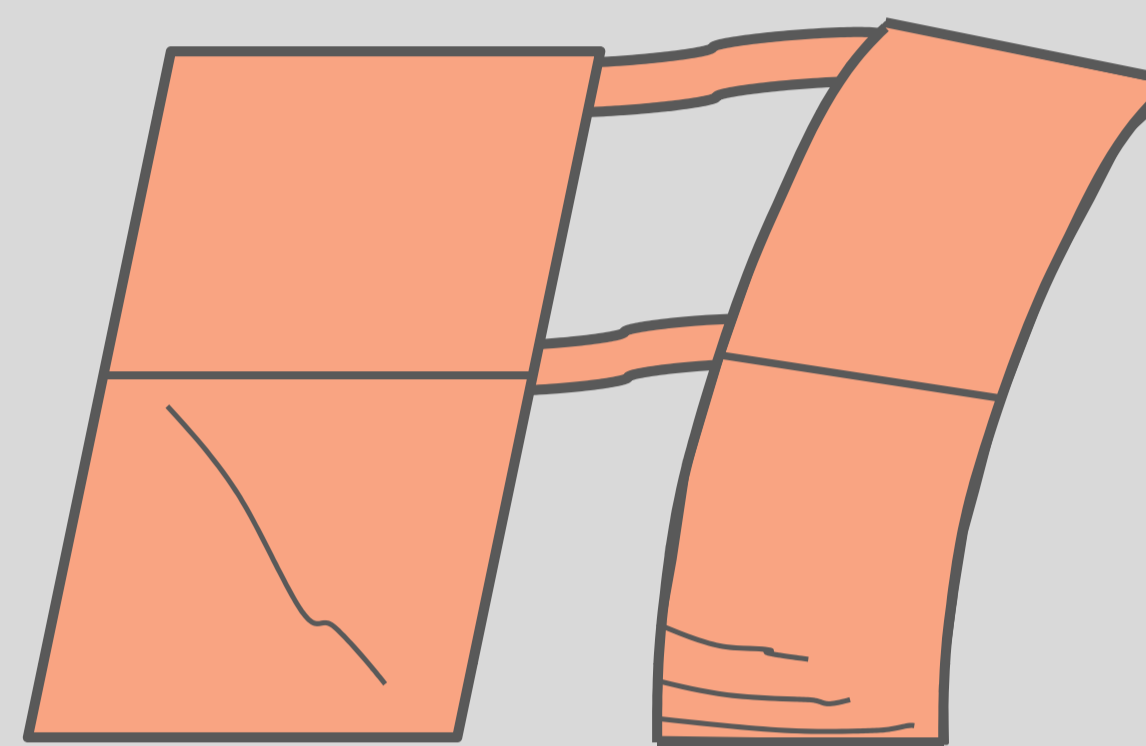


Research Issue

Seismic Behaviour of mixed reinforced concrete (RC)- unreinforced masonry (URM) wall systems

- Seismic behaviour quite uncertain because of the coupling of different systems (shear and flexural walls)
- Structures relatively common in Switzerland
- No recommendations in the SIA code
- Over-simplified design assumptions

