



## The project partners

The following parties have decided to work together on the Ellewoutsdijk project:

- Municipality of Borsele
- Projectbureau Zeeweringen (Coastal Protection Project Bureau)
- Rijkswaterstaat (Department of Transport, Public Works and Watermanagement)
- Province of Zeeland
- Waterschap Zeeuwse Eilanden (Water Board)
- ComCoast
- Vereniging Natuurmonumenten (National Heritage and Monuments Association)

## Colophon

### Project management ComCoast

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More information on the ComCoast project can be found on [www.comcoast.org](http://www.comcoast.org)

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### Photography

Rijkswaterstaat; Projectbureau Zeeweringen; Nelle Houtekamer; Limit Fotografie. Aerial photograph: Joop van Houdt Fotografie with thanks to the Schelde InformatieCentrum

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# ComCoast

## Project Ellewoutsdijk (NL)

## What is ComCoast

The countries bordering the North Sea wish to ensure that the coastal area remains safe and liveable, even if the climate changes and the sea level rises. Denmark, England, the Netherlands, Germany and Belgium are therefore pooling their resources in the fight against flooding. Within the ComCoast project, they are developing and demonstrating new methods for managing and developing the coastal zone. The goal is to make the coastal area a safer and more attractive place to live, to undertake new business initiatives, and to enjoy recreational activities.

These countries aim to accomplish this by working together with local residents, entrepreneurs, government organizations and organized interest groups to find environmentally and economically durable solutions for flood safety which are also appropriate to the local social and cultural setting. Communication with residents and other interested parties is therefore an important element of ComCoast.

ComCoast is subsidized by the EU (programme Interreg IIIb North Sea).

The seaward side of the new dike is strengthened with a layer of open asphalt. This layer is covered with soil allowing grass to grow on.

The port of Ellewoutsdijk is part of the sea defence. The breakwaters are strengthened.



The seaward side of the old dike is strengthened with rubble mound penetrated with asphalt at the lower stretch. The upper stretch is strengthened with concrete blocks.

The landward side of the old dike is strengthened with open asphalt covered with soil allowing grass to grow on.

The crest is strengthened with asphalt.

Fort Ellewoutsdijk will occasionally have 'wet feet'. According to calculations this will happen approximately once every 50 years.



## The most important milestones in the process

creation of ComCoast-Ellewoutsdijk project group	info evening about the work on the dike and about ComCoast for all interested parties and residents	residents and interested parties receive the report of the information evening	Natuurmonumenten becomes member of project group to ensure that the plans can be coordinated	all interested parties receive a letter about the progress of the project	PBZ consults with the water-sport association regarding the consequences for the harbour	consultations with environmental protection organizations with regard to the environmental assessment	Projectbureau Zeeweringen consults with the project group regarding the definitive design; the water board agrees	background information about the project and ComCoast available for a broad public	consultations with watersport association about modifications to the design	newsletter to residents about the project's progress	formal process whereby interested parties can contribute and have a say in the matter	information evening and opening of the exhibition	construction of splash-over resistant dike
November 2004	February 2005	April 2005	November 2005	November 2005	January 2006	March 2006	March 2006	Spring 2006	May 2006	June 2006	Juli-Dec. 2006	March 2007	April-July 2007



## Pilot Ellewoutsdijk

One of ComCoast's 10 pilot projects involves strengthening the dike near the village of Ellewoutsdijk in the Netherlands. There are two sea dikes next to the village: a new higher dike (1980) on the edge of the village and an older lower one somewhat closer to the sea. Between the dikes lies a historic fort owned by the 'Vereniging Natuurmonumenten' (National Heritage and Monuments Association).

Every five years, the Dutch authorities responsible for managing the dikes make an assessment as to whether the dikes still comply with legal requirements. The assessment carried out in 1996 determined that in many places the stone revetments on the dikes were not strong enough. As it turns out, the sea waves are stronger than previously thought. The 'Projectbureau Zeeweringen' (Coastal Protection Project Bureau) has been assigned the responsibility of replacing all stone revetments declared unfit.

Both dikes near Ellewoutsdijk are also not strong enough to safely withstand a superstorm level such as would

occur with a frequency of once every 4000 years. Raising the level of the new dike is not a desirable option, as it would come at the expense of the fort. That is why the Projectbureau Zeeweringen has worked together with ComCoast to find a different solution to maintain safety standards for this location.



## Shared design



Working together with ComCoast, Projectbureau Zeeweringen produced an innovative design for strengthening the dikes at Ellewoutsdijk, under which the two dikes on both sides of the fort were both strengthened. The older dike closer to the sea was strengthened on the bottom with a cover of quarry stone and asphalt and on top with concrete columns. Besides that, also the crest and inner slope were reinforced, which makes the dike resistant to large volumes of overtopping water. This dike can now withstand a super storm. Under such extreme conditions, waves will wash over the dike, but the dike cover can now withstand such action. The new dike on the other side of the fort can also withstand splash-over, as it has also been strengthened with asphalt. Together, the

dikes form a strong flood protection zone. Once every 50 years on average, a few decimetres of water will collect between the two dikes, and once every 100 to 250 years, 1 m or 2 m of water will collect. This will not pose a threat to the safety of the area or the fort.

The partners have organized various information evenings for the residents of Ellewoutsdijk, and an exhibition in the fort provides information about the operation of the splash-over resistant dike and the other ComCoast pilots.



