«..the historical importance of a nation is due to its ancestral urban vestiges, intellectual products, scientific inventions and civilizational achievements. Just as we believe that men, wherever they may be, made some contribution or other in the edification and consolidation of universal culture, We also believe that the maturity of a nation is judged by its awareness of the importance of its heritage and the interest it shows in protecting and renovating it... »

Extract of the message of His Majesty King Mohammed VI
to the participants in the 23rd Session of the World Heritage Committee,
on Monday 29 November 1999 in Marrakech.

PREAMBLE

Morocco has large seaboards on both the Mediterranean Sea and the Atlantic Ocean. These seaboards extend over about 3500 km, and are marked with 39 lighthouses devoted to maritime navigation aid, especially in coastal areas, and most of which are still operational.

Morocco started installing modern lighthouses of its coasts since the second half of the 19th century, as the Cape Spartel lighthouse, first of its kind, was started operating on 15 October 1864, upon the order of Sultan Sidi Mohammed Ben Abderrahmane.

The lighthouses bear witness to an era of history and crystallize architectural diversity, according to the period when they were built, and the sites that accommodate them. This national heritage reflects several facets which deserve to be explored by the experts, specialists and amateurs, as they constitute a rich information source up to now unknown.

Apart from a restricted number of initiated individuals, the lighthouses of Morocco in general are not sufficiently known among the general public. However, they have started attracting increasing interest. In fact, some have recently been celebrated by associations or public agencies on the occasion of maritime or specific events.

The Ministry of Equipment, Transport and Logistics published this book in order to mark the particular event of the celebration, on 15 October 2014, of the 150th anniversary of the startup of Cape Spartel Lighthouse, on the one hand, and to provide the National Library with the first reference book including all the lighthouses of Morocco, on the other hand.

Uncovering the lighthouses of Morocco, as a national heritage, the publication of this document will also allow the development of the architectural, technical and historical potentials that they conceal.

By its content, this technical book is particularly addressed to the professionals and researchers of the maritime sector. Nevertheless, it provides enriching technical, architectural and historical information to the public or private agencies in charge of culture, tourism, archives, documentation and craft industry.

This book was prepared by a team of the Ministry staff, who capitalized, for this purpose, the documents and artifacts available in the various lighthouses of Morocco. It is meant to be a first reference mark for safeguarding the memory of the lighthouses of Morocco, through recording the information currently available to the administration. This work has to be enriched by later updates, by the information contained in private archives and collections, as well as in the documents and artifacts accessible or recovered from the archives of other countries.

By its content and photographic illustrations, this piece of work would hopefully contribute to the development of the architectural heritage and esthetics of the lighthouses of Morocco, which serve as a source of inspiration to travellers, poets and writers alike.

LIGHTHOUSE

CAPE SPARTEL LIGHTHOUSE...

...Light of Gibraltar Strait for 150 years

THE OLDEST LIGHTHOUSE OF MOROCCO CELEBRATES ITS 150 YEARS ON 15 OCTOBER 2014

The oldest lighthouse of Morocco, which celebrates its 150 years on 15 October 2014, is still operating. A national monument, internationally renowned, rich in its architecture, history and maritime role, Cape Spartel Lighthouse is located at the north-western point of Morocco and Africa, between two seas and three continents, near White Tangier.

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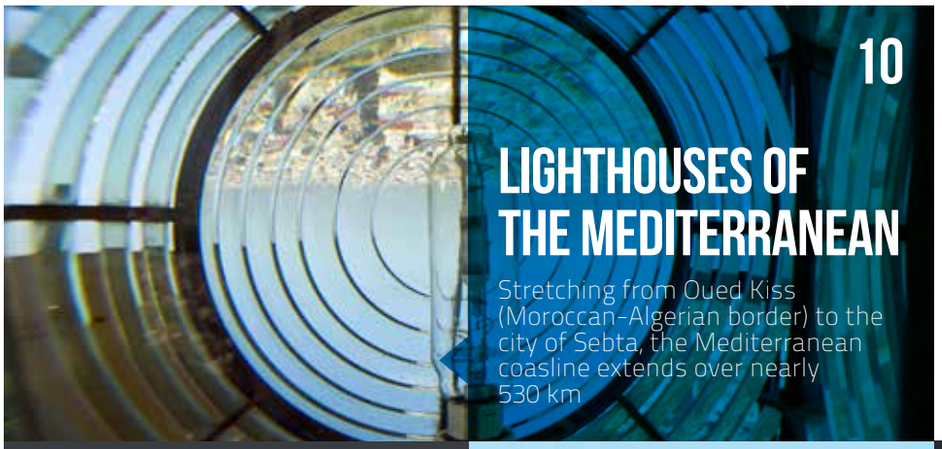

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LIGHTHOUSES OF THE MEDITERRANEAN

Stretching from Oued Kiss (Moroccan-Algerian border) to the city of Sebta, the Mediterranean coasline extends over nearly 530 km

LIGHTHOUSES OF THE STRAIT

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CAPE SPARTEL LIGHTHOUSE

...Light of the Strait for 150 years

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ARTIFACTS AND CORE BUSINESS OF LIGHTHOUSES

PREAMBLE

The publication of this document will also allow, by introducing the lighthouses of Morocco as national architectural heritage, the development of the architectural, technical and historical potentials that they conceal.

02

12

INTRODUCTION

This book, besides its introductory part, contains two sections including five chapters

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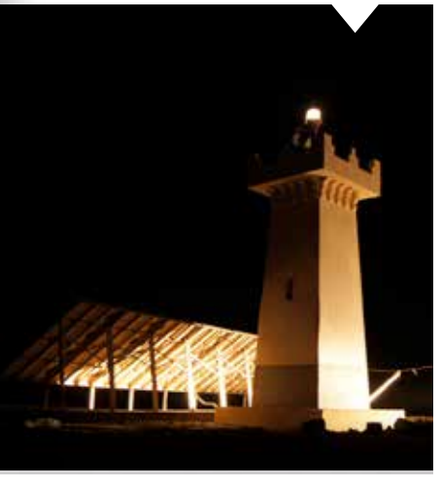


INTRODUCTION

In addition to its introductory part, the present book, is divided into two sections including five chapters. The first section, devoted to the presentation of the current lighthouses of the Kingdom, includes four chapters, while the second, which includes only one, is devoted to the artifacts of lighthouses.

This book was divided into four chapters in order to group the lighthouses together according to four homogeneous seaboards from a geographical perspective, in order to locate them in their economic and maritime contexts: Mediterranean seaboard, strait seaboard, northern Atlantic seaboard and southern Atlantic seaboard.

Hence, the chapters respectively deal with the lighthouses relating to these seaboards:

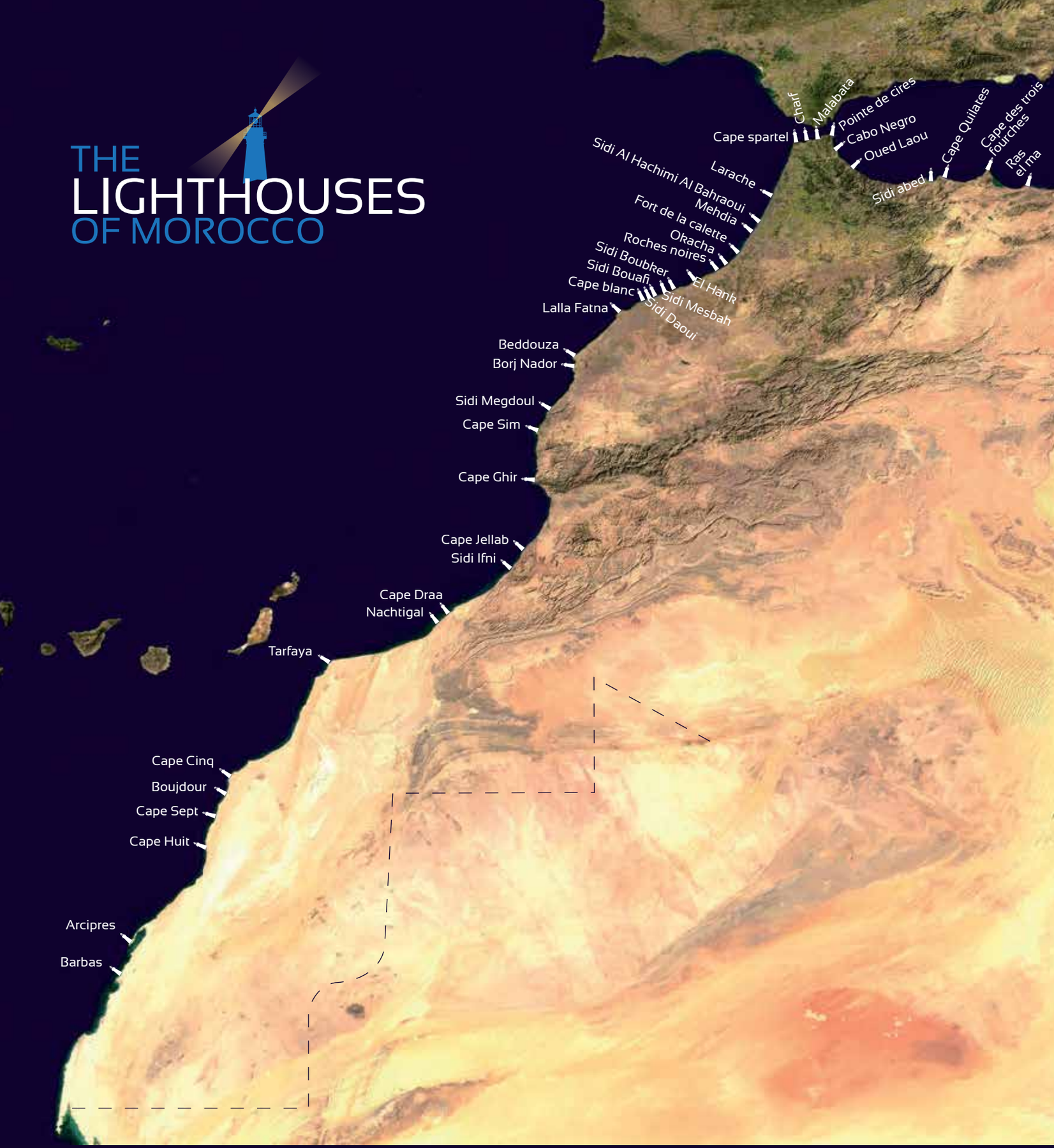
- Chapter 1 is devoted to the six lighthouses of the Mediterranean seaboard, located between Oued Kiss and Sebta;
- Chapter 2 outlines the four lighthouses of the seaboard of the Strait of Gibraltar, located between Sebta and Cape Spartel;
- Chapter 3 is devoted to the seventeen lighthouses accommodated by the Northern Atlantic coastline located between Cape Spartel and the south of the city of Essaouira;
- Chapter 4 addresses the twelve lighthouses of the Southern Atlantic coastline, which extends from the north of Agadir to the city of Lagouira.

Each chapter comprises an introduction to the specific context of the seaboard concerned, followed by the presentation of each of the lighthouses located on this seaboard, focusing mainly on the following points:

- the technical data of the lighthouse and its light;
- the extracts of historical accounts or press articles relating to the lighthouse concerned
- the photographic illustrations relating to the major distinctive architectural patterns of the lighthouse or its facilities;
- the diurnal and nocturnal photographic views of the building accommodating the lighthouse concerned

.The second section includes the fifth chapter devoted to the artifacts and core business of lighthouses. It describes the objects available to date in lighthouses, their utility as well as the core businesses related to lighthouses, with a view to bringing to the fore these historical landmarks.

THE LIGHTHOUSES OF MOROCCO



MEDITERRANEAN SEABORD

(6 lighthouses)

- Ras El Ma lighthouse (Cabo del Agua)
- Trois fourches Lighthouse
- Quilates lighthouse
- Sidi Abed lighthouse
- Oued Laou lighthouse
- Cabo negro lighthouse

STRAIT OF GIBRALTAR SEABOARD

(4 lighthouses)

- Pointe de Cires lighthouse
- Malabata lighthouse
- Charf lighthouse
- Cape Spartel lighthouse

NORTHERN ATLANTIC SEABORD

(17 lighthouses)

- Larache lighthouse (Tip of Nador)
- Sidi Al Hachmi Al Bahraoui lighthouse
- Mehdia lighthouse
- Rabat lighthouse (Calette Fort)
- Oukacha lighthouse
- Roches Noires lighthouse
- El Hank lighthouse
- Sidi Boubker lighthouse
- Sidi Mesbah lighthouse
- Sidi Daoui lighthouse
- Sidi Bouafi lighthouse
- Cape Blanc lighthouse
- Lalla Fatna lighthouse
- Beddouza lighthouse
- Borj Nador lighthouse
- Sidi Megdoul lighthouse
- Cape Sim lighthouse

SOUTHERN ATLANTIC SEABORD

(12 lighthouses)

- Cape Ghir lighthouse
- Cape Jellab lighthouse
- Sidi Ifni lighthouse
- Cape Draa lighthouse
- Cape Nachtigal lighthouse
- Tarfaya lighthouse: CAPE JUBY
- Cape Cinq lighthouse (Actilghazi)
- Boujdour lighthouse
- Cape Sept lighthouse(Aftissat)
- Cape Huit lighthouse (Nouifed)
- Arciprès lighthouse
- Cape Barbas lighthouse

MEDITERRANEAN SEABOARD

MEDITERRANEAN SEABOARD

From Oued Kiss (Moroccan-Algerian border) to the city of Sebta, the Mediterranean seaboard extends over nearly 530 km.

