Workshop
"COASTAL AREAS ENVIRONMENTAL IMPACTS ASSESSMENT AND MANAGEMENT "

Working group N. 6

Choose the best solution for an environmental problem in an Italian harbour analyzing the results of physical and numerical models

The Pescara river outlet is faced by a 800 m long breakwater. This leads to a concentration of the pollutant present in the river's water along the near shore where a beach is present. The breakwater is part of the harbour's structures and is one of the main defence against incoming waves. Seven possible solutions to the problem are given and for each of them physical model's results are provided. You have to analyze them and then to propose a solution (not necessarily one of the showed solutions).

PART 1: Present situation

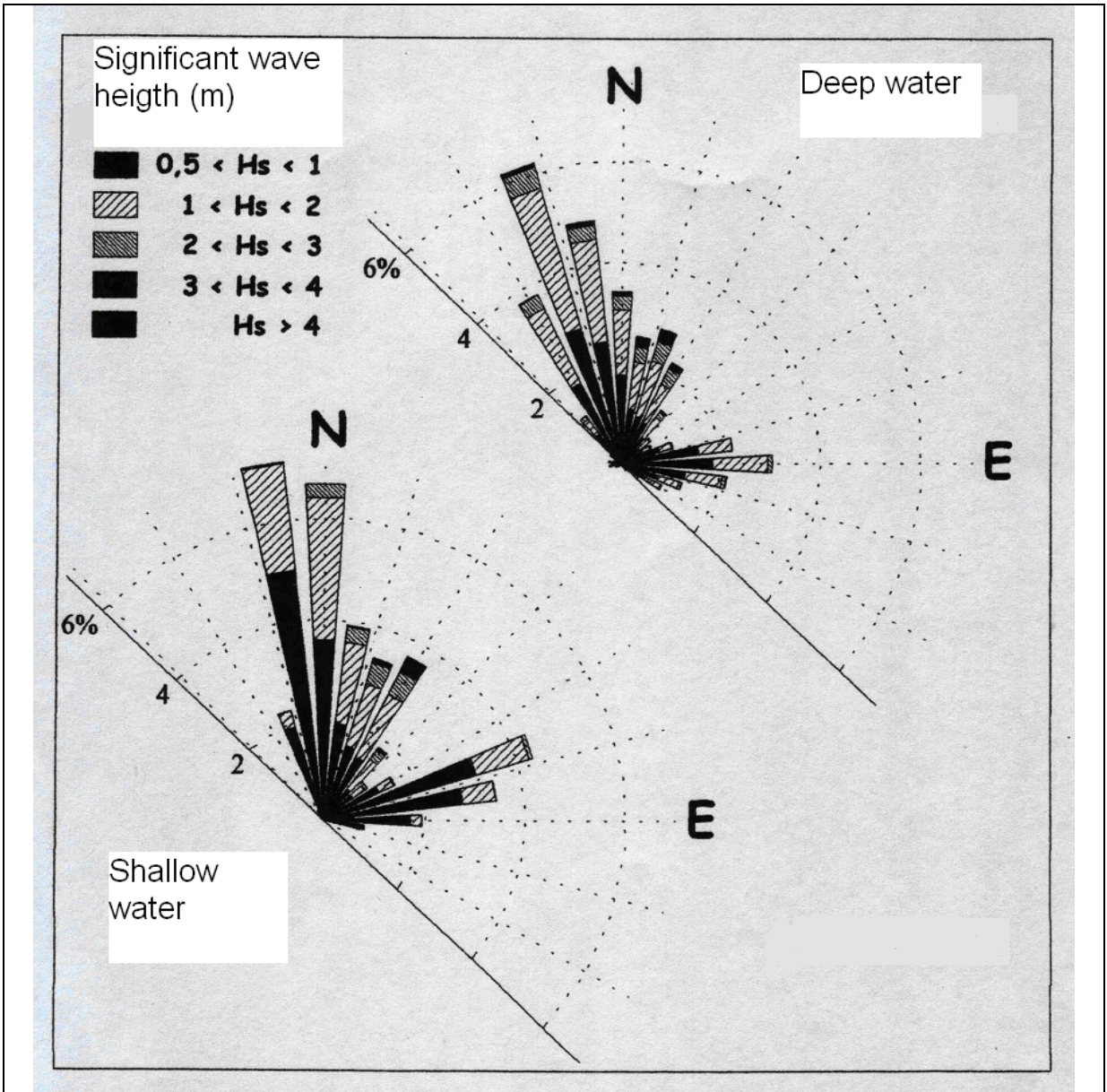Fig.1: Pescara's harbour – present situation.

Fig. 2: Wave's directional frequency distribution.

