

# Maasvlakte 2 reclamation: nautical design

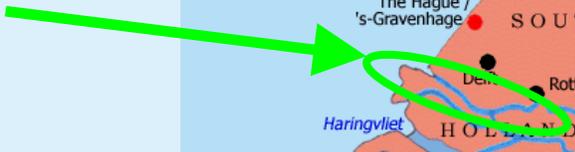
Port Infrastructure Seminar

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Manager Engineering, Port of Rotterdam Authority



Port of Rotterdam





**OBSTRUCTIONS:**  
Submarine pipelines, with vert extend up to 2.5km from the

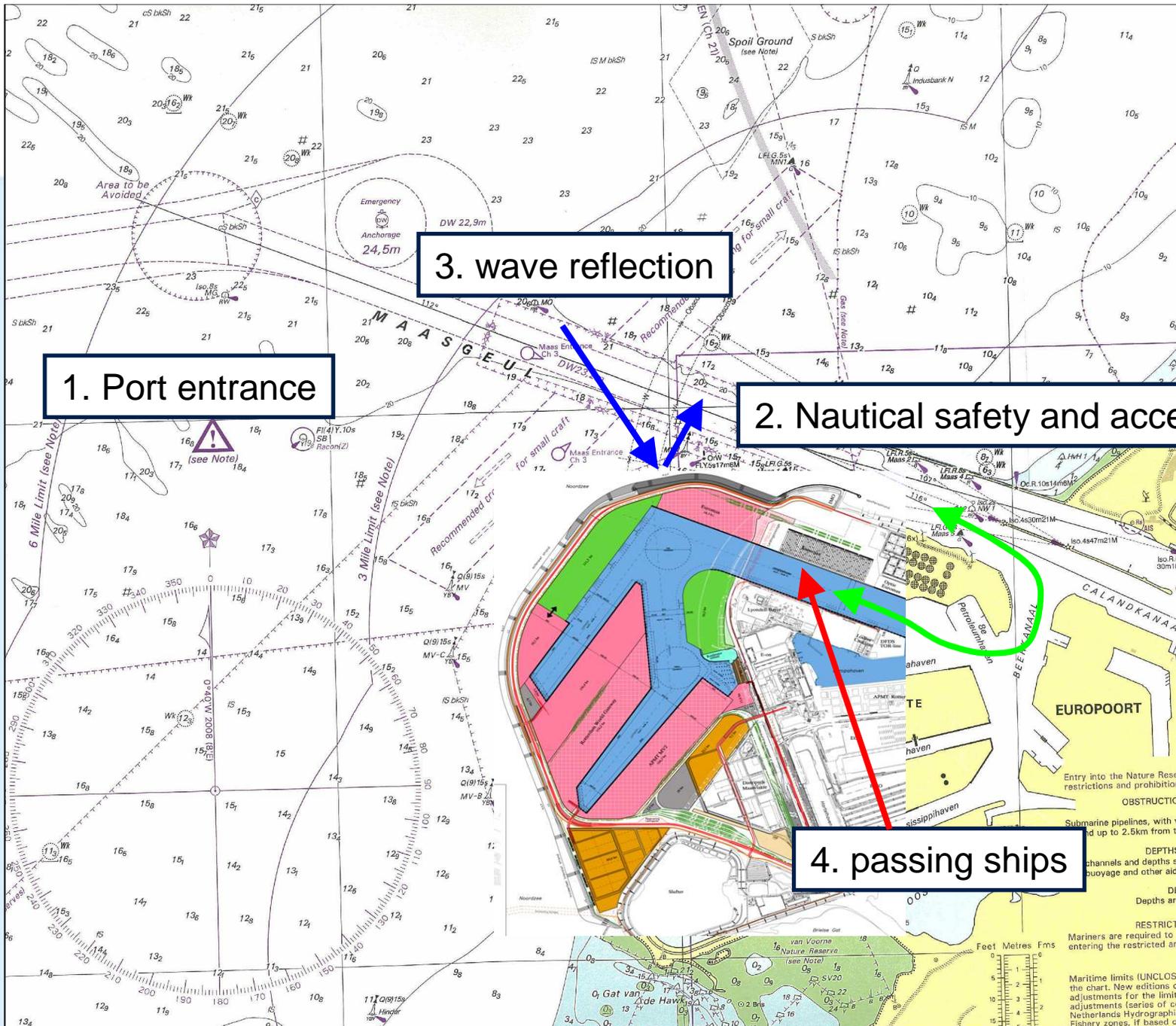
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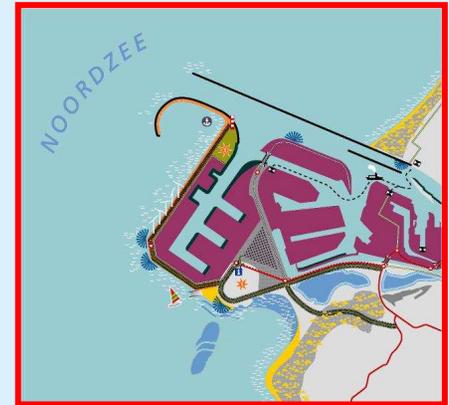
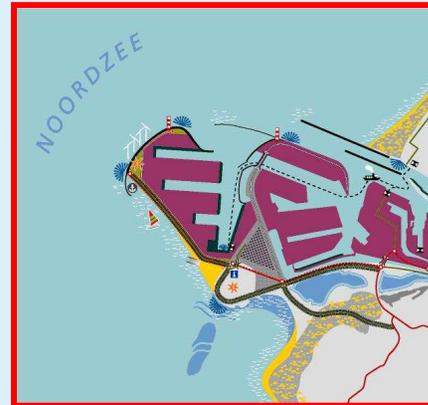
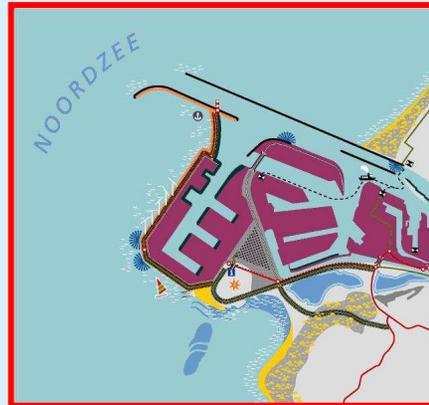
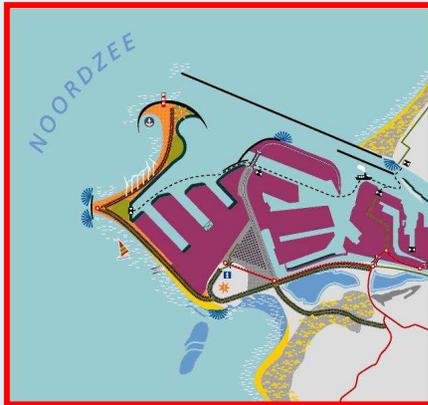
1. Port entrance

