

# Feasibility of Nicaragua Canal Seco Project



**Financed by:** CINN and Ministry of Flanders - Dept. of Economics, Employment, Home Affairs and Agriculture

**Client:** CINN SA - Consorcio del Canal Interoceanico de Nicaragua

**Date:** 2002 – 2004

**Budget:** € 500 000  
(The total construction cost is actually estimated at 2.6 billion USD)

**Location:** Nicaragua

**Partners:** IBM Business Consulting Services

## Assignment:

Technical and economical feasibility study for ports and harbour infrastructures and facilities regarding the interoceanic railway link between 2 new to be built deep sea container ports at either side of the Central American isthmus, connecting the Pacific and Atlantic Ocean.

## Scope of Services:

Technical and economical feasibility study for harbour infrastructures, including defining design parameters on tsunamis and earthquakes, geotechnical, geological and hydrodynamic aspects, nautical analysis, market analysis on container traffic, risk analysis.

## Technical Description:

The technical feasibility study for ports and harbour works is part of the overall feasibility study of the Nicaragua Dry Canal project, as presented to the Nicaraguan government after completion of the Viability Study in 1998.

The project is related to the increasing global need for east-westbound and trans-American maritime transport of containerised goods, using both Panamax and Post-Panamax vessels.

Based on the main traffic flows world-wide, container traffic would further increase with 235% to 345% between 2002 and 2026. This justifies the need for an alternative to the US land bridge and the Panama Canal, which are now experiencing serious capacity and congestion problems.



*Postpanamax container vessel*

According to the Terms of Reference, the technical feasibility study for ports and harbour works consists of :

- marine and oceanographic study
- GIS and base mapping
- geotechnical/geological and seismic studies
- market analysis and demand forecast
- conceptual design and cost estimates of port layouts.

At present alternative railroad alignments might be identified. The northern route connecting Monkey Point with Pie del Gigante has a length of approximately 380 km.



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*Pie del Gigante*

A southern shorter route runs along the border of Nicaragua and Costa Rica and connects San Juan del Norte with Bahía de las Salinas.



*San Juan del Norte*



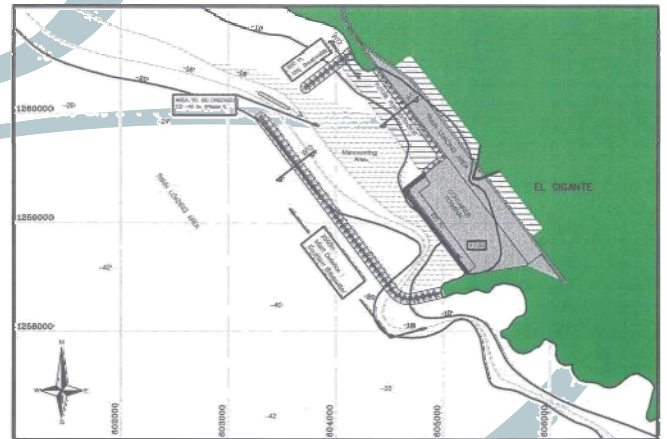
*Administrative map showing northern and southern railroad alternatives*

The candidate sites for the port facilities are subject to in-depth oceanographic and geotechnical study. The final site selection will be based on a multi-criteria analysis, involving all significant parameters.

A detailed analysis of the local wave climate (respectively associated with tsunamis and hurricanes) forms a bridge to an adapted hydrodynamic impact definition of the port structures.

Specific attention was given to proper tsunamis and earthquake design parameters for the harbour infrastructure. Both breakwater design and general port layout were oriented towards these specific local design conditions.

Some preliminary breakwater (slope) stability runs are performed to identify adapted design measures and the associated sensitivity analysis.



*Conceptual design of the Pacific port at Pie del Gigante*

Preliminary hydrodynamic modelling results in a proper breakwater configuration and associated stability design.

Finally, a general risk analysis for both locations is developed in order to qualify the overall technical feasibility of the project.