

The EASIE Project an overview

EPAQ Congress 2011 in Rome

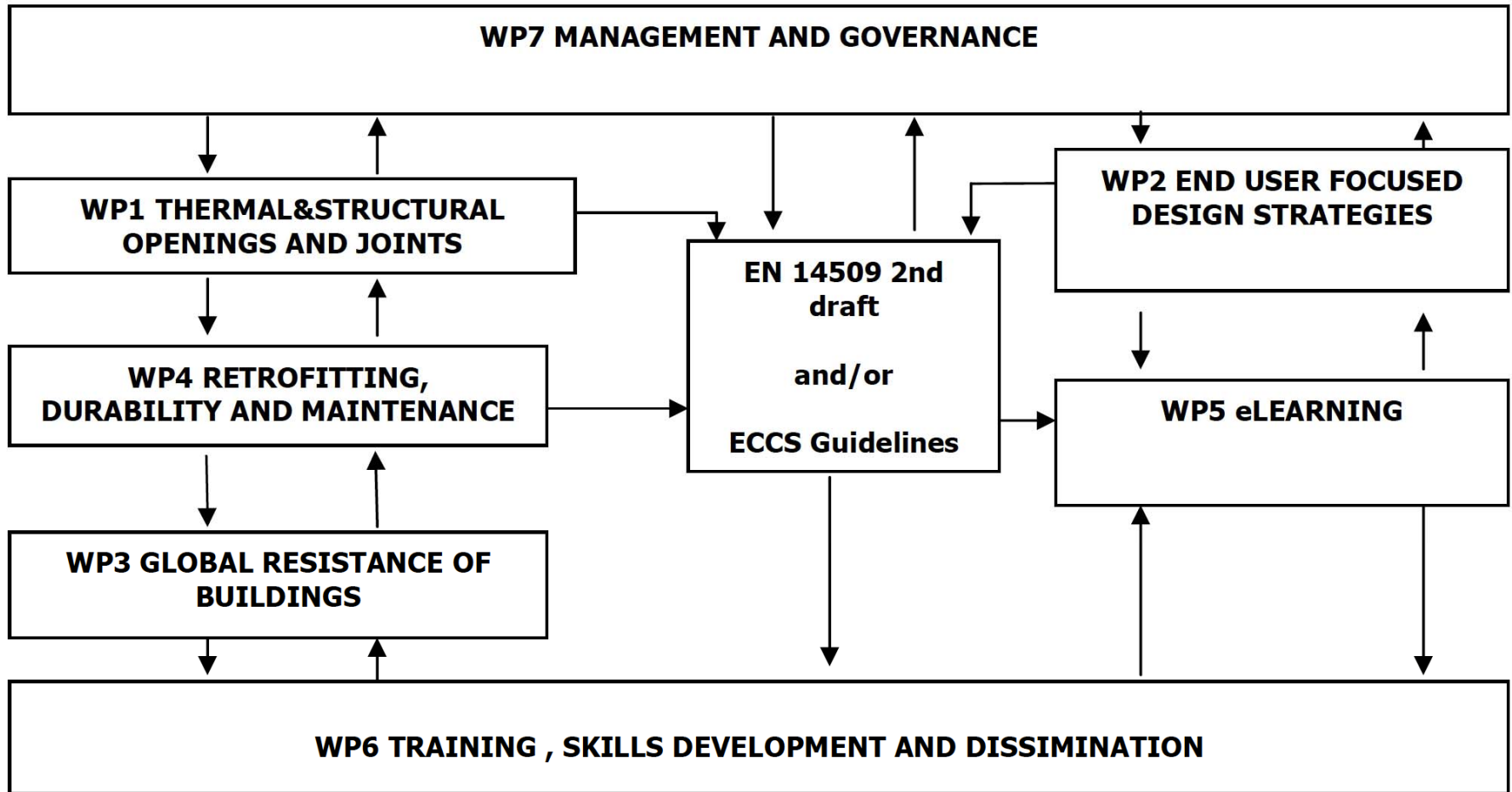
22.09.2011

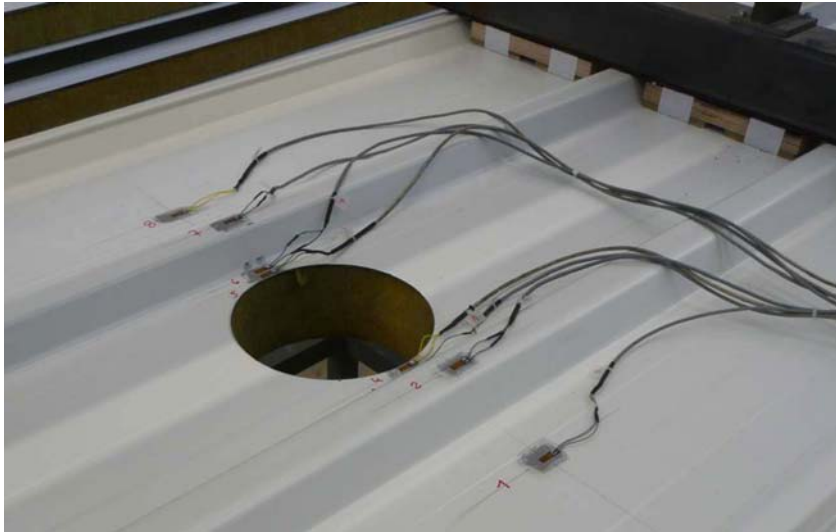
Bernd Naujoks

Prof. Dr.-Ing. Bernd Naujoks

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iS-mainz





Openings without frames?