URM wall Shear behaviour **RC wall** Flexural behaviour

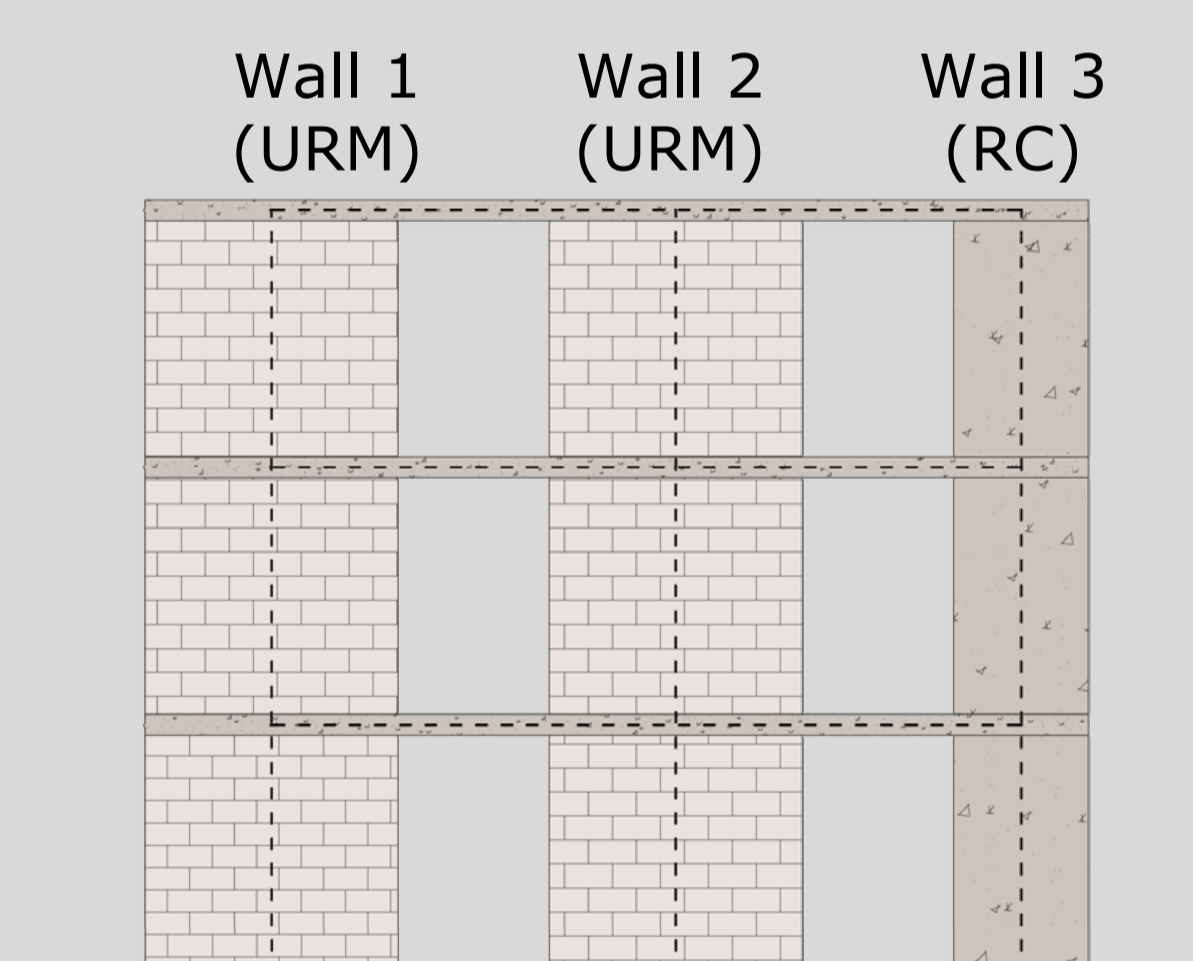


Main Research Objectives

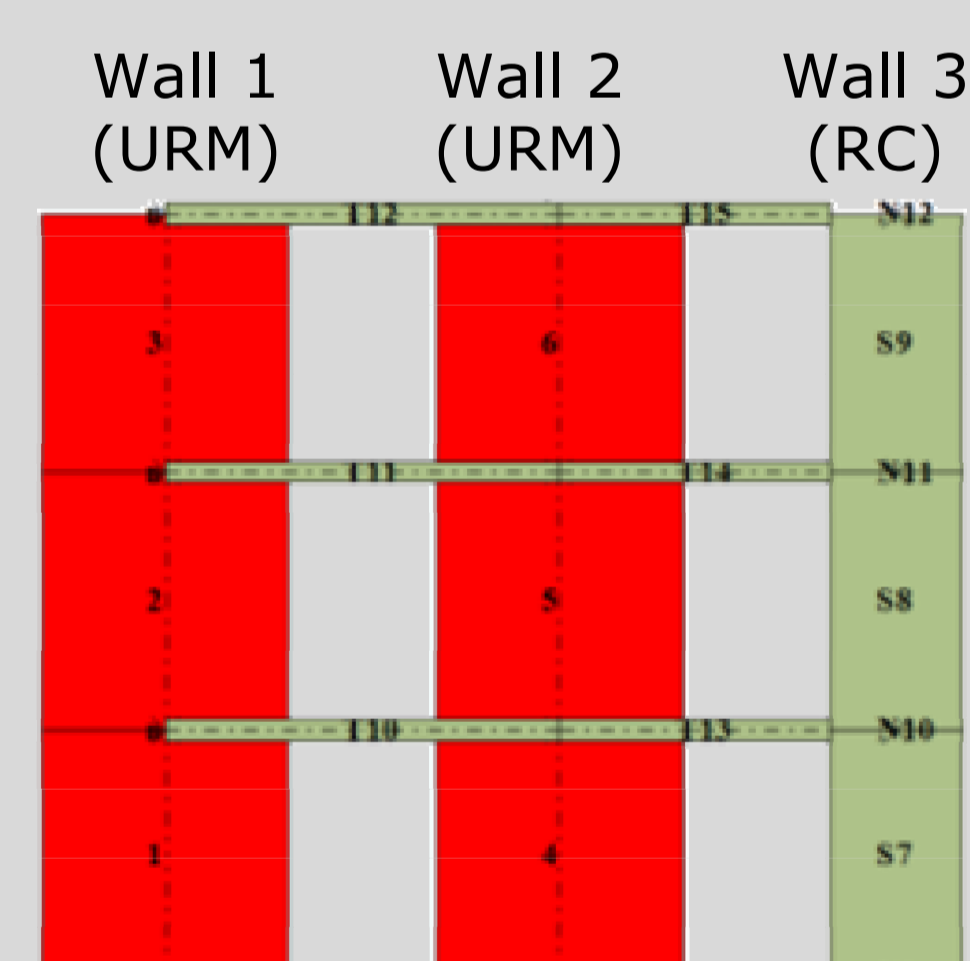
- Proposal of simplified models for the design approach
- Repartition of forces between the different walls
