



**67 PETROBRAS/SCHAHIN –
BACIA DE CAMPOS – BRAZIL
“LANÇAMENTO DE CABO DE FIBRA
ÓPTICA PARA INTERLIGAÇÃO
ENTRE O ANEL ÓPTICO ATUAL E O
TERMINAL DE BARRA DO FURADO”**

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Entre O Anel Óptico Atual E O Terminal De Barra Do Furado”**

1 General project Overview and Reference



Figure 1: Barra do Furado beach

2 Scope of work

The scope of work was the laying and burial of approximately 3 km submarine optical cable with 12 fibers, between segment A of the existing fiber optic ring in the Campos and the onshore splice box, located at Point A, in Barra do Furado.

The splice box, called Beach Manhole, was built with the function of connecting the marine optical cable to the terrestrial one.

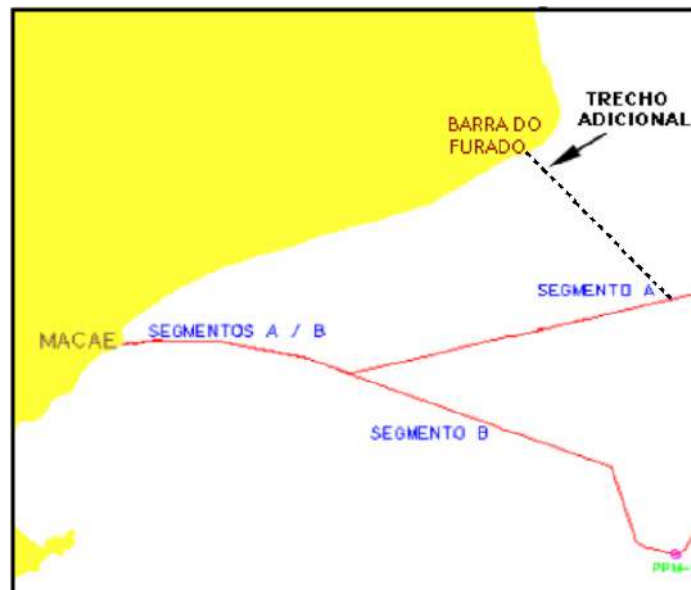


Figure2: General route layout

1" Optical Cable specifications:

Shore Approach – Cable type DA with 18 fibre

Offshore – Cable type SA with 18 fibre

Cabo tipo DA de 18 fibras

Especificação	Dado
Diâmetro Externo	28,8mm
Peso no Ar	2,49Kg/m
Peso na Água	1,95Kg/m
Tensão Nominal de Operação	169kN
Carga de "Break"	368kN
Raio Mínimo de Curvatura	1m
Comprimento	10km

Cabo tipo SA de 18 fibras

Especificação	Dado
Diâmetro Externo	22,78mm
Peso no Ar	1,29Kg/m
Peso na Água	0,92Kg/m
Tensão Nominal de Operação	84kN
Carga de "Break"	182kN
Raio Mínimo de Curvatura	1m
Comprimento	30km

Table 1: Optical cable specifications

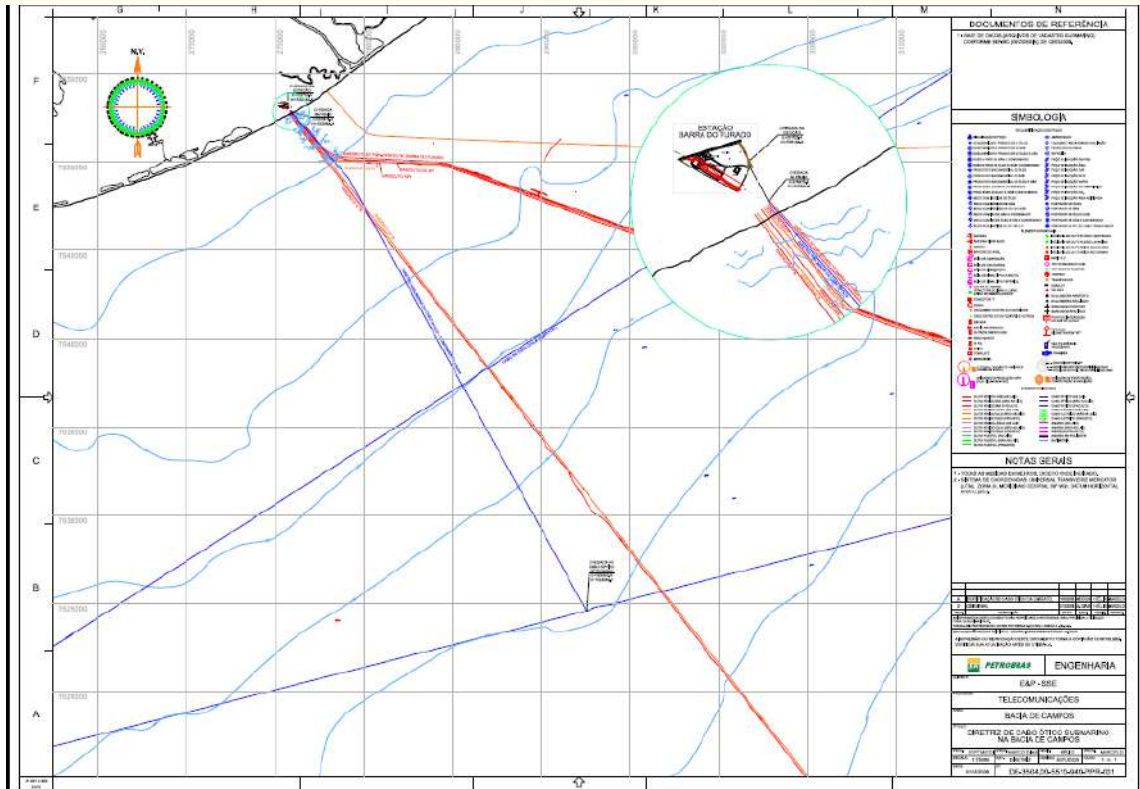


Figure 2: Optical cable route

Trenching equipment:

- MAC 2
- MACRO

Trenching support Naval means (supplied by SEA):

- Catamaran DP2 Iskatel-2.
- Trimaran Rosanna barge -for shore approach section

Execution Period: From November 2009 to June 2011 (Trenching from July 2010 to June 2011 including a stop window from Nov to May for turtle season)

Scope of work

The project was executed in two different phases:

- Shore Approach - pulling the optical cable on the beach and burying the section with MAC2 (phase 1) 2010
- Off Shore – simultaneous launch and burial of the optical cable along the remaining section (approx. 3 km) with MACRO machine and DP2 Iskatel-2 (phase 2) 2011

The equipment was also successfully tested (“Sea Trial”) in Barra do Furado between the 13th and 17th of April 2011, with Petrobras and Schahin as witnesses.



Section	From KP	To KP	Water depth (m)	Trenching depth (m)
Shore approach (*)	0,00	0,135	From 0 to 4	2,5 ToC
Offshore	0,135	2,565	From 4 to 8 m	0,8 m ToC
	Total meters	2.565		

(*) carried out during the first phase in October 2010

3 Encountered Soil condition

- Hard CLAY
- Very soft- fluid CLAY
- Cemented sand

4 Photos at worksite



Barra do Furado beach



Aerial photo of the Barra do Furado Terminal (Point A) highlighting the beach section chosen for the installation of fiber optic cable



MACRO 1 PTM