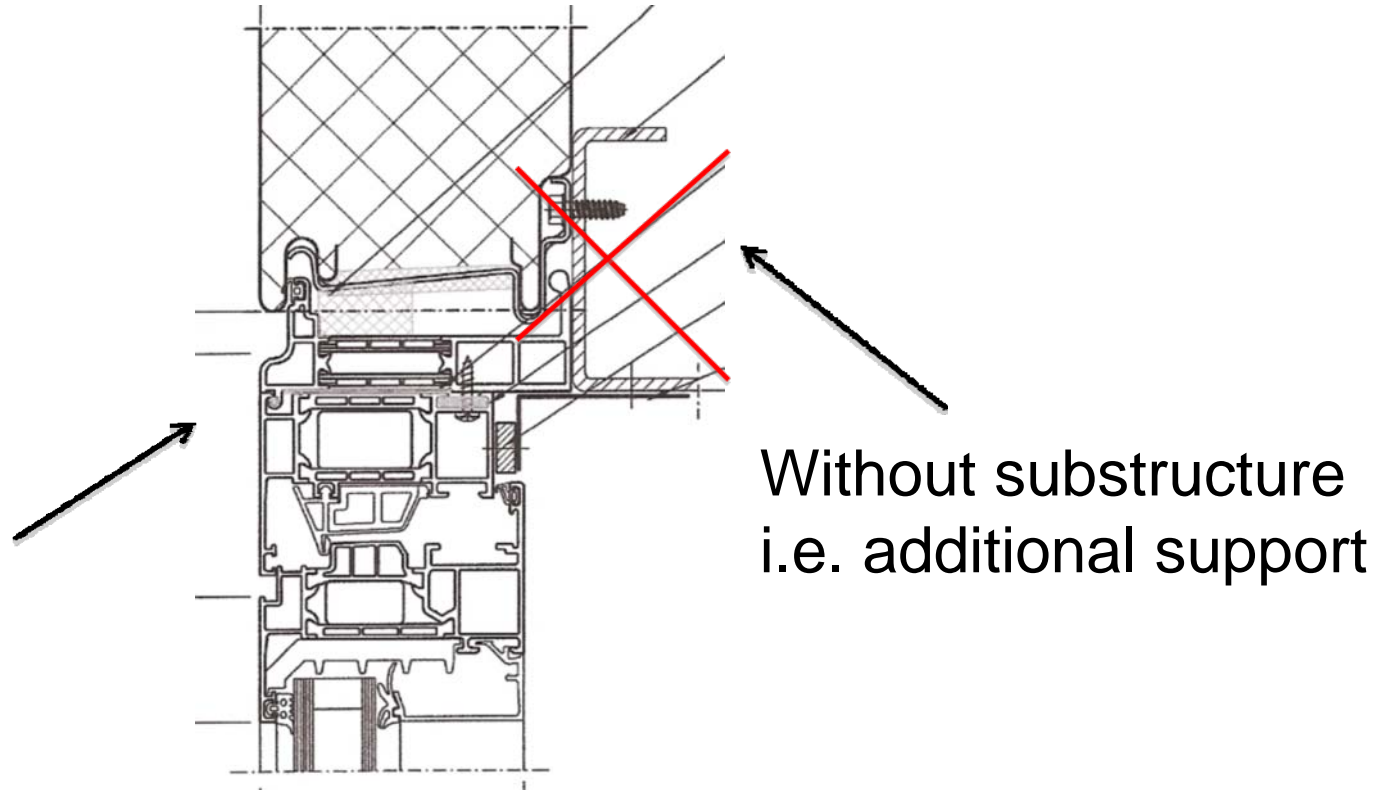


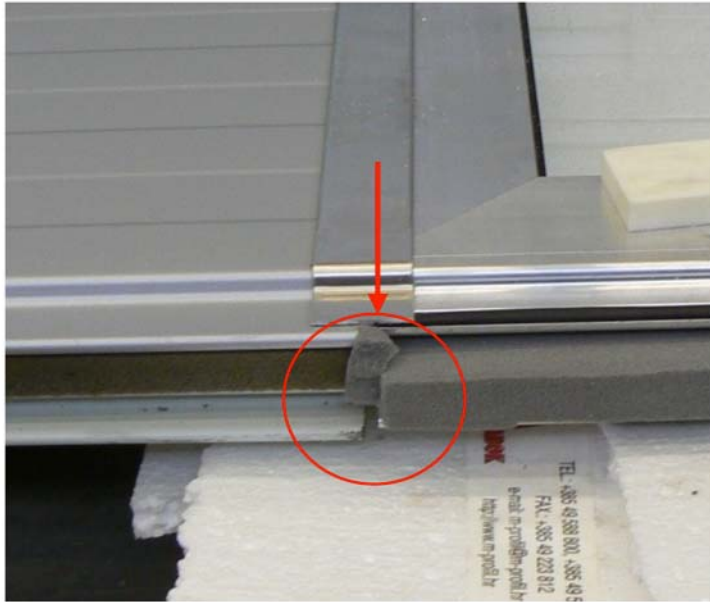
(Fech-Jet-System)



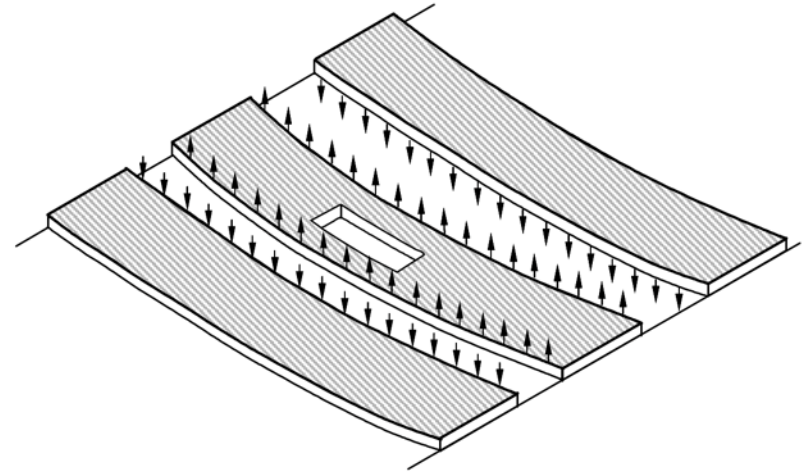
