

Le Havre – Port 2000: a move towards the environmental restoration of the Seine Estuary: Part 1

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The Port 2000 operation, which had its first operations in March 2006, was born from the will of the French State to position Le Havre as a main gateway for the flows of containerised goods.

The first phase consists of four quay berths over a total length of 1.4 km. Two additional berths, which will be constructed further on according to the requirements of the terminal operators, are already scheduled and funded. Six additional berths will be built later on, according to traffic requirements.

This huge port operation has also provided the opportunity to initiate a real move towards the environmental restoration of the Seine Estuary.

The ecological interest of the Seine Estuary as well as the statement concerning its past led the Port of Le Havre Authority to implement a significant programme of environmental measures and work, within the framework of Port 2000, aiming at safeguarding and even developing its environmental functions. With a budget of about EUR 46 million, this programme is the fruit of the dialogue derived from the public debate and the cooperation between developers and environmental actors of the estuary (DIREN, Maison de l'Estuaire (Estuary House), environmental associations, fishing industry...), which is due to continue and is today a major asset for the Seine Estuary. The measures initiated concern the restoration of the mudflats and the creation of rest places for birds, but also, especially, measures in favour of the Nature Reserve, the development and ecological

management of a preserved area, the creation of an ecological beach, the fish observatory and the related monitoring system, the environmental training and information, the transfer and safeguard of protected species as well as scientific monitoring.

We are going to focus in the course of this paper, on the two most symbolic operations of this set of environmental measures – which resorted to dredging techniques for a large part – namely, the creation of mudflats in the Seine Estuary (part 1), near the Normandy Bridge and the creation of a resting islet in the Seine river, for sea birds, South of the Estuary (part 2), and then we will rapidly conclude on the strictly port works and the follow-up studies carried out during the works.

Restoration of mudflats in the Seine Estuary (M€ 23)

The construction illustrated by Figure 1 is particularly innovative for several reasons:

- First operation on such a scale (M€ 23, more than 100 ha involved) for the restoration and re-creation of mudflats in a French estuary, in addition, carried out in a Nature Reserve
- Use of maritime engineering techniques: physical and mathematical models, creation of breakwaters, mass dredging (more than 1.5 million c.m.) for purely environmental purposes

