



 **AQUAROCKBAG®**
- the flexible polymer net bag -

I. Product Overview

II. Advanced Net Technology

III. Applications

IV. Benefits

V. Filling

VI. Installation

VII. Projects

The AquaRockBag® has been developed as a result of 25 years of soil bioengineering experience using high performance nets filled with graded rocks as flexible, but ecologically advantageous, revetments.

- the nets have been proven to be the most robust nets in fresh and saline water
- they have the highest UV resilience and anti-abrasion properties of any net product
- they are a flexible and sustainable solution
- the smaller graded rock within reduces flow velocities
- these high interstitial spaces also provide enhanced habitat for organism
- AquaRockBags® is the most effective erosion control solutions

„Applied for Patent“ (Indian Patent Office - Patent Application Number 201821030314)

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The material

- is abrasion resistant
- is UV resistant
- has the greatest longevity
- has the lowest risk to the natural environment
- they are significantly more stable than nets made from recycled polymers
- Constant investment is made in net technology to improve engineering performance and to ensure minimal environmental impact



II. Advanced Net Technology

Technical Data Sheet

APPLICATION	River Training, Erosion control, Bank protection, Flood Control and Embankment works
STANDARDS	EN 13249-EN 13257:2016
BAG DIMENSIONS FILLED (APPROXIMATE)	190cms diameter x 40cms height when filled and placed
NETTING FOR BAG	Polyester material
SZUTEST NOTIFIED BODY NUMBER	2765

	2 Ton	4 Ton	
TENSILE STRENGTH MD	≤25KN/M	≤35KN/M	EN ISO 10319
TENSILE STRENGTH CMD	≤8.5KN/M	≤15KN/M	EN ISO 10319
ELONGATION AT MAXIMUM LOAD MD	15% MINIMUM	15% MINIMUM	EN ISO 10319
ELONGATION AT MAXIMUM LOAD CMD	75% MINIMUM	75% MINIMUM	EN ISO 10319
MASS / UNIT AREA	195 GMS/SQ. METER	300 GMS/SQ. METER	ISO 9864
THICKNESS @ 2 kPa	2 MM	2.4 MM	ISO 9863-1
STATIC PUNCTURE STRENGTH (CBR)	1500 N	2500 N	ISO 12236
RESISTANCE TO HYDROLYSIS TEST	Retained Strength 85%	Retained Strength 85%	NF EN 12447
MICROBIOLOGICAL RESISTANCE TEST	Retained Strength 80%	Retained Strength 80%	ENV ISO 12225
RESISTANCE TO CHEMICAL DEGRADATION MENTION A	Retained Strength 90%	Retained Strength 90%	ISO TR 12960
RESISTANCE TO CHEMICAL DEGRADATION MENTION B	Retained Strength 90%	Retained Strength 90%	ISO TR 12960
RESISTANCE TO WEATHERING TEST	Retained Strength 85%	Retained Strength 85%	EN 12224

DURABILITY TO BE COVERED WITHIN 1 MONTH FROM INSTALLATION DESIGN LIFE EXCEEDING 25 YEARS	EN 12224 Natural Soils pH range 4-9		Soil temperature <25°
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WE CERTIFY THE PERFORMANCE OF PRODUCT AS PER ABOVE PARAMETERS



International Geosynthetic Society

- * This information is provided for reference purposes only and is not intended as a warranty or guarantee.
Dimensions vary based on type of fill material
- * Internationale Geotextil GmbH reserves the right to change the specifications without prior notice.
- * Drag is not a functionality during use, it is a representative test



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III. Applications

AquaRockBags® are used in both freshwater and saline conditions

They are flexible, work far better with natural processes than other revetments, provide ecological benefits and can be vegetated over relatively short time scales.

AquaRockBags® work best under water and can be combined with softer soil bioengineering solutions above water level.

AquaRockBag® is not intended for use on high seas, in particular for protection and securing of submarine cables, pipelines or offshore wind power installations.

