

Project to train station in A Coruña

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Keywords: Structure, train station.

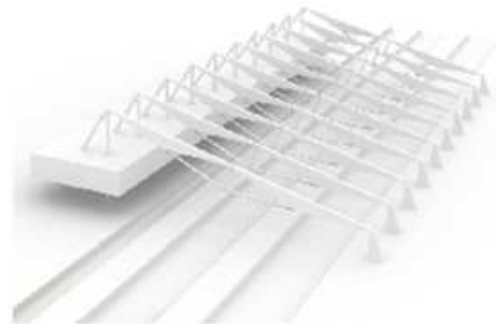
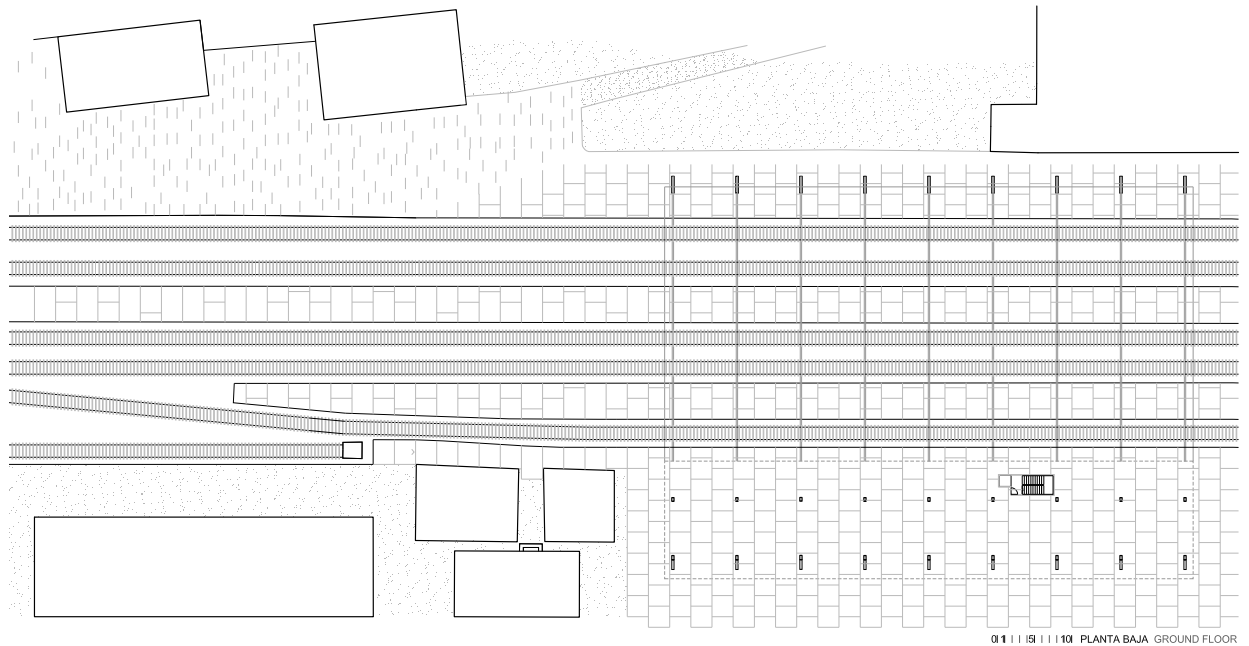


Figure 1: Plan site.

The project is proposed in response to the issue raised in the Structural Projects II subject, taught by Professor of Structures Javier Estévez Cimadevilla in the Higher Technical College of Architecture in Corunna. The proposal emphasizes the importance of structural design as a part of the architectural process. This project had to take architectural intentions into account, and it also had to include technical aspects in connection with materials and loads. . . which make the final answer more complex.

The initial program includes a roof over the platforms and a building for offices and shops uses in Corunna. The basic questions are the need for high-sided elements to cover the span over the ends of the platforms, together with the connection between the roof and the building.

The project had to integrate both of its parts in a single unit that contributes to social relations while making use of public space in a building with the characteristics of a train station.



01 | 151 | 101 | PLANTA BAJA GROUND FLOOR



VISTA DESDE EL INTERIOR VIEW FROM INSIDE

Figure 2: Ground floor. View from inside.

The proposal is based on a simple scheme: a girder supported by two corbels which becomes more complex due to its span and design. One of the corbels increases in size and supports a volume raised over ground level and which contains commercial and administrative areas. In this way, a single unit provides space for more private uses, defines an open public space between the platforms and the street, while also creating a place for resting and visual control over the tracks.