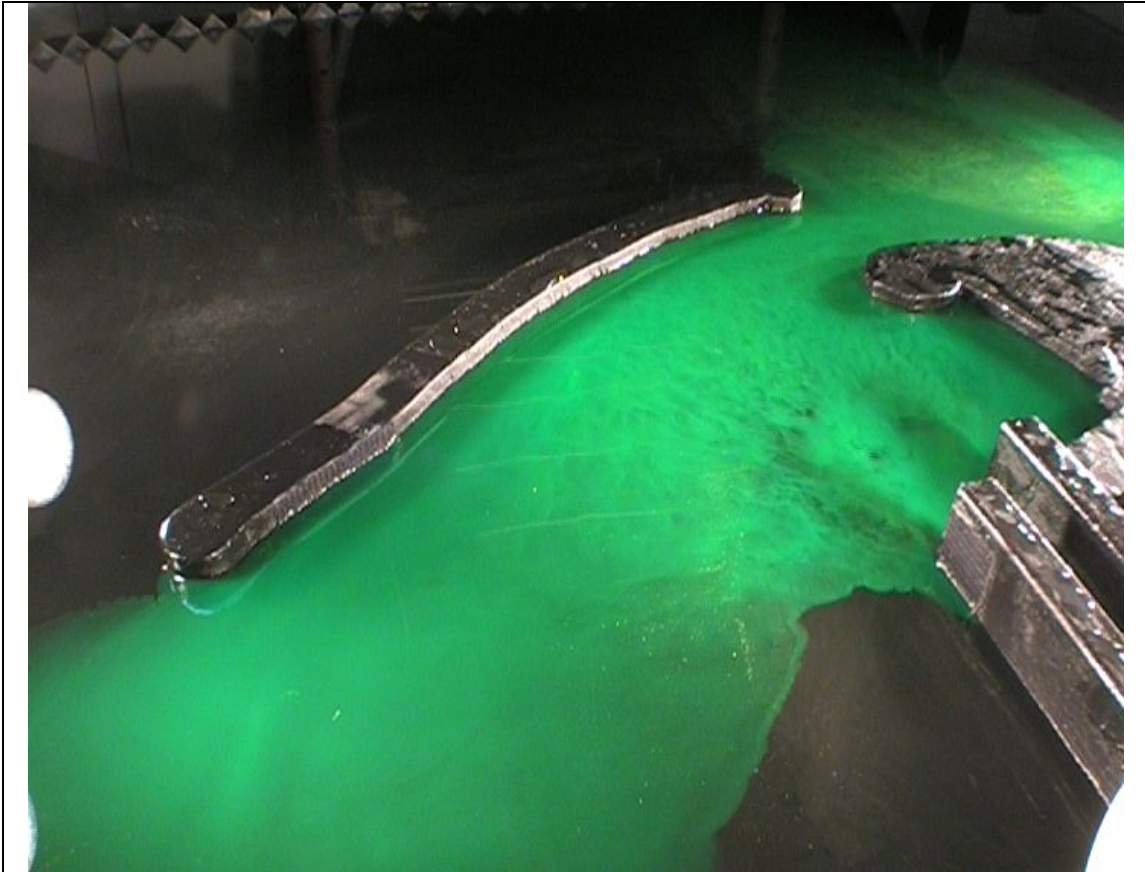Fig. 3: Geographically referred image of Pescara harbour.
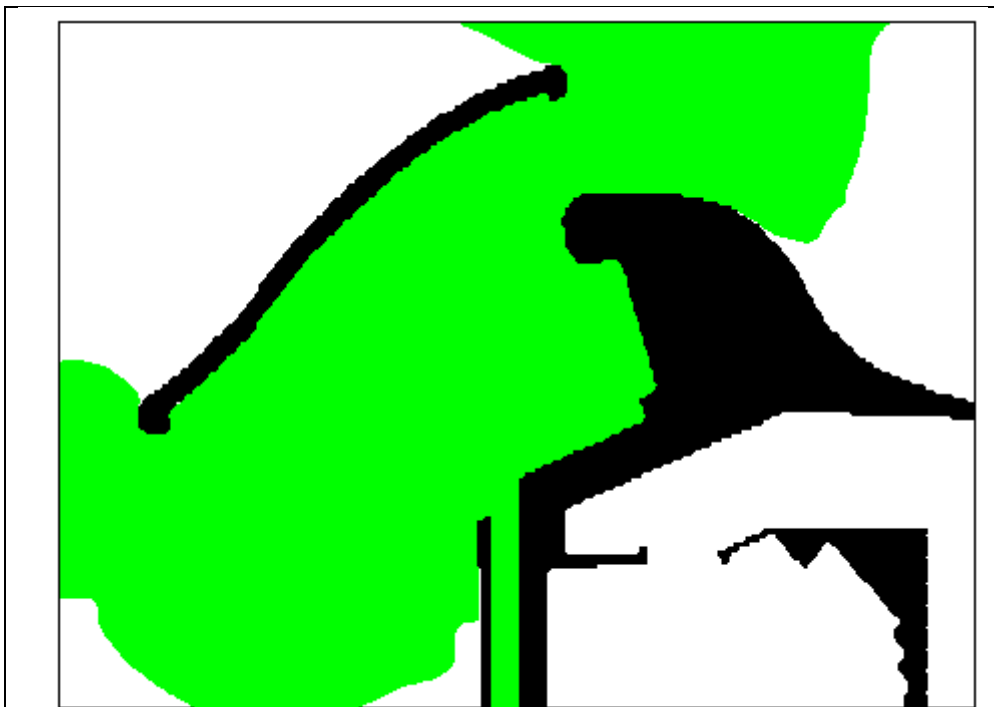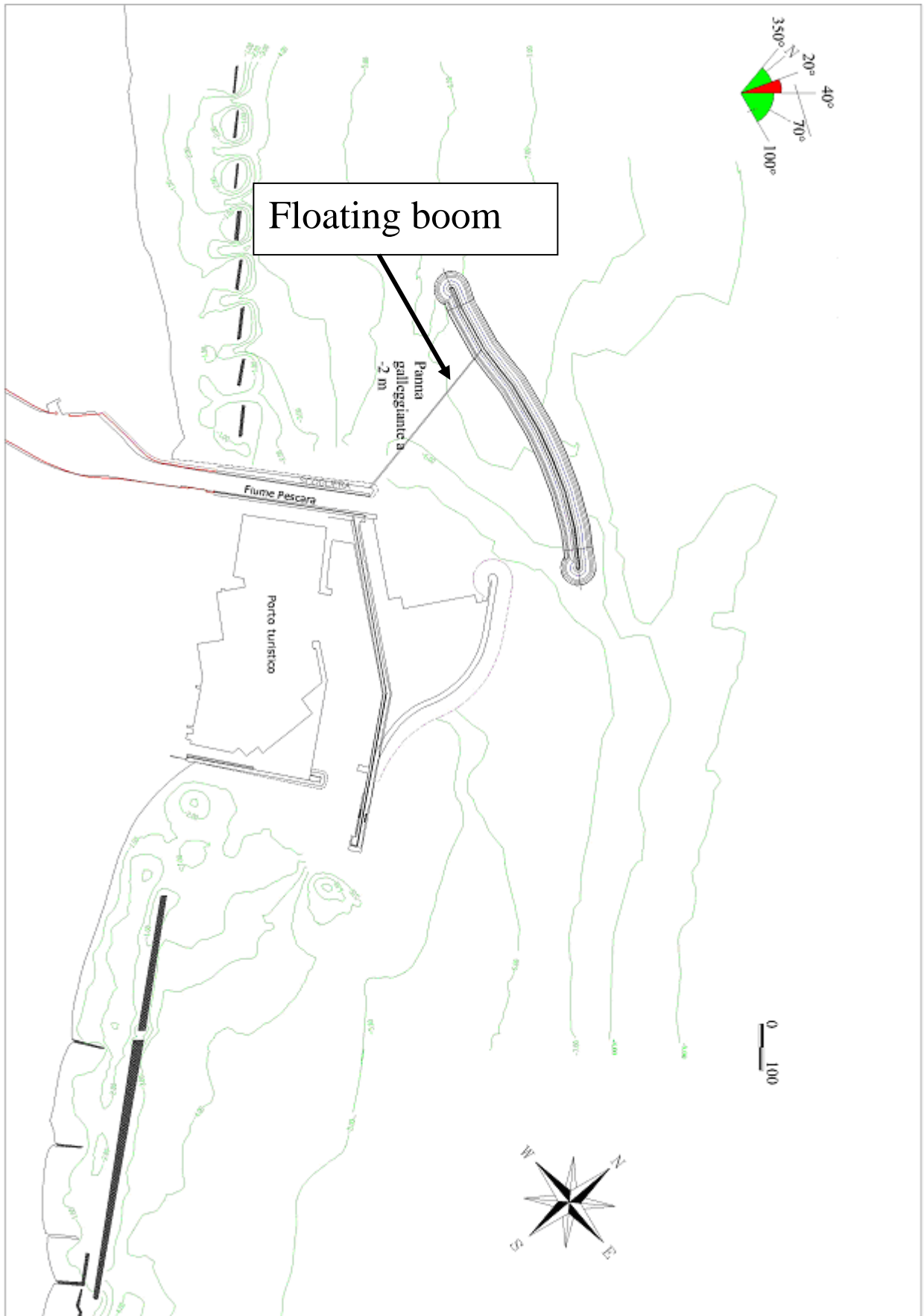
Fig. 4: Physical model.