Applications

- River bank revetments
- Scour protection around bridges and other structures
- Temporary works solutions



III. Applications

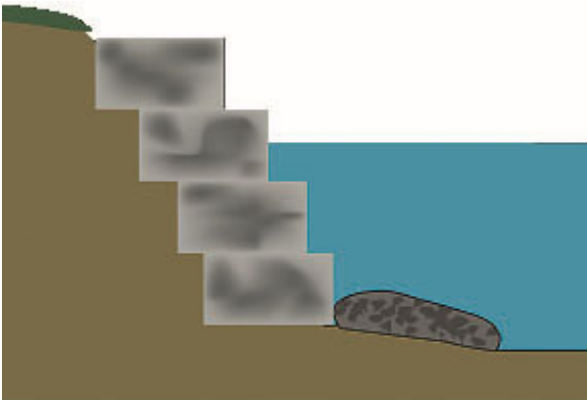
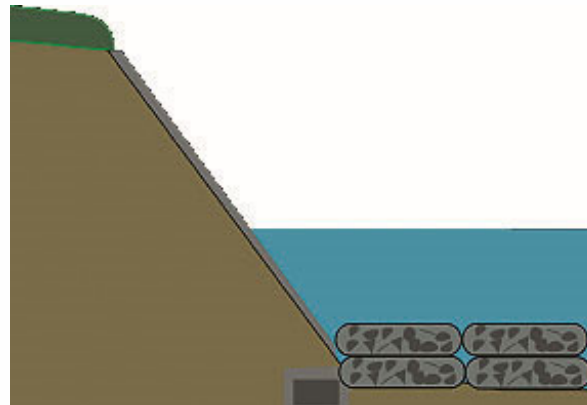
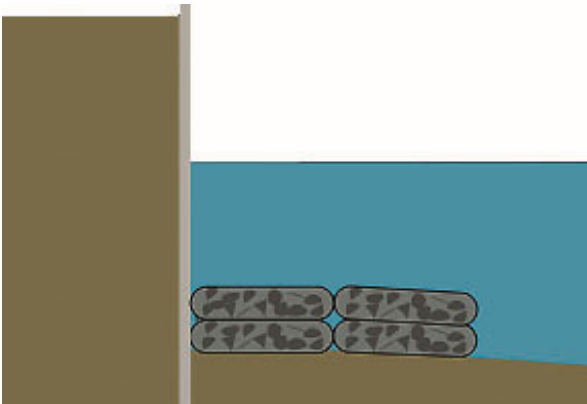
Applications