3. wave reflection

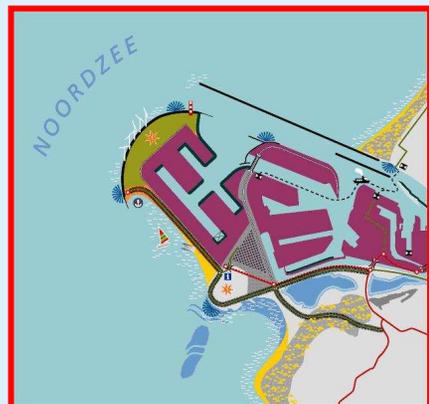
2. Nautical safety and accessibility

4. passing ships

# Dominant design decision: sea entrance to Maasvlakte 2



2003



# Maasvlakte 2: nautical design

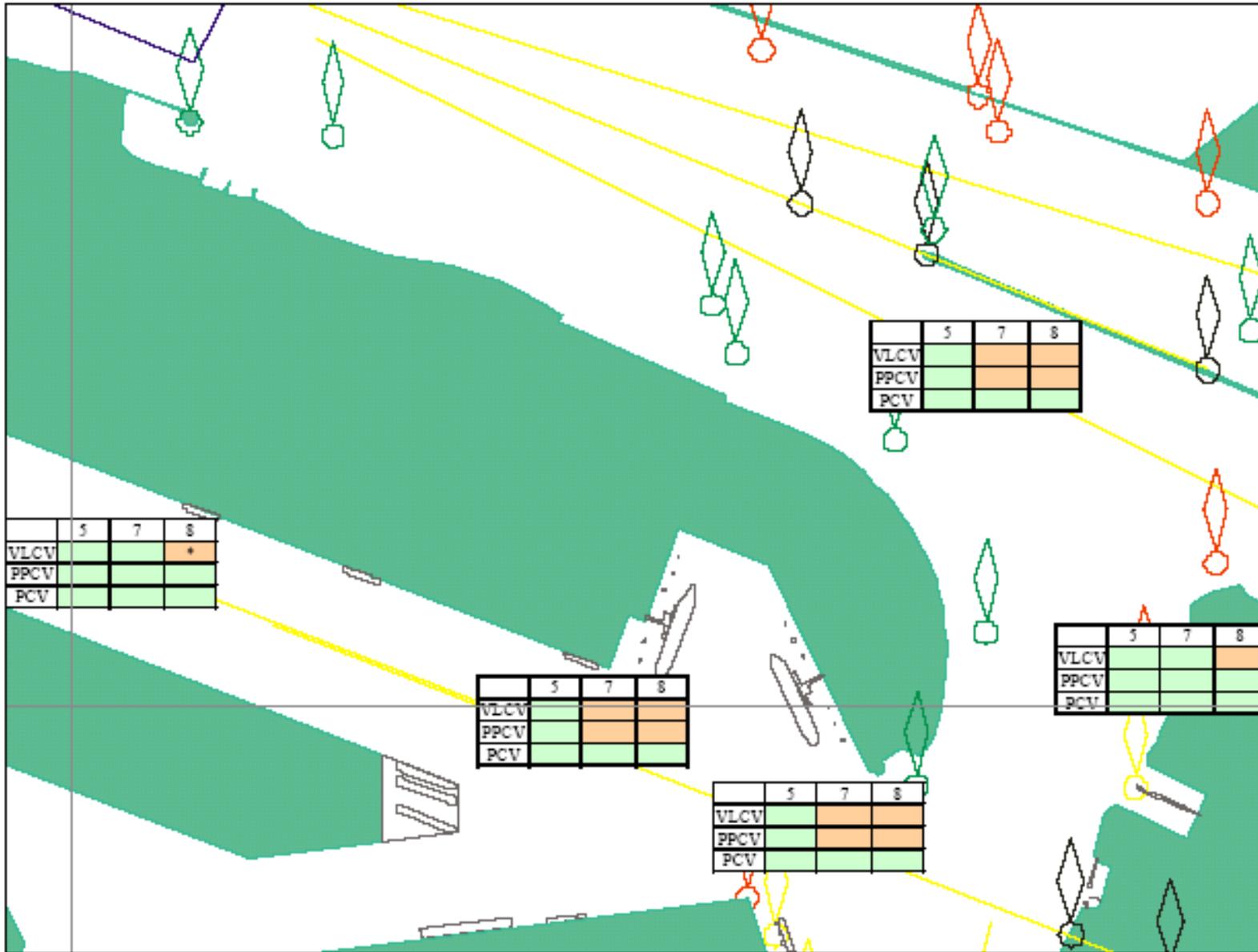


- **Objective**  
Maintain nautical safety and provide sufficient nautical capacity up to 2035.
- **Traffic**  
