

Fiberglass Structure

How are Loads Carried through Diagonals?

In order to transfer wind and earthquake loads into the foundation through a highly efficient “braced-frame” cooling tower structure, loads must be transferred from the horizontal members into the diagonals.

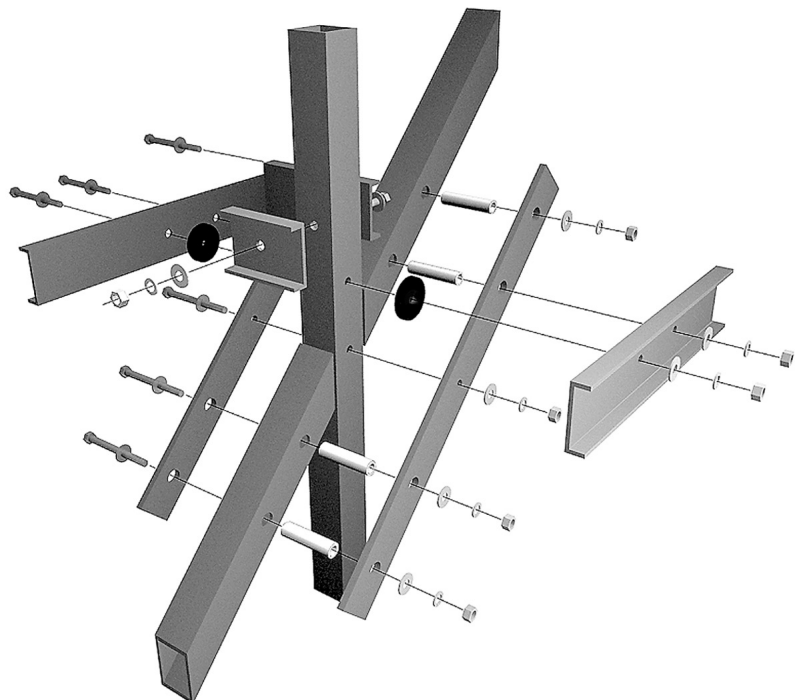
The axial loads thereby induced in the diagonals must be transferred through points where the diagonals are discontinuous. These joints typically occur where girts, columns and diagonals intersect.

Proper Connectors are Vital to Tower Operating Life

At points of intersection between the diagonal and column line, the total axial load in the diagonal must be transferred into side strap connectors and returned to the diagonal on the other side of the column. Additional load is also transferred from the horizontal girt line into the diagonal. The design of the diagonal side strap connectors, therefore, is critical to proper load transfer.

Marley braced-frame pultruded fiberglass structures use 1/2" thick fiberglass pultruded side straps in the diagonal connection design. This connection system is typically controlled by the allowable bearing stresses on the fiberglass pultrusions. The amount of load being transferred determines the size and or number of connectors in a joint. Critical framing joints are augmented with heavy-wall stainless steel structural sleeves that increase the bearing area and joint capacity.

The stainless steel mechanical fasteners used in the braced-frame pultruded structure do not require pretension forces. Creep or slight change of structural dimension will not affect the integrity of the joint. After assembly, an anaerobic locking compound is used on all fasteners to insure bolt assemblies remain secure.



The Marley Difference

Marley pultruded structures are completely and securely assembled using mechanical stainless steel fasteners without the use of glued joints. Every joint is guaranteed as specified whereas a glue joint is only as good as the preparation made prior to the application.

Marley pultruded structures can be assembled at any time, even in coldest weather – gluing is not recommended below 40°F. If any structural member within

a Marley tower has to be replaced for any reason, it's a simple matter of unbolting the structure and adding the new part.

The resin-rich surface veil applied to all pultruded fiberglass parts makes field-gluing inappropriate and structurally inadequate. Having no structural fiber content, this veil is the weakest area of the part and must be properly removed to permit bonding to the fibrous structural layer. This surface preparation is very difficult under field

conditions and, coupled with the absence of any temperature and humidity control, makes field-glued joints not only ineffective, but potentially dangerous.

How to Specify

Include language as follows in your specification:

Structure shall be braced by diagonal members. Diagonal connectors transmitting forces through column lines shall be 1/2" thick fiber reinforced polyester pultrusions, or equally inert material of comparable strength. Where required, structural connector sleeves shall be used to augment joint capacity. Glued connection of structure will not be allowed. Edges exposed in fabrication shall be thoroughly coated with polyester resin.



Marley pultruded FRP structure

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