

**Final
Meeting**

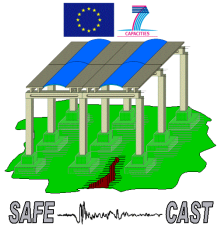
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Rome
21st-22nd March
2012

Final Meeting – 21st and 22nd March 2012

**WP2 – Experimental activity on new and
existing : news about tests performed during
last months**

ACTIVITIES CARRIED OUT AT LNEC



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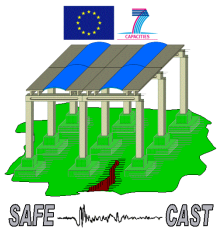
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ACTIVITIES CARRIED OUT AT LNEC

Two types of tests were performed:

- ❑ 2D real scale static tests on beam-column subassemblies of precast industrial portal frames under monotonic and cyclic horizontal loads;
- ❑ 3D large scale dynamic tests on precast cladding panel to column connections.

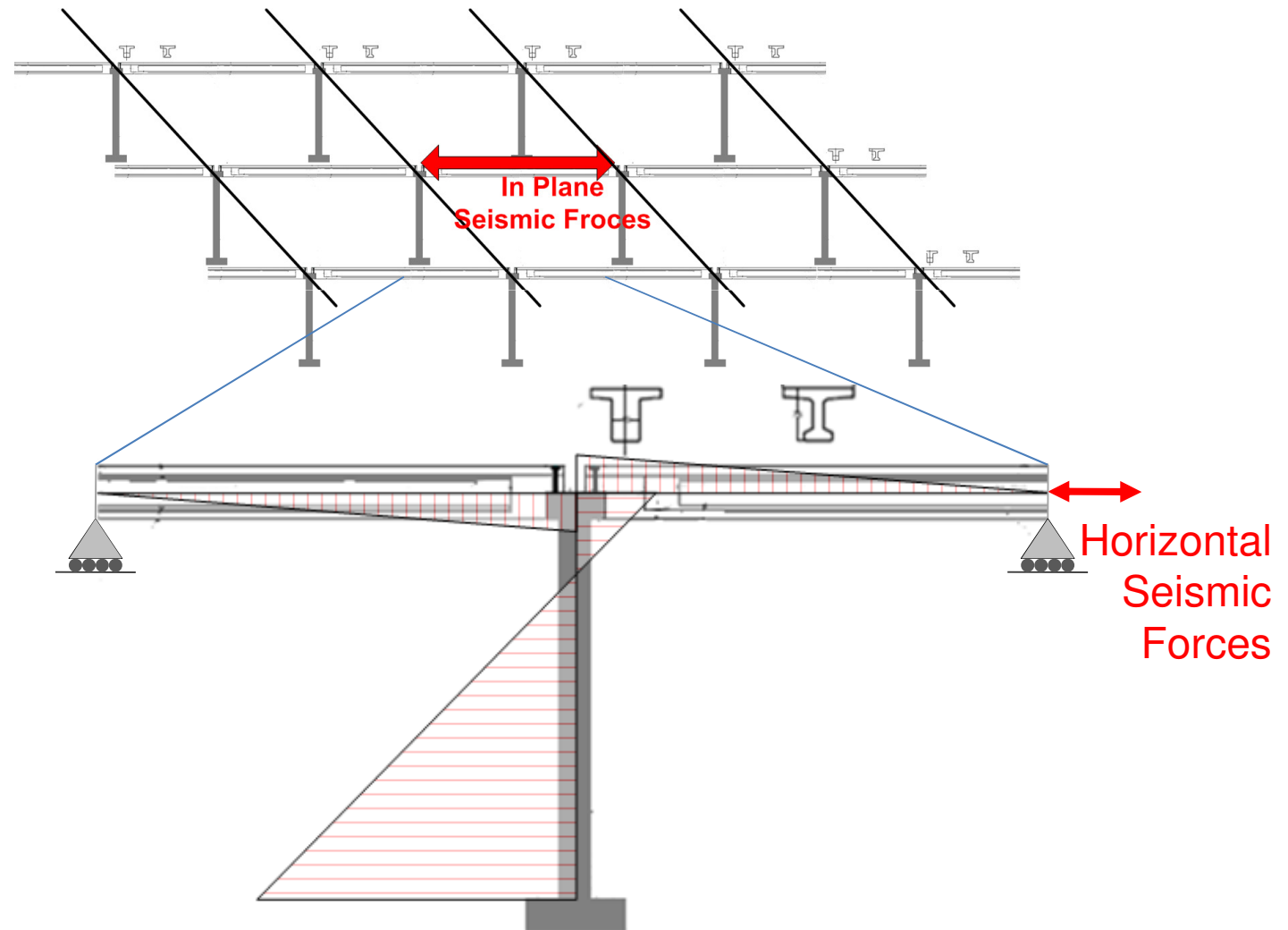