The architectural planes show the intentions of the proposal as regards the creation of open spaces and continuity with the public road. The cross-section shows how the building works more clearly. The volume and roof delimit a space while also differentiating each part of the design. Everything converges on the train platforms, the center of the project.

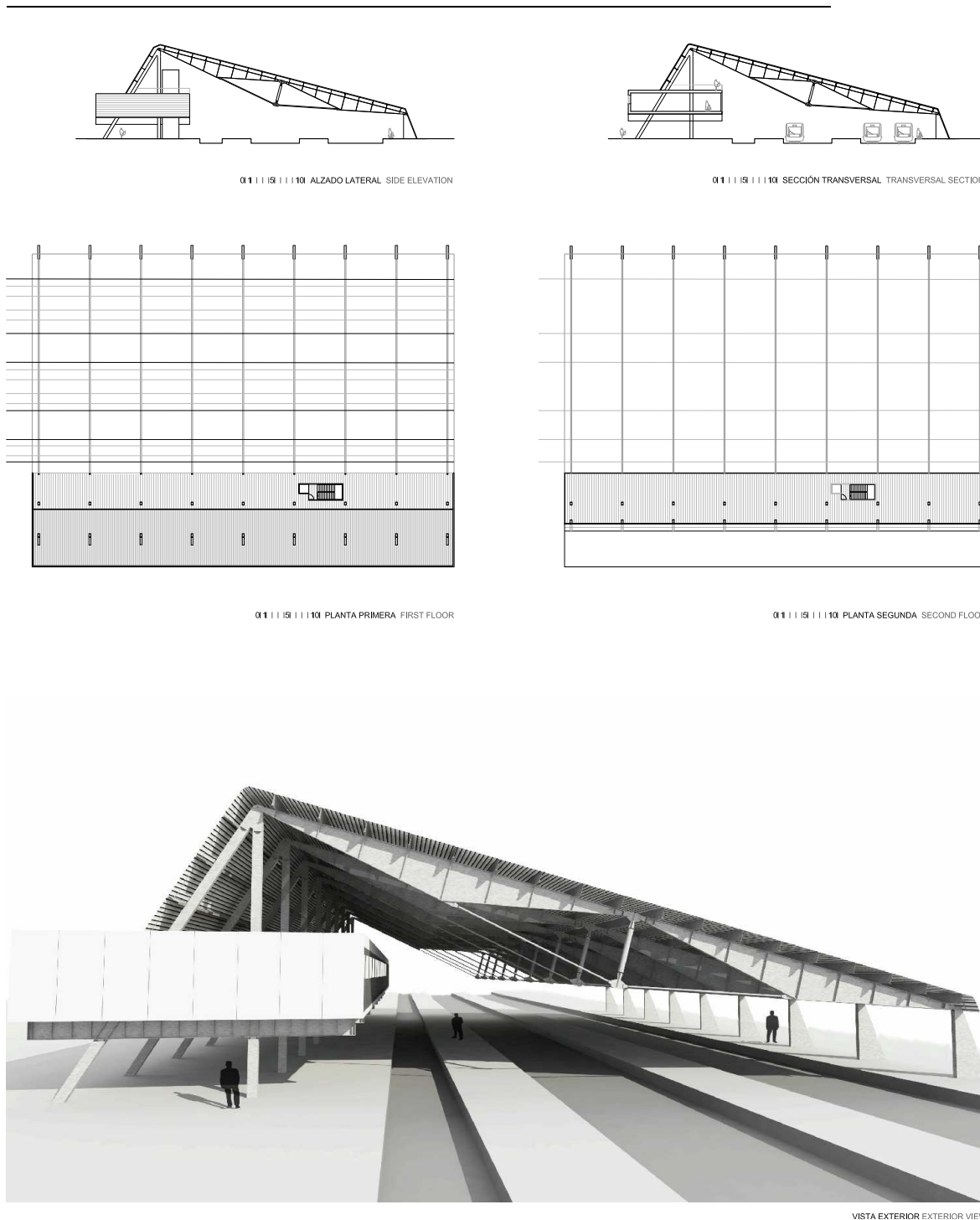


Figure 3: First floor. Second floor. Exterior view.

In such a building the structure acquires a significant presence because of its size. This is why this project attempts to make the whole structure as light as possible. The large girder with two supports is divided into smaller parts with free spaces between them. Due to their great height, the entry of light and the repetition of the same portico, passengers will see themselves as being within ribbed structure.

On the other hand, the appearance of lightness is reinforced by the division of the biggest corbel into two pillars in an inverted V shape, and by the raised office area. The lobby which opens onto platforms will be only interrupted by vertical means of access to offices.

