

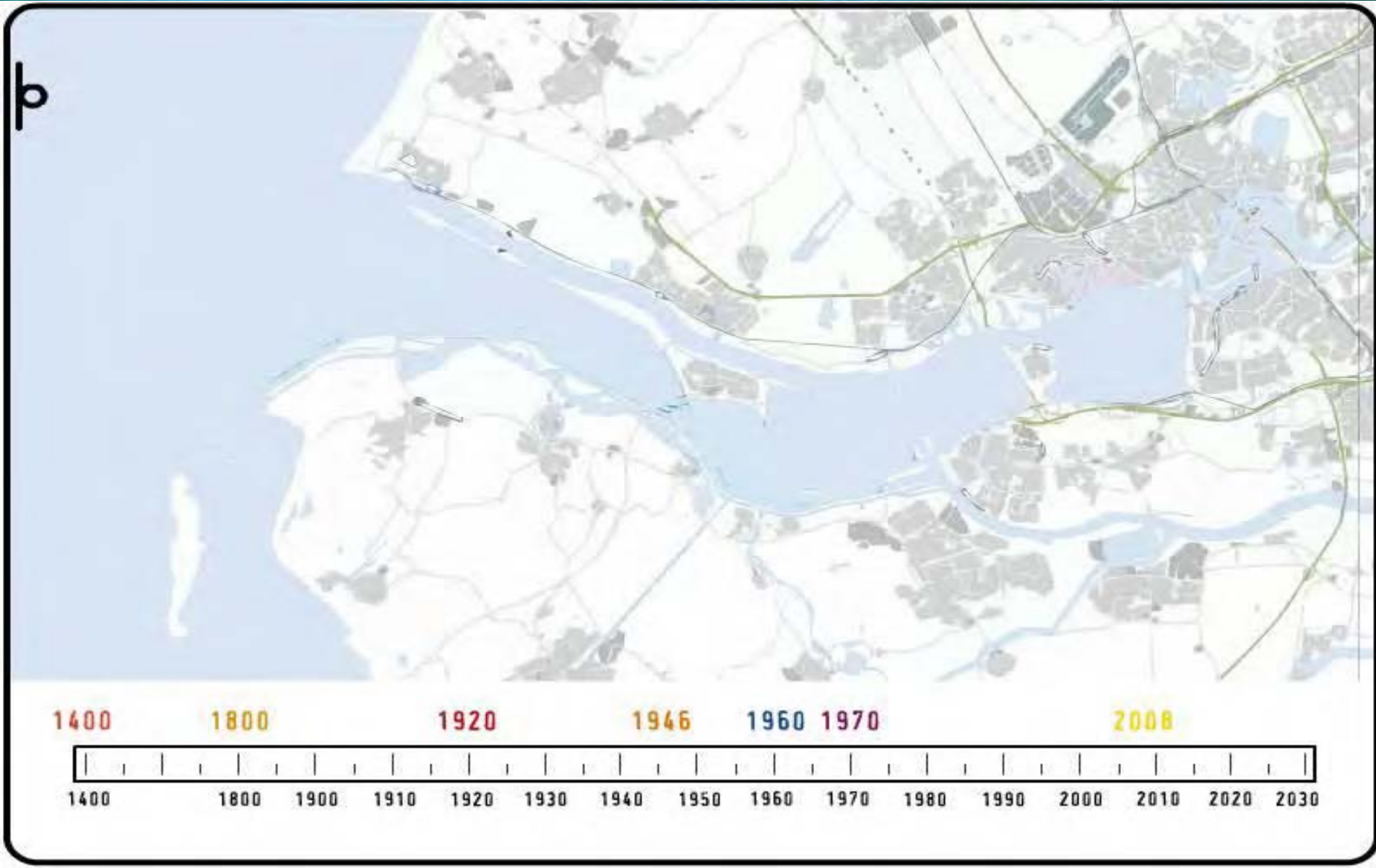
PUMA

Projectorganisatie Uitbreiding Maasvlakte



September 21st 2011
Jaap Dekker

Mainport Rotterdam



Maasvlakte 2 Project



Hard sea defence
'Partnering result'

