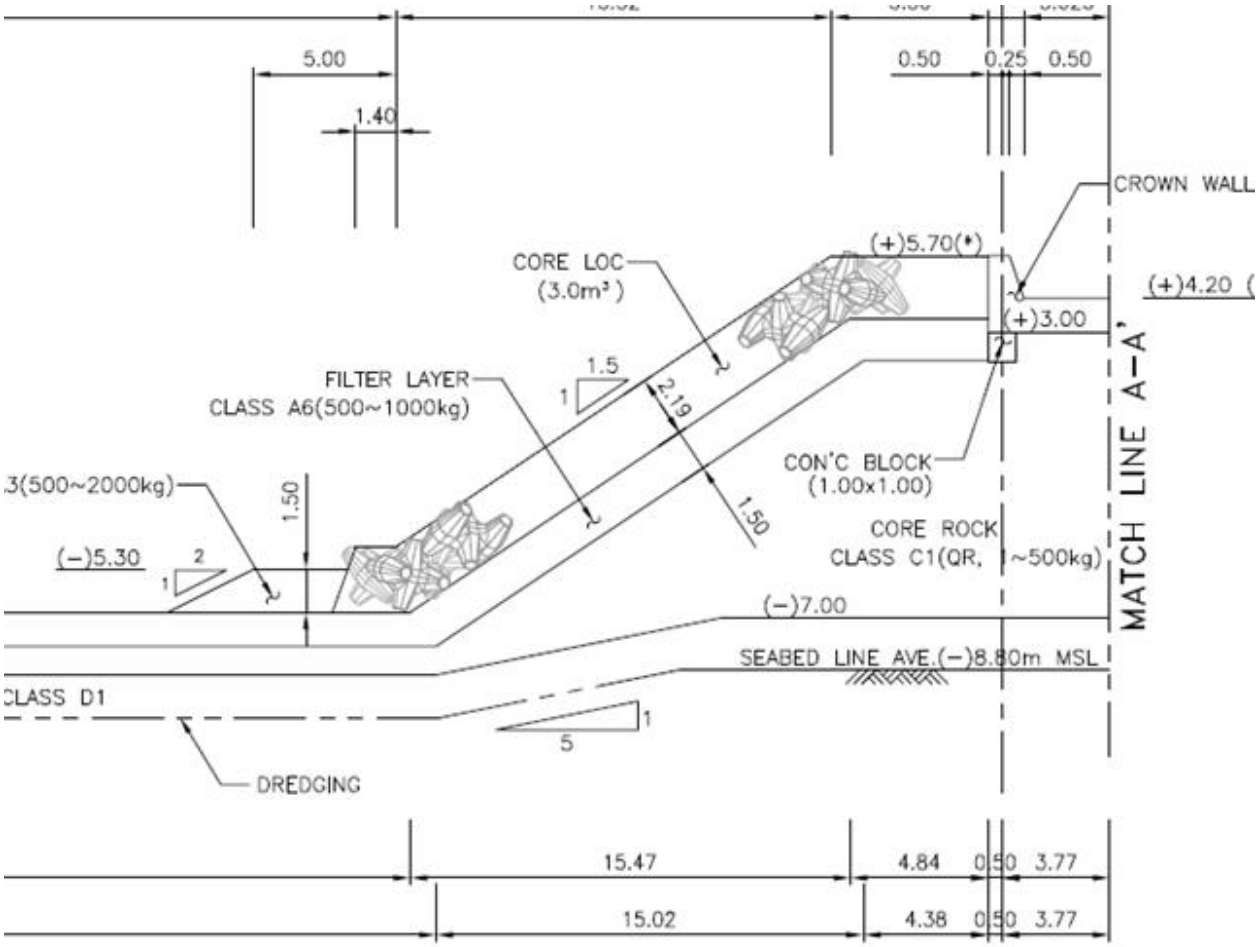
The certification procedure

The objective is to be able to deliver to a report of inspection which specifies that the built construction is technology compliant. A certificate of conformity to the ACCROPODE ™ technique, ACCROPODE ™ II, ECOPODE ™, CORELOC ™ or X-bloc® confirmed by the registered trademark CLAS TECHNOLOGY COMPLIANT recognizable by this stamp:

Step 1 Study the profiles

The profiles tell us the nature of the materials and the theoretical depth to which they must be found. They define the thicknesses of these materials. This is the reference set by the designer.

