

A: Formalities

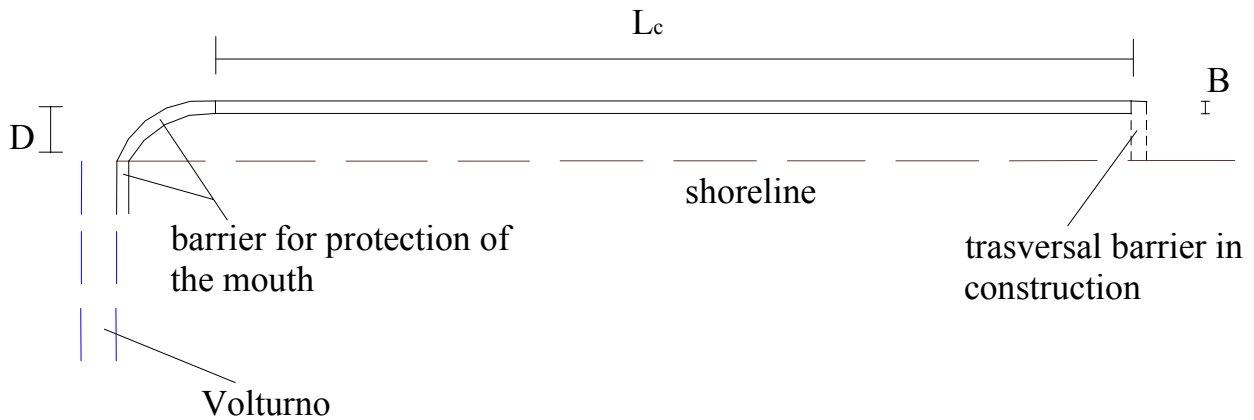
Participant code and who to contact.	UR3-MOD
E-mail	leof@uniroma3.it
This date (today, mm:dd:yyyy) and revision number (A..Z).	
Location of LCS.	Castel Volturno (Caserta)
Start date, length and/or end of works. Have there been any later changes? If so, when?	Start '94 End July '95
Design life - the minimum length of time the beach management scheme is designed to last.	
Which tools and regulations are used for the design formulae (mathematical models, model tests, engineering experience, standards, recommendations).	Engeneering experience, standards
Who fund the work (e.g. Public Administration or private company)?	Ministry of Public Works
Costs.	

B: Geometry and construction materials

B1 System layout (aerial view)

Are shore attaching structures present (e.g. groins)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Are emerging head islands present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The following sketch concerns only shore parallel LCS; if the layout is different you must insert another sketch and specify parameters like the ones suggested. If a picture is available please insert it too.



Parameter	Description	Fill in box	unit
D	Distance from shoreline	60 130 100	meters
L_{SB}	Length of LCS at sea bed	200 1200 300	meters
L_{CL}	Length of LCS at crest level	200 1200 300	meters
n	Number of LCS in system	1	

Remarks In the previous table the structures has been divided in three section

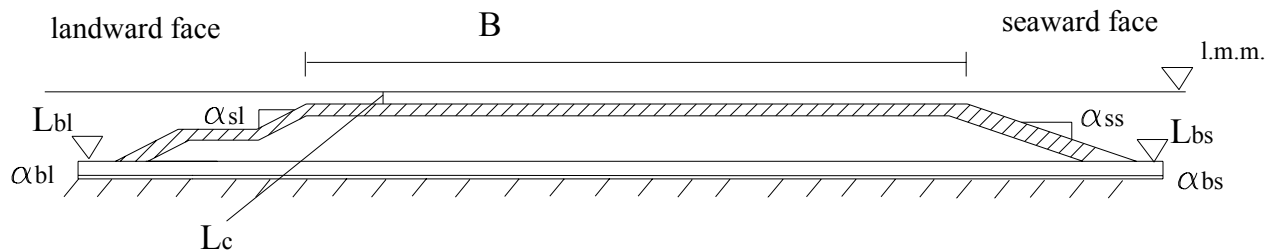
B2 Bathymetry of sea bed and beach

Please insert a dimensioned sketch if possible.

Description of bathymetry when LCS were build
 Is detailed information (measurements) available? If so, please explain.

