

DELOS – EVK3-CT2000-0041

Deliverable No 5 for WP1.1

LCS in **ES**

Based on the brief questionnaire

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

UPC_ES_001, Playa de Cubelles (Beach of Cubelles), Barcelona	2
UPC_ES_002, Playa de Altafulla (Beach of Altafulla), Tarragona	6
UPC_ES_003, Playa del Puerto de Pollença (Beach of the Port of Pollença), Mallorca	9
UPC_ES_004, Playa de Vinaroz (Beach of Vinaroz), Castellón	11
UPC_ES_005, Playas Comín (Almadraba, Torrecassim y Villa Carpi) (Comín Beaches -Almadraba, Torrecassim and Villa Carpi-), Benicassim, Castellón	14
UPC_ES_006, Playa de Altea (Beach of Altea), Alicante.....	17
UPC_ES_007, Playa de Campello (Campello Beach), Alicante	19
UPC_ES_008, Playa del Postiguet (El Postiguet Beach), Alicante.....	21
UPC_ES_009, Playa de Los Alcázares (Los Alcázares Beach), Murcia.....	23
UPC_ES_010, Playa de la Ermita (La Ermita Beach), Mazarrón, Murcia.....	28
UPC_ES_011, Playa del Rihuete (Rihuete Beach), Mazarrón, Murcia.....	30
UPC_ES_012, Playa de Poniente de las Aguilas (Beach at the west of Las Aguilas), Murcia	32
UPC_ES_013, Playa de La Garrucha (La Garrucha Beach), Almería	34
UPC_ES_014, Playa del Zapillo (Zapillo Beach), Almería	36
UPC_ES_015, Playas de Aguadulce (Aguadulce Beach), Almería	38
UPC_ES_016, Playa de Castell de Ferro (Castell de Ferro Beach), Granada	41
UPC_ES_017, Playa de Torrenueva (Torrenueva Beach), Granada.....	43
UPC_ES_018, Playa de Fuentepiedra (Fuentepiedra Beach), Granada	44
UPC_ES_019, Playas del Rincón de la Victoria y de la Cala del Moral (Rincón de la Victoria and Cala del Moral Beaches), Málaga	46
UPC_ES_020, Playas del Palo (Palo Beaches), Málaga	49
UPC_ES_021, Playa de Benalmádena (Benalmádena Beach), Málaga	51
UPC_ES_022, Playa del Tablillo (Tablillo Beach), Lanzarote, Canary Islands.....	54
UPC_ES_023, Playa del Ancla (Ancla Beach), Lanzarote, Canary Islands.....	57
UPC_ES_024, Playa de La Laja (La Laja Beach), Gran Canaria, Canary Islands	60
UPC_ES_025, Playa de Baja Mar (Baja Mar Beach), La Palma, Canary Islands	63
UPC_ES_026, Playa de Güimar (Beach of Güimar), Tenerife, Canary Islands.....	65
UPC_ES_027, Playa de Fañabé (Fañabé Beach), Tenerife, Canary Islands.....	67
UPC_ES_028, Playa Jardín (Jardín Beach), Tenerife, Canary Islands	69

UPC_ES_001, Playa de Cubelles (Beach of Cubelles), Barcelona



Main motive for building the LCS

Coastal Erosion and unbalance of littoral dynamics due to construction of artificial structures. These structures are the port of Vilanova i la Geltru (northwards of the town) and the coastal defenses of the power station of Cubelles (southwards). Moreover, the dams of the Foix river (northeast from the beach) has produced a deficit of the natural sediment inputs to the coastal system.

Impacts on bio-environment

No information available

Socio-economic impact

Increase of recreational activities.

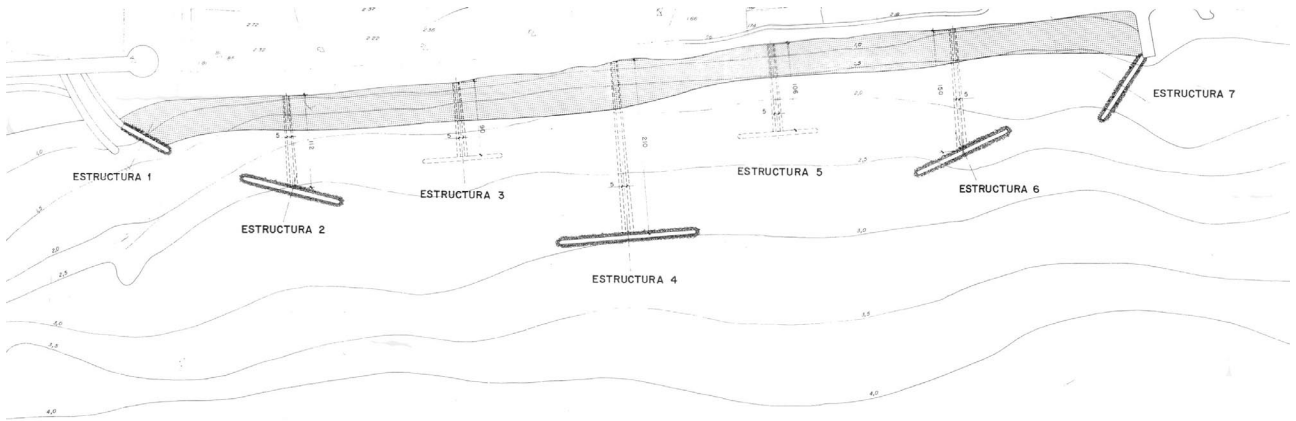
System Layout (dimensioned sketch)

5 detached breakwaters (3 emerged at +0.70 and 2 submerged at -0.25).

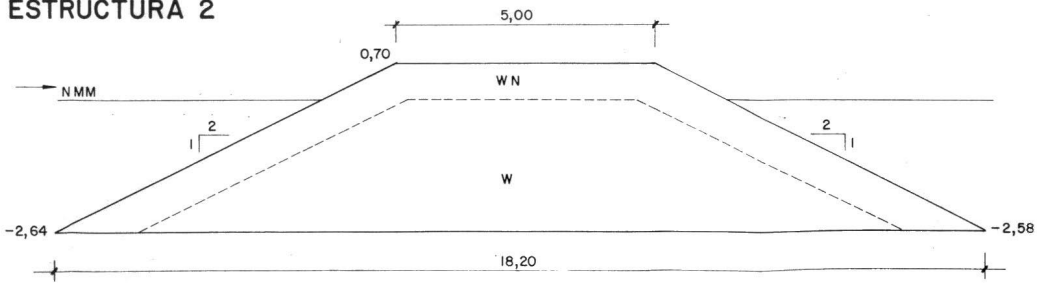
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Emerged	130	18.2	112
Submerged	100	13.1	90
Emerged	175	19.9	210
Submerged	100	13.0	90
Emerged	130	17.6	150

Typical cross section (dimensioned sketch)

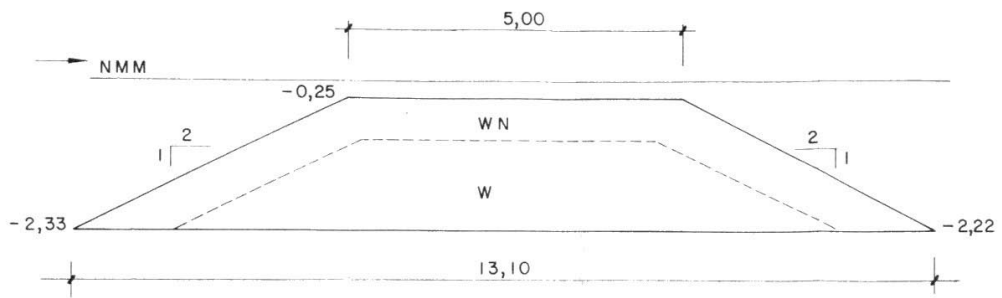
Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Emerged	+0.70	115	5	From -2.1 to -2.6
Submerged	-0.25	90	5	-2.25
Emerged	+0.70	160	5	-3.0
Submerged	-0.25	90	5	-2.25
Emerged	+0.70	115	5	From -2.1 to -2.6



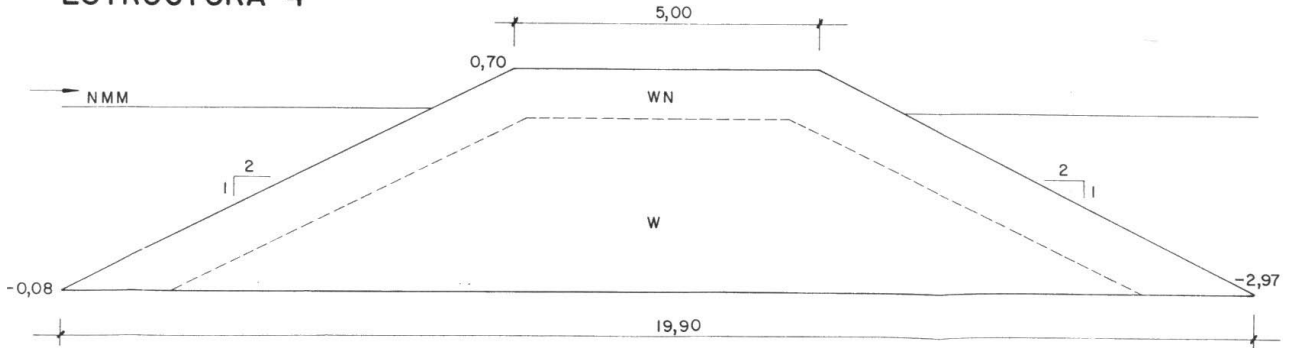
ESTRUCTURA 2



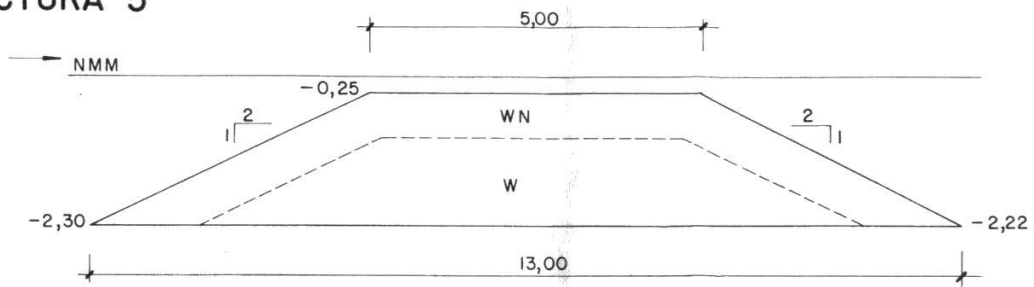
ESTRUCTURA 3



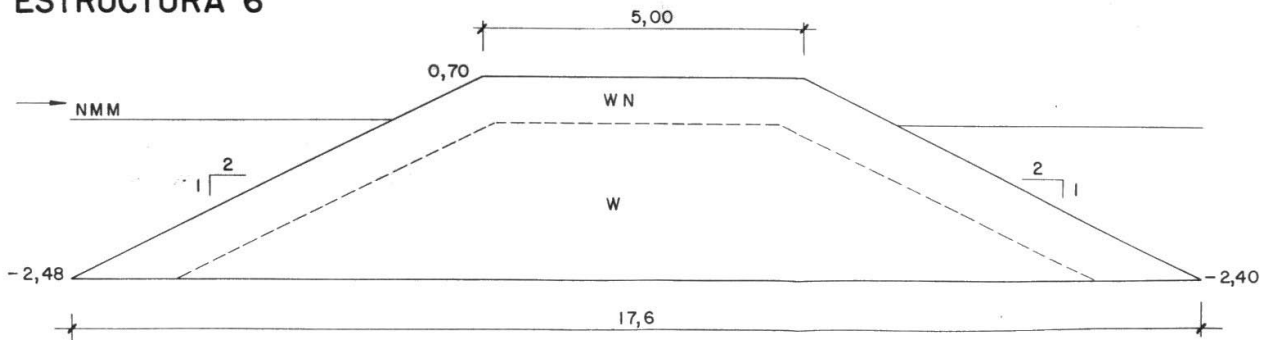
ESTRUCTURA 4



ESTRUCTURA 5



ESTRUCTURA 6



Indication of water level variations

Tidal range: 0.25 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_002, Playa de Altafulla (Beach of Altafulla), Tarragona



Main motive for building the LCS

No information available.

Impacts on bio-environment

No information available

Socio-economic impact

Increase of tourist activities. The breakwater is used as mooring structure for small crafts.

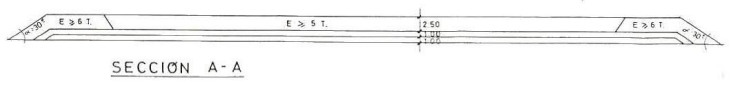
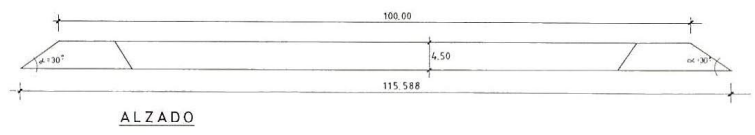
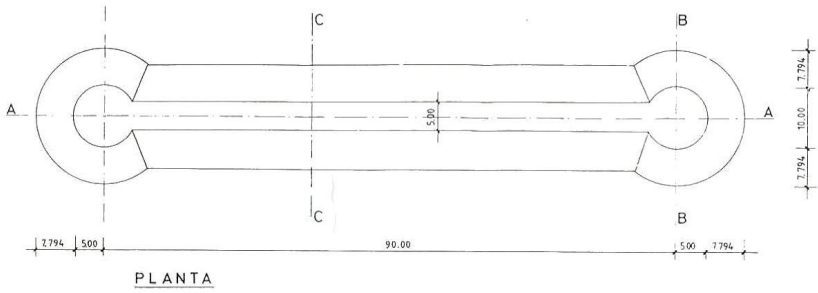
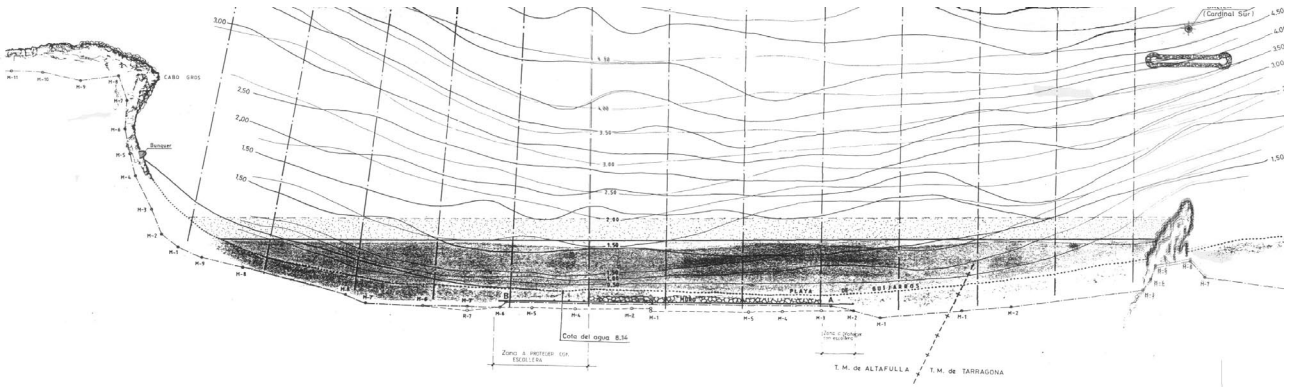
System Layout (dimensioned sketch)

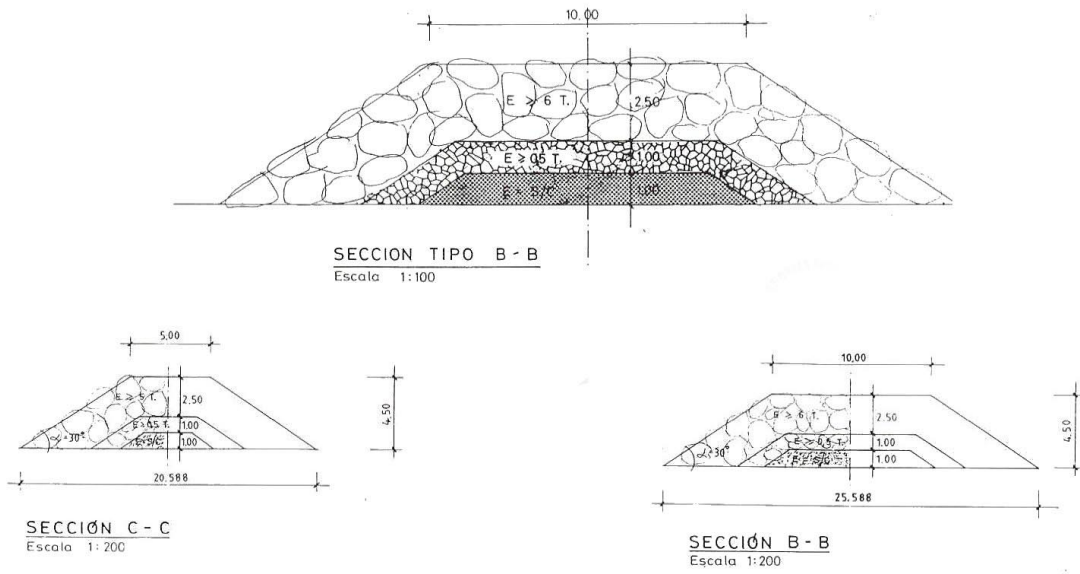
1 detached emerged breakwaters at +0.50.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Emerged	116	21	180

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Emerged	+0.50	100	5	From -3.5 to -4.5





Indication of water level variations

Tidal range: 0.25 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_003, Playa del Puerto de Pollença (Beach of the Port of Pollença), Mallorca



Main motive for building the LCS

Generation of 2 beaches located between the “La Gola” Torrent and the Llenaire Beach.