- Understanding of the interaction between reinforced concrete and unreinforced masonry walls

Methodology

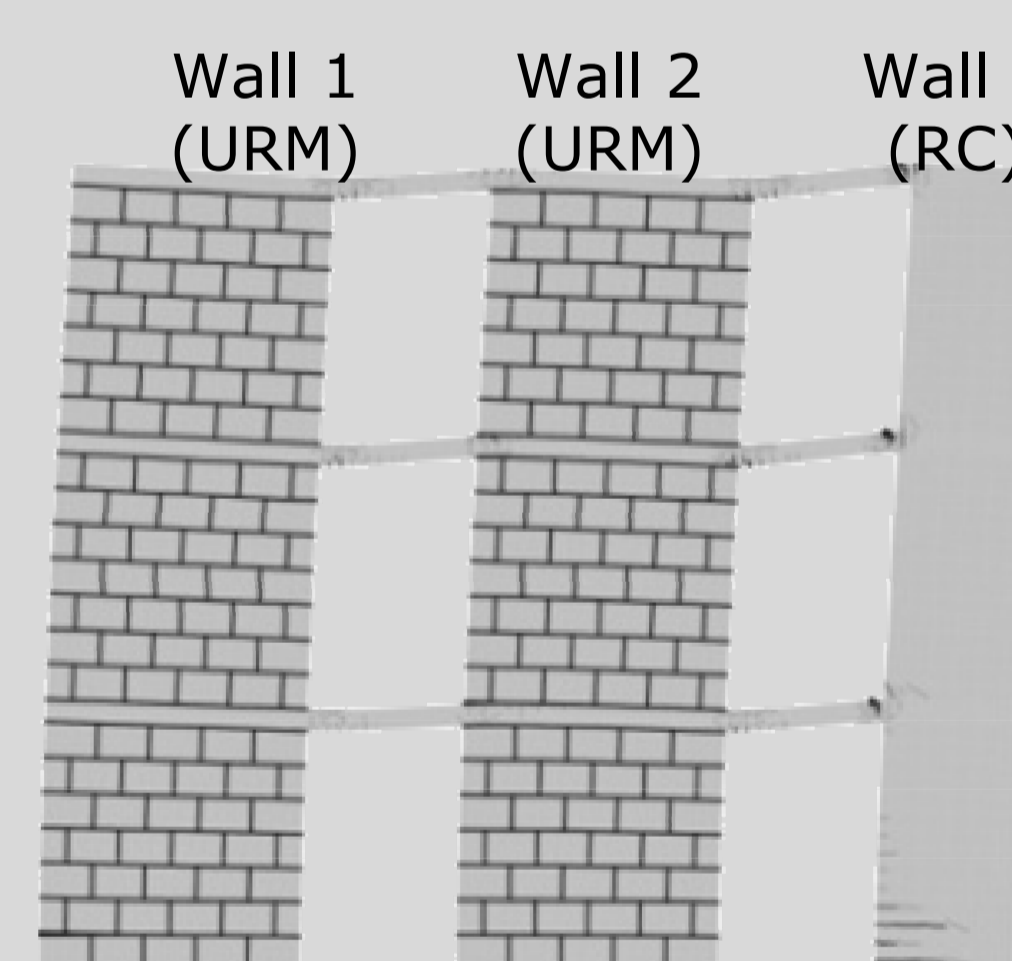
1 – Analyses of mixed systems with different numerical tools and comparison of the results