B3 Trunk cross section/contour geometry – outer profile

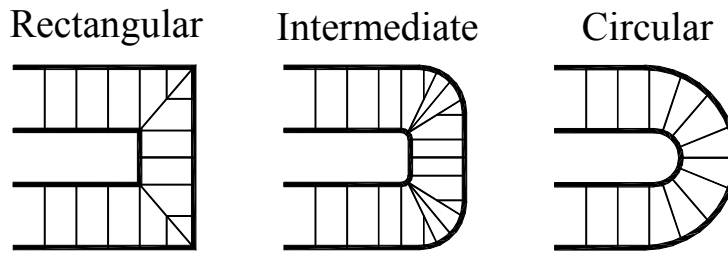
If shore attached structures perpendicular to shoreline are present, please insert a sketch with typical longitudinal section and typical selected cross sections. Specify parameters as the ones given below. If the layout does not fit the following sketch please insert another sketch.



Parameter	Description	Fill in box	unit
α_{BS}	Steepness of sea bed, seaward	1% / 2%	
α_{BL}	Steepness of sea bed, landward	1% / 2%	
α_{SS}	Steepness of slope, seaward	1:3	
α_{SL}	Steepness of slope, landward	1:2	
L_c	Level of crest	-0.1	Meters
l_{BL}	Level of sea bed, landward	-2.5	Meters
l_{BS}	Level of sea bed, seaward	-3.5	Meters
B	Width of crest	12	Meters

Remarks (e.g. different layout along shoreline, other important parameters).

B4 Round head contour geometry



What is the shape of the round head?

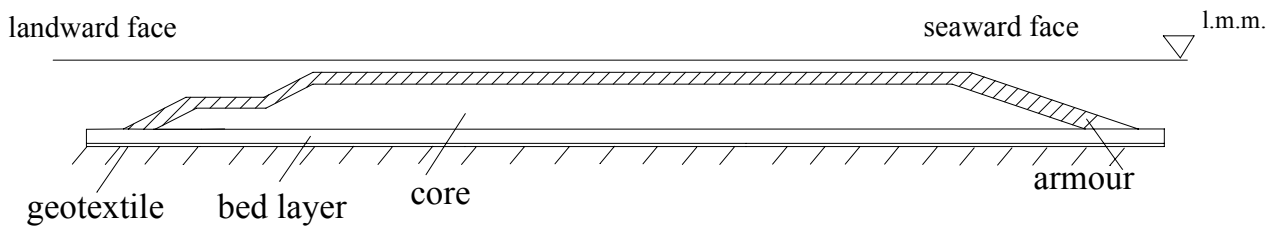
Rectangular

Intermediate

Circular

B5 Description of layers

Please insert a dimensioned sketch with the typical cross-section composition.



For each layer, please provide the following information.

Layer type e.g. ARMOUR LAYER CHARACTERISTICS			
Parameter	Description	Fill in box	unit
	Material (e.g. quartzite, concrete)	Limestone, basalt	
	Shape of blocks (e.g. quarry rock, sea stones, cubes)	Quarry rock	
ρ_r	Mass density of material		kg/m ³
D_{n50}	Nominal diameter		meters
Gr	Grading of the material (D_{85}/D_{15})		
	Geotextile between layers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Remarks (e.g. details on geotextile)

B6 Construction method

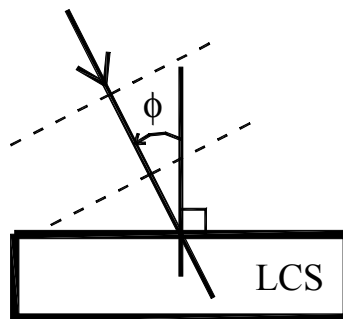
How have the stones been placed?

