maeg

PRODUCTION PROCESS

DESIGN
PROCUREMENT
PRE-PROCESSING
PROCESSING
TREATMENT
INSTALLATION
QUALITY

maeg

Specialist in the **design**, **manufacturing** and **installation** of steel structures

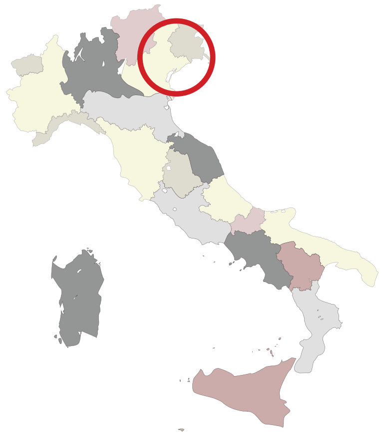
About Maeg

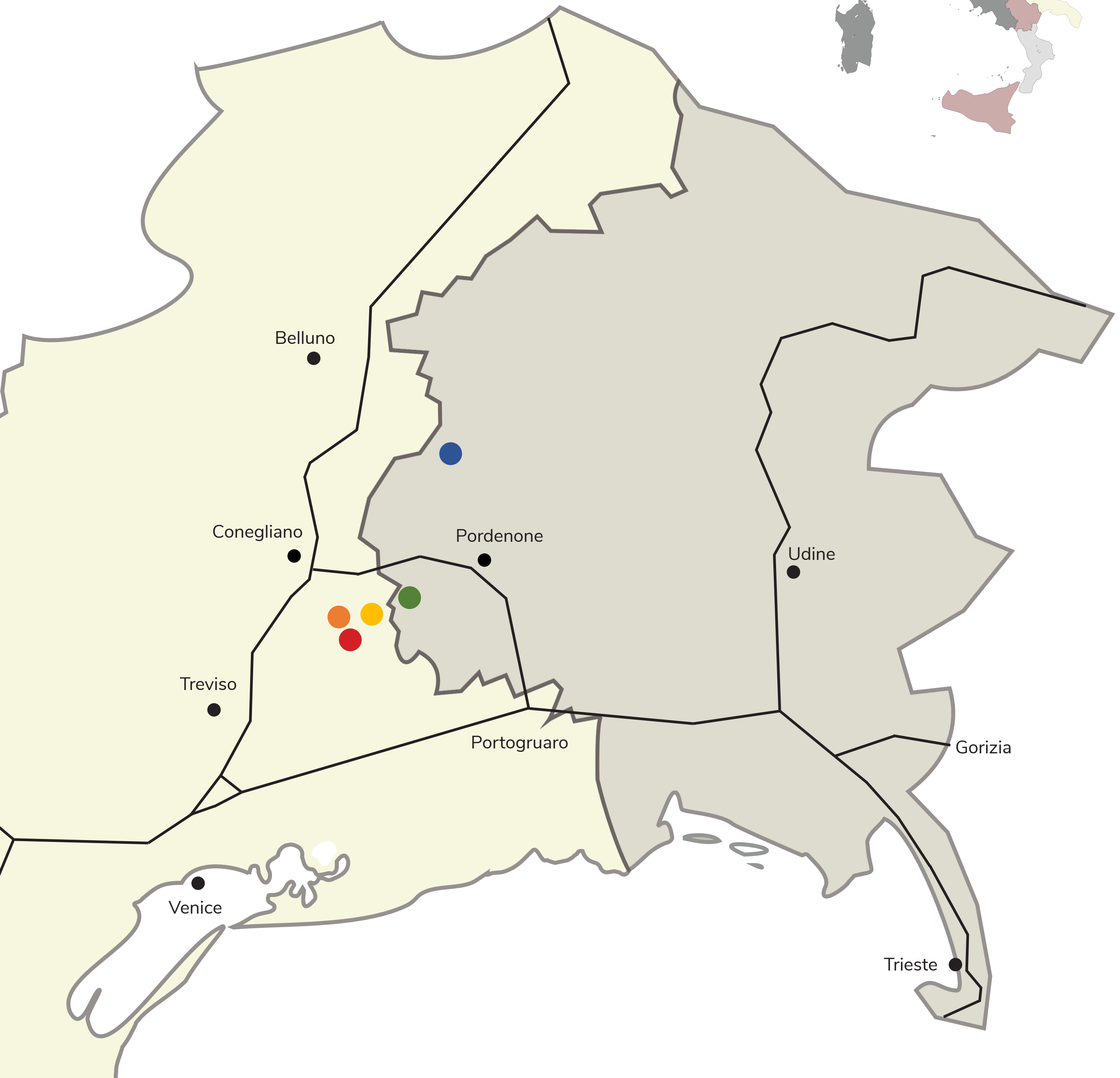
Maeg is an international player in the construction sector. With more than 40 years of experience, Maeg's expertise can adapt to each project characteristics to devise tailor-made and innovative engineering solutions, concretely transforming design into substance.

Index

PRODUCTION FACILITIES

Maeg's production workshops are concentrated in the North-East of Italy, in five production plants located in an area of 35 kilometers so the production process remains flexible and monitored.





Vazzola (HQ)

Establishment	1989
Address	Via Toniolo 40, 31028 Vazzola (TV) – Italy
Phone number	+39 0434 441558
Workforce	25-30
Surface	7.000 sqm (3.500 covered, 3.500 uncovered)
Activities	Manufacturing

Cimavilla

Establishment	1998
Address	Via del Lavoro, 52 - Z.I. Cimavilla, 31013 (TV) – Italy
Phone number	+39 0438 470813
Workforce	50-55
Surface	14.000 sqm (5.500 covered, 8.500 uncovered)
Activities	Pre-processing

Maron di Brugnera

Establishment	2003
Address	Via Moret 13, 33070, Maron di Brugnera (PN) – Italy
Phone number	+39 0434 608219
Workforce	80-100
Surface	48.000 sqm (12.500 covered, 35.500 uncovered)
Activities	Manufacturing, treatment

Codognè

Establishment	2010
Address	Via Comun 7, 31013, Codognè (TV) - Italy
Phone number	+39 0438 794933
Workforce	80-100
Surface	35.000 sqm (8.500 covered, 26.500 uncovered)
Activities	Pre-processing, manufacturing, treatment

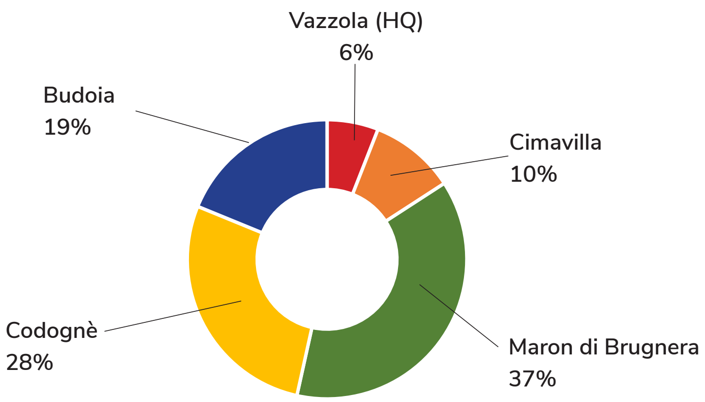
Budoia

Establishment	2016
Address	Via della Braida 5, 33070, Budoia (PN) - Italy
Phone number	+39 0434 737304
Workforce	40-50
Surface	23.500 sqm (5.000 covered, 18.000 uncovered)
Activities	Manufacturing, treatment

5 Workshops
126.500 sqm
100% Italian
700+ People
65.000 Tons/year
25+ Countries
40 Years of experience

The process of designing, procurement and manufacturing of the steel elements constitutes the major part of a project.

