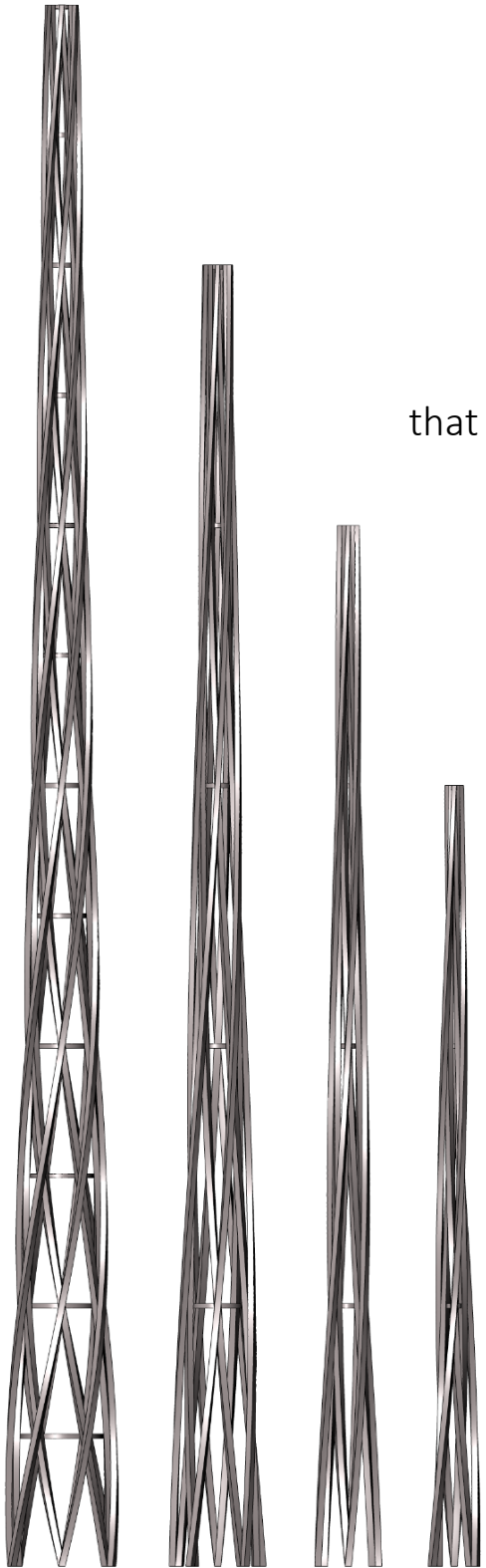
Wooden masts

for

radio sites

Independence Towers

For our future.



Independence Towers offers competitive supporting structures

that combine sustainability, economy, innovation and aesthetics in grid expansion.

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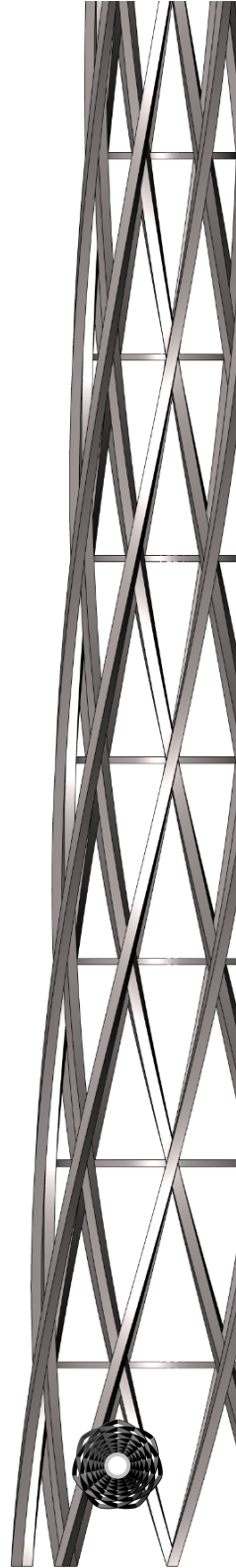


Glulam – a material with outstanding properties

The use of glulam in structural engineering is gradually gaining importance. Whether in bridge construction or for hall roofing'.