Soft sea defence
(beach & dunes)

Contract 1



- 27 February 2008
- DCM: Design, Construct & Maintenance
- Requirements Chart - Verification Matrix
- Approximately € 1.1 billion , lumpsum



Contract 1

Stage 1, 2013



Scope Contract 1

Contract breakwater and first harbor areas (Stage 1)

Hard Sea defence 3.5 km

Sandy coast 7.3 km

Harbor basin 530 ha

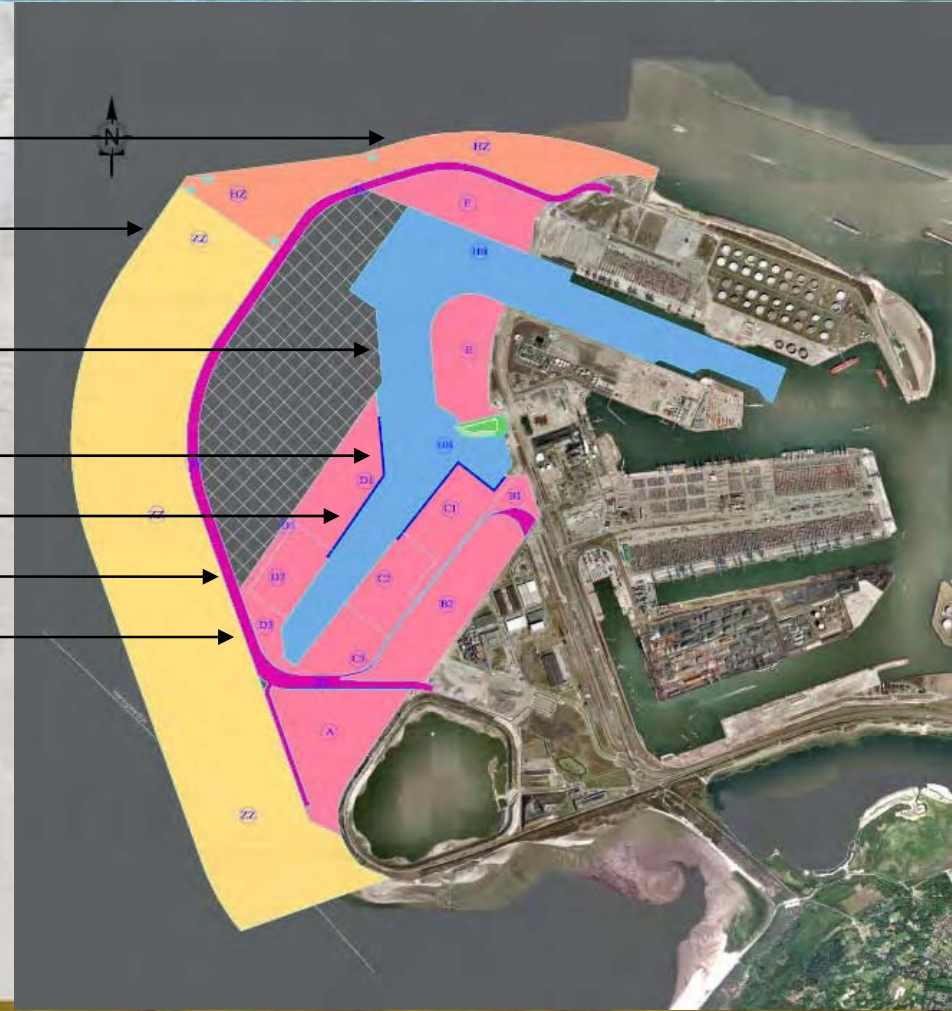
Harbor areas 700 ha

Quay walls 3.5 km

Roads 13 km

Railways 14 km

- 240 million m³ of sand
- 7 million tons of rock
- 20,000 concrete blocks (40 tons each)



