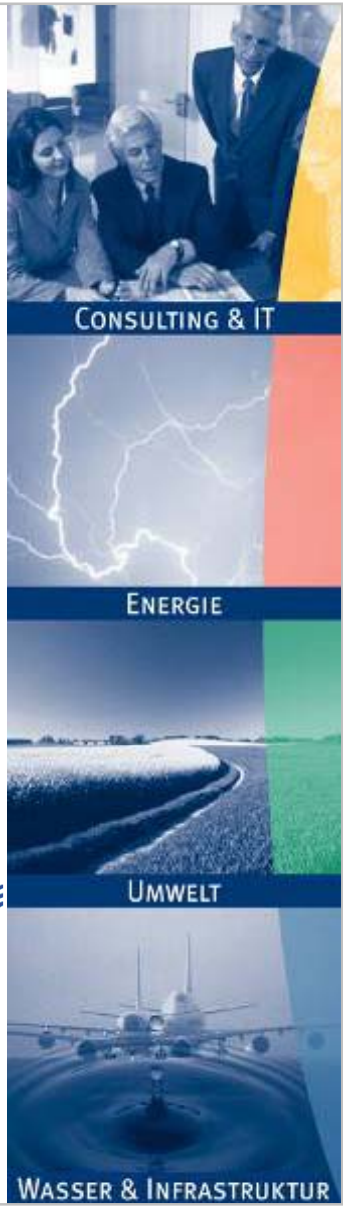
FICHTNER

Paper 50

Parallel Session 11

Theme 2: Hydraulic and Coastal Applications (LT2)