<input type="checkbox"/>	Dumped with barges
<input checked="" type="checkbox"/>	Placed with barges
<input type="checkbox"/>	Land based operation
<input type="checkbox"/>	Other:

Sequence of operation.	
<input checked="" type="checkbox"/>	Construction started upstream
<input type="checkbox"/>	Construction started downstream

C: Local meteomarine conditions at the structure

C1 Waves



Parameter	Description	Fill in box	unit
H_{m0}	Design significant wave height	6.70	meters
T_p	Design peak period		seconds
ϕ	Design wave incidence angle		degree

Remarks

C2 Water levels

TIDAL WATER LEVEL VARIATIONS			
Parameter	Description	Fill in box	unit
HAT	Highest astronomical tide level	0.22	meters
MHWL	Mean tide high water level		meters
MWL	Mean water level		meters
MLWL	Mean tide low water level	0	meters
LAT	Lowest astronomical tide level	-0.20	meters

Water level statistics (If available, please provide information on design water level and tide and surge generated water levels corresponding to return periods 1

month, 1 y, 10 y, 50 y)

C3 Current

Tidal currents

Description & statistics if available

No significant tidal current

Surge generated currents

Description & statistics if available (e.g. mean velocities as function of water depth/distance to shore line)

No information.

D: Sea bed and beach characteristics, incl. sediment transport

Description of the coast (e.g. bar type coast with gentle slope or plane coast with steep slope)

D1 Natural sea bed material at surface

Parameter	Description of sea bed material	Fill in box	unit
	Material (e.g. quartzite)	Sand	
ρ_r	Mass density of material		kg/m ³
D _{n50}	Nominal diameter grain size	0.326-0.250	mm
Gr	Grading of the material (D ₈₅ /D ₁₅)		

Remarks (provide grain distribution if available)

D2 Natural beach material at surface

Parameter	Description of beach material	Fill in box	unit
	Material (e.g. quartzite)	Sand	
ρ_r	Mass density of material		kg/m ³
D _{n50}	Nominal diameter grain size	0.326-0.250	mm
Gr	Grading of the material (D ₈₅ /D ₁₅)		

Natural supply?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Supplied by beach nourishment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks (provide grain distribution if available)

D3 Artificial beach nourishment

Description of nourishment

Parameter	Description of artificial nourishment	Fill in box	unit
	Material (e.g. quartzite)	Sand and gravels	
ρ_r	Mass density of material		kg/m ³
D_{n50}	Nominal diameter	0.4-2 2-5	mm
Gr	Grading of the material (D_{85}/D_{15})		

Remarks (provide grain distribution if available)

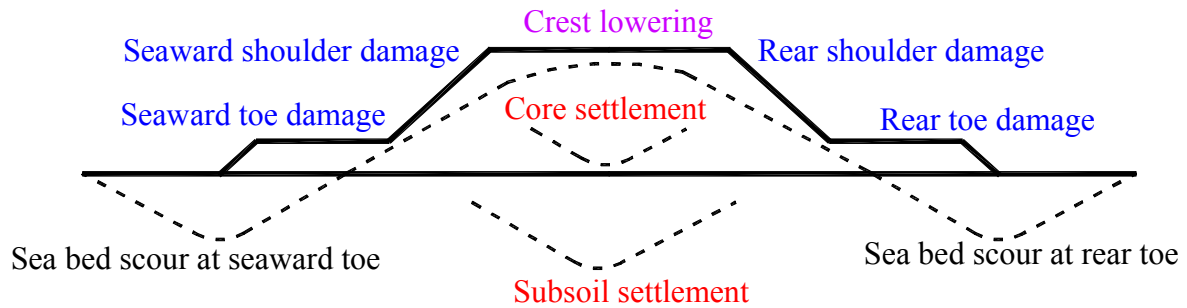
D4 Sediment transport

Description of the sediment transport (e.g. direction and amount of transport, distribution over the coastal profile)
 Most of sediment (about 70%) is dragged on the bed. These sediments has a nominal diameter included in 0.5 - 0.326 mm.
 The prevalent direction of sediment transport is Southward

Parameter	Description of sediment	Fill in box	unit
	Material (e.g. quartzite)		
ρ_r	Mass density of material		kg/m ³
D_{n50}	Nominal diameter	0.5 – 0.326 0.326 – 0.125 0.125 – 0.00625	mm
Gr	Grading of the material (D_{85}/D_{15})		

E: Structural performance

E1 Definition of failure modes



E2 Materials

Problems caused by deterioration?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Problems caused by breakage?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Description of the condition of the materials
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E3 Settlement of the structure