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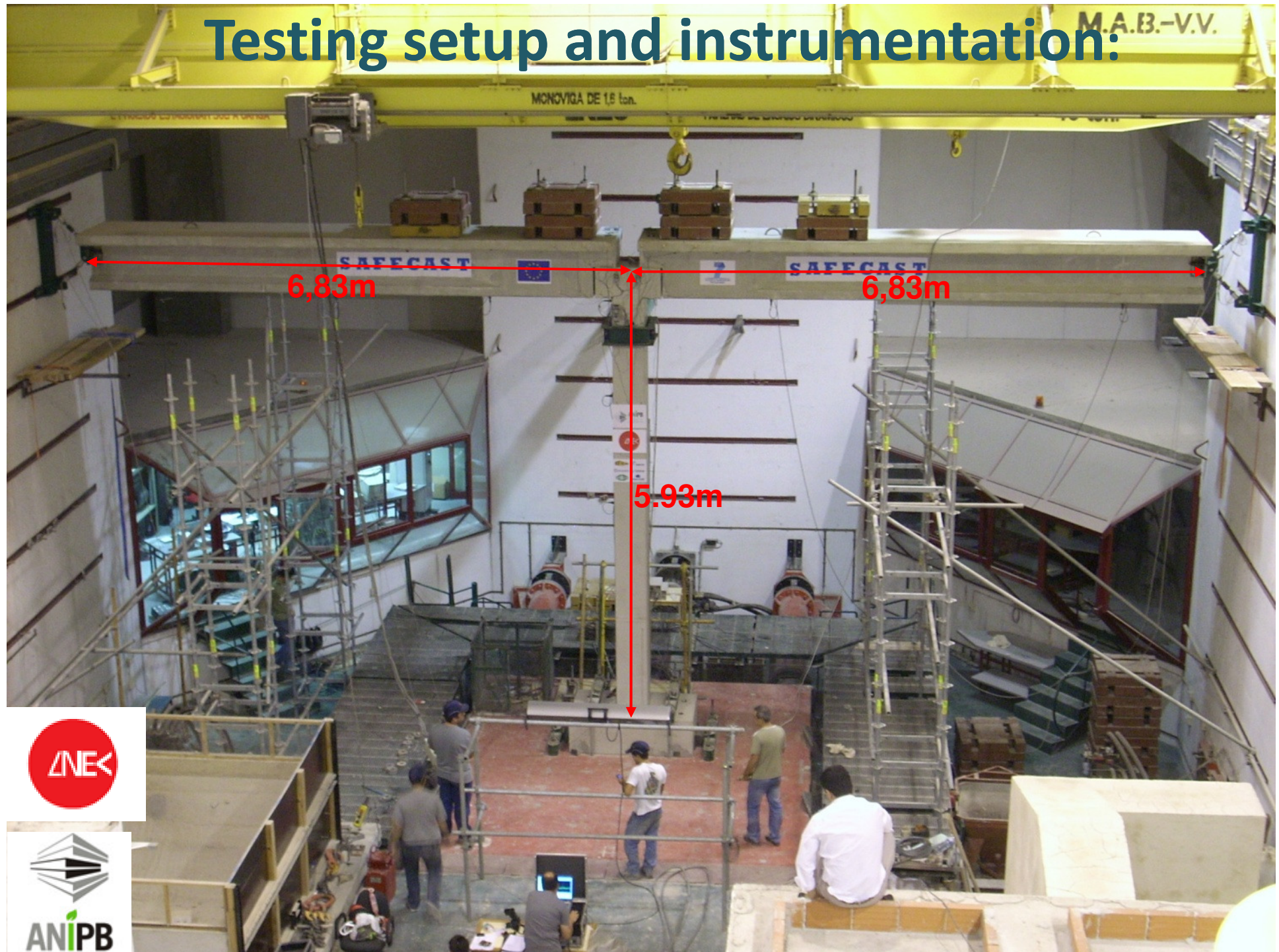
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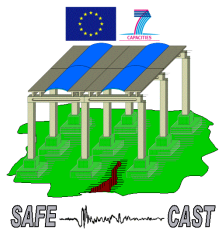
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❑ 2D real scale static tests on beam-column subassemblies



Testing setup and instrumentation:





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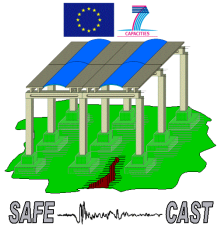
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Testing setup and instrumentation:

- Out-of-plane displacement constraint





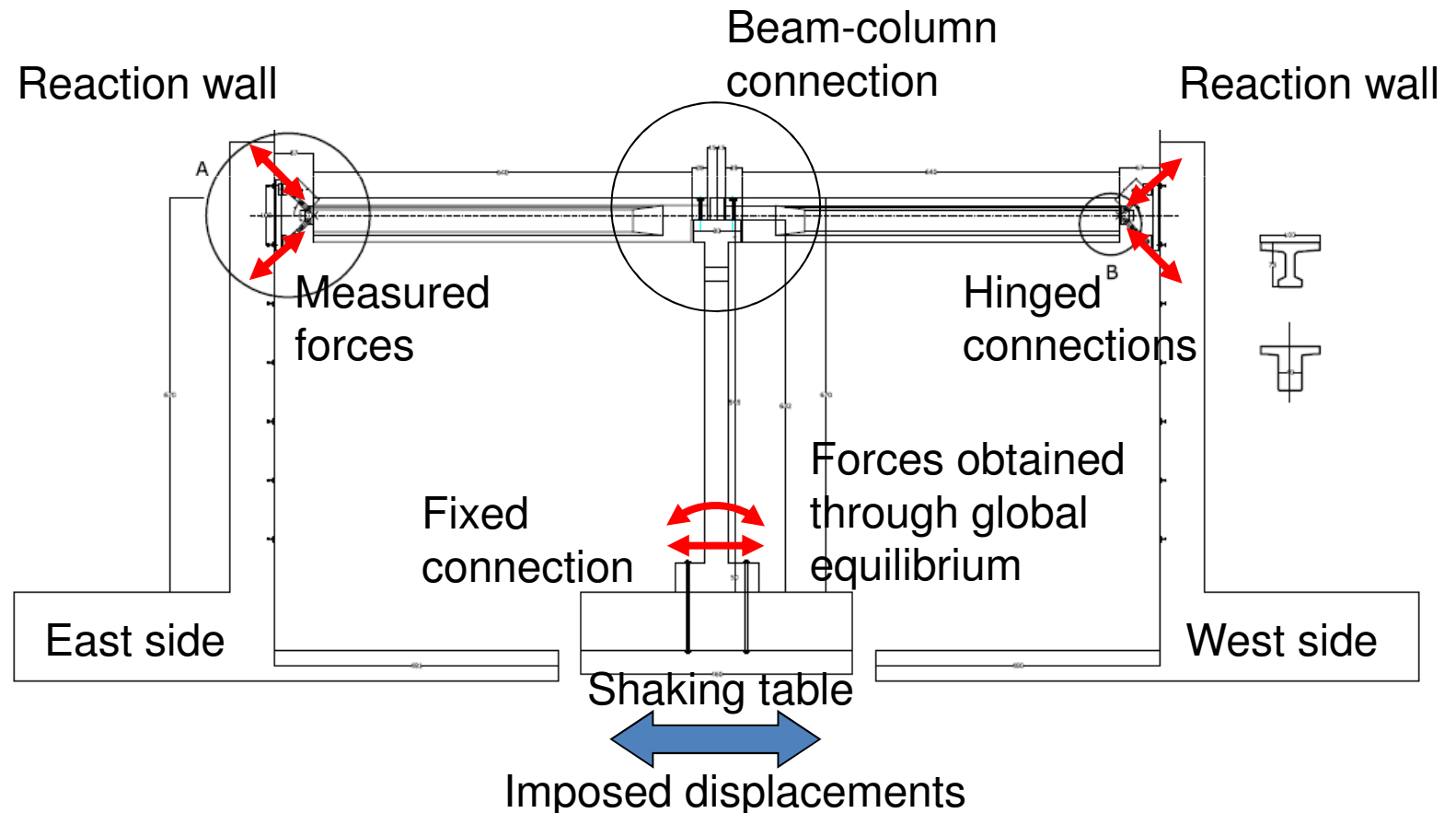
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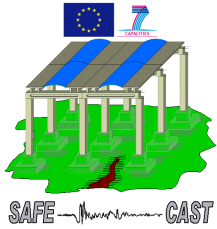
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Testing setup and instrumentation:

- *Assessment of internal forces (4^o degree hyperstatic str.) .*
- *Assessment Lateral displacements of the column along the height & column top rotation*





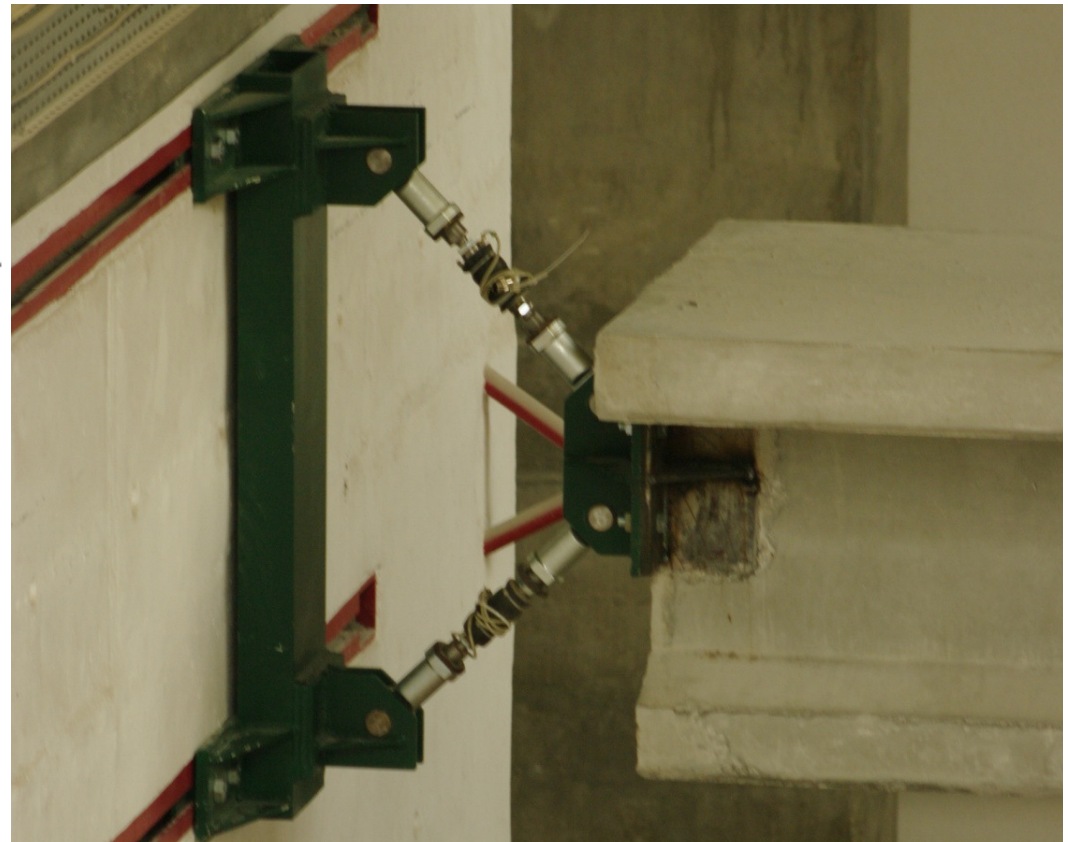
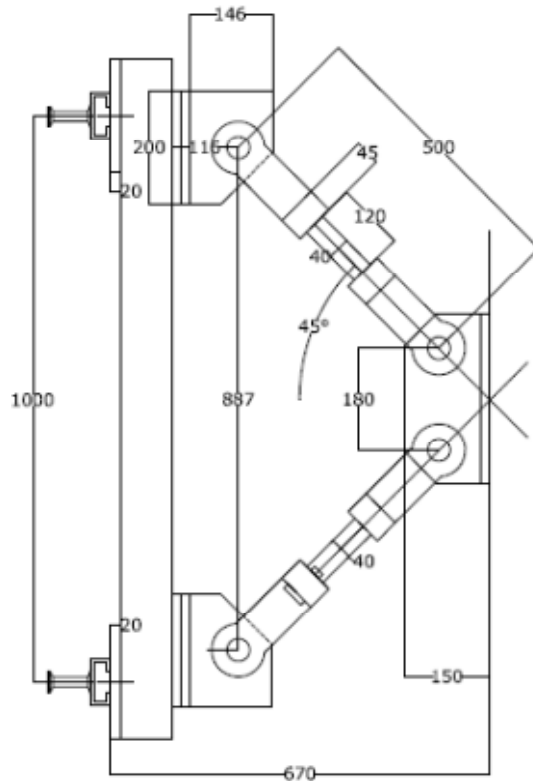
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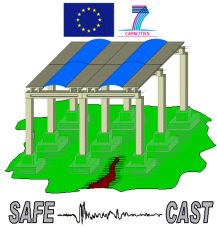
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Measurement of internal forces

- *2x2 orthogonal cell forces at each beam ends fixed on the reaction walls*





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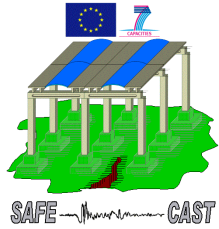
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Measurement of the column rotation and beams motions at the top

- *26x3 components infrared leds (Krypton equipment)*





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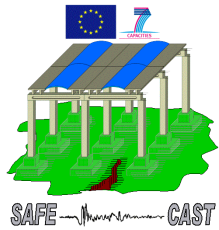
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Measurement of the Column lateral displacements

- 6x3 components optical infrared (Krypton equipment)
- 5x2 components optical infrared (Hamamatsu equipment)