Overflow Protection of Flood Embankments with Geosynthetics

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NAUE

BAUBERATUNG GEOKUNSTSTOFFE

Overview

1 Introduction

2 General Application of Geosynthetics

3 Overflow Protection Using Geosynthetics

4 Benefits

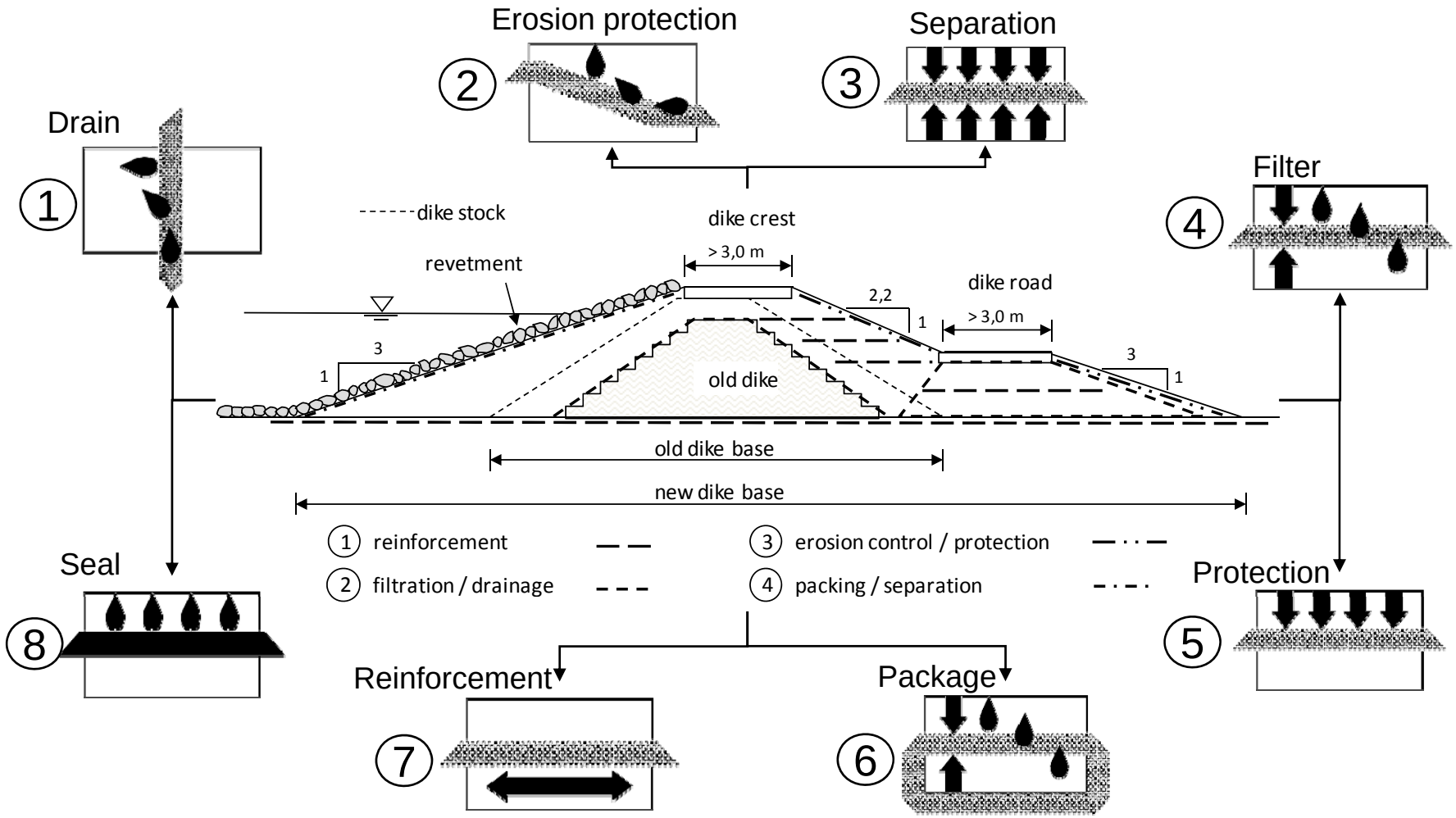
5 Conclusions

1 Introduction

- Concentration of flood events in the years 1995 – 2007 in Germany
- High economical damages → Adjustment of flood protection plans and measures
- Reactivation of flood retention areas/volume in the catchment areas and along rivers
- Application of flood embankment dams overflow sections *(Required by national codes and laws!)*
- Application of geosynthetics: effective and economical method/solution