This coast, which administratively belongs to three regions (Eastern Region, Taza-Al Hoceima-Taounate and partially Tangier-Tetouan), is characterized by diversified geomorphology, with a predominance of rock cliffs, distinguishing the Rif area, as well as almost rectilinear sandy coasts and river mouths. This seaboard, which accommodates four large urban centers (Tetouan, Al Hoceima, Nador and Berkane), witnesses advanced urbanization.

It accommodates six (6) sea transport lighthouses:

- Ras El Ma Lighthouse
- Trois Fourches Lighthouse
- Quilates Lighthouse
- Sidi Abed Lighthouse
- Oued Laou Lighthouse
- Cabo negro Lighthouse

The maritime economic activity along this coast witnesses significant growth, by the wealth and attractiveness of its potential. This is indicated by the large-scale investments in the various sectors related to the coastline, particularly the ports sector. The latter, besides the small ports devoted to fishing and leisure activities, currently revolves on the

commercial ports of Nador and Al Hoceima. In the medium term, the port system of this seaboard will be reinforced by the construction of the large Nador West Med Port.

In addition, the maritime activity of the Mediterranean seaboard, besides the commercial and leisure ships using the major international sea route of North of America - South East Asia passing nearby, is especially marked by the will of the public authorities to boost the commercial exchanges passing through its ports. which it accommodates. The Table below presents the current import/export traffic and the relevant projections by 2030:

Traffic in 2013 (1000 T)				Traffic projected for 2030 (1000 T)			
Import	Export	Import+Export	Transshipment	Import+Export assumptions		Transshipment assumptions	
				low	high	low	high
1500	600	2100	-	11400	12200	24000	48000

Leisure and recreation activity is characterized particularly by the growing number of holiday-makers visiting the many natural and supervised beaches of its coastline (Saîdia, Martil, M'diq, Rifiine, Oued-Laou) and the number of yachts using the marinas located on its coast (Kabila, Smir, Mar Chica and Saïdia).

Coastal and artisanal fishing, with 33.800 tons of fish catch in 2013, records constant increase in the number of boats docking in the ports of the region, particularly in Ras El Ma, Jebha, M'diq and the many unloading outlets developed for the benefit of this flotilla.

The lighthouses punctuating this seaboard, whose distinctive features will be presented successively in this chapter, play a key role in the maritime activity of the bordering areas mainly by ensuring navigation aid for the ships and boats which cross along their coast..

LIGHTHOUSE

RAS EL MA
Cabo del Agua

Identification of the lighthouse

SHOM[1] Number	72450 E.6757
Type	Coast marking
Start date	1946

Landmark

Type of construction	Octagonal pyramidal house with terrace, in smooth masonry, with crowning at the upper part, overarched by an octagonal turret in smooth masonry with crowning at the top
Height/sea	43 m
Height/ground	09 m

Position

Geographical location	In the East of the Northern coast of Morocco on the cliff of Water Cape, 60 km to the East of the city of Nador
Coordinates	35° 08'48.65" N 02°25'31.55"O

Description of Light

Type of lamp	Horizon
Rate	2 white flashes /6s [Fl (2) W.6s]
Luminous range	08 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	None

LIGHTHOUSE

TROIS FOURCHES CAPE

Identification of the lighthouse

SHOM Number	71800 E.6778
Type	Landing
Start date	1927

Landmark

Type of construction	Rectangular building with crowning and angle chains surmounted by a square turret with corbelling and chains of angles; the entire building in exposed stone masonry
Height/sea	115 m
Height/ground	23 m

Position

Geographical location	In the East of the Northern coast of Morocco, on Nuevo Cape, the northernmost point of the three forks, located 50 km to the north of the city of Nador.
Coordinates	35° 26'16" N 02°57'47"O

Description of light

Type of lamp	Turning
Rate	4 flashes every 20s Fl (3+1) W.20s)
Luminous range	20 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor + mercury tank

LIGHTHOUSE

QUILATES

Identification of the lighthouse

SHOM Number	71660D.6784
Type	Landing
Start date	1930

Landmark

Type of construction	Octagonal tower in smooth masonry, consisting of three bottom-up decreasing superimposed parts, joined with the northern face of a rectangular building in smooth masonry.
Height/sea	83 m
Height/ground	33 m

Position

Geographical location	North-western side of the Betoya bay on Quilates Cape, 65 km in Al Hoceima - east
Coordinates	35°16'58.36" N , 03°40'49.66" O

Description of light

Type of lamp	Turning
Rate	3 white flashes every 12 seconds [Fl (3) w.12s]
Luminous range	23 nautical miles
Energy source	Generator set + Solar panels
Control	None
Rotation device	Electric motor + mercury tank

Designed by a Spanish engineer called Alfonso Caballero Rhodos, and built in December 1929, the lighthouse shows its Moroccan identity by its esthetic details and the shape of its tower which looks like a minaret.

Besides its position allowing it to be seen from all directions, it would have also been used for air navigation.

LIGHTHOUSE

SIDI ABED

Identification of the lighthouse

SHOM Number	71340 E.6786
Type	Landing
Start date	NS

Landmark

Type of construction	Square tower
Height/sea	138.8 m
Height/ground	12 m

Position

Geographical location	Located on a heading at the western entry of Al-Hoceima bay on Morro-Nuevo cliff
Coordinates	35°15'40" N , 03°55'45" O

Description of light

Type of lamp	Turning
Rate	2 white flashes every 10 seconds [Fl (2) w.10s]
Luminous range	28 nautical miles
Energy source	Electric sector
Control	Automatic
Rotation device	Electric motor

LIGHTHOUSE

CABO NEGRO

Identification of the lighthouse

SHOM Number	71000 E.6824
Type	Landing
Start date	NS

Landmark

Type of construction	In smooth Masonry: octagonal tower with a pyramid base
Height/sea	134.8 m (height of light, with light 135.8 m)
Height/ground	15.8 m (13.8 m with light, 12.8 without light)

Position

Geographical location	City of Martil (northern side of the bay of Tétouan on Cabo Negro)
Coordinates	35°41'05.21'N , 05°16'28.32'O

Description of light

Type of lamp	Turning
Rate	1 flash every 4s [F (1) 4s]
Luminous range	15 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor

LIGHTHOUSE

OUED LAOU

Identification of the lighthouse

SHOM Number	71180 E.6789.5
Type	Coast marking
Start date	1986

Landmark

Type of construction	In masonry
Height/sea	200 m
Height/ground	6 m

Position

Geographical location	City of Oued Laou
Coordinates	35°28'26.08 N 05°06'31.66' O

Description du Feu

Type of lamp	Tournant
Rate	2 occulations every 6s [Occ (2) .6s]
Luminous range	13 nautical miles
Energy source	Solar
Control	Automatic
Rotation Device	Electric motor

GIBRALTAR STRAIT SEABOARD

GIBRALTAR STRAIT SEABOARD

The seaboard of the Strait of Gibraltar, which extends from Sebta to Cape Spartel (Tangier), belongs to the administrative region of Tangier-Tétouan. It stretches over approximately 60 km, accommodating four lighthouses of sea transport:

- Pointe de Cires Lighthouse;
- Malabata Lighthouse;
- Charf Lighthouse;
- Cape Spartel Lighthouse

The morphology of the coasts is characterized here by a series of small beaches (Ksar Sghir, Dalia, Oued-Aliane, Sidi Kanqouch, Lamrissat and Ghandouri) well protected within a rock coastline and witness significant summer visits by holiday-makers.

The back-country constitutes a center of economic growth par excellence. It records important investments, in various economic sectors, generated mainly by the development potentialities of the territories and cities which compose it (Tangier, Tétouan, Ksar Sghir) and by the significant logistic and transport infrastructure with which it is equipped including major port structures such as Tangier-Med Port and Tangier-city Port.

Tangier Med Port translates the will of the Kingdom of Morocco to set up, on the southern shore of the Strait of Gibraltar, a world-class industrial and logistic platform, integrated into the networks of world exchanges.

The reconversion of Tangier-city Port, which will be home to cruising and leisure terminals, aims at repositioning the city as a tourist and cultural center, in a dynamic region whose economic and industrial fabrics witness significant growth.

The sea traffic of the ports of this seaboard is made up mainly of the transshipment of containers, ro-ro traffic and passenger traffic amounting in 2013 to more than 3 million 700 thousand people crossing the Strait of Gibraltar.

The Table below presents the current import/export and transshipment traffic traffic as well as the projections of such traffic by 2030.

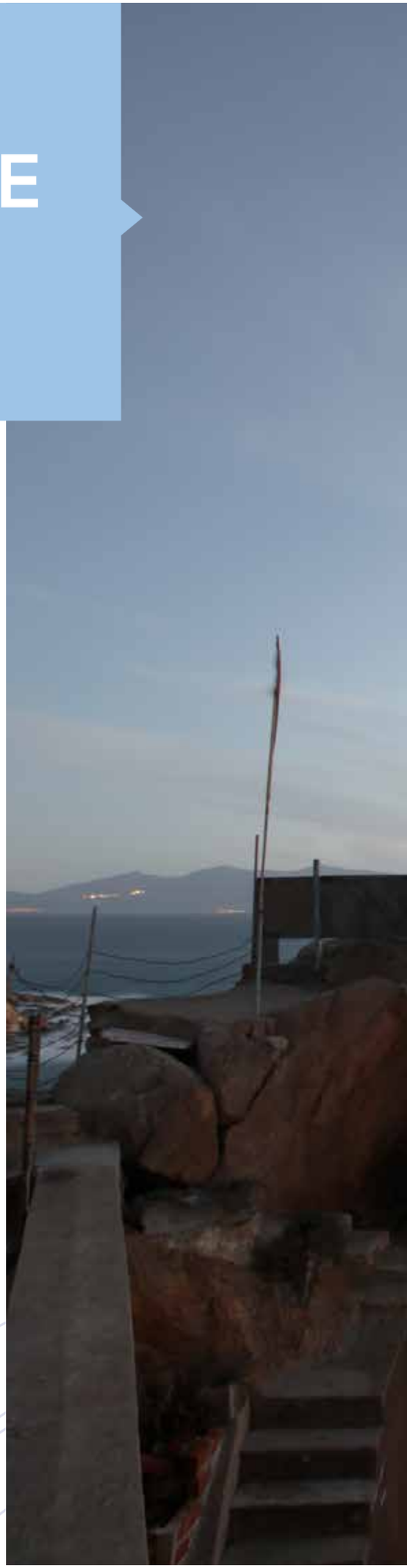
Traffic in 2013 (1000 T)				Traffic projections for 2030 (1000 T)			
Import	Export	Import+Export	Transshipment	Import+Export assumptions		Transshipment assumptions	
				Low	High	Low	High
5200	2400	7600	25200	17800	44400	64000	81200

In 2013, the volume of inshore and artisanal fishing catches, along this seaboard, amounts to approximately 10500 tons.

Four lighthouses puctuate this seaboard, including the prestigious lighthouse of Cape Spartel, internationally renowned, and continue to ensure their service of support to the safety of the navigation of ships and boats using the coasts of the strait.