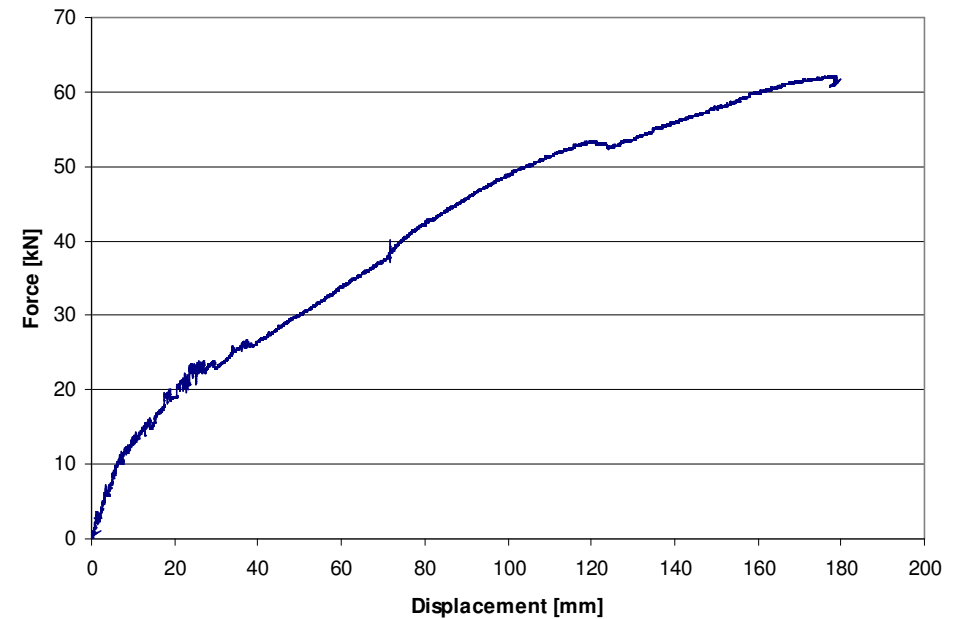
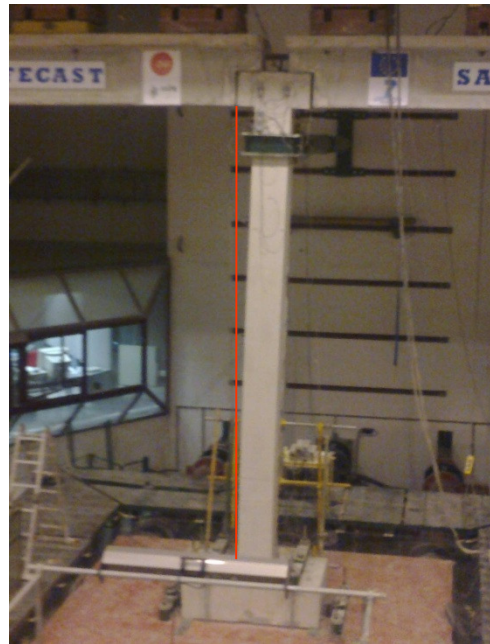
Monotonic Test



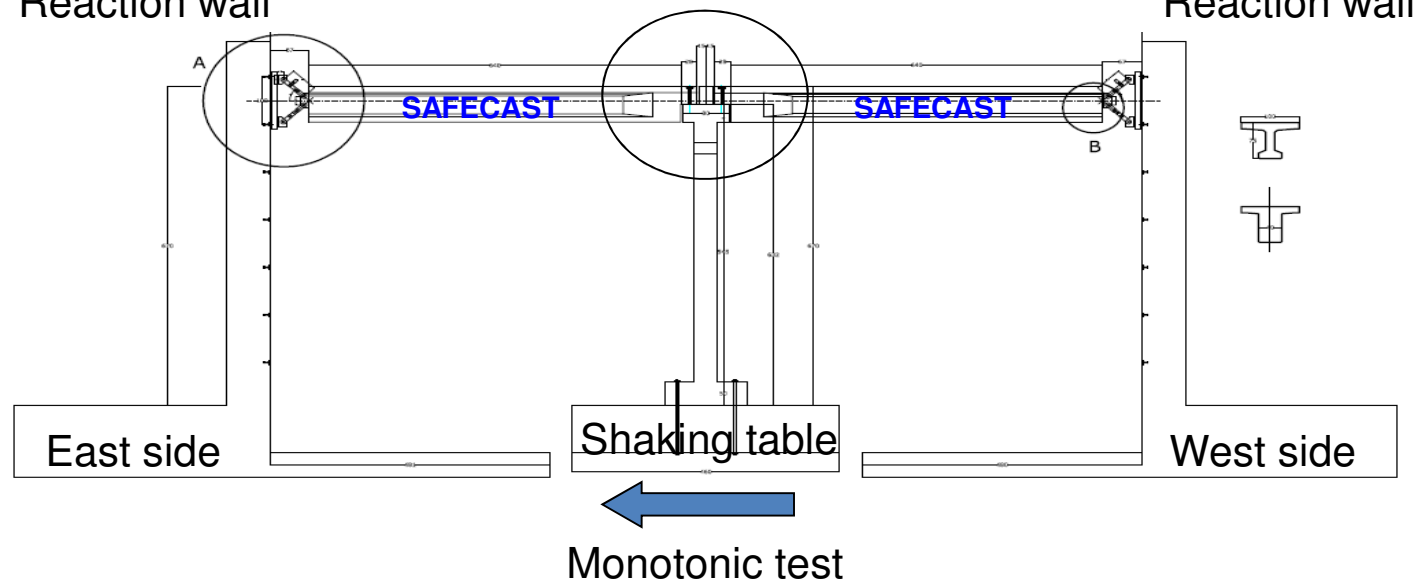
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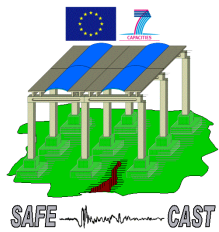
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Reaction wall