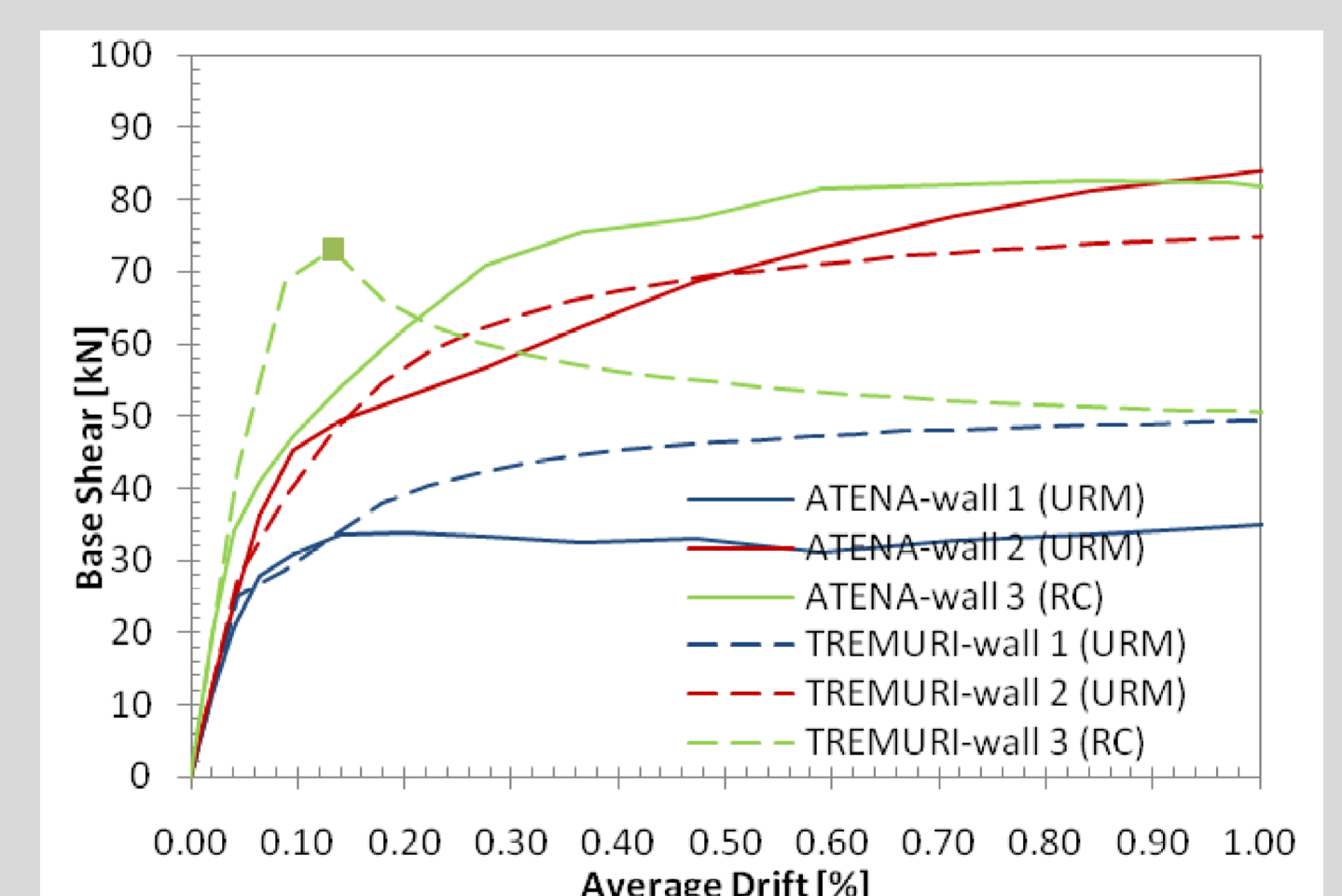
Reference structure:
three storey building