LIGHTHOUSE

POINTE DE CIRES



Identification of the lighthouse

SHOM Number	68470 D. 2493
Type	Coast marking
Start date	NS

Landmark

Type of construction	Cylindrical tower in smooth masonry coupled to the northern side with an enclosing wall
Height/sea	46.5 m
Height/ground	8 m

Position

Geographical location	West southern part of the strait of Gibraltar, on Pointe de Cires located 50 km away from the city of Tangier
Coordinates	35° 54' 24.72" N , 5° 28' 54.05" O

Description of light

Type of lamp	Turning
Rate	3 white flashes every 12 s [Fl (3)W.12s]
Luminous range	18 nautical miles (nominal)
Energy source	Sector
Control	Automatic
Rotation device	Electric motor

LIGHTHOUSE

MALABATA

Identification of the lighthouse

SHOM Number	68330 D.2498
Type	Landing
Start date	1924

Landmark

Type of construction	Square tower in smooth masonry
Height/sea	76 m
Height/ground	15 m

Position

Geographical location	16 Km from city of Tangier
Coordinates	35°49'00.71"N 5°44'57.55"O

Description of light

Type of lamp	Horizon
Rate	1 flash every 5 seconds [Fl (1) .5s]
Luminous range	20 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	None

LIGHTHOUSE

CHARF

Identification of the lighthouse

SHOM Number	68330 D.2498
Type	Coast marking
Start date	1949

Landmark

Type of construction	White house with terrace of irregular form in smooth masonry
Height/sea	101 m
Height/ground	8 m

Position

Geographical location	In the South-east of Tangier Port on El Charf Hill
Coordinates	35° 46' 06" N 5° 47' 18"O

Description of light

Type of lamp	With sectors
Rate	3 occulations every 12 s [OC (3) WRG.12s]
Sectors	Green: 34°30' (140° to 174°30') White: 25°30' (174° 30' to 200°) Red: 25° (200° to 225°) Darkness: 275° (225° to 140°)
Luminous range	Green = 11 nautical miles Red = 12 nautical miles White = 16 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	None

LIGHTHOUSE OF

LIGHTHOUSE OF TWO SEAS

The oldest lighthouse of Morocco, which celebrates its 150 years on 15 October 2014, is still operating. A national monument, internationally renowned, rich by its architecture, history and maritime role, Cape Spartel Lighthouse is located at the North-western point of Morocco and Africa, between two seas and three continents, near "White Tangier". One of the most beautiful sites of Morocco, with diversified morphology, "it preserved its harmony with nature, combining mixed vegetation, influenced by the Mediterranean and the Atlantic Ocean"[1]. A platform of multiple meetings and influences, necessarily enriching, Cape Spartel and its lighthouse, often cited as a mythical site, bring great pride to the region.

"Before, and until the emergence of steamboats, the major threat initially came from the corsairs, including those which had Salé as their home port, an important port then located at the mouth of Bouregreg river, and which since the sixteenth century had long haunted the waters of this part of the Atlantic, extending from Canary islands to the shores of the north of Spain. Serving as the characters of a semi-forgotten legend, the risk of shipwreck would be essential ever since, as the most major real danger in this coastline zone of the city of Tangier" 2. The most famous shipwreck being that of the Brazilian training ship which caused the death of 250 cadets in 1860. The following year Sultan Mohammed Ben Abderrahmane ordered the construction of Cape Spartel. The works, directed by a French engineer called L. Jacky and assisted by specialized local labor, lasted 2 years and the importation of lighting material and its adjustment required one year. Hence this lighthouse of great international interest was inaugurated on 15 October 1864 and an agreement was signed the following year (1865) between Morocco and 10 countries, for bearing the operation and maintenance costs of this facility. Control was entrusted to an international commission with revolving annual presidency.

Cape Spartel Lighthouse is a landing lighthouse whose technology has witnessed continuous developments:

[1] *http://www.etudier.com/dissertations/perdicaris/207398.html*

[2] *History of the lighthouse of a Cape called Spartel, Pr. Mohammed GERMOUNI, the Economist N° 3860 Dated 2012/09/05*

1860	1861	1863	1864	1865	1892	1905	1914
Shipwreck of the training ship of the Brazilian marine «Dona Isabel »	Start of works	Completion of works	Lighting with oil lamps	Signature of an agreement with 10 countries for bearing operation and maintenance expenses of the lighthouse	Creation of a semaphore post which sent visual signals for the boats in daytime	Oil lighting and creation of the famous «diaphone» at Cape Spartel (anti-fog Siren)	Increase in lighting power of the lighthouse from 6000 to 20000 candles

CAPE SPARTEL

Restoration of the building — 1926

Increase in the power of the lighthouse to 300000 candles — 1931

Installation of a sound system, useful in case of fog — 1933

A radio beacon was added to allow the ships to determine their location — 1937

Use of electric energy — 1950

Installation of a transmission radio (transmitter) — 1952

Transformation of the optics of the light house, and increase in the power of the light (lamp of 6000 watts) — 1954

Refitting of the building of the lighthouse — 2013

FOR 150 YEARS

LIGHTHOUSE OF TWO SEAS

ARCHITECTURE

With an architecture inspired by that of a Hispanic-Moorish mosque, the lighthouse is characterized by a rather wide base. Its form is that of a square minaret3 typical of the Maghreb, 31 m in height. It has a spiral staircase of 101 steps, with mahogany handrails, giving access to the lantern of the lighthouse, which accommodates the optic system. At the end of these staircases, there is a space which offers a superb panoramic view onto all the beaches of the city.

"The tower has a square base and built in smooth masonry, with angle chains of exposed stones; it is 24 m in height (79 feet). Painted in ocher-yellowish, it "emerges" from the facade of a square building lodging the guards and technical premises.

The lantern (metal gray) is surrounded by a stone railing which is prolonged (downwards) by a profiled cornice. " 4

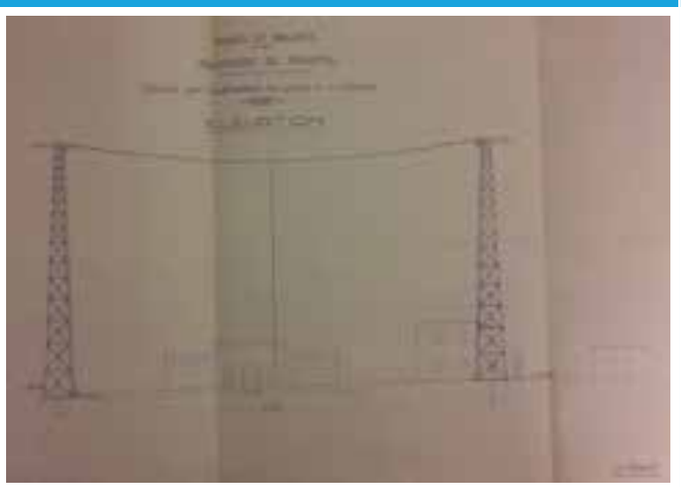
Beyond its maritime dimension, this lighthouse conveys a legend according to which the water of its fountain has therapeutic virtues. Late Abdellah Kaaboune, a long-standing superintendent of Cape Spartel Lighthouse, said that this water, rich in iron, cured asthma and that his father and son bear witness to this fact, since by drinking the water of this spring, they were cured like others before them.

The building is located in a very aggressive environment. It hence requires regular maintenance. Therefore, it was the subject of restoration operations, the most recent of which was carried out in 2013. The works of this restoration, carpentry works, metal works and other core businesses, preserved the original features of the building and safeguarded the authenticity of its Moorish architecture, as a heritage asset of the history of the city and the country.

In addition, several associations, operating in the field of safeguarding heritage, grant a top priority to raising awareness about the safeguard of the lighthouse of Cape Spartel.

[3] *"Minaret" is the Arabic term for "lighthouse"*

[4] *http://pharoteliste.blogspot.com*



Concours pour l'emplacement du pylone et de l'antenne

Cape Spartel lighthouse celebrated its centenary on 15 October 1964 and a stamp was issued on this occasion

First day cover [FDC 1]

Cover cancelled in Tangier, 15.10.1964

Edition : First Day Cover ®

Envelope illustrated with the image of the lighthouse

Dimensions of the cover: 92 mm x 165 mm [US No. 6¾]

Commemorative seal "Centenary of Cape Spartel Lighthouse"

(blog Pharotéliste.fr)

Theme of the stamp: Cape Spartel Lighthouse (celebration of its centenary) [1]

Date of issue: 15.10.1964

Issuing postal authority: Morocco Post

Face value: 0.25 Moroccan dirham (MAD)

Dimensions of the stamp: 26 mm x 37 mm

Serrated: 12 ½ x 11 ½

Sheet size: 25 stamps

Printing house: today unknown to the postal authority

Type: rotogravure (polychromy)

Prints: 252 500

Numbers of catalogs: Yv 479 / S 109 / SG 158 / M 541

[1] The medallion image shows Mohammed IV ben Abderrahmane (1810 - 1873), Sultan of Morocco (1859 -1873) at the time of its construction.

Cape Spartel commemorated at the back of a 200-MAD note issued by Bank Al-Maghrib in 2013

The strategic importance of Cape Spartel Lighthouse, particularly in war time, raised fears and instigated competition among powers. Hence, Great Britain, France and Spain notified the Sultan that an arrangement was to be concluded to ensure the neutrality of the lighthouse. Ten powers, including the United States, signed this agreement on 31 May 1865.

Article 1 stipulates: "Whereas His Majesty, in the interest of humanity, ordered the construction, at the expense of the Moroccan Government, of a lighthouse at Cape Spartel, agrees to grant, for the entire duration of this Agreement, the higher management and administration of this facility to the representatives of the contracting powers" without any prejudice to the property rights and sovereignty [8]. The signatory powers shall respect the neutrality of the lighthouse [9].

[8] J. Basdevant, Treaties and agreements in force between France and foreign powers, T. 3, Paris, Imprimerie Nationale, 1920, p. 738,740.
[9] W. Malloy, Treaties, op cit., p. 1213-1220

El-Mostafa Azzou
History researcher (Ph.D), University of Oujda (Morocco)

Identification of the lighthouse

SHOM Number	68000 D. 2510
Type	Landing
Start date	1864

Landmark

Type of construction	Square tower in smooth masonry painted in yellow
Height/sea	95 m
Height/ground	25 m

Position

Geographical location	15 km from the city of Tangier
Coordinates	35° 47' 27.50"N 5° 55' 25.25" O

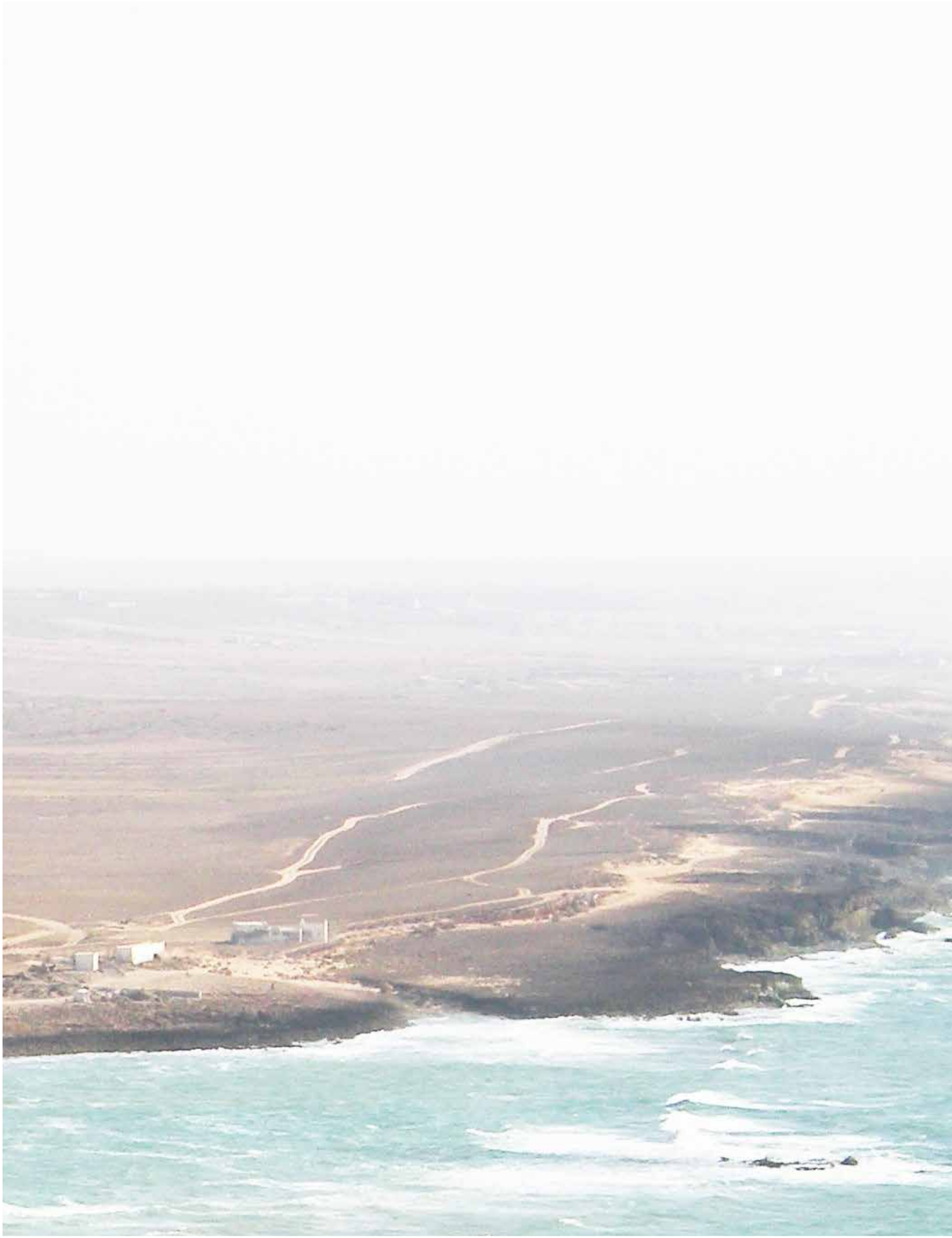
Description of light

Type of lamp	Turning
Rate	4 white flashes every 20 seconds [Fl (4) W .20s]
Luminous range	30 Nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor + mercury base

LIGHTHOUSE OF T

LIGHTHOUSE OF TWO SEAS

THE CAPE SPARTEL



NORTH ATLANTIC SEABOARD

NORTH ATLANTIC SEABOARD

The North Atlantic seaboard corresponds to the coastline extending from Cape Spartel to the city of Essaouira, over approximately 940 km and administratively belongs to the regions of Tanger-Tétouan, Gharb-Chrarda- Bni Hssen, Rabat-Salé- Zemmour-Zaer, Chaouia-Ouardigha, Center (Greater Casablanca), Doukkala- Abda, and Marrakech-Tensift-El Haouz.