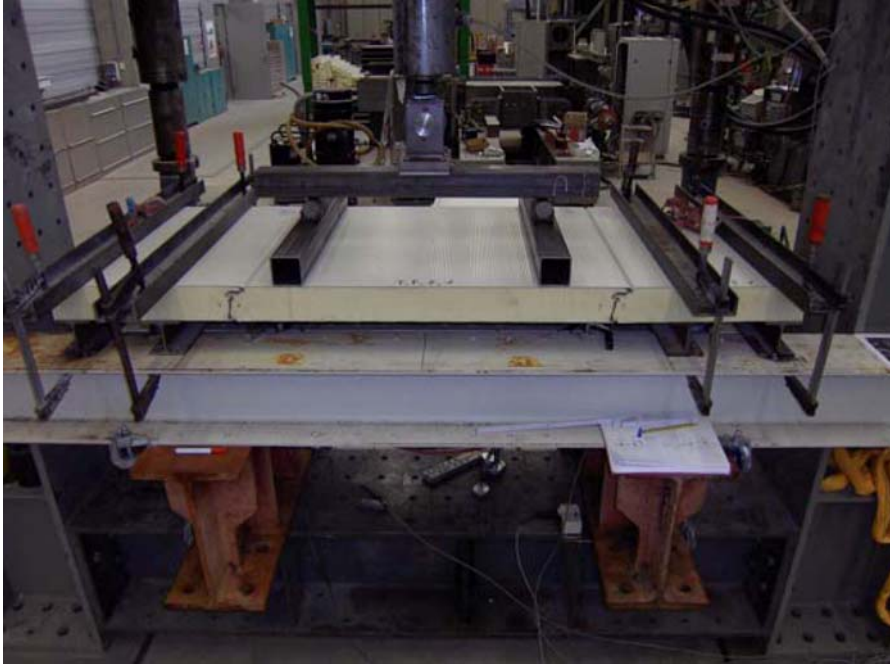
Load-bearing behaviour of
Openings with windows acting as a frame?