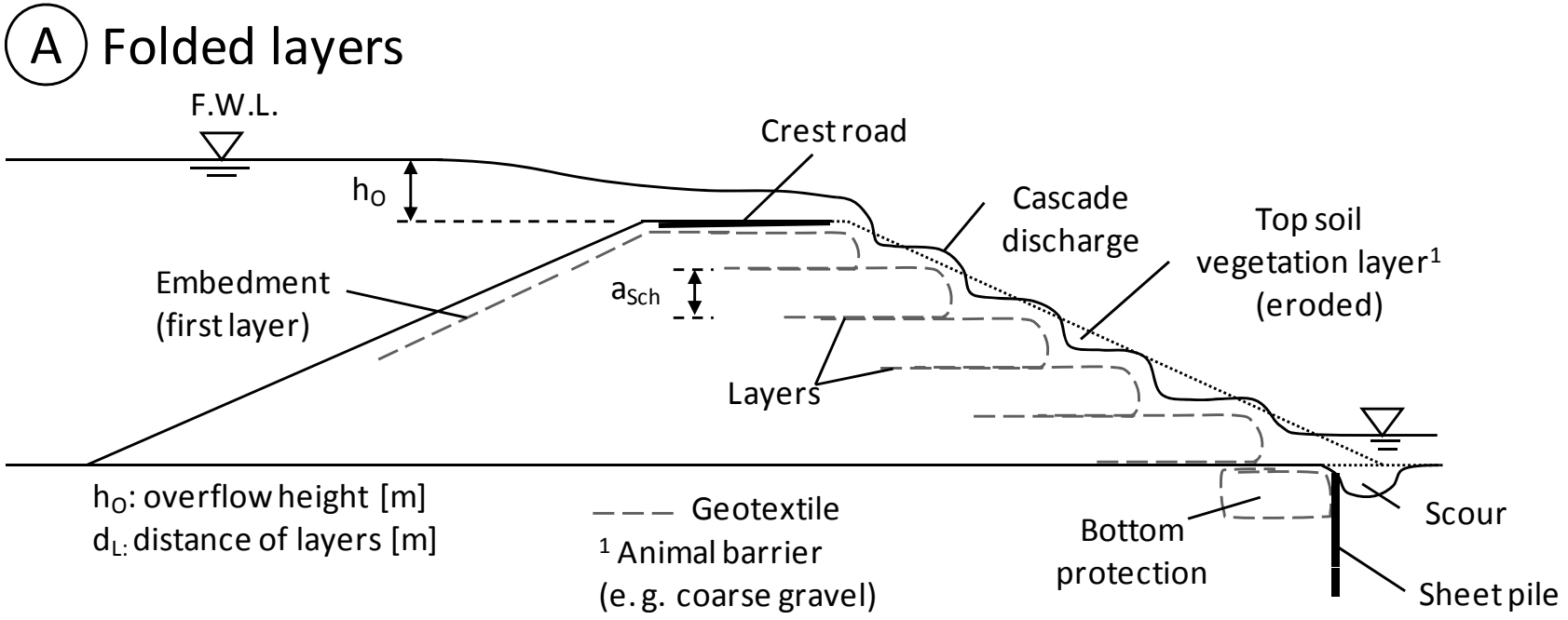
2 General Application

- Selected application forms within an embankment dam cross section



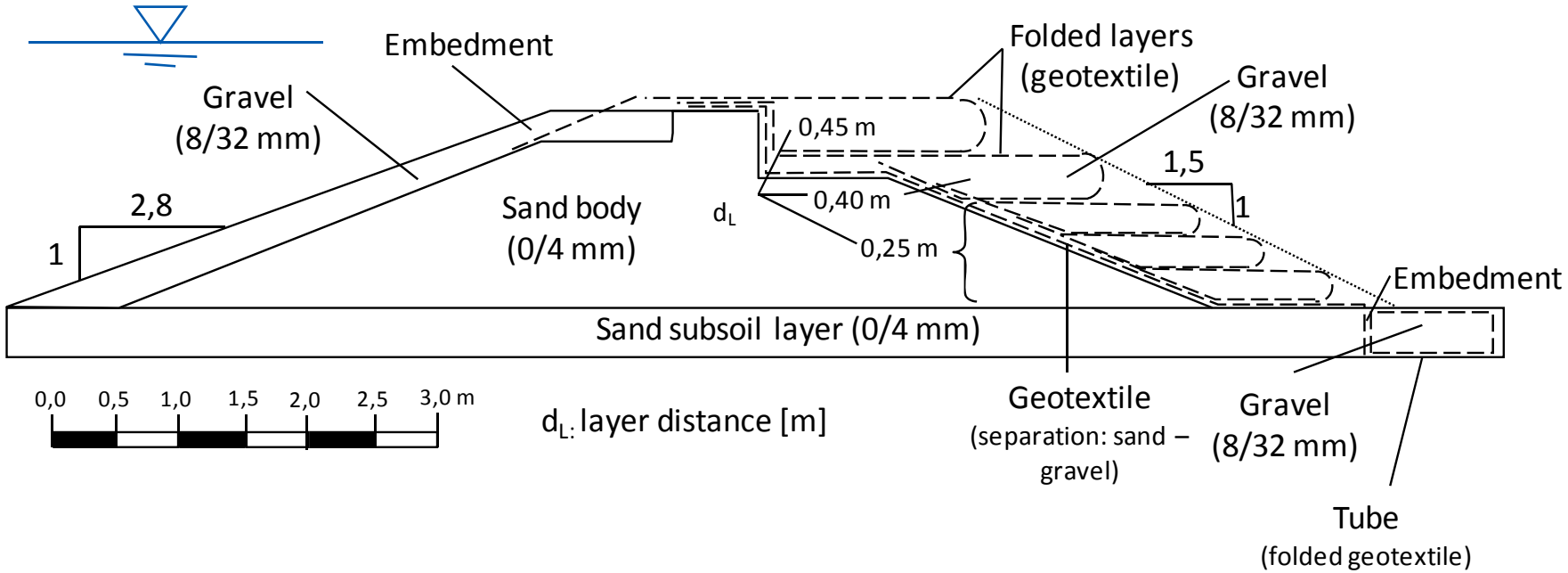
3 Overflow Protection Methods

- Typical cross section – folded layer design (example)