- Artificial reefs
- Shoreline protection
- Marine and coastal structures



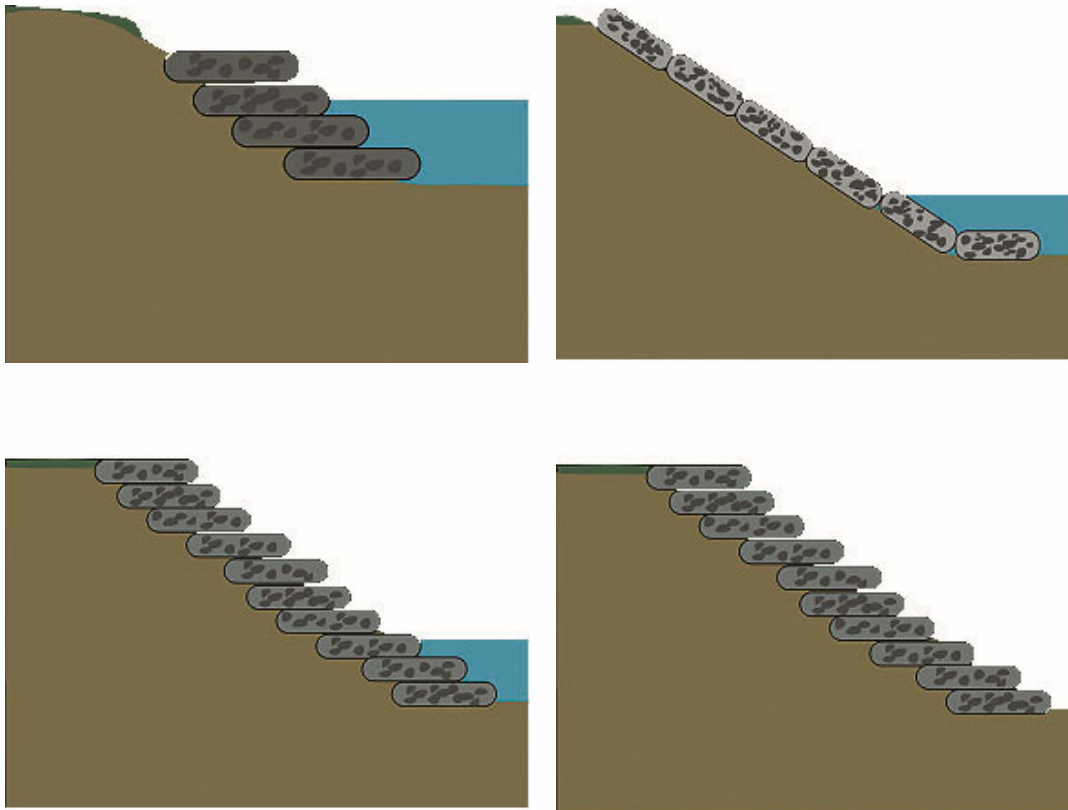
III. Applications

Protection of Bank Structures



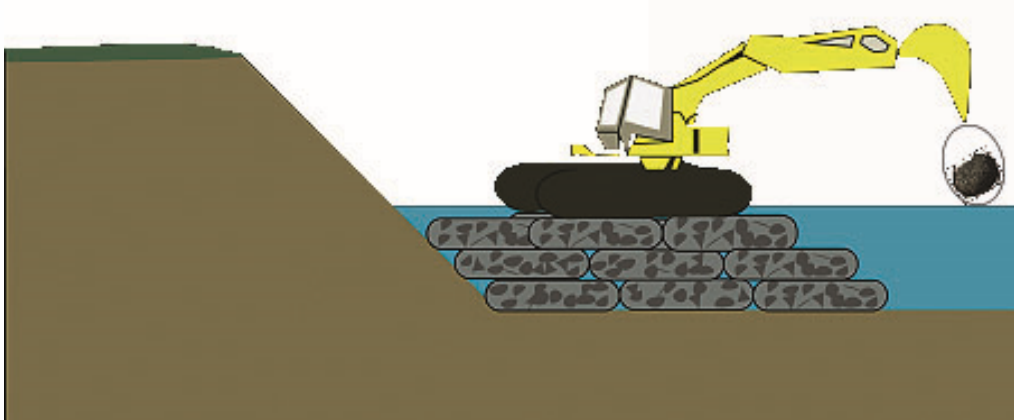
III. Applications

Bank Erosion Revetments



III. Applications

Temporary Works Solutions

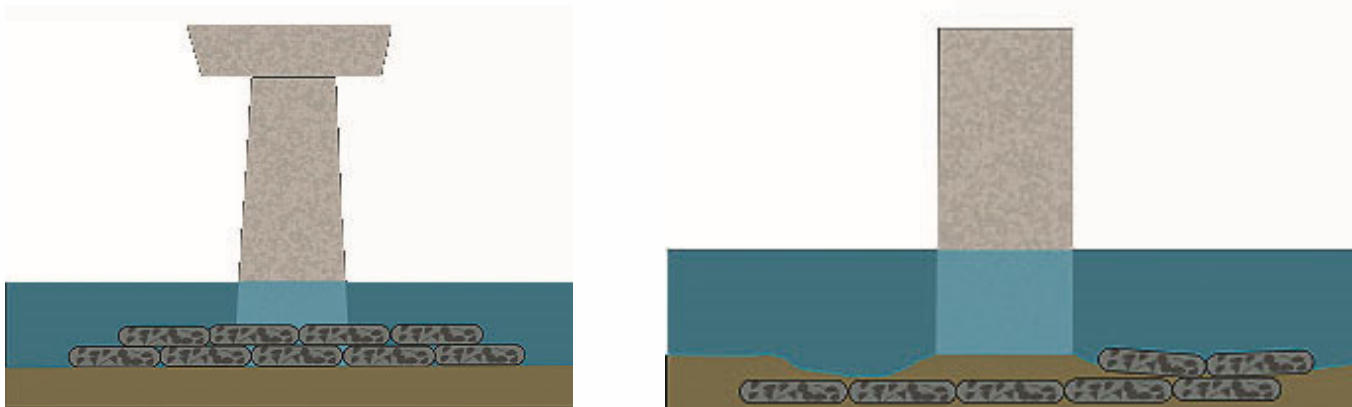


Combine with Soil Bioengineering Solutions

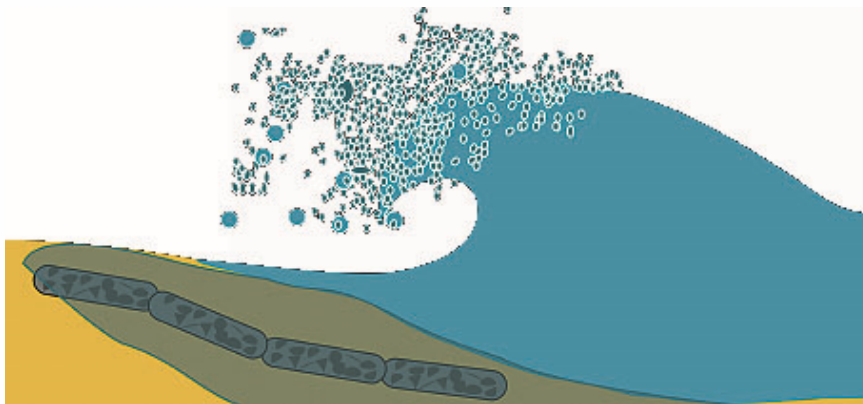


III. Applications

Scour Protection Around Bridges & Other Structures



Coastal Defence and Artificial Reefs



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IV. Benefits

Rapid and Safe Installation

- Rapid installation compared to filling wire mattresses on site with big savings on labour costs
- Can be installed in flowing water or below water level
- Units are pre-filled meaning so less labour is required to install (90% labour savings over gabions)
- Simple and quick to fill on site
- Can often replace large rock armour, concrete and rip rap with the added benefit of providing long term protection for soft/green engineering solutions
- Can be used in fresh or salt water
- Flexible system that contours to the surface
- UV stabilised nets are abrasion resistant and do not suffer from corrosion
- Health & Safety benefits due to no fabrication on site reducing accident risks