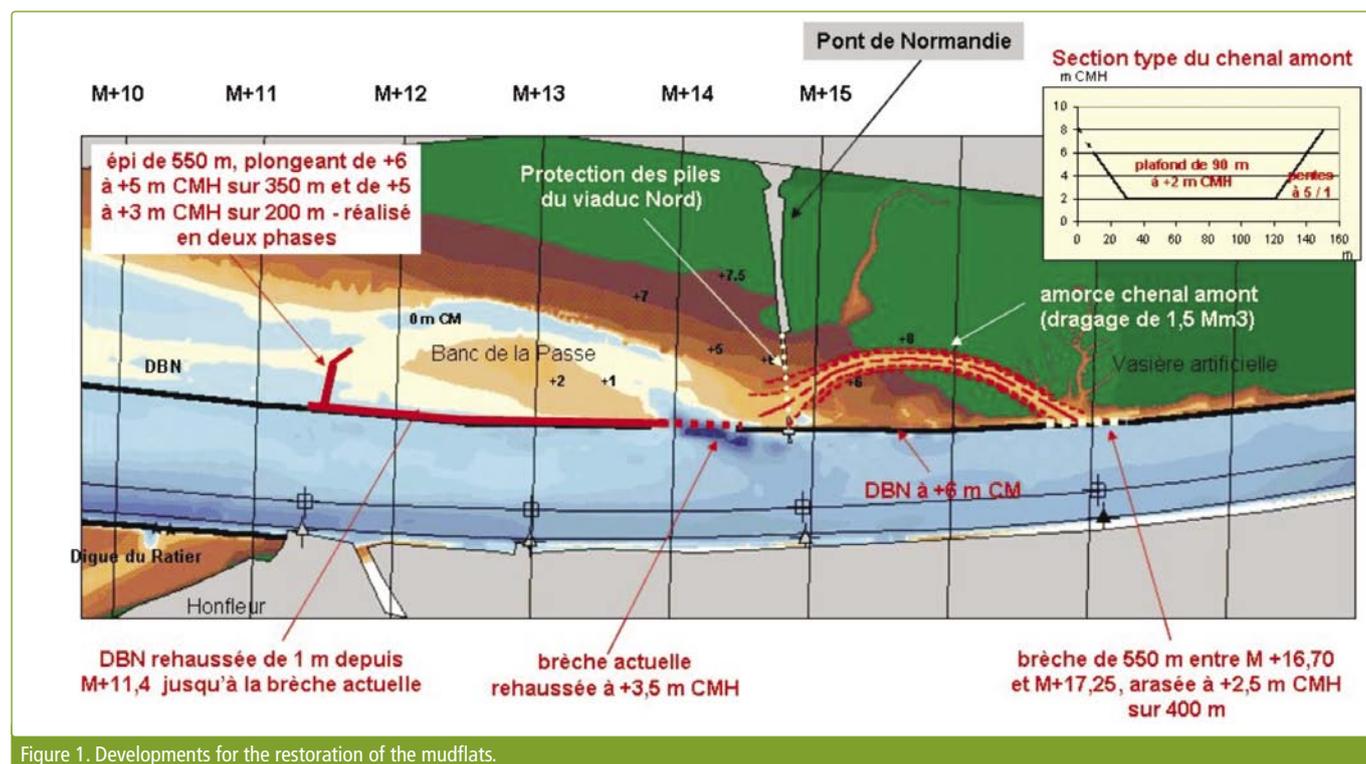


Figure 1. Developments for the restoration of the mudflats.



Figure 2. Groin subbase 10 months after work. The 'banc de la passe' area strengthens and the meander increases.

- Definition of the programme and then detailed project in close cooperation with the 'Scientific and Technical Council of the Seine Estuary Global Management' within the scope of a political will of global management of the Seine Estuary
 - Implementation of the principles of adaptive management for the downstream groin of mudflat creation, with the construction of the groin subbase as a first stage – with materials coming from dredging operations for purely port works – and only after one year of observations confirming the studies, construction of the whole groin (see Figure 2)
 - Invitation to tender for companies on the basis of a preliminary project drawn up by a specialised engineering company (SOGREAH), via a tender in 'design and build' for the construction of the environmental channel
 - Setting-up of monitoring over a period of 10 years minimum for the whole work aiming at carrying out a thorough follow-up study of the depths and the settlement of the new mudflats thus created
- In order to derive maximum benefit from the possible improvements due to company specific equipment, it was decided,



Figure 3. In the foreground: levelling of the opening. In the background: dredging of the channel with disposal in deposit area in the background.

despite the heavy procedure, to launch an invitation to tender for 'design and build' during the summer 2003.

In early 2004, a selection committee made up of the Port Autonome du Havre, Port Autonome de Rouen, the Direction Régionale de l'Environnement (Environmental Regional Division), the Maison de l'estuaire (the manager of the Nature Reserve) and the Le Havre Chamber of Commerce and Industry met to study the tenders. The SODRANORD company, a subsidiary of the Dutch group Van Oord, expert in studies and completion of dredging works, was selected, as its technical solution was the most respectful for the environment especially because putting dredged materials ashore was entirely carried out by pipes (whose placing technique avoided levelling work for a provisional access way which would have had very strong impact on the Nature Reserve in which it should have been created) and because the placing and removing of the pipes took place before the nesting period and after the young birds have left the nest.

In addition, this company proposed to use its Aegyrdredger whose special feature is that it can beach in which is thus particularly adapted to this work in shallow waters with emerging zones at low tide at the beginning of the work.

In other respects, following dialogue with environmental specialists, it was decided that the exhaust waters from the deposit areas would not be transferred by pipes to the Seine but would be disposed of upstream by certain 'filandres' (local name for the drainage channels of the slikke) in the mudflats in order to oversupply them with water and then improve their durability which is favourable to certain juvenile fish like the bass.

All this work was carried out between February 2005 and August 2005 (see Figures 3 and 4) especially owing to permanent dialogue with the manager of the Nature Reserve (The Maison de l'Estuaire/Estuary House) and the Port Autonome de Rouen (in order to avoid any risk of accidental coming of materials in the channel of this port).

The scientific monitoring set up will now make it possible to check the changes in the environmental channel, the rise of silt materials on the 'banc de la passe,' north of the breakwater of the Port of Rouen and the settlement of living beings in these areas. The first results of these studies show a sedimentological change in line with the forecasts in this area. The settlement of living beings does not seem to have suffered from the works.



Figure 4. Environmental channel.

End of part 1. Part 2 of this article will focus on the creation of a resting islet in the Seine river, for sea birds, South of the Estuary, and then conclude with the port works and follow-up studies carried out during the works.

The original version of this paper was presented at the CEDA Dredging Days 2006: Dredging and sustainable development (1-3 November 2006, Tangier, Morocco). It is reprinted here with the kind permission of the Central Dredging Association (CEDA).

ABOUT THE ORGANISATION

Le Havre is the fifth biggest European port for tonnage, the biggest French port for external trade, and the biggest French port for containerised trade. With its wide range of port terminals, Le Havre can process every type of cargo, whether in liquid or dry bulk format, or general cargo (containers and ro-ro traffic) or dangerous goods.

Owing to its ideal geographic location at the head of the ports of the northwest seaboard of Europe, Le Havre is most often included in the round trips of large liner ships as the first European port of call on import or last port of call on export. As a deep-water seaport, Le Havre can accommodate the largest vessels (containerships with a capacity of more than 9,000 TEU, oil tankers up to 500,000 dwt). Accessible around the clock, seven days a week and all year through, the port of Le Havre offers fluid inland connections throughout western Europe, by waterway (feeder/short sea) and inland transport.

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