Last stage - 2030



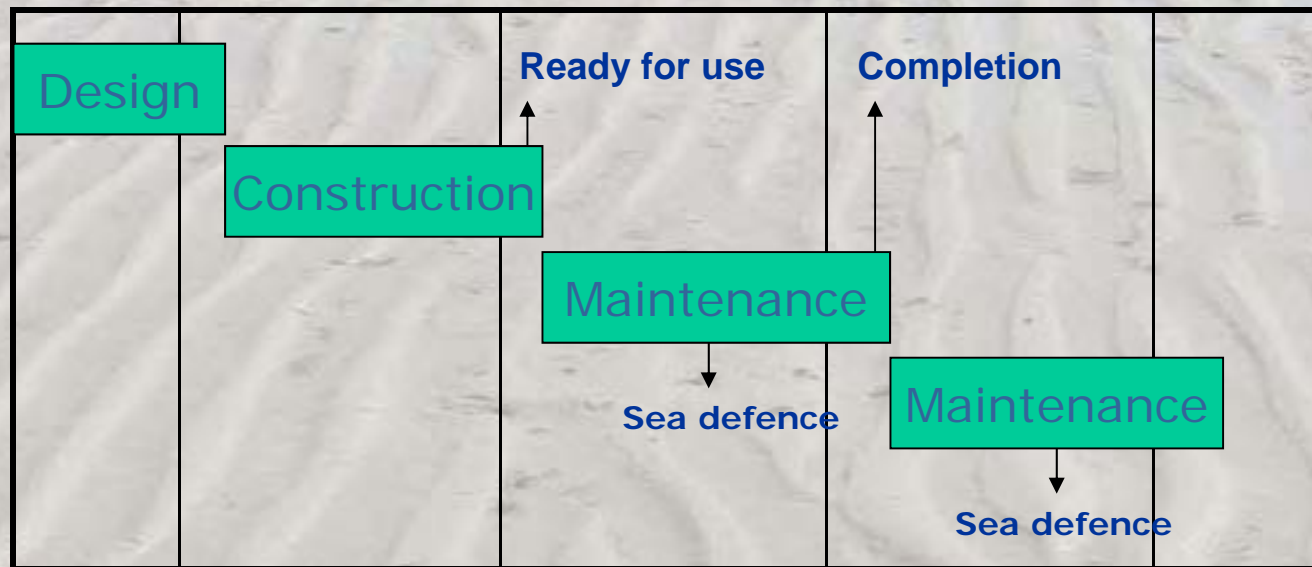
Planning

2006 2008

2013

2018

2023

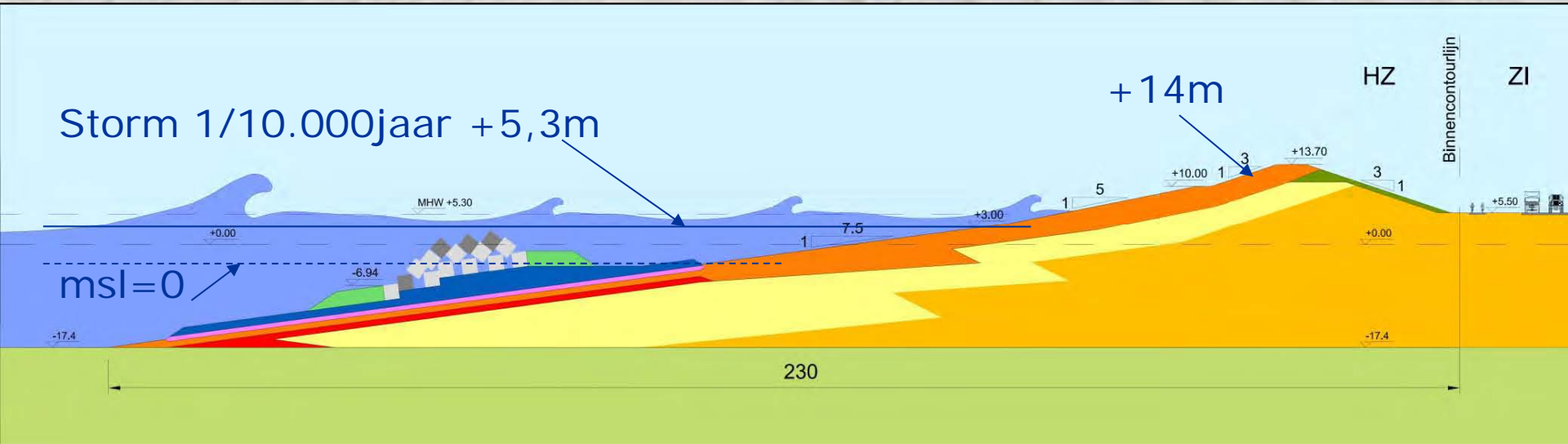


Division of risk

- **PMV2**
 - Change of scope outside initial requirements
 - Damage to the works by heavy storm (more than 1/50 jaar = chance smaller than 2% per year)
 - Location of sea defence
 - 5 primary licenses + planning permission
- **PUMA**
 - Durability of the construction
 - All other construction risks
 - Design sea defence and soil conditions
 - All other licenses

Hard Sea defence MV2

Total length 3,5 km



December 2008



July 2011





Rocks Delivering at Yangtzehaven









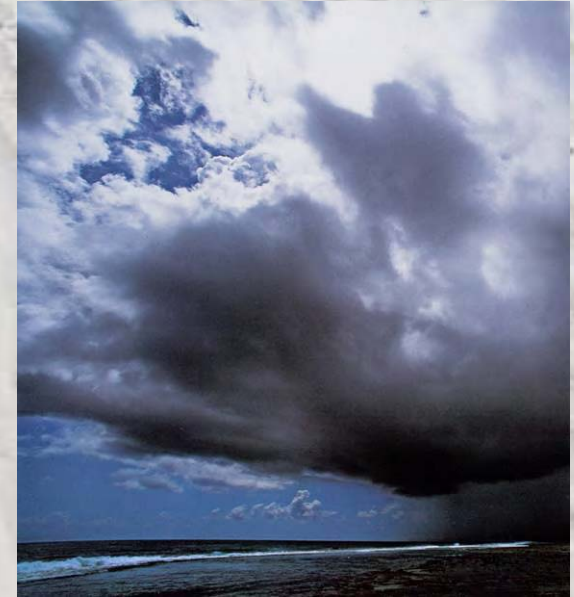
Risk Management PUMA

- **Objective:** create a risk aware organisation through keeping insight in risks en control measures.
Goal → reduction of failure costs
- **Risk definition:** Uncertain events which influences achievement of objectives positive (Opportunity) or negative (Risk).
- Open communication is essential
- Risk-owners manage the risks and the action-takers are responsible for the preventive actions.

Risk Management

Top 5 risks PUMA

1. Breakdown E-crane
2. Contractual interpretation between Client and Contractor
3. Damage of underlayers of Hard Sea Defence during storm conditions
4. Damage of temporary protection of Hard Sea Defence during storm conditions
5. Dredging of contaminated soil at Maasvlakte 1



Top 5 Opportunity's PUMA

1. Design Change into Reef Breakwater with cobble beach
2. Improvement of Human development
3. Use of broken concrete
4. Encourage Knowledge sharing
5. Close cooperation with Client for Handing over work



Quantitative risk analyses

- Based upon risk register
- All risks and uncertainties are implemented (negative and positive!)
- Use of Monte Carlo simulation model
- Outcome: total sum of the risk exposure
- Prediction of future performance against key objectives
- Sensitivity of risks is made clear

Risk management Lessons Learned

Implementation in practice

- Also contractual, communication and organisation risks, not only technical risks
- Risk Management stimulates pro-active measures
- Opportunity & Risk Workshops
- Frequent communication about risks and opportunities is necessary to keep it alive
- Task forces of engineer, preparation and superintendent
- 'Online' Risk file