Fig. 5: Numerical solution.

PART 2: Proposed solutions

Floating boom

Panna galleggiante a -2 m

Fiume Pescara

Porto turistico

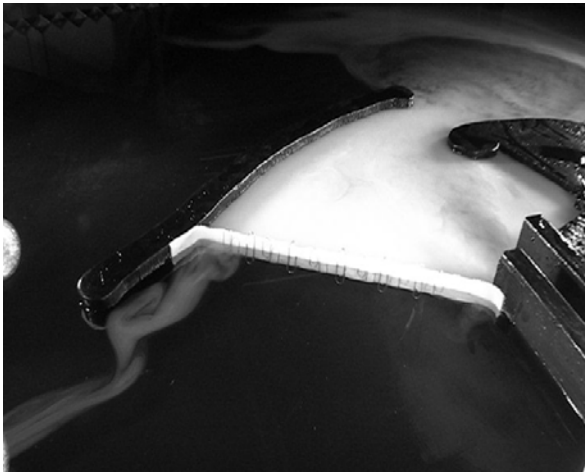350° N 20° 40° 70° 100°

0 100

Solution 1

Solution 1

Description

A floating boom connecting the jetty and the breakwater will prevent the flux from going northward

Physical model

| Flux sketch	Features
	• Efficient protection of the beach • Cheap • The area between the harbour and the breakwater has an insufficient circulation. • The northern entrance to the harbour is blocked by the boom, so this solution will be used only during summer months when the beach is filled by tourists.