In 2035 number of calls will increase by 54% to 52500 per year. IWT by 170% to 140000.
- Geometry should be such that manoeuvres can safely be carried out.
- Limits of operation for all vessels in terms of wind and two way traffic.
- Turn around time (sum of arrival and departure manoeuvres incl berthing and de-berthing)

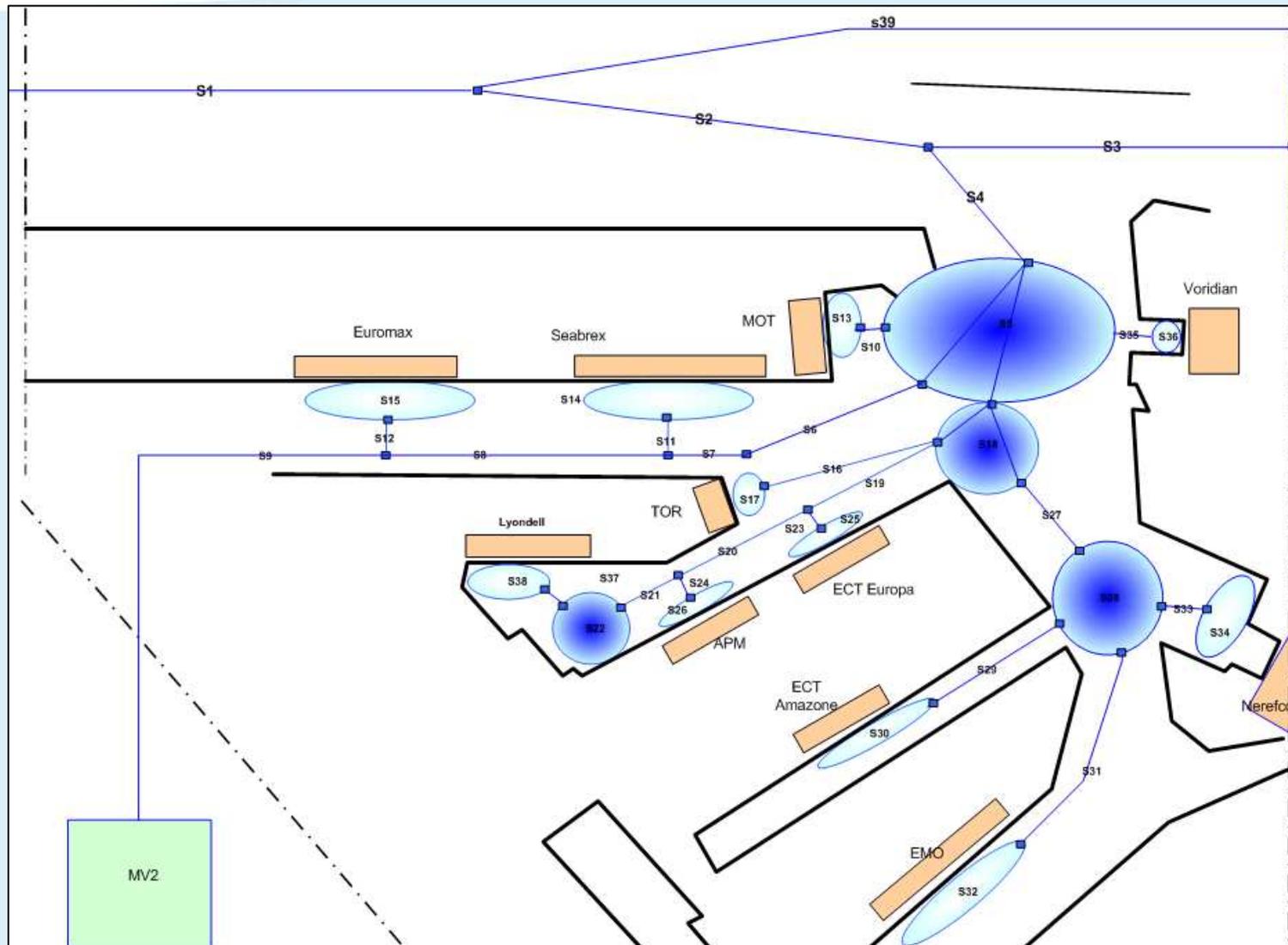
# Real time manoeuvring simulations (2x)