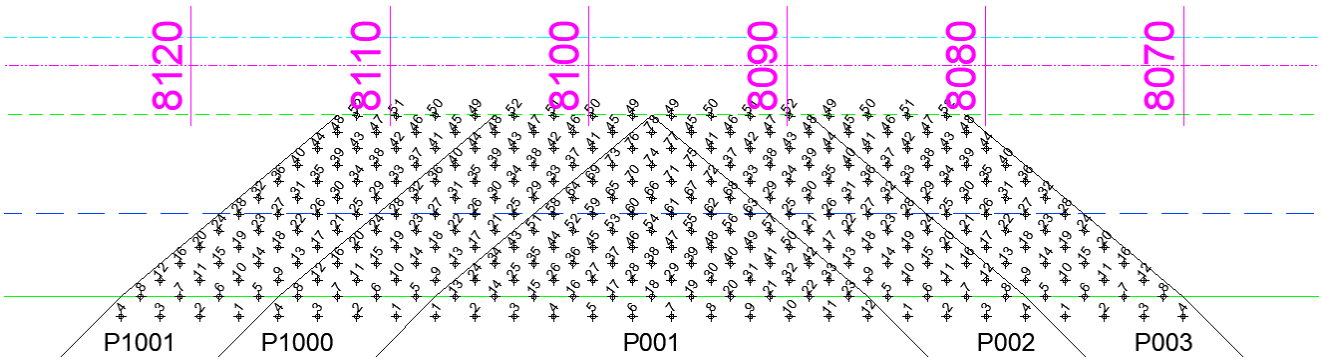
CORELOC ™ armour profile



Study 2 The placement drawings

The installation plan tells us if there is a peculiarity on the laying area, such as a rapid change of depth or the connection between two block sizes, for example.

ACCROPODE ™ II placement drawing



Step 3 The TID

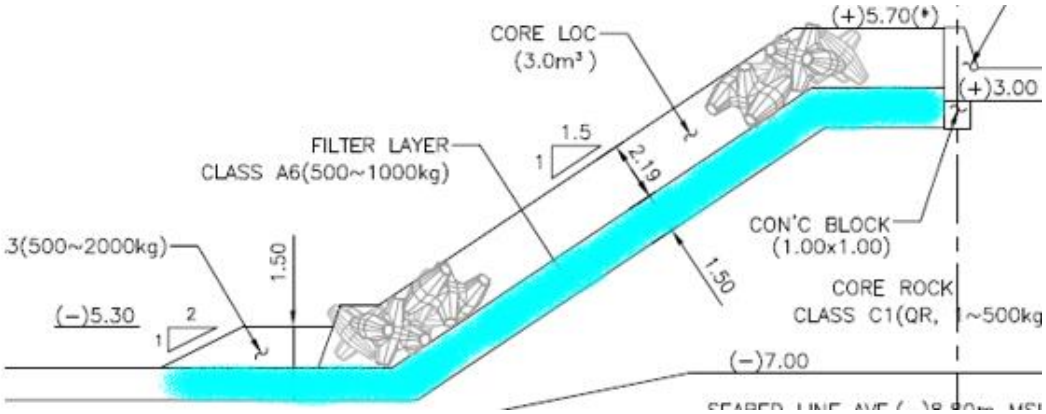
TID can evolve from year to year depending on advances in technical knowledge and feedback. CLAS uses the TID of your project to the exclusion of any other.

For the ACCROPODE™, ACCROPODE™II, CORELOC™, and ECOPODE ™ blocks we use the TID established by CLI and for X-bloc® the TID established by DMC.