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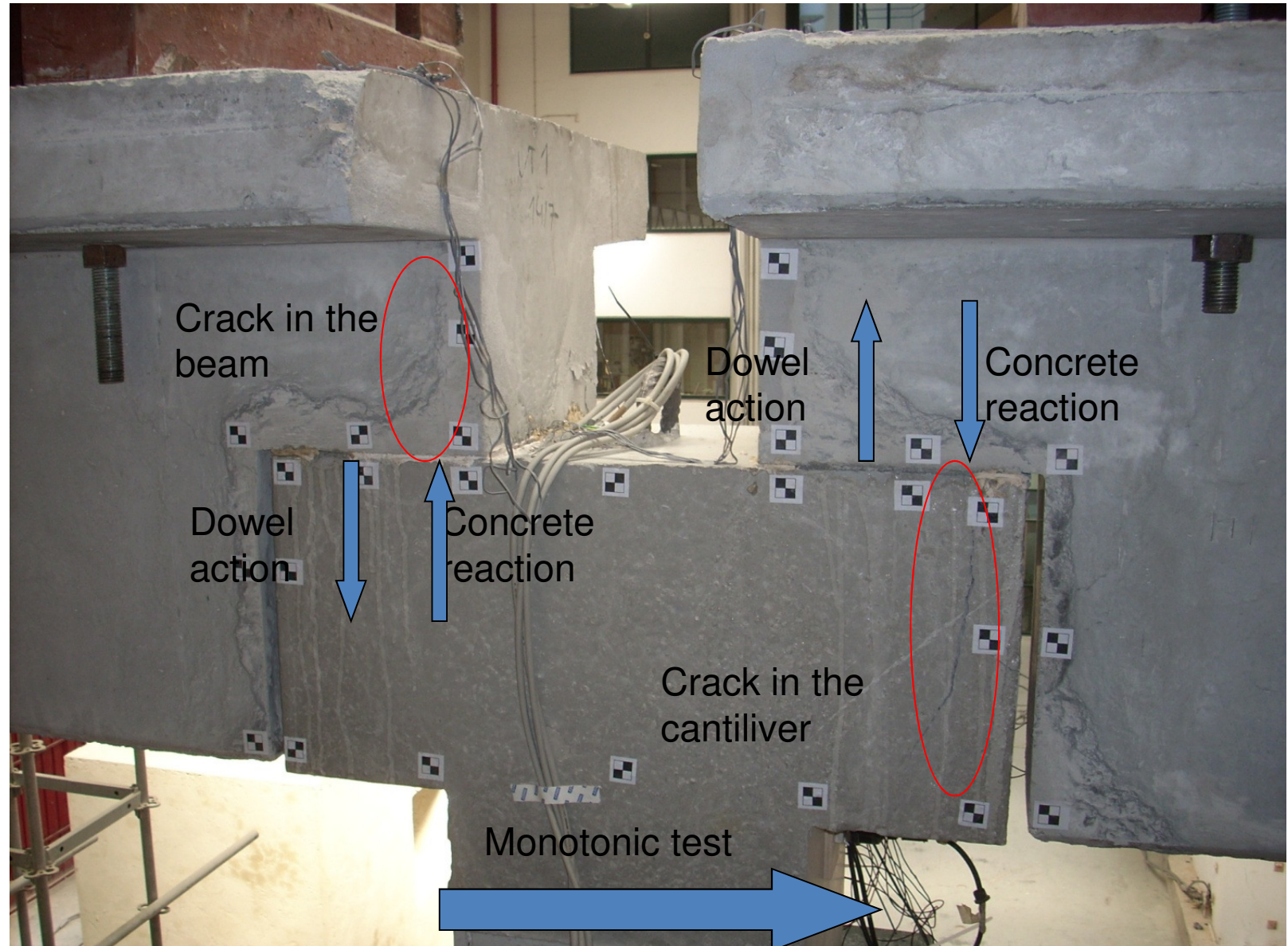
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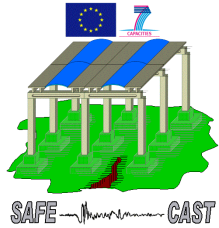
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Monotonic Test

- Damage Observation*





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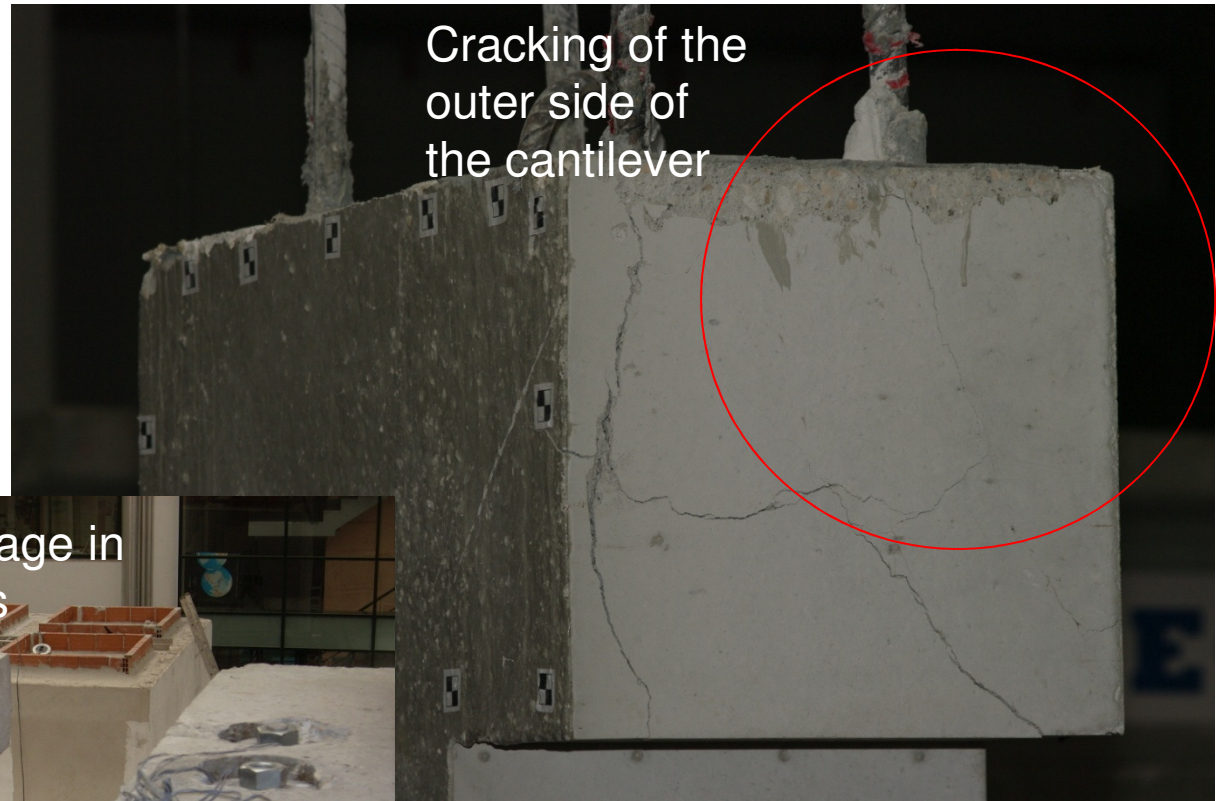
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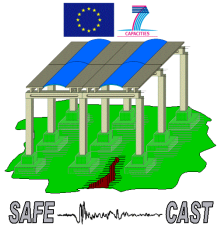
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Monotonic Test