Transforming an idea into its tangible realization is a complex process, involving several different phases. Each phase is managed by dedicated and expert teams, who coordinated and integrate their different skills and capabilities maximizing the efficiency of the process for the benefit of time and cost reduction.
The obtaining from internationally recognized assessment bodies of the major certifications of the sector in terms of quality and know-how assures Maeg's capabilities and attention to quality standards to deliver the project in compliance with the require-ments.



Subdivision of the production area by factory

	Sqm int	Sqm ext	Total sqm	Pre-processing	Manufacturing	Treatment	External area
Vazzola (HQ)	3.500	3.500	7.000		●		
Cimavilla	6.000	7.000	13.000	●			
Maron di Brugnera	12.500	35.500	48.000		●	●	●
Codognè	8.500	26.500	35.000	●	●	●	●
Budoia	5.130	18.430	23.560		●	●	●
Total	35.630	90.930	126.560				

maeg

THE PRODUCTION PROCESS

Steel manufacturing is a niche in the construction sector and requires specialist knowledge of the material's characteristics, features and performance to optimize the project and carry it out in the best way possible.

01 Design

The design process bases on standards, calculations, technical specifications, and drawings to define every detail of the structure in terms of production and installation.

1.1 Analysis of the documentation
1.2 Development for the production
1.3 Development for the site

02 Procurement

Commercial process providing the necessary supplies to satisfy the procurement needs of the project, basing on the bill of quantities developed by the technical office.

2.1 Metal sheets
2.2 Profiles
2.3 Pipes
2.4 Shear studs
2.5 Bolts
2.6 Paint

03 Pre-processing

Pre-production activities consist in the realization of the single plates and elements composing the structure through CNC machines - Computer Numerical Control.

3.1 Inbound logistic and nesting
3.2 Cutting
3.3 Chamfering
3.4 Drilling
3.5 Welded beams
3.6 Steel preparation

04 Manufacturing

Through the manufacturing process, single elements or single plates are assembled in marks, namely composed elements that, once joined together, compose the final structure.

4.1 Internal logistic
4.2 Assembly
4.3 Welding
4.4 Shear studs welding
4.5 Pre-assembly

05 Treatment

Surface treatment aims to prevent rust and corrosion according to the type of project, on its use and on the atmospheric conditions to which the structure is exposed.

5.1 Coating
5.2 Galvanization
5.3 CorTen
5.4 Outbound logistic

06 Installation

Once the structure is transferred from the production plants to the construction site, it is assembled and installed in its final location, thus completing the production process.

6.1 Site preparation
6.2 Assembly
6.3 Steel installation
6.4 Auxiliary elements installation
6.5 Painting
6.6 Completion

07 Quality

The set of all actions, processes, and documents along the entire production cycle guaranteeing the compliance of the work according with the standards and with project's requirements.

7.1 Traceability
7.2 Welding inspection
7.3 Topographic surveying
7.4 Coating inspection
7.5 Bolting inspection

01
DESIGN

The design process bases on standards, calculations, technical specifications, and drawings to define every detail of the structure in terms of production and installation.

1.1 Analysis of the documentation
1.2 Development for the production
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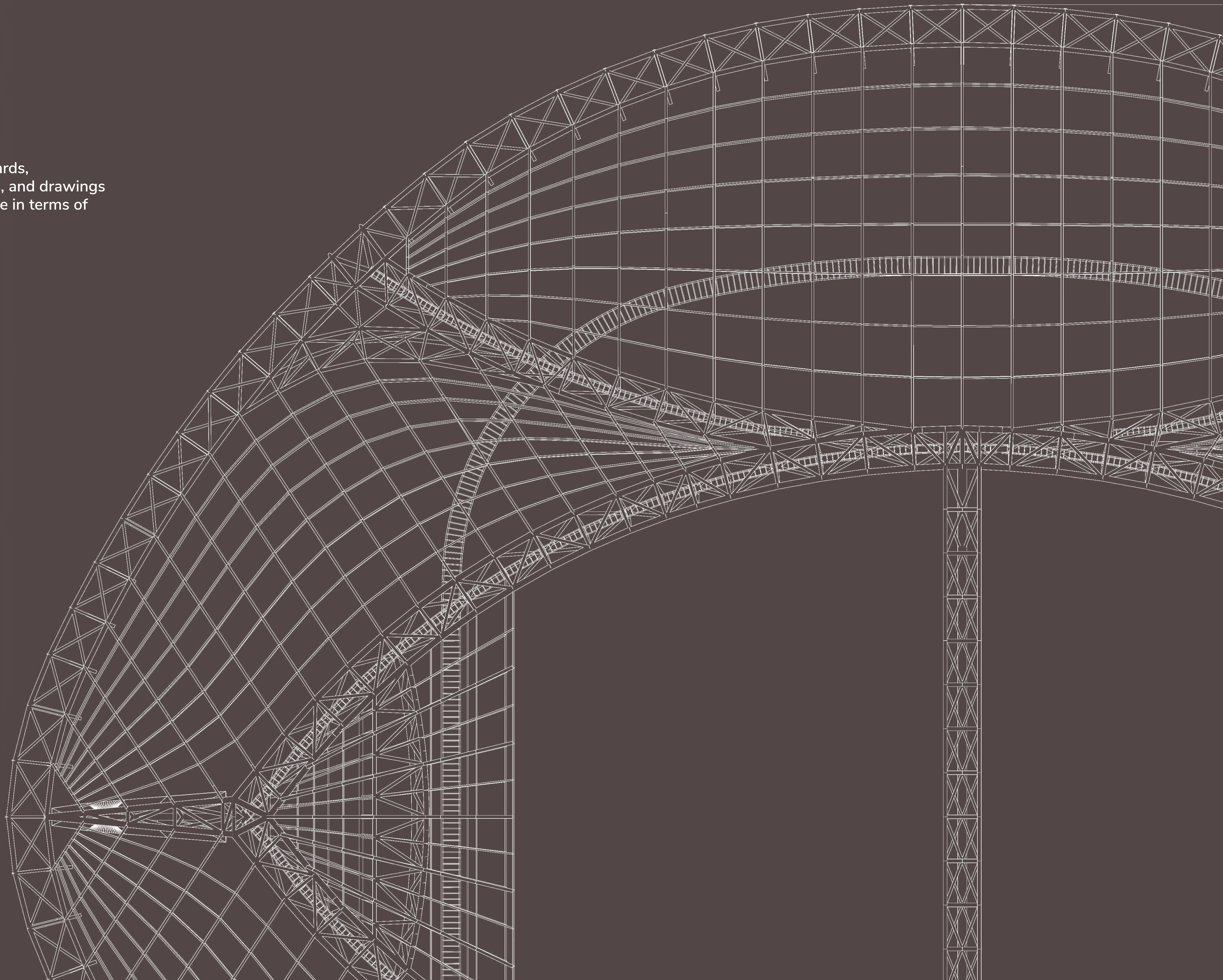