Impacts on bio-environment

No information available

Socio-economic impact

Improvement of the maritime promenade and the beaches.

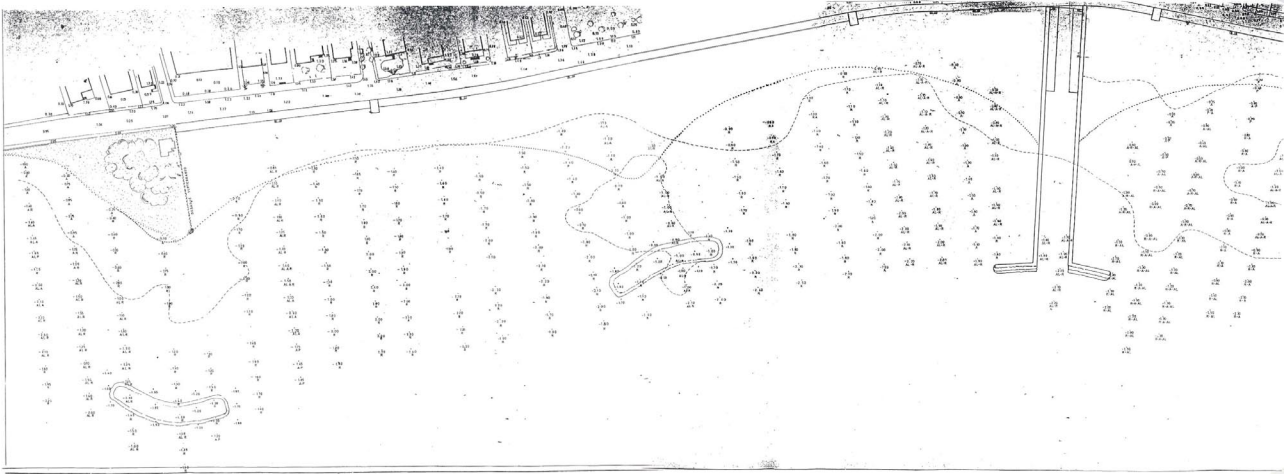
System Layout (dimensioned sketch)

2 detached breakwaters at +0.00.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
(a) Emerged (curved)	83	20	169
(b) Emerged (curved)	80	18	112

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width(m)	Water Depth (m)
(a) Emerged (curved)	+0.00	79	12.50	From -1.5 to -1.8
(b) Emerged (curved)	+0.00	75	12.50	From -1.0 to -2.0



Indication of water level variations

Tidal range: 0.25 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_004, Playa de Vinaroz (Beach of Vinaroz), Castellón



Main motive for building the LCS

Generation of a beach located northwards of the Vinaroz port (where there was an existing beach of gravel and stones).

Impacts on bio-environment

No information available

Socio-economic impact

Increasing touristic activities.

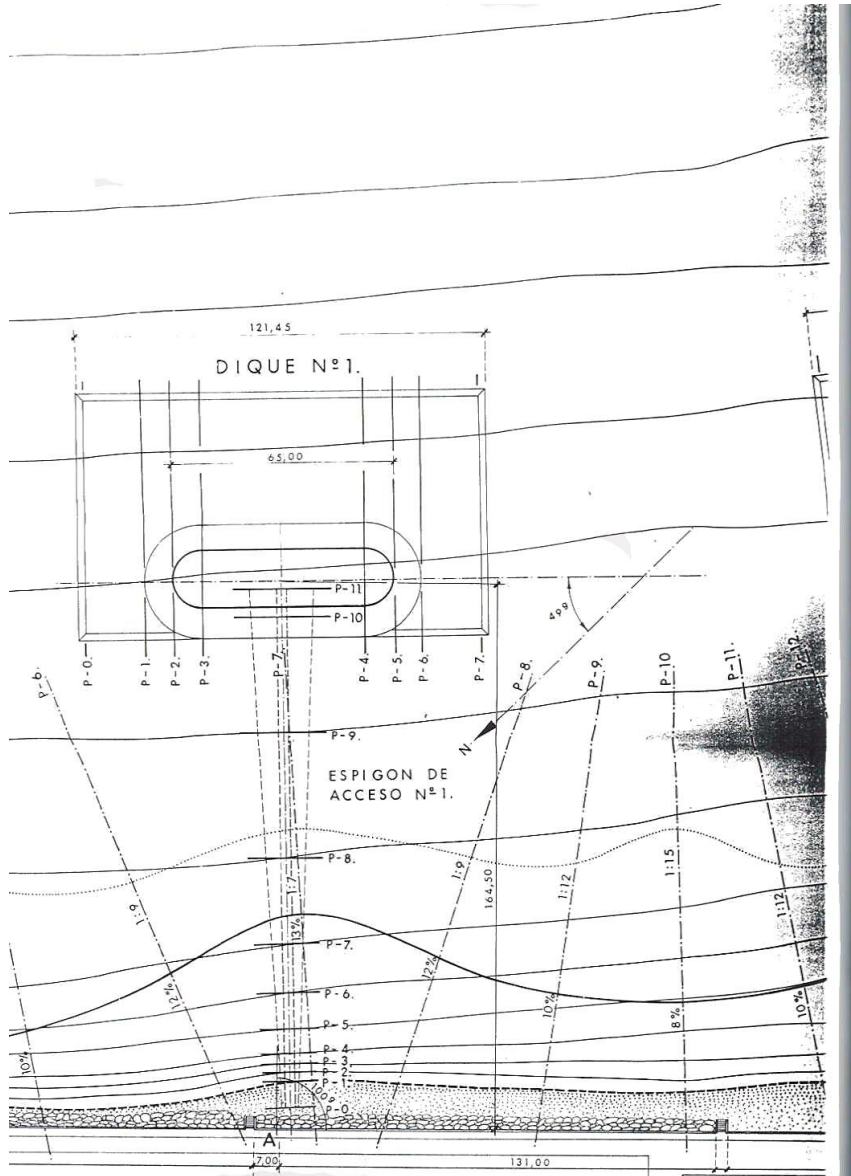
System Layout (dimensioned sketch)

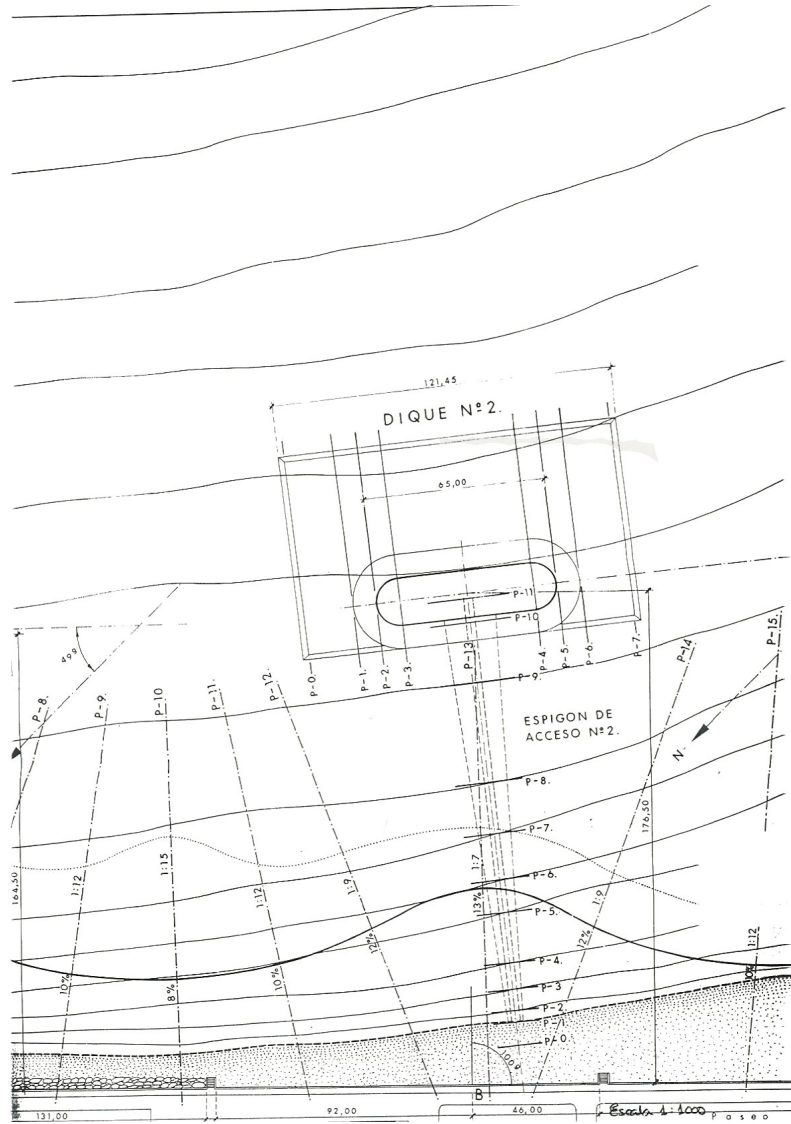
1 pre-existing T-type detached breakwater with no available data.
 2 detached breakwaters at +0.50.

Type of Structure	StructureLength (m)	Structure Base Width (m)	Distance to Shoreline (m)
(1) Emerged	125	35	165
(2) Emerged	125	35	177

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
(1) Emerged	+0.50	65	17.50	-4.5
(2) Emerged	+0.50	65	17.50	-4.5





Indication of water level variations

Tidal range: 0.30 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_005, Playas Comín (Almadraba, Torrecassim y Villa Carpi) (Comín Beaches -Almadraba, Torrecassim and Villa Carpi-), Benicassim, Castellón



Main motive for building the LCS

Nourishment of Comín Beaches.

Impacts on bio-environment

No information available

Socio-economic impact

Increasing tourist activities.

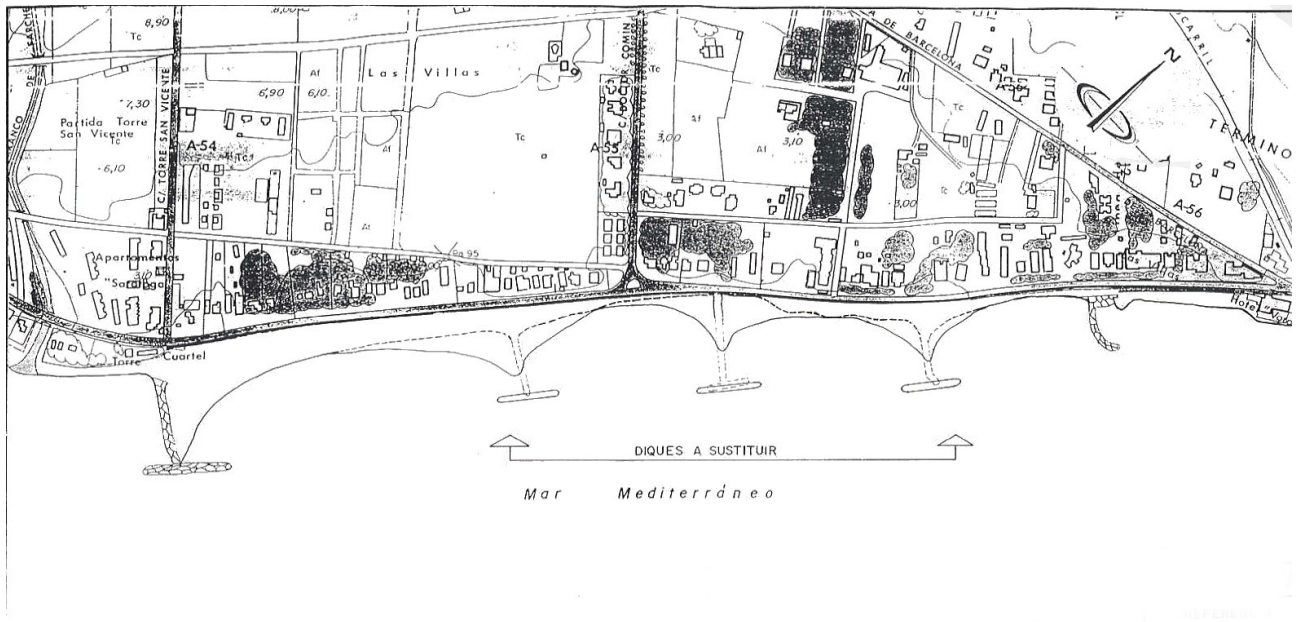
System Layout (dimensioned sketch)

3 detached breakwaters at +0.50.

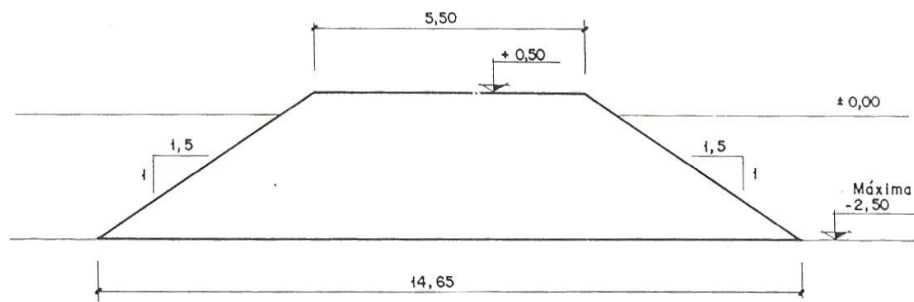
Type of Structure	Structure Length (m)	StructureBase Width (m)	Distance to Shoreline (m)
(1) Emerged	122	15	138
(2) Emerged	113	15	145
(3) Emerged	100	13	130

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	FreeboardWidth (m)	Water Depth (m)
(1) Emerged	+0.50	114	5.50	-2.00
(2) Emerged	+0.50	105	5.50	-2.30
(3) Emerged	+0.50	90	5.50	-2.55



SECCION PROYECTADA (Ap.)



DISTRIBUCION DE LOS PESOS DE LA ESCOLLERA					
400 a 900 Kg.	900 a 1.300 Kg.	1.300 a 1.700 Kg.	1.700 a 2.200 Kg.	2.200 a 2.600 Kg.	2.600 a 3.200 Kg.
5% MAXIMO	15% MAXIMO	30% MAXIMO	30% MINIMO	15% MINIMO	5% MINIMO

Indication of water level variations

Tidal range: 0.30 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_006, Playa de Altea (Beach of Altea), Alicante



Main motive for building the LCS

Generation of a beach, creating a sheltered zone.

Impacts on bio-environment

No information available

Socio-economic impact

Increasing of tourist activities.

