



PORT AUTONOME DU HAVRE



15 September 2005

PORT 2000 : A NEW PORT SITE DEDICATED TO CONTAINER TRAFFIC

UPDATE ON CONSTRUCTION WORK IN PROGRESS

Today the shipping industry requires the port of Le Havre to provide nothing less than the best competitive terms and conditions to accommodate, handle and load the largest containerships in the world. Port 2000 comes up to these expectations by significantly improving the performance and capacity of the Port of Le Havre.

The goal of the Port 2000 project is to develop a complex of port facilities designed to handle the largest containerships in the industry. It will improve transfers between ships and expand upon inland connections by rail, road and river. It will also help to improve France's standing in European logistics.

After three years and a half work, port works for the first phase of Port 2000 infrastructures were completed in May 2005. In all, 9 kilometres of breakwaters, including more than 5 km for the outer breakwater of Port 2000 and 1.6 km of quays (for 1.4 km utilisable) have been built and 60 million cubic metres have been dredged or removed, including half of them being re-used in the structures themselves.

I. PORT 2000 DEVELOPMENT WORK

A - THE PORT 2000 PROJECT SUMMARY

Port 2000 offers a potential of 12 quayside berths, 350m (approx. 1,100 feet) in length each for a total length of over 4 kilometres, together with large back-up areas permitting both rapid vessel-handling times and optimised outputs.

The first phase includes 4 berths. Two additional berths are already financed and will be built depending on the terminal operators' needs. Six additional berths will be built later on, according to traffic requirements.

These berths are accessible without passing through locks and without tidal constraints. They can receive the biggest present container vessels. The first berths permit ships with draughts to 14.50 m (approx. 48 feet) to dock at any tide and offer 500-metre (1,640 feet) wide back-up area. It will be possible to deepen the westernmost berths to a level that allows for the reception of ships with draughts to 17 m (approx. 55 feet).

In addition, Port 2000 offers :

- safe and secure nautical access,
- the ability to load multiple railcars or complete trains in the immediate proximity to the quays,
- dedicated river terminal directly linked to Port 2000,
- easy container transfers between the ocean-going vessels and feeders, as well as with other modes of inland transport.

The objective of the Port of Le Havre Authority, upon completion of the first 6 berths, is to double the handling capacity for container traffic through the Port to 3 million TEU by 2008. Le Havre handled 2,15 million TEU in 2004.

All work at the port is done under the strictest environmental standards. The eventual objective is to rehabilitate the entire Seine River Estuary, according to the ministerial decisions.

B - SELECTION OF SOLETANCHE-BACHY AND GTM CONSTRUCTION, AND START OF THE WORK

Following international invitations to tender issued in 2000, the Port of Le Havre Authority awarded contracts to companies, in the summer of 2001, for the construction of the infrastructures of Port 2000 beginning in the autumn of 2001.

The first contract, amounting to EUR 122 million (US\$ 121.59 million)¹, was awarded to Soletanche-Bachy for the construction of the first four berths (the service order for the start of construction was signed on May 29th, 2001).

The second contract for the construction of the breakwater and dredging of the ship channel, amounting to EUR 244 million (US \$ 243.19 million), was awarded to a group of companies led by GTM-Construction, a subsidiary of the VINCI Group (the service order for the start of construction was signed on August 24th, 2001).

In October 2001, Soletanche-Bachy began construction of the quay using the diaphragm wall technique. Marine construction of the breakwater and dredging of the Port 2000 access channel led by GTM-Construction began in early 2002. GTM has formed a consortium with a

¹ Conversion figures based on exchange rate of .9967 Dollars to every Euro

Belgian company, Dredging International, which has worked on site using several dredgers and service ships to extract the materials required to construct the breakwater and dig the future access channel.

