NC STATE UNIVERSITY

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June 26th, 2023

TO: James Turner
F.J. Turner Company, Inc.
P.O. Box 20741, Raleigh, NC 27619

FROM: Johnathan McEntire, Research Technician

CFL DOCUMENT NUMBER: IS-23-03

RE: *Composite Utility Riser Compression Testing*

A fiberglass infused, polyethylene utility riser was tested in direct compression by the Constructed Facilities Laboratory at NC State University on June 15th, 2023. The riser was fully supported by a machined aluminum ring. Both the riser and the ring were provided to the laboratory by F.J. Turner Co. of Raleigh, NC. Photos of the riser and ring support are shown in Figure 1.

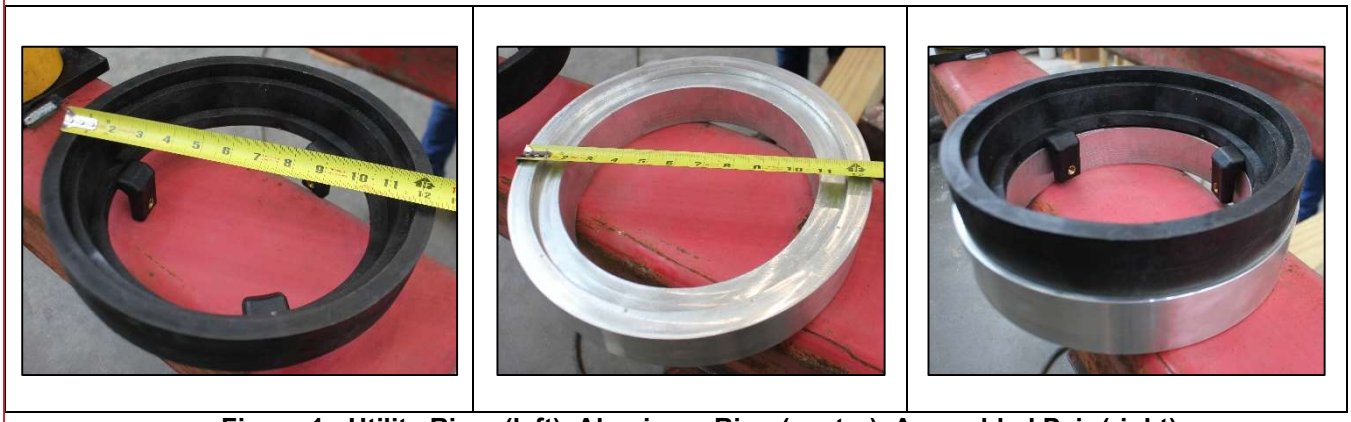

Figure 1: Utility Riser (left), Aluminum Ring (center), Assembled Pair (right)

The composite riser was placed into the machined aluminum ring. Load was applied to the top of the riser using a 1 inch thick, 11-3/16" diameter steel disk uniformly loaded on its top surface. The test was conducted in a 200,000 lbs. capacity universal testing machine. A photo of the riser in the testing machine is shown in Figure 2.

Figure 2: Utility Riser Assembly as Tested

The utility riser was loaded in compression at a constant machine displacement rate of 0.05 inches per minute up to an applied load of 50,000 lbs. After holding the load at a constant level of 50,000 lbs. for one minute, loading resumed to failure. Failure occurred at a maximum applied load of 71,263 lbs. A plot of applied load vs time is shown in Figure 3.

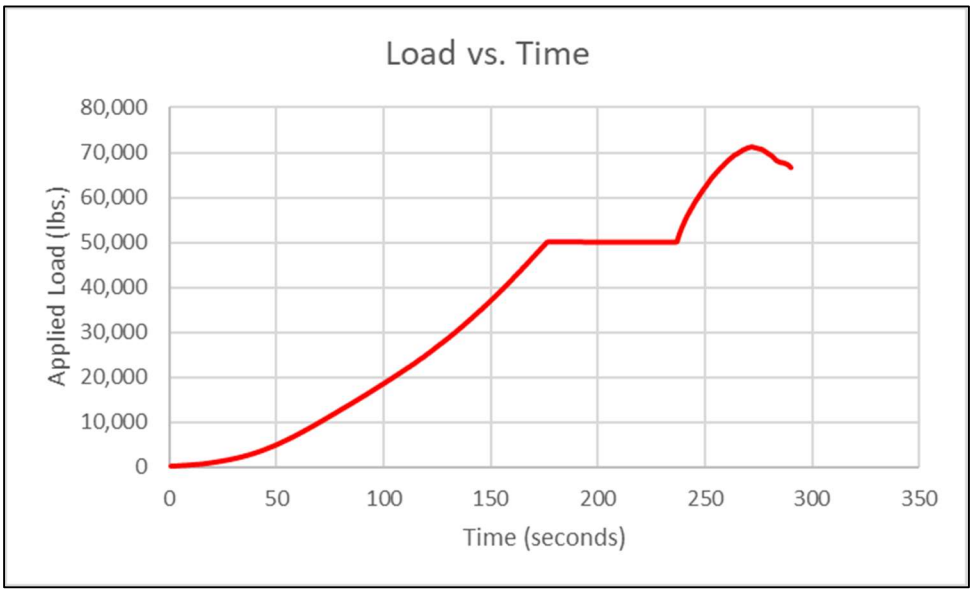

Figure 3: Applied Load vs Time Plot

The failure mode included a crack in the riser along the edge of the steel loading disc. This crack is shown in Figure 4 and Figure 5.

Figure 4: Photograph Showing Location of Crack at Failure on Top of Riser

Figure 5: Photograph of Crack at Failure in Bottom of Riser

Thank you for the opportunity to work with you on this project. Please let us know if you have any questions.

Best regards,

Johnathan McEntire
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