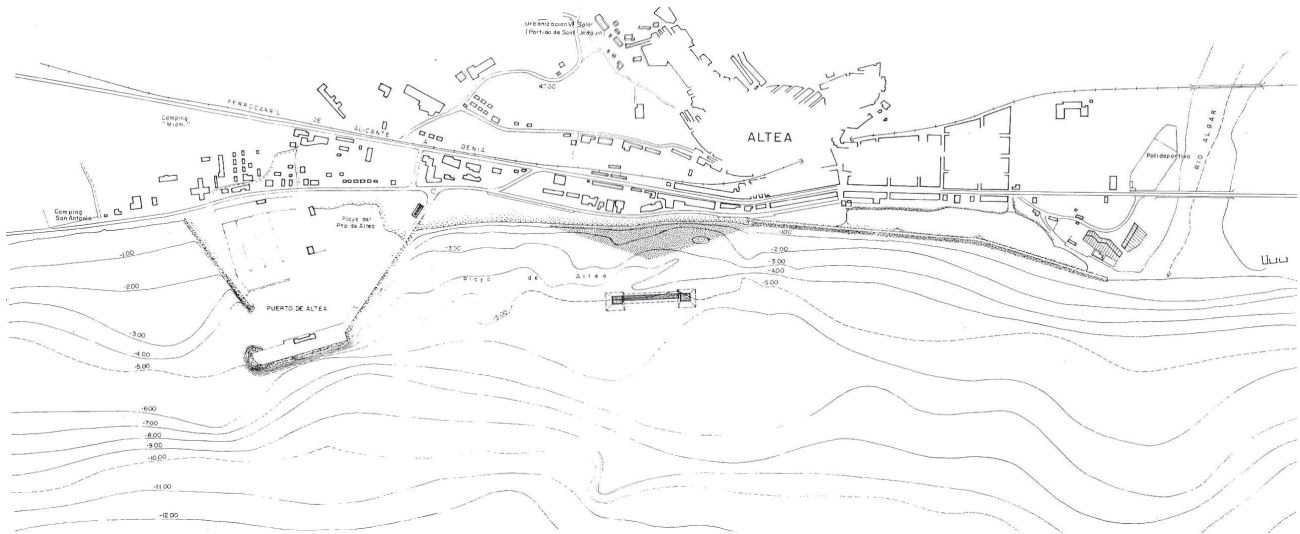
System Layout (dimensioned sketch)

1 detached breakwater at +0.20.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
(1) Emerged	220	25	200

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth(m)
(1) Emerged	+0.20	190	12	-5.00

**Indication of water level variations**

Tidal range: 0.30 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_007, Playa de Campello (Campello Beach), Alicante



Main motive for building the LCS

Nourishment of Campello beach due to a great increase on its tourist demand.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

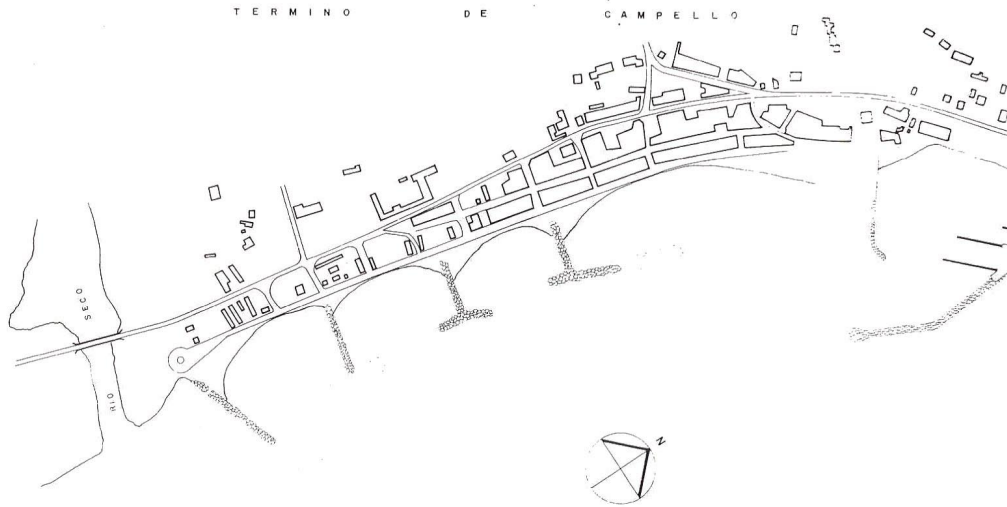
System Layout (dimensioned sketch)

4 previous structures: 2 attached (perpendicular) “T-type” groins and 2 straight attached (perpendicular) groins with no available information on their sections and dimensions. The project consisted on the construction of a parallel breakwater (attached to one of the straight groins) at +0.5m, the elongation of one “T-Type” groin at –1.0 m, and the construction of a submerged low bench at –3.0

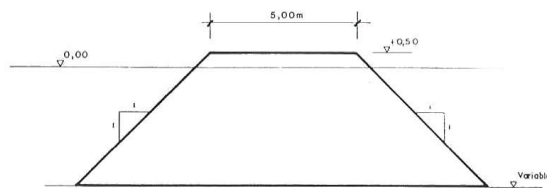
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Parallel breakwater	98	14	130
Elongation	72	11	135
Low bench	From 115 to 270	7	130

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

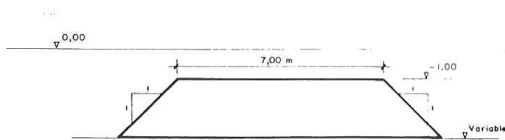
Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Parallel breakwater	+0.5	81	5.0	-4.0
Elongation	-1.0	70	7.0	-3.0 to –3.5
Low bench	-3.0	From 115 to 270	4.0	From –3.5 to –4.0



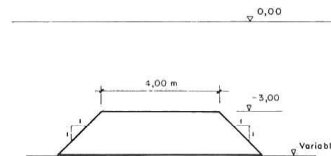
SECCION TIPO ESPIGON N° 7



SECCION TIPO ESPIGON N° 6



SECCION TIPO BANQUETA



Indication of water level variations

Tidal range: 0.30 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_008, Playa del Postiguet (El Postiguet Beach), Alicante



Main motive for building the LCS

Nourishment of a tourist beach, with sand fill and coastal structures.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

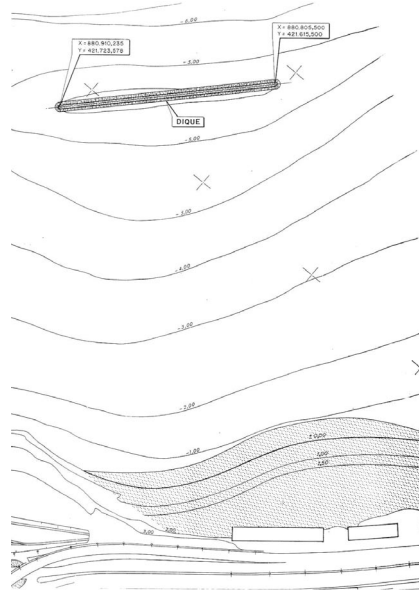
System Layout (dimensioned sketch)

1 detached breakwater at - 2.00.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Submerged	160	8.5	270

Typical cross section (dimensioned sketch)

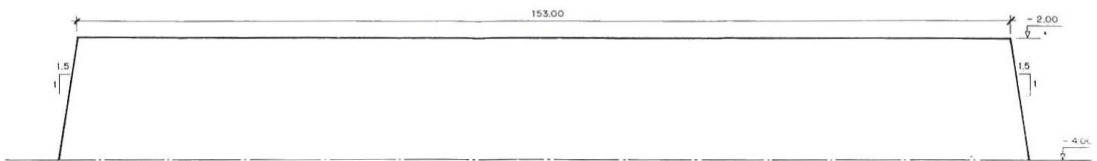
Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Submerged	-2.00	153	2.5	-4.00



PERFIL LONGITUDINAL N-N

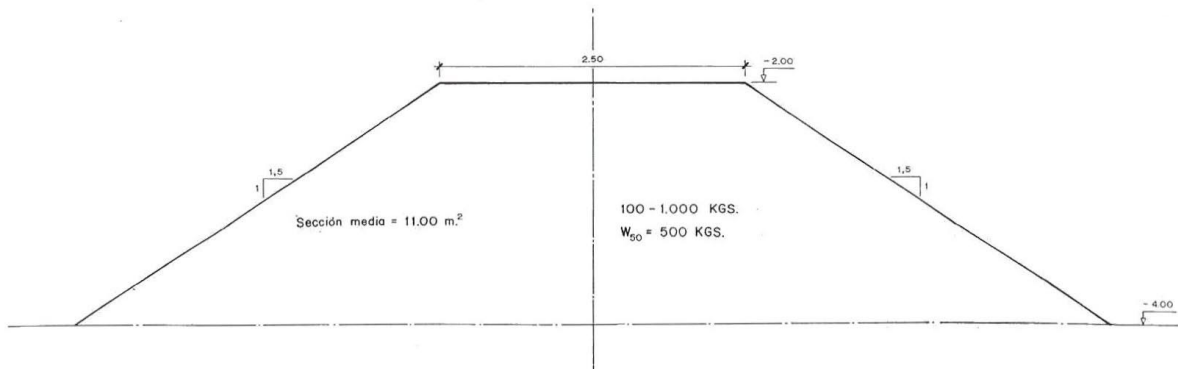
E. H. 1:500
V. 1:50

2.30



SECCION TIPO

E. 1:25



Indication of water level variations

Tidal range: 0.30 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_009, Playa de Los Alcázares (Los Alcázares Beach), Murcia



Main motive for building the LCS

Nourishment of a tourist beach, with sand fill and coastal structures.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

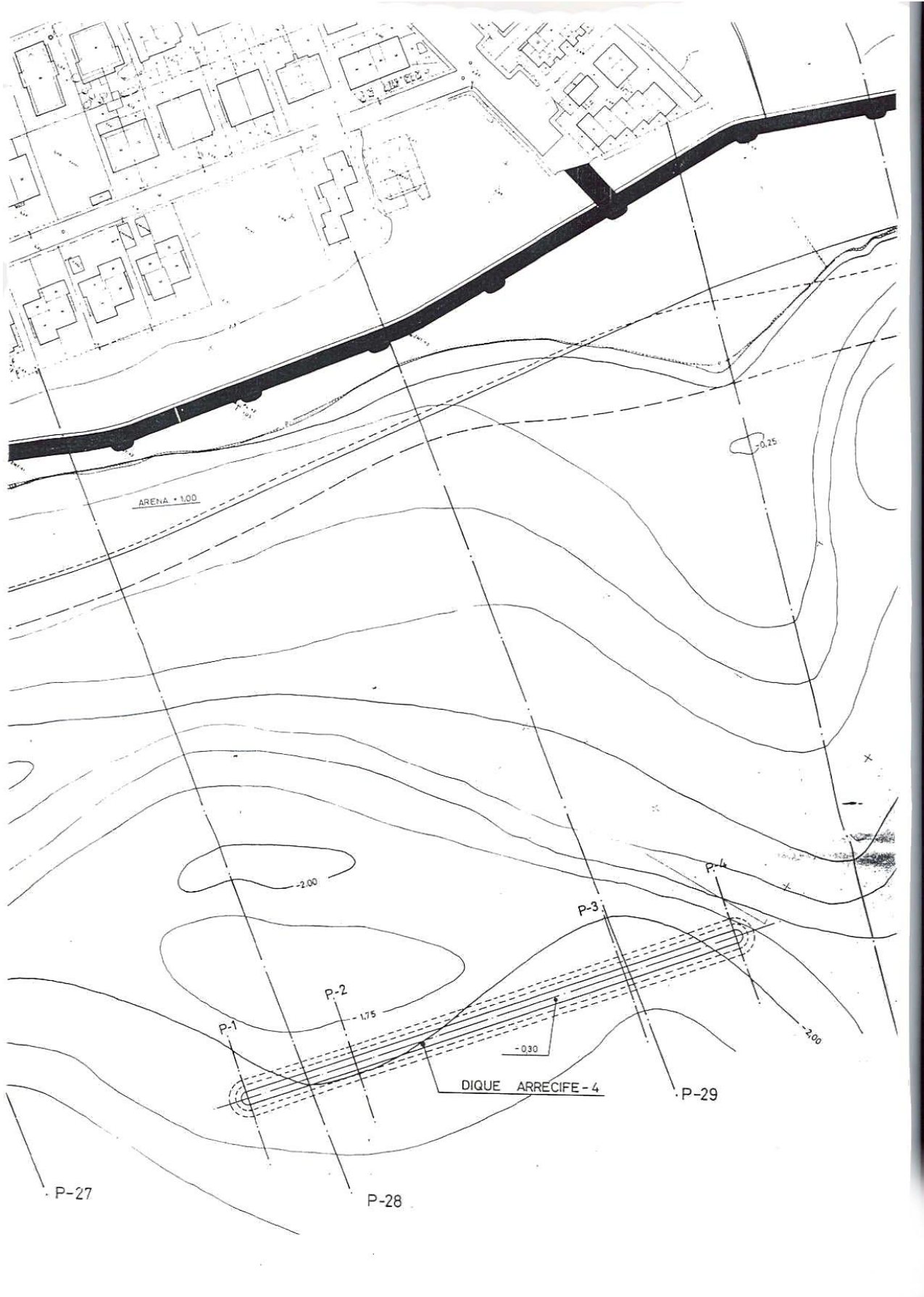
System Layout (dimensioned sketch)

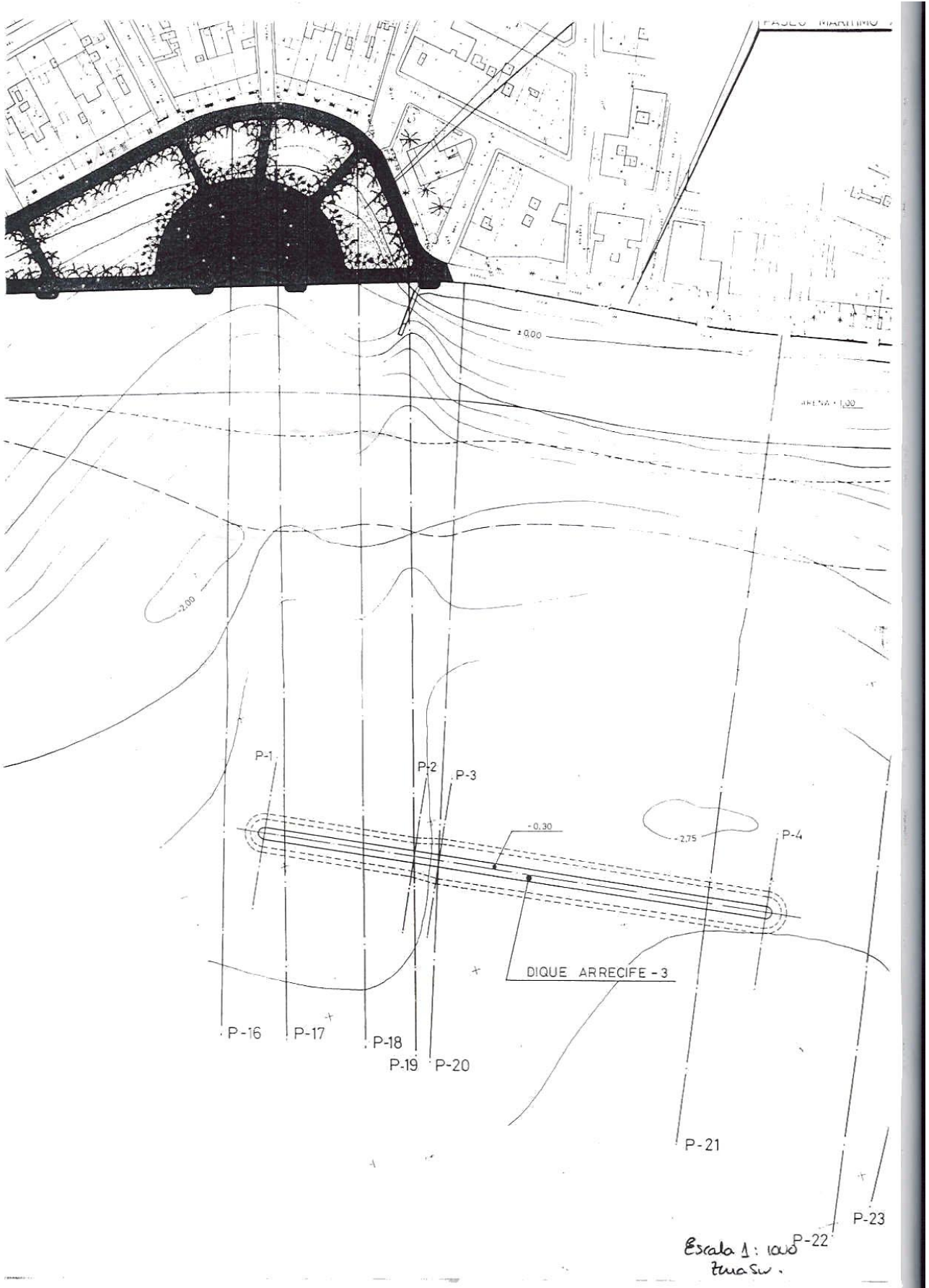
3 detached breakwaters at -0.3 m.