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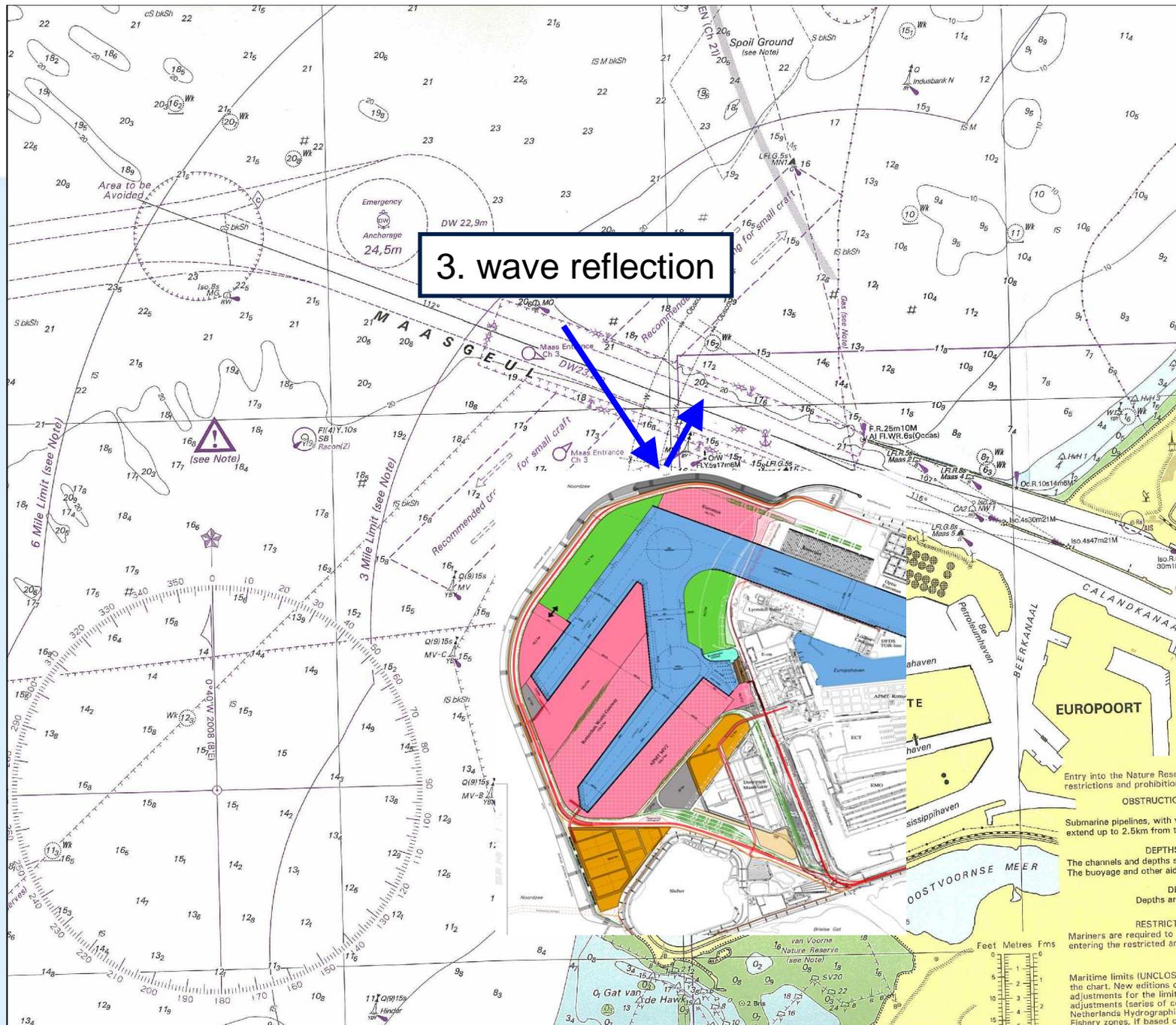
# ProSim model (TU-Delft)



# Nautical safety and accessibility



- Port will be safely accessible for 12500 TEU vessels at 8 Bft.
- Two way traffic restrictions will apply for vessels > 8700 TEU at 7 Bft at some locations.
- In 2035 the average turn around time increases by 20% (40 min)