- Easy to move on site



IV. Benefits

Resilient protection whilst also providing habitats

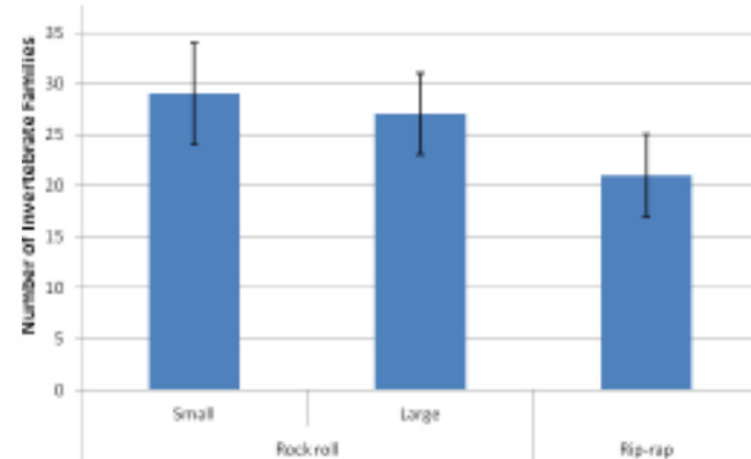


AquaRockBags® provide habitats for a diverse range of marine and freshwater invertebrates. Examples found in research from Swansea University include:
Top left to right: *Phyllodoce maculate* , *Capitella capitata* , *Scoloplos armiger*;
Bottom left to right : *Melita palmate*, *Carcinus meanus*, *Idothea pelagica*.

IV. Benefits

Ecological Benefits

- The stone sizing and grading within the AquaRockBag® has been developed to provide a balance between the structural and the optimum grading for ecosystem development and diverse biotic community habitat
- AquaRockBag® encourages fine accretion of sediment to enable vegetation establishment providing habitat for invertebrates, which in turn supports fish and water bird populations
- Unvegetated AquaRockBag® blend in easily with natural freshwater and marine sediments and provide substratum for numerous faunal and invertebrate species
- Many hard revetments deflect and reflect water energy which can cause erosion and scour issues elsewhere.
- AquaRockBags® absorb water energy, preserving natural processes and minimizing the impact on the substrate
- AquaRockBags® can be used in conjunction with Soil Bioengineering techniques as a hybrid solution