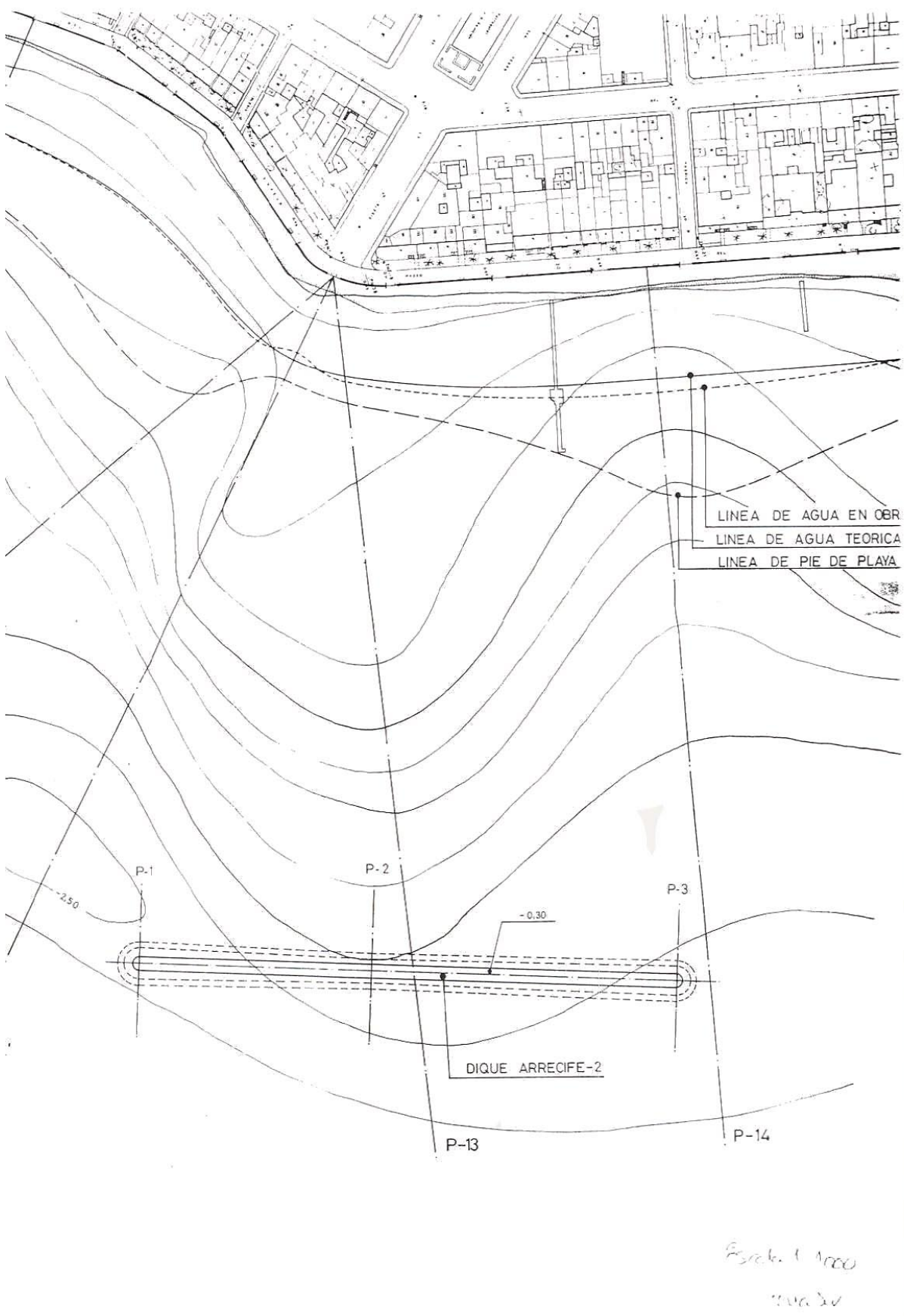
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Submerged (breakwater 2)	177	12.5	200
Submerged (breakwater 3)	177	12.5	180
Submerged (breakwater 4)	177	12.5	200

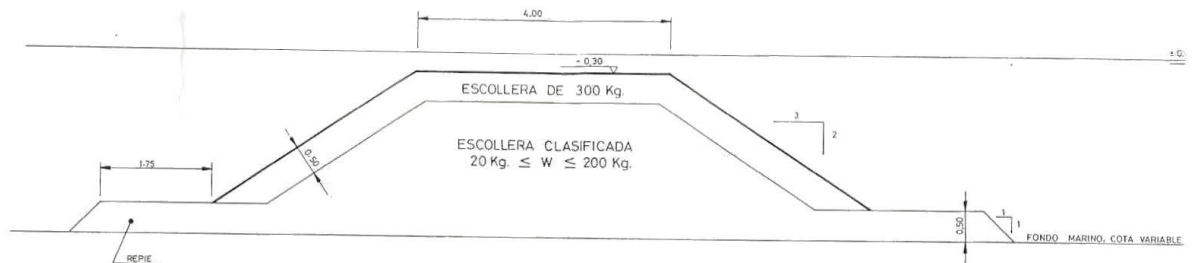
Typical cross section (dimensioned sketch)

Type of Structure	Freeboard	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Submerged (breakwater 2)	-0.3	170	4.00	-2.25
Submerged (breakwater 3)	-0.3	167	4.00	-2.50
Submerged (breakwater 4)	-0.3	170	4.00	-2.00









SECCION TIPO DIQUE - ARRECIFE

Indication of water level variations

Tidal range: 0.40 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_010, Playa de la Ermita (La Ermita Beach), Mazarrón, Murcia



Main motive for building the LCS

Urgent nourishment of a tourist beach, with sand fill and a submerged structure.

Impacts on bio-environment

No information available

Socio-economic impact

Increasing of tourist activities.

System Layout (dimensioned sketch)

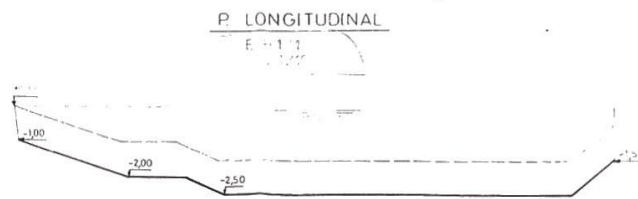
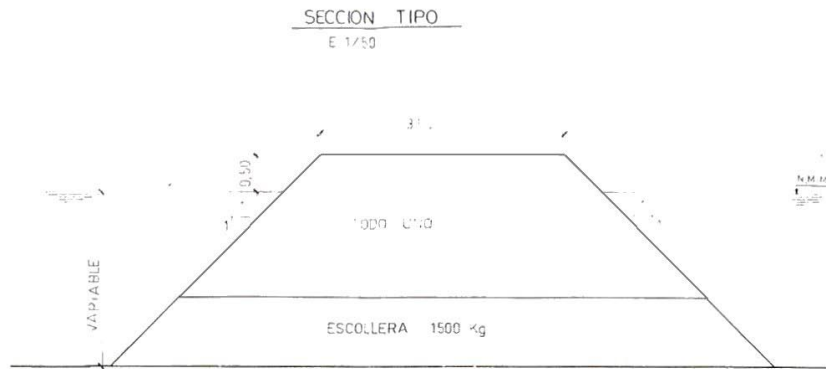
1 detached structure at -1.50.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
(1) Submerged	115	9	Variable between 50 and 90

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
(1) Submerged	-1.50	105	7	-2.50

CORDON LITORAL:
SECCION Y PERFIL



Indication of water level variations

Tidal range: 0.40 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_011, Playa del Rihuete (Rihuete Beach), Mazarrón, Murcia



Main motive for building the LCS

Nourishment of a tourist beach, with sand fill and construction of 1 groin elongation and 3 detached breakwaters

Impacts on bio-environment

No information available

Socio-economic impact

Increasing of tourist activities.

System Layout (dimensioned sketch)

3 detached breakwaters and one elongation of the port groin at + 0.00.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
(1) Groin elongation	45	32	75
emerged breakwater 1	105	50	169
emerged breakwater 2	100	50	147
emerged breakwater 3	95	50	129

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	WaterDepth (m)
(1)Groin elongation	+0.00	40	14.8	-2.50
emerged breakwater1	+0.00	90	18.0	-3.50
emerged breakwater2	+0.00	85	18.0	-3.50 to -4.00
emerged breakwater3	+0.00	80	18.0	-3.50 to -4.00

Indication of water level variations

Tidal range: 0.40 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_012, Playa de Poniente de las Aguilas (Beach at the west of Las Aguilas), Murcia



Main motive for building the LCS

Nourishment of a tourist beach, with sand fill and a detached breakwater.

Impacts on bio-environment

Since there is only a sandy beach, there are no sea weeds, and the fish are only those sporadically reaching shallow waters. The construction of the breakwater, although its first aim was to protect the beach, allowed the generation of a favorable environment for creation and refuge of marine life.

Socio-economic impact

Increasing of tourist activities.

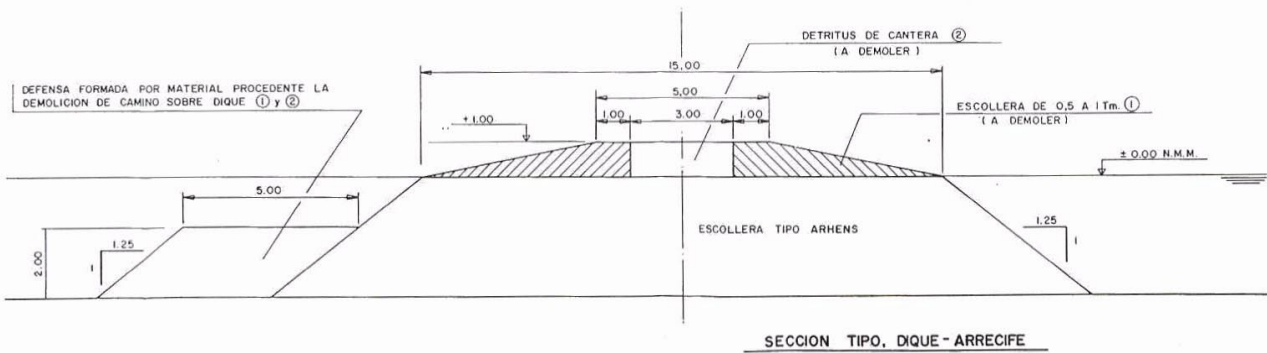
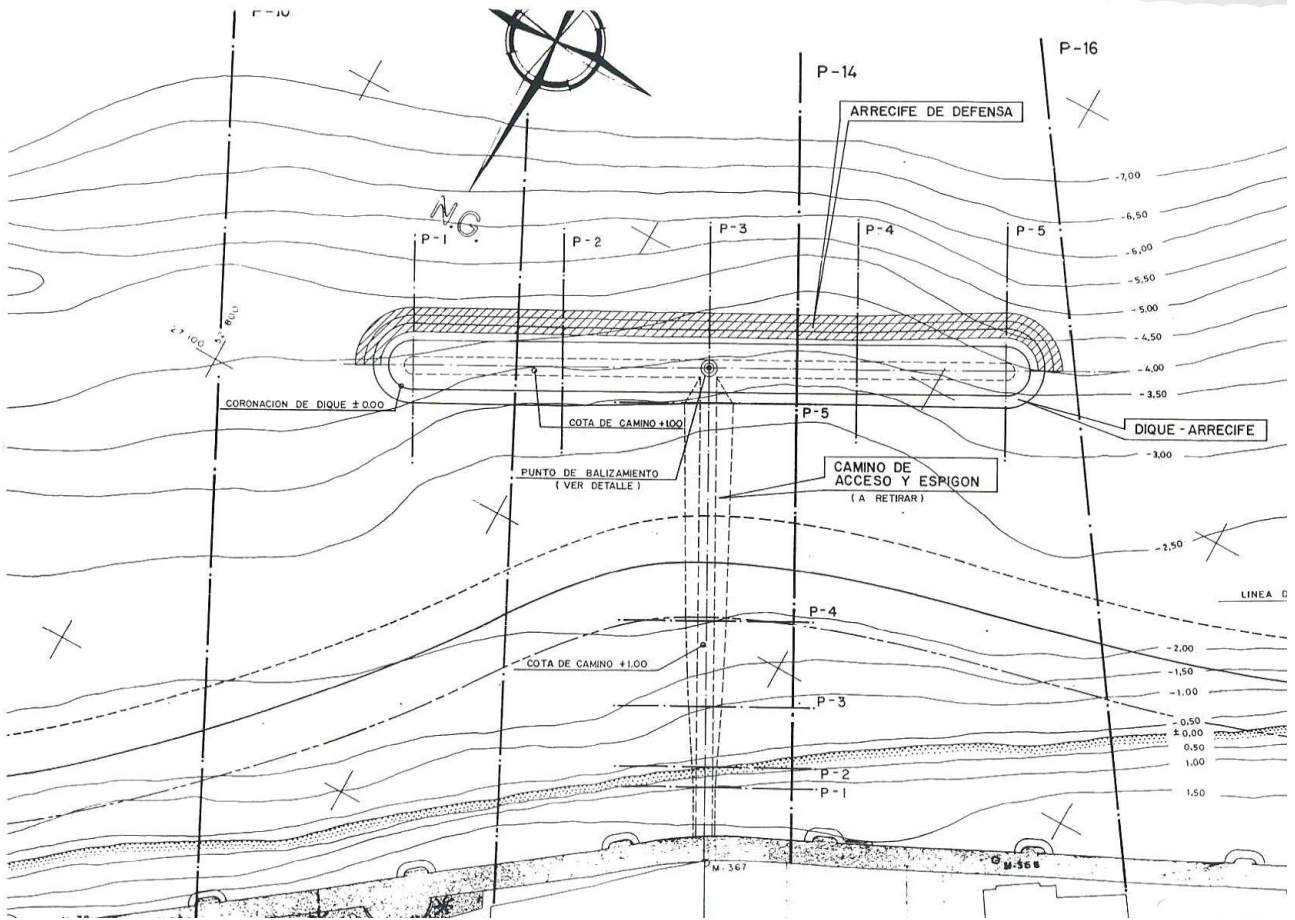
System Layout (dimensioned sketch)

1 detached breakwater at + 0.00 and at -0.2 m after subsidence (foreseen).

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Emerged	220	30	125

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Emerged	+0.00 to - 0.2	200	15	-4.00



Indication of water level variations

Tidal range: 0.40 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_013, Playa de La Garrucha (La Garrucha Beach), Almería



Main motive for building the LCS

Nourishment and protection of La Garrucha beach.

Impacts on bio-environment

No information available

Socio-economic impact

Increasing tourist activities.

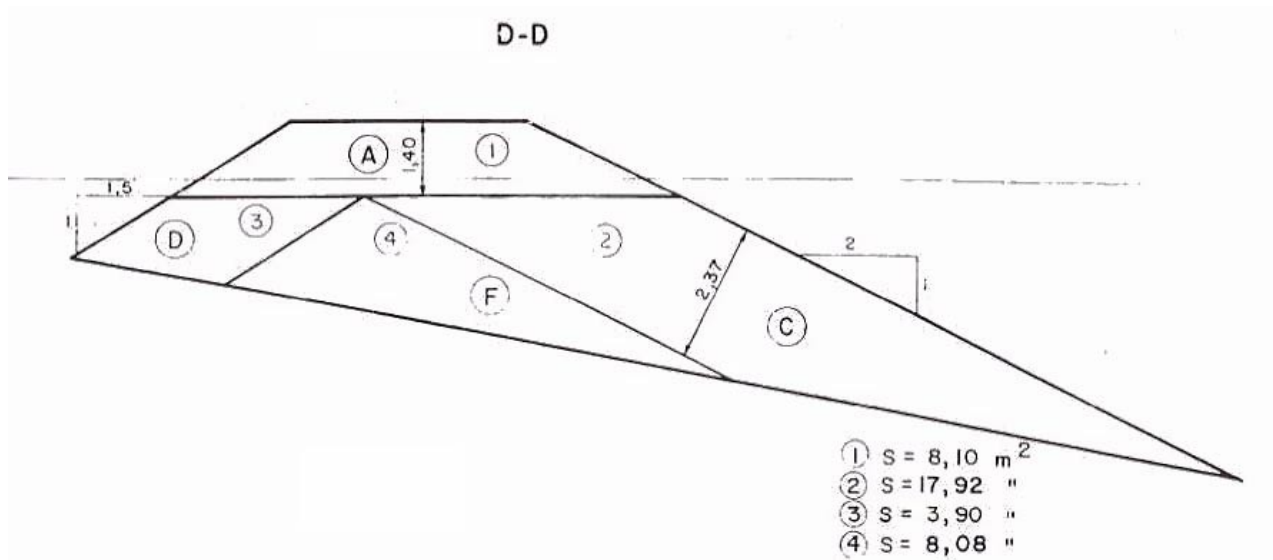
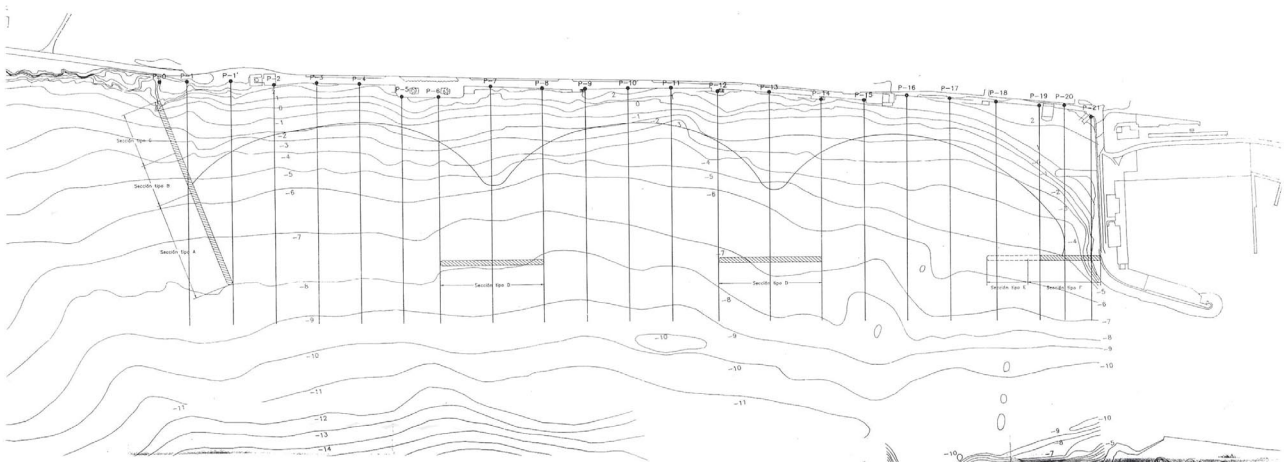
System Layout (dimensioned sketch)

2 attached (perpendicular) groins that enclose the beach and 2 detached parallel breakwaters at +0.50.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Breakwater 1	134	24	200
Breakwater 2	136	26	200

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Breakwater 1	+0.50	120	10	-7
Breakwater 2	+0.50	120	10	-8



Indication of water level variations

Tidal range: 0.60 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_014, Playa del Zapillo (Zapillo Beach), Almería



Main motive for building the LCS

Nourishment and protection of Zapillo beach.