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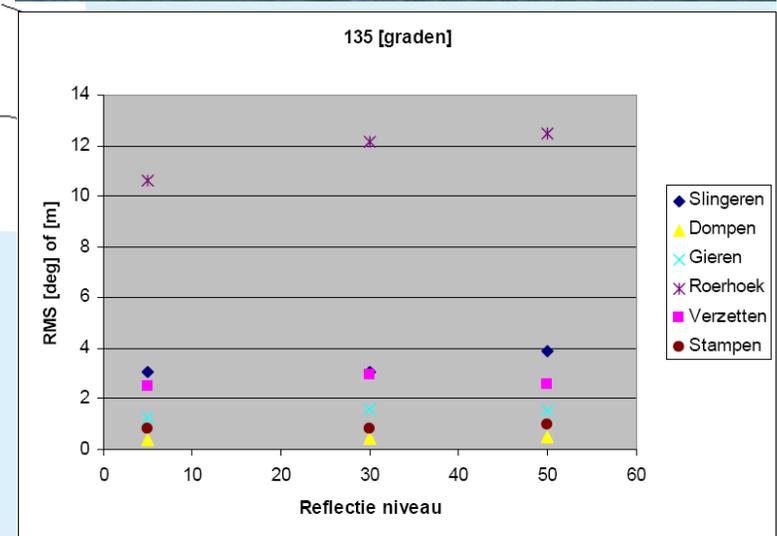
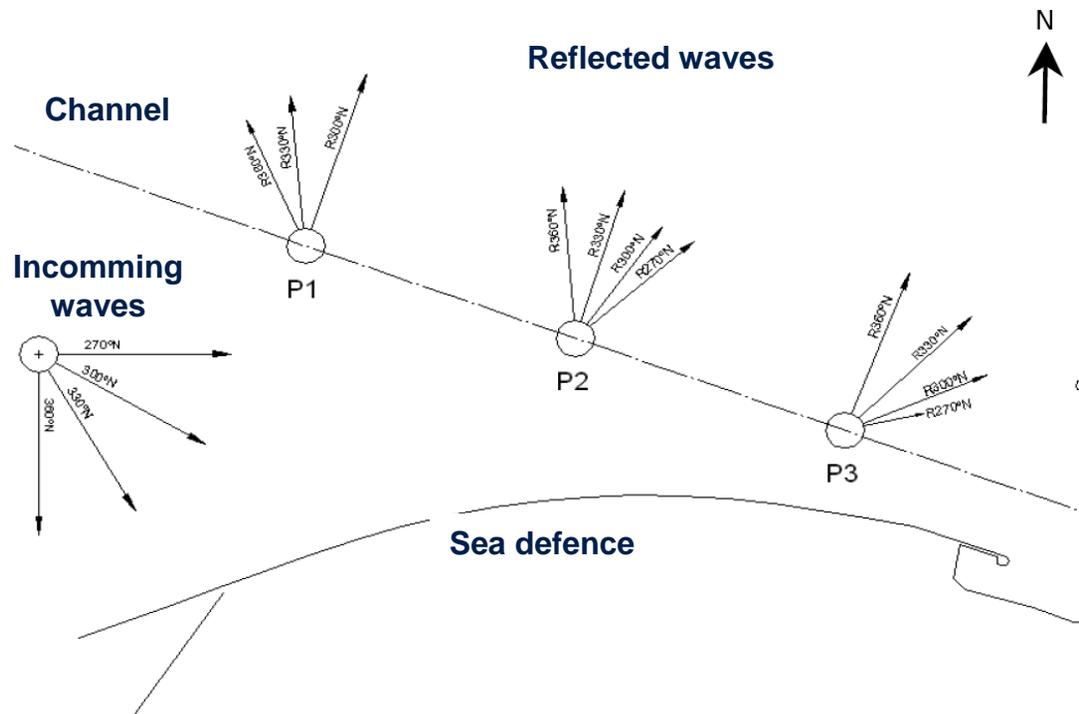
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