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Triangle Fastener Corporation
4661 Hinckley Industrial Parkway
Cleveland, OH 44109 - (216) 351-9933

Statement of Certification

This is to certify that we have conducted a comprehensive schedule and a program of laboratory testing on your "Bracer" hillside washers. The objective of the testing program was to establish the load carrying capacity of these washers and the failure modes.

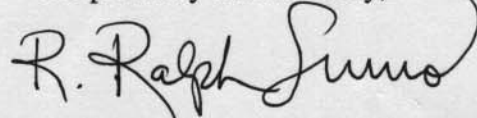
This work was conducted at the Structural Laboratories of the Civil Engineering Department of Mississippi State University under my direction and supervision.

The test results confirmed that the 4.00X3.00 inches base of the "Bracer" made from structural quality ductile steel influenced positively the failure mode and caused flexure deformations to the web rather than localized failures such as nipple, direct or punching shear, tensile fracture and/or weld failures of the web-flange connection of the column section. The "Bracer" washers exceeded the load carrying capacity of the x-bracing rods when selected adequately to match the web thickness of the column section.

Hillside washers and associated parts made using cast iron had unpredictable low strength with no warning sudden failures.

Procedures and calculations established in the literature for the design of x-bracing anchorage can be used with confidence when specifying and selecting ductile iron "Bracer" hillside washer.

Respectfully submitted by,



R. Ralph Sinno, Ph.D., P.E.
Professor of Civil Engineering