3 Overflow Protection Methods

- Full scale tests – folded layer design



3 Overflow Protection Methods

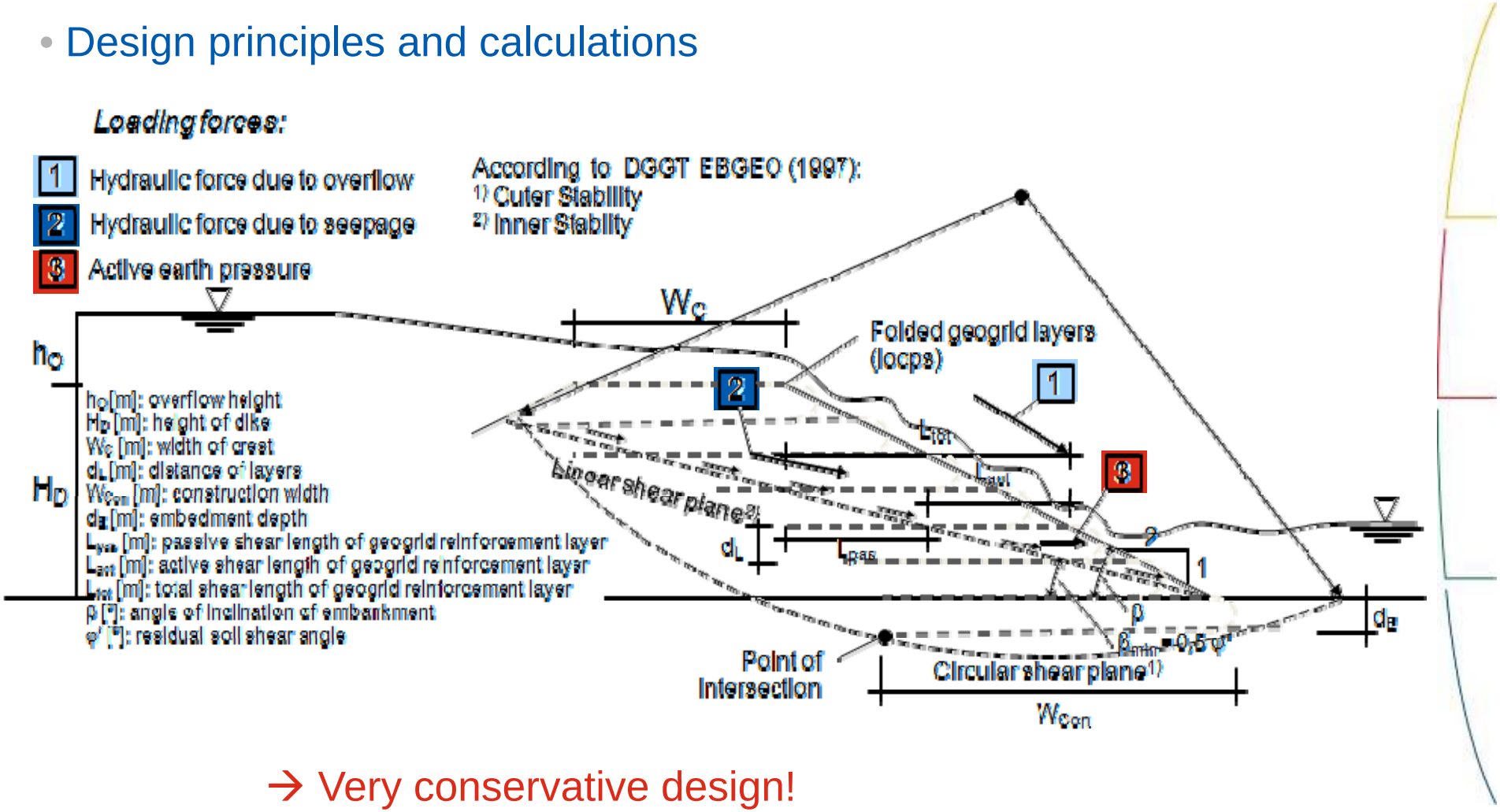
- Full scale tests – folded layer design - photos

Construction completed

In operation – 130 l/(s*m)