Impacts on bio-environment

No information available.

Socio-economic impact

There is not enough recreational area in the beach.

System Layout (dimensioned sketch)

5 breakwaters: 3 attached (perpendicular) groins at +0.5 and 2 detached breakwaters at +0.50 and -2.5

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Attached groin 1	75	15.5	-----
Attached groin 2	186	14.0	-----
Detached breakwater 3	412	9.0	170
Detached breakwater 4	212	17.5	150
Attached groin 5	100	11	-----

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Attached groin 1	+0.5	70	5.5	From 0 to -5.5
Attached groin 2	+0.5	180	5.5	From 0 to -5.0
Detached breakwater 3	-2.5	400	3.0	-5.5
Detached breakwater 4	+0.5	200	5.5	-5.5
Attached groin 5	+0.5	97	5.5	From 0 to -3.0

Indication of water level variations

Tidal range: 0.60 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_015, Playas de Aguadulce (Aguadulce Beach), Almería



Main motive for building the LCS

Nourishment and protection of Aguadulce beach.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

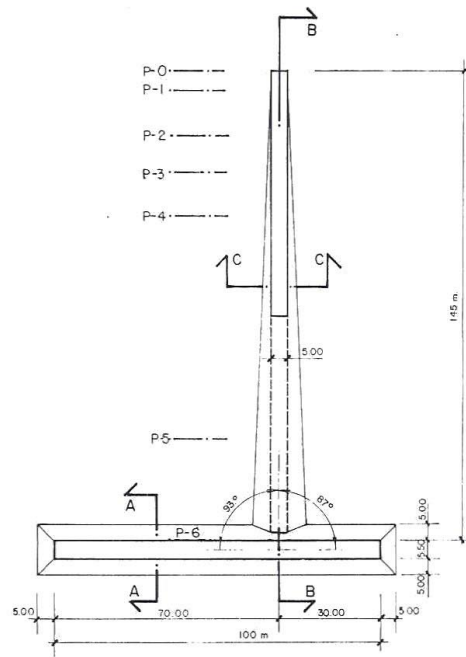
System Layout (dimensioned sketch)

1 detached breakwater at +0.5

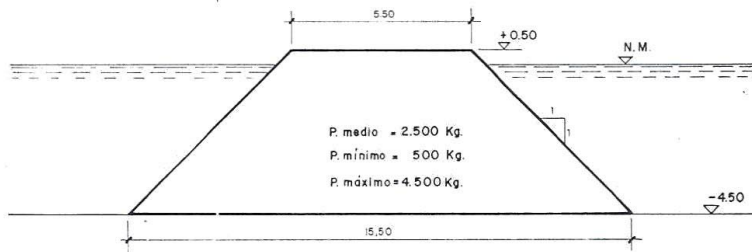
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Breakwater	110	15.5	170

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

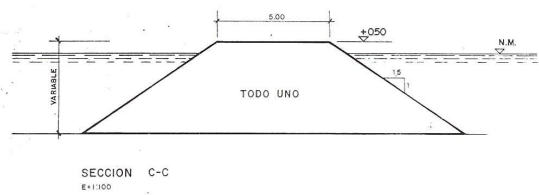
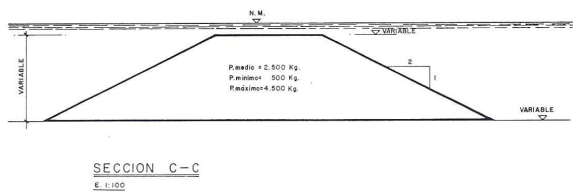
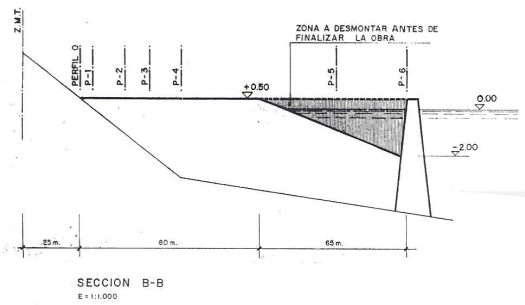
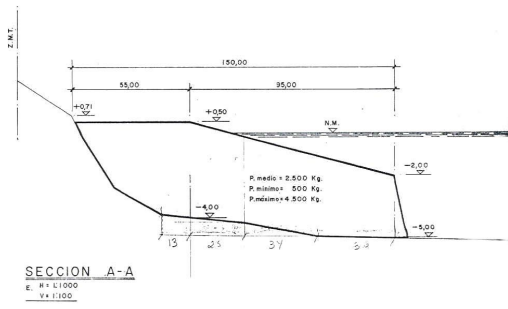
Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Breakwater	+0.5	100	5.5	-4.5



PLANTA DEL DIQUE
E = 1:11.000



SECCION A-A
E = 1:100



Indication of water level variations

Tidal range: 0.60 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_016, Playa de Castell de Ferro (Castell de Ferro Beach), Granada



Main motive for building the LCS

Construction of 3 detached breakwaters to diminish the incident wave energy on the beach and to induce the creation of their respective tombolos. Between the breakwaters, 2 triangular structures (at -3.0) were placed in order to decrease the amount of filling sand.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

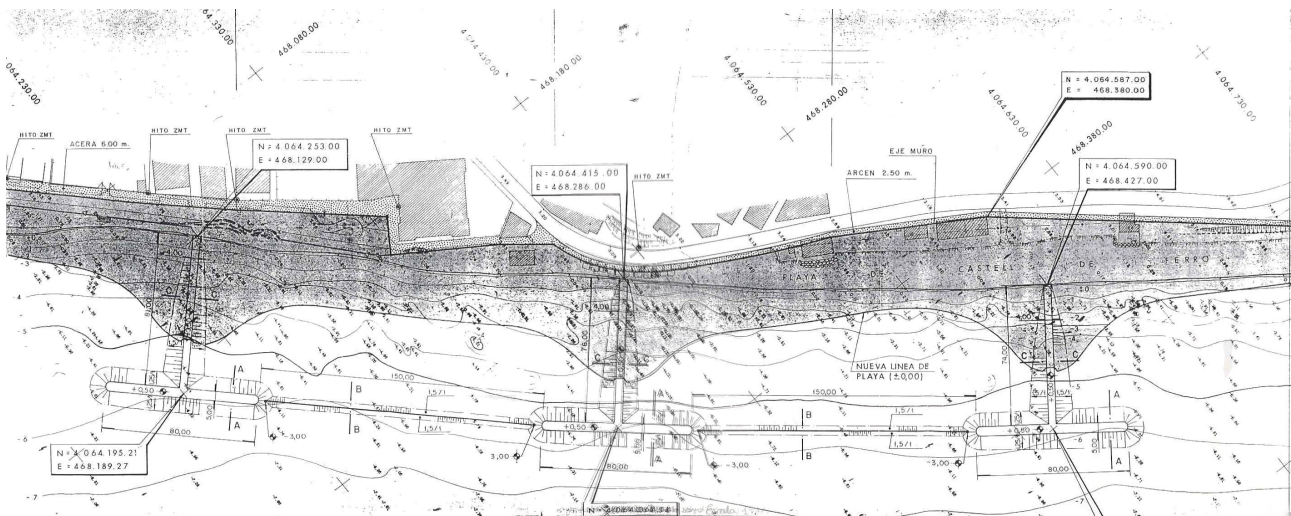
System Layout (dimensioned sketch)

3 detached breakwaters at +0.5

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Emerged (breakwater 1)	97	21.5	30
Emerged (breakwater 2)	97	21.5	25
Emerged (breakwater 3)	97	21.5	35

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth(m)
Emerged (breakwater 1)	+0.5	80	5	-6.00
Emerged (breakwater 2)	+0.5	80	5	-6.00
Emerged (breakwater 3)	+0.5	80	5	-6.00



Indication of water level variations

Tidal range: 0.70 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_017, Playa de Torrenueva (Torrenueva Beach), Granada



Main motive for building the LCS

Nourishment and protection of Torrenueva beach.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

System Layout (dimensioned sketch)

1 detached breakwater at +0.00

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Structure	no information	no information	no information

Typical cross section (dimensioned sketch)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Structure	+0.00	303	5.00	no information

Indication of water level variations

Tidal range: 0.70 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_018, Playa de Fuentepiedra (Fuentepiedra Beach), Granada



Main motive for building the LCS
Nourishment of Fuentepiedra Beach.

Impacts on bio-environment
No information available.

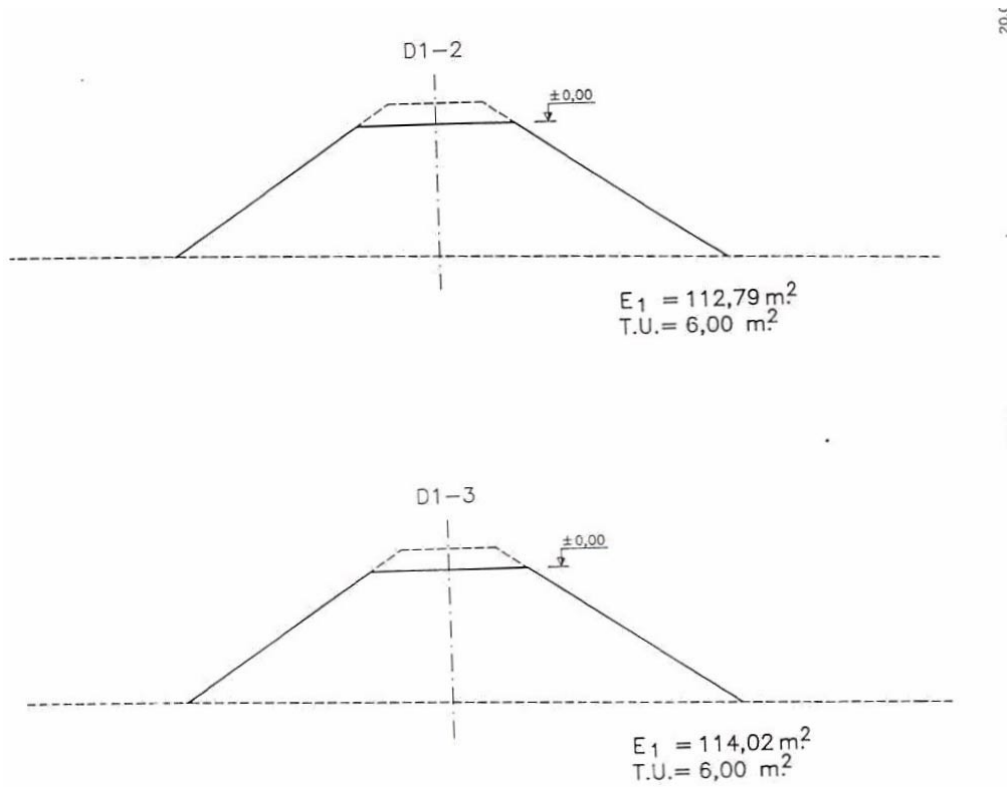
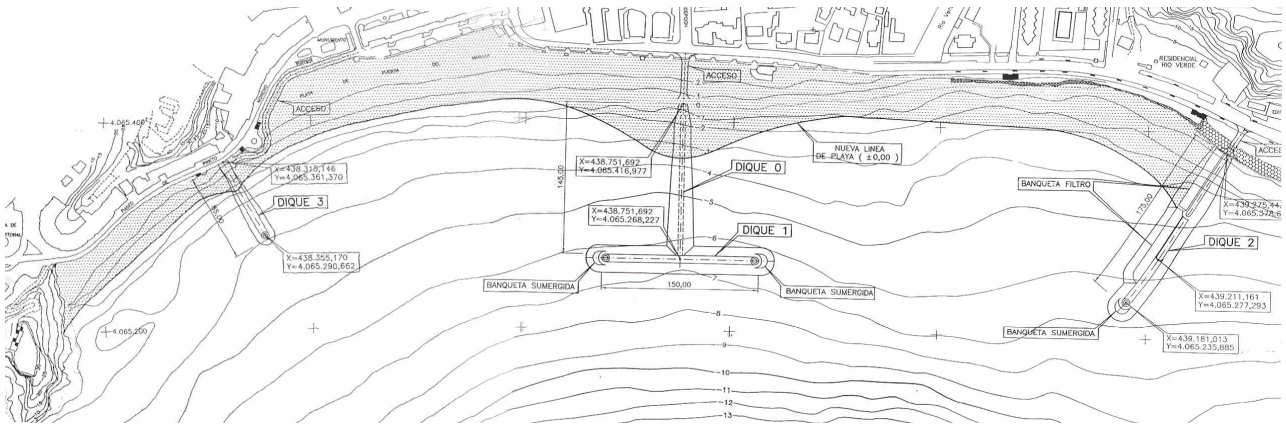
Socio-economic impact
Increasing of tourist activities.

System Layout (dimensioned sketch)
1 detached breakwater at +0.00.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Parallel breakwater	180	26	145

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Parallel breakwater	+0.00	150	8	-6.5



Indication of water level variations

Tidal range: 0.70 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
 The location is appropriate for further investigation.

UPC_ES_019, Playas del Rincón de la Victoria y de la Cala del Moral (Rincón de la Victoria and Cala del Moral Beaches), Málaga



Main motive for building the LCS

Nourishment of Rincón de la Victoria and Cala del Moral beaches.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

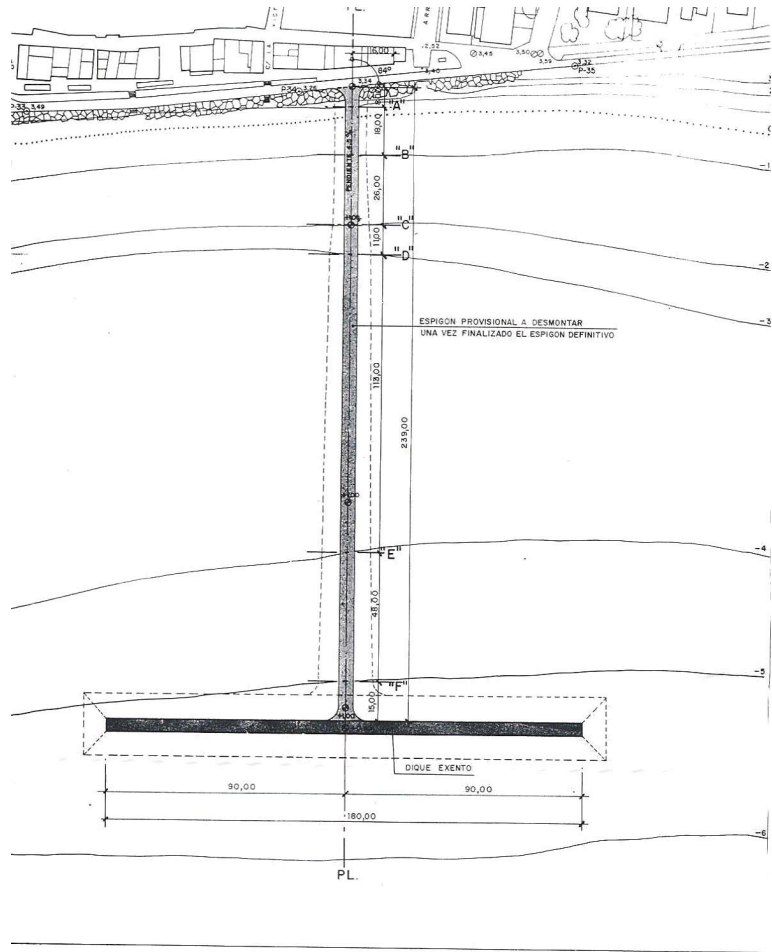
System Layout (dimensioned sketch)

1 detached breakwater at +0.5m.