Step 4 The inspections

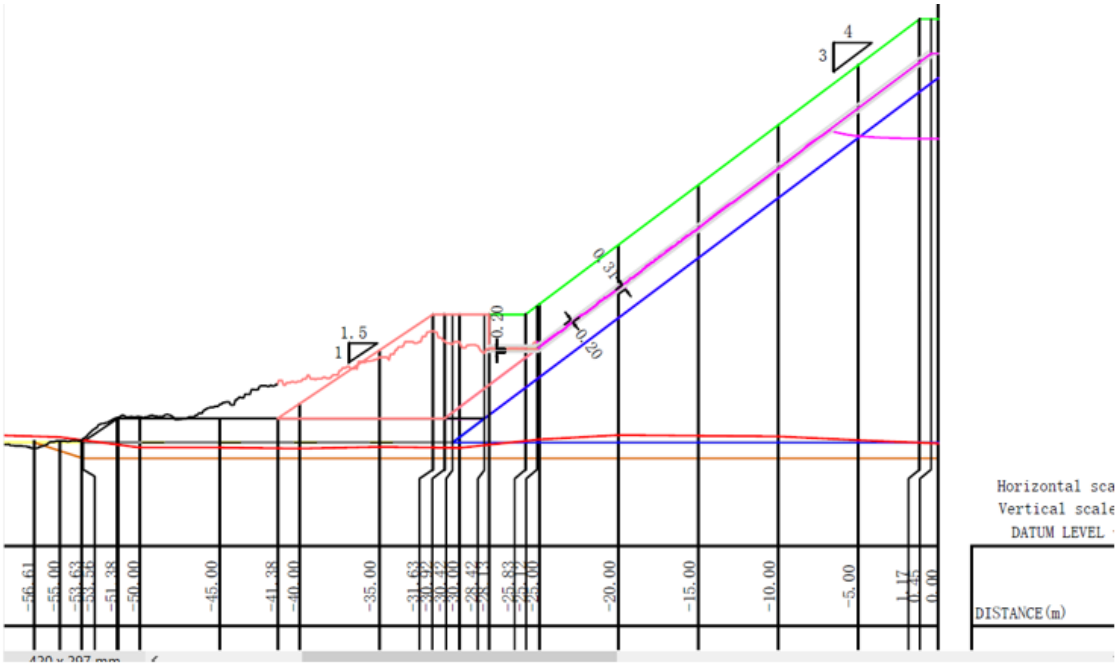
Being an inspector cannot be improvised. It is a profession in its own right that can be learned. Being a professional diver is not enough, but it is essential. An inspector must be rigorous, critical, have a sense of observation and authority.

4-1 Inspection of the horizontal berm and the underlayer



Concrete Layer Assistance & Survey

Inspection using a multibeam echo sounder showing the profile perfectly within +/- 0.2 meter tolerances and approved by the company and customer survey department



CLAS inspection on the same profile showing gaps and protruding rocks on an irregular profile de + or – 1,7 meters and more exactly on the same profile.

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This is not an extreme case and it is not uncommon. The underlay does not conform to design or technology. The installation of the ACCROPODE™, ACCROPODE™II, ECOPOD ™, CORELOC™ or X-bloc® blocks, which must comply with the tolerance rules of the underlayer as defined in their respective TID, is not possible. This marks a stop point. CLAS inspectors produce a video with measures to justify their decisions.
When the underlayer and the horizontal berm are approved the placement of ACCROPODE ™, ACCROPODE ™ II, ECOPODE ™, CORELOC ™ or X-bloc® blocks is allowed.

Technology Compliance Report for ACCROPODE ™ II underlayer

			Project	KUANTAN	
			SLOPE INSPECTION above water		
			PANEL	CHAINAGE	
			LEE WARD SIDE	FROM	TO
				3610	3630
DATE	29 03 2017				
	YES	NO	REFERENCE	INSPECTOR	
PHOTO	X		CH3610 3630 UL AW LW	Pascal JARD	
COMMENTS					
The slope is generally too smooth . This can be the origine of settlements and lack of porosity. Furthermore this kind of placement is slow. Report CLAS 2017 03 30 CH3610 3630 UL AW				PLACEMENT OF ACCROPODES POSSIBLE	
				YES	NO
				X	

The ACCROPODE ™, ACCROPODE ™ II, ECOPODE ™, CORELOC ™ or X-bloc® blocks are checked several times a day to limit disassembly.

