



## More sustainability through innovative steel solutions

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TU Delft, 18.05.2016

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Chair for Steel and Lightweight Structures: Markus Feldmann

Chair for Sustainable Metal Building Envelopes: Markus Kuhnhenne

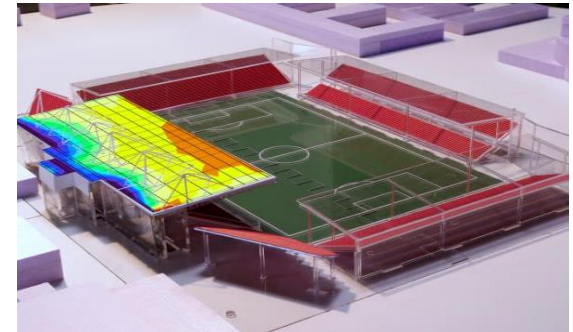
Steel Construction since 1870



Light Weight Structures since 1976



Wind Engineering since 1985



Structural Glazing since 1995



Sustainable Construction since 2001

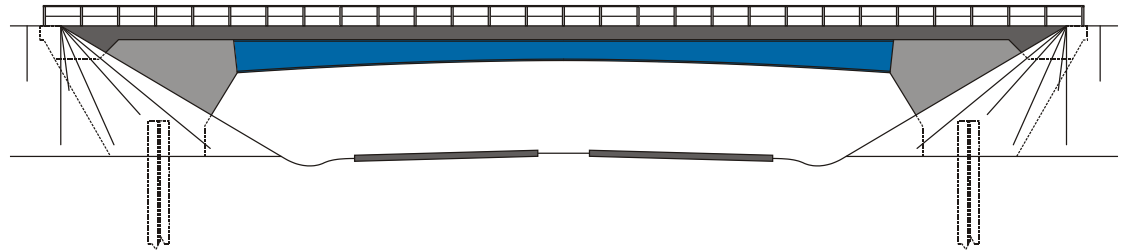


Timber Structures since 2010





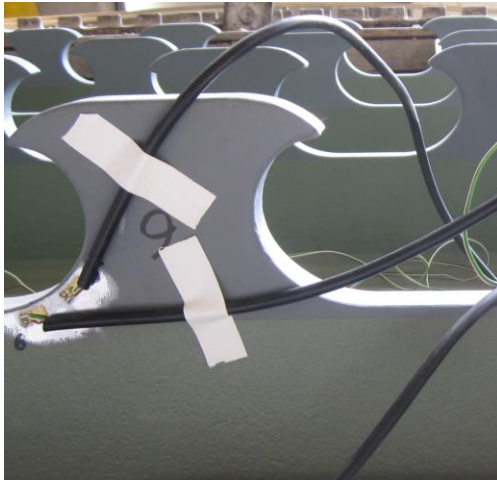
# Project Example – Economic and Durable Design of Composite Bridges with Integral Abutments (INTAB)



## Composite bridges with integral abutments

- simple, fast erection (using VFT “composite prefabricated element” technology)
- reduced traffic disturbance
- no accident hot spot
- reduced maintenance costs
- robust construction

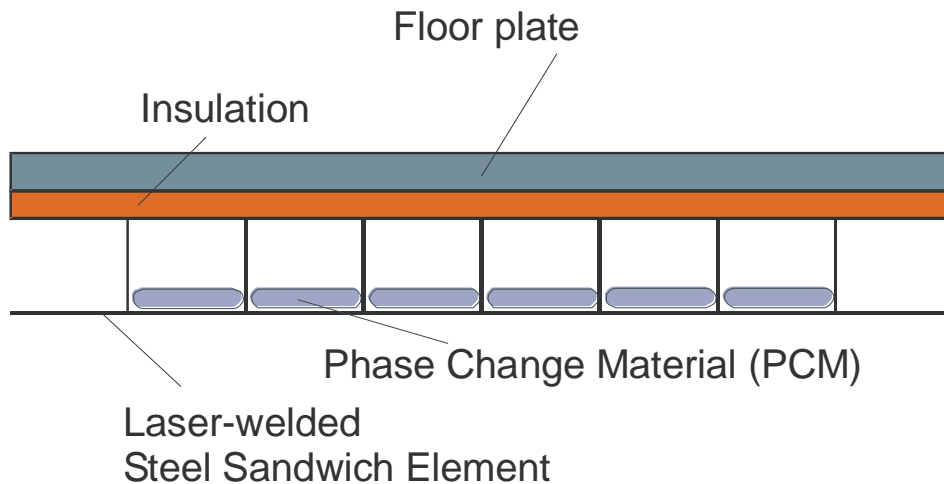
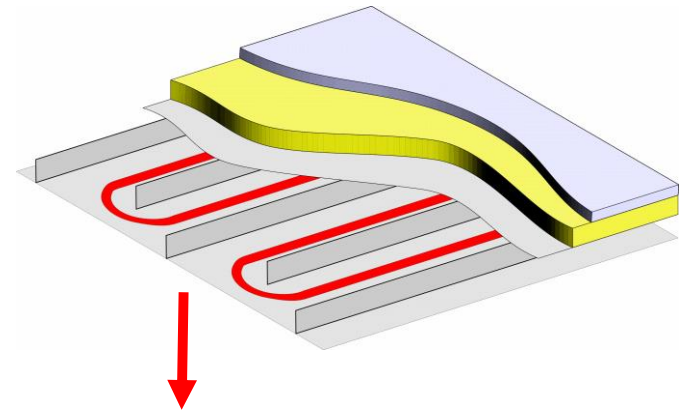
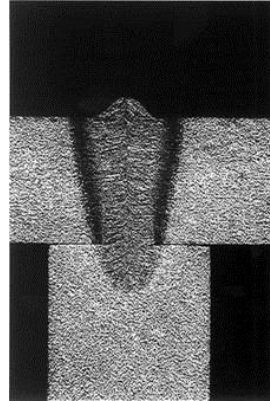
# Project Example – Economical Bridge Solutions based on innovative composite dowels and integrated abutments (ECOBRIDGE)