Visual relationships are of fundamental importance in the interior and exterior of the building. The arrival of trains is part of the exterior public space, as it is also visible from the street.

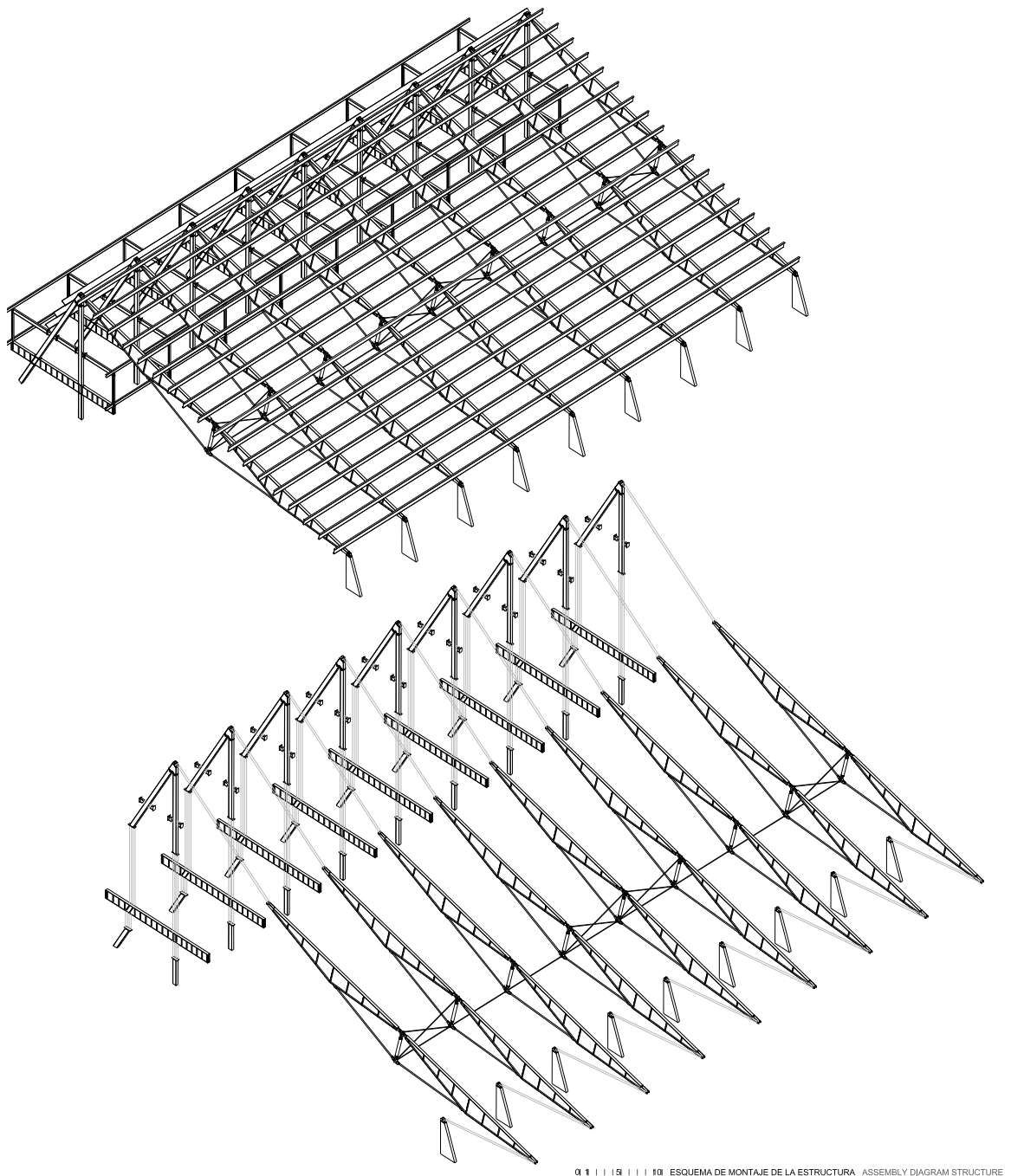


Figure 4: Assembly diagram structure.

The design of the component parts of the structure is conditioned by technical aspects such as loads and spans to be covered..., although it is also influenced by other factors in connections with building work. In a facility of this type, this requires previous planning.