Solution 2

Solution 2

Description

A gap is created in the breakwater and a deflector is built just next to the gap.
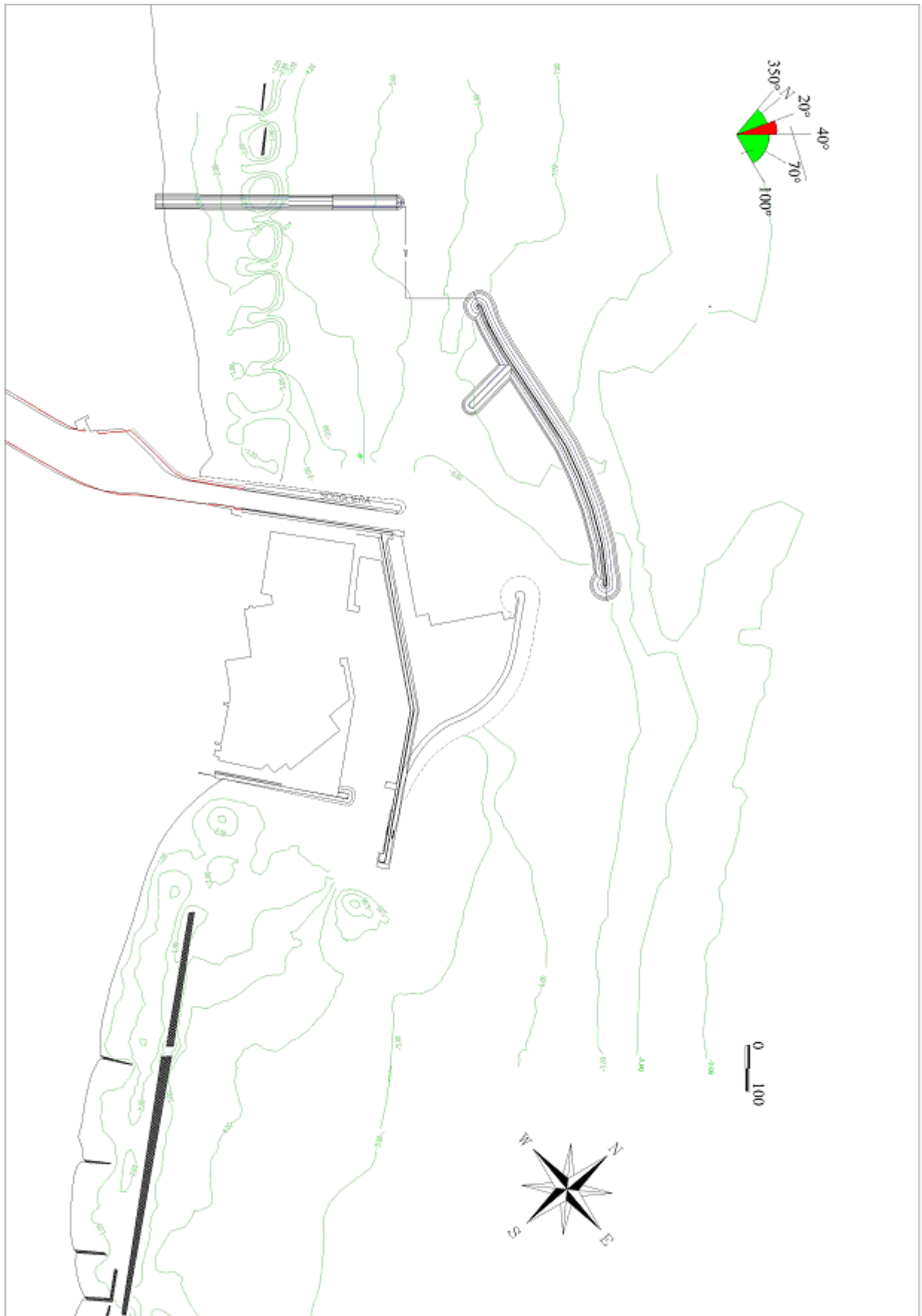
Physical model

Flux sketch
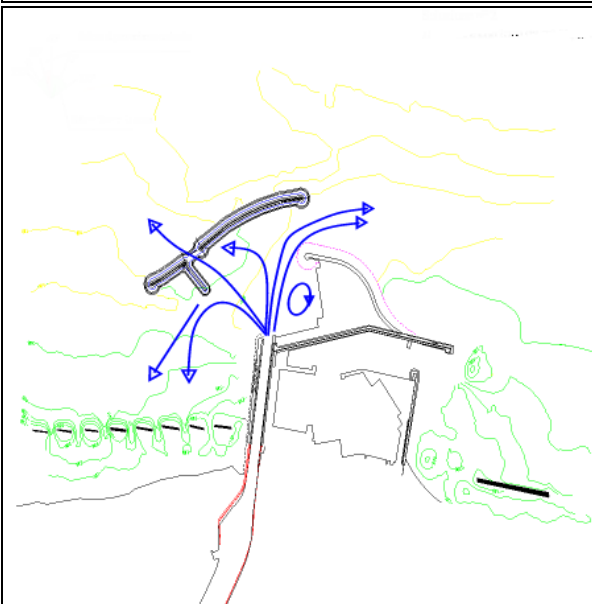
Features

- Part of the flux flow through the gap towards open sea.
- The deflector does not prevent the flux from reaching the beach, so it could be necessary to use also a boom like in solution 1.
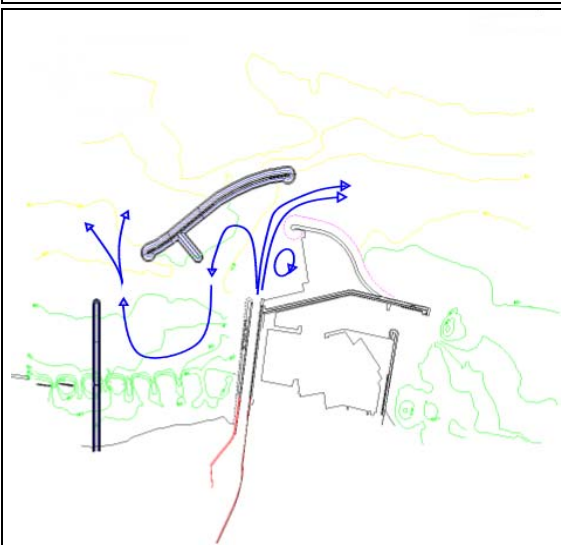
Solution 3