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V. Filling

Typical dimensional details of AquaRockBag®

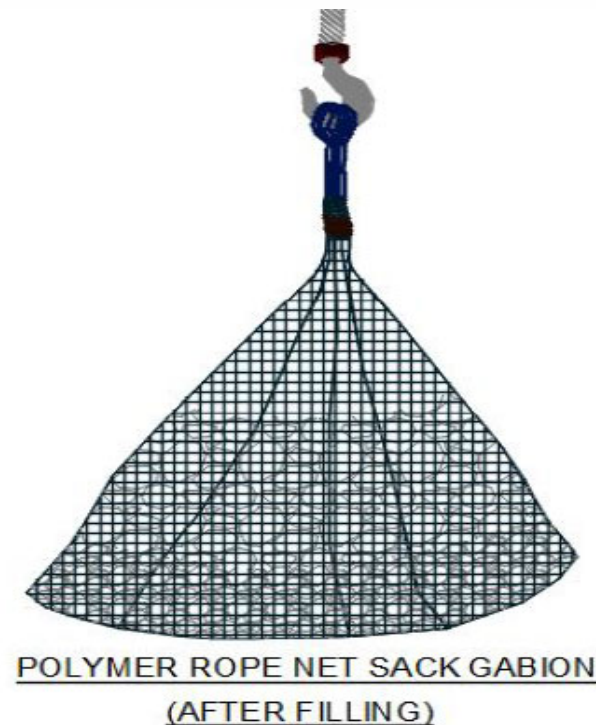
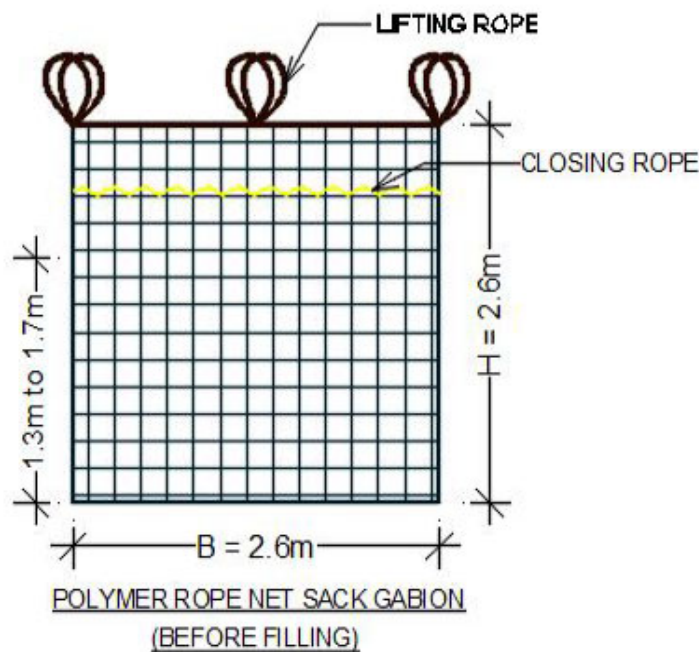


