Probabilistic design of the Land Barrier on the Bolivar Peninsula



Introduction







Introduction







Overview



























Objective

Probabilistic design of the Land Barrier on the Bolivar Peninsula taking the overtopping failure mechanism into account, exploring the possibilities of overtopping resilience.





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Objective









Coastal Spine





Current situation - Galveston seawall

- ation Scenario 2 seawall - Galveston seawall
 - Bolivar Roads

Scenario 3 - Galveston seawall

- Land Barrier

- **Coastal Spine**
- Galveston seawall
- Bolivar Roads
- Land Barrier











Two Scenarios



Land Barrier Height [m]

ŤUDelft



Alternatives

- Height
 - 1. Natural approach
 - (hign barrier) 2. Low design
 - Other measures
 - 3. In between





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Alternatives





Alternatives































Resilience:

The ability to withstand loads higher than the design water levels and wave conditions while gradually some damage may occur















Coastal Spine

- Coastal spine limits the inflow sufficiently
- Other configurations were not sufficiently limiting the inflow





Land Barrier

- Low barrier is favored
 - Consequence is large overtopping discharges





Inner slope

- Other failure mechanisms start to play a role
 - Sliding of the revetment
 - Scour hole behind the structure





- It is possible, improvements can be made
- Resilience is investigated, definition not suitable for total probability of failure



Recommendations

- Flow behavior behind the Land Barrier
- Material and erosional resistance
- Resilience
 - Definition
 - Implementation



Probabilistic design of the Land Barrier on the Bolivar Peninsula Ilze Plomp – van der Sar