Solution 3

Description

A deflector is built in the northern part of the breakwater and a groin will protect the beach from the polluted flux.
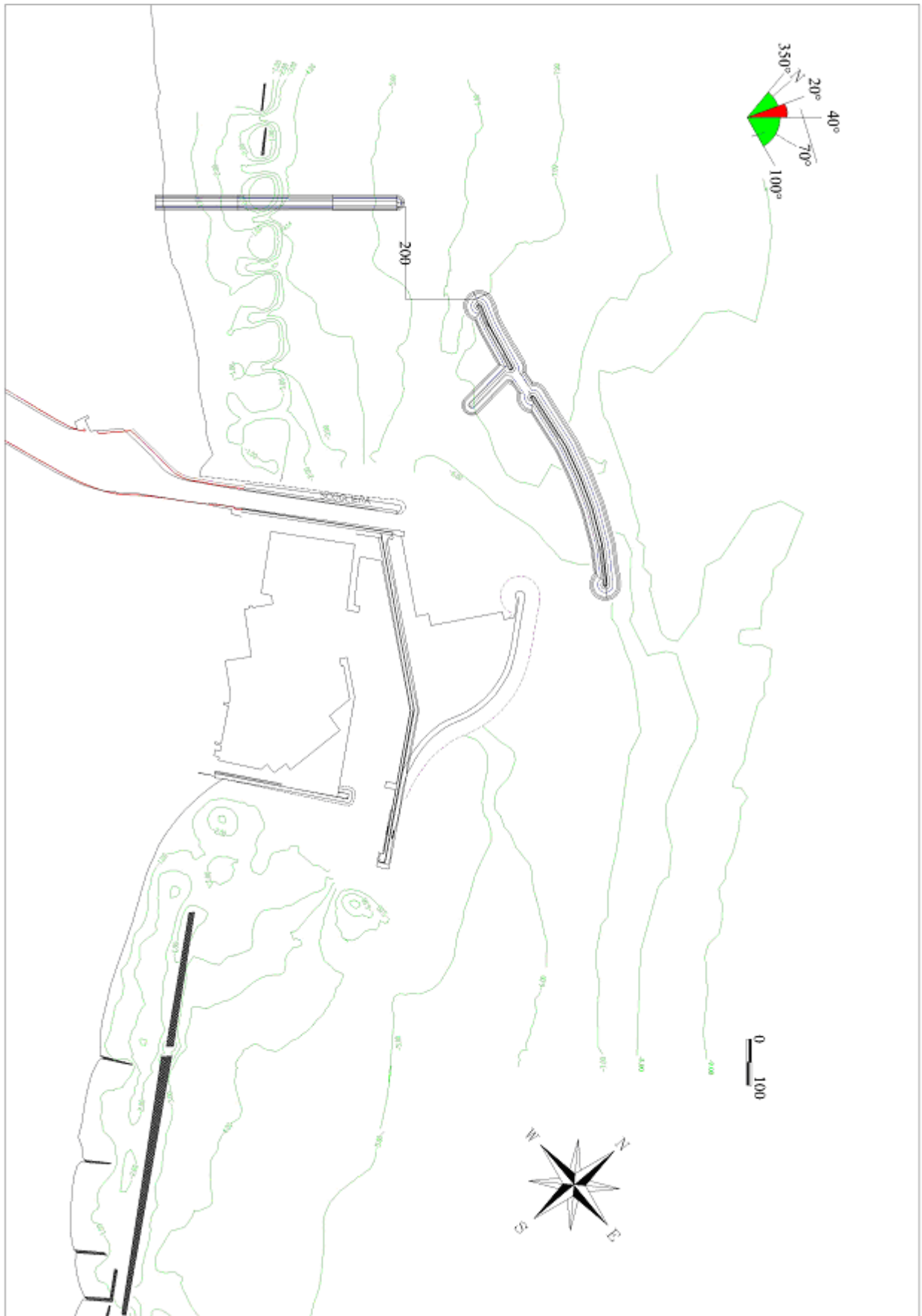
Physical model

Flux sketch

Features

- Efficient protection of the beach
- The beach is shortened of the area between the groin and the harbour.
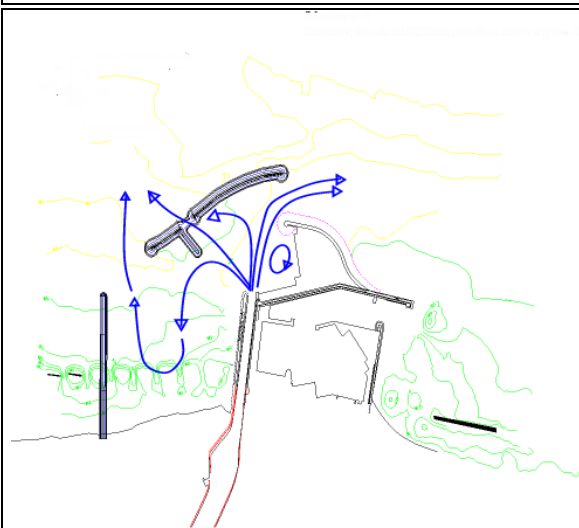
Solution 4