01
DESIGN

1.1 Analysis of the documentation

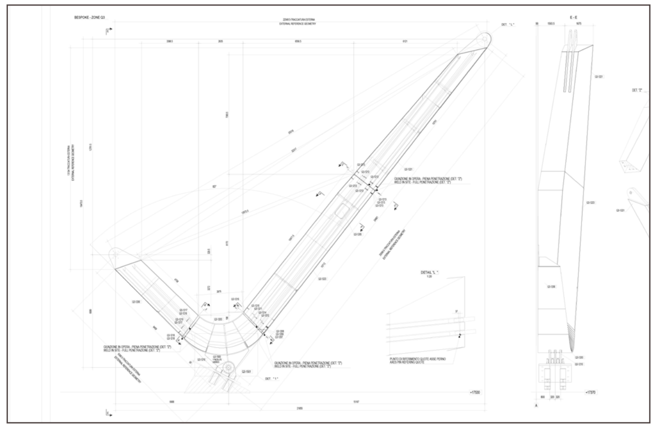
The design process starts with the analysis of the project information received from the Client. The design could be a **preliminary project** - providing the significant characteristics to be further developed in detail - or it could be an **executive project**, already including the structure's specifications in terms of materials, dimensions, and geometric features.
An essential part of the documentation is represented by the **technical specifications**, namely the regulatory references to identify the requirements of the project in terms of quality, surface treatment and execution class.

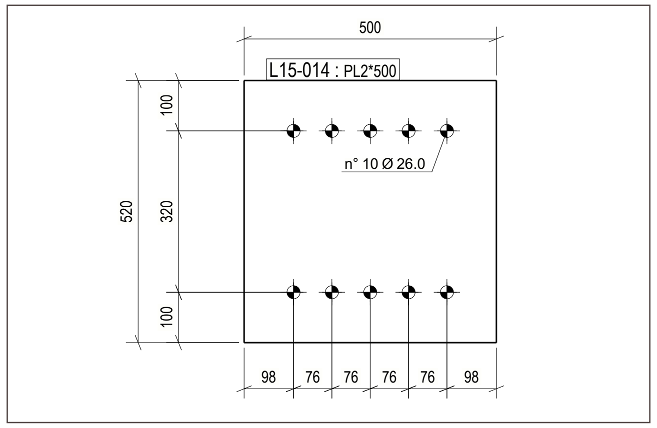
1.2 Development for the production

The project is modeled and analyzed in every detail to develop the **shop drawings**. Every specific detail such as geometry, holes, thickness, chamfers, welds, and quantities of pieces to produce are defined for each element of the structure, which is then labelled with an identification number (marking).

Once every single element of the structure is defined, from the shop drawings is extracted the **bill of quantities**, a list summarizing the required quantities, the quality, and the dimensions of the materials to be supplied for the project.

For each single plate is elaborated its **construction drawing**, reporting all the information on the material production processes to start the actual production phase.



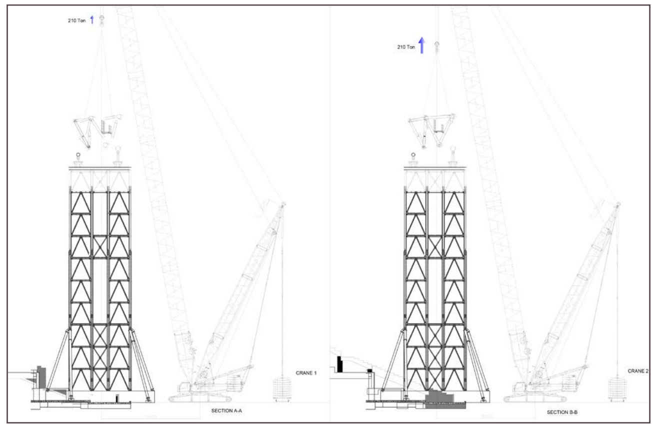


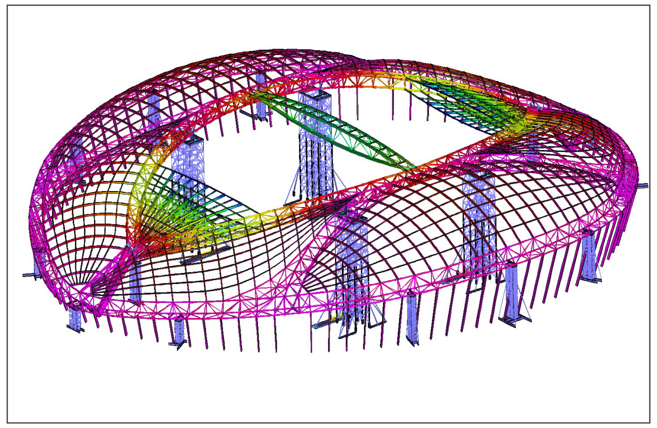
1.3 Development for the site

After all single smallest elements composing the structure have been examined, allowing the production to start, an **assembly plan** is developed to establish the methods and sequence for joining these single elements into marks or combined elements, taking into account size, constructability, transportability, site layout and space, crane lifting capacity and assembly on site.

In the first place, considering the different variables, a **calculation model** is created to verify the structural strength of the work during the different construction phases. Step by step, the temporary equipment necessary during the installation phase gets defined (benches, temporary towers, etc. for which executive drawings and designated calculation reports are created, in order to proceed with their fabrication), as well as the necessary lifting and transport means (cranes, barges, etc. to be supplied).

Once the methods for installation on construction site are defined, the technical office compiles a **method of statement** to illustrate each different stage, ensuring compliance with safety regulations.





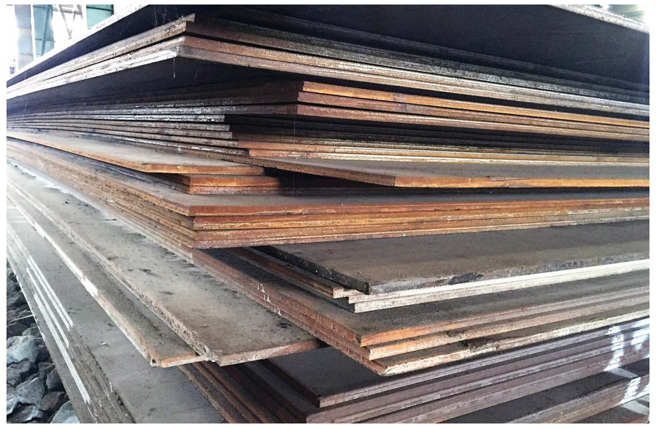
02
PROCUREMENT

Commercial process providing the necessary supplies to satisfy the procurement needs of the project, basing on the bill of quantities developed by the technical office.

