

**STUDY CASE**

**Analysis and development of solutions for a modular steel system**

**Fire Safety Design**

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**INTRODUCTION**

**GENERAL BUILDING DESCRIPTION**

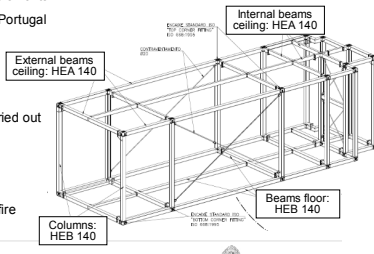

- Prefabricated modules for hotel buildings
- steel structure + partition elements
- Based on 4-floors hotel – Portugal

**FIRE ENGINEERING**


- Study: fire safety design
- Calculation procedure carried out in the field of temperature

**SELECTED DESIGN FIRE**

- Study: Standard ISO 834 fire

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**REGULATORY REQUIREMENTS – FIRE ENGINEERING**

**PORTUGUESE REGULATIONS**

- Type of use VII – accommodation and food services (DL nº 220/2008, article 8)
- Hazardous locations:


**E** - Establishment intended for overnight stays;

**B** - Place accessible to the public or the establishment staff;


**C** - Place that has aggravated risks of outbreak and fire development (kitchen)

- Regulatory requirements:

<b>Walls</b>	EI60
<b>Drop ceilings</b>	EI60
<b>Slabs</b>	REI60
<b>Beams</b>	REI90
<b>Columns</b>	REI90



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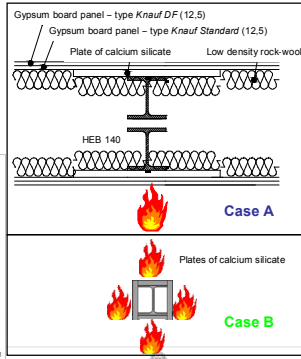
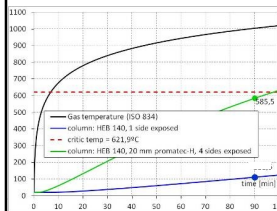

**FIRE SAFETY DESIGN**

**CRITICAL TEMPERATURES**


- EC3, 1-2; S275,  $\eta_{f1} = 0.6$

**COLUMNS**

- Case A: Into walls
- Case B: Isolated column

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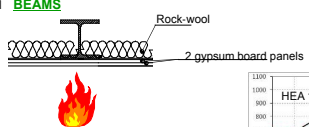


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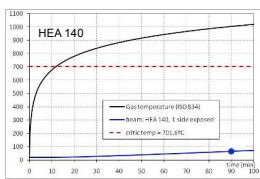

**FIRE SAFETY DESIGN**

**BEAMS**




**SLABS**

- Protected by the drop ceiling
- REI60 guaranteed

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**CONCLUSION**

**PROPOSALS FOR PARTITION ELEMENTS**


- Based on knowledge and experience of UC
- Based on data of fire protection materials from manufactures

**FIRE SAFETY DESIGN**


- EC 1 and 3, part 1.2
- Standard ISO 834 fire
- Calculation procedure based on a prescriptive approach and is carried out in the field of temperature
- Geometrical definition of the structural profiles insulation did not fit to the typologies indicated in Eurocodes → simplifications and approximations

**ADVANCED CALCULATION MODELS**

- Could lead to more economical solutions



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*Thank you  
for your attention!*

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