

# Diagonal Truss Members *for large, cantilevered frames*

ABC's "Easy Sheet" series on building extruded aluminum sign frames - 1/01

# 18

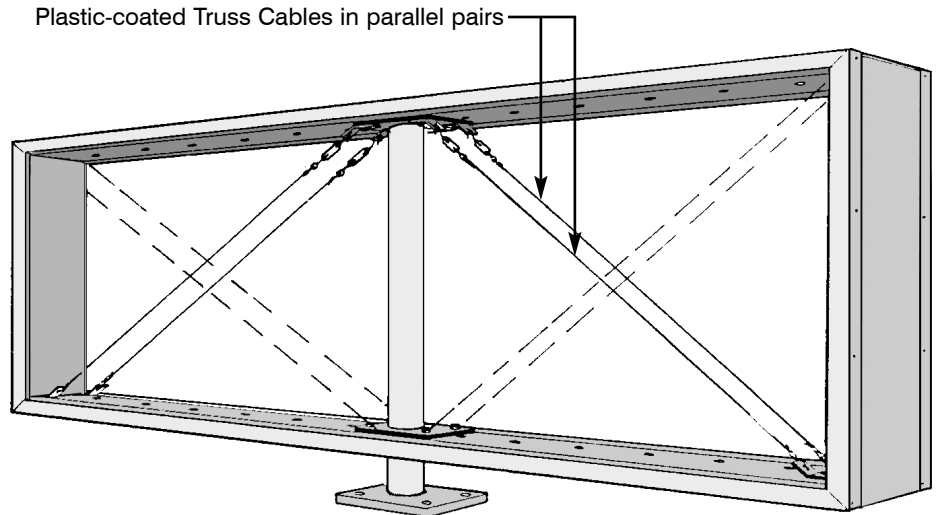
Diagonal truss members are used to prevent the whole frame from sagging from the dead-load (weight) which is cantilevered from the support column(s). This can be a very serious problem for large signs with rigid plastic faces because even the slightest camber in the hanger-bar from which the face is suspended causes the face to be unevenly supported over its total width, and cracks will invariably result in time. Although less critical in flexible face signs, the frame should be properly trussed to withstand high wind loads.

For signs built of the Large A/Flexframe, we recommend using diagonal truss members whenever the cantilever exceeds 6 feet from the centerline of support column. And when a cantilever exceeds 9 feet, we suggest using X trusses, as illustrated in dotted line.

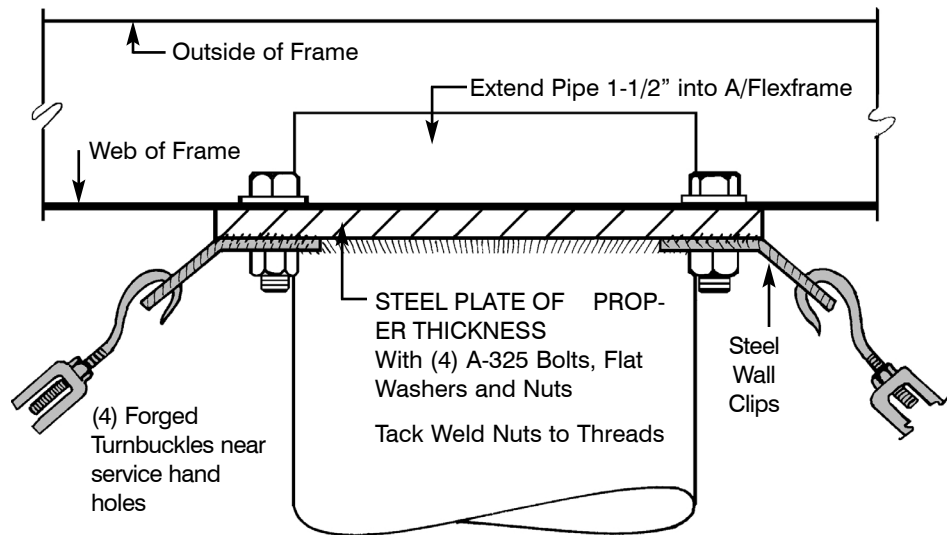
For ABC's Wide Fab system, we recommend using diagonal truss members when the cantilever exceeds 8 feet from the support column.