II. CONSTRUCTION COSTS AND FINANCING FOR PORT 2000

Funding for the first 6 berths of Port 2000, the inland connections and the environmental aspects, will be provided by several partners, as superstructures are fully borne by terminal operators :

COST AND FINANCING BREAKDOWN BETWEEN THE PARTNERS					
(target cost as at end of works)					
in million €	Port	Environment	Close connections	Superstructures	TOTAL
T.E.N.	2.50		2.21		4.71
FEDER (European Fund)	33.10	5.00	4.02		42.12
Region :	19.44	9.91	23.20		52.55
'Département' :	19.44	9.91	20.20		49.55
RFF - SNCF			13.70		13.70
State :	160.10		37.82		197.92
PAH	433.60				433.60
Private Operators				275.00	275.00
Sub-total 1	647.27	45.73	101.15	275.00	1 069.15
TOTAL	693		101.15	275.00	1069.15

III. THE CONSTRUCTION SITE

A - THE QUAY

How is the quay built ?

The quay is made up of a diaphragm wall in the earth, 1.20m thick and 40m high built with successive panels, each measuring 6 m long.

Once the wall is built, earthwork 10 m high will be carried out in front of this wall for the construction of the capping beam and behind it 16m high to place anchoring tie-rods. The tie-rods which stabilise the wall transfer the stresses to a metallic wall 8.50 m high situated 45m behind the diaphragm wall.

This structure is completed by a travelling rail for container gantry cranes : the front rail runs on the capping beam and the rear rail on another reinforced concrete beam superficially founded on embankments. Materials in the front of the quay are removed down to the level (-

15.50 m) to enable the future ships to berth, using shore grab cranes from the level (+ 10.00) to the level (+ 6.00), and they are disposed of by dumpers in deposit areas located east of the worksite or in the future back-up areas of Port 2000, and then, by sea, by means of a dredger from the level (+ 6.00) to the level (- 15.50).

The construction of the quay in a few figures	
Overall length of the diaphragm wall	1,600 m
Earthmoving/backfilling at the rear of the quay	1,6 Mm ³
Concrete in the diaphragm wall	79,120 m ³
Concrete in the beams	30,700 m ³
Reinforced bars in the diaphragm wall	12,070 t
Reinforced bars in beams	2,083 t
Wall sheet-piles	2,260 t
Anchoring tie-rods	125,000 m
Gantry crane rails	2,900 m
Mooring bollards	134 u
Digging of the dock in front of the quay	11,4 Mm ³

B - THE BREAKWATERS

How are the breakwaters built ?

The breakwaters of Port 2000 are made up of two types of structures : the outer breakwaters which protect the port from swells and currents and a surrounding protection breakwater inside the port which delimits the future back-up areas.

The breakwaters are built according to the following technique :

- a substructure emerging at low tide is built on the sea bed with sand and pebbles removed when dredging the future access channel of Port 2000,
- then, a core of sand and pebbles, siliceous limestone fill materials protected by rock-fills of same and then hard rock-fills (quartzite) are successively placed on the substructure from ashore,
- For the outer breakwaters, these rock-fills which are too small to resist the swell action, are covered by concrete artificial blocks (Accropodes®).

Siliceous limestone rock-fills come from Trouville-la-Haule and hard rock-fills from the 'Cotentin'. They were carried by river or sea. The Accropodes® were made on-site.

The construction of the breakwaters in a few figures

Length of the outer breakwaters	:	5,790 m
Length of the inner breakwaters	:	3,200 m
Extension of the Rouen lower breakwater	:	750 m
Volume dredged for nautical access	:	45 Mm ³
Volume of accompanying dredging operations	:	3,5 Mm ³
Volume used in the structures	:	15 Mm ³
Volume of siliceous limestone fill materials	:	720,000 m ³
Volume of siliceous limestone rock-fills	:	292,000 m ³
Volume of hard rock-fills	:	340,000 m ³
Number of Accropodes®	:	32 000
Volume of concrete for the Accropodes®	:	55,000 m ³
Volume of concrete of the superstructures	:	37,000 m ³
Sizes of the caissons (L x H x w)	:	56 x 28 x 21 m
Weight of a caisson	:	13,000 T before filling 40,000 T after filling

How are the maritime accessways built ?

