STRUCTURAL ANALYSIS
OF
BOXHOUSE
LAHAINA SMALL HOUSE

Prepared for:

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BoxHouse

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Patrick E. Bird 4/30/24

Signature Expiration Date of My License

EXECUTIVE SUMMARY

SolidBox has performed a structural analysis on a Small House, constructed with Steel Box-Beams, Composite Wall Panels, and Steel Cladding, designed by BoxHouse for use in Lahaina, Hawaii. This structure is designed to be capable of withstanding the environmental and seismic loads of the Hawaiian Islands. The structure is designed to withstand a basic wind load of 150 mph. This analysis is performed per the ASCE, IBC, and Hawaii State building codes, but also considers important engineering criteria that exceed the ASCE 7-16 code. This report details the steps taken to ensure that the structure designed by BoxHouse meets all requirements set forth by ASCE, IBC, and Hawaii Building Code for a Risk Category III structure, designed for a wind speed of 150 mph (Exposure C) in a D seismic design category zone.

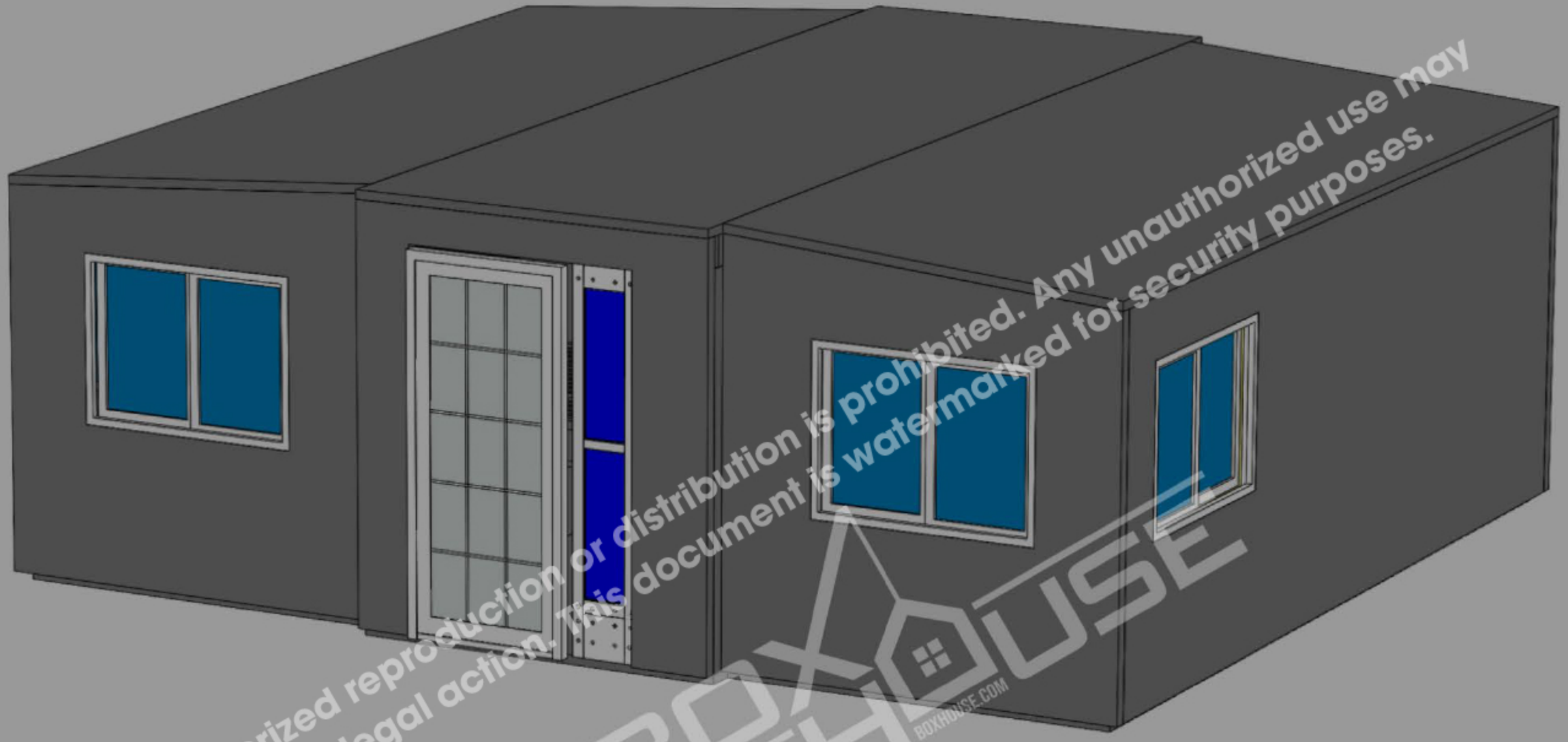


Figure 1: BoxHouse Small House Structure

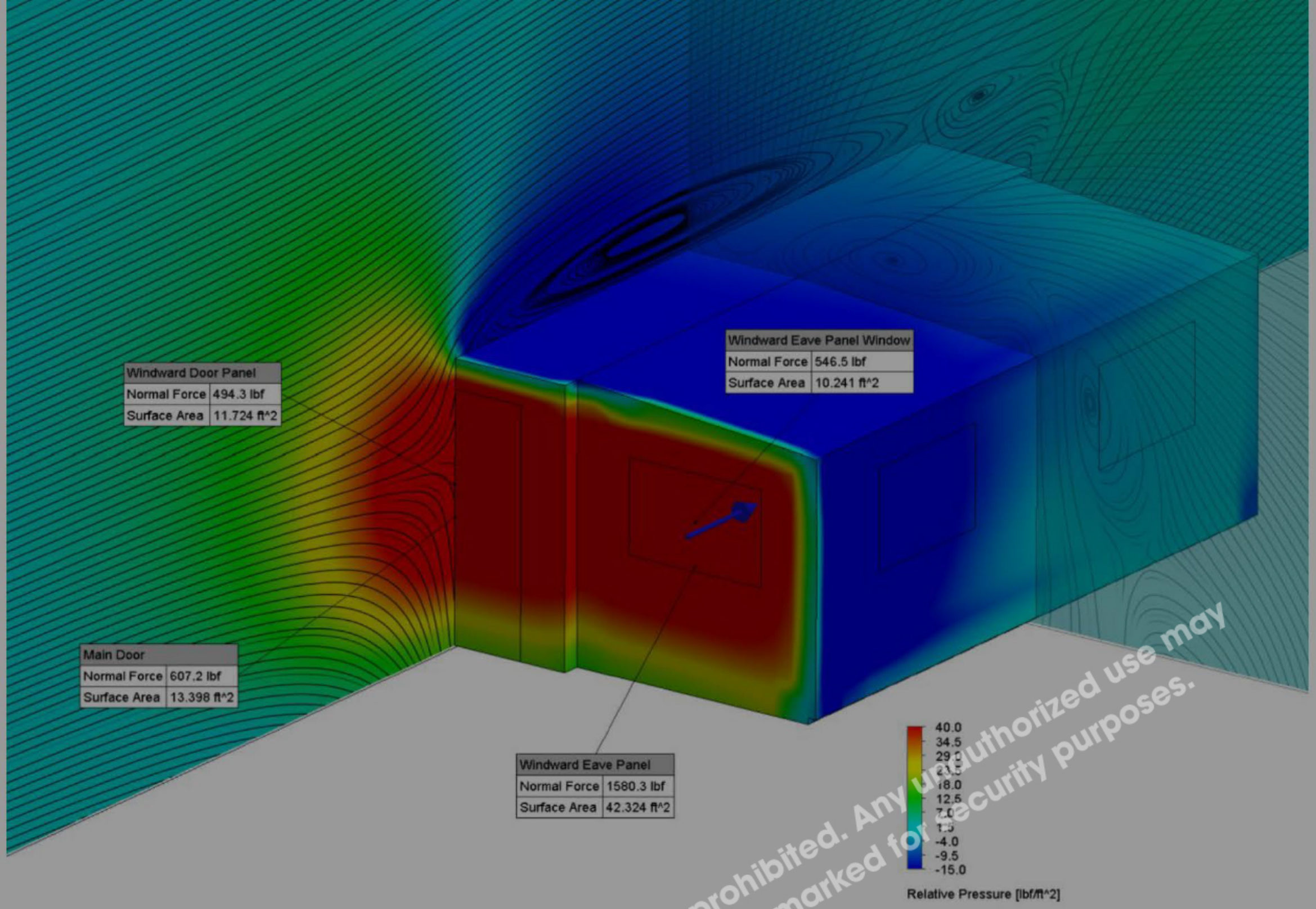


Figure 3: Wind Pressure – Parallel to Ridge

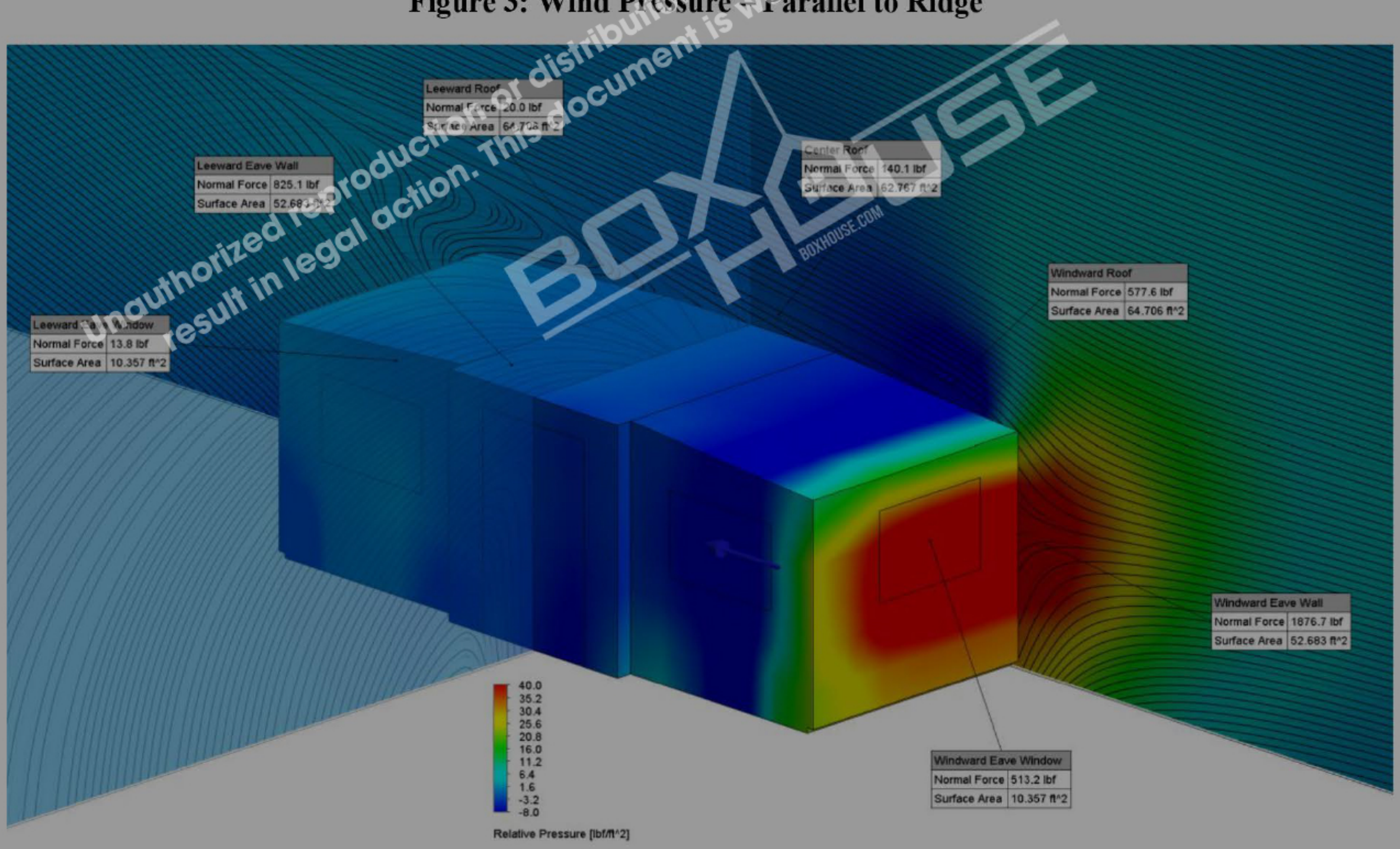