These trusses should transfer the cantilevered weight from the bottom ends of the sign to the top of the **steel support column**, not to the sign frame. This can be done very simply and economically with truss cables and turnbuckles. While steel rods or hollow steel tubes may also be used for these diagonal truss members, cables are stronger than comparable diameter steel rods, and are easier to install, adjust properly and maintain.

Turnbuckles are necessary to level the frame **as it will be when installed**. When the sign is complete except for the faces, this can be done in the shop by resting the sign frame on blocks under the support column location, or on the match plate(s) if pipe stubs are built into the sign.



6' x 12' EXAMPLE OF SINGLE POLE WITH TRUSS CABLES



STEEL CLIPS BOLTED AND WELDED TO TOP PIPE PLATE

Please contact ABC if you have any questions:  
2028 SE Frontage Road, Fort Collins, Colorado 80525  
Toll-Free: 800-248-9889 Fax: 970-482-4019 Email: [abcsigns@abcsignproducts.com](mailto:abcsigns@abcsignproducts.com)

The parts described on this page are covered by one or more of the following patents:  
U.S. 4,007,552 4,265,039  
CANADIAN 1,021,565 1,149,159 1,170,048 1,170,049 1,170,050

**ABC**<sup>®</sup>  
**Sign Products**

# Diagonal Truss Members *for large, cantilevered frames (cont.)*

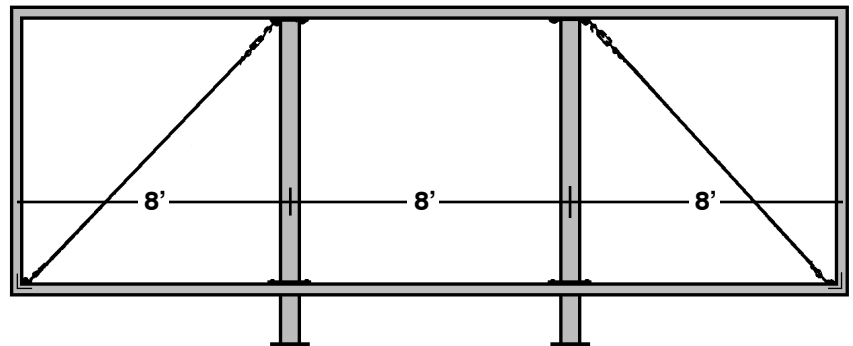
ABC's "Easy Sheet" series on building extruded aluminum sign frames - 1/01

Tighten the turnbuckles until the frame is perfectly straight for the length of the sign. Be sure the tension on the parallel members is as equal as possible, and that there is no twist, or wracking of the ends of the sign. Then secure the turnbuckles so they cannot be loosened by wind and vibration. The easiest way to do this is to use left and right threaded nuts to use as jamb-nuts on the threads of the turnbuckles.