Solution 4

Description

A gap is created in the breakwater and a deflector is built just next to the gap. A groin will protect the beach from the polluted flux.
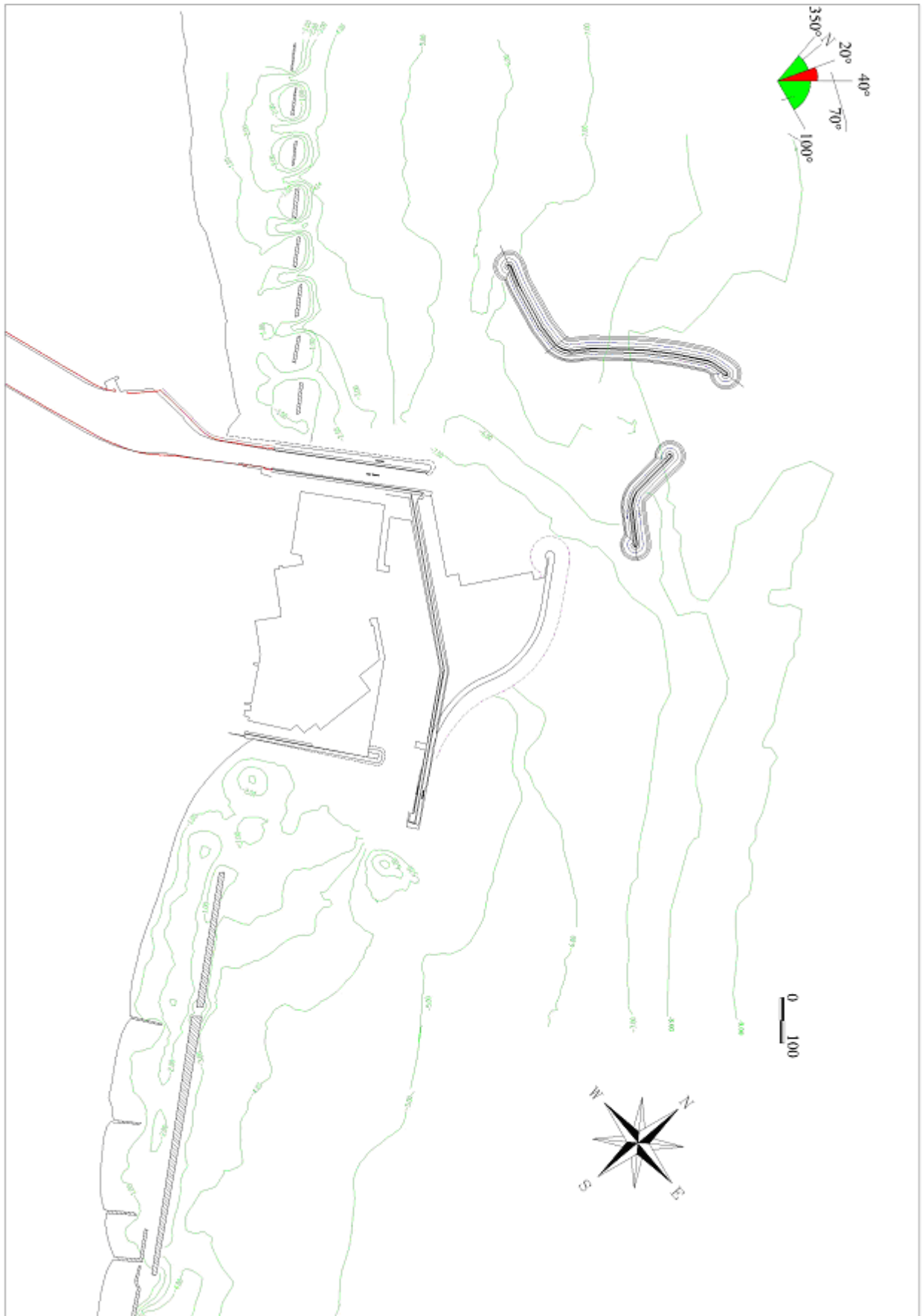
Physical model

Flux sketch

Features

- Efficient protection of the beach
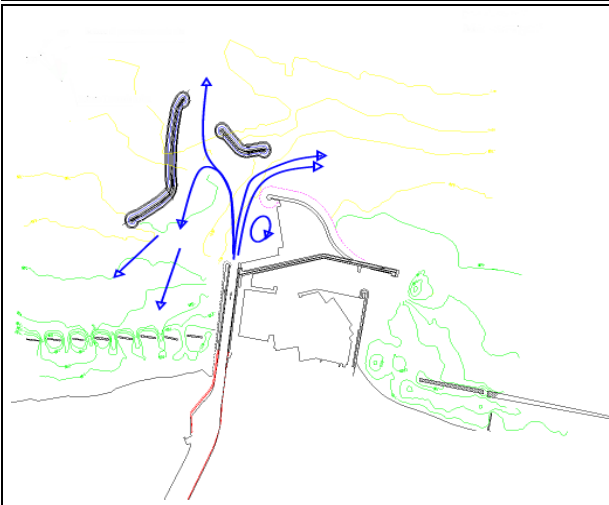- The beach is shortened of the area between the groin and the harbour.