A new access channel connects Port 2000 with the present channel of the port of Le Havre. The entrance fairway of the new port is made up of 2 reinforced concrete caissons on which the breakwaters end. The maritime accessways will be completed by dredging. The dredged materials will be either re-used for the construction of the structures (breakwater substructure, embankment of the future back-up areas reclaimed on the sea and other embankments, beaches, aggregates for concrete...) or deposited at sea.

IV. COMPLETION OF THE PORT INFRASTRUCTURE WORKS

A - THE QUAY

Completed in February 2004, the 1,602 metres of diaphragm wall constitute the quay wall for the first four quay berths (that is 1,400 utilisable metres). The capping beam, which supports the front running rail for gantry cranes and the rear running rail were also completed on a utilisable length of 1,400 linear metres. From the end of 2004, the back-up areas have been made available to operators to develop their terminal, the arrival of the first gantry cranes being scheduled for mid-October 2005.

As from late December 2004, digging work for the dock in front of the quay was completed : About ten million cubic metres of materials have been removed and dredged. In early April 2005, the whole quay was finally accepted by the PAH.

B - THE BREAKWATERS

In all, more than 46 million cubic metres of materials have been dredged and the major part of them has been used for the construction of the breakwaters and back-up areas. Completed on July 29th, 2003, the inner breakwater (3,200 m), also called enclosing breakwater, delimits the future back-up areas (for the berths located west of the first four).

The outer protection breakwaters have been completed since November 6th, 2004 (the caisson-pierheads were floated on site in May 2004) and their superstructure is also completed. Their protection is carried out by rock-fills and Accropode® artificial concrete blocks (about 32,000 units have been made) as well as by a capping beam. A last dredging campaign is scheduled for the end of the year 2005, the coming-on-stream of Port 2000 being scheduled for the first six months of 2006.

V. UPDATE ON THE CONSTRUCTION WORK OF THE IMMEDIATE SERVICE LINKS

As early as their coming-on-stream, Port 2000 terminals will be directly connected with road and rail modes.

As the site developer, the Port of Le Havre Authority has initiated the works for the service links of Port 2000 as soon as late 2003, preparing the railway platforms of Port 2000 and creating the draining basins and network north of the future terminals so that the operators could develop their terminal.

The Port of Le Havre Authority is the contracting party for the rail immediate service links of the first phase of Port 2000 and the SCETAUROUTE Company is the project manager. The rail track platforms called northern lines (behind the future terminals) and the construction of 2,500 metres of rail tracks were completed in June 2005. The operating equipment for level crossing and rail switches are under installation. A second rail track, called southern line, with a dedicated main rail network, will be constructed in 2006/2007.

As for road links, the first phase of construction of the roadways serving the western entry is over. The construction of the 10-lane covered checkpoint (whose functionalities will evolve in time) has started this summer and will be completed by the end of the year 2005. The works for the inner service links include :

- the construction of roadways connecting the roundabout of Port 2000 with the "terminal de France" of GMP and the southern breakwater of Port 2000,
- the service link for the other terminals in the southern boundary of the CIM company.

The excavation work prior to the construction of the structure located east of Port 2000 (called structure n° 4) was completed in January 2005. In the autumn of 2005, 390,000 m³ of materials - said to be for pre-filling - will be placed on site on a length of 750 metres. They constitute the body of the future structure which will permit to lower the crossroads

between the Estuary highway and the railway line, by the year 2006, and the road will then go over the railway track.

For safety reasons, a double screen-wall, made up of filled containers, is installed between Port 2000 and the CIM oil terminal. The 1st phase of the construction works for roadways and foundations of this wall was completed in early 2005. The first containers were installed in September 2005 (duration of the works : 3 to 4 months). Installed for the end of the year, the walls are made up of about 900 new containers (said to be 'first-voyage' as they have carried goods from their place of origin to Le Havre) filled with sand and gravel coming from Port 2000 dredging operations.