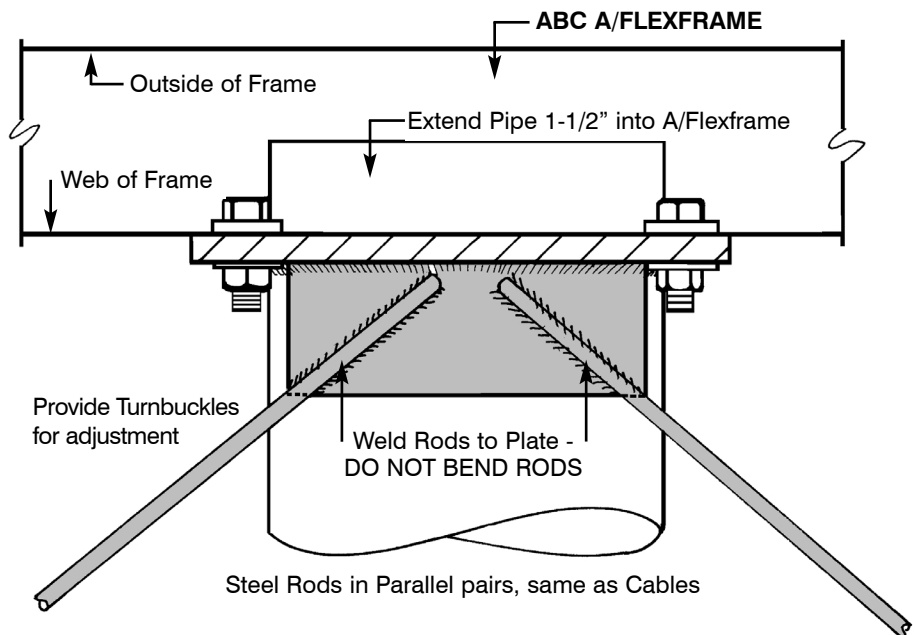
This procedure can also be done by the installers, after the sign is mounted to the support column(s), by reaching through the service hand-holes to adjust and lock the turnbuckles.

The illustrations show our recommended methods of connecting truss cables or rods to the top of the steel pipe plate, and at the bottom corners of the frame. For all bolt connections, be sure the bolts are of sufficient size, are grade five or A-325 quality, and are properly torqued. When all connections are completed, the nuts should be tack-welded to the bolt to prevent loosening.

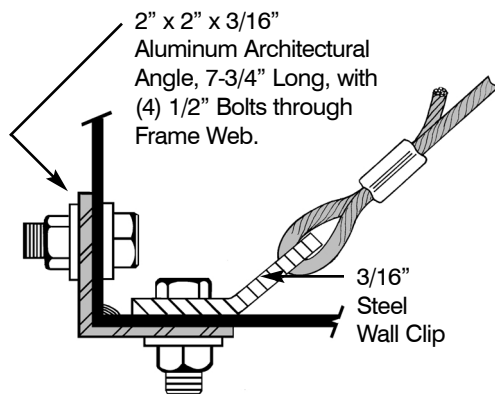
Flexible faces deflect in very high winds, and may touch the truss members. To prevent mark-off on the back of the faces, we recommend using 3/16" or 1/4" Vinyl Coated Aircraft cable, available from industrial supply companies.



**8' x 24' EXAMPLE OF DOUBLE POLE WITH TRUSS CABLE**



**ALTERNATIVE 2" x 2" x 1/4" PLATE WELDED TO TOP PIPE PLATE FOR STEEL ROD TRUSS MEMBERS, OR FOR CABLE EYES.**



**CABLE CONNECTION AT BOTTOM ENDS OF FRAME**

If steel truss rods are used, they should not be bent for welding, as the bends can stretch, allowing the frame to sag. On very wide signs built of ABC's WideFab frame, light wall square tubes may be used, with care given to proper welding and attachment at the top steel pipe plates.

Hollow aluminum tubes for diagonal members are not recommended, because welding reduces the allowable stress from 18,000 psi to 8,000 psi for 6063-T6 aluminum.

Please contact ABC if you have any questions:  
 2028 SE Frontage Road, Fort Collins, Colorado 80525  
 Toll-Free: 800-248-9889 Fax: 970-482-4019 Email: [abcsigns@abcsignproducts.com](mailto:abcsigns@abcsignproducts.com)

The parts described on this page are covered by one or more of the following patents:  
 U.S. 4,007,552 4,265,039  
 CANADIAN 1,021,565 1,149,159 1,170,048 1,170,049 1,170,050