Solution 5

Solution 5

Description

A big gap is made in the breakwater. The gap is protected by two converging breakwaters.
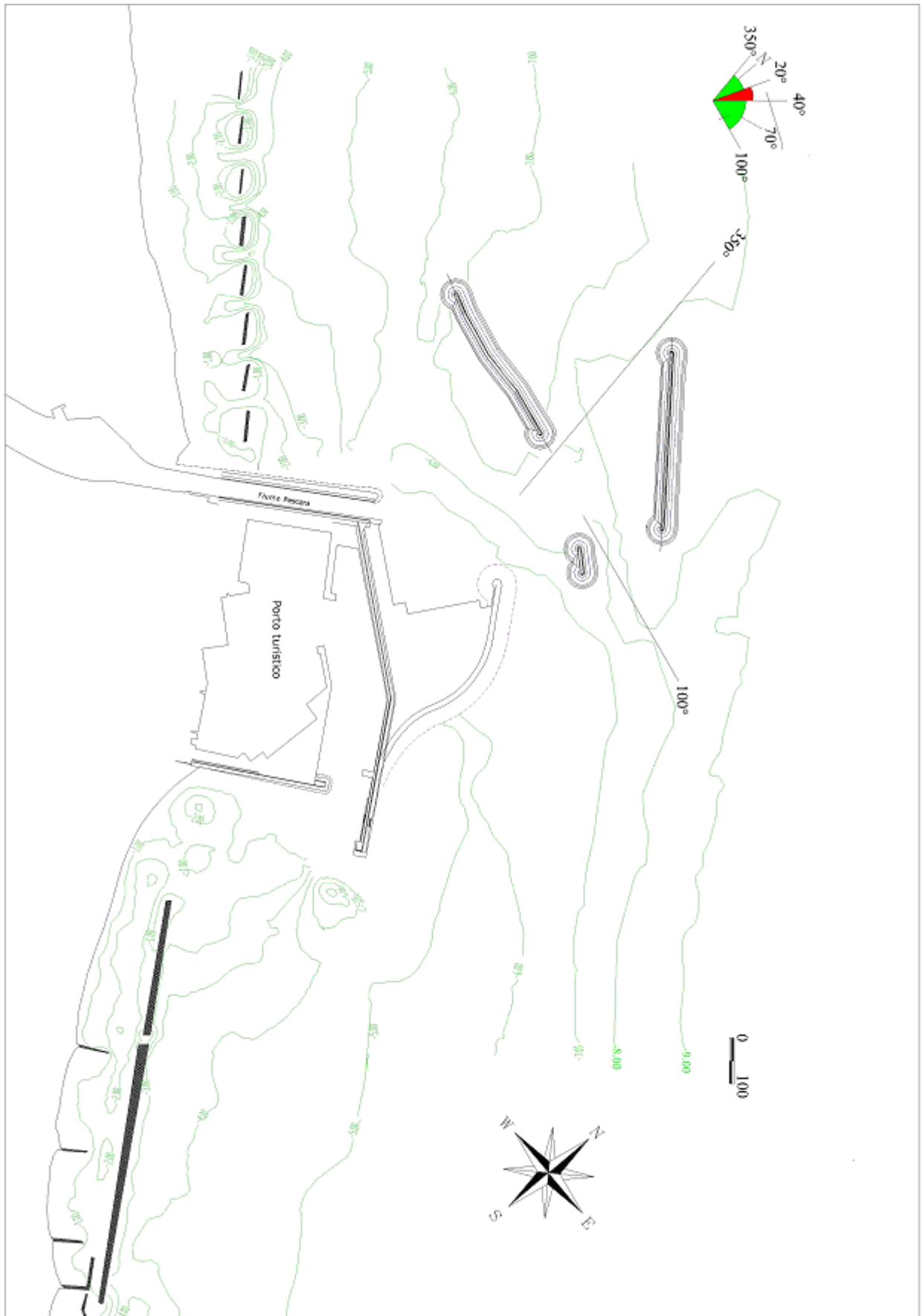
Physical model

Flux sketch

Features

- A new entrance to the port is available.
- The flux still reach the beach.