As for **river links** : The organisation of the inland service links with Port 2000 has been entrusted to an operator : the SAITH - 'Société d'Aménagement des Interfaces Terrestres du Havre' (Development Company for Le Havre Inland Interfaces) -. The selected project plans to set up a common operation for all rail and river traffic of the south container terminals of the port of Le Havre on the following basis :

- a dedicated river terminal (located in the western part of the 'quai de l'Europe'),
- a rail yard behind the Port 2000 terminals including four rail tracks of 1,100 utilisable metres, served by 2 rail gantries,
- a system of rail shuttles transferring containers between these two poles and the main rail networks located east of Port 2000 (Port 2000 and Bougainville) in which the traffic of the terminals of Normandie, Ocean and Port 2000 will be handled.

Landscaped developments :

Between the screen-wall and the CIM, 620 trees (Italian poplars) were planted in February 2005 : They will form, in the long term, the landscaped screen hiding the CIM tanks from the left bank of the river Seine.

At the same time, a landscaped action for the immediate service links of Port 2000 is planned: it means the setting-up of large green areas, planted with bushes of trees, water surfaces and landscaped ditches and the planting of plants being local species as well as various kinds of grass on the roundabouts.

VI. UPDATE ON ENVIRONMENTAL ACTIONS

The environmental aspect of Port 2000 has been integrated, from the beginning, in the project. The very phasing of the construction site has been chosen to reduce the impact on the estuary to the minimum. In addition, more than EUR 46 million have been allocated to it (which is a première for port works), half of which for the restoration of the mudflats, a complex project but an essential one for life in the Seine Estuary.

The very first site carried out for Port 2000 has been an environmental work. The dune bird sanctuary was indeed completed in February 2002, whereas port works had just begun. One of the technical difficulties in Port 2000 will have been the completion of the two types of

work at the same time, all having to be studied, selected and implemented to limit the impact of the port works on the estuary environment and on sedimentology as much as possible (accompanying dredging operations, phasing of the breakwater works, design of the structures with maximum re-use of the materials of the site itself...).

This cooperation work between developers and environmental actors in a port construction site located in an estuary led to a close work with the different bodies concerned (DIREN - Regional Division of the Environment-, Maison de l'Estuaire -Estuary House-, environmental associations...). Being the result of the public debate, the cooperation initiated is due to continue and is today a major asset for the Seine estuary.

A - THE RESTORATION OF THE MUDFLATS, A MAJOR ELEMENT IN THE ENVIRONMENTAL PART OF PORT 2000

Begun in the summer of 2003 after simulations on models (carried out by SOGREAH with DIREN as the contracting party and under supervision of a committee of experts), the works for the restoration of the mudflats was completed during the summer of 2005. Several stages have indeed been thought necessary in order to give time to nature to take its course again.

The first step consisted in creating the substructure of the groin, in the summer of 2003, in the northern area of the estuary at right angles with the radar tower in Honfleur. The changes noted in situ (reduction in bottom depth and beginning of a mudflat) confirmed the studies, which permitted to launch the second phase of work. From September to December 2004, the groin was raised on almost all the length (500 metres) and the lower Northern breakwater on a length of 2,000 metres (downstream the Normandy bridge, between the opening and the groin).

The third and last stage of this programme aimed at improving the water circulation and creating additional mudflats upstream the Normandy Bridge to protect fish nurseries. Begun in late 2004, it included **the digging of an environmental channel and the creation of an opening at the upstream outlet of the channel while raising the present opening**. The invitations to tender for this last stage were launched during the summer of 2003, and the tenders were addressed for this contract of design/completion in December of the same year. In early 2004, a selection committee made up of PAH, PAR, DIREN, the 'Maison de l'Estuaire' and the Le Havre Chamber of Commerce and Industry (CCIH) 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 is entirely carried out by pipes.

SODRANORD made the most of the summer of 2004 to complete the studies of the project and the specifications, on the basis of the guidelines provided by the Port Autonome du Havre. As prime contractor and work contractor for this work site, SODRANORD began the works end of 2004 by the **development of a deposit area**, north of the Estuary Highway. Connected to the dredger by 2.5 km of pipes (including a shore part and a floating one), this

deposit area received the materials collected by the stationary suction dredger "AEGYR". After settling of the sediments dredged from the docks, the water received in the deposit area was pumped towards the Seine estuary, thus re-supplying the existing 'filandres' (local name for the drainage channels of the slikke) to guarantee their long-term existence in a better way.