## Investigation of VFT Rail® system (low-cost prefabricated composite bridge)

- shear connector: composite dowel strip (“Verbunddübelleiste”)
  - bottom: replacement of conventional composite dowel
  - top: strengthening of reduced compression zone
- no ballast, direct rail fixation
- no additional anti-derailment device
- fast erection process

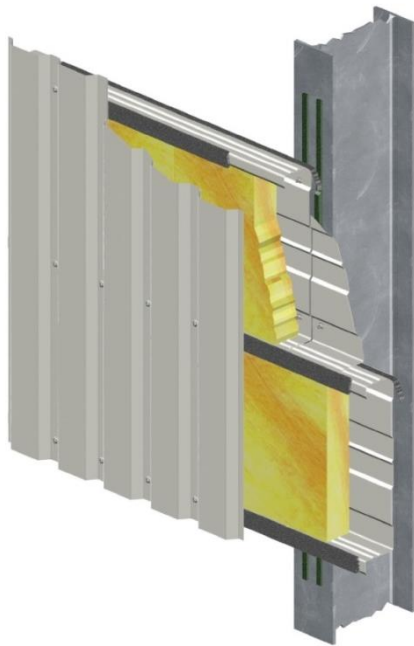
# Project Example – Development of laser-welded steel deck elements with integration of PCM or water pipes for heating and cooling