Description of settlements of core/subsoil The average settlement of the crest is 0.5 meters

E4 Local erosion of sea bed/scour

Description of erosion/scour by roundheads (please specify scour depth) No data available on this aspect
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Description of erosion/scour by trunk (please specify scour depth) No data available on this aspect

E5 Erosion and instability of slopes, shoulders, crest and toes

Stage of damage
<input type="checkbox"/> No or marginal damage
<input checked="" type="checkbox"/> Moderate to severe damage
<input type="checkbox"/> Failure

Description of displacements of structural material (provide sketch if possible)

E6 Damage parameters

The definition of a displaced unit is, when a unit is displaced by more than D_{n50} .
 Try to give an estimate of the following damage parameters relevant to armour.

Parameter	Description	Fill in box	unit
The relative number of displaced units	$D(\%) = \frac{n_d \text{ (number of displaced units)}}{\text{Total number of units}} \cdot 100$	0	%
The strip displacement	$N_{od} = \frac{n_d}{L / D_{n50}}$, L is the length of LCS	0	

F: Socio-economic aspects

What regime of property has the coast at this site?

Private , Public full free access , Public limited access , Natural reserve , Don't know ,
 Other (please specify):

Who decided that an LCS should be built at that site?

Individual, acting for private purpose
 Individual, acting for public purpose (e.g. Natural park administrator)
 Local authority (e.g. city council)
 Regional authority (e.g. province level)
 National authority (e.g. ministry)
 Don't know
 Please give name of the authority whenever applicable:

What was the main motive for building the LCS?

Coast erosion
 Inducing or maintaining recreational activity , please specify:
 Environmental concern , please specify:
 Other , please specify:
 Don't know

Was that LCS part of a larger coastal management plan?

Yes , please specify:
 No , please specify:
 Don't know

Public opinion on that LCS:

Construction was accompanied by public protest
 The public did not react
 Public opinion asked for the LCS
 Local commerce asked for the LCS
 Don't know
 Other (please specify):

Description of the coast:

Urban , Densely constructed , Scarcely constructed , No apparent construction

Are there dunes? Yes , No

Has commercial activity changed significantly after construction of the LCS?

hotels construction: More hotels , Less hotels , Unaffected , Don't know

bars and similar construction: More , Less , Unaffected , Don't know

advertising for the area: More , Less , Unaffected , Don't know

other (specify):

Visual impact of LCS not already described in Part B: Are there parts of the LCS visible under average conditions? Poles , Cables , Reefs ,

Others (please specify):

Water quality changes since LCS construction

Are there episodes of water turbidity since construction?

No , Rare , Often , Permanent

Were there episodes of water turbidity before construction?

No , Rare , Often , Permanent

Has water quality otherwise been affected (for example, more or less detritus accumulating)?

Please describe:

How would you qualify the following recreational activities at or around the LCS? (DK = Don't know)

Fishing (recreational) Intense Moderate Scarce Absent DK

Seafood collecting Intense Moderate Scarce Absent DK

Wildlife watching Intense Moderate Scarce Absent DK

Sunbathing and similar Intense Moderate Scarce Absent DK

Scuba diving Intense Moderate Scarce Absent DK

Sailing and similar Intense Moderate Scarce Absent DK

Other (specify) Intense Moderate Scarce Absent DK

Could you describe those recreational activities before the LCS was built? (DK = Don't know)

Fishing (recreational) Intense Moderate Scarce Absent DK

Seafood collecting Intense Moderate Scarce Absent DK

Wildlife watching Intense Moderate Scarce Absent DK

Sunbathing and similar Intense Moderate Scarce Absent DK

Scuba diving Intense Moderate Scarce Absent DK

Sailing and similar Intense Moderate Scarce Absent DK

Other (specify) Intense Moderate Scarce Absent DK

Has that LCS had an environmental impact assessment before being built? Yes , No , Don't know

Could you give its references and location (specify)?

Has there been an economic study on that LCS,

before it was built? Yes , No , Don't know , References:

after it was built? Yes , No , Don't know , References:

G: Ecological aspects

What are the dominant species on the structures?

The rock barrier has favoured the development of marine fauna, being now fully covered with mussels and crabs.