3 Overflow Protection Methods

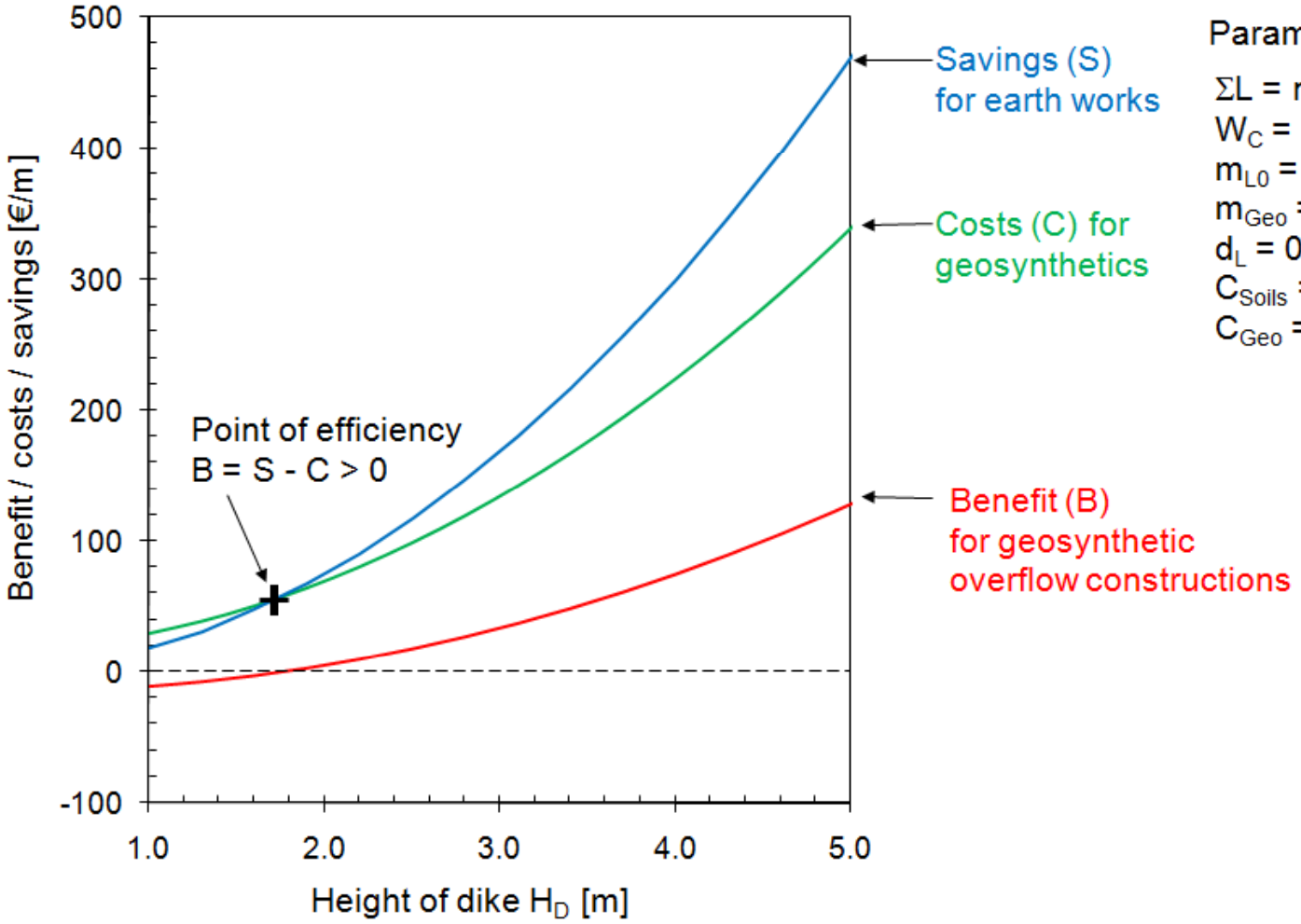
- Design principles and calculations



→ Very conservative design!

