ANNEX 4-B

Case study

AIRBUS INDUSTRIAL HALL
IN TOULOUSE

Steel construction industry provides efficient long span and limited weight structural frame for a huge industrial hall that will produce the A380 Airbus airplane of next generation for intercontinental flights.

This huge industrial building covers 200 000 m² of ground occupation, is 45 m high and provide spans of more than 115 m. Criteria to be met are, efficient space occupancy, flexibility in arrangement of the internal volume. Due to the expected change in the industrial process after several year of production, a reconfiguration/refurbishing approach design has been considered taking count of fast financial return. Architectural and structural appearance shall also be an attractive sign of the company performances.

The widest module, 115 long by 250 m deep building is equipped with the following heavy crane material:

- two parallel industrial rolling cranes, 50m span, 22 tons load for wings lifting,
- two parallel industrial rolling cranes, 35 m span, 30 tons load for fuselage transportation,
- Two dual loads 2x4 suspended cranes for normal service.

The wing lifting cranes are rolling on ways that are at one support suspended at the upper truss of the structural frame of the roof and at the other support fixed on the columns.

Sliding doors shall provide a 117 x 32 m² opening. They are structural frame by themselves.

This huge structure can only be erected in an economical way using steel as material, fabricated sections and a trussed upper beam.

Indoor picture of the plane montage building

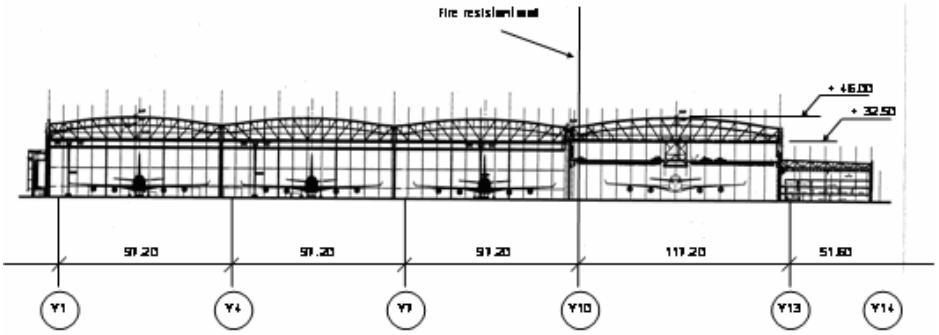
Client:	EADS
Architect:	ADPI
Design office	Cooperation : ADPI and Jaillet Rouby
Contractor:	URSSA (Spain), CIMOLIA (Italy), CASTEL et FROMAGET, JOSEPH PARIS, RICHARD DUCROS (France), BUICK (Belgium)
• **Control Office**	SOCOTEC and VERITAS

Application Benefits

- Fast track construction
- Intensive use of steel components
- Flexib ility of space organisation
- Sustainability approach
- Structural strength

Internal view during construction. Personage at the ground level gives scale size

External view during erection of hall S34: 100 x 100 m². Building on the back gives scale size.



Construction Details

Roof and roof trusses: The structural roof trusses spans 117 m. Height of the trusses vary from 8 m on supports up to 13,50 m at mid span. Main roof elements are composed of two parallel truss frames distant of 33 m and made of rectangular hollow steel sections. One roof element include a pair of front and back trusses, roof structure, roof service equipments, fire safety network …, and when completed at ground level is lifted and positioned at top of columns in one piece along the structural columns. The gap between two adjacent elements is meters.

Columns are rigidly fixed on ground foundations and have equal slenderness ratio in each direction to avoid any premature horizontal buckling phenomenon during lifting operations.

Construction of the trusses on ground has the advantage of safe building site, limited structural scaffolding, simple operation and fast construction arrangement.

Joints between the truss elements and the top of the columns are pinned. This is a simple method that provides the following advantages:

- Rapid joint operations in a critical erection step,
- No welding operation during erection,
- The truss upper flange element is connected and simply resting on a short span joint beam on top of the column.

Vertical deflection of any truss is limited to 1/2000 of the span length due to crane operation requirements.

Elements of the truss are I shape constructed sections and bolted on joints.

Each column is made of two separate constructed sections jointed by a continuous truss web.