17 lighthouses punctuate this facade:

- Larache Lighthouse (Nador Tip)
- Sidi Al Hachmi Al Bahraoui Lighthouse
- Mehdia Lighthouse
- Rabat Lighthouse (Calette Fort)
- Okacha Lighthouse
- Roches noires Lighthouse
- El Hank Lighthouse
- Sidi Boubker Lighthouse
- Sidi Mesbah Lighthouse
- Sidi Daoui Lighthouse
- Sidi Bouafi Lighthouse
- cape Blanc Lighthouse
- Lalla Fatna Lighthouse
- Beddouza Lighthouse
- Borj Nador Lighthouse
- Sidi Megdoul Lighthouse
- cape Sim Lighthouse

The coast is made up of a series of beaches, protected by bordering dunes, generally of significant width, though narrow at some points, alternating with rock coasts on a broad continental plateau. This seaboard also accommodates the mouths of the major rivers of the Kingdom on the Atlantic (Loukos, Sébou, Bouregreg, Oum-Rbia and Tensift) as well as two RAMSAR lagoons classified as sites of biological and ecological interest (Oualidia Lagoon, known for its shellfish farming and Merja Zerka, a world renowned ornithological site).

Along this maritime seaboard are established the major urban centers which constitute the economic and commercial hub of Morocco, such as the cities of Larache, Kénitra, Mohammedia, Casablanca, Salé, Rabat, El Jadida, Safi and Essaouira, accommodating the major port infrastructures of trade of the Kingdom. They ensure the major share of the national sea traffic in import and export, or more than 75% of domestic traffic, in 2013, ensured through 8,7 million stopovers of ships.

The national port strategy by 2030, approved at the end 2012, provides for the traffic of the ports of this seaboard a significant development, which will relate primarily to the traffic of containers, mineral and energy traffic as well as cruising and leisure activity. Also, important investments were decided for both the requalification of the existing ports (Casablanca, Kénitra-river and Safi-city) and the construction of new ports such as the mineral port of Safi, currently under construction, the port of Kenitra - Atlantic and the energy port of Jorf Lasfar, in the study stage.

The Table below presents the current and projected traffics relating to the ports located in the North Atlantic maritime seaboard:

Traffic in 2013 (1000 T)				Traffic projected for 2030 (1000 T)			
Import	Export	Import+Export	Transshipment	Import+Export assumptions		Assumptions/ Transshipment	
				low	high	low	high
36600	21600	58200	-	153200	214000	-	-

This seaboard accommodates an inshore and artisanal fishing activity that generated a catch volume estimated at 114.000 tons in 2013, unloaded in the ports and fishing docks, located on this coastline (Essaouira, El Jadida, Casablanca, Mohammedia, Safi- city, Mehdia, Assilah) or the unloading points developed for this purpose (Tafedna, estuary of Merja Zarga Lagoon, Skhirat, Lahdida, Sidi Abed).

This coast also accommodates a very important bathing activity, benefiting, on the one hand, many holiday-makers visiting the various natural and supervised beaches (beaches of Assilah, Larache, Bouznika, Ain Diab, sidi Rahal, Haouzia, El Jadida, Oualidia, Safi, Souiria-Kadima and Essaouira) and, on the other hand, the amateurs of water sports resorting to an important supply of marinas (Bouregreg Marina, Casablanca Marina).

To assist the ships and sailing boats along this seaboard, lighthouses with varied architecture punctuate the layout of the North Atlantic coast. Some of them, impressive by their height and/or form, have inspired local legends.

LIGHTHOUSE

LARACHE
Nador Tip

Identification of the lighthouse

SHOM Number	42700 D.2532
Type	Landing
Start date	1929

Landmark

Type of construction	White octagonal reinforced-concrete tower and house
Height/sea	120 m
Height/ground	50 m

Position

Geographical location	Inside the urban center of the city of Larache
Coordinates	35° 11' 34" N ; 006° 10'04"O

Description of light

Type of lamp	Turning
Rate	2 flashes red and white every 15 S [Fl (2) R.W.15s]
Luminous range	26 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor + mercury tank

Northwards, one arrives at the Balcony of the Atlantic, this space designed in the 1940s as a platform of meeting, walking and celebrations. It rises above Ain Chaka precipice. It is the facade of the city seen from the sea, it is a balcony from which one can contemplate the Atlantic Ocean, particularly at the end of the day when the pallet of the tonalities of the sky is the most beautiful. It is an excellent sight onto Al-Qubaybat Castle and one of the bastions: Sidi Bu Qanadil, built under the reign of Muhammad Abd Allah in the second half of the eighteenth century. It was given this name to honor the person who was in charge of guiding ships from the ground with an oil lamp, serving as a guard of the lighthouse.

Colors of memory. Roads of architecture for emotional travellers. Academia.edu P 136

LIGHTHOUSE

SIDI AL HACHMI AL BAHRAOUI

Identification of the lighthouse

SHOM Number	42770 D.2537
Type	Coast marking
Start date	1990

Landmark

Type of construction	Turret supported by three columns in whitewashed smooth masonry
Height/sea	68 m
Height/ground	9 m

Position

Geographical location	In Mnasra Municipality, 40 km away from the city of Kénitra.
Coordinates	34°39'05.97" N 6°24'42.54"O

Description of light

Type of lamp	Turning
Rate	2 white flashes every 10 s [Fl (2) W.10s]
Luminous range	12 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor


منار سيدي الهاشمي البحراوي
PHARE SIDI EL HACHMI EL BAHRAOUI

LIGHTHOUSE

MEHDIA

Identification of the lighthouse

SHOM Number	42801 D.2540.1
Type	Landing/Alignment
Start date	1917

Landmark

Type of construction	Octagonal tower in smooth masonry, painted in green with corbelling at the top part, on a low-rise octagonal base in smooth masonry
Height/sea	74 m
Height/ground	4 m

Position

Geographical location	City of Kénitra-Mehdia
Coordinates	34°15'38.42" N 6°39'35.84"O

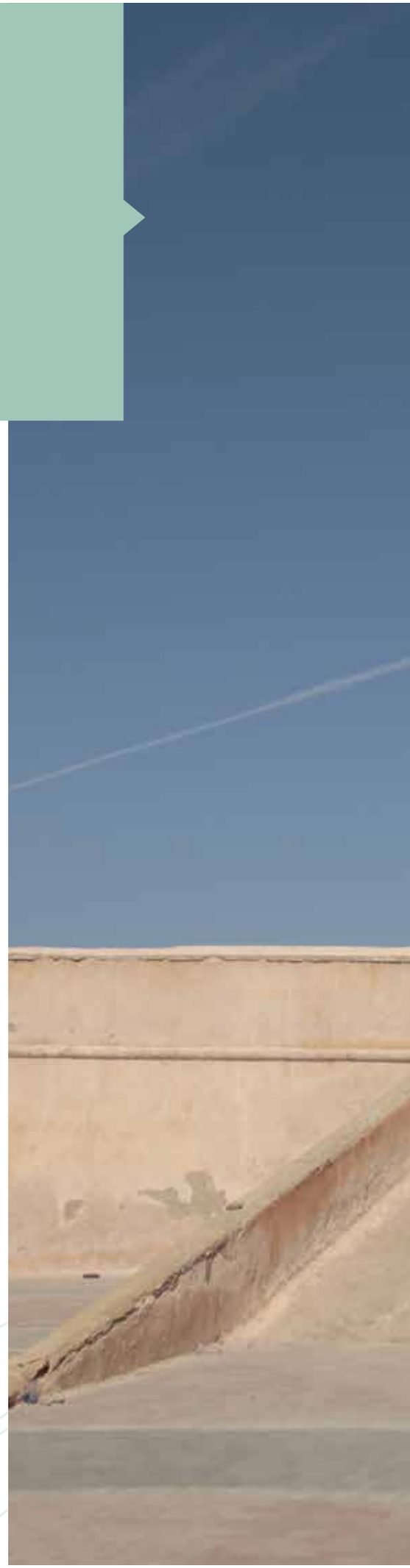
Description of light

Type of lamp	Turning
Rate	3 occulations every 12 s [Occ (3) .12s]
Luminous range	16 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor + mercury tank


1919

LIGHTHOUSE

RABAT
Calette Fort



Identification of the lighthouse

SHOM Number	42980 D.2554
Type	Coast marking
Start date	1920

Landmark

Type of construction	In Masonry
Height/sea	31 m
Height/ground	20 m

Position

Geographical location	City of Rabat
Coordinates	34°01'53.34" N - 6°50'39.72"O

Description of light

Type of lamp	Turning
Rate	2 occulations every 8 s [Occ (2) .8s]
Luminous range	20 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor

Located at the north-western end of Almohade Wall, not far from the Kasbah Oudayas, Rabat Lighthouse is built on top of a cliff on the platform of Sirat bastion that had served, along with other forts of this rock coast, for the defense of the city of Rabat all the times.

Built in 1919, under the reign of Sultan Moulay Youssef, during the French Protectorate, it started operating in April of the following year. "Echo du Maroc", a newspaper at that time, announced its opening as follows:

"The lighthouse will start operating on April 25th. Since the inaugural ceremony, Rabat Lighthouse had not been heard of any more. One wondered by contemplating this cylinder of masonry: will it ever start? But the lighthouse remained as impenetrable as a sphinx. Finally in the night of April 25th to 26th the white light, with occulations grouped by pair, every 8 seconds, reached up to 17 miles off the coast into the thickness of darkness."

LIGHTHOUSE

OUKACHA

Identification of the lighthouse

SHOM Number	43400 D.2566
Type	Coast marking
Start date	1960

Landmark

Type of construction	Square concrete tower
Height/sea	30 m
Height/ground	20 m

Position

Geographical location	Casablanca
Coordinates	33°36'57.00' N 07°33'46.00"O

Description of light

Type of lamp	Turning/auxiliary lamp with sectors
Rate	2 white flashes every 2 s [Fl (2) W.2s]
Luminous range	15 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor + Bearing

LIGHTHOUSE

ROCHES NOIRES

Identification of the lighthouse

SHOM Number	43450 D.2567
Type	Coast marking
Start date	1920

Landmark

Type of construction	Cylindrical concrete tower
Height/sea	23 m
Height/ground	18 m

Position

Geographical location	To the East of Casablanca Port
Coordinates	33°36'19.35' N - 07°34'59.71"O

Description of light

Type of lamp	With sectors
Rate	1 occulation each 4s [Occ (1) .4s]
Luminous range	16 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	None


Le Phare des Roches-Noires

LIGHTHOUSE

EL HANK

El Hank Lighthouse has for a long time risen over Casablanca as the highest building of the city, before it was overtaken by the minaret of Hassan II Mosque.

Designed by a French architect called Albert Laprade, El Hank Lighthouse was built in 1916 on the tip of El Hank, a coast considered dangerous, at the western entry of Casablanca Port. It was inaugurated on 1 August 1920, and in 1926, a siren to be used in foggy times was installed.

Disregarded for a long time by Casablanca residents, the lighthouse of El Hank, still operating, is today an essential monument of the economic capital of the Kingdom.

Identification of the lighthouse

SHOM Number	43870 D.2574
Type	Landing
Start date	1920

Landmark

Type of construction	Cylindrical concrete tower
Height/sea	70 m
Height/ground	51 m

Position

Geographical location	Casablanca
Coordinates	33°36'36.54" N 7°39'17.09"O

Description of light

Type of lamp	Turning
Rate	3 white flashes every 15 s [Fl (3) W.15s]
Luminous range	30 nautical miles
Energy source	Sector (metal halide lamp 1000W)
Control	Automatic
Rotation device	Electric motor + mercury tank

A piece of work against oblivion

"El Hank Lighthouse is the symbol of Casablanca maritime memory. The painted work of Mohamed Abouelouakar is a tribute to this memory against oblivion and indifference.

