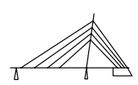
VIADUCTS

maeg

SPECIALIST IN THE DESIGN, MANUFACTURING AND INSTALLATION OF STEEL STRUCTURES

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.



Bridges & viaducts

Civil buildings

Industrial buildings

Special structures

SVILAJ BRIDGE

Location
Svilaj, Croatia

Client
Republic of Croatia & Bosnia and Herzegovina

Contractor
Hering d.d.

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2017-2019

Weight
5.300 tons

Length
640 meters (70+85+100+130+100+85+70)

The realization of this bridge, crossing the Sava River at the border between Croatia and Bosnia and Herzegovina, is part of a broader European project aimed to improve the viability system of the Western Balkans and connect the area within the European road system.

Svilaj Bridge is a double-lane bridge with an overall length of 640 meters, divided in seven spans. The steel structure has an overall weight of 5.000 tons and lays on four concrete pillars, two of which inside the fluvial riverbed. Single elements have been firstly pre-assembled on the ground, then erected in position on the top of temporary structures and staxo towers for those areas above the shore, while the central span is installed and supported by mean of a crane. To ensure accessibility also during flooding season, two banks have been created within the river by using sheet piles to stem the water flow.

MUHAMMAD BAQUIR AL-SADR BRIDGE

Location
Basra, Iraq

Client
Basra Governorate

Contractor
Maeg Branch Iraq

Scope of work
General Contractor

Period of execution
2013-2017

Weight
6.100 tons

Length
1.188 meters

This structure, crossing the union of the rivers Tigris and Euphrates, is the first great realization of a broader urbanization program of the Iraqi region. By connecting the city of Basra to its suburbs developing transport and trade, the project has had a remarkable impact on the local population. Maeg was appointed as a General Contractor, completing the work in just 26 months.

The project is composed of two viaducts having a length of 450 (37+43*8+69) taking to a central cable-stayed bridge 288 meters long (69+150+69) and supported 14 steel cables connected to two antennas 40 meters tall. The width of the bridge is 21.5 meters. Altogether, the weight of the steel structures is 6.017 tons, supported by 25 concrete pillars having a diameter between 1.8-2 meters, dug into the ground at a depth of 50 meters to offset the seismicity of the area. Overall, 33.500 cubic meters of concrete have been used. The assembly method was designed to meet two main requirements: firstly, to concentrate as many activities as possible on the ground, where working conditions are easier and more controlled, and secondly to avoid interference with the maritime traffic.

The solution was to create on both sides of the bridge a pre-assembly area equipped with gantry cranes to prepare 10-12 meters long segments to be slid on roller conveyors by means of jacks and then installed by incremental launching. Similarly, steel antennas were firstly transported at location horizontally, then lifted with jacks and a specially designed equipment installed in front and behind the antenna to allow final positioning.

LOUKKOS RAILWAY VIADUCT

Location
Larache, Morocco

Client
Office National des Chemins de Fer (ONCF)

Contractor
Société Générale des Travaux du Maroc (SGTM)

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2012-2015

Weight
10.500 tons

Length
2.256 meters

Part of the broader project arriving to Casablanca, it serves the 350 kilometers long high-speed train line between Tangier and Kenitra, halving the travel time among the main cities of the country. At the completion of the works, this railway line will be one of the longest in the whole Africa.

The Loukkos Railway Viaduct crosses the Loukkos River and has a total length of 2.256 meters, divided in 41 spans with a variable length between 51.6 and 56.5 meters. Single spans were lifted and launched from the ground. From the planimetric point of view, the viaduct has a constant curvature with a radius of 25.000 meters. The structure is composed of two main double-T beams, 3.75 meters high and with an interaxle spacing of 6.3 meters, whose thickness increase in correspondence of the bearings. On the lower part of the structure, 2 meters wide flat slabs are placed and fixed to the main beams by means of studs and concrete, acting both as a bracing and planking level to inspect the structure.