# Project Example – Thermal Performance of Steel Cassette Walls

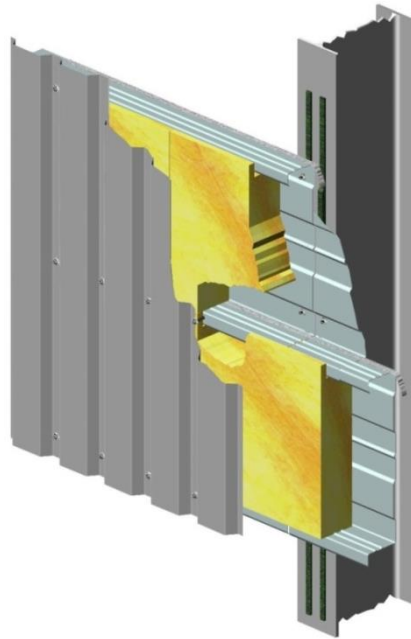
## Comparison of solutions

Solution 1



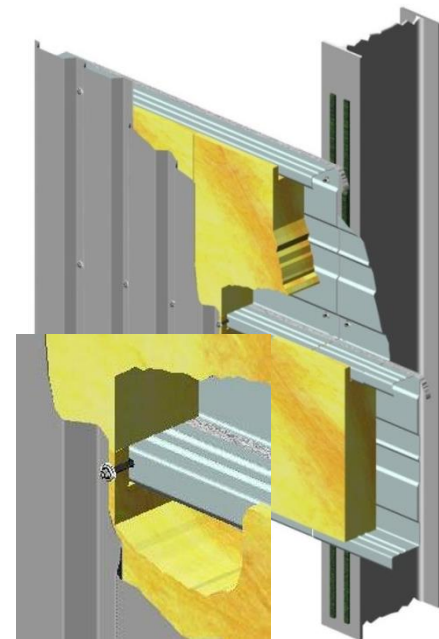
200 mm  
+ 3 mm separation strip

Solution 2



160 mm  
+ 40 mm additional

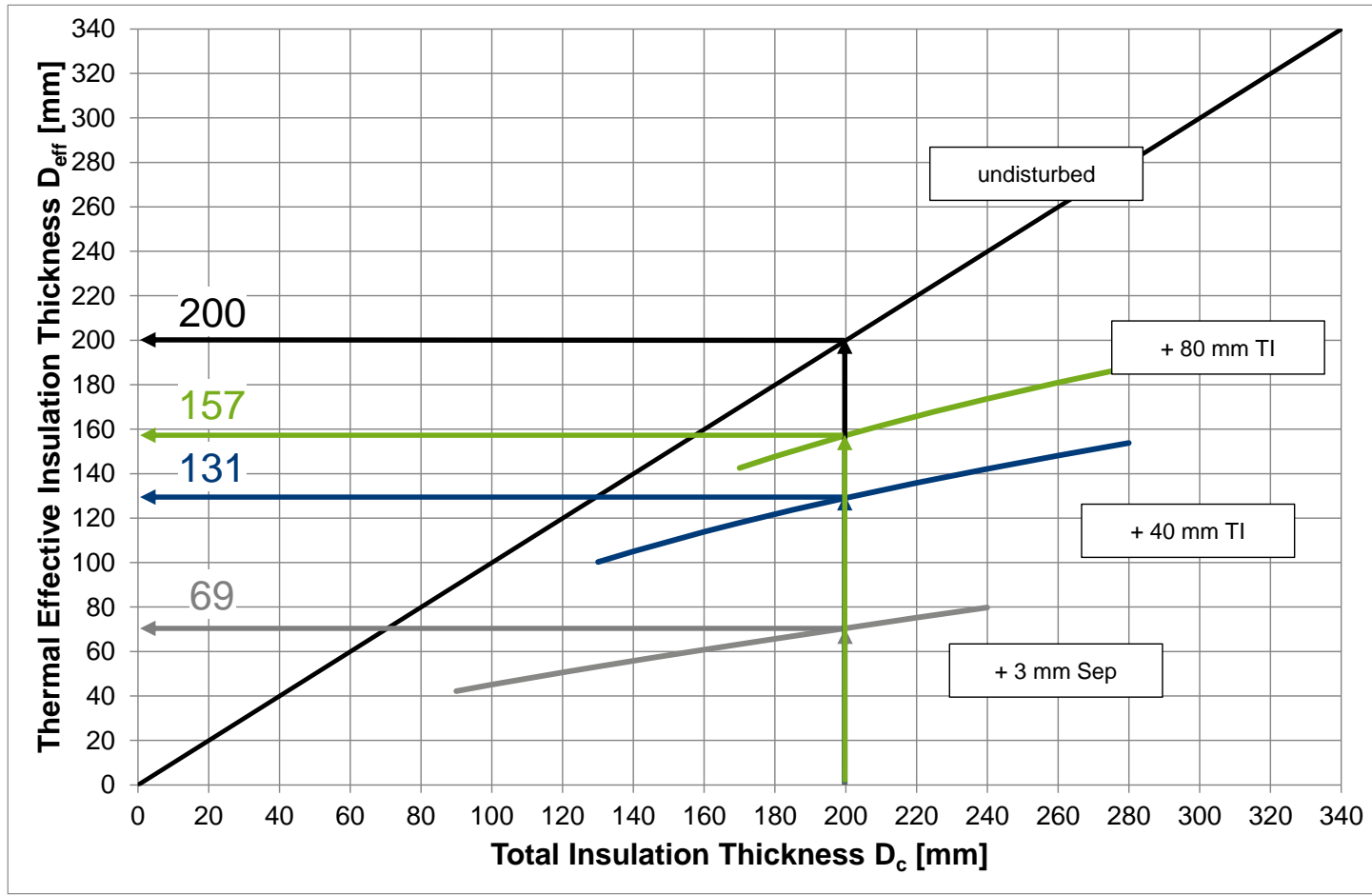
Solution 3



120 mm  
+ 80 mm additional

# Project Example – Thermal Performance of Steel Cassette Walls

## Comparison of solutions





## **More sustainability through innovative steel solutions**

- New products and solutions have to be developed
- Integrated investigations and optimisations
- Building renovation as key area for more market
- Nearly-zero- and Plus-Energy-Buildings require integration of renewable energy resources
- Future-oriented design and improved life cycle performance