The painted lighthouse is a celebration of the presence of the Ocean which constitutes a kernel part of the history and identity of the city. Perpetual motion, luminous overflow, evocation and celebration, this piece of work is the dream of a city reconciled with its memory and its creative genius, avid for fertile spaces, rebellious to all closures. The structure strives to rehabilitate the lighthouse as a sublime spot of memory and projection towards the possible endeavors of the future. A link between the ocean, the port and the city, its far-reaching signals serve as the guardians of the premises... Through this painted work, we are in harmony with this call not to forget and to imagine and unceasingly recreate the forms of the future." (Mohamed Jibril)

www.babelmed.net

LIGHTHOUSE

SIDI BOUBKER

Identification of the lighthouse

SHOM Number	43960 D.2582
Type	Coast marking
Start date	1921

Landmark

Type of construction	Cylindrical concrete tower
Height/sea	47 m
Height/ground	13 m

Position

Geographical location	In the east-north of El Jadida Port, to the south of the tip of Azemour.
Coordinates	33°20'36"N 08°18'18"O

Description of light

Type of lamp	With sectors
Sectors	White: 25° (75° to 100°) Red: 145° (100° to 245°) Darkness: 190° (245° to 75°)
Luminous range	White: 13 nautical miles Red: 10 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	None

LIGHTHOUSE

SIDI MESBAH

Identification of the lighthouse

SHOM Number	44010 D.2584
Type	Coast marking
Start date	1921

Landmark

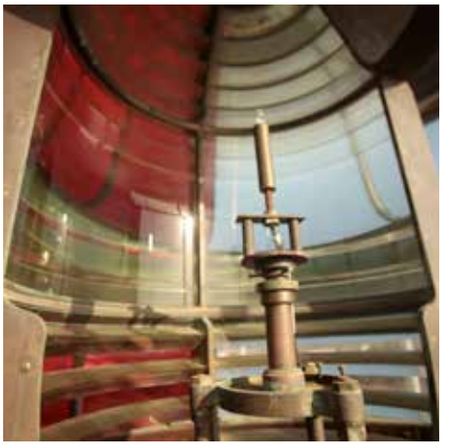
Type of construction	Square concrete tower
Height/sea	52 m
Height/ground	17 m

Position

Geographical location	in the east-south, to the east of El Jadida Port
Coordinates	33°14'34,02"N 08°26'10,94"O

Description of light

Type of lamp	With sectors
Rate	2 occulations every 6 s [Occ (2) 6s]
Sectors	Red: 90° (61° to 151°) White: 37° (151° to 188°) Darkness: 233° (188° to 61°)
Luminous range	14 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	None



LIGHTHOUSE

SIDI DAOUI

Identification of the lighthouse

SHOM Number	44060 D.2587.5
Type	Coast marking
Start date	2001

Landmark

Type of construction	Metal tower with black and white stripes
Height/sea	14 m
Height/ground	10 m

Position

Geographical location	El Jadida center
Coordinates	33°15'50,89"N 08°30'34,69"O

Description of light

Type of lamp	Turning
Rate	2 flashes every 10 s [Fl (2) W.10s]
Luminous range	10 nominal nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor

Photo d'archives

LIGHTHOUSE

SIDI BOUAFI

Identification of the lighthouse

SHOM Number	44050 D.2588
Type	Landing
Start date	1916

Landmark

Type of construction	Slightly truncated tower with corbelling at the upper part, in smooth masonry
Height/sea	65 m
Height/ground	45 m

Position

Geographical location	On Cape Mazagan, the highest point of the city of El Jadida, in the south-west of El Jadida Port
Coordinates	33°15'00,87"N 08°31'00,42"O

Description of light

Type of lamp	Turning
Rate	1 flash every 5 s [Fl (1). 5s]
Luminous range	34 nominal nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor + mercury tank

In the south-west of the city, Sidi Bouafi Lighthouse was set up on the highest site of Cape El Jadida. Located at the center of a district of the city, the lighthouse rises a few dozens of meters of the dome of the marabout bearing the same name. It is listed among the monuments of the city, testifying to a rich and diversified history.

A land for both settlement and transit, El Jadida was, down the ages, a plural society, an exceptional testimony of cross-infuences between the European and Moroccan cultures.

Subject of legends and myths, besides its role of indicating dangerous zones, the port and the estuary, Sidi Bouafi Lighthouse is famous in the area for its therapeutic power, unless its proximity to the marabout has something to do with this belief.

LIGHTHOUSE

CAPE BLANC

Identification of the lighthouse

SHOM Number	44180 D.2590
Type	Landing
Start date	NS

Landmark

Type of construction	Square white tower, and a black top
Height/sea	31 m
Height/ground	17 m

Position

Geographical location	4 km from Jorf Lasfar Port and 17 km from El Jadida
Coordinates	33°09'42.55"N 08°37'39.42"O

Description of light

Type of lamp	With sectors
Rate	1 occulation every 6 seconds [Occ (1) .6s]
Sectors	White: 172° (18° to 190°) Red: 38° (190° to 228°) Darkness: 90° (228° to 318°) Red: 60° (318° to 18°)
Luminous range	White: 10 nautical miles Red: 7.5 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	None

LIGHTHOUSE

LALLA FATNA

Identification of the lighthouse

SHOM Number	NS
Type	Landing
Start date	2003

Landmark

Type of construction	Pylon
Height/sea	50 m
Height/ground	30 m

Position

Geographical location	10 Km from El Oualidia Lagoon northwards
Coordinates	32°47'55,73"N 08°57'36,87"O

Description of light

Type of lamp	Turning
Rate	3 flashes every 12 s [Fl (3) .12s]
Luminous range	20 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor

LIGHTHOUSE

CAPE BEDDOUZA

Identification of the lighthouse

SHOM Number	44250 D.2592
Type	Landing
Start date	1916

Landmark

Type of construction	Square tower with crowning, in smooth masonry, inside a Kasba with a large square enclosure, many crenels, square angle towers, a round path, and a central tower bearing a large-diameter lantern.
Height/sea	68 m
Height/ground	18 m

Position

Geographical location	32 km in the north of Safi Port
Coordinates	32°32'25.34"N 9°16'51.50"O

Description of light

Type of lamp	Turning
Rate	2 white flashes in 10 s [Fl (2) W.10s]
Luminous range	22 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor + mercury base

LIGHTHOUSE

BORJ NADOR

Identification of the lighthouse

SHOM Number	44260 D. 2595
Type	Coast marking
Start date	1957

Landmark

Type of construction	Square tower in smooth masonry
Height/sea	92 m
Height/ground	11 m

Position

Geographical location	Located 7 km to the north-west of Safi Port
Coordinates	32° 19' 49,27" N 9° 16' 41,90"O

Description of light

Type of lamp	White horizon
Rate	4 occulations every 12 seconds [Occ (2) .12s]
Luminous range	18 nominal nautical miles
Energy source	Sector
Control	Automatic
Rotation device	None

LIGHTHOUSE

SIDI MEGDOUL

Identification of the lighthouse

SHOM Number	44530 D.2602
Type	Guidance
Start date	1916

Landmark

Type of construction	White square tower in local material masonry
Height/sea	19 m
Height/ground	15 m

Position

Geographical location	At the exit of the city of Essaouira, on the way to Agadir.
Coordonnées	31°29'32.02" N 9°45'50.79"O

Description of light

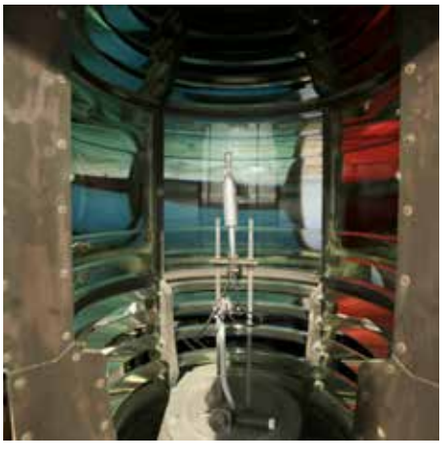
Type of lamp	With sectors
Rate	3 occulations white, red and green every 12 seconds [Oc.WRG.12s]
Sectors	Green: 90° (34° to 124°) White: 12° (124° to 136°) Red: 78° (136° to 214°) White: 46° (214° to 260°) Attenuated White: 90° (260° to 350°) White: 44° (350° to 34°)
Luminous range	White of 14 nautical miles Red of 11 nautical miles Green of 9 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	None

The current city of Essaouira dates back to 1765. It was the Alaouite Sultan Sidi Mohamed Ben Abdallah who decided to build a port intended to open the city onto the world. (.....) For years, Essaouira was the only Moroccan port open to foreign trade; it was through Mogador that tea was introduced to Morocco in the 18th century.

Portal of the city of Essaouira: Essaouira.vivre-maroc.com

Sidi Megdoul Lighthouse is located on the Cape of Sidi Megdoul in the South of Essaouira, beside the marabout bearing the same name, one of the "saints of the port, protecting the shores and sailors, whose cupolas, standing as the watchtowers of the sea, punctuate the shores. The sailors pay them tribute at the opening of each fishing season [1].

[1] *www.rivagesdessaouira.hautetfort.com*



LIGHTHOUSE

CAPE SIM

Identification of the lighthouse

SHOM Number	44720 D.2604
Type	Landing
Start date	1917

Landmark

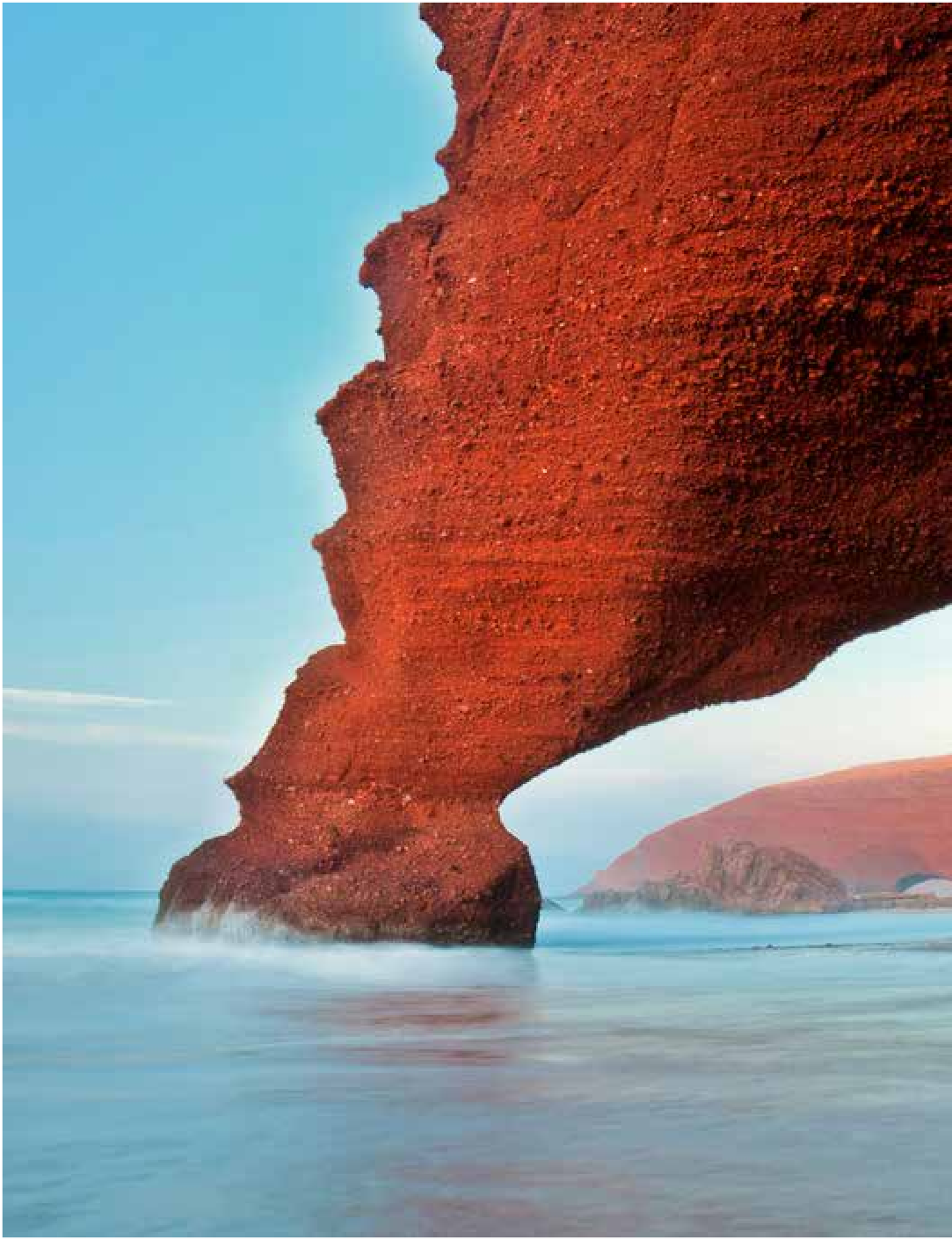
Type of construction	Masonry in local materials (green and white tower in the center of an enclosure flanked by five towers)
Height/sea	103 m
Height/ground	15 m