Inspection of an ACCROPODE ™ II armour and evidence of bad interlocking of one ACCROPODE™II

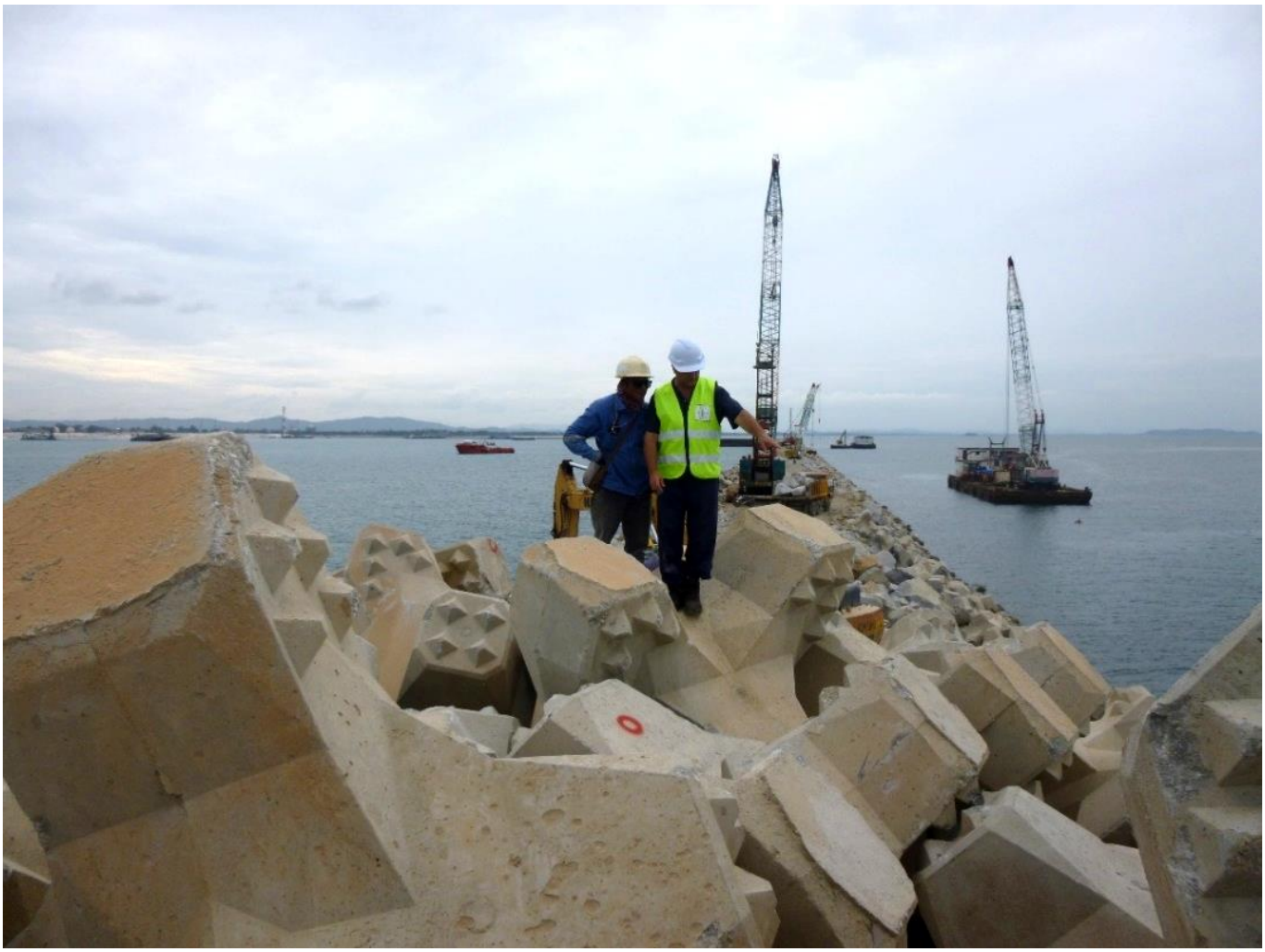
When the placement is TECHNOLOGY COMPLIANT the ACCROPODE™II armour is filmed

The contractor must then place the toe mount protection before building the armour out of the water. As long as the underwater armour is not properly wedged by the toe mount, the ACCROPODE™, ACCROPODE™II, ECOPODE™, CORELOC™ or X-bloc® blocks are suspended.