Macro-element model:
each wall modelled as a
single element

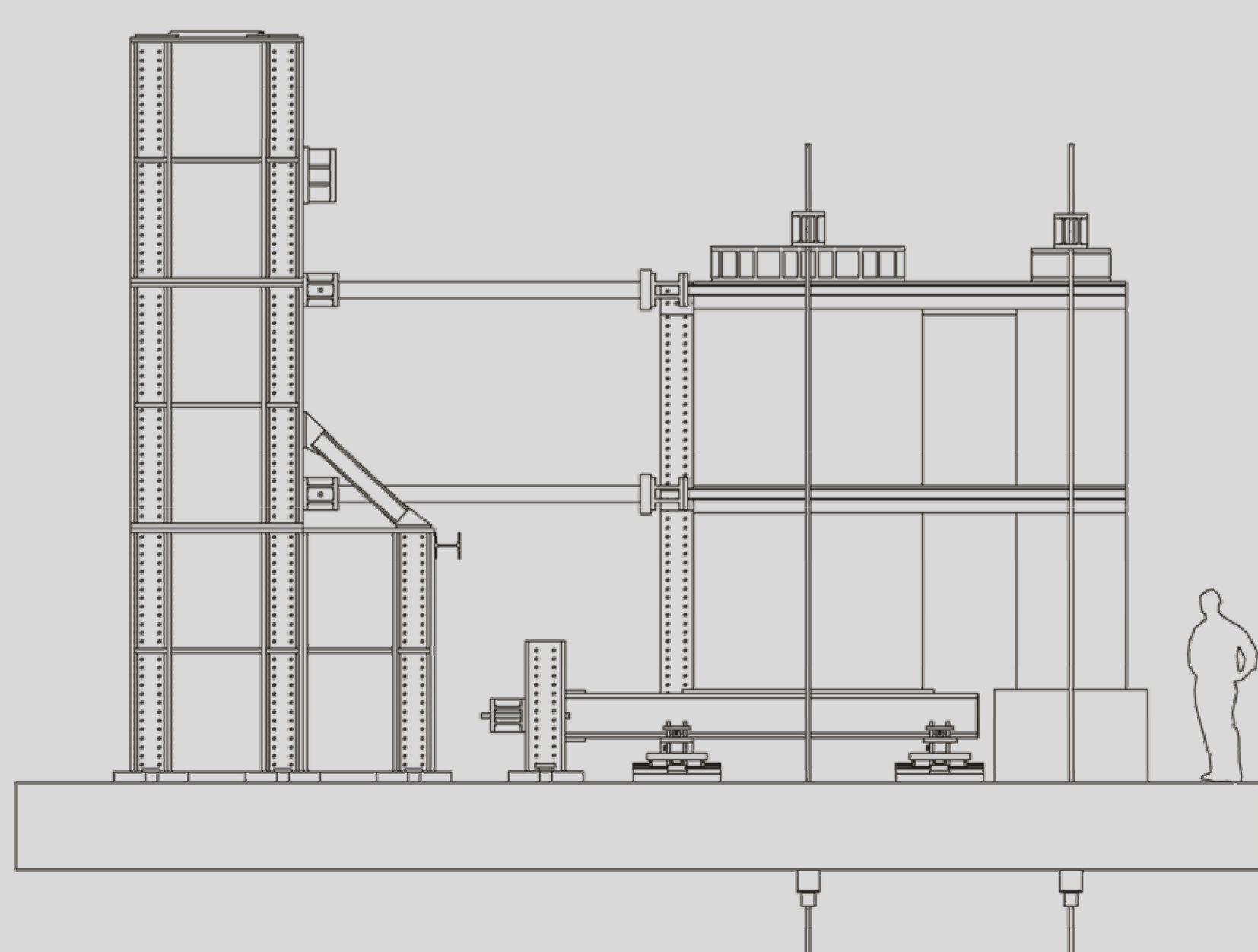


Finite element model: each
brick modelled as a separate
unite, joints modelled as
contact interfaces