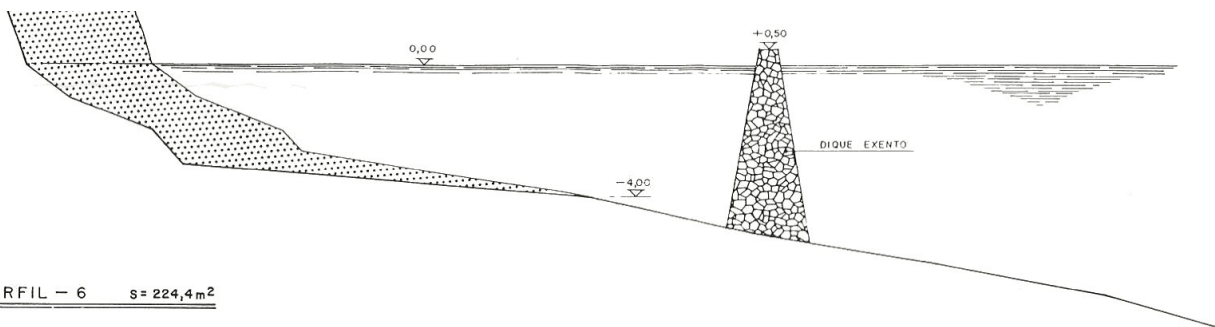
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Parallel breakwater	197	23.5	230

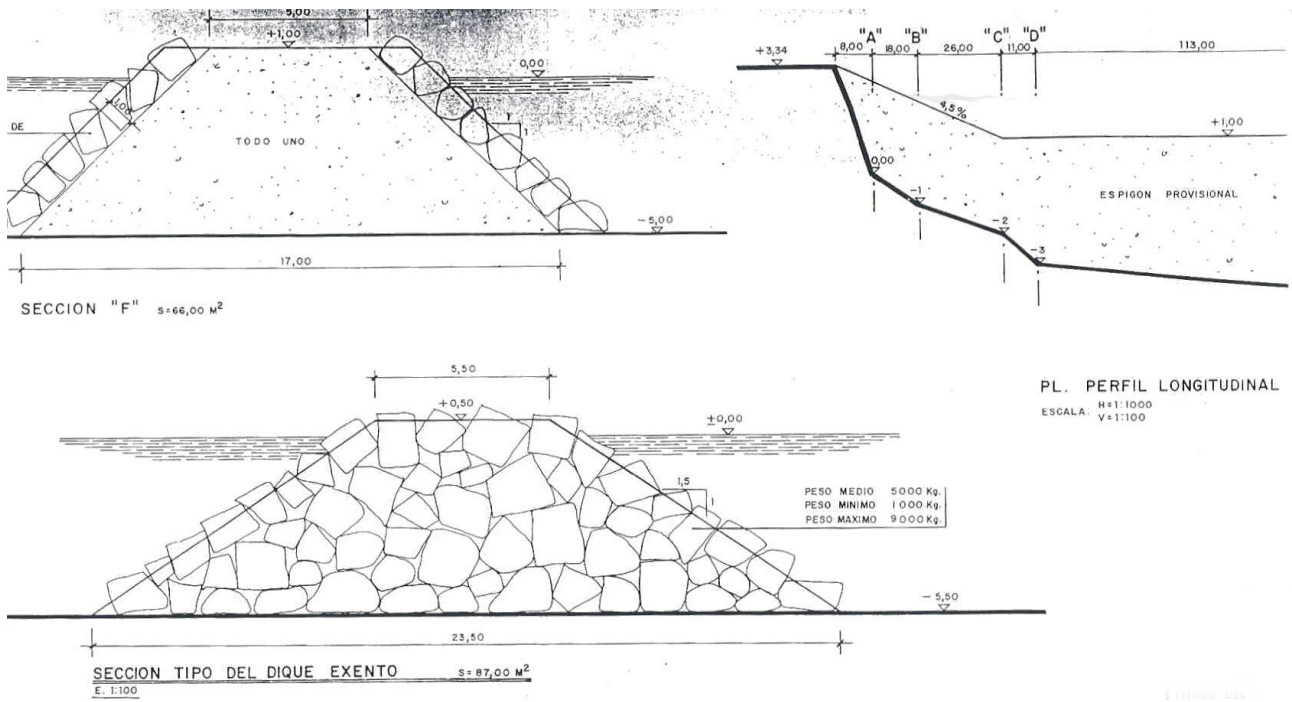
Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Parallel breakwater	+0.5	180	5.5	-5.0 to -5.5



PLANTA DEL ESPIGON
E. 1:11000





Indication of water level variations

Tidal range: 0.80 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_020, Playas del Palo (Palo Beaches), Málaga



Main motive for building the LCS

Generation and protection of Palo beaches.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

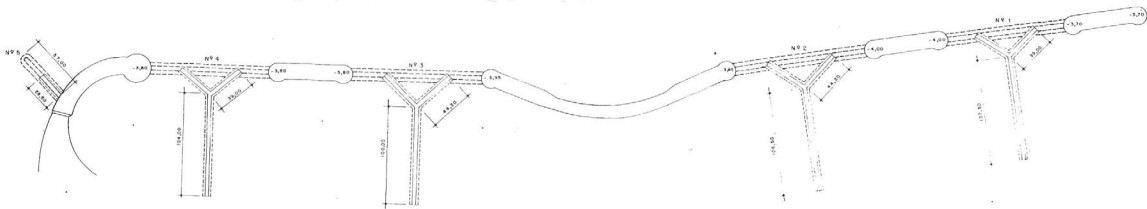
System Layout (dimensioned sketch)

9 breakwaters as follows: 1 attached breakwater (East), 4 detached submerged breakwaters alternated with 4 detached “partially emerged” breakwaters

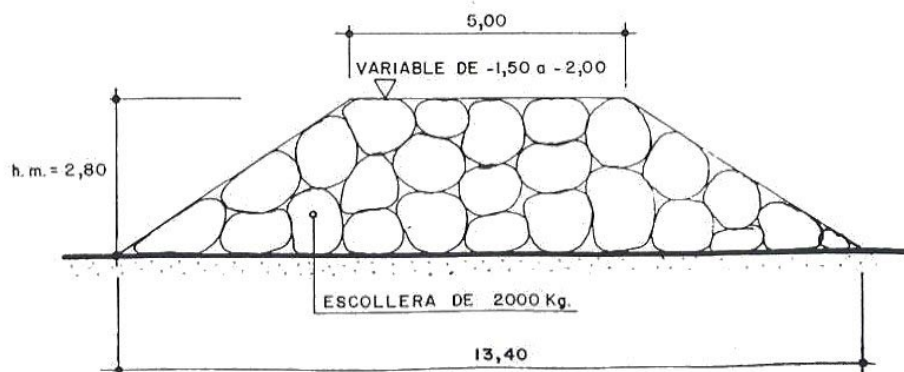
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Attached Breakwater 1	120	35	attached
Submerged 2	125	13.40	125
Emerged 3	90	22	125
Submerged 4	135	13.40	125
Emerged 5	300	35	between 90 and 135
Submerged 6	140	13.40	125
Emerged 7	90	22	125
Submerged 8	125	13.40	125
Emerged 9	90	22	125

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Attached Breakwater 1	+1.25	110	16.5	-3.80
Submerged 2	between -1.50 and -2.00	120	5.00	-3.80
Emerged 3	+1.25	86	20	-3.80
Submerged 4	between -1.50 and -2.00	130	5.00	-3.90
Emerged 5	+1.25	275	13.00	-4.00
Submerged 6	between -1.50 and -2.00	130	5.00	-4.00
Emerged 7	+1.25	86	20	-4.00
Submerged 8	between -1.50 and -2.00	120	5.00	-3.80
Emerged 9	+1.25	86	20	-3.70



SECCION DIQUE SUMERGIDO



Indication of water level variations

Tidal range: 0.80 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_021, Playa de Benalmádena (Benalmádena Beach), Málaga



Main motive for building the LCS

Generation and protection of Benalmádena beach.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

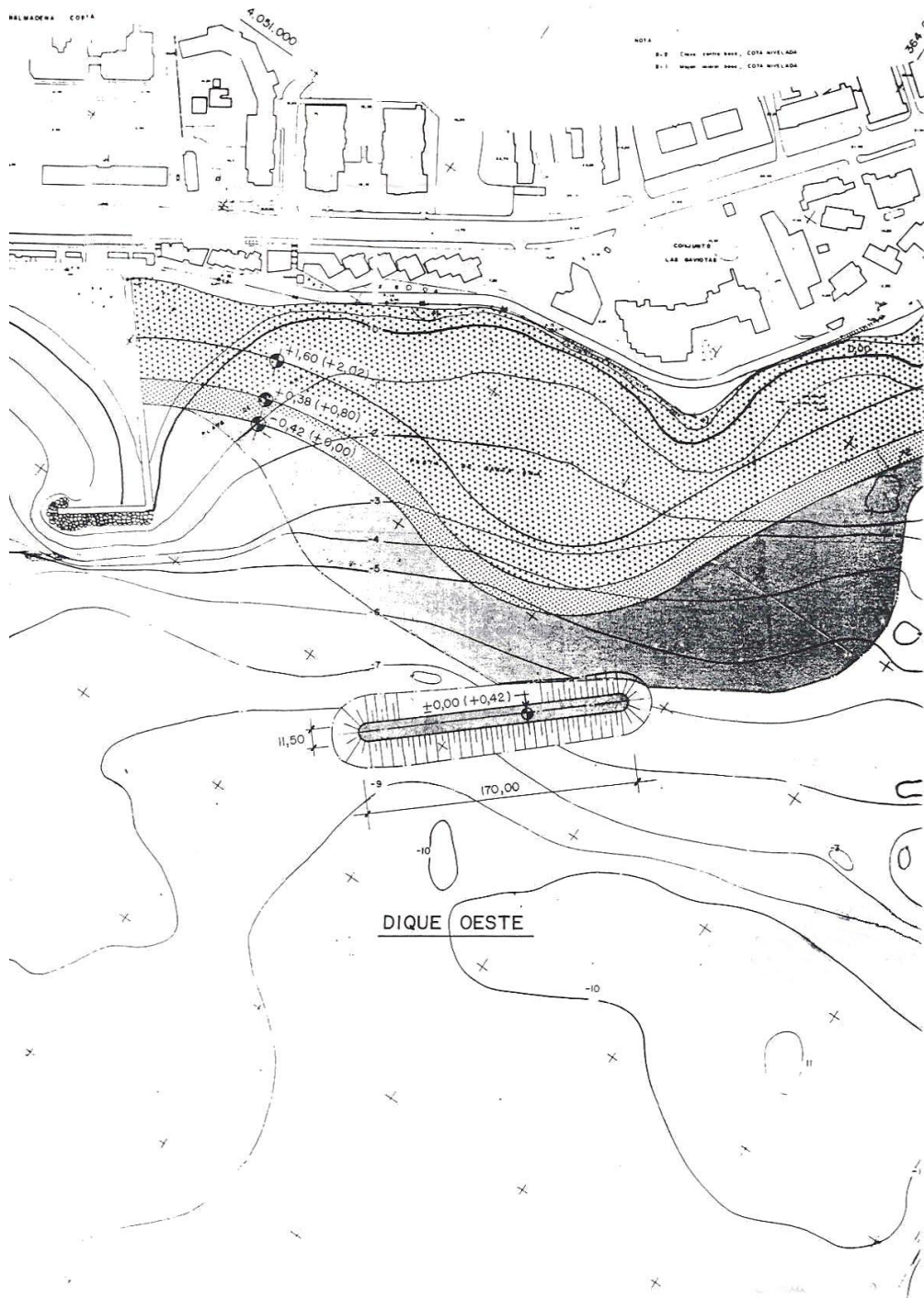
System Layout (dimensioned sketch)

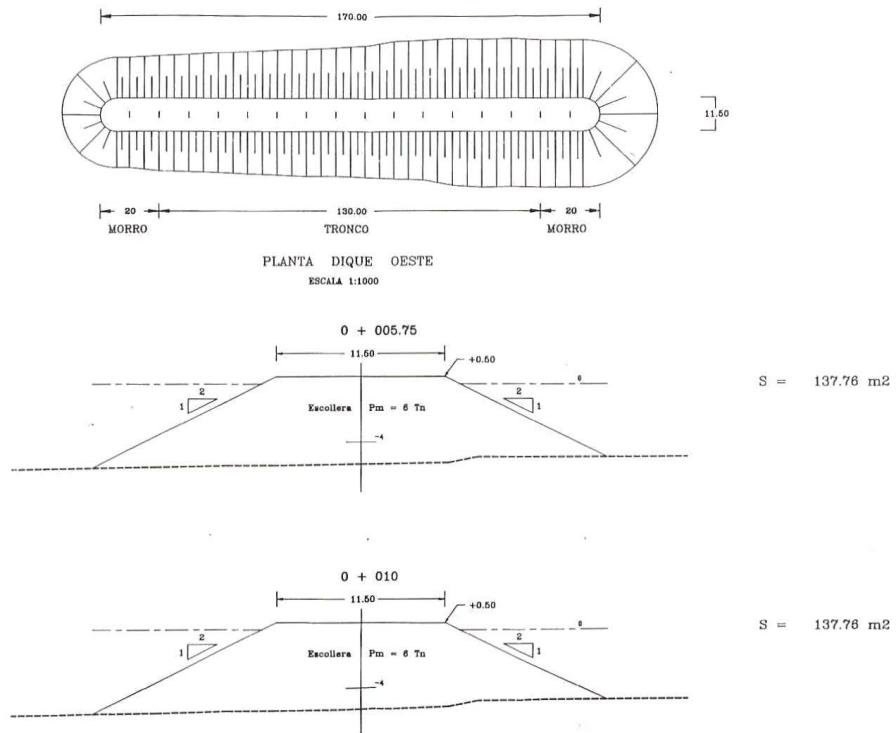
1 detached breakwater at +0.50

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Detached Breakwater	200	42	160

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Detached Breakwater	+0.50	170	11.5	-6.00 to -8.00





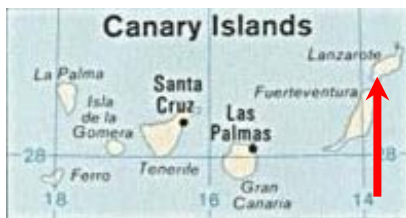
Indication of water level variations

Tidal range: 0.80 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
 The location is appropriate for further investigation.

UPC_ES_022, Playa del Tablillo (Tablillo Beach), Lanzarote, Canary Islands



Main motive for building the LCS

Generation of Tablillo beach

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

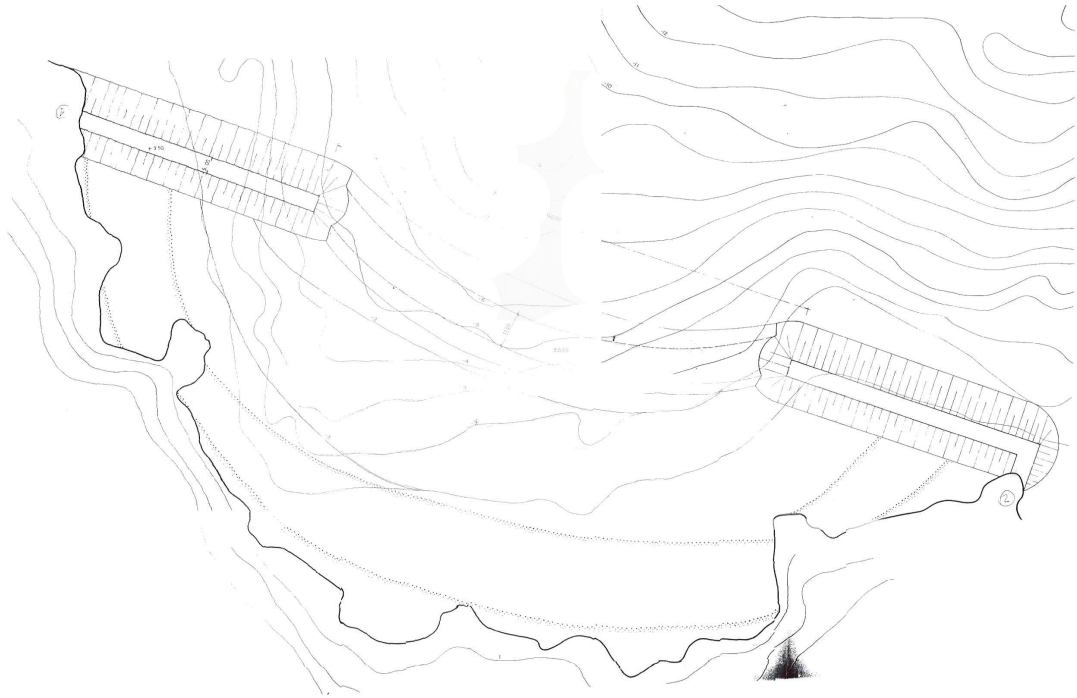
System Layout (dimensioned sketch)

1 submerged detached structure at +0.00 and 2 attached breakwaters at +3.5 (water levels are referred to low tide).