Figure 1: Polymer net sack gabion before and after filling for 2.0 cu. m

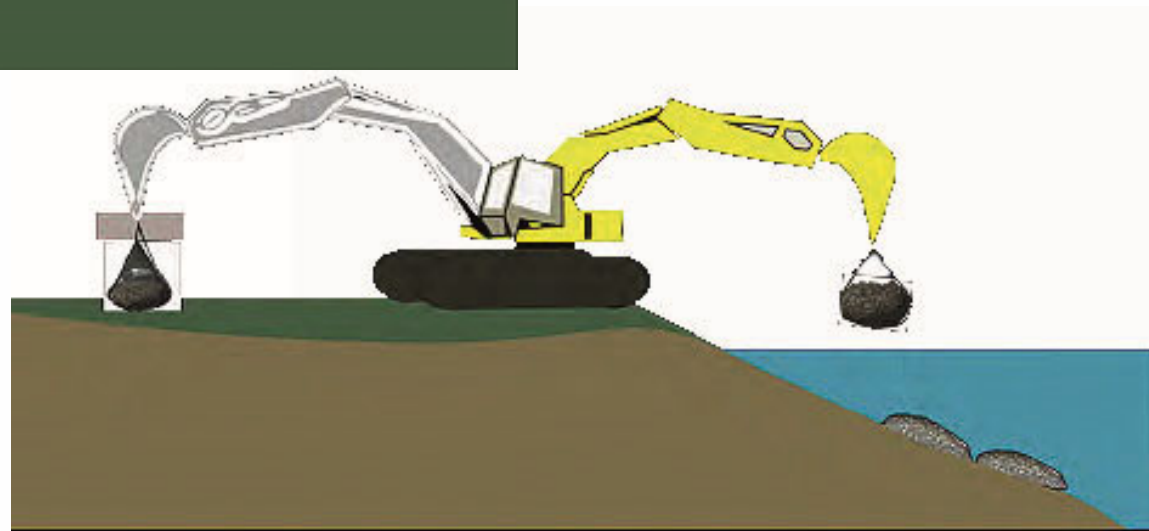
V. Filling

Filling AquaRockBags®



V. Filling

- AquaRockBags® are typically filled at the job site using a portable filling jig
- AquaRockBags® are very quick to fill and require basic site staff training
- A white marker rope indicates the filling level and is not to be exceeded
- Each net comes with a lifting eye and all ties



V. Filling



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VI. Installation

- AquaRockBags® are very quick and simple to fill on or off site and can be installed far quicker than other revetment types, saving site resources and cutting construction programme time on site
- AquaRockBags® are flexible and conform well to undulations on the surface of the ground. As a result, less ground preparation is required, compared to concrete block, rip-rap or gabion mattresses
- AquaRockBags® are easy to transport around site, are rapidly installed and can be positioned using GPS and released automatically using a quick hitch when installed under water



VI. Installation



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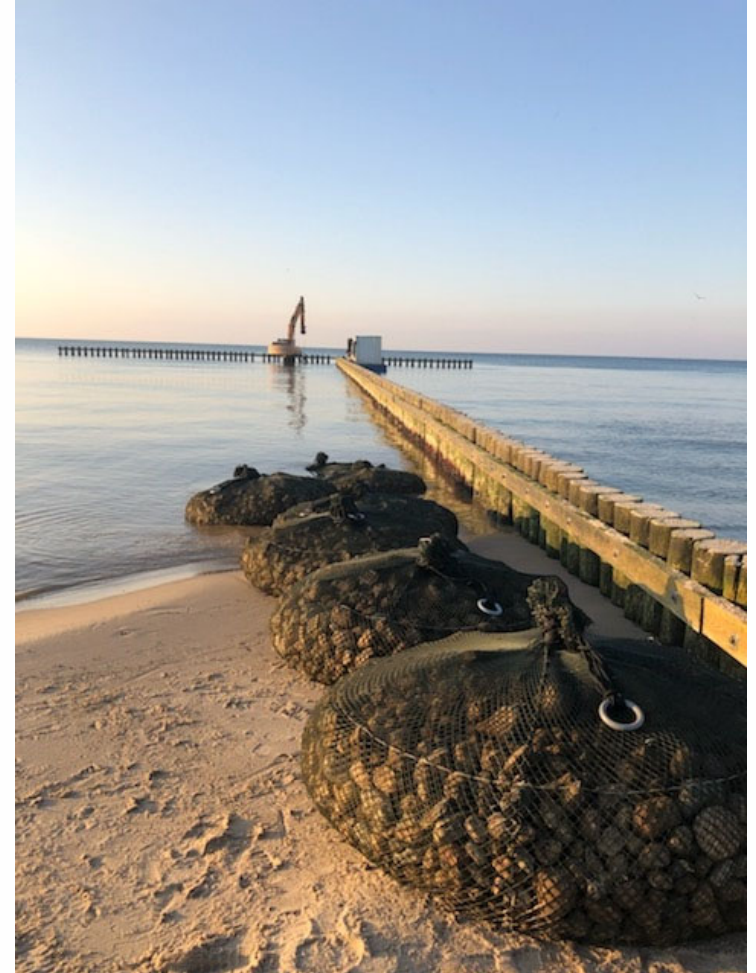
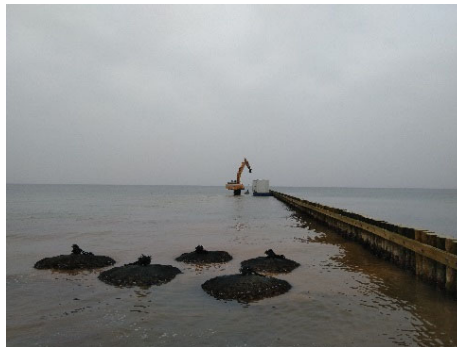
VII. Projects

United Kingdom



VII: Projects

Poland



Thank you for your attention!

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