Prior to the dredging of the environmental channel, **additional protection of the northern access piles of the Normandy bridge** was implemented. This meant digging an underwater excavation, between February and mid-March 2005, at the foot of the piles and, afterwards, a pontoon brought rock-fills there, to get a protection against erosion. **Dredging works** have then begun : they involved 1.8 million cubic metres of sediments on-site (mixed materials made up of sand and mud), corresponding to the dredging of a channel about 100 metres wide (from North to South) and on a length of 2,800 metres (from west to east).

The last stage of this work site involved the **creation of a new opening at the upstream outlet of the environmental channel** and **raising of the downstream opening** in order to facilitate the free flow of the rising tide into the new channel. All the works were completed during the summer of 2005.

B - CREATION OF A REST PLACE FOR BIRDS IN THE SEINE ESTUARY

After 165 days of work and some 600 trips with nautical craft, the rest place for birds located in the southern part of the estuary (in front of Villerville) was completed in April 2005. Constructed by "ATLANTIQUE DRAGAGE" - a subsidiary of the Dutch group BOSKALIS - on the basis of the studies and survey on model previously carried out, this unique site is 320 m long and 200 m wide.

Its main characteristics (shape, level of the grounds) have been decided further to a very close cooperation with the Upper and Lower-Normandy "DIREN" and the 'GON' (Groupe Ornithologique Normand : Normandy Ornithological Society), the Maison de l'Estuaire ('Estuary House') and the engineers of both ports of Le Havre and Rouen. Designed to receive sea birds and diversify the reception and rest places for the various species, this 5-hectare sanctuary which is unbroken at low tide, is divided into 3 separate emerging islets at high tide, with a total surface of 1.5 hectare.

Being a true technical achievement owing to the complex shape of the sanctuary and its situation in the estuary, the works began in early October 2004 and were completed in mid-April 2005. On-site, 4 craft (1 self-propelling barge, 1 barge, 1 dredger and 1 discharging barge) and 5 shore machines (2 bulls, 2 shovels and 1 loader) worked simultaneously to carry out the deposit of 57 000 tonnes of rock-fills from the Cotentin and 610 000 tonnes of sand and gravel materials.

The personnel of the Maison de l'estuaire excepted, as they will follow the coming of birds and the possible settling of fauna and flora species, any presence of human beings is forbidden, in compliance with the decree of the Nature Reserve in order to preserve the tranquillity of the place.

C - SCIENTIFIC FOLLOW-UP SURVEYS

All environmental works go together with a significant pluri-annual scientific follow-up which makes it possible to assess the efficiency of the developments made. A specific follow-up of the fishing resources has been carried out for numerous years and will continue for several years.

VII. REMINDER OF THE GENERAL TIMELINE OF PORT 2000

September 1995 :	President Jacques Chirac declares that : "Port 2000 is a project of major national interest".
1996 :	Technical studies and meetings with Maison de l'Estuaire continue
Nov. 1997 - March 1998 :	Public Debate
Spring 1998 :	Studies and meetings with the 'Estuary House' continue especially about the definition of environmental measures (this dialogue still continues today).
December 1998	The Port of Le Havre Authority is authorised by the Minister of Public Works, Transport and Housing, to submit the Port 2000 project for administrative and statutory proceedings. The French Prime Minister confirms this decision on December 15 th , 1998, before the CIADT (Interdepartmental Committee of National Planning and Development)
From January 1999 to Autumn 2001	Administrative procedures carried out. Public enquiries addressed (March 2000 - May 2000)
Autumn 2000 - Spring 2002 :	Preliminary construction begins (clearing of site, including removal of mines, debris and safeguarding of batrachians...)
Autumn 2001 :	Work begins on Port 2000 and environmental measures (bird sanctuary)
February 21st - March 23rd, 2002 :	Second public statutory enquiries for the additional berths
May 2005 :	The first four berths are delivered to the operators.
First half of the year 2006	Commercial coming-on-stream of Port 2000