ACILIU VIADUCT

Location
Sibiu, Romania

Client
Romanian National Company of Motorway and National Roads

Contractor
Collini Lavori Spa Trento - Sucursala Bucuresti

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2013-2014

Weight
8.100 tons

Length
1.100 meters (14*78)

Built along the 82 km long motorway A1 between Orastie and Sibiu, in Romania, the Aciliu Viaduct is one of the several infrastructures planned to upgrade the IV Pan-European corridor running through Eastern Europe. It is also known as the longest and the highest viaduct in Romania, with a height of 80 meters and a length of 1.100 meters.

The Aciliu viaduct is made with inclined double-T beams in Corten steel, with welded longitudinal and transversal joints and bolted reticular internal bracings. The viaduct has a length of 1.100 meters, divided in fourteen spans 78 meters long, with a width of the deck of 24 meters. The structure dominates the Aciliu valley at a height of 80 meters from the ground and rests on concrete piles planted at a depth of 40 meters into the ground to offset the instability of the sandy soil of the valley. The viaduct was assembled in macro-segments in the assembly field on the ground with 80 tons gantry cranes and then incremental launched with the aid of a launching nose, proceeding simultaneously on each direction.

VALTELLINA VIADUCT

Location
Morbegno, Italy

Client
Anas S.p.A.

Contractor
Ing. Claudio Salini Grandi Lavori S.p.A.

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2009-2014

Weight
8.250 tons

Length
3.850 meters

The project is part of the variant of the state highway n. 38 between the intersection with the road n. 36 “of the Como lake” at the km 8+200, so-called “dello Stelvio”, in the municipality of Cosio Valtellino. The infrastructure will improve the connection of the lower part of the Valtellina valley, reducing the transit on local roads and ensuring safety and livability to residents.

The Valtellina Viaduct consists of two parallel mixed viaducts having a total length of 3.850 meters, divided into seven segments measuring 480 meters and composed of ten spans each (40+50*8+40) and a final eighth segment with eleven spans having a length of 490 meters. The section of the viaduct measures 13 meters of width and comprises two main beams with inclined web with a variable height of the beam between 1.75 and 2.80 meters (in correspondence of the pillars). The connection between the two main beams is made by mean of lower reticular bracings aimed to absorb horizontal loads. Altogether, the weight of the steel structure amounts to 8.249 tons. The installation of the viaduct crossing the bottom of the Valtellina valley has been performed from the bottom using cranes.

GIOSTRA VIADUCTS

Location
Messina, Italy

Client
Anas S.p.A.

Contractor
Ricciardello Costruzioni Srl

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2010-2013

Weight
4.800 tons

Length
3.700 meters

The Giostra viaducts are part of a complicated project to reorganize the viability of Messina, allowing a significant reduction of traffic by completing the urban project of the area. These highway junctions consist of fourteen elevated viaducts on various levels with a total extension of 3.7 km.

The fourteen viaducts composing the Giostra highway junctions consist of double-T beams made of Corten steel with bolted reticular diaphragms, weighing 4.800 tons. Overall, the work has a length of 3.7 kilometers divided into spans of variable length based on the specific location of the viaduct. The width is divided into seven unidirectional single-lane ramps with a deck width of 8.25 meters and seven unidirectional double-lane ramps with a width of 10.75 meters. Built at the base of the Nebrodi mountains, within an urban context, the work was entirely launched from below.

FORNELLO EAST VIADUCT

Location
Verghereto, Italy

Client
Anas S.p.A.

Contractor
De Sanctis Costruzioni S.p.A.

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2012-2013

Weight
1.000 tons

Length
220 meters (52+115+53)

The Fornello Viaduct was originally built between 1968 and 1970 in concrete. However, the structure has proven to have deformability problems, therefore it has been substituted with a steel option to modernize and improve the seismic performance of this structure, part of the road E45, with clear safety benefits.

The Fornello Viaduct is composed of two parallel viaducts, named “East” and “West” with the same characteristics: they have a width of 12 meters, a length of 220 meters divided in three spans with a variable section between 2 and 5.2 meters. Beams are located at 4.9 meters. The steel structure was pre-assembled and welded on the top of the existing viaduct made of reinforce concrete, then installed with an incremental launch. Basing on the variable section and of the relevant distance of 115 meters during the launching phase, particular attention was placed in the study of the launching nose. The new viaduct is built on top of the already existing concrete pillars. To improve seismicity, in correspondence of the bearings have been also installed seismic isolators.