02
PROCUREMENT

2.1 Metal sheet

Steel plates are cut out from metal sheets produced through rolling (semi-finished casting product made by continuous casting of liquid metal in specific shapes), a metal forming process in which metal stock is passed through one or more pairs of rolls to reduce the thickness and to make the thickness uniform.



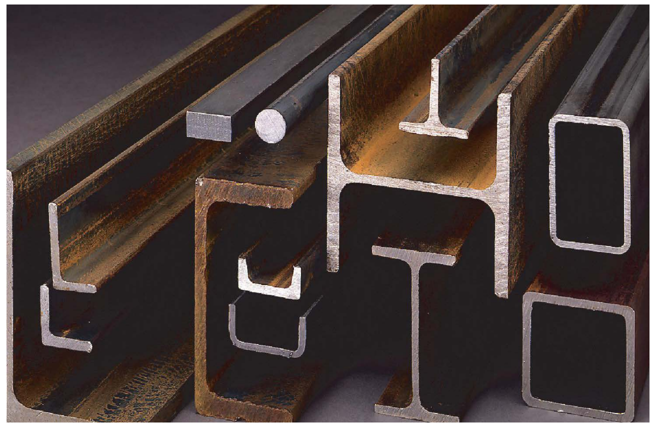
2.2 Profiles

Profiles are hot-rolled products called “commercial” as they follow precise international standards regarding the shape of the section. The most common sections are:

“Duble T” shaped profiles: profiles composed of two parallel flanges perpendicularly connected by a web. These profiles can be of different types: IPE (the height of the web is about twice the width of the flanges) or HE (the web and the flanges have the same size). When the dimensions of the double T profiles exceed the standard, they are built with steel sheets.

“U” o “C” shaped profiles: profiles made of a web and two flanges joined at one of their extremities, the most common type is UPN.

“L” shaped profiles or angles: commercial profiles of two perpendicular elements, called “with equal wings” if they have the same length, or “with unequal wings” if they have a different length.



2.3 Pipes

Round tubes created via extrusion or longitudinal welding, or square-shaped or rectangular tubes created by bending and subsequent welding or wire drawing.

2.4 Shear studs

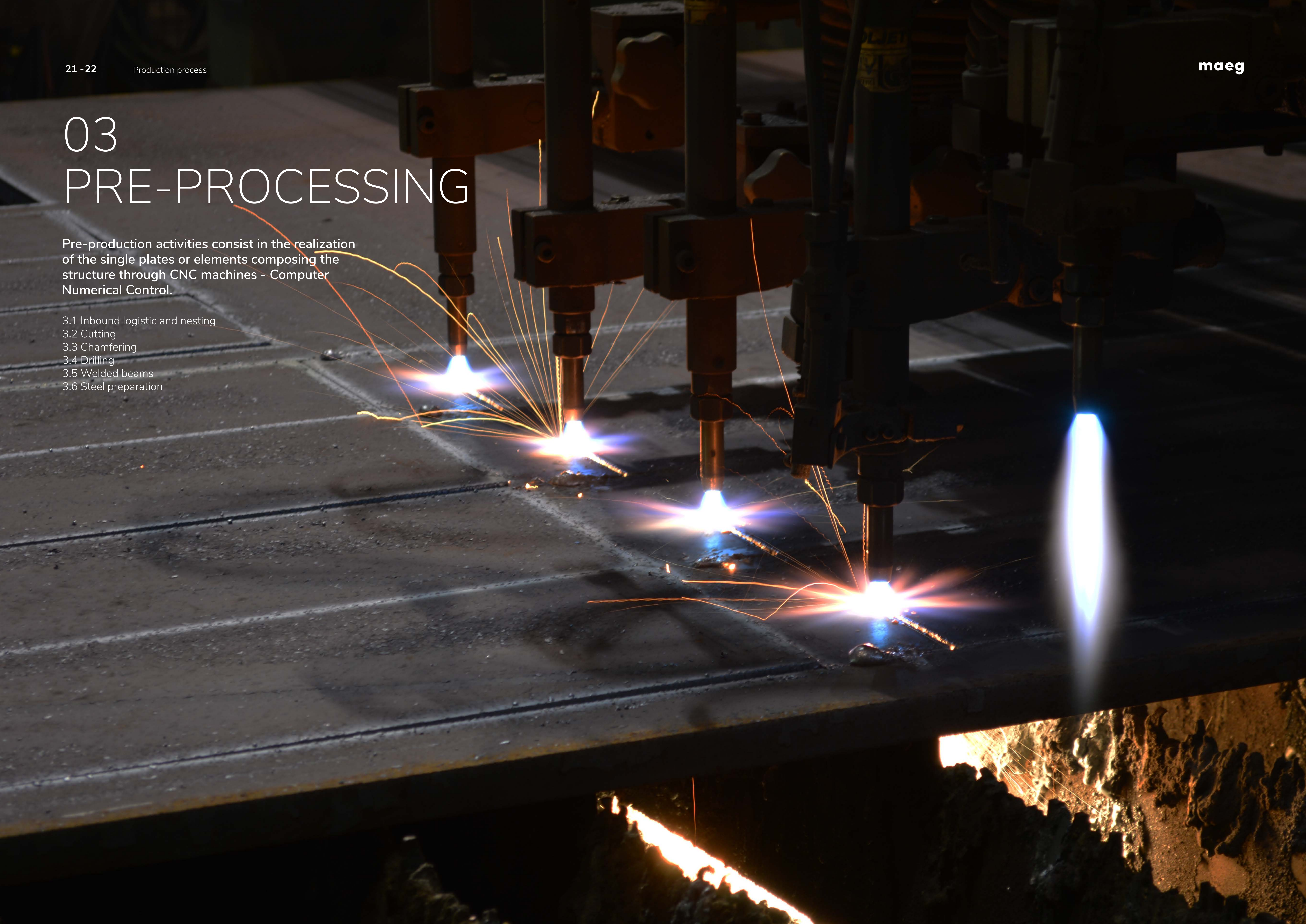
Shear studs are connectors used mainly in steel-concrete composite structures, aimed at creating a collaborate effect between the two materials, through the stud’s head, which is has a larger diameter than the stem.

2.5 Bolts

Bolts are junction elements that can be disassembled, usually consisting of a male elements (screw), a female element (nut) and one or several washers, used to improve the locking and distribution of the loads over a larger surface. In addition to size, bolts differ in terms of strength: in general, most used ones are usually the classes 8.8 (high strength) and 10.9 (very high strength).

2.6 Paint

Considering the surface of the structure and the natural environment in which it is installed, the required quantity is calculated and supplied.



