PORTUSplus

# Architecture on the limits [Industrial romanticism]

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Port: Place in the coast or in the river side, that because of his characteristics, allows ships to do loading/unloading operations.
In our concept of Industrial Romanticism, we are going to describe three buildings, constructed between 2009 and 2011 in port areas; places on the limits, where the urban fabric, melts with the sea. Small independent Republics with their own regulations [laws/no laws].

The projects born from industrialization and dynamism, they are built in shorter times and are light constructions, so they can be moved, grow or decrease with the pass of the time and the needs of the Port. Spaces close to industry and in progress always linked to the city. This areas are reflected so good in some movies from Wim Wenders, Kaurismäki, Kim Ki duk, Wong Kar Wai …

In resume, places where the urbanism becomes imperfect, where imperfection becomes beauty, where the sea and heavy industry is breathed.

**Keywords**
**Port; Industralization; Limits; Metal**

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## Introduction

Daedalus was a very famous Greek architect. Icarus, was Daedalus son, builder of Crete´s labyrinth. He taught everything to him. Sculpture, Architecture and the freedom desire.

"Men have no wings, but we will build it and then we can fly" Icarus finds daring the plan of this genial architect, that was his father. Icarus fascinated because of the lightness of his body in the air, don´t belong to his father anymore, he decided to fly.

A little bit by chance, like most of this things happen, a little bit looping for it, we develop our working line on the limits of the industry [physical and conceptual limits], building in Ports and post-industrial areas, in the limits of city-industry, city-sea, sea-industry. There is where we feel comfortable, in the ZAL, near of the containers, of the train rails, of the cranes and pipes.

Architecture on the limits leads some special conditions. The absence of plot, the industrial character, ships, metal, cranes… make necessary that building works as a connection space. The capacity of building depends of the port fluctuation, it could grow or decrease, may even disappear.

We try to export this idea of construction model much closer of the avant-garde industrial, to any kind of building and programmes [housing, cultural, commercial, etc…]

In these times of technology, we should escape from this constructive labyrinth, were we are in and bet for a lighter architecture. Recover the spirit of a quality construction, linked to steel, started in the first part of the last century, when the mirror to look at, was automotive, Aeronautic and the arms industry [study houses in California, Charles and Ray Eames, Mies Van Der Rohe, etc…]

The heavy construction is a question of the past. Why not to think in a new way of building, really sustainable, more over than "this fashion word", a light construction, dry, fast, flexible, close to industrialization, that allows an easy deconstruction, recyclable, and with short times. Is here were steel and light construction have a really important role.

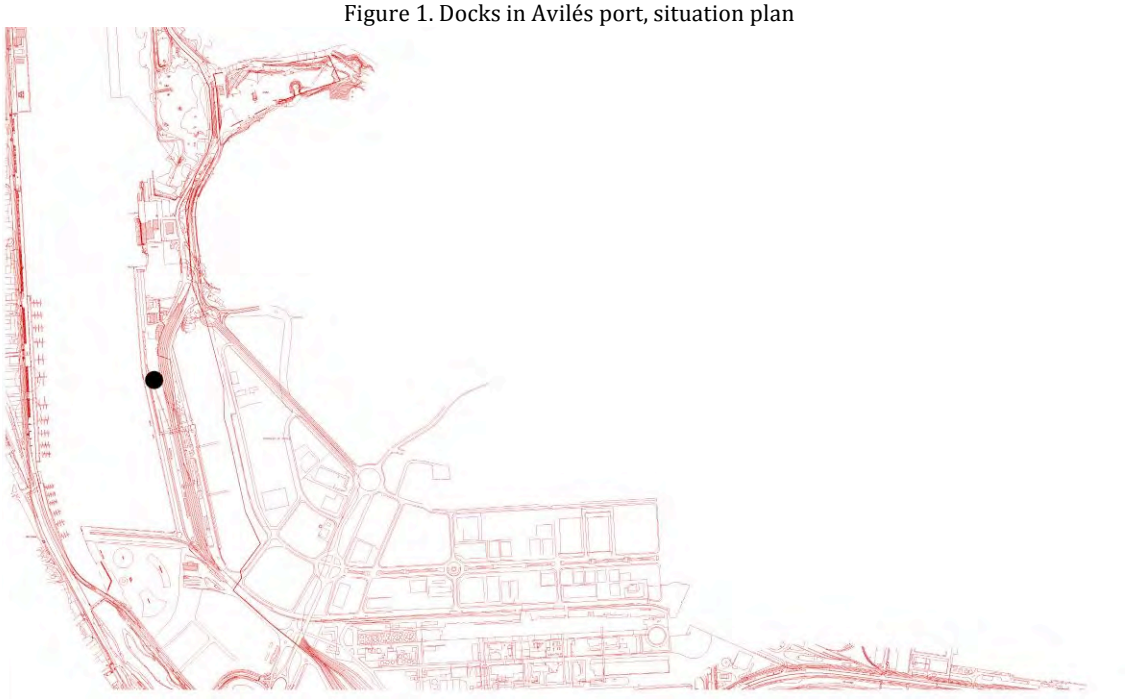
The lightness of a material, of a solution, that allows big formats and an easy manipulation of them, linking the production process, design and work on site. New materials, that allows new architecture.