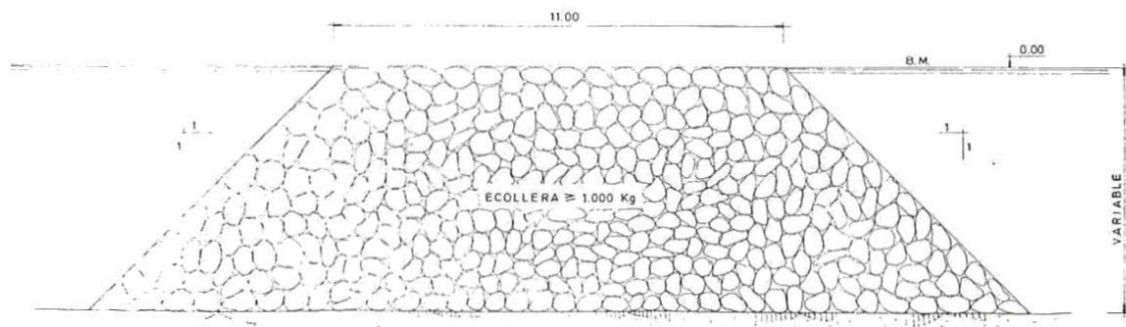
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
detached structure	135	23	80
Attached breakwater 1	78	24	----
Attached breakwater 2	88	24	----

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

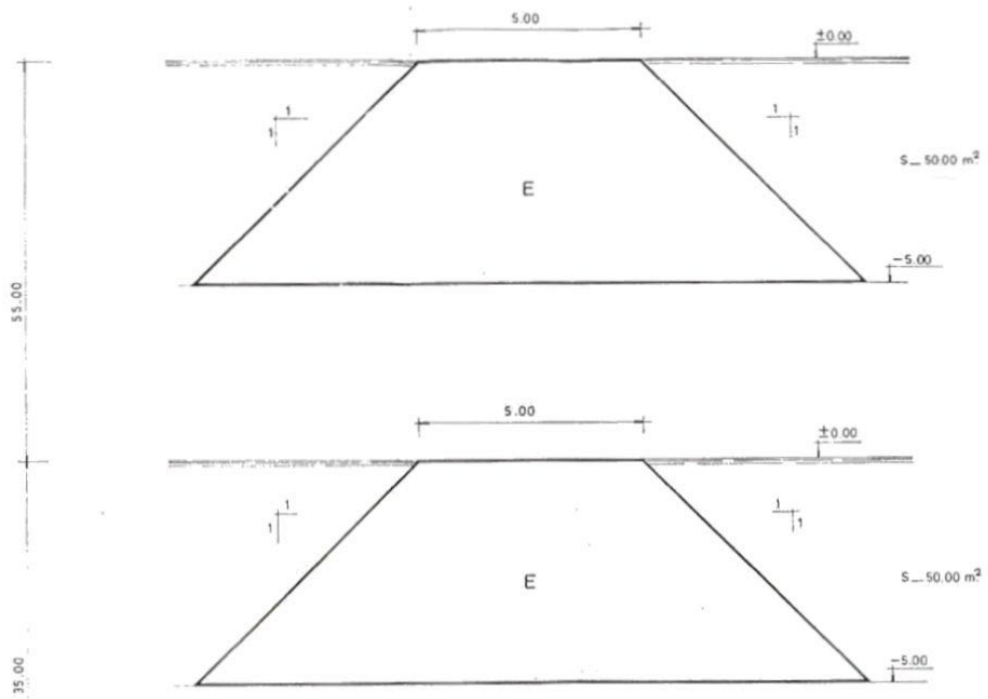
Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Detached littoral belt	+0.00	128	11	between -2 to -6
Attached breakwater 1	+3.5	70	5.00	From 0 to -5.5
Attached breakwater 2	+3.5	70	5.00	From 0 to -2.5



SECCION TIPO DIQUE SUMERGIDO



SECCIONES TRANSVERSALES



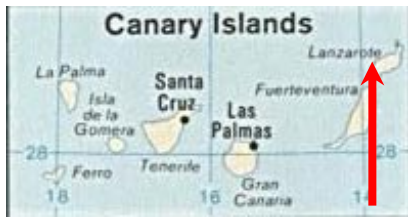
Indication of water level variations

Tidal range: 3 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_023, Playa del Ancla (Ancla Beach), Lanzarote, Canary Islands



Main motive for building the LCS

Nourishment of Ancla beach

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

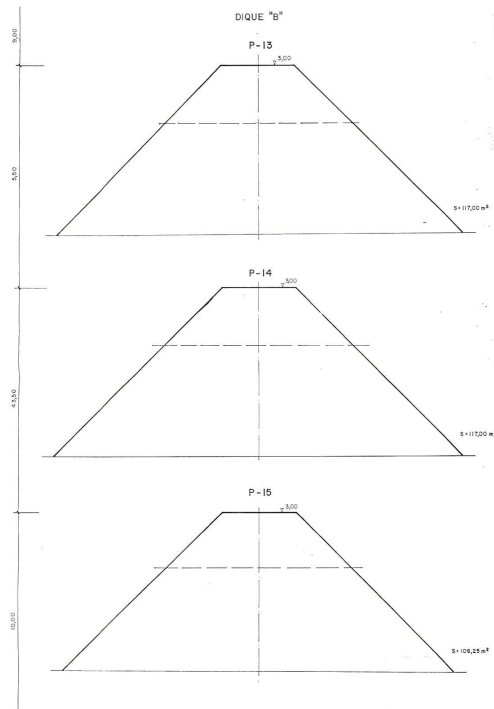
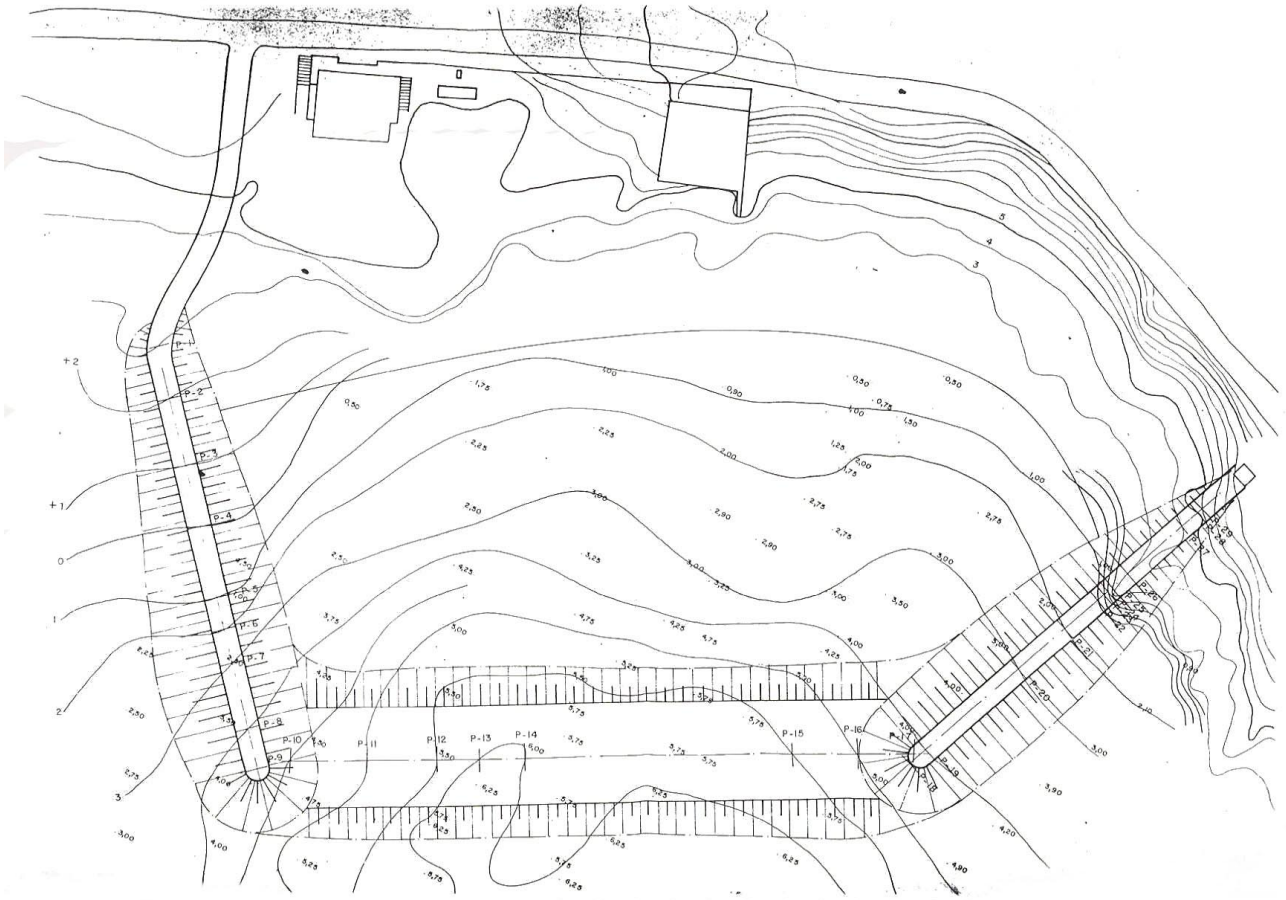
System Layout (dimensioned sketch)

1 detached structure at +0.00 and 2 attached breakwaters at +3.00 (water levels are referred to low tide).

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Detached structure B	90	28	70
Attached breakwater A	83	Between 10 to 23	-----
Attached breakwater C	78	Between 10 to 20	-----

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Detached littoral belt B	+0.00	85	16	Between -5.5 to -6.5
Attached breakwater A	+3.00	75	4.00	From 0 to -4.5
Attached breakwater C	+3.00	70	4.00	From 0 to -5.0



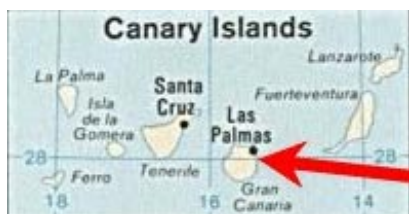
Indication of water level variations

Tidal range: 3.0 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_024, Playa de La Laja (La Laja Beach), Gran Canaria, Canary Islands



Main motive for building the LCS

Nourishment of La Laja beach

Impacts on bio-environment

No information available.

Socio-economic impact

Re-distribution of tourists and bathers of the saturated adjacent beaches.

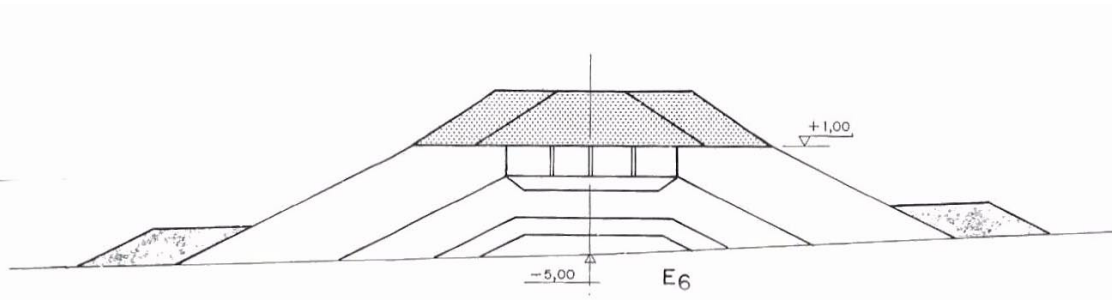
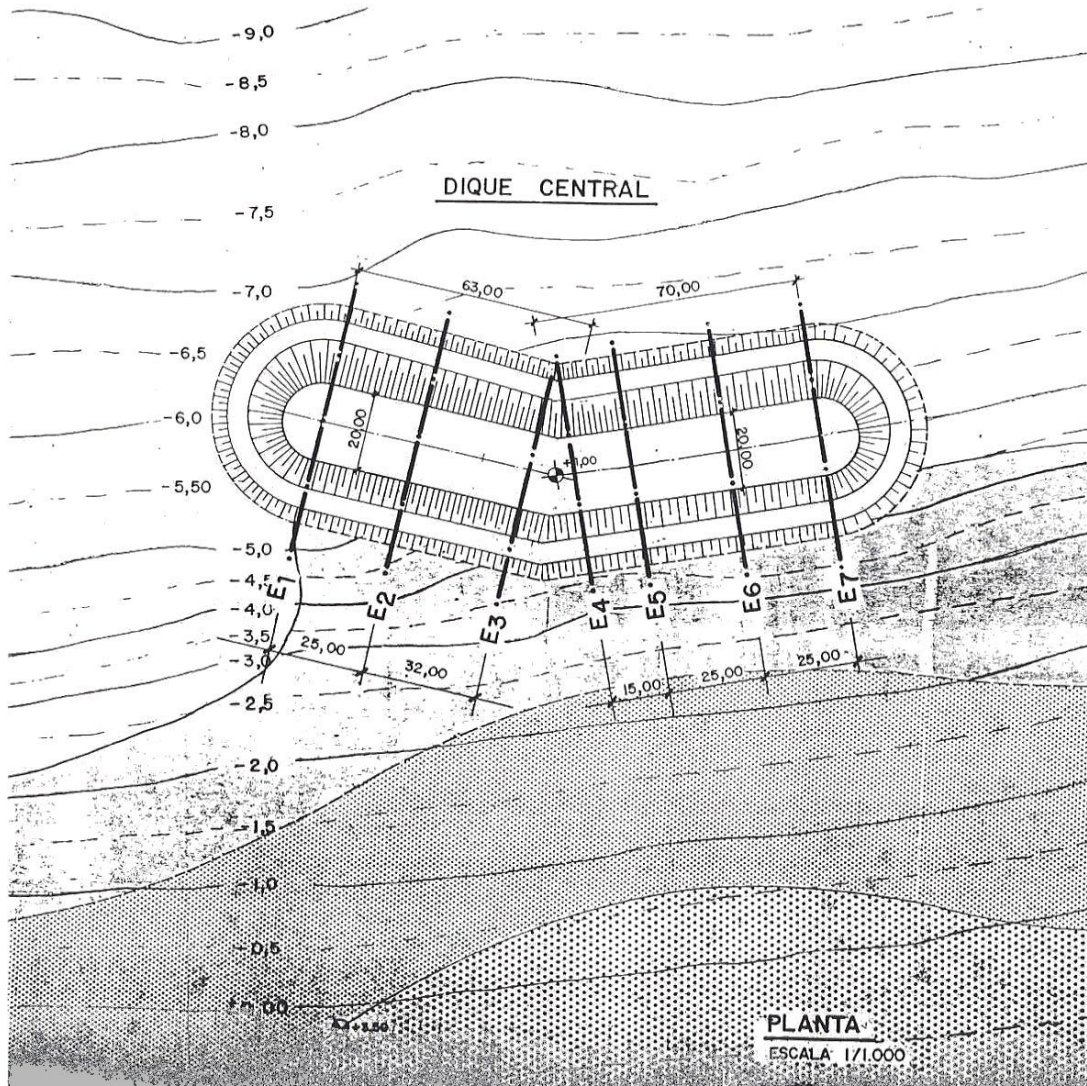
System Layout (dimensioned sketch)

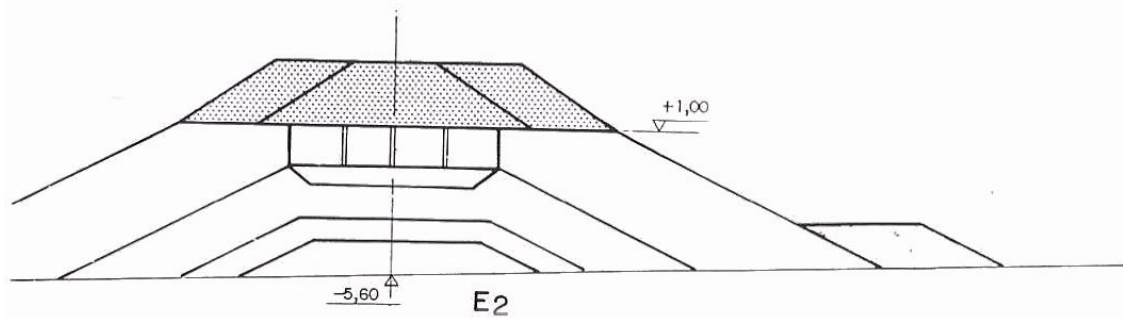
1 detached breakwater at +1.00

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Detached breakwater	200	55	140

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Detached breakwater	+1.00	153	20	-6.00



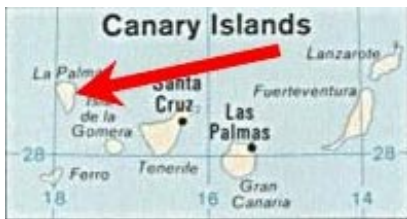
**Indication of water level variations**

Tidal range: 2.7 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_025, Playa de Baja Mar (Baja Mar Beach), La Palma, Canary Islands



Main motive for building the LCS

Generation of Baja Mar beach for tourist activities and protection of a neighbouring highway.