Openings with frames:






Airtightness of windows acting as a frame without substructure?



Transfer of shear loads through the longitudinal joints?

Two methods – same purpose:

CE Label and Span Tables

 01234
AnyCo Ltd, PO Box 21, B-1050 XYZ Co 06 01234-CPD-00234
EN 14509 Metal faced insulating panel for use in buildings. Reference: KS1000. Insulation: PUR Density: 35 kg/m ³ Thickness: 80mm. Facings: Steel 0,5 mm external; 0,4 mm internal (EN 10326). Coating: PVC. Mass: 12 kg/m ² .

Span table

for: **Arcelor 1001 TS-roof-100**

D = 140,69 mm $t_{nom,1} = 0,474$ mm $t_{nom,2} = 0,47$ mm

The stated values are only valid together with the input datas and safety factors according to clause A and B

for: One span panel

Colour group	Characteristic snow load [kN/m ²]													
	0,00	0,25	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	5,00	
I	7,01	7,01	6,00	5,35	4,88	4,52	4,20	3,91	3,67	3,46	3,28	3,08	1,67	
II	7,01	7,01	6,00	5,35	4,88	4,52	4,20	3,91	3,67	3,46	3,28	3,08	1,67	
III	7,01	7,01	6,00	5,35	4,88	4,52	4,20	3,91	3,67	3,46	3,28	3,08	•••	1,67

Colour group	Characteristic wind suction load [kN/m ²]													
	0,00	-0,25	-0,50	-0,75	-1,00	-1,25	-1,50	-1,75	-2,00	-2,25	-2,50	-2,75	-5,00	
I	7,01	7,01	7,01	6,44	5,60	5,01	4,56	4,21	3,92	3,68	3,47	3,29	2,30	
II	7,01	7,01	7,01	6,12	5,41	4,91	4,53	4,21	3,92	3,68	3,47	3,29	2,30	
III	7,01	7,01	5,99	5,39	4,97	4,61	4,27	4,00	3,77	3,58	3,41	3,26	•••	2,30

Cost-Benefit-Ratio of:



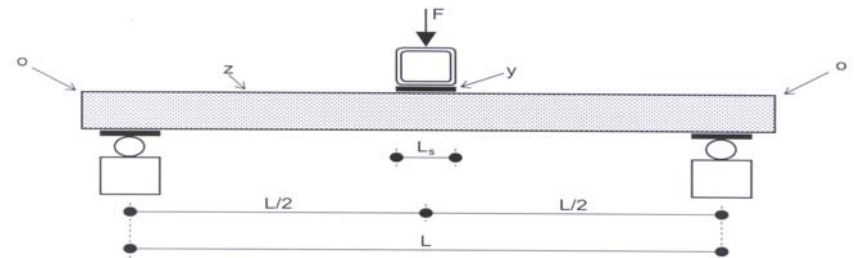
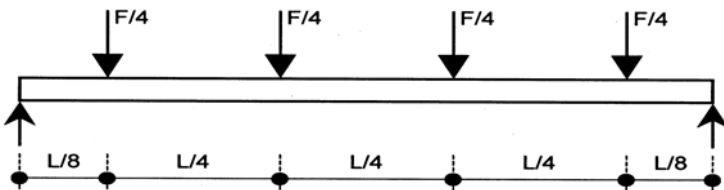
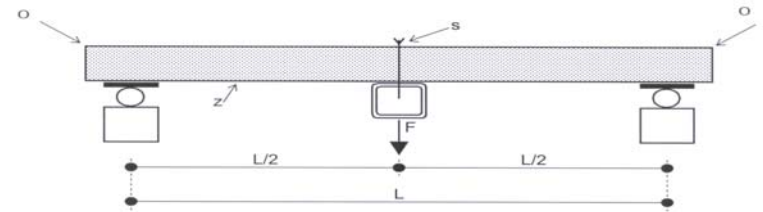
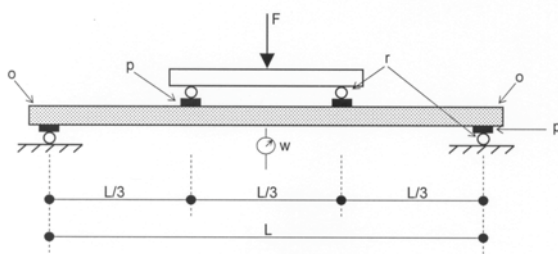
Thermal Tests?

Cost-Benefit-Ratio of:



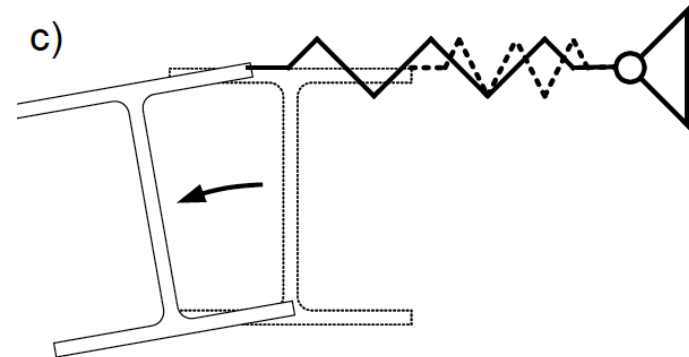
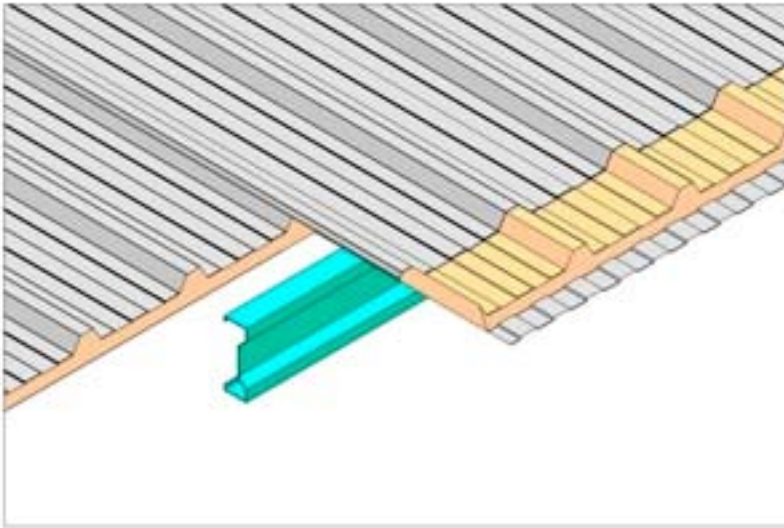
Two Span Tests?