Like an example of this type of architecture on the limits we are going to describe three buildings, constructed between 2009 and 2011.

## Docks in  Avilés Port , Asturias, Spain 2009
## [Neighbours of Óscar Niemeyer]

The building is sited in a privileged location in the Aviles harbour, in front of the city. An industrial landscape with ArcelorMittal´s factory as main character.

Figure 1. Docks in Avilés port, situation plan



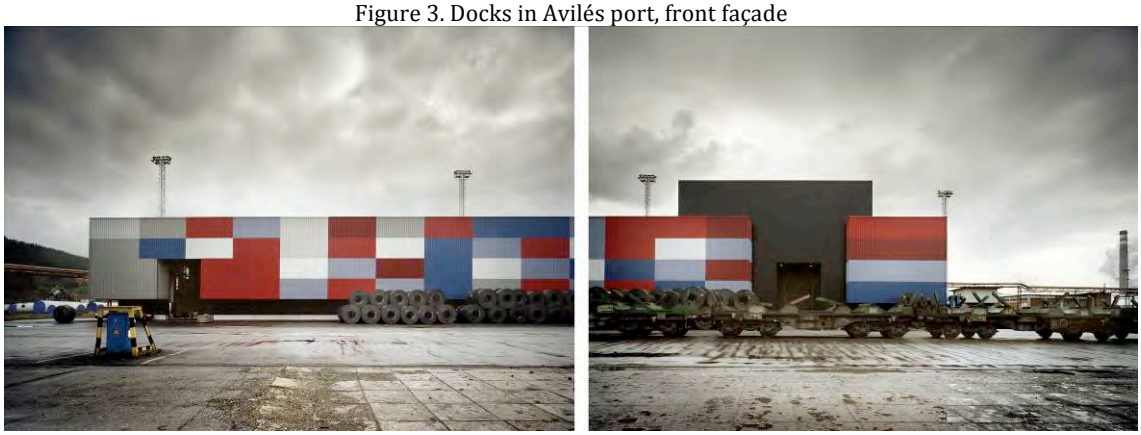
Because of the fast growth of the city, the new plan for the harbour [Innovation Island. Norman Foster] and neighbour building from Oscar Niemeyer, we are invited to propose an alternative to the existing project, a conventional industrial storage, with 120 m of facade to the city, this was the starting point.

Figure 2. Docks in Avilés port, panoramic view

We think in the idea of containers, a port image, placed in the mind of the people. The containers give shape to the facades and to the roof, breaking the building in colourful pixels that help to integrate the big scale building in the place, adding movement and colour to the area.