The contact between the toe mount and the armour blocks is controlled and filmed.

When the toe mount is in place, ACCROPODE™, ACCROPODE™II, ECOPODE™, CORELOC™ or X-bloc® can be placed out of the water.
The construction out of the water is the subject of the same attentions as the construction under the water. CLAS inspectors conduct a walking tour that is essential and a drone inspection.

CLAS inspector on an ACCROPODE™II armour



The walking tour is completed by a drone inspection. CLAS has developed a special procedure for the use of the drone, which allows us to collect all the information that the walking tour does not give.

X-bloc® inspected by drone

When the carapace is technically compliant, the crest can be laid and inspected in the same way. Non-compliance marks a stopping point.

Drone inspection of an ACCROPODE ™ II armour crest

Each step of the construction that marks a stop point in the event of non-compliance gives rise to an inspection report. Once the various construction steps have been approved and the proof of compliance established, the CLAS inspector drafts the Technology Compliance Report.

Example de TCR established for an X-bloc® armour

TECHNOLOGY COMPLIANCE REPORT

PANEL 1069

	PANEL 1069			
	SLOPE INSPECTION BY DIVER			Date : 13 08 2016
FROM CH	TO CH	VIDEOS Ref.	PLACEMENT OF X-bloc POSSIBLE	INSPECTOR
1750	1765	UL-AW- 1750-1765	Yes	SKIERNIEWSKI

FOLLOWING OF THE PLACEMENT OF X-Bloc			
NUMBERS	DATE	RISK	INSPECTOR
Step 1 unit 1 to 55			
1-4, 6-9, 11-14,16-19	14 08 16	0	SKIERNIEWSKI
21	15 08 16	0	SKIERNIEWSKI
5, 10, 15	25 08 16	0	SKIERNIEWSKI
20, 22-30	26 08 16	0	SKIERNIEWSKI
31 to 35	28 08 16	0	SKIERNIEWSKI

Compliance Technology Form step 1 – Underwater placement				
Panel	1069	Video underwater	Ref.	No visibility
Density		Internal	Date of approval	21 09 16
Checked Internally			YES	NO
1	Are blocks forgotten on second layer on the armour ?			X
2	Are blocks out of profile			X
3	Is there blocks not touching the slope ?			X
4	Is there not secured blocks by two other block above and free to move ?			X
5	Are the blocks placed in mostly varied attitude ?		X	
6	Is it possible to extract the underlayer through the gaps between blocks ?			X
Level of risk on this panel from row 1 to row 11			0	
Level of qualification of the inspector	Name and signature		Stamp	
Senior Inspector	*Eric SKIERNIEWSKI*		CLAS Prat de Baix d'Envalira Edifici F Planta baixa Porta 2A Soldeu Canillo AD100 Andorra NRT L-710305-Z Numero Registral 15147 www.clascertification.com	

Lorsque toutes les étapes de la construction sont franchies, de la fondation de l´ouvrage jusqu´à la crête, CLAS remet au Maître d´Ouvrage ou à son représentant, le document final complet au plus tard dans la semaine qui suit la fin de la construction.

Tous les documents assurance qualité établis par les inspecteurs de CLAS sont mis à jour en temps réel sur site durant la construction. L´intervention de CLAS ne génère aucun retard dans la prise de décision et aucun retard de payement pour l´entreprise.

La procédure de certification mise en place par les inspecteurs de CLAS apporte la certitude de disposer d´un ouvrage ACCROPODE™, ACCROPODE™II, ECOPODE™, CORELOC™ ou X-bloc® de CLASSE A

Concrete Layer Assistance & Survey

When all stages of construction are completed, from the foundation of the work to the crest, CLAS hands over to the owner or his representative, the complete final document no later than one week after the end of the construction.

All quality assurance documents prepared by CLAS inspectors are updated in real time on site during construction. CLAS's intervention generates no delay in decision making and no delay in payment for the contractor.

The certification procedure put in place by the CLAS inspectors provides the certainty of having ACCROPODE ™, ACCROPODE ™ II, ECOPODE ™, CORELOC ™ or X-bloc® CLASS A

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