Position

Geographical location	Douar Ouassen, approximately 20 km to the south of the city of Essaouira
Coordinates	31°23'48,45" N 09°49'46,56"O

Description of light

Type of lamp	Turning
Rate	3 white flashes every 15 s [Fl (3) W.15s]
Luminous range	21 nautical miles (geographical)
Energy source	Solar
Control	Automatic
Rotation device	Electric machine + base floating in a mercury tank



SOUTH ATLANTIC SEABOARD

SOUTH ATLANTIC SEABOARD

The South Atlantic seaboard relates to the Atlantic coast extending from the south of Essaouira to Lagouira (Moroccan-Mauritanian border). This seaboard, approximately 1880 km long, includes the Atlantic maritime coasts belonging to the Regions Plain of Souss Massa Draa, Guelmim- Essmara, Laayoune-Boujdour-Sakia El Hamra and Oued Eddahab-Lagouira. Throughout this coast stand majestically twelve (12) lighthouses of sea transport:

- Cape Ghir Lighthouse
- Cape Jellab Lighthouse
- Sidi Ifni Lighthouse
- Cape Draa Lighthouse
- Cape Nachtigal Lighthouse
- Tarfaya Lighthouse: CAPE JUBY
- cape Cinq Lighthouse (Actilghazi)
- Boujdour Lighthouse
- cape Sept Lighthouse (Aftissat)
- cape Huit Lighthouset (Nouifed)
- Arciprès Lighthouse
- Cape Barbas Lighthouse

At the morphological level, the southern Atlantic seabord is composed of sharp cliffs, located in the Maghreb faceplate, with a limestone-sandy formation of the villafranchian type, as well as vast fine-sand beaches, whose width may exceed 500 m, some of which are located near the urban centers (Taghazout, Agadir, Sidi Ifni) and others in a natural environment free from any pollution (Aghroud, white beach, Oum Elkheirine, Eloutia, Foum El Oued). It also accommodates particular geomorphological sites such as bays (of Dakhla), tips (Sarga), dunes (Duna Blanca) and lagoons (Khnifiss, classified as RAMSAR, which offers an astonishing diversity of biotope for fauna and flora).

On the economic front, the back-country of the South Atlantic seaboard is characterized by its important agricultural (plain of Souss), halieutic, tourist and bathing potentials, with internationally renowned sites.

Hence, the maritime activity of this seaboard is marked, on the one hand, by the intense activity of exporting agri-food and mining products through the existing ports (Agadir, Tan Tan, Laâyoune, Dakhla), and on the other hand by the important high-sea, coastal and artisanal fishing activity, whose volume of the products unloaded on the fishing ports exceeded a million tons, in 2013, unloaded mainly in the major ports (Sidi Ifni Tarfaya,

Agadir, Imsouane, Tan Tan, Laâyoune, Boujdour and Dakhla) as well as the unloading outlets developed for this purpose (Imi N'ouadar, Tifnit, Aglou, Sidi Boulfdail, Rkount, Khnifiss).

The development perspectives of the fishery potential led, under the Port National Strategy 2030, in addition to the extension of the existing infrastructures, to the completion of new port infrastructures dedicated to fishing, such as the new ports of Lamhiriz and Dakhla – Atlantic, currently under study.

Moreover, the bathing and leisure activity, supported by beaches and maritime sites, is characterized by the increasing number of cruise tourists, national and international holiday-makers, and water-sport amateurs who visit such sites.

The following Table shows the volumes of the major port traffic recorded in the ports located on this seaboard, as well as their projections by 2030

Import/export Traffic (1000 T)					Volume of unloaded fishing products (1000 T)	
2013			Projected for 2030		In 2013	As of 2014
Import	Export	Import+Export total	Assumptions/Import+Export			
			Low	High	1000	1000 (*)
3500	4000	7500	20500	32000		

(*) planned for the new Port of Dakhla- Atlantic

Except for the old light of Casamar, which was built in 1882 by the English explorer McKenzie, and stopped operating since the construction of Tarfaya Lighthouse, the twelve (12) lighthouses which punctuate this Atlantic seaboard, most of which are relatively new, provide the ships sailing in this maritime seaboard with a highly valuable service, particularly for the boats that are not equipped with sophisticated technological positioning systems. This is why the fishermen continue to express their need for the reinforcement of coastal signage, and the construction of two new lighthouses is underway, at the fishing villages of Imoutlane and Ntirefet, located in the region of Dakhla.

LIGHTHOUSE

CAPE GHIR

Identification of the lighthouse

SHOM Number	44760 D.2608
Type	Landing
Start date	1932

Landmark

Type of construction	Slightly truncated white tower with crowning, in smooth masonry
Height/sea	86 m
Height/ground	26 m

Position

Geographical location	Southern part of the west coast of Morocco, on Cape Ghir at the foot of a mountain 45 km to the west of the city of Agadir
Coordinates	30°37'55,09"N 09°52'55,47"O

Description of light

Type of lamp	Turning
Rate	1 white flash every 5 seconds [Fl (1) W. 5s]
Luminous range	23 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor + mercury tank

LIGHTHOUSE

CAPE JELLAB

Identification of the lighthouse

SHOM Number	45070 D.2615
Type	Coast marking
Start date	2004

Landmark

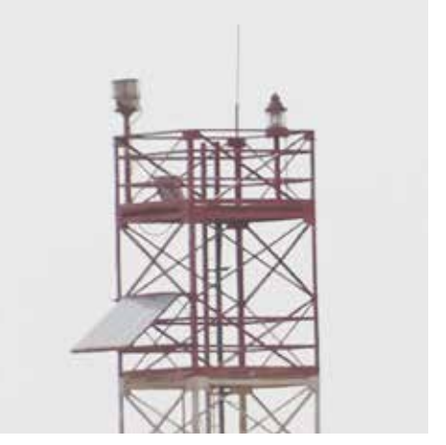
Type of construction	Metal pylon
Height/sea	60 m
Height/ground	20 m

Position

Geographical location	40 km to the north of the city of Sidi-ifni
Coordinates	29°40'32,31" N 09°58'53,14"O

Description of light

Type of lamp	Turning
Rate	2 grouped flashes +1 in 12s [Fl (2+1) W.12s]
Luminous range	20 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor + turning base with ball bearings



LIGHTHOUSE

SIDI IFNI

Identification of the lighthouse

SHOM Number	45080 D.2616
Type	Landing
Start date	1949

Landmark

Type of construction	Square tower in smooth masonry
Height/sea	60 m
Height/ground	13 m

Position

Geographical location	In the center of the city of Sidi Ifni
Coordinates	29°23'18,40" N 10°10'17,43" O

Description of light

Type of lamp	Turning
Rate	3 grouped flashes + 1 flashe every 30 seconds [Fl (3+1) W30s]
Luminous range	22 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor + Turning base with mercury and bearings

LIGHTHOUSE

CAPE DRAA

Identification of the lighthouse

SHOM Number	45180 D.2616.6
Type	Coast marking
Start date	1999

Landmark

Type of construction	A 33 m- high pylon, painted in black and white; the lamp indicator is conical
Height/sea	87 m
Height/ground	33 m

Position

Geographical location	Erected at the mouth of Wadi Draa, 30 km to the west of Tan Tan Port
Coordinates	28°40'31,73" N 11°07'28,20" O

Description of light

Type of lamp	Turning
Rate	2 flashes every 10s [Fl (2) .10s]
Luminous range	30 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor

LIGHTHOUSE

CAPE NACHTIGAL

Identification of the lighthouse

SHOM Number	45200 D. 2617
Type	Port light
Start date	1977

Landmark

Type of construction	Turret supported by three columns in smooth whitewashed masonry
Height/sea	40.75 m
Height/ground	8.75 m

Position

Geographical location	Within the port on a cliff 32 m in height
Coordinates	28°30'00" N 11°21'00" O

Description of light

Type of lamp	Turning
Rate	1 white flash every 10 s [Fl (1) W.10s]
Luminous range	23 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor

LIGHTHOUSE

TARFAYA
Cape Juby

Identification of the lighthouse

SHOM Number	45300 D.2619
Type	Landing
Start date	1986

Landmark

Type of construction	Cylindrical concrete tower
Height/sea	-
Height/ground	13.40 m

Position

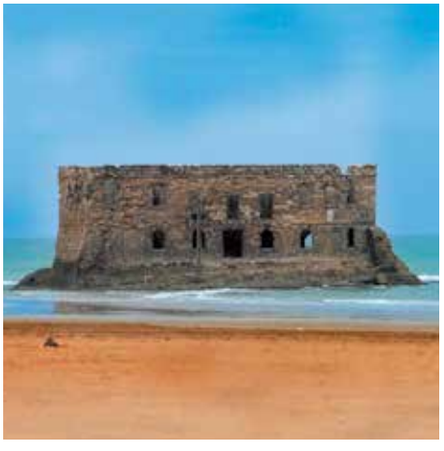
Geographical location	City of Tarfaya
Coordinates	27°55'11,00" N 12°56'15,00"O

Description of light

Type of lamp	Mirror drum of cut glass
Rate	2 white flashes every 08s [Fl (2) .8s]
Luminous range	20 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor

Casamar is not the only monument in the city of Tarfaya. But it has the chance to appear as the take-off and landing point of the collective memory of universal literature through the work of the great Antoine de Saint-Exupéry: "Courrier Sud", written in Tarfaya between 1927 and 1929 and "Petit Prince", inspired by Tarfaya between sky and land, ocean and desert, in plenitude and serenity for the creation of a character that appeared like a mirage in this environment of the desert. "Tarfaya has the assets which will make of it one of the best destinations of the Kingdom and promises to compete with the traditional tourist resorts", explains Isabelle Daniel, a Frenchwoman who chose to settle definitively in this city.

Mohamed Laabid
Aujourdhui.ma | 1-09-2009 12:21:00



LIGHTHOUSE

CAPE CINQ
Aghti El Ghazi

Identification of the lighthouse

SHOM Number	45800 D.2626
Type	Coast marking
Start date	Unknown

Landmark

Type of construction	Cylindrical reinforced- concrete tower, white with horizontal black stripes
Height/sea	32 m
Height/ground	32 m

Position

Geographical location	50 km to the north of the city of Boujdour
Coordinates	26°25'33.50" N 14°10' 48.09"O

Description of light

Type of lamp	Rythmic light
Rate	3 white flashes every 12s [Fl (3) W.12s]
Luminous range	18 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	None

LIGHTHOUSE

BOUJDOUR

Identification of the lighthouse

SHOM Number	45840 D. 2628
Type	Landing
Start date	NS

Landmark

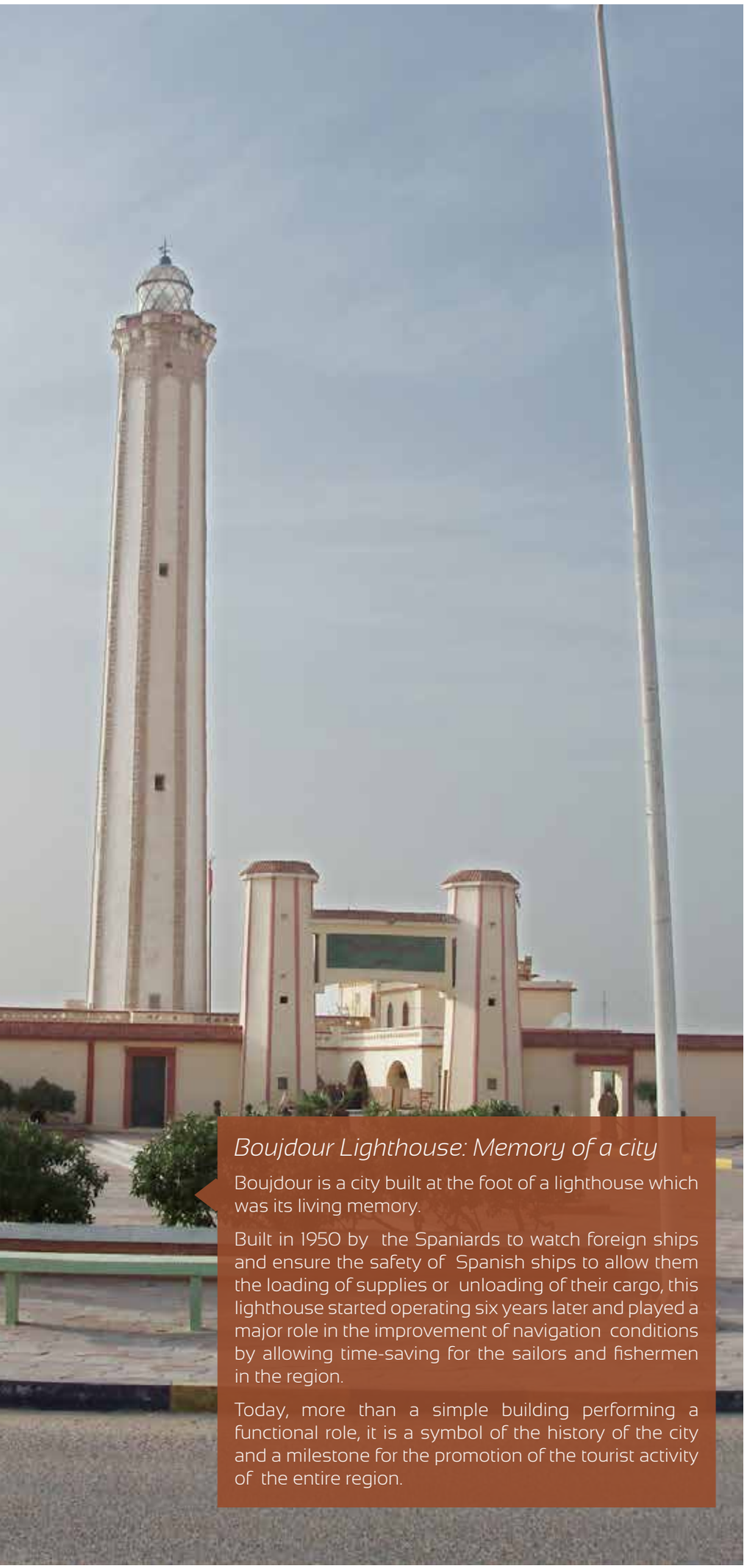
Type of construction	Heptagonal reinforced concrete tower; white with vertical beige stripes
Height/sea	70 m
Height/ground	52 m