The main corbel of the project supports the roof and the office area. It takes the form of an inverted V composed of two HEB 500 profiles reinforced with plates. For the purpose of transport they are divided into two parts at a height of 3.1 metres. It is at this point that the box which holds the less public facilities is supported. Due to the cantilevers, a 1 meter wide reinforced girder with an “I” shaped cross-section and stiffeners is required. This supports the porticos, which are made of HEB and IPE profiles that form the box. The framework is composed of hollow core slabs.

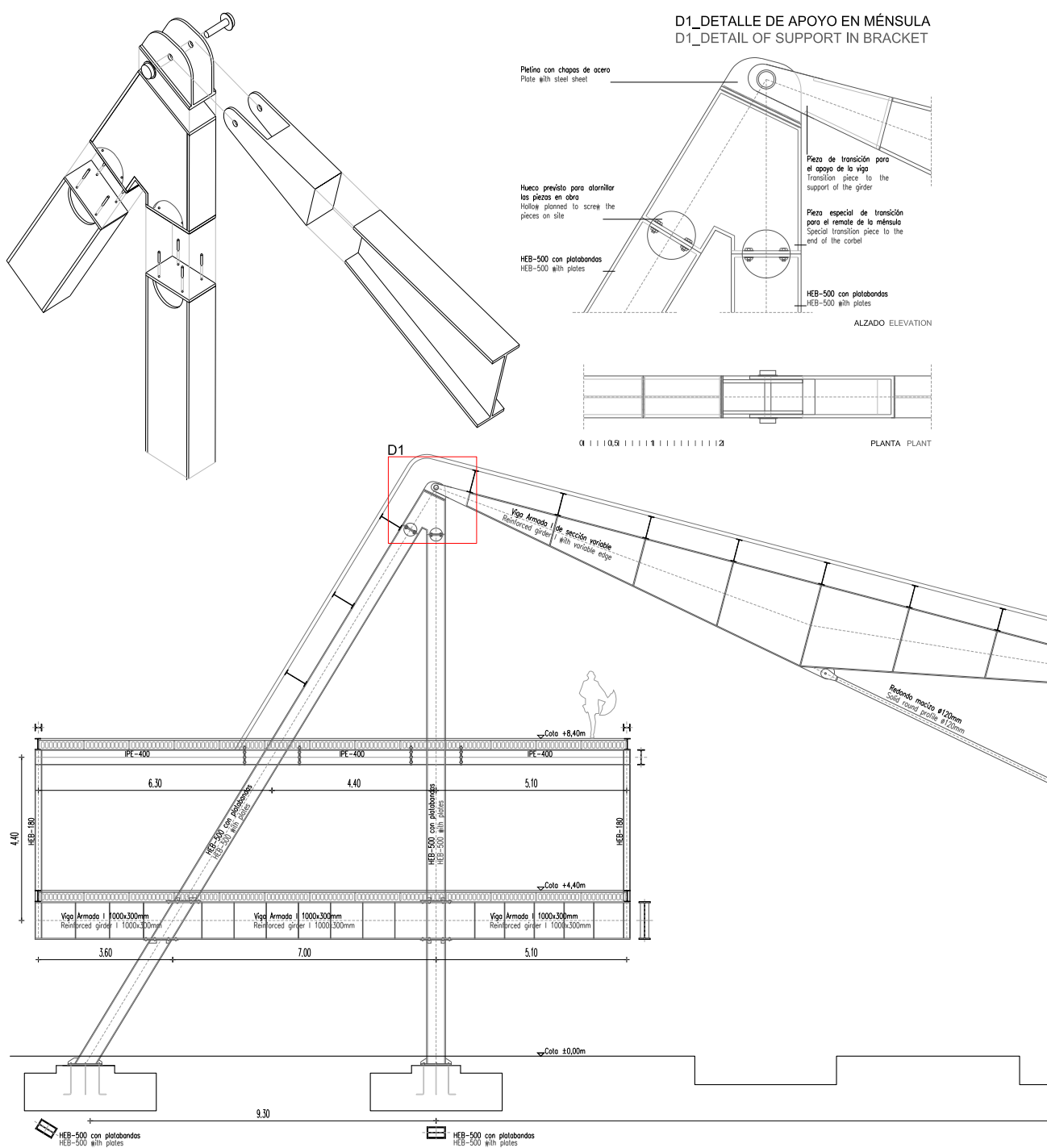
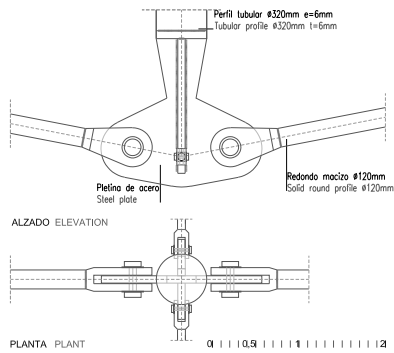


Figure 6: Roof structure.