Glulam beams are not only a sustainable alternative to steel or steel-concrete beams, they are also increasingly the first choice from a structural point of view. As a standardised material (DIN EN 14080), modern manufacturing processes allow load-bearing shapes to be produced that for a long time could only be safely achieved with metals. The advantageous ratio of load-bearing capacity to deadweight and almost unlimited durability when used correctly (Eurocode 5) make glulam a material with outstanding properties.

Wood protection

The biggest enemy of structural woodwork is water or moisture. Once the wood fibres have become saturated, the wood begins to swell, becomes susceptible to fungal and pest infestation and loses its strength irretrievably. What receives little attention in concrete and steel construction determines in timber construction whether a structure delivers what it promises. We decided to preserve the Independence Towers with a back-ventilated layer of waterproof boards according to DIN 68800. This method is well proven in house construction and ensures that the beams of the supporting structure can be classified in service class 2. The reduced safety coefficient of the beam thickness compared to service class 3 can largely compensate for the additional costs of the protective layer.

Transparent acrylic glass panels at the top allow a quick visual check to see if water has penetrated the rear ventilation.
For protection during thunderstorms, the Independence Towers are equipped with lightning rods (DIN 57185-1 /-2 (VDE 0185-1 /-2)). Applying varnishes, glazes or oils can only provide short-term protection and must be repeated regularly. Nevertheless, we are working with a renowned German chemical company to find an environmentally friendly solution for this type of preservation.

We decided to preserve the Independence Towers with a rear-ventilated layer (DIN 68800) of water- and UV-resistant boards. This method is well-tried in house construction and ensures that the beams of the supporting structure can be classified in service class 2. The reduced safety coefficient of the girder thickness compared to service class 3 can more than compensate for the additional costs of the protective layer. Transparent acrylic glass plates at the upper end of the support structure allow a quick visual inspection to determine whether water has penetrated the rear ventilation.
For protection during thunderstorms, Independence Towers are equipped with lightning protection systems (DIN 57185-1 /-2 (VDE 0185-1 /-2)).

Basic wood preservation

Almost everyone has seen it when wooden beams on benches, roofs or carports become partly grey and cracked and even fungi grow out of these cracks. At the latest then it is time for a replacement or even a complete new construction.
To delay the weathering of wood as long as possible, it must be protected from water and radiation as best as possible. Here, there are basically the possibilities of chemical treatment and constructive protection.

In timber construction, constructive protection means either arranging elements so that they are not directly exposed to the weather or protecting them with a layer and choosing wood with a suitable resistance class depending on the climatic conditions. To prevent moisture from creeping in behind protective layers, a minimum distance of 2 cm and sufficient ventilation should be set up.

Basically, it should be considered constructively that:

- Water drains off quickly.
- boreholes and face wood are particularly at risk.
- a thin separating layer (e.g. foil) is placed between metal and wooden elements.
- pockets of dirt are avoided.
- the ambient humidity is above 80% for a maximum of a few weeks a year in order to achieve service class II or lower.

Severe mould infestation and irreparable damage to a roof structure

Changes in the wood structure due to direct weathering and leaching of the natural "wood glue" lignin

Our range of services

You have a site, we build on it. Also available as general contractor incl. access road, fencing and empty conduits.

In collaboration with our suppliers, we elaborate the execution planning of the desired support structure according to your specifications and supply the statics. Once all the preliminary work has been completed, we take over the transport and turnkey erection of your new transmission mast or transmission tower. For maintenance of the transmitting devices by network operators, the support structures are equipped with stationary climbing systems (DIN 18799).

We can take care of the annual maintenance and offer fair performance-related rates for this.

Currently, approx. 1.3 mobile radio operators use a radio mast in Germany. In the mid-term, this ratio will increase to at least 1.5, which will also lead to the gradual installation of more antennas on the masts and towers. We will take care of the necessary load calculations and any adjustments to the suspension devices.

To maximise the ecological added value of the Independence Towers, we are starting a 30-year mixed forest reforestation programme for each mast and tower in cooperation with tree nurseries and forestry offices. In this way, our support structures act as carbon stores and atmospheric carbon sinks.

Prices and further information on request.