- *Damage Observation*





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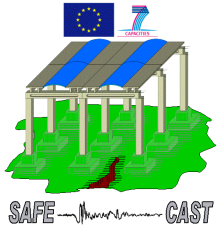
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Monotonic Test

- *Key results*

- Even with a large displacement input (180 mm), collapse of the subassembly was not reached for monotonic loading;
- At the end of the test it was observed damage in the beam-column connection (spalling of concrete cover, crushing of concrete);
- At the end of the test it was observed damage along the column height (cracking of concrete);
- No considerable damage was attained in the beam and in the dowels;
- Cracking of concrete was visible for a displacement of 5 mm;
- The resisting moment at the bottom of the column was attained for a displacement of 180 mm.

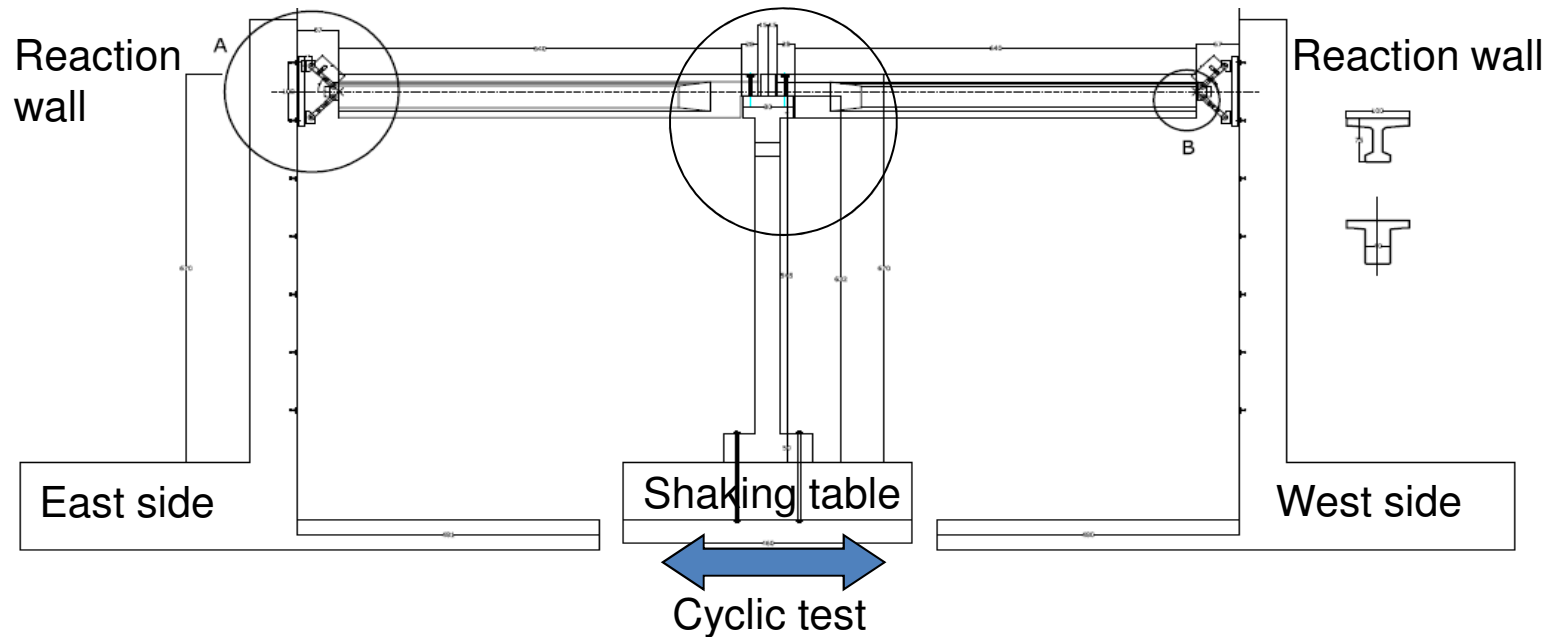
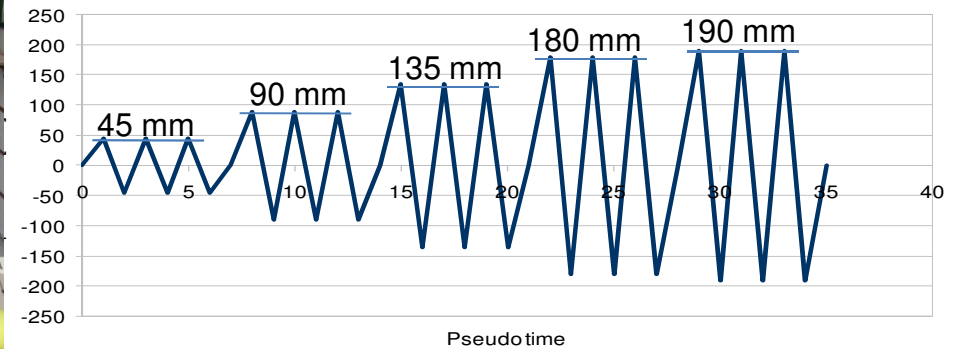
Cyclic Test