03 PRE-PROCESSING

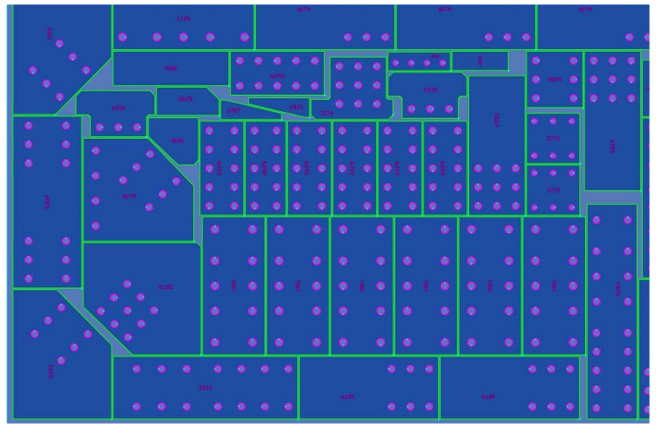
Pre-production activities consist in the realization of the single plates or elements composing the structure through CNC machines - Computer Numerical Control.

3.1 Inbound logistic and nesting
3.2 Cutting
3.3 Chamfering
3.4 Drilling
3.5 Welded beams
3.6 Steel preparation

03 PRE-PROCESSING

3.1 Inbound logistic and nesting

Raw material is delivered to the production plant, sorted according to production priorities in the storage area and transported to the processing bays with the aid of magnetic supports. The process starts with an analysis of the **cutting plan or nesting**, aimed to optimize the cutting of the metal sheets minimizing scrap material or production waste according to the drawings produced by the technical office: the nesting stores the data of each element such as dimensions, thickness and required processes to perform.



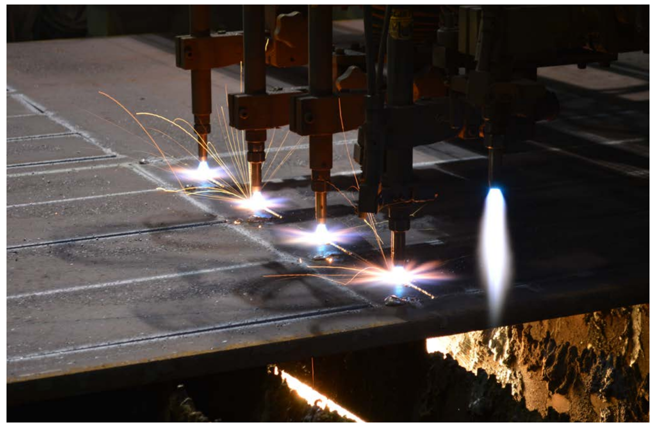
3.2 Cutting

Once the cutting plan is determined, the effective cutting phase begins on metal sheets, pipes, and angles.

In case of **plasma cutting**, the cutting is made through a jet of ionized gas with a temperature above 20.000°C melting the material along the way. Generally, the cutting thicknesses are limited, therefore the cutting is faster and limits the heating of the steel, with a consequent lower thermal deformation.

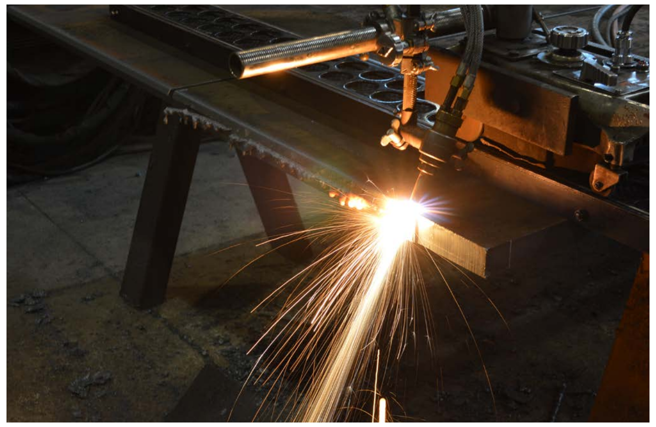
In case of **oxy-fuel cutting or autogenous cutting**, the combination of gas, propane and oxygen brings the steel to a higher temperature volatilizing the carbon and creating the cut. It generally allows to cut greater thicknesses (up to 600 mm) and, while moving at a slower pace, it produces a more precise result even though the slower pace might expose the material to a longer heating.

During or after the cutting, according to the type of machine, the **marking** is executed, namely a low stress punching (with less impact on the sheets to avoid weak spots and cracks) on the cut sheet with the identification number of every single element, allowing its identification and traceability at every step of the construction.



3.3 Chamfering

When single elements are joined by welding, to ensure its correct execution, the edges of the plates are prepared through chamfering, an angled cut creating a space between once pulled together with the other element to weld called chamfer. This space ease the deposit of the filling metal by means of molten metal during welding. The weld joint can have different types: “V”, “U”, “Double U”, “X” and “Y”



3.4 Drilling

When the single elements are later joined through bolting or bars, they are prepared with holes to accommodate the bolt. Drilling is a mechanical operation removing metal swarf leaving the whole and, in case of oval and non-circular holes, it is necessary to employ a boring machine that, thanks to a rotational motion, increases the diameter of the hole and produces the desired oval shape.

3.5 Welded beams

When the size of commercial profiles exceeds the standard, the Double T beams are composed of metal sheets and large plates with a thickness usually greater than 12 mm, then welded together through automatic welding systems. In this way it is possible to obtain section of shapes and dimensions otherwise unattainable through regular hot rolling.

3.6 Steel preparation

If the structure needs to be coated, the material undergoes the steel preparation phase - edge grinding, corner sharpening, hole boring, all activities performed automatically to guarantee the quality - with the aim of refining the cut after pre-processing activities to ease the adherence of the paint that will be applied later on, especially in those areas of the structures such as holes and corners where rust is more likely to develop.

04 MANUFACTURING

Through the manufacturing process, single elements or single plates are assembled in marks, namely composed elements that, once joined together, compose the final structure.

4.1 Interal logistic
4.2 Assembly
4.3 Welding
4.4 Shear studs welding
4.5 Pre-assembly

04 MANUFACTURING

4.1 Internal logistic

Pre-processed single elements completed during the previous phase are sorted and transported to other production plants to be assembled and manufactured into composite structures.

4.2 Assembling

To begin the composition of the elements, individual elements of the structure are temporary assembled together and fixed in position with a spot welding through electrodes/wire, allowing the subsequent jointing of the pieces until complete welding.

4.3 Welding

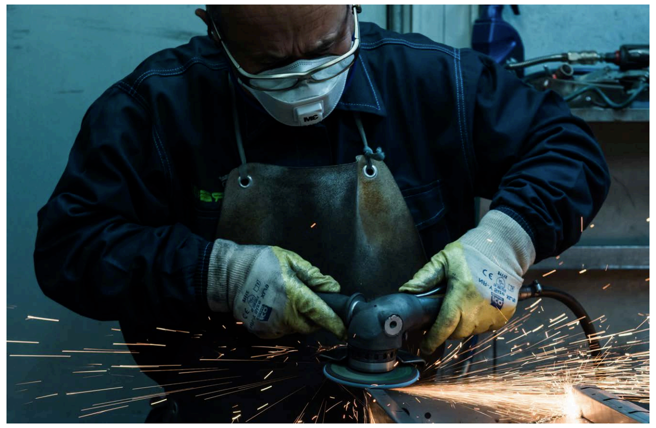
The welding process allows to joint two or more elements together with solution of continuity (namely it transfers the characteristics of the materials from on element to the other, giving continuity) by either melting part of the elements together or by merging together the edges of the elements by mean of a filler metal (welding wire).