## Plan Ellewoutsdijk

The plan for strengthening the dikes at Ellewoutsdijk consists of the following elements:

- Two sea dikes have been strengthened and together they now form a broad flood protection zone.
- The harbour has become part of the flood protection zone and has also been strengthened; the harbour building has been connected to the sewer system, and electrical power lines and water lines have been laid down to connect to the landings.
- The historic fort of Ellewoutsdijk has been preserved.
- The access routes for supplying and removing materials were chosen in such a manner as to ensure that the residents of Ellewoutsdijk and the summer birds along the coastline would be disturbed as little as possible.



example of a splash-over resistant dike

## Contributions by ComCoast

ComCoast contributed to the plan by encouraging cooperation between the various parties involved and communication with the local residents. ComCoast also contributed to the design of the flood protection zone.



To accomplish this, ComCoast took the following initiatives:

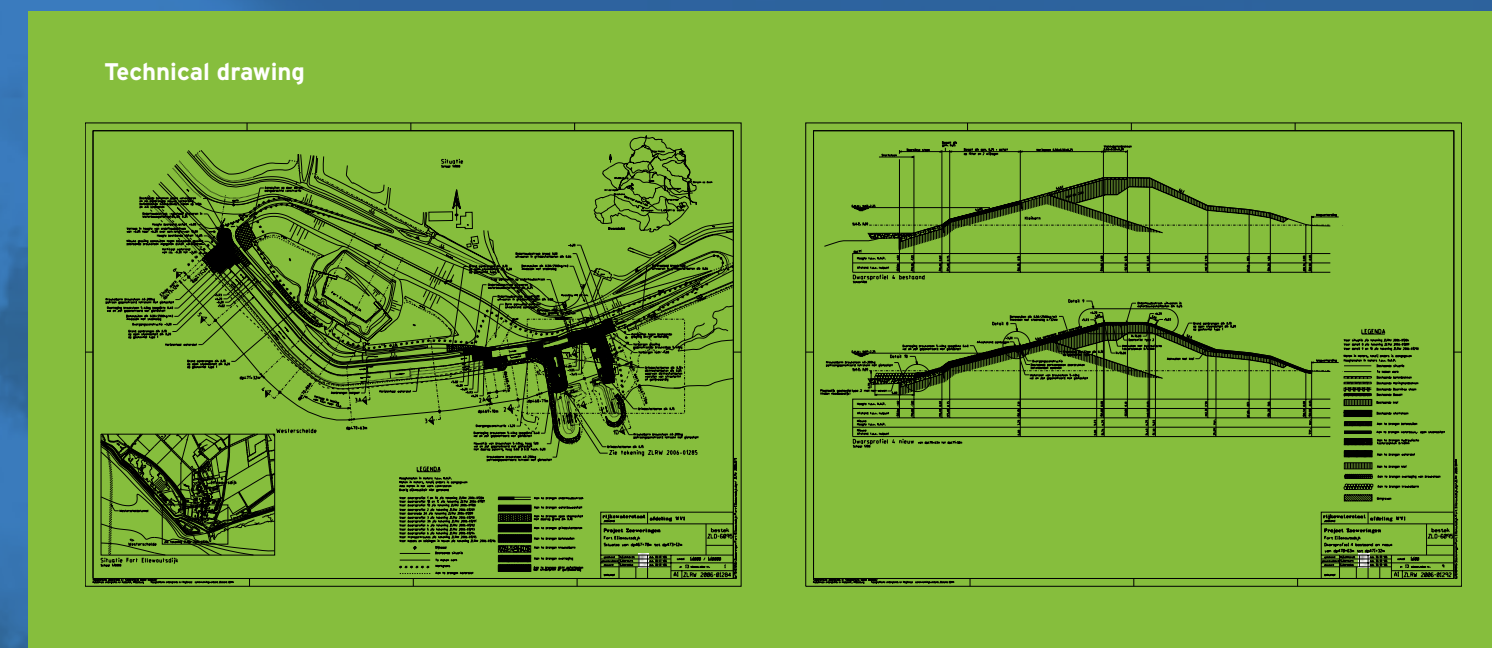
1. ComCoast encouraged mutual consultations between Rijkswaterstaat, the province, the water board, the municipality and Natuurmonumenten.
2. ComCoast organized various gatherings to inform the residents of Ellewoutsdijk about the solution chosen and the scheduling of the various activities involved.
3. Together with the other parties involved, ComCoast organized an exhibition in the fort of Ellewoutsdijk about the various ComCoast pilots and the splash-over resistant dike at Ellewoutsdijk.



## New insights and lessons learned

The dike strengthening project at Ellewoutsdijk was a small and relatively simple project, thereby making it possible to implement and complete it fairly quickly. This also makes it very suitable as a demonstration project.

The solution chosen for Ellewoutsdijk would also seem to be applicable for other locations in the region. As a result of the pilot project carried out at Ellewoutsdijk, this type of solution has become more widely known, and this will facilitate its acceptance at other locations.



### All ComCoast projects

1. Rømø (DK)
2. Nessmersiel (D)
3. Polder Breebaart (NL)
4. Hondsbosse Zeewering (NL)
5. Ellewoutsdijk (NL)
6. Perkpolder (NL)
7. Kruikeke - Bazel - Rupelmonde (BE)
8. Hamme Lippenbroek (BE)
9. Abbotts Hall (UK)
10. Horsey Island (UK)