

MASTER'S DISSERTATION AT STRUCTURAL MECHANICS

DEPARTMENT OF CONSTRUCTION SCIENCES | FACULTY OF ENGINEERING LTH | LUND UNIVERSITY



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PRESENTATION

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REPORT

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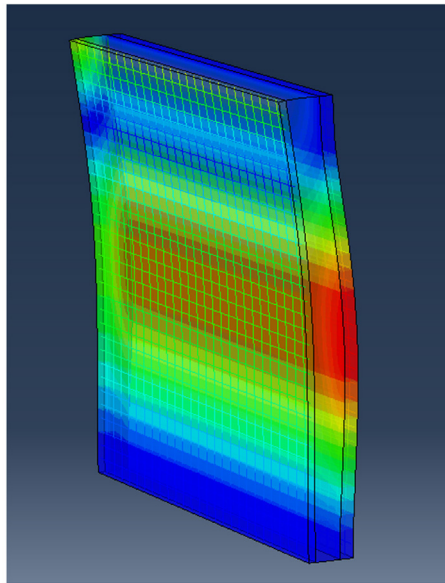
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**THE WORK IS PERFORMED AT
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REDUCTION OF EXPLOSION EFFECTS BY USE OF A SANDWICH WALL



BACKGROUND

In March of 2022 it was decided that a new hospital is to be built in Växjö. An important aspect when designing hospitals is that it can function also during wars and crises. Therefore, in 2021 the Swedish Civil Contingencies Agency (MSB) updated their guidance report "Den robusta sjukhusbyggnaden". This report gives guidelines on how a hospital should be built to make it act robustly against antagonistic attacks. This is, however, stated without any specific requirements. In another report by MSB, "Bebyggelsens motståndsförmåga mot extrem dynamisk belastning - Del 3: Kapacitet hos byggnader", it is mentioned that sandwich elements can be used favourably against blast loads, since the layer of insulation leads to an energy consumption when the outer concrete plate is pressed towards the inner - load carrying - plate. This would then lead to the load carrying plate being affected by a smaller load. How large effect this would have is not explained more in depth.

AIM

The aim is to contribute with more knowledge about how blast loads affect sandwich elements, and to see if sacrificing the outer plate as well as using the layer of insulation can lead to reduced damage to the inner plate. This will be investigated for sandwich elements with different constructions. The questions that will be investigated are:

- Are sandwich elements favourable in blast load circumstances, and what construction is in that case the most favourable?
- What methods of analysis work for this situation?

METHOD

The methods that will be used are a literature study, and then the elements will be modelled in the Finite element program Abaqus. The results will then be analysed.

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