Impacts on bio-environment

No information available.

Socio-economic impact

Increase of tourist activities and coastal protection.

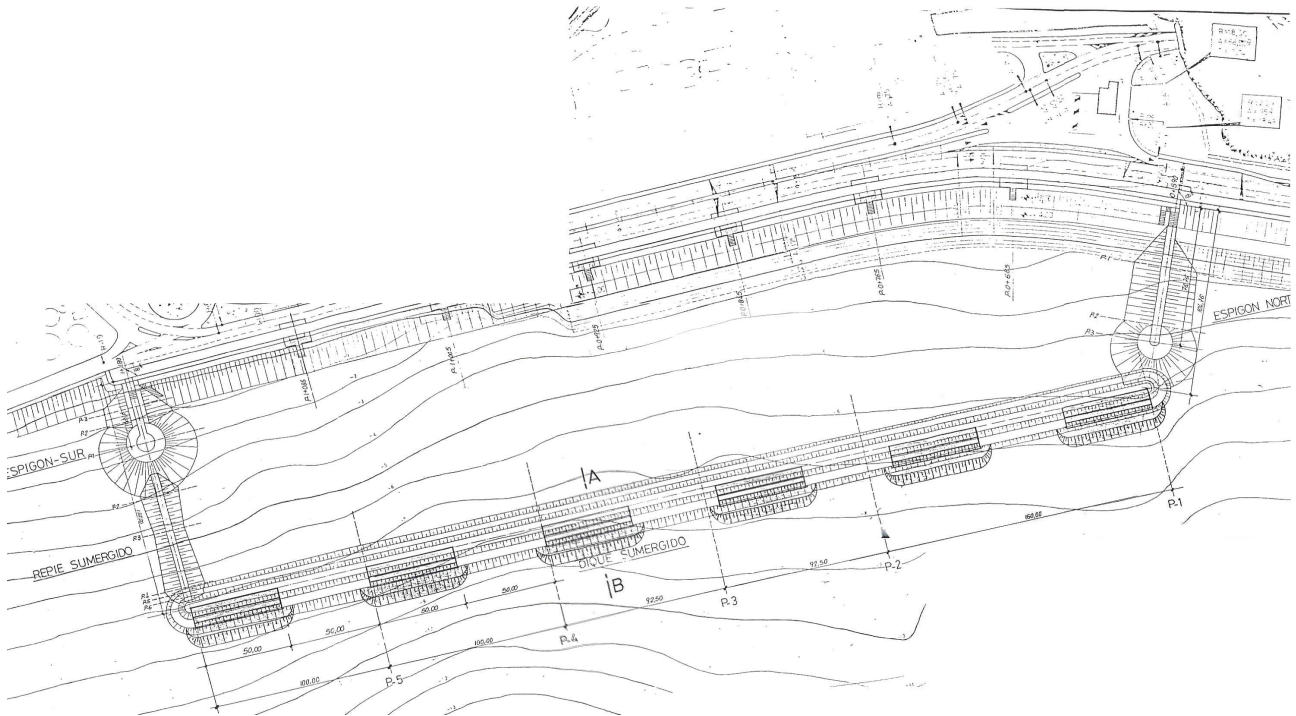
System Layout (dimensioned sketch)

3 breakwaters: 2 totally emerged attached (perpendicular) groins and 1 detached breakwater with 2 different dimensional sketches (6 at +0.5 and 5 at -1.5) separated 50 meters alternated 5 times.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Detached breakwater section 1	50	37	125
Detached breakwater section 2	50	30	125

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Detached breakwater section 1	+0.5	50	6.0	From -6 to -8
Detached breakwater section 2	-1.5	50	6.0	From -6 to -8



Indication of water level variations

Tidal range: 2.70 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_026, Playa de Güimar (Beach of Güimar), Tenerife, Canary Islands



Main motive for building the LCS

Improvement of the coastal protection of Güimar beach.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

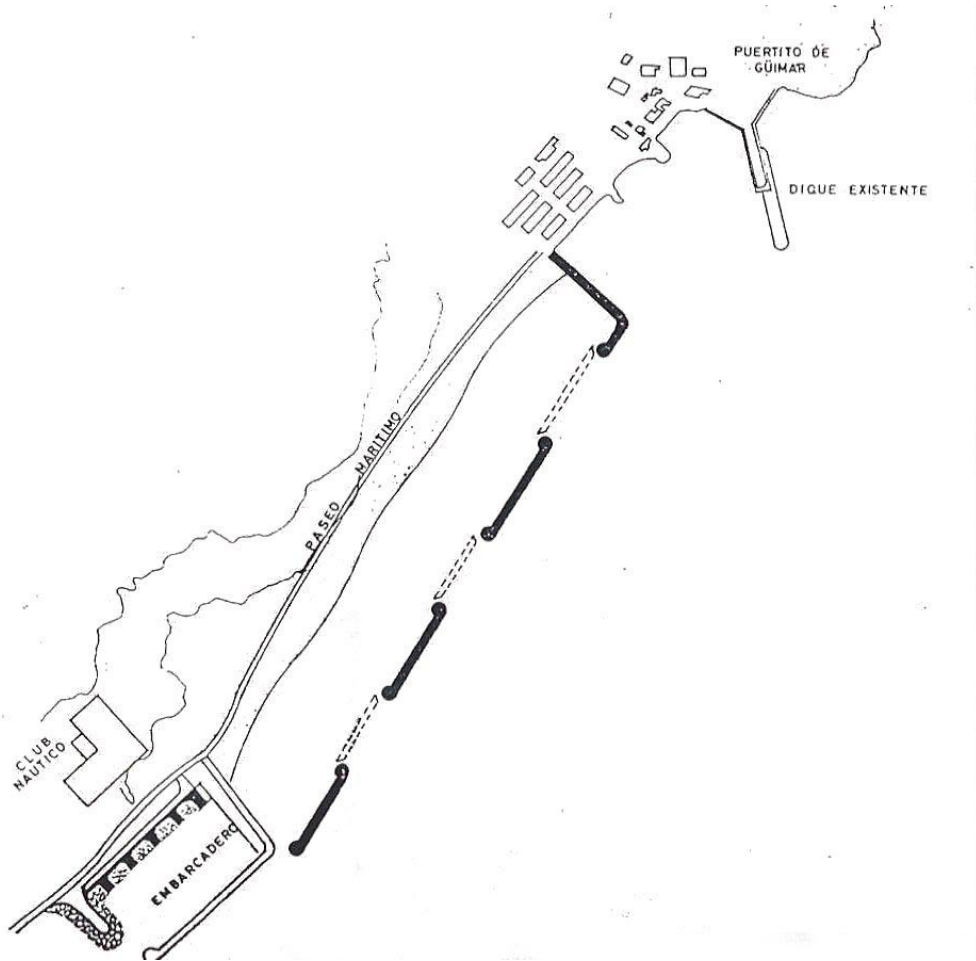
System Layout (dimensioned sketch)

3 detached breakwaters and construction of an elongation of a pre-existent groin at +2.5.

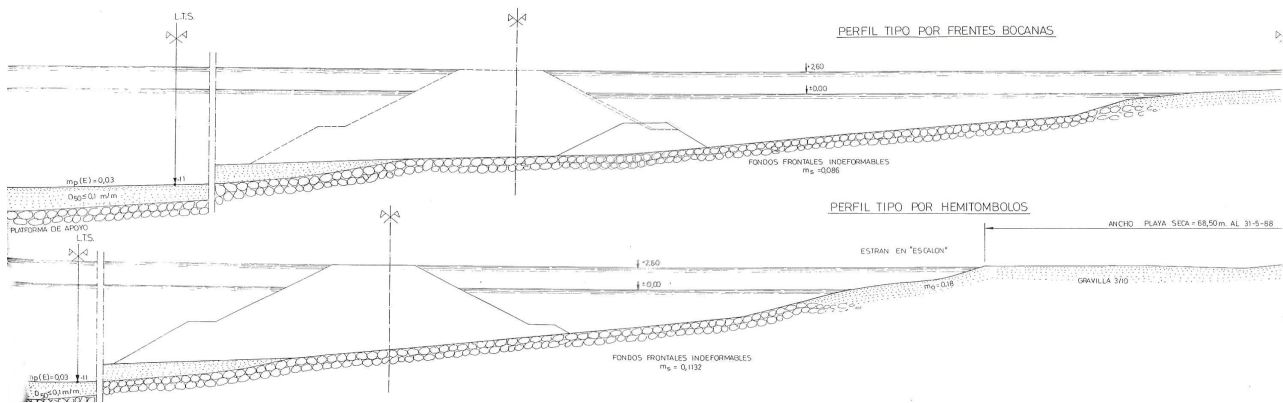
Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Attached Breakwater	80	45	85
Emerged 1	175	50	85
Emerged 2	175	55	85
Emerged 3	100	55	85

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Attached Breakwater	+2.5	60	10.00	between -8 and -9
Emerged 1	+2.5	130	10.00	between -8 and -9
Emerged 2	+2.5	130	10.00	between -8 and -9
Emerged 3	+2.5	65	10.00	between -8 and -9



(PLANO-7)
 REGENERACION DE PLAYA EN GÚIMAR
 ESTUDIO DE ESTABILIDAD EN PERFIL
 Escala = 1:200



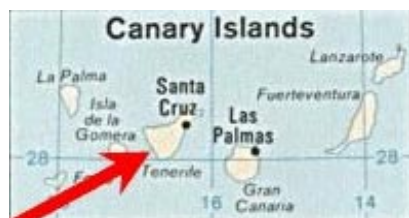
Indication of water level variations

Tidal range: 2.5 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
 The location is appropriate for further investigation.

UPC_ES_027, Playa de Fañabé (Fañabé Beach), Tenerife, Canary Islands



Main motive for building the LCS

Generation and protection of a beach in Collado de Fañabé.

Impacts on bio-environment

No information available.

Socio-economic impact

Increasing of tourist activities.

System Layout (dimensioned sketch)

8 breakwaters as follows: 1 attached breakwater (North), 4 detached submerged breakwaters alternated with 3 detached “partially emerged” breakwaters

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Attached Breakwater 1	150	45	----
Submerged 2	66	30	200
Emerged 3	120	45	200
Submerged 4	55	30	200
Emerged 5	120	45	200
Submerged 6	55	30	200
Emerged 7	120	45	200
Submerged 8	66	30	200

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum low tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Attached Breakwater 1	+2.00	134	15	-5.00
Submerged 2	-1.00	66	16	-5.00
Emerged 3	+2.00	80	15	-5.00
Submerged 4	-1.00	55	16	-5.00
Emerged 5	+2.00	80	15	-5.00
Submerged 6	-1.00	55	16	-5.00
Emerged 7	+2.00	80	15	-5.00
Submerged 8	-1.00	66	16	-5.00

Indication of water level variations

Tidal range: 2.5 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.

UPC_ES_028, Playa Jardín (Jardín Beach), Tenerife, Canary Islands



Main motive for building the LCS

Nourishment of Jardín beach.

Impacts on bio-environment

No information available.

Socio-economic impact

Increase of tourist activities and coastal protection.

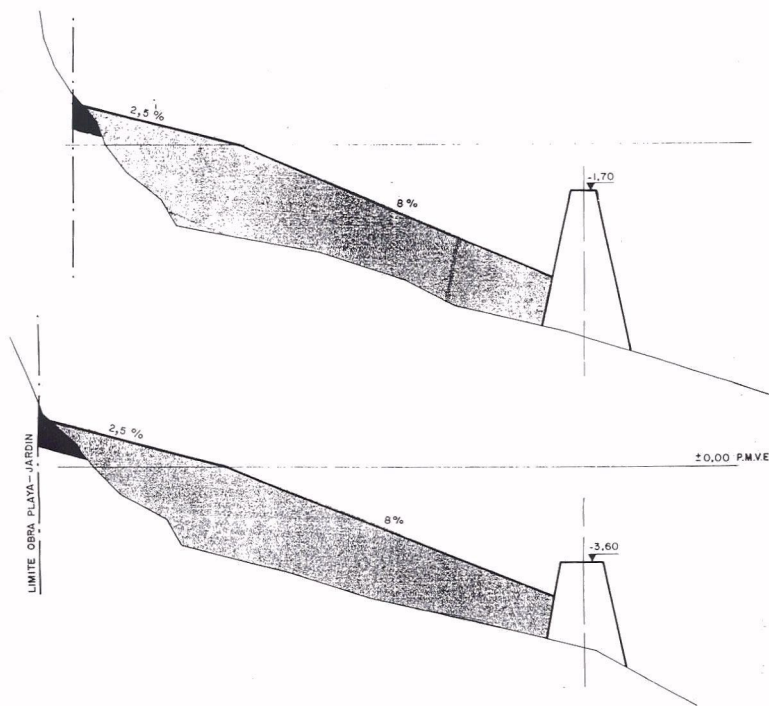
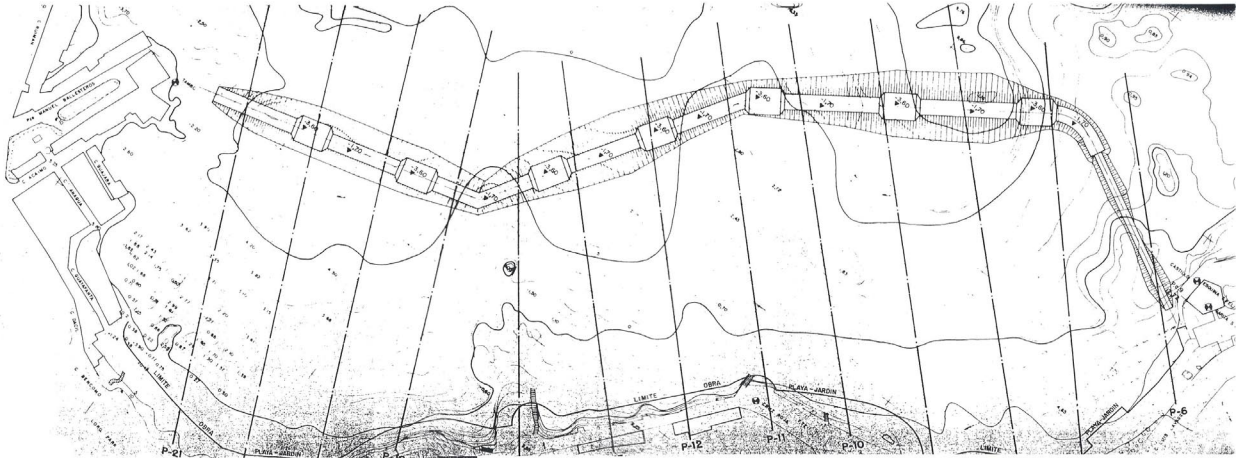
System Layout (dimensioned sketch)

1 submerged structure 560 meters long, with 2 different cross sections, 8 stretches at -1.7 and 7 at -3.6) surrounding the beach.

Type of Structure	Structure Length (m)	Structure Base Width (m)	Distance to Shoreline (m)
Submerged section 1	25	30	Between 70 and 145
Submerged section 2	From 45 to 65	30	Between 70 and 145

Typical cross section (dimensioned sketch) (water levels and depths are referred to maximum high tide)

Type of Structure	Freeboard (m)	Freeboard Length (m)	Freeboard Width (m)	Water Depth (m)
Submerged section 1	-3.6	20	16	-5.0
Submerged section 2	-1.7	45	10	-5.0



Indication of water level variations

Tidal range: 2.70 meters.

Existence of detailed information

It is hardly impossible to obtain more information.
The location is appropriate for further investigation.