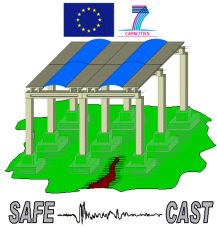


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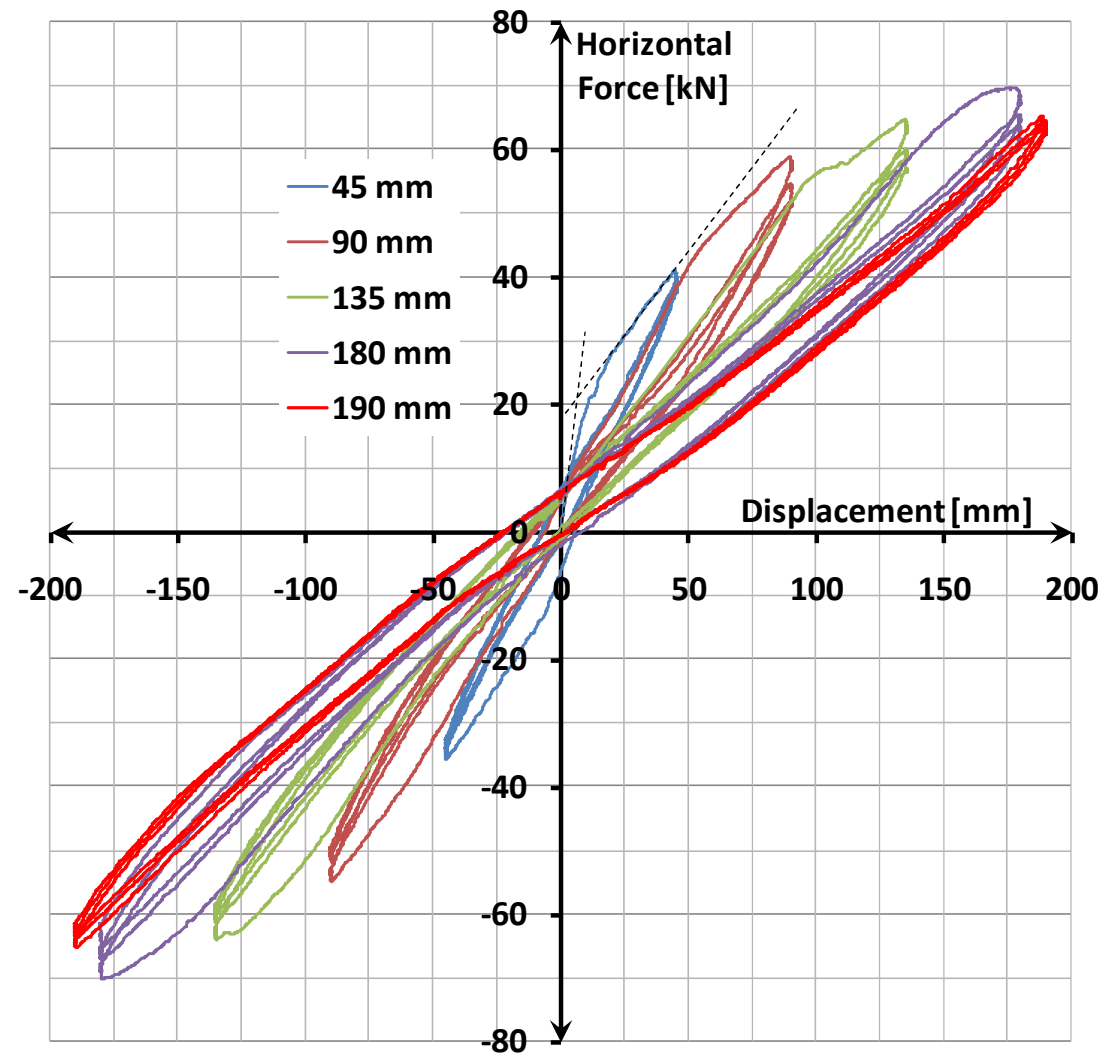
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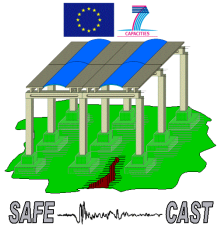
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Cyclic Test

- Analysis of the Results*

Force x Displacement curve





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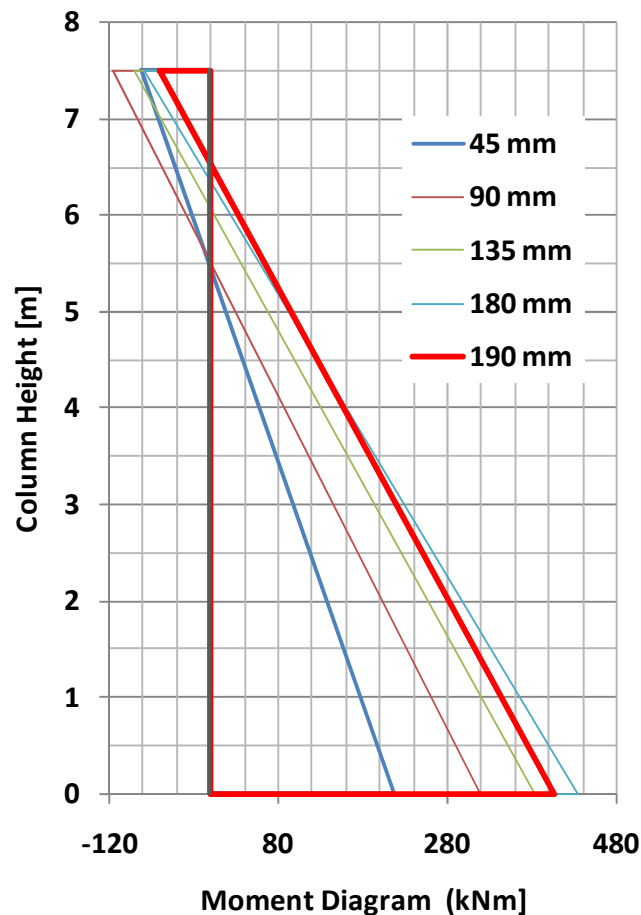
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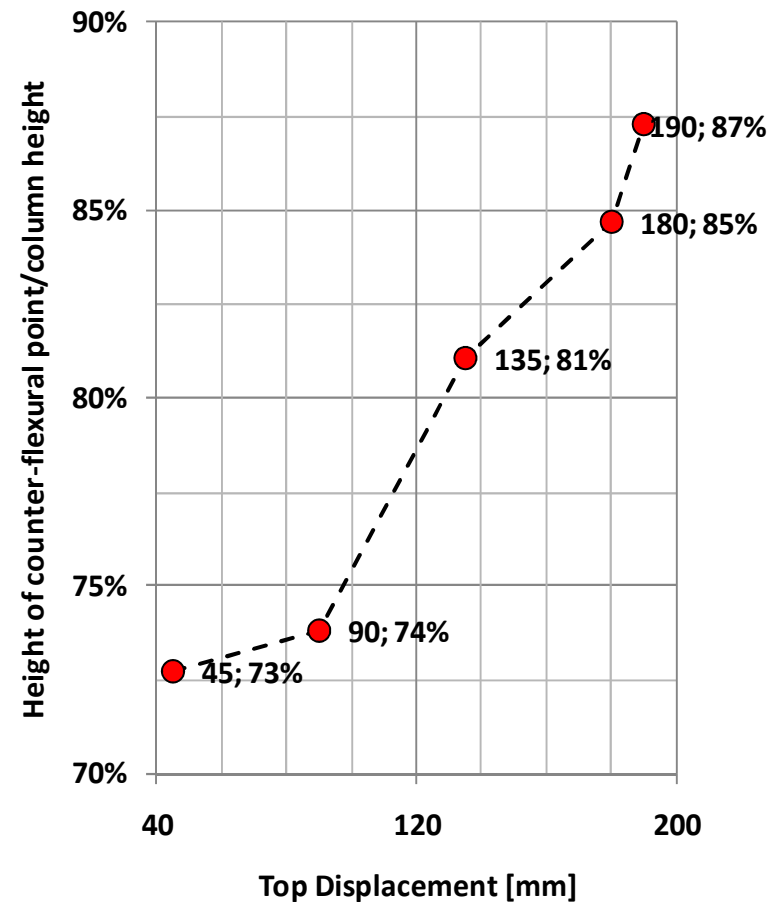
- Analysis of the Results*

