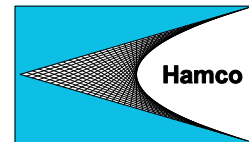


Animal crossing bridges made of corrugated steel products

Company in Dinslaken offers such solutions

Dipl.-Ing. (FH) Christian Hammes



Roads are traffic buildings with great economical, political and often military importance. During the construction of roads of all classes a direct connection between the places are aspired whereas for most of the cases the integration of curves, bridge and tunnel buildings are unavoidable.

To pay attention to the steady increase of the traffic density and to reach an efficient road network the road construction has been developed continuously regarding technology and materials. But the consequence of the steady growing of the road network is that with decreasing space decisive influences to humans, flora and fauna appear. At the present time this subject is of great significance which shall not be ignored.

In some cases the construction of road projects in regions is inevitable, where there really is not optimal. In these cases, eg. when villages are separated from each other or previously pristine biotops and natural animal habitats are disturbed, additional constructions are necessary to ensure the continued interplay between the separated areas. For this purpose, inter alia the corrugated steel construction has more than proven which more than 100 years ago for the first time in the USA stepped in appearance, and since then to today is experienced large application.

Hamco Dinslaken Bausysteme GmbH is a family-run, international operating company dealing with the manufacture and sales of prefabricated steel parts for road construction, civil engineering, agriculture and industry since 1956. The corrugated steel construction was introduced to Germany by the company and has always been significant supported by scientific investigations and technical tests. One of the results is the Klöppel/Glock design method which is still anchored in many guidelines for dimensioning of corrugated steel pipes.

Besides the traditional applications Hamco corrugated steel pipes have been used several times for spectacular large projects like the mountain railway station at the Zugspitze or the two German Antarctica research stations.



Picture 1: Mountain railway station at the Zugspitze
(span 14,22 m)



Picture 2: Second Antarctica research station (repeated crossing
of circular profiles, span 8,00 m each)

To allow humans and animals a safely cross over or pass under of busy roads, in recent decades a number of Hamco corrugated steel pipes were used as animal crossing bridges. In this case the animal crossing bridge made of Hamco MultiPlate in the mid-80s above the Dutch

highway section between Arnhem and Apeldoorn is still today one of the most impressive buildings worldwide ever made of the corrugated steel product MP 200. The whole animal crossing bridge consists of three adjacent circular arch profiles as follows:

Circular arch profile for each highway direction (2 lanes plus emergency lane for each direction)

Corrugated steel product	Hamco MultiPlate 200 x 55 (short form: MP 200)
Profile type	SuperSpan arch (circular arch)
Profile no.	SSB 113
Span	16,13 m
Rise	8,15 m
Length	110 m
Plate thickness	7,00 mm
Corrosion protection	hot-dip galvanized acc. to DIN EN ISO 1461 plus additional plastic coating

Circular arch profile for the parallel to the highway running country road

Corrugated steel product	Hamco MultiPlate 200 x 55 (short form: MP 200)
Profile type	SuperSpan arch (circular arch)
Profile no.	SSB 87
Span	12,03 m
Rise	6,45 m
Length	110 m
Plate thickness	7,00 mm
Corrosion protection	hot-dip galvanized acc. to DIN EN ISO 1461 plus additional plastic coating

The above profiles are assembled on site and ring-wise by corrugated, corresponding to the profile cross-section curved and corrosion protected steel sheets. At the same time, the respective foot points are positioned in site prepared recesses within the concrete strip foundations. After assembly the corrugated steel profiles are backfilled with appropriate soil material according to the installation requirements. The required concrete abutments for transferring the loads are built after reaching their backfilling height, because of the relief work. The interplay between corrugated steel profile and correct and proper backfilled and compacted earth body ensures the enormous load capacity of flexible, embedded corrugated steel pipes. Exclusively for the construction period of the backfilling process, because of the profil dimensions the outer crown area is stiffened at regular intervals by curved steel beams corresponding to the profile cross-section. After completing of the backfilling the steel beams take no tasks anymore, since now full extent the principle of the flexible, embedded corrugated steel pipes can be demonstrated (see pictures 3 and 4).



Picture 3: Greenbridge national park WoesteHoeve (NL) during construction



Picture 4: Greenbridge national park Woeste Hoeve (NL) at finale state

In the recent past the Hamco sales programme has been expanded by a further corrugated steel product which allows due to its features and condition still larger spans and profile cross-sections with unusual rise-width-ratios.

Independent of the corrugated steel product following features characterize this construction method:

- Wide spectrum of different profile cross-section and dimensions
- Fast and simple assembly of the prefabricated steel parts (short construction time)
- After correct and proper assembly and backfilling the building can be loaded immediately
- Long service life by high-quality corrosion protection
- Low planning and construction costs
- Very low or nonexistent maintenance costs

The innovative corrugated steel product also shows well in this application once more its performance regarding economical and technical potential.



Picture 5: Culvert with double sidewalk for amphibians, small animals, etc.



Picture 6: Bat tunnel