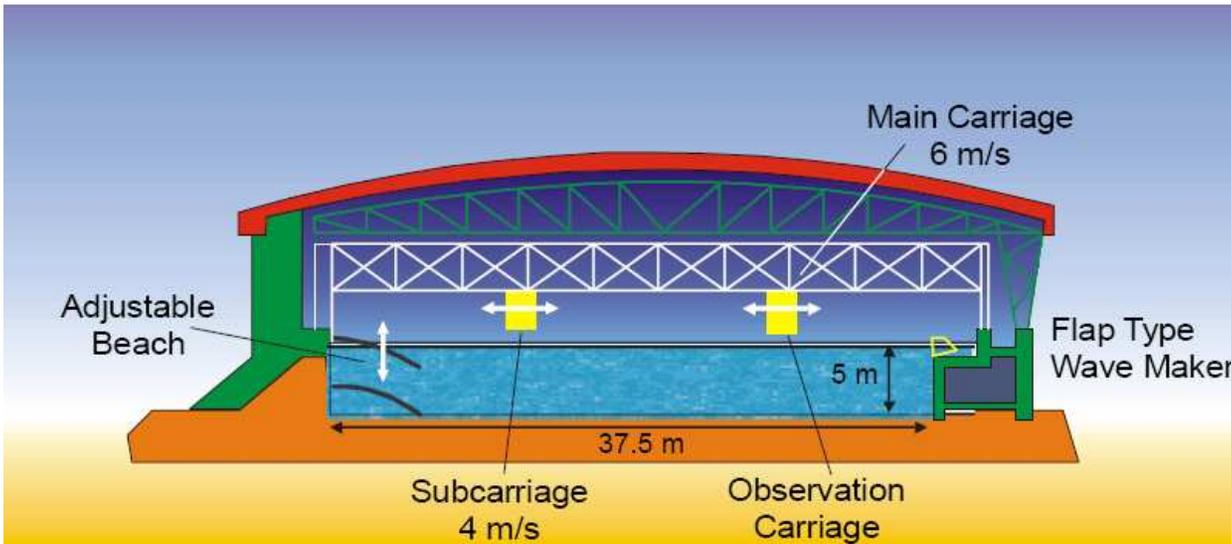
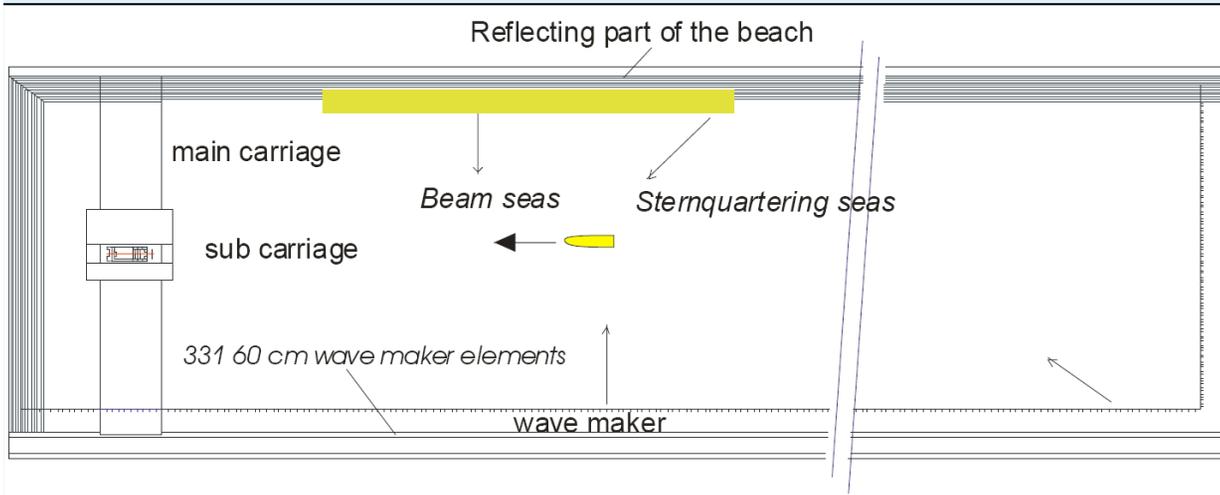
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# Wave conditions