- Comparison of the results:
- between different models
 - between different assumptions for the same model

2 – Large scale testing to validate and calibrate the analytical models



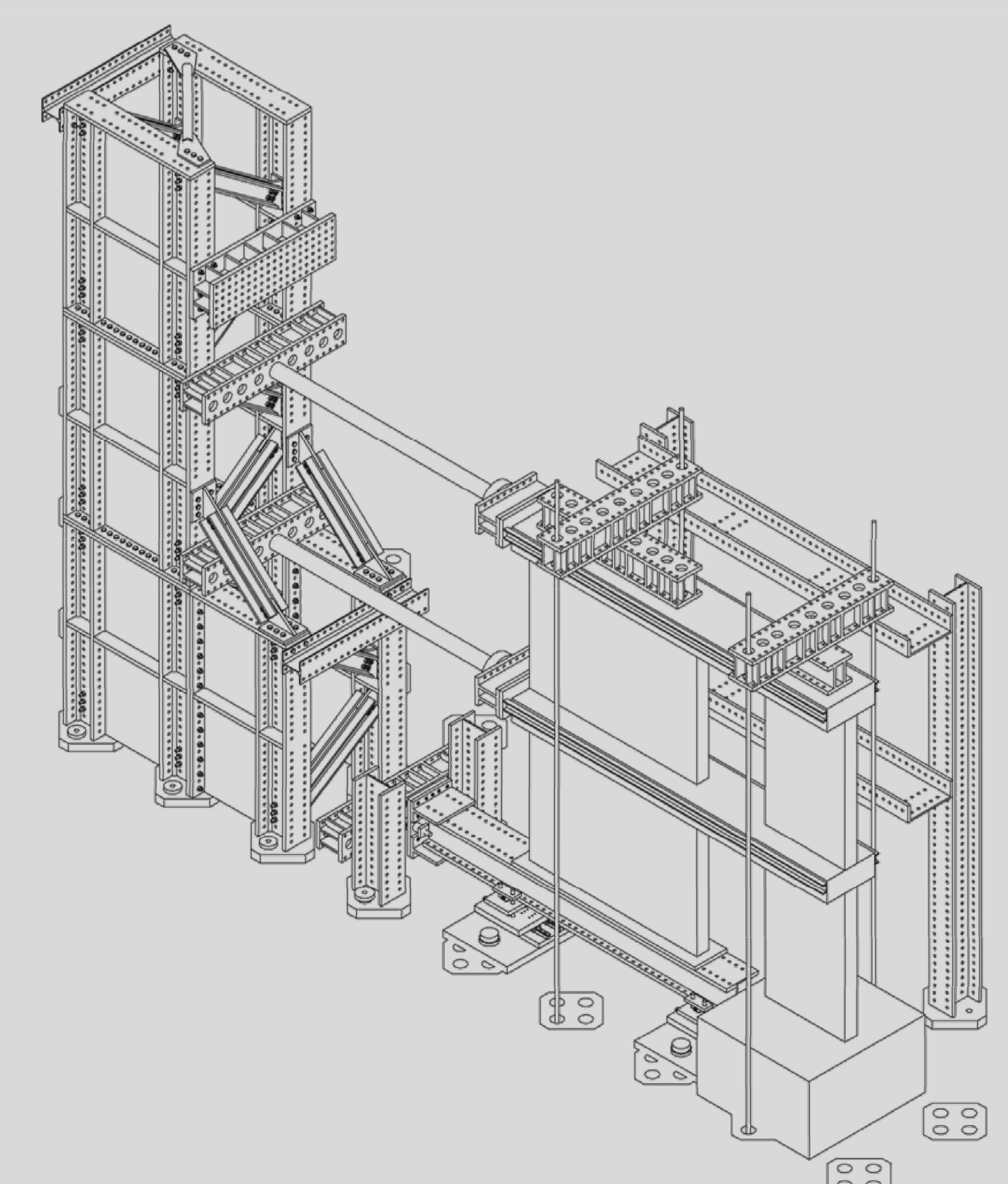
PRELIMINARY ANALYSES



LARGE SCALE TESTS



REFINED ANALYSES
+
DESIGN GUIDELINES



3 – Parametric studies to propose simplified design approaches