Total number of necessary tests:



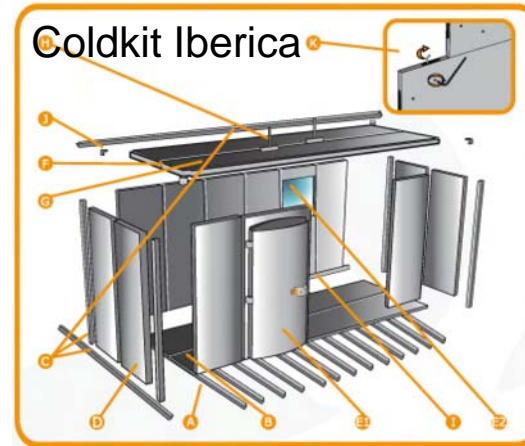
$$\Sigma n = f (D_i, t_{1i}, t_{2i}, G_{ci}, \Delta T_i) = ???$$

Stabilization of purlins?
Global stabilization of complete buildings?



Sandwich Elements acting as a diaphragm:
Stiffness of fastenings?

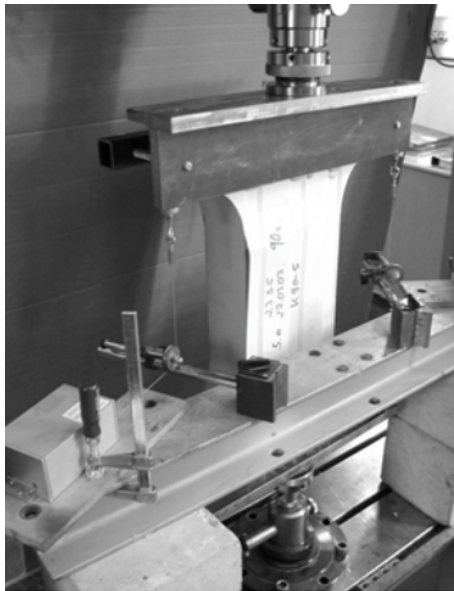
Sandwich Buildings without substructure



Global buckling of Sandwichelements under axial forces:
Influence of creeping?
Wrinkling/Debonding at Load introduction?

Relation between artificial and real ageing?

Influence of ageing of core material on wrinkling strength and shear strength?

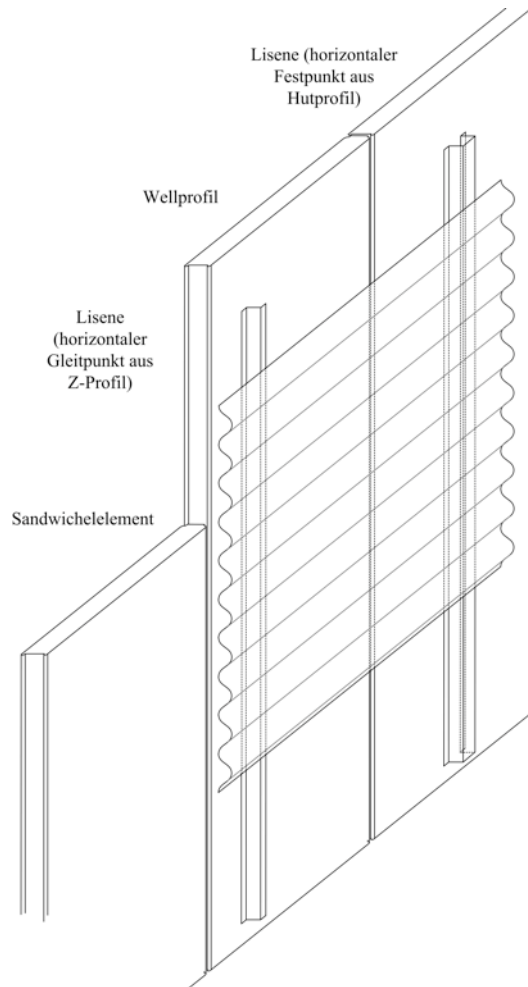




Influence of defects?

Reduction of wrinkling
strength?

Retrofitting?



New to Old Concept:
Design of Elements
with additional cladding?