Now the world’s most valuable carmaker, Tesla has dramatically shaken up the world of driving.

Despite initial struggles, the company now has record demand for its electric cars and

is racing to scale production accordingly - enhancing processes, fine-tuning automation

and building its Gigafactories with astonishing speed.

Tesla bought its first factory from General Motors in 2010 and quickly transformed the

facility into one of the world’s most advanced automotive plants.

In the decade since, the firm has quickly expanded in the US with large custom-built

battery and solar panel plants - or Gigafactories - in Nevada and New York, and a further facility

now under construction in Texas.

Eyeing greater international expansion and aiming for a production facility on each inhabited

continent, Tesla is now constructing Gigafactories in Berlin and Shanghai at an incredible speed.

The Shanghai factory went from a bare patch of land to making its first models in under

a year, and the progress now being seen at Giga Berlin could result in an even faster build time.

So, how does Tesla do this when most buildings - let alone advanced factories - take many

months to design and then easily a year or more to construct?

Unlike most one-off building projects, Tesla has developed a clear template for its Gigafactories.

It knows what it needs and what will work best for its businesses and isn’t

reinventing the wheel each time.

Its design manual can be quickly and easily adapted whatever the local site context or constraints.

These pre-honed designs are now being built using prefabricated construction techniques.

This is where a building’s elements are pre-made in a factory, before being transported

to the building site for assembly - saving time, cutting costs and improving quality.

Tesla knows which materials it wants to use, how its Gigafactories break down into component

parts and how those parts all go together. Its teams know the drill and aren’t now

creating a prototype each time they build.

During the final assembly on site, each step is carefully sequenced with teams following

each other and starting the next build activity before the previous one has completed where possible.

Mindful of the need to potentially scale up capacity in the future, the Gigafactories

are also designed to be easily expanded - a feature clearly visible in Nevada.

At Giga Berlin, thousands of roof and wall elements have been arriving by train, before

being quickly slotted into place.

It’s thought that up to 1,200 tonnes of building material is being transported to

the site by rail at a time, whereas in Shanghai only truck deliveries were possible.

While offsite construction is more commonly used for housing, large-scale commercial and

industrial applications have been on the rise.

A Tweet from Tesla’s CEO Elon Musk in July 2020 confirmed the approach, pointing out

the “impossible-seeming” speed of the build and positioning Germany’s construction

sector as a leader in offsite.

In fact, the country is one of the world’s biggest adopters, with around 9% of construction

projects now using offsite techniques.

But despite the factory emerging at an electrifying speed,

things haven’t been entirely straightforward in Berlin.

The original design called for some 15,000 concrete piles but environmentalists raised

concerns about the impact on local nature and groundwater and the firm revisited the

plan, cutting the number to 500 and constructing just the press shop on a piled foundation.

Tesla is also building at its own risk, with only preliminary approvals granted and the

crucial final permits yet to be signed, though this issue looks likely to be resolved by

the end of 2020.

Despite some arguably inevitable local hiccups, Tesla has found a formula for rapid factory

building that it can repeat and perfect on future projects, moving it closer to achieving

its mission of “terawatt-hour” levels of battery production that Musk believes would

bring about “a fundamental shift in the world’s energy usage.”

The firm’s approach is compelling for those already using offsite techniques on other

repeatable building types like schools, prisons, hotels and homes - and for those other car

giants now racing for a slice of the electric market.

If you enjoyed this video and would like to get more from the definitive video channel

for construction, subscribe to The B1M.