In case of **automatic welding**, the filler material is applied through special machineries and it is especially recommended when the welding occurs for long regular sections without interruption.

In other cases, **manual welding** is preferred, and the filler material is applied by a welder who manually adjusts the welding machine and operates the heath source, adapting to the shape of the element to weld. Based on the position of the joint with respect to the operator, different welding positions can be identified: flat, horizontal, overhead, vertical, and inclined.

The type of welding can also be identified according to the thermal source creating the heat used to melt the filling metal. In **gas welding**, the protection of the weld pool is ensured by a covering gas protecting the welding from the surrounding atmosphere, while in the case of **arc welding**, the fusion occurs through an electric “arc” that is generated between an electrode and the part to be welded, melting the electrode and laying down the filling material along the joint.

By means of a grinding wheel or grinder, at the end of the welding process, grinding may be necessary to smooth, round, polish the excess welding or to level the profile of the joined parts



4.4 Shear studs welding

Shear studs are welded on steel beams through a pressure welding system: performed with a gun, shear stud welding is carried out by striking an electric arc between the tip of the stud and the surface of the metal element. It is mainly employed in steel-concrete composite structures of bridges to create a collaborate effect between the two materials through the shear stud’s head.

4.5 Pre-assembly

Basing on the assembly drawings, different parts of the structure are temporarily pre-assembled together. This activity is usually carried out in the factory when the structure is particularly complex and the whole geometry needs to be checked before dispatchment to the construction site because, in this way, geometry problems can be anticipated and rectified to limit unexpected setbacks on site, allowing for a better performance and for a containment of the costs.

05 TREATMENT

Surface treatment aims to prevent rust and corrosion according to the type of project, on its use and on the atmospheric conditions to which the structure is exposed.

05
TRAETMENT

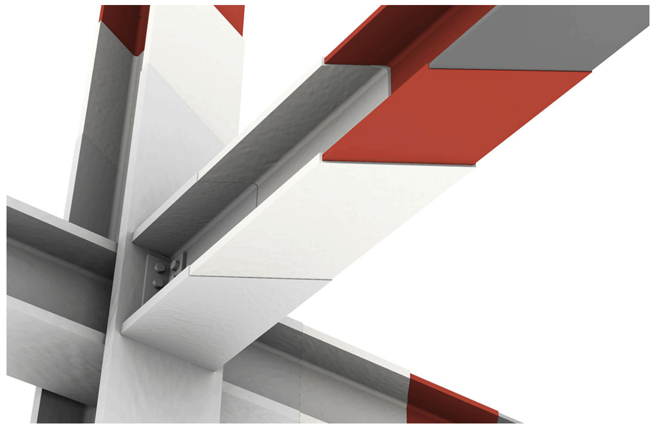
5.1 Coating

The coating process consists in the application of several layers of paint on the surface of the structure to form a protective coating, whose thickness is measured in microns. Coating usually involves the following steps:

Sandblasting: a mechanical process of abrasion of the surface through a jet of grit and air to remove the calamine (the oxide deriving from the cutting of the metal sheets) and other impurities by eroding the most superficial part of the material, obtaining the necessary coarseness to ensure a more effective paint adhesion and grip. When the elements to sandblast exceed the dimensions of the automatic sandblaster, or in case of specific evaluation, the process is carried out manually.

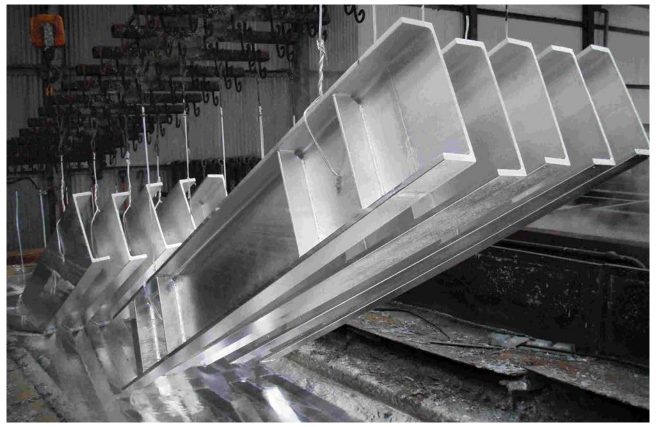
Application: Within a few hours from the sandblasting it is necessary to proceed with the application of the paint to prevent the comeback of the oxidation process. Surfaces on composed elements might be extremely variegated and irregular, hence the painting process is preferably manual by mean of compressed air guns rather than automatic, when all the corners could be reached. The thickness of the painting is established beforehand in the technical specifications by the technical office, the quality department, and the Client, determining it according to the structure's surface, on the corrosion level in the environment.

Intumescent: if required, a layer of intumescent paint can be applied to the structure which, at high temperatures, provides further protection against fire through an expansion process of the chemical components of the paint itself, creating a highly insulating and heat-resistant microcellular layer. Intumescent paint is the final layer, hence it is applied on site after installation is completed with particular airless pumps, with a thickness suitable to provide an R-REI fire resistance varying from 30 to 120 minutes, allowing the necessary time to evacuate the area in case of blaze.



5.2 Galvanization

The galvanization process consists in the application of a zinc coat to the steel structure to protect it from corrosion. First, the material must adequately be prepared by pre-degreasing, pickling and final degreasing. Second, the galvanization could be either hot-dipped galvanization (the element to be treated is completely immersed in fused zinc at a temperature of about 445°C), or through electrolytic galvanization (the element is immersed in an electrolytic solution, containing zinc salts).



5.3 CorTen

In this case, steel protection naturally occurs through its own passivating characteristic, for which the material develops a self-protecting rust layer. This feature is specific of a kind of steel called CorTen, term originated from the abbreviation of the English terms defining the main characteristics of the material: CORrosion resistance and TENsile strength. This option is usually not recommended in marine environments because they prevent the formation of the self-protecting coat.

5.4 Outbound logistic

Once the manufacturing and treatment are completed, finished elements are transported to the destination site to be assembled and installed in their final arrangement. Depending on the distance and accessibility of the site, transportation can be:

By land: by means of standard trucks with a trailer of 13.50 meters or in case measures or weight limits are exceeded, specific permits are required categorizing the transport as exceptional.

By sea: intermodal transport in which the material is initially transferred by land to the port of dispatchment, to continue the route by sea in standard 40-foot containers (11.90x2.30x2.30 meters net of load) or, when the items to ship exceed this dimension and cannot fit in a container by "break-bulk", an exceptional transportation mode with no feasibility limits allowing to load considerably large elements. Once the vessel reaches the port of destination, the material is unloaded on a truck to be taken to the construction site by land.

Airfreight: in exceptional cases, only for single lightweight elements, it is possible to rely on air shipment.

06
INSTALLATION

Once the structure is transferred from the production plants to the construction site, it is assembled and installed in its final location, thus completing the production process.