Position

Geographical location	In the center of the city of Boujdour
Coordinates	26°07'26,40"N 14°29'10,22" O

Description of light

Type of lamp	Turning
Rate	3 white flashes every 15s [Fl (3)
Luminous range	24 nautical miles
Energy source	Sector
Control	Automatic
Rotation device	Electric motor

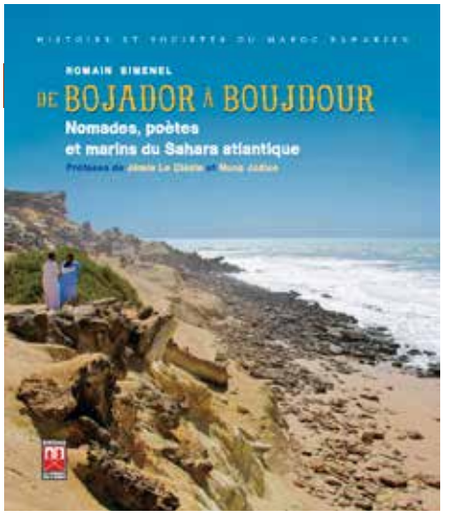


Boujdour Lighthouse: Memory of a city

Boujdour is a city built at the foot of a lighthouse which was its living memory.

Built in 1950 by the Spaniards to watch foreign ships and ensure the safety of Spanish ships to allow them the loading of supplies or unloading of their cargo, this lighthouse started operating six years later and played a major role in the improvement of navigation conditions by allowing time-saving for the sailors and fishermen in the region.

Today, more than a simple building performing a functional role, it is a symbol of the history of the city and a milestone for the promotion of the tourist activity of the entire region.



At the outset, a lighthouse, the leading light of Cabobojador, essential challenge for medieval navigation towards central and southern Africa then the Indies. Cardinal point of the creative expressions of the Saharan and Portuguese cultures, Bojador was the theater stage of the combined blooming of Saharan and Portuguese poetry. Uttered by nomads and sailors, Hassani Gaf and Portuguese Fado resounded together, unknowingly, on both sides of the cape of poets.

LIGHTHOUSE

CAPE SEPT
Aftissat

Identification of the lighthouse

SHOM Number	45920 D.2630
Type	Coast marking
Start date	Unknown

Landmark

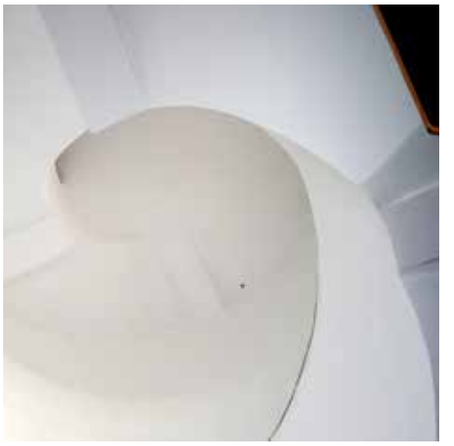
Type of construction	Cylindrical reinforced concrete tower; white with horizontal black stripes
Height/sea	70 m
Height/ground	12 m

Position

Geographical location	62 km to the south of the city of Boujdour
Coordinates	25°35'31.08" N 14°41'16.82" O

Description of light

Type of lamp	Fixed rhythm
Rate	2 white flashes every 9 s [Fl(2)W.09s]
Luminous range	18 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	None




POWERSONIC

LIGHTHOUSE

CAPE HUIT
Nouifed

Identification of the lighthouse

SHOM Number	45960 D.2631
Type	Coast marking
Start date	Unknown

Landmark

Type of construction	Cylindrical reinforced concrete tower; white with horizontal black stripes
Height/sea	173 m
Height/ground	12 m

Position

Geographical location	125 km to the south of the city of Boujdour
Coordinates	25°05'01.40" N 14°50'05.82" O

Description of light

Type of lamp	Rhythmic fixed
Rate	4 white flashes in 15s [Fl (4) W.15s]
Luminous range	18 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	None

LIGHTHOUSE

ARCIPRES

Identification of the lighthouse

SHOM Number	4602 D.2972
Type	Landing
Start date	1916

Landmark

Type of construction	Cylindrical reinforced concrete tower; white with horizontal black stripes
Height/sea	86 m
Height/ground	56 m

Position

Geographical location	Dakhla
Coordinates	23°43'35.79"N 15°57'15.18"O

Description of light

Type of lamp	Turning
Rate	1 flash every 5 seconds [Fl(1).5s]
Luminous range	20 nautical miles
Energy source	Solar
Control	Automatic
Rotation device	Electric motor + base with bearing

Rising at the edge of the road with its elegantly striped body, Dakhla Lighthouse, seen from the ground seems to rise in layers and serves as a beacon for sailors.

Its exceptional form and unusual aspect make of it a unique lighthouse of its kind.

Inaugurated in 1968, with its Spanish name "Arcipres", to provide navigation assistance, it is visible from 25 nautical miles. Its 56 m - high body, in the middle of a clear land plot, confers upon it incomparable visibility.

LIGHTHOUSE

CAPE BARBAS

Identification of the lighthouse

SHOM Number	NS
Type	Landing
Start date	1969 (out of order)

Landmark

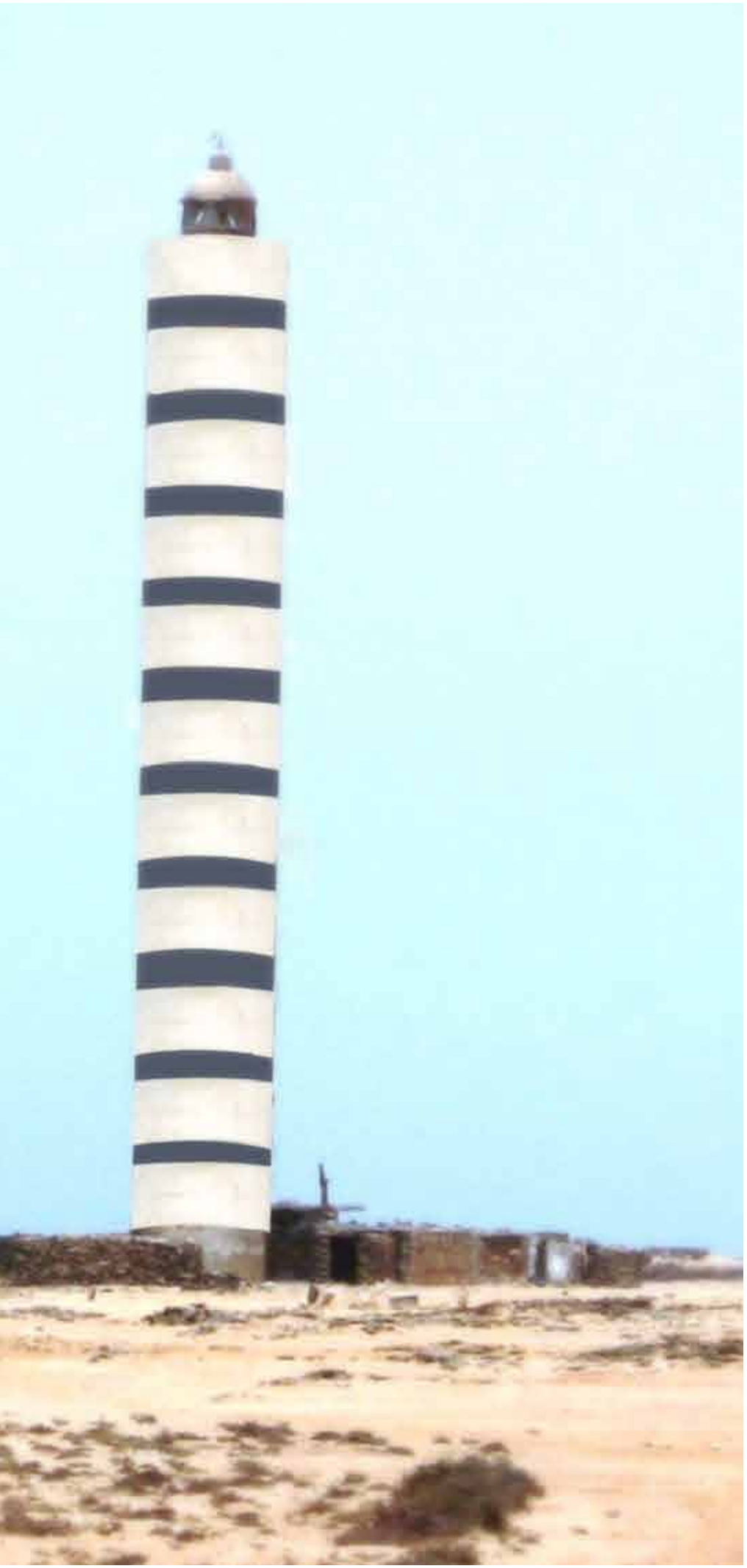
Type of construction	Cylindrical reinforced concrete tower
Height/sea	54 m
Height/ground	44 m

Position

Geographical location	Dakhla, 15 Km as the crow flies to the north east of the site of the project of Lamhiriz Fishing Port
Coordinates	22°17'41.00"N 16°40'37.00"O

Description of light

Type of lamp	Turning
Rate	NS
Luminous range	NS
Energy source	NS
Control	Automatic
Rotation device	Electric motor + ball bearing




BBT PARIS

ARTIFACTS AND CORE BUSINESSES OF LIGHTHOUSES

ARTIFACTS AND CORE BUSINESSES OF LIGHTHOUSES

Unlike other countries where certain lighthouses are on the open sea, the thirty-nine lighthouses of Morocco are all accessible via land. They make it possible for ships to locate the position of the danger zones as they sail close to the coasts, as well as the seaports nearby.

"At the end of first half of the 20th century, , the cornerstone of marine navigation aids in Morocco was composed of a chain of flashing lighthouses : Cape Spartel (1864), Cape Fédala (1934), El Hank (1920), Sidi Bou Afi (1917), Cape Cantin (1916), Cape Sim and Cape Ghir. This chain was supplemented by the small landing lighthouses of Mehdia, Calette, Roches Noires, Azemmour, Tombeau, cape Blanc of the North, Tower Tip, Sidi Mogdoul and Aresdhis Tip. To this list should be added all small port lights and the various installations: luminous landing buoys of Casablanca, Safi and Agadir, port and entrance range lights, as well as El Hank radio beacon. "[1]

The lighthouses are equipped with a powerful lighting system usually located at the top of a tower. The techniques used for the light sources of the lighthouses evolved along with light technology development. Also, the rotation of these light sources, which used to be manual, now operates automatically.

The operation of this system requires regular maintenance and monitoring. Any operation related to such activities is accurately recorded in specific registers.

This operation is ensured by a professional group, with particular profiles, whose categories and manpower evolved in a progressive way along with the development of the technology used for the operation of lighthouses.

