

DELOS – EVK3-CT2000-0041
Deliverable No 5 for WP1.1
LCS in GR
Based on the brief questionnaire

This document summarizes the information collected for DELOS WP1.1 “Inventory of engineering properties of LCS”.

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GR Map

AUTH_GR_002, St. Nikolaos, Lasithi, Crete

System of 3 successive detached breakwaters parallel to the shoreline at St. Nikolaos, Lasithi, Crete. St. Nikolaos (red circle) is situated in Eastern Crete. The map below is not scaled.



Main motive for building the LCS

The construction of a marina has caused extensive beach erosion in the vicinity. The breakwaters were built in order to protect the beach from further eroding and to restore a sufficient beach width as the place serves as a swimming area.

Impacts on bio-environment

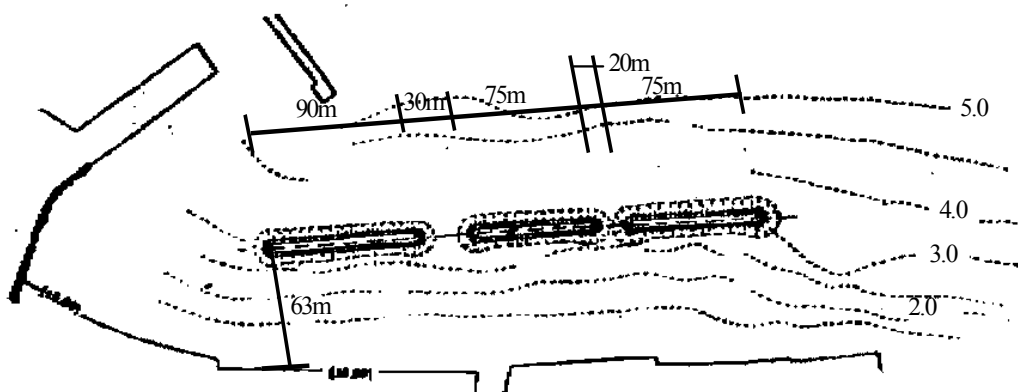
Not known

Socio-economic impact

Not known.

Typical cross section (dimensioned sketch)

The cross section has a trapezoidal shape. The breakwaters are probably armoured with natural stones. The crest of the breakwaters is 1.2 m above still water level. No further details available.



Indication of water level variations

Storm surge around 0.2-0.3 m. Measurements concerning tide not available.

Existence of detailed information

It is possible to obtain more information.

AUTH_GR_003, Lakopetra, Ahaia, Peloponnisos

Three successive detached breakwaters parallel to the shoreline at Lakopetra, Ahaia. Lakopetra (red circle) is located on the North West coast of Peloponnisos 10 km eastwards of the entrance of Patraikos Gulf. The map below is not scaled.



Main motive for building the LCS

The scheme was constructed in 1992 in order to protect and stabilize a 300 m sandy beach section that lies in front of a hotel. The beach was particularly vulnerable to wave attack which posed hazards to the swimmers.

Impacts on bio-environment

Not known

Socio-economic impact

The beach width increased considerably a few months after the project completion. Moreover, the structures provide an area of calm water that is ideal for swimming and other recreational activities. Consequently the value of the area as a holiday resort has been enhanced.

System Layout

System layout characteristic dimensions are :

- Breakwaters length : 70 m
- Gap between the breakwaters : 40 m
- Distance from the shoreline : 125 m
- Crest width at the body : 3.0 m
- Crest width at the round head : 5.0 m

Typical cross section

- The breakwater consists of three layers :
- An armour protection layer of natural blocks
- An intermediate layer and a core of rubble stones

The crest of the breakwaters rises 0.7 m above still water level. Water depth at the toe is 3.3 m.

Indication of water level variations

Measurements concerning tide are not available at present.

Existence of detailed information

It is possible to obtain detailed information from the consulting engineering firm that was engaged in the project.

AUTH_GR_004, Paphos, Cyprus

Description: Detached breakwater parallel to the shoreline situated 5 km north of the city Paphos. Paphos is located on the West coast of Cyprus.

Main motive for building the LCS

The beach that extends in front of a hotel is rocky hence it was inaccessible to swimmers. To overcome this deficiency a sufficient amount of rocky mass was excavated and removed and an artificial beach pocket was created applying sand nourishment. Considering that the coastline in the area is subject to significant wave action, the breakwater was constructed in order to maintain and enhance the pocket.

Impacts on bio-environment

It is believed that the presence of the breakwater has resulted in growth of rocky shore animal's population.

Socio-economic impact

The water area in the lee of the breakwater has become ideal for swimming. The recreational value of the beach has substantially increased.

System Layout (dimensioned sketch)

The breakwater is curved shaped. System layout characteristic dimensions are :

Breakwater length : 110 m

Offshore distance : 70 m

Crest width at the body : 5.0 m

Crest width at the round head : 7.5 m



Typical cross section (dimensioned sketch)

The breakwater consists of three layers :

An armour protection layer of natural blocks

An intermediate layer and a core of rubble stones

Breakwater crest exceeds slightly from still water level. Water depth at the toe is approximately 4.5 m.

Indication of water level variations

Tidal water level variations are not available.

Existence of detailed information

Detailed information may be available from the consulting engineering firm that carried out the planning, design and construction of the project.

AUTH_GR_005, Alaminos, Larnaka, Cyprus

Description: Four successive (detached) oblique breakwaters at Alaminos, Larnaka. Alaminos is situated on the South East coast of Cyprus.

Main motive for building the LCS

The coastline in the specific area is steep with a narrow stretch of sandy beach at the toe. During the past 15 years wave action effect has resulted in progressive beach erosion posing a landslide threat. An offshore defense scheme was instigated to cease erosion and build up beach level.

Impacts on bio-environment

Not known

Socio-economic impact

Since construction of the scheme beach level has been stabilized. Moreover, significant sediment accumulation primarily in the lee of the structures has created an improved recreational beach.

System Layout

System layout characteristic dimensions are :

Angle between breakwaters and shoreline : 13°

Breakwaters length : 140 m

Gap between the breakwaters : 25 -30 m

Offshore distance : 140 m

Crest width : 3.7 m



Typical cross section

Seaward, shoreward slope : 1:1.5

Crest height : 0.5 m above mean sea level

Water depth at the structures' toe : 2 - 4 m.

The breakwaters consist of three layers :

An armour protection layer of natural blocks (3.0-5.0 t)

An intermediate layer and a core of rubble stones

Indication of water level variations

Tidal variations are not available at present.

Existence of detailed information

It is questionable whether additional information can be obtained. A response is awaited from the engineering consultants that were engaged in the project.