6.1 Site preparation
6.2 Assembly
6.3 Steel installation
6.4 Auxiliary elements installation
6.5 Painting
6.6 Completion

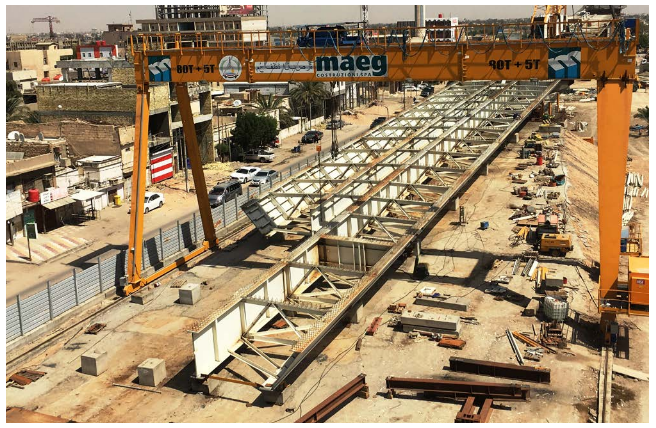
06 INSTALLATION

6.1 Site preparation

This is the start-up phase of the site organizing the necessary facilities, structures and logistic to proceed with the production on site once the material arrivers from the production plants. This set up involves general facilities (offices, warehouse, toilettes), equipment (to either transportation or lifting of the material) and the preparation of all the temporary structures later required during the assembly or installation of the structure in its final position.

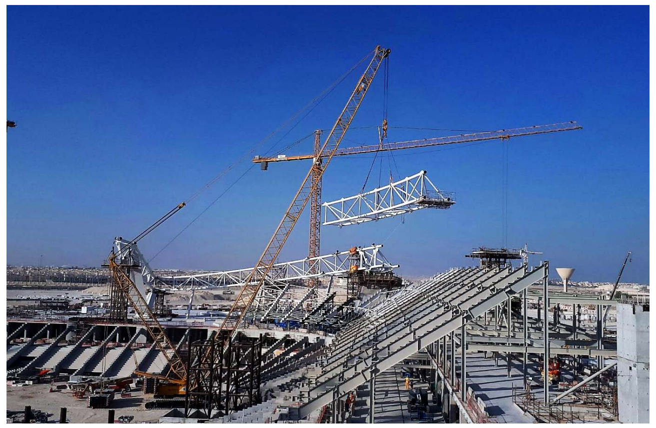
6.2 Assembling

The material shipped from the production facilities, designed to optimize both the production sequence and the transportation, is assembled together in composed elements or segments according to the assembly method, conceived to determine the best size of the different elements to ease installation. Once on site, according to the erection plan, steel elements are definitively jointed together through welding or bolting.



6.3 Steel installation

Based on the type of work and on the specifications contained in the method of statement, which specifies the installation methodology taking into account the weight of the structure and the available areas of the construction site, the parts of the structure previously assembled and joined by bolting or welding are installed in their final location.



When the final position can be reached from the ground and there is an adequate space to operate, the installation can take place by lifting from the ground, either with a crane or more working in tandem (tandem-lift). In case of bridges with significant spans, at an altitude that would make a lift with a crane from the ground impossible or in case the site does not have the necessary space or accessibility for the crane, the structures can be launched.

At the end of the installation of the elements, the connections are jointed according to the project specifications (welded, bolted), completing the installation of the structure, which is then adjusted in its final position to assume the final static and self-supporting behavior.

6.4 Auxiliary elements installation

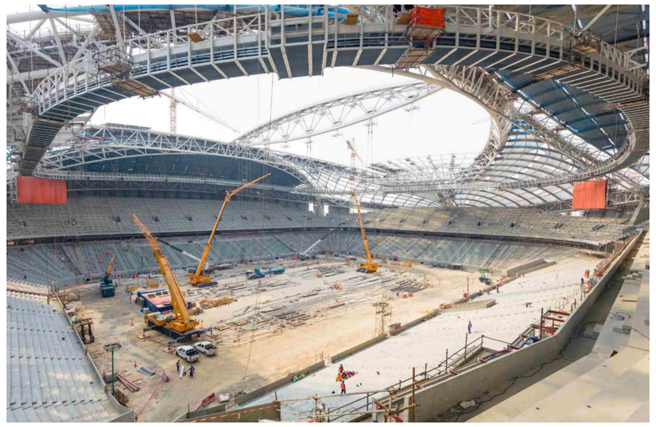
Depending on the type of structure, the installation may also include other elements which do not belong directly to the specific competence of steel but closely related in terms of engineering, construction and installation, (i.e. cables, membranes, bearing, etc.) which are managed together with specialized subcontractors.

6.5 Painting

The painted structures are usually shipped and handled on site without the last coat of aesthetic finishing because it would be damaged during the installation process. The last coat of paint is hence usually applied in the construction site together with other necessary touch-ups, when necessary, to ensure the conformity of the painting cycle.

6.6 Completion

Once the works and phases are completed, the structure becomes statistically self-supporting, it undergoes testing, and finally all temporary structures are removed. The installation is thus completed, it is possible to proceed with the removal of all temporary facilities and equipment from the construction site. The process is considered finished, leaving room for subsequent activities of other suppliers (for example asphalt in case of bridges, coverings and plants in case of buildings).



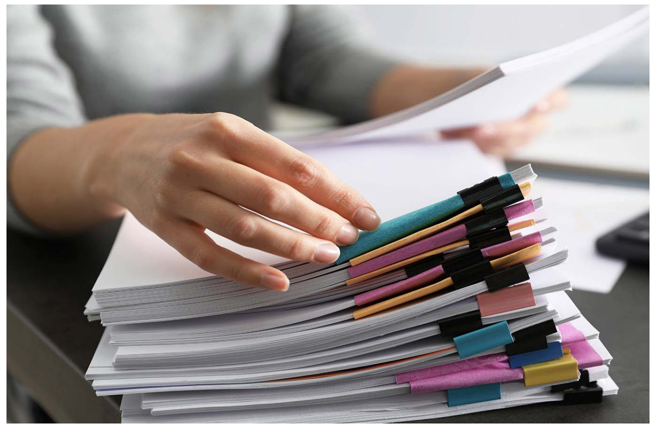
07
QUALITY

The set of all actions, processes, and documents along the entire production cycle guaranteeing the compliance of the work according with the standards and with project's requirements.

7.1 Traceability
7.2 Welding inspection
7.3 Topographic surveying
7.4 Coating inspection
7.5 Bolting inspection

07
QUALITY

7.1 Traceability



The entire production process complies with current quality standards to ensure materials traceability and related processes throughout the whole supply chain. This is needed to prove the conformity of the structure, ensuring the compliance with the regulations along the different stages. In addition to the raw material certificates to be requested from the supplier on purchase, which certify the compliance of the supply with the order based on specific sample checks, subsequent processing activities are also monitored and certified according to the project specifications.