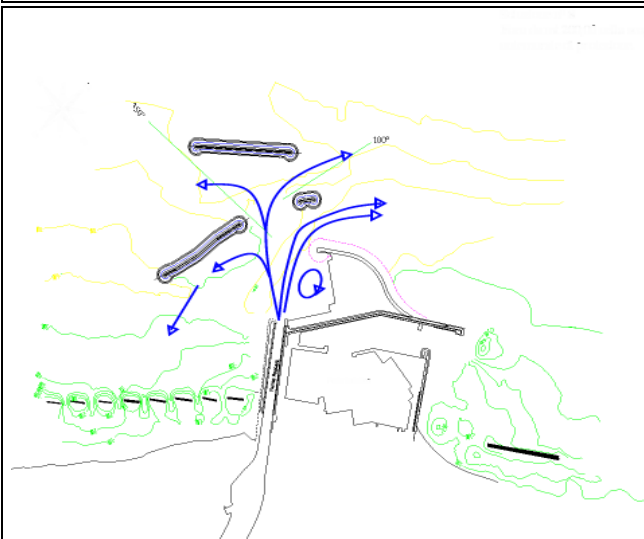Solution 6

Solution 6

Description

A big gap is made in the breakwater and it is protected by a new smaller breakwater.
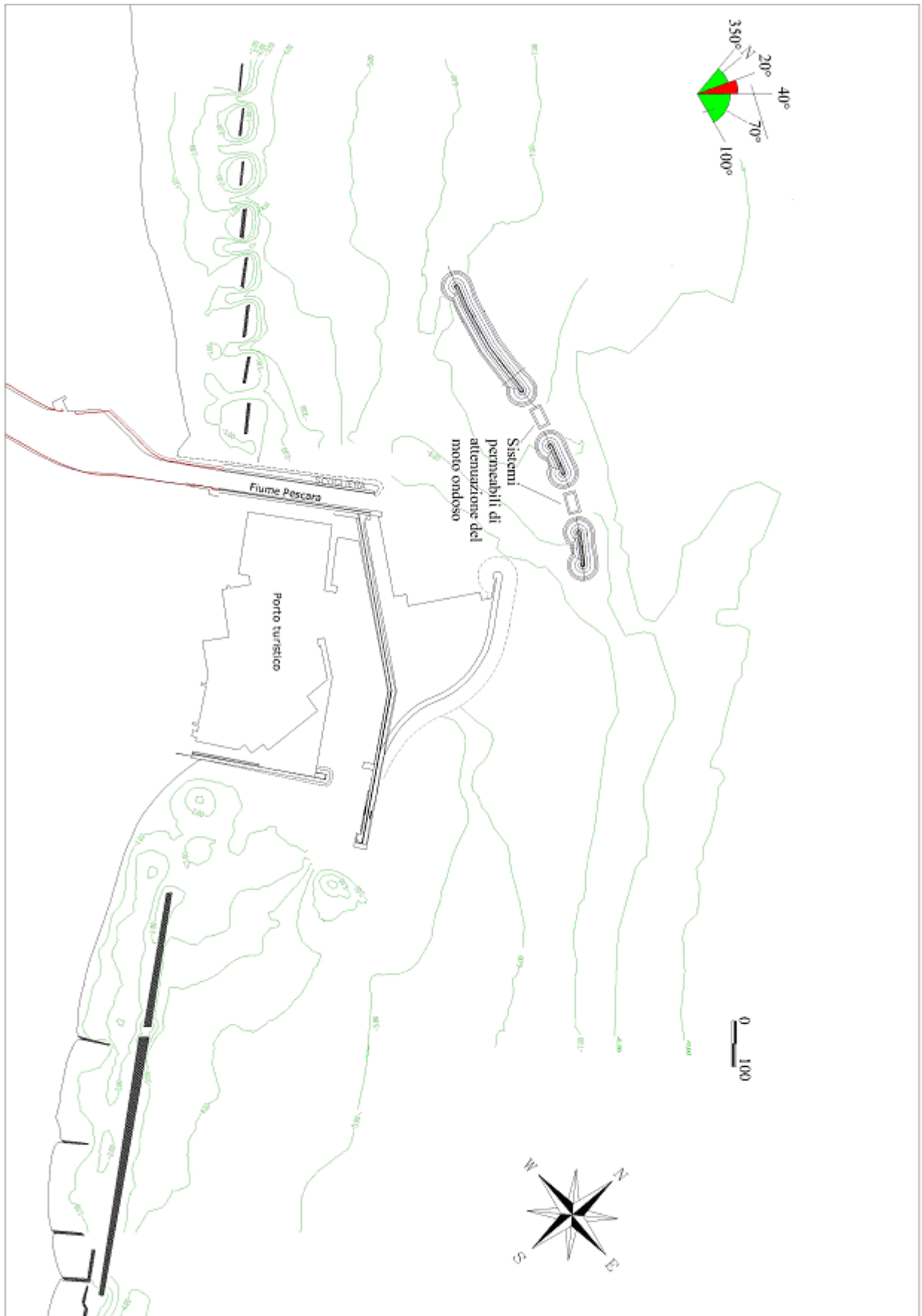
Physical model

Flux sketch

Features

- A new entrance to the port is available.
- Only a small portion of the flux reach the beach.

Solution 7

Map labels: 350°, N, 20°, 40°, 70°, 100°

Sistemi permeabili di attenuazione del moto ondoso

Fiume Pescara
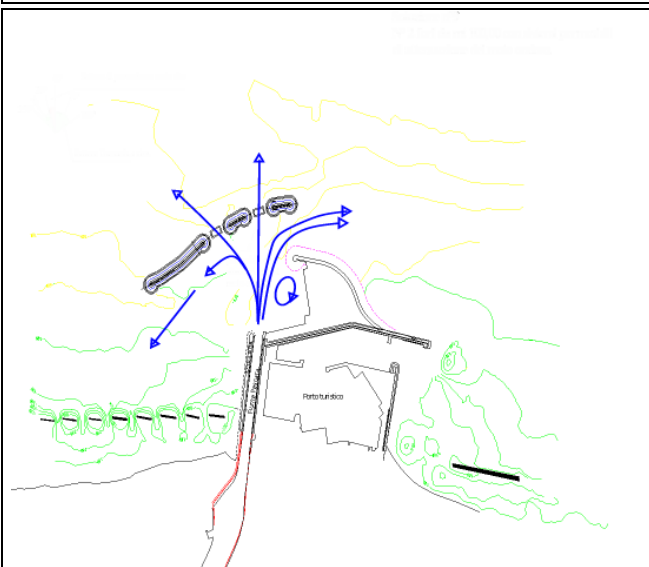
Porto turistico

0 100

N, E, S, W

Solution 7

Description

Two gaps of the same length are opened in the breakwaters. The gaps are provided with permeable protection from the waves.

Physical model

Flux sketch	Features
	• Only a small portion of the flux reach the beach.