A – Lighthouse equipment

The equipment and artifacts of the lighthouses as well as the elements illustrated in this chapter are presented according to the following typology:

1- the equipment used to provide and maintain the source of light, sound and electromagnetic waves;

2- the devices of amplification and guidance of light signals;

3-the devices of light rotation;

4- the tools for reporting the events experienced in the lighthouse.

[1] *'How can Casablanca be farther from Europe than Singapore?! /Najib Cherfaoui, Civil Engineer / Economist , Issue N° 1663 of 16/12/2003*


GRAISSE BELLEVI
ENTRETENIR la DOUCEUR & L'ÉTANCHÉITÉ
L'ERMITAGE

1 THE EQUIPMENT USED TO PROVIDE AND MAINTAIN THE SOURCE OF LIGHT, SOUND AND ELECTROMAGNETIC WAVES

The energy sources used in the lighthouses to generate light are oil, gas, petroleum and electricity (sector, solar energy, generator).

The sources of light are characterized by a very important range, according to their light power and intensity.

OIL LAMP: (ALADIN)

Lighthouse of Tangier (Cape Spartel)

- Fueled with animal fat, plant oil, whale oil or mineral oil

OIL LAMP: (KANDIL)

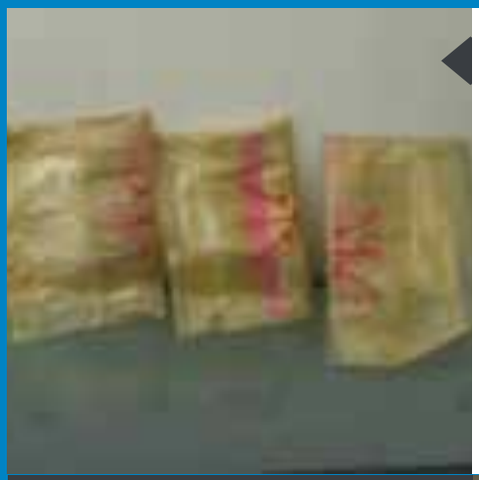
Casamar (Tarfaya)

- the roof of the building of Casamar, built in 1882 by the English explorer McKenzie.

INCANDESCENT BURNER WITH OIL VAPOR

Lighthouse of Tangier (Cape Spartel)

- Invented by Polish pharmacist Ignacy Lukasiewicz in 1853.
- Composed of a tank containing paraffin oil (distilled oil), which goes up towards the nozzle via a wick. The whole is topped by a glass chimney.



TEXTILE SLEEVE

Cape Beddouza Lighthouse

- Fireproof fabric sheath impregnated with rare earth oxide and/or thorium;
- Used for oil lamps

TRADITIONAL INCANDESCENT BULB

Cape Ghir lighthouse

- Invented in 1879 by Joseph Swan;
- Improved by the works of Thomas Edison;
- The lighthouses were equipped by these bulbs at the beginning of their supply by the electric current

MOBILE OIL LANTERNE

Cape Ghir lighthouse

- Provides the guard of the lighthouse with lighting in the absence of a source of light

The sound sources result primarily from the compression of the air in a complex device. They have a reduced range.

FOGHORN

El Hank lighthouse

- Sound signaling hooter used when it is difficult to see the light (fog...) ;
- Very cumbersome devices that consume a great amount of energy

EMERGENCY LIGHT

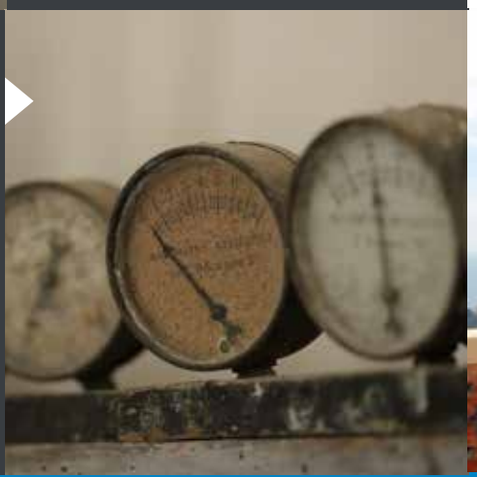
Lighthouse of Tangier (Cape Spartel)

- Installed in all lighthouses;
- Equipped with a weak-range light compared to the main light;
- Used in the event of the dysfunction of the main light

PRESSURE GAUGE

Cape Ghir lighthouse

- Installed in pressure lamps, in order to check the pressure of the compressed air



BALLOONS FOR THE CONDENSATION OF COMPRESSED AIR

El Hank Lighthouse

- Allowing the condensation of air in order to create a jet that oscillates a cast iron piston towards the foghorn

The electromagnetic wave sources are emitted by the radio beacons installed in a room near the lighthouses. Currently, they have been abandoned following the use of new positioning technologies.

RADIO BEACON:

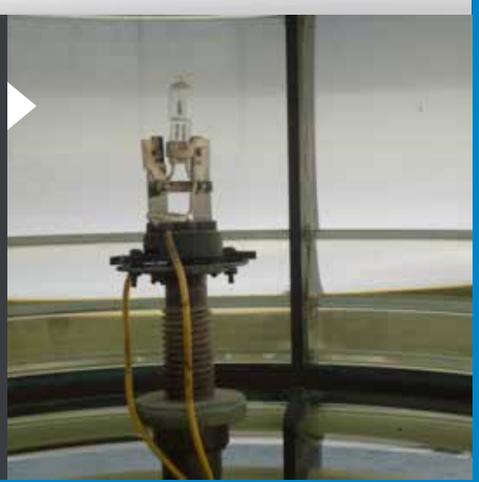
Cape Ghir lighthouse

- Transmitter of electromagnetic waves;
- Makes it possible for ships to locate the direction of the emission and determine their location;
- The first radio beacons were installed at the lighthouses of Cape Spartel and El Hank,
- Abandoned following the use of new positioning technologies.

HALOGEN LAMP

Rabat lighthouse

- Incandescent lamp whose gas contains halides;
- Currently used in the majority of lighthouses in Morocco



2 DEVICES OF AMPLIFICATION AND GUIDANCE OF LIGHT SIGNALS

FRESNEL LENS

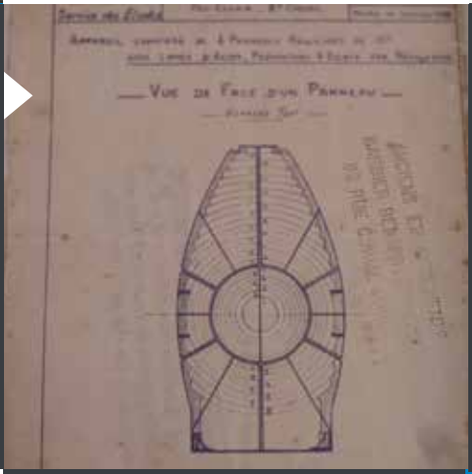
Sidi Bouafi Lighthouse

- Also called zoned lens;
- Invented by Augustin Fresnel in 1822;
- Allows amplification of the beam of light to increase the range of light;
- Some lighthouses of Morocco still have this type of lens.

MANUFACTURING PLAN OF FRESNEL LENS

Cape Ghir lighthouse

- The plan provided by the French manufacturer of the optical system of the lighthouse is carefully preserved by the administrative department.



NEW FRESNEL LENS

- Currently available on the market;
- Cast lens manufactured out of thermoplastic polymer in general;
- Much lighter and more effective;
- Their lifespan is incomparable with the cut- glass lenses.

CONTROL DEVICE

- Composed of a box;
- Allows the automation of the operation of the lighthouse;
- Fixes the rhythm of the lighthouse in an automatic fashion.

LIGHT ROTATION DEVICES

In the past, the rotation device was manual or the guard of the lighthouse would lift the counterweight several times per day. Nowadays it functions in an automatic way.

ROTATION PULLEY

Cape Ghir lighthouse

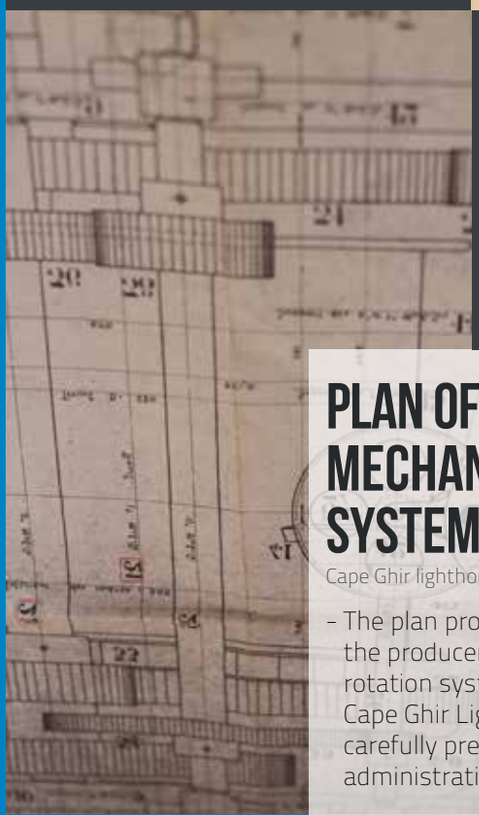
- Connected by a rope to a counterweight at its end;
- Allows the lifting of the counterweight in order to ensure the rotation of the mechanical system supporting the lamp.

COUNTERWEIGHT

- Composed of a cylindrical stone block,
- Used for the rotation of the lamp.

MECHANICAL ROTATION SYSTEM

- Composed of a set of traditional gears;
- Still operating in some lighthouses of Morocco.



CRANK FOR ROTATION MECHANICAL SYSTEM

PLAN OF ROTATION MECHANICAL SYSTEM

Cape Ghir lighthouse

- The plan provided by the producer of the rotation system of Cape Ghir Lighthouse is carefully preserved by the administrative department.

ROTATION SYSTEM WITH MERCURY TANK

- Invented in 1889 by Arthur Meurs;
- Ensures guided rotation of optics thanks to a ring immersed in a mercury pool;
- Allows the elimination of frictions;
- Allows low utilization of energy required for rotation.

4 TOOLS FOR TRACING THE EVENTS EXPERIENCED IN THE LIGHTHOUSE

SIGN-IN REGISTER

Cape Ghir lighthouse

- This register records the information relating to the sign-in of the guards of the lighthouse at that time;
- It is carefully kept by the administrative department.

RADIO BEACON REGISTER

El Hank Lighthouse

- This register contains information on the events which have occurred and the information collected during the operation of the radio beacon;
- It is carefully kept by the administrative department.

B. OPERATION MODE OF LIGHTHOUSES

Since the construction of the first lighthouses, their operation was centered on the presence and vigilance of the guards and lighthouse superintendents. These have always played a major role to ensure their operation and maintenance, under rather constraining conditions. The daily activity of the lighthouse guard and his family was for a long time influenced by the pace of the activities required by the operation of a lighthouse, throughout the day, constantly impacting their life.

The professions related to the monitoring and operation of lighthouses in Morocco were set by a vizieral decree dated 9 April 1920 "on the organization of the personnel of the guards of lighthouses of the Sharifian Empire". This profession included two categories: the lighthouse superintendent and the guards operating under his responsibility.

ARRÊTÉ VIZIRIEL DU 9 AVRIL 1920
(19 Rejeb 1338)
portant organisation du personnel des gardiens de phare de l'Empire Chérifien

LE GRAND VIZIR,

Vu les dahirs des 18 avril 1913 (11 Djoumada I 1331), 27 mai 1916 (24 Rejeb 1334) et 27 décembre 1917 (13 Rebia 1336) portant organisation du personnel des Services Civils de l'Empire Chérifien ;

Vu l'arrêté viziriel du 16 février 1915 (1er Rebia II 1333), modifié par l'arrêté viziriel du 31 janvier 1918 (17 Rebia II 1336) portant organisation du personnel des Travaux Publics de l'Empire Chérifien ;

VIZIERAL DECREE OF 9 APRIL 1920
(19 Rajeb 1338)
On the organization of the personnel of the guards of the lighthouses of the Sharifian Empire

THE GRAND VIZIER,

Considering the dahirs of 18 April 1913 (11 Djoumada I 1331), 27 May 1916 (31 Rajjeb 1334) and 27 December 1917 (13 Rbia 1336) on the organization Rajeb of the personnel of the civil services of the Sharifian Empire;

Considering the vizieral decree of 16 February 1915 (1 Rabia II 1333), modified by the vizieral decree of 31 January 1918 (17 Rebia II 1336) on the organization of the personnel of Public Works of the Sharifian Empire;

Nowadays, guarding lighthouses is ensured by at least a person called "Lighthouse Guard", operating under the responsibility of the Department of the Management of Regional Maritime Public Property. He currently performs the following missions:

- Monitoring the operating condition of the lighthouse;
- Servicing the various components of the lighthouses (lenses, batteries, metal parts, curtains....);
- Guarding the building of the lighthouse and its appurtenances.
- Reporting the information relating to the operating condition of the lighthouse.

ACKNOWLEDGEMENT

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