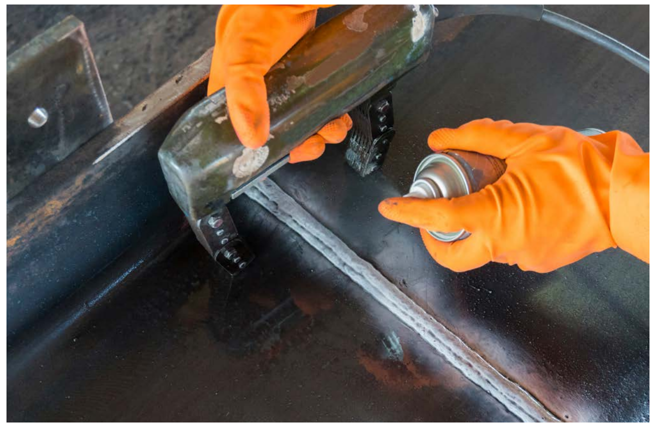
7.2 Welding inspection

To verify that there are no impurities inside the welds, checks are carried out on the welded joints. In case of **destructive tests**, the material is altered, and it involves the destruction of the joint, therefore requiring the production of specific test samples. The aim is mainly to evaluate the mechanical (tensile, bend and resilience tests) or metallurgic (macrographs or micrographs) characteristics of that typology of joint. In case of **Non-Destructive Testing (NDT)**, instead, tests do not affect the material and can be performed directly on the welded joint. Non-Destructive Tests are mainly:

Visual inspection (VT)
It verifies the compliance of the weld with the geometric specification of the project to identify possible distortions or evident irregularities such as cracks, porosity, incomplete castings, and other visible defects without the aid of further tests.

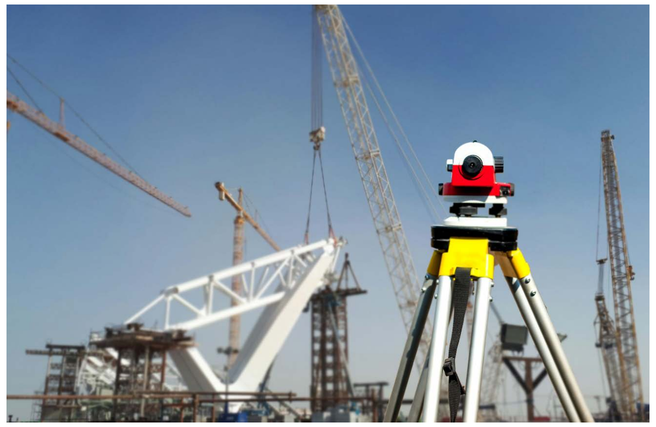
Ultrasonic testing (UT)
Using a probe, high frequency sound waves are radiated through the material to be examined, highlighting superficial and internal defects, measuring the thickness of the materials as well as the position and the size of the defects.

Magnetic testing (MT)
The weld is then is sprinkled with magnetic powders and then, by using a spray containing metal particles creating a magnetic field, it is possible to check if a higher concentration of metal powder appears, corresponding to the presence of defects.



For each project, according to the typology and on reference standards, the level of control to guarantee is established, specifying the percentage of tests to perform for each typology of welded connection to ensure the timely rectification of potential defects.

7.3 Topographic surveying

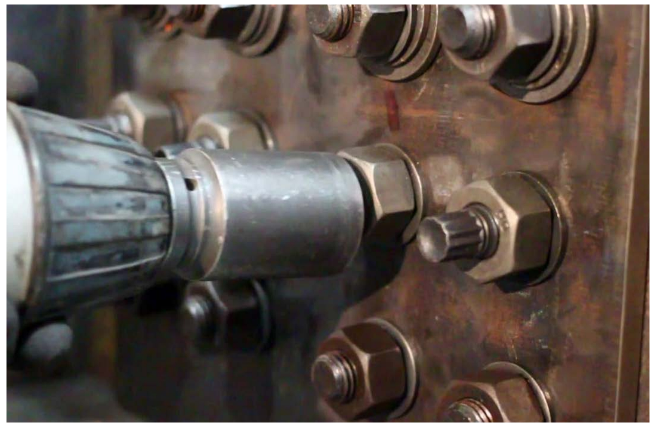


A topographic survey consists in the acquisition of the measurements and data in the space to obtain a graphic representation of the surveyed element. During the assembly of singe elements in complex structures, it is necessary to ensure the correct geometry and position before proceeding with welding and bolting. Topographic inspection allows to detect the coordinates of the real structure and to compare it with the model, verifying any deviations to be rectified safeguarding the right geometry.

7.4 Coating inspection

Magnetic micro-tests are performed to verify the proper application of the paint and the right thickness (measured in microns), as well as to provide a warranty of the durability and tightness of the paint. The magnetic micro-tests can measure the distance between the surface and the underlying layer of steel.

7.5 Bolting inspection



To ensure the functioning of a bolted union, bolts must be accurately tightened with a torque wrench: for obvious reasons they must not be tightened slightly, but neither too tightly, to avoid the risk of yielding or even the breaking of the screw.

ADVANTAGES OF STEEL STRUCTURES

Steel's features make it a flexible material, capable of adapting to multiple structural uses and offering a better performance than other materials used in the building sector.

01 Aesthetics

The combination of strength, durability, precision, and malleability offers architects a broad variety of options to develop innovative ideas. By exploring different shapes and structures, new aesthetic results - not attainable with other traditional materials - can be achieved.

02 Performance

Steel allows to reach high structural performances with light structures and notable spans, reducing obstructions and intermediate supports. Steels stands out for its ability to bend at a given distance, creating segmented curves and combinations for facades, arches, or domes.

03 Durability

Steel's life cycle is considerably longer than other traditional materials because its chemical composition is quite resistant to external agents. Its durability is also favored by the strict controls required along its industrial production process.

04 Corrosion resistance

A steel structure can resist to corrosive agents for years with adequate mechanical protection (protective paint) and electrochemical protection (cold or hot galvanizing) helping the material to maintain its properties and defend it from water and oxygen.

05 Fire resistance

Steel has an excellent fire-resistance; it needs the application of a protective intumescent paint reactive to fire, forming an insulating layer limiting the heating of the area to which it is applied and reducing the impact of the heat on the characteristics of the material.

06 Energy efficiency

Steel is a highly energy efficient material: heat radiates quickly from coverings, creating a cooler domestic environment in hot climates or, alternatively, the heat can be contained in cold temperatures by using double walls of insulating steel panels.

07 Earthquake-resistance

Steel is an elastic and ductile material; these qualities allow it to absorb the stresses of a seismic event. In addition, steel is an isotropic material and therefore has the same resistance to tensile or compressive stresses, whether longitudinal or transversal.

08 Building speed

The lightweight quality of steel structures, compared to concrete ones, allows constructing smaller foundations and, moreover, steel elements can be pre-assembled before installation, thus optimizing site activities and facilitating the logistic management.

09 Precision

The construction process of steel structures is called "dry" and ensures a greater precision and compliance between the design and construction, unlike concrete constructions which is more vulnerable to the variability of site installation.

10 Sustainability

Steel is a fully recyclable material and can be potentially reused an infinite number of times while maintaining the same properties: this characteristic is referred to as "up-cycling" and contributes to the conservation of natural resources.

ISO 9001:2015
WORLDWIDE
Design, fabrication and installation of steel structures

ISO 1090-1/2
WORLDWIDE
Conformity of the production process for steel structures

ISO 3834
WORLDWIDE
Welding, joining and cutting for steel structures

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