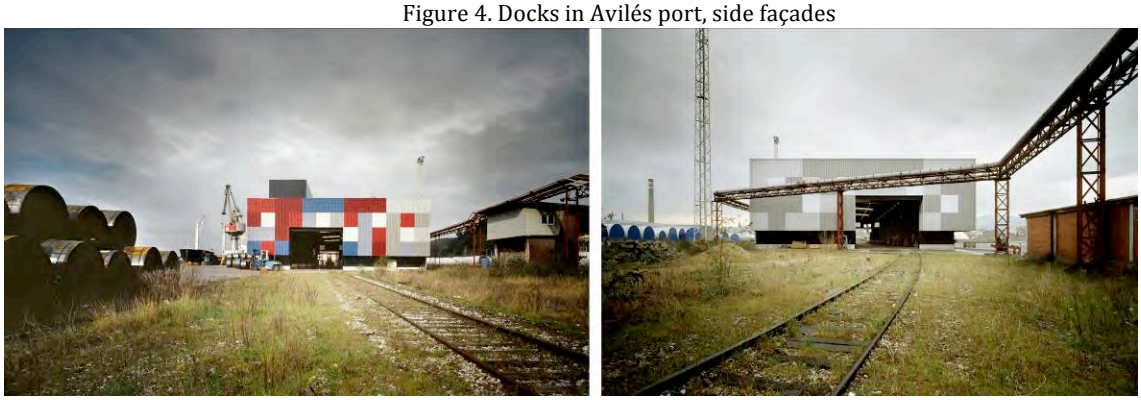
The chosen of the colours is not Only because of the logos of the two companies, but also because of an intention of relation with the industrial areas in the surroundings and with the colours that have been used in industrial storage buildings.
Over a dark socket, metallic, built as a hulk, born the tower, over the landscape, dialoguing with cranes and pipes, breaking again the continuity of the facade. This element will hold the logos of the companies that will use the building [ArcelorMittal and AGP] and is also the limit with the roof, the fifth facade of the building, very important because of the view from the planes that land and take off in the nearest airport.

Figure 3. Docks in Avilés port, front façade



The sheds are built entirely of steel, including the frame, the exterior building skins, façades and roof, with the logical and rational use of materials as manner of construction. All the components of the building are produced at the nearby factories, and, as a bolded-steel structure, is totally demountable and recyclable. The components are also composed by a high percentage of recycled material – more than seventy per cent – produced using an electric furnace system.

Figure 4. Docks in Avilés port, side façades

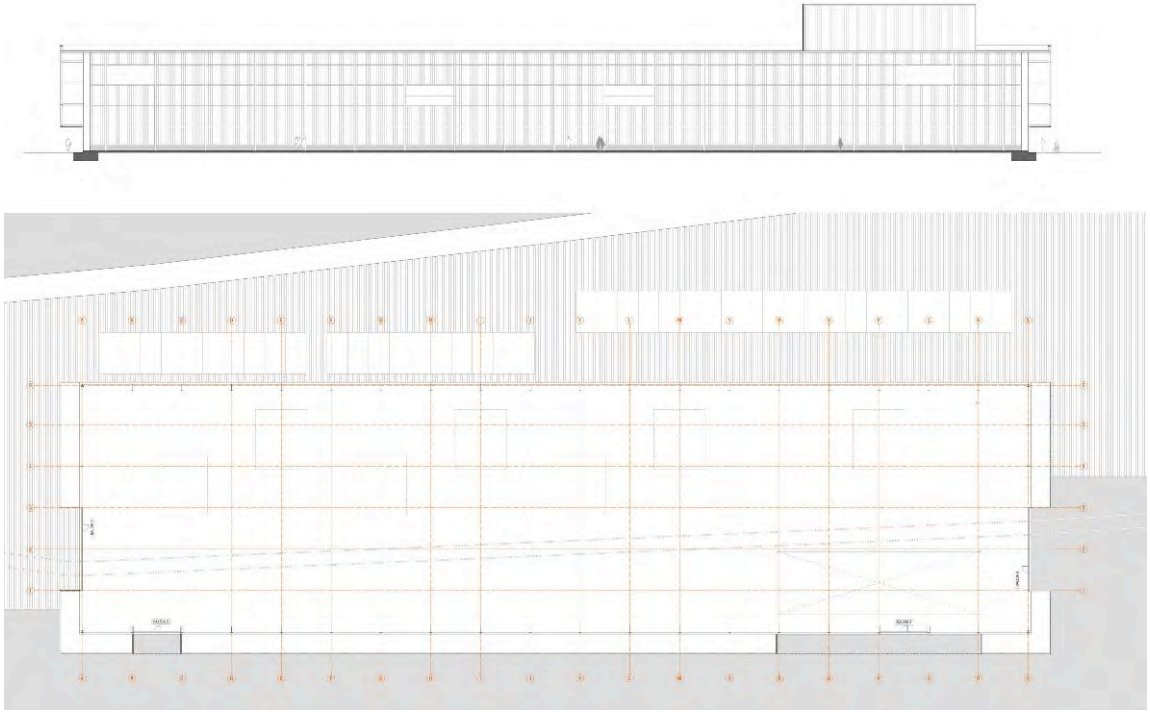


Two different types of enclosure are combined:

- The black basement and tower cladding is made of metallic sandwich-type panels, composed by two steel sheets 0.5mm thickness internally coated with 60mm polyurethane insulate, that provides the enclosure a thermal insulate of 0,36W/m2ºK and an acoustic insulation of 28 dB.
- The panels are fixed by a tongue-and-groove lapping, which avoids panels from swinging and allows make a hidden screwing to overlap the panels.
- Over this black basement stands the coloured façade, realized with breadth and depth galvanized steel profiles (PL40/250) 0,8mm thickness with a Polyurethane polyamide internal coating. These profiles are directly screwed to the secondary structure formed by cold-formed steel profiles. As it is an industrial building that works as a warehouse, it´s not necessary the use of thermal insulate.

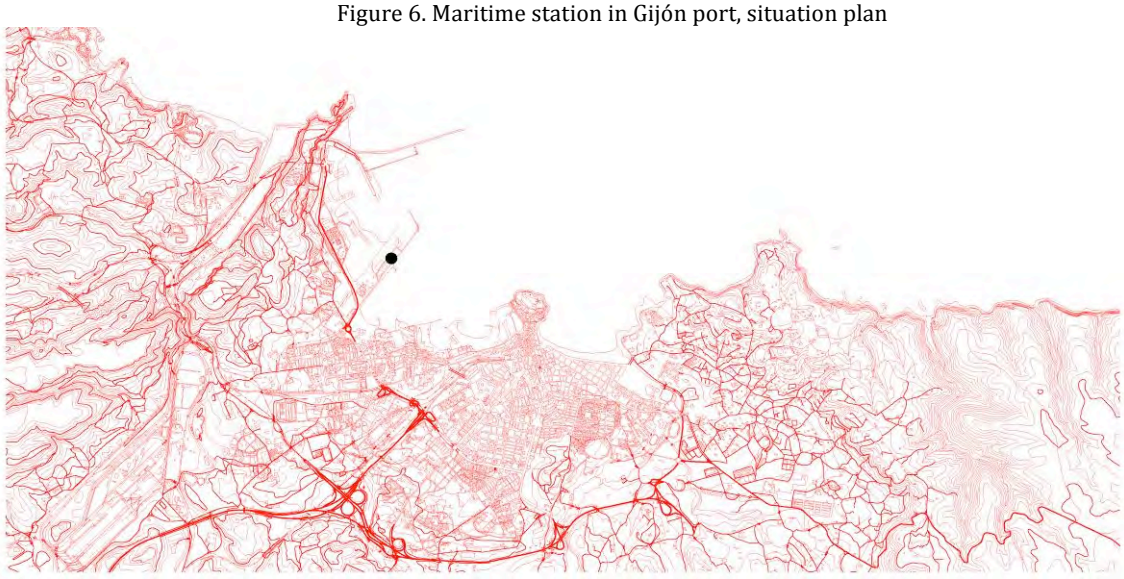
The result is an ephemeral building which use could be in relation with city development: it has the possibility to be translated or demounted, even its use could be change over time if necessary (concert place, space for cultural activities...)

Figure 5. Docks in Avilés port, plans



## Maritime Station in Gijon Port, Asturias, Spain 2010 [The sea highway]

Figure 6. Maritime station in Gijón port, situation plan



Located in De La Osa Pier, in Gijón Port, The Musel, the building is an assignment of the Port Authority of Gijón that consists in the project of the new maritime station for the sea highway. The new station would give service to the future ferry routes between Gijón and Nantes (France).

The programme has two different areas, pre-boarding and boarding, as well as a large-scale parking, mainly for trucks. The building must be working in six months and we have to consider the option of building expansion in a near future.

Figure 7. Maritime station in Gijón port, front façade

Due to these conditions, the building is planned as a modular one, with steel structure and opening to the sea. The building is performed entirely in the factory and subsequently assembled on site in a few weeks. By this way, the execution work period gets shorter and there is an important optimization of the working time because of the uniform conditions the factory provides. This type of construction allows an extension of the building in a short time and in a fully compatible way.