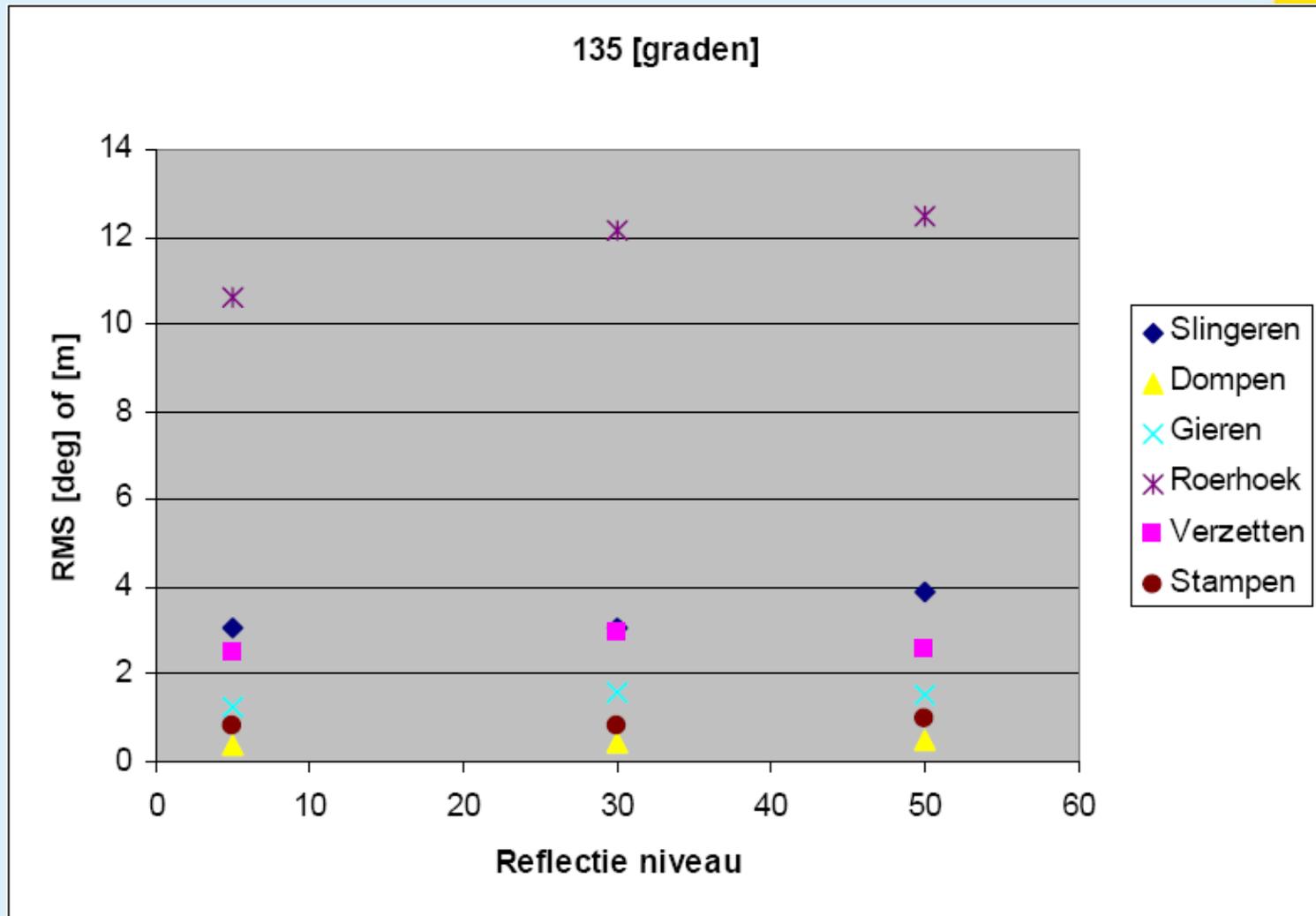


- Wave reflection off Zuiderdam must meet limits for smaller sea vessels, i.e. feeders

# Physical scale modelling (Marin)



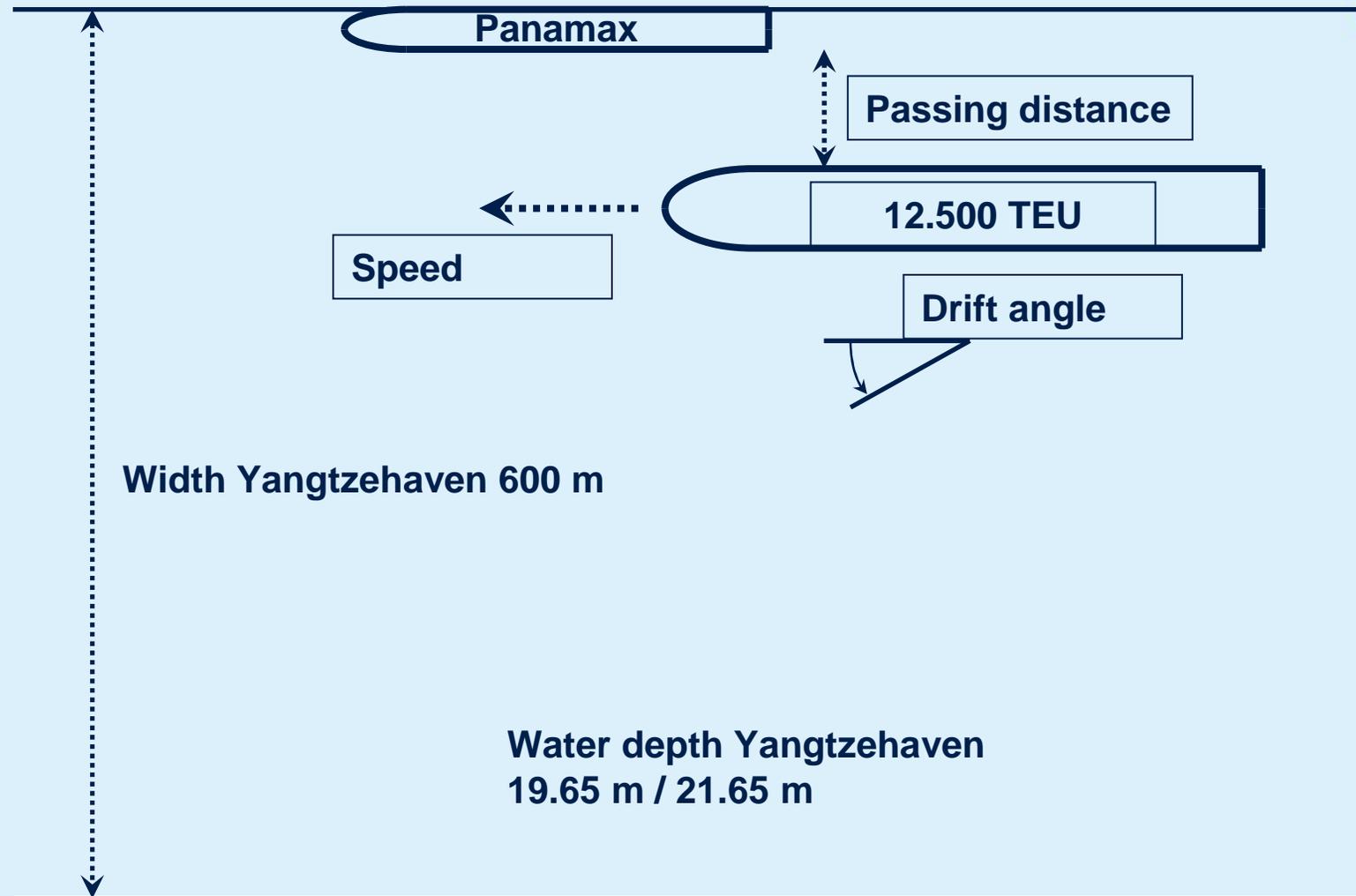
# Physical model results – wave reflection