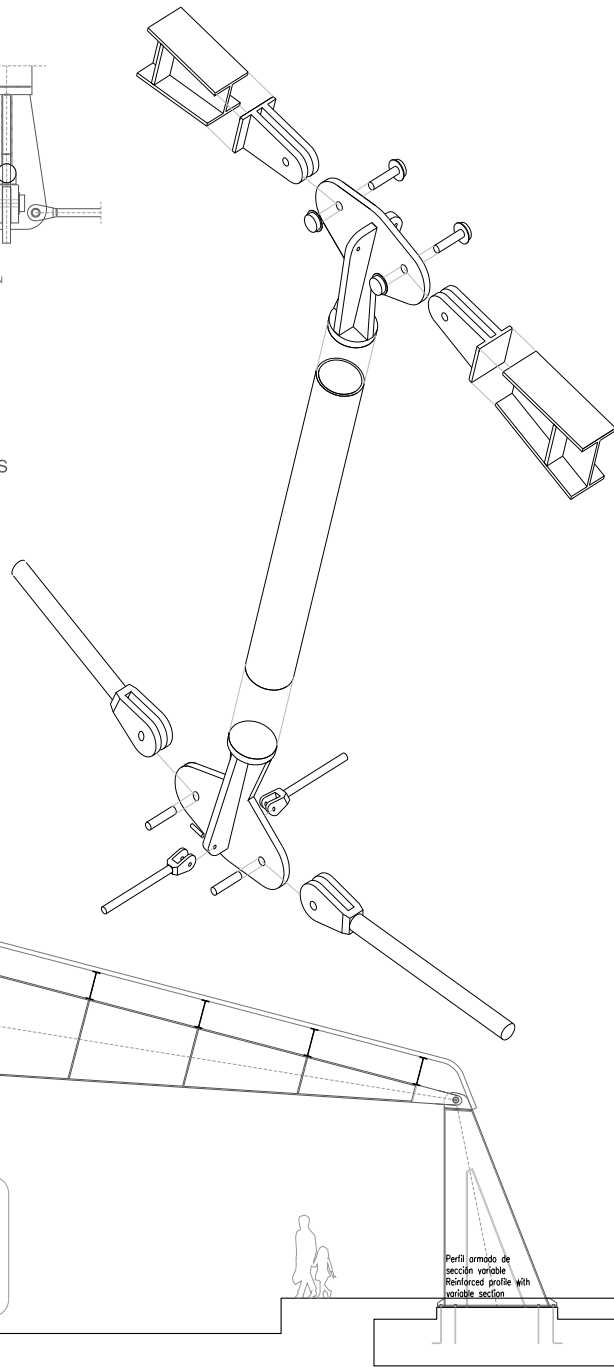
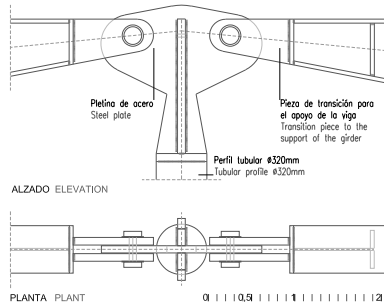
The different elements of the structure are not always perpendicular where they join. This complicates the designs of the solutions adopted at these points. The approach that is followed is always the same: pieces that function as transitions are designed to overcome formal irregularities. The main profiles are therefore simplified to make them easier to produce in a workshop, making it possible to use more pieces with the same dimensions.

The support of the roof girder in the “V”-shaped corbel is resolved with a transition piece that works as a cap. Another element is welded onto this using steel plates to create the articulated joint. High strength screws are used to join it to the pillars. Hollows in the reinforcing plates make it easier for workers to handle them.

D3_DETALLE DE UNIÓN ENTRE CABLES
D3_DETAIL OF CONNECTION BETWEEN WIRES



D2_DETALLE DE UNIÓN ENTRE VIGAS ARMADAS
D2_DETAIL OF CONNECTION BETWEEN REINFORCED GIRDERS



42.80

1:0.5 1:10.5 1:12.5 1:13 ESTRUCTURA DE LA CUBIERTA ROOF STRUCTURE

Figure 7: Roof structure.

The roof pieces are joined at the ends of the central frame. The aim is for there to be as few as possible different parts. The plate that covers the ball and socket joint between the two reinforced girders is the same as the one which is attached to the cables. Both joints take the form of transition pieces welded to the ends of the reinforced and round profiles.