4 Benefits

- Comparison of costs, savings and benefit

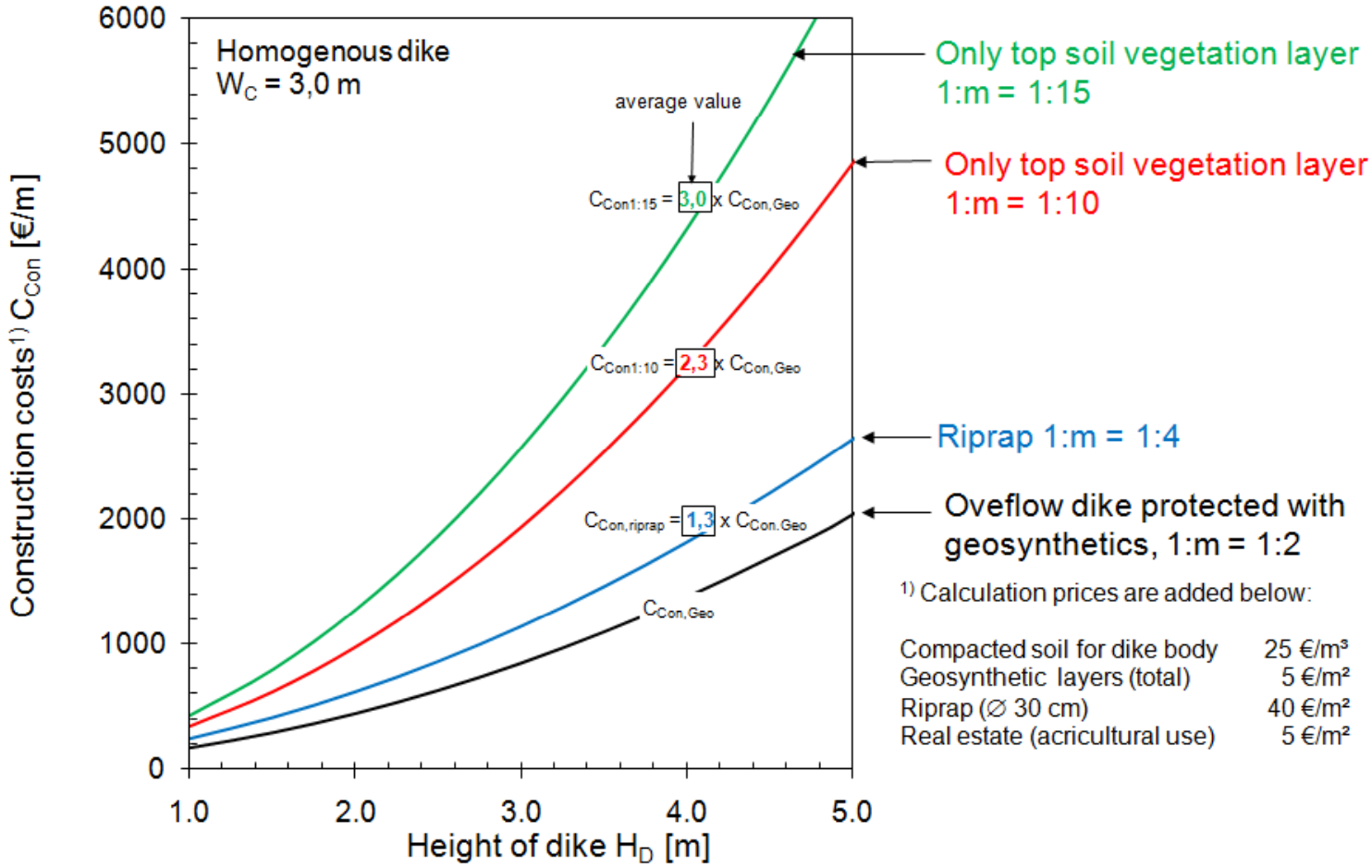


Parameters:

$\Sigma L = n^*L_{Layer} + W_C$
$W_C = 3{,}0$ m
$m_{L0} = 3{,}0$
$m_{Geo} = 1{,}5$
$d_L = 0{,}3$ m
$C_{Soils} = 25$ €/m³
$C_{Geo} = 5$ €/m²

4 Benefits

- Construction costs of different overflow protection methods



5 Conclusions

- Effective, economical reliable design method for overflow flood embankment sections using geosynthetics
- Design principles, functionality and effictiviness are undisputed
- Need for further particular research and development (hydrodynamic forces ...) to create design specifications and construction codes
- First realization projects in design stage and preparation in Southern Germany

The end

Thank you for your Attention!