Figure 8. Maritime station in Gijón port, plans


The modules have 3,60 m. wide and 15 m. length maximum.

The roof structure of the modules is made with IPE-160 rolled steel profiles, and transversely, at intervals of 600 mm to 1200 mm approximately, galvanized steel sheet straps 20 mm thick are set out.

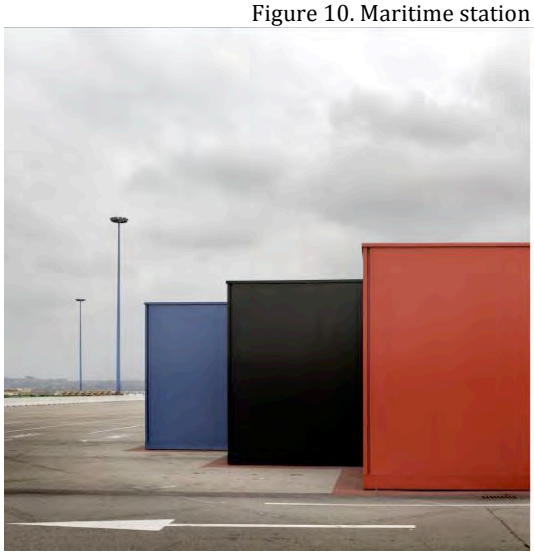
The façade is composed by sandwich-type panels, formed by two steel sheets lacquered in different colours, the interior and exterior sheets are 0.5 mm thick with a 60mm polyurethane insulate between them, that provides the enclosure a thermal insulate of 0,36W/m2ºK and an acoustic insulation of 28 dB.

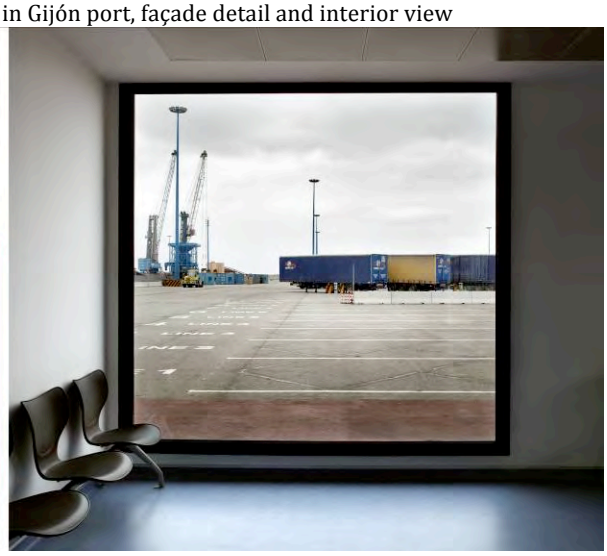
Figure 9. Maritime station in Gijón port, back façade

The panels are fixed by a tongue-and-groove lapping, which avoids panels from swinging and allows make a hidden screwing to overlap the panels. They are mounted vertically in 900 mm wide modules screwed to the secondary steel structure.

Internally, the enclosure is finished with a double 13mm plasterboard screwed to 46mm steel battels with an inner rockwool insulation 40mm thickness.