CABALLA VIADUCT

Location
Morano Calabro, Italy

Client
Anas S.p.A.

Contractor
Cogip Infrastrutture. S.p.A.

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2010-2011

Weight
1.855 tons

Length
654 meters

Realization of three viaducts within the intervention of modernization and improvement of the portion of the A3 highway between Salerno and Reggio Calabria, to ensure the required level of safety to the structure part of an important segment 11 km long.

The project is composed of three double-carriageways viaducts substituting the namesake previous concrete viaduct, now demolished. The viaduct North Caballa has a constant section 324 meters long (54+72+72+72+54) and with a weight of 847 tons, launched from the ground by mean of cranes. The viaduct Caballa 1 is characterized by a variable section between 3 and 5.5 meters and has a length of 220 meters (60+100+60) and a weight of 738 tons. The structure was installed with an incremental launching to overcome the distance of 100 meters of the central span. Lastly, the viaduct Caballa 2 has a length of 110 meters (55+55) and a weight of 300 tons.

TEVERE VIADUCT

Location
Monterotondo, Italy

Client
Anas S.p.A.

Contractor
Tecnis S.p.A.

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2009-2010

Weight
2.400 tons

Length
375 meters (50+75+125+80+50)

The realization of the Tevere Viaduct is part of a broader project of renovation of the state road Salaria n. 4 in Monterotondo connecting it with the provincial road “Tiberina”. It consists of a viaduct with double-T beams with a variable section, with welded longitudinal and transversal joints.

The steel structure of the Tevere Viaduct has a weight of 2.400 tons with an overall length of 375 meters. The peculiarity of the project lies in the erection methodology conceived for the installation of the 125 meters long central span above the Tevere River. The conformity of the site made impossible to install any temporary equipment inside the river and offered a limited manoeuvring space on the shores, forcing to opt for a cantilevered solution for the installation. To overcome these constraints, two pitches have been realized on the shores, also using sheet piles, in a way to create more space able to support two 600 tons cranes. The cantilevered installation of the segments has forced the cranes to work at the top of their payload.

SANGRO VIADUCT

Location
Fondovalle Sangro, Italy

Client
ANAS S.p.A.

Contractor
Tecnis S.p.A.

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2008-2009

Weight
1.054 tons

Length
344 meters (58+92+92+60+42)

The realization of the Sangro Viaduct is part of the broader project for the renovation of the section between the Gamberale and Civitaluparella stations, 2° lot – 1° section of the State Road n. 652 named “Fondovalle Sangro”.

The deck of the structure has a static scheme with a constant beam basing on six bearings, with spans of 58+92+92+60+42 meters made of double-t beams with a variable section and an interaxle spacing of 9 meters. Webs have a 24° inclination respect the lower flange. Overall, the deck has a width of 13.5 meters and an overall weight of 1.054 tons.


CAT
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SARDINIAN GRENADIERS BRIDGE

Location
San Donà, Italy

Client
ANAS S.p.A.

Contractor
Tecnis S.p.A.

Scope of work
Design, fabrication and installation of steel structures

Period of execution
2007-2008

Weight
2.270 tons

Length
480 meters (90+100*3+90)

The Sardinian Grenadiers Bridge, built over the Piave River, takes its name in honour of the ancient Italian Army unit who fought during the First World War not far from the place where the bridge is built.

The structure consists of five spans, two side ones 90 meters long and three central ones 100 meters long. The use of concrete and steel makes the structure extremely resistant to seismic movements and, to give greater protection from atmospheric agents, the external surface has been painted with a waterproofing cycle typical of the naval sector Particularly important has been the launching of the two sections composing the central span above the river: they have been firstly assembled on the ground and then positioned with a combined operation from the two shores, using a unique crane in Italy with a 800 tons capacity. Part of the 2nd lot of the variant of San Donà di Piave to the highway 14, this bridge has allowed to completely modify the road structure and direct the heavy traffic far from the inhabited centres. The roadway includes two lanes (one for each direction) and passable verges along the bridge with cycle paths and sidewalks.


TECTIS

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