What are the dominant species in the sediment and fish assemblages around the structures?

No information.

Were any environmental changes observed following the construction of the structure (e.g. increase of water turbidity, floating algal debris)?

There was an increase of water turbidity and floating algal near the shore because of a wrong disposition of old structures built to defend the coast from erosion; these old structures have not been removed.

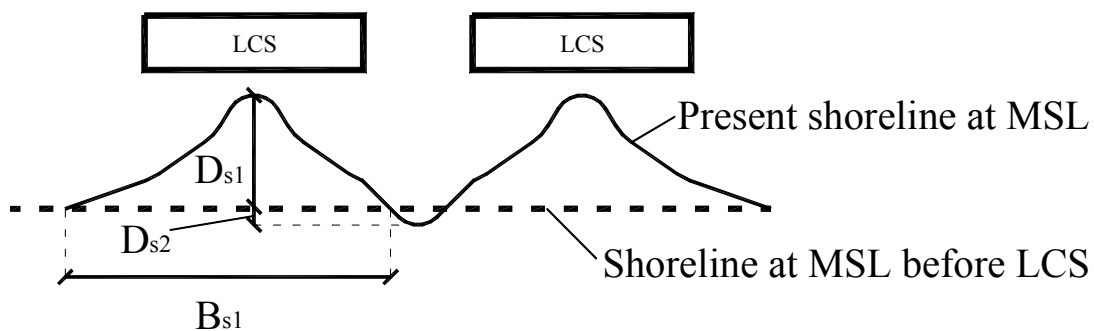
H: Coastal protection performance

H1 Bathymetry and beach evolution

Description of historical beach evolution before LCS was built (10-20 years).
 The coast has always kept a symmetry respect to the mouth of the river Volturno ,only since about 1980 the erosion is progressed more on the left side because of the construction of the armour of river.
 From 1964 to 1994 the erosion has removed 6 milion of m³ of sand.

Description of beach evolution after LCS was built up to now.
 The structures has not caused progress of the beach.

H2 Salient formation

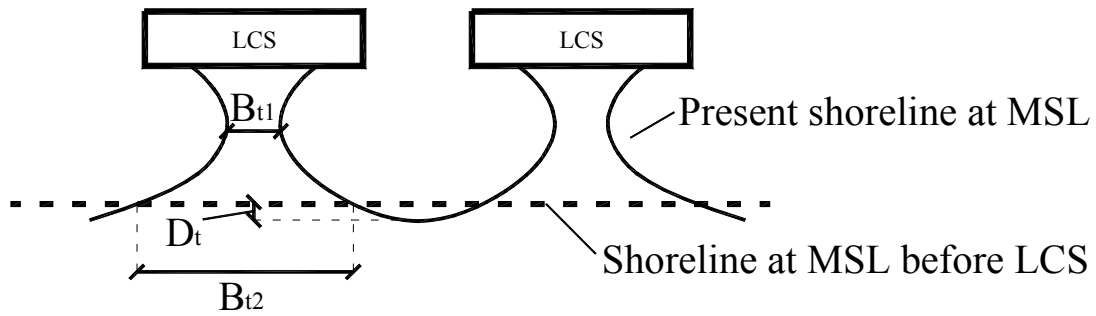


Parameter	Description	Fill in box	unit
D_{s1}	Max distance between new and old shoreline, seaward		meters
D_{s2}	Max distance between new and old shoreline, landward		meters
B_{s1}	Width of salient at old MSL		meters

There are no salient formation.

H3 Tombolo formation

There are no tombolo formation.



Parameter	Description	Fill in box	unit
D_t	Distance between new and old shoreline, landward		meters
B_{t1}	Minimal width of tombolo		meters
B_{t2}	Width of tombolo at old MSL		meters

H4 Renourishment

Description of renourishment (add more fill) (e.g. amount, how often)
 The amount of renourishment is constituted by 82361 m³ of tout-venant and 49261 m³ of big sand.

H5 Down drift erosion

Please insert a sketch if relevant.

Description of down drift erosion (morphological impact, e.g. down drift erosion length and maximal down drift shoreline retreat)
 No information

I: Problems in general

Description of other problems/impacts