Figure 10. Maritime station in Gijón port, façade detail and interior view

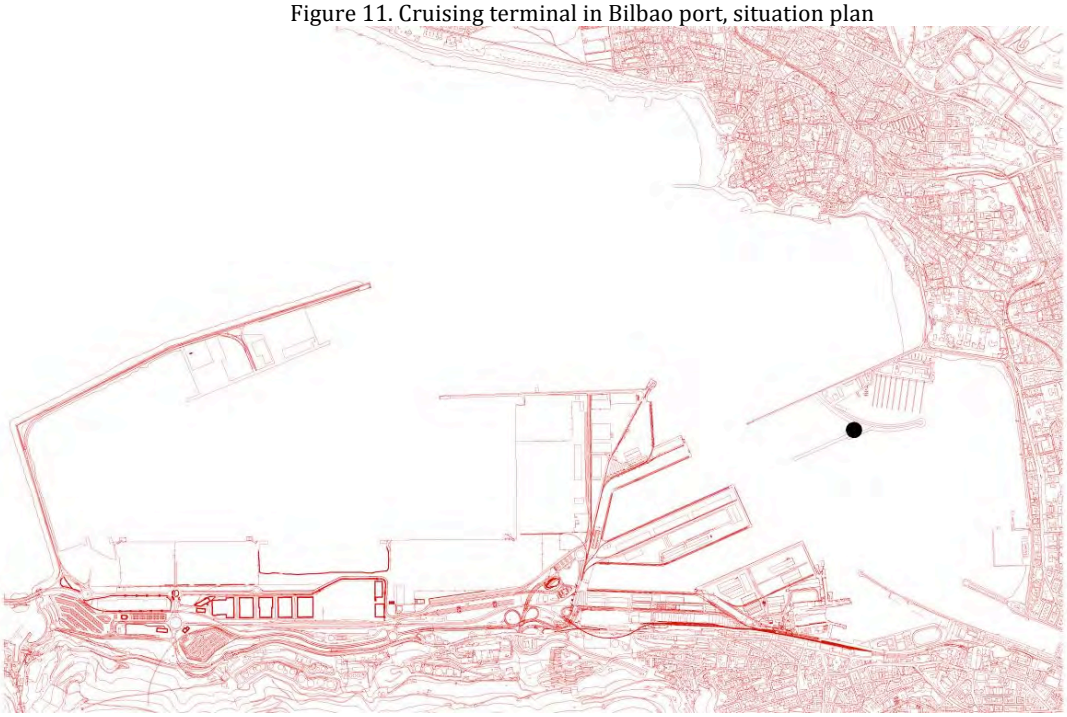




## Cruising Terminal in Bilbao Port, Basque Country, Spain 2011 [the love boat]

The Port of Bilbao, launches a competition at the end of 2009 in order to build the new Terminal of Cruise ships in Bilbao. A damp city, with a metallic memory, of shipyards, cranes, post-industrial areas, the suspension bridge of Portugalete…

Figure 11. Cruising terminal in Bilbao port, situation plan



We start from a metallic orthogonal prism, working in it, as it was a sculpture. The building starts to open to the sea, with a big crystal façade.

To the south, to the city, enclosure is much more opaque, framing the arrival square and attracting the northern light that comes in the building through the big skylights. The project starts to be structured in several containers with different volumes and length. The new Terminal runs in one floor, but it´s section is shaped by big skylights picking up northern light.

Figure 12. Cruising terminal in Bilbao port, panoramic view

We start to play with the idea of full and empty, by reference to the Basque sculptors [Chillida, Oteiza], introducing the programme for the Terminal in some of the containers, and keeping the empty space. Spaces where you can wait ship arrival.

We propose different spaces for different waiting forms: several types of lounges with different orientations, spreading spaces and open-air zones.

Figure 13. Cruising terminal in Bilbao port, front façade

Outside we ordered the arrival space, the big parking, where several light lines illuminate the building, making it a reference from the city.

In order to reduce construction time, [The building have to be in use in six months to receive the first cruise ship] we decide to make steel industrialized construction, building most part of the building in a factory, and transporting it by road from Asturias to Bilbao, where the building was assembled.