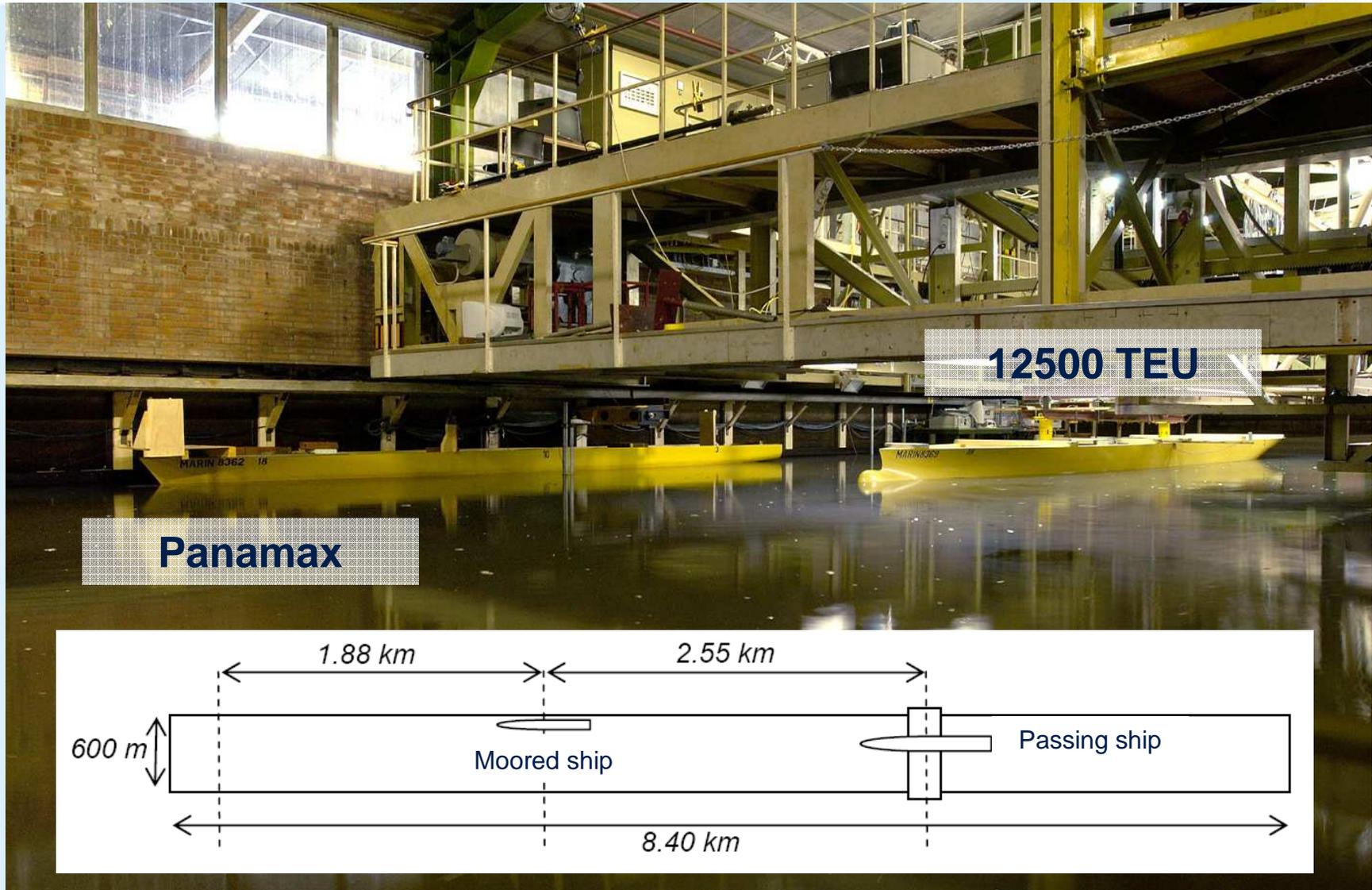


**4. passing ships**

# Physical scale model tests (Marin)



# Physical scale model (Marin)



# Passing ships - results

	Passeersnelheid – NYLON		
Passeerafstand	$V_s=4.5$ kn	$V_s=5.5$ kn	$V_s=6.5$ kn
150 m	✓	✓	✓
100 m	✓	✓	✓
75 m	✓	✓	✗

- Passing speed of 5 knots in combination with 6-7Bft wind at a distance of 100 m is acceptable (for a 12500 TEU VLCC).
- Reduction of draft leads to reduction of motions.
- Increase of waterdepth leads to reduction of motions.



**Thank you for your attention.**

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