Statics, dynamics and economy

The number of beams and the number of revolutions around the mast/tower centreline determine how many connection nodes and rings the respective support structure has. From a static and dynamic point of view, the stiffness and the possible load-bearing capacity increases with an increasing number of beams and revolutions. From an economic point of view, the number of beams should be minimised, with 6 beams and 3 supports being the minimum numbers.
This very slim design is suitable for mast/tower heights up to 36m. As the height increases, the number of beams should also increase to maintain a balance between load capacity and economy.
For use in high-growth regions and regions with growth potential, we recommend oversizing the support structures to keep future costs low.

Your benefits at a glance

- minimum of 27 antenna slots on a 30m mast possible combined at 30m and 20m hight
- minimum of 60 antenna slots on a 40m mast possible combined at 40m, 30m and 20m hight
- minimum of 80 antenna slots on a 50m mast possible at 49m, 48m, 40m and 32m hight
- Extension with up to 6.5 m long extension tube possible with all mast variants
- excellent torsional stiffness $\Phi < 0{,}5°$
- Cable routing on C-rails double clamped at the side of the *Söll* climbing system
- *Söll* climbing system made of anodised aluminium with central spar and guide rail
- >95% CO_2 saving compared to conventional steel- or steel-concrete alternatives
- active climate protection through reforestation
- value enhancement of the sites through the use of high-quality materials and a pleasant organic look
- particularly suitable for sensitive locations/communities
- assembly and maintenance by carpenters if required
- international transport in standard 40“containers
- reduced foundation size due to lightweight construction
- roof sites are possible

Platforms equipped with fall protection devices facilitate maintenance and allow safe climbing.

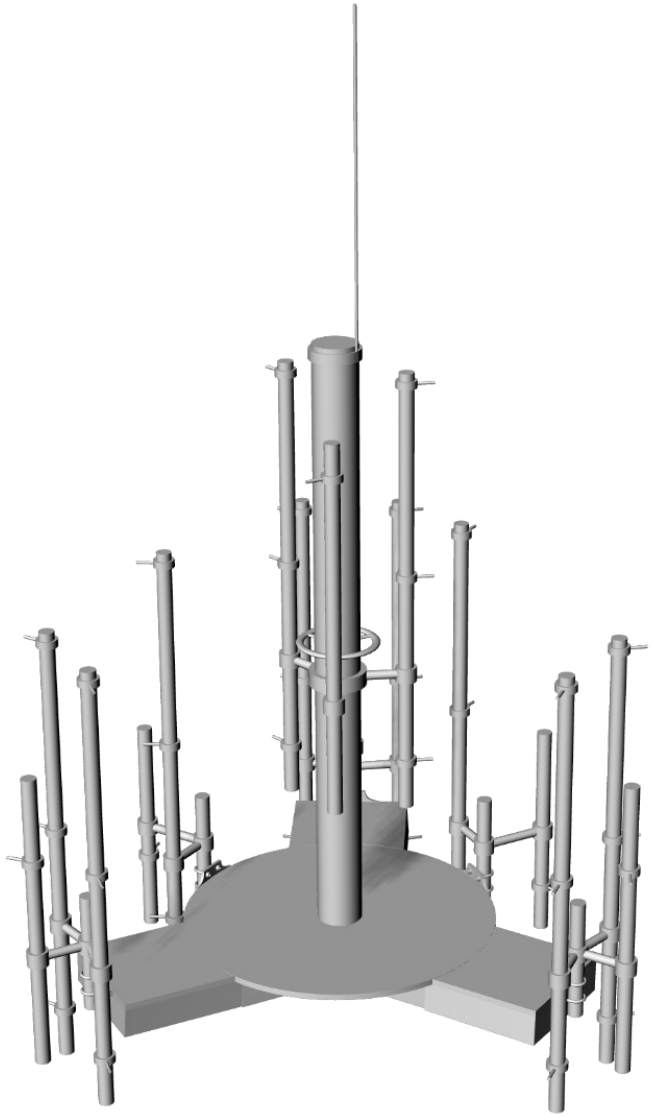
Mountings

Subsequent extensions have already been taken into account in the planning and allow additional antenna sites to be added quickly and cheaply.

For this we replace the attachment pipe with a maximum length of 6.5 m.

All tubes, clamps, bolts and nuts are galvanised for adequate corrosion protection and a service life of more than 30 years.

We supply the support tubes for the antenna mounts with diameters of 88.9mm and 114.3mm and wall thicknesses of 4.0mm, 5.0mm and 6.3mm.



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