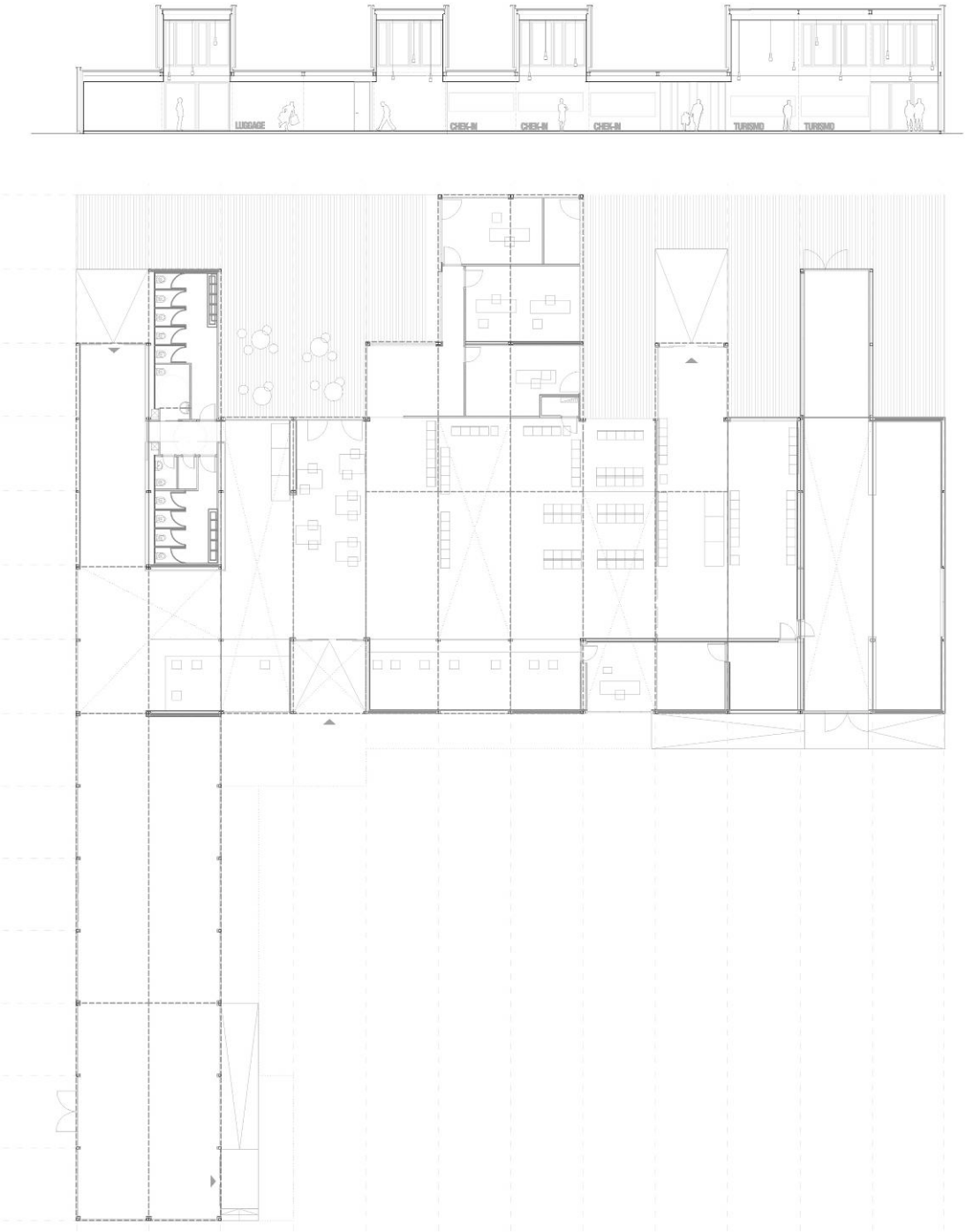
In this case, enclosure panels are performed by two steel sheets with an 80mm rockwool panel inside as insulation. These panels, with a great hygrothermal performance, provide inner space of optimal comfort conditions.

The building is developed around some basic parameters:

- Factory construction [Industrialisation]
- Transportation and assembled on site
- Rational Sustainability
- Light architecture
- Steel 100% recyclable and 70% recycling
- Removable building
- Enlarged ongoing

The structural system is formed by laminated steel modules, made in factory and assembled on the building work.
By this way, the execution work period gets shorter and there is an important optimization of the working time because of the uniform conditions the factory provides.
The façade enclosure is made by sandwich panels (Agnios) formed by two steel sheets black lacquered with an 80mm rock wool insulate between them. Panels are 900mm wide, and they are fixed to galvanized steel secondary structure.
The fine relief of the panels makes the building changing colours over the day.

Figure 14. Cruising terminal in Bilbao port, plans




We used plaster board partitions, formed by a double 13mm sheet on each side screwed to 70mm steel studs placed each 400mm with an inner rock wool insulation of 40mm and a density of 30Kg/m3.

The roof structure of the modules is made with IPE-160 rolled steel profiles, and transversely, at intervals of 600 mm to 1200 mm approximately, galvanized steel sheet straps 20 mm thick are set out.

Roofing has strong presence from parts of the city and either from the ships that arrive at the terminal, so external appearance was very important becoming on the fifth façade of the building.

Figure 15. Cruising terminal in Bilbao port, exterior view

The terminal building is entirely demountable and recyclable since it is a steel screwed structure. It´s worth mentioning that steel used in the construction has a high percentage of recycled material in its composition (more than 70%). This steel is made by electric oven system.