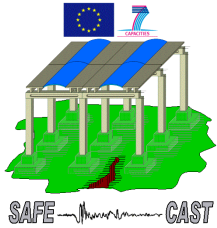
Column moment redistribution

Column bending moments diagrams



Evolution of bending moment diagram inflexion points





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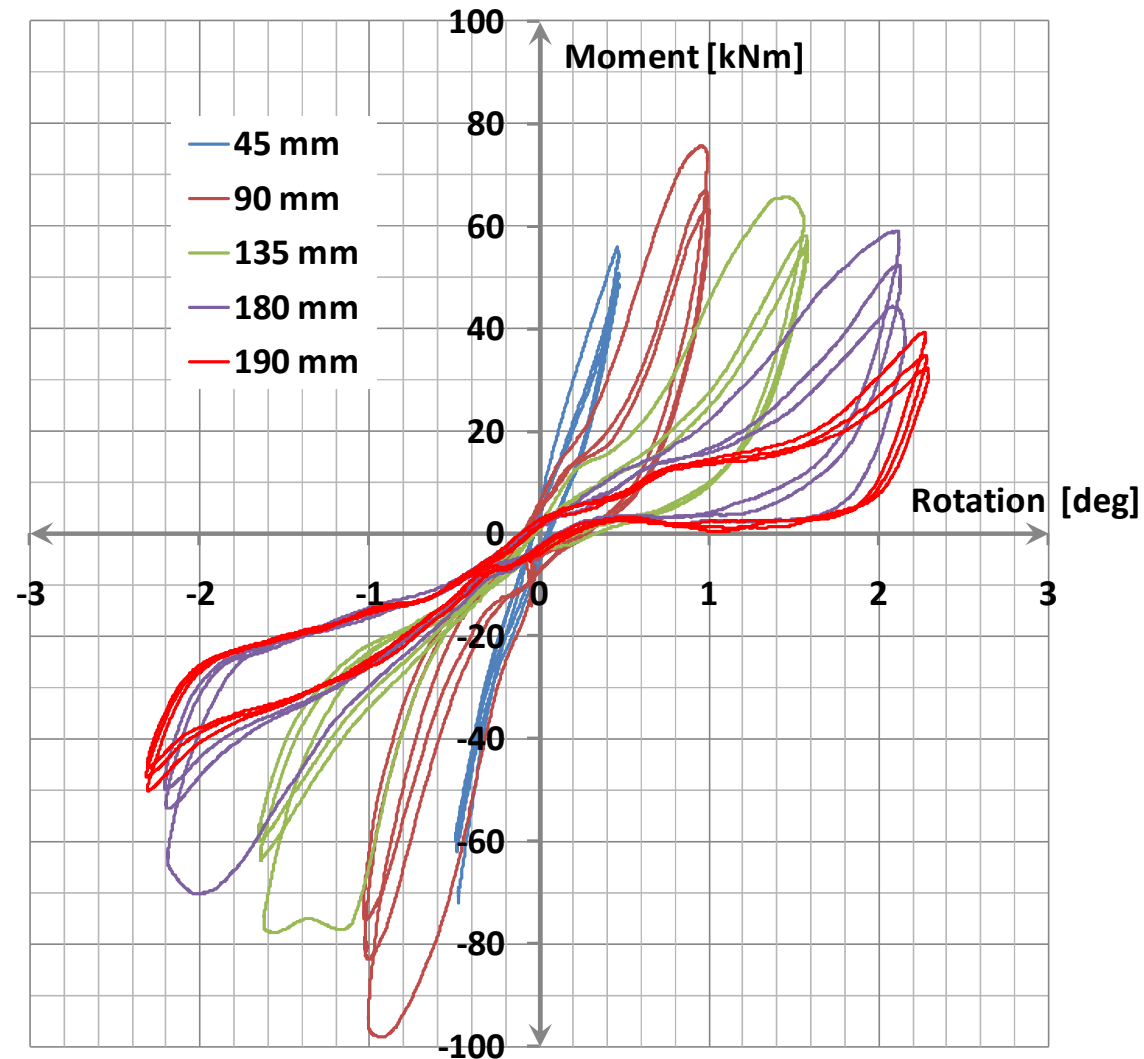
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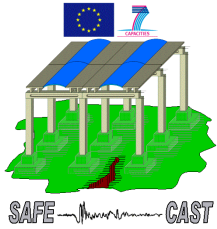
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Cyclic Test

- *Analysis of the Results*

Moment x Rotation curve





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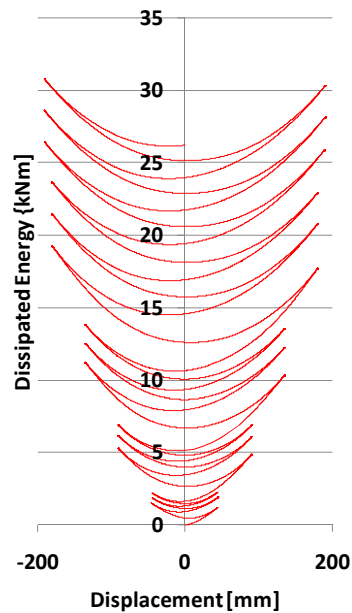
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Cyclic Test

- Analysis of the Results*

Dissipated energy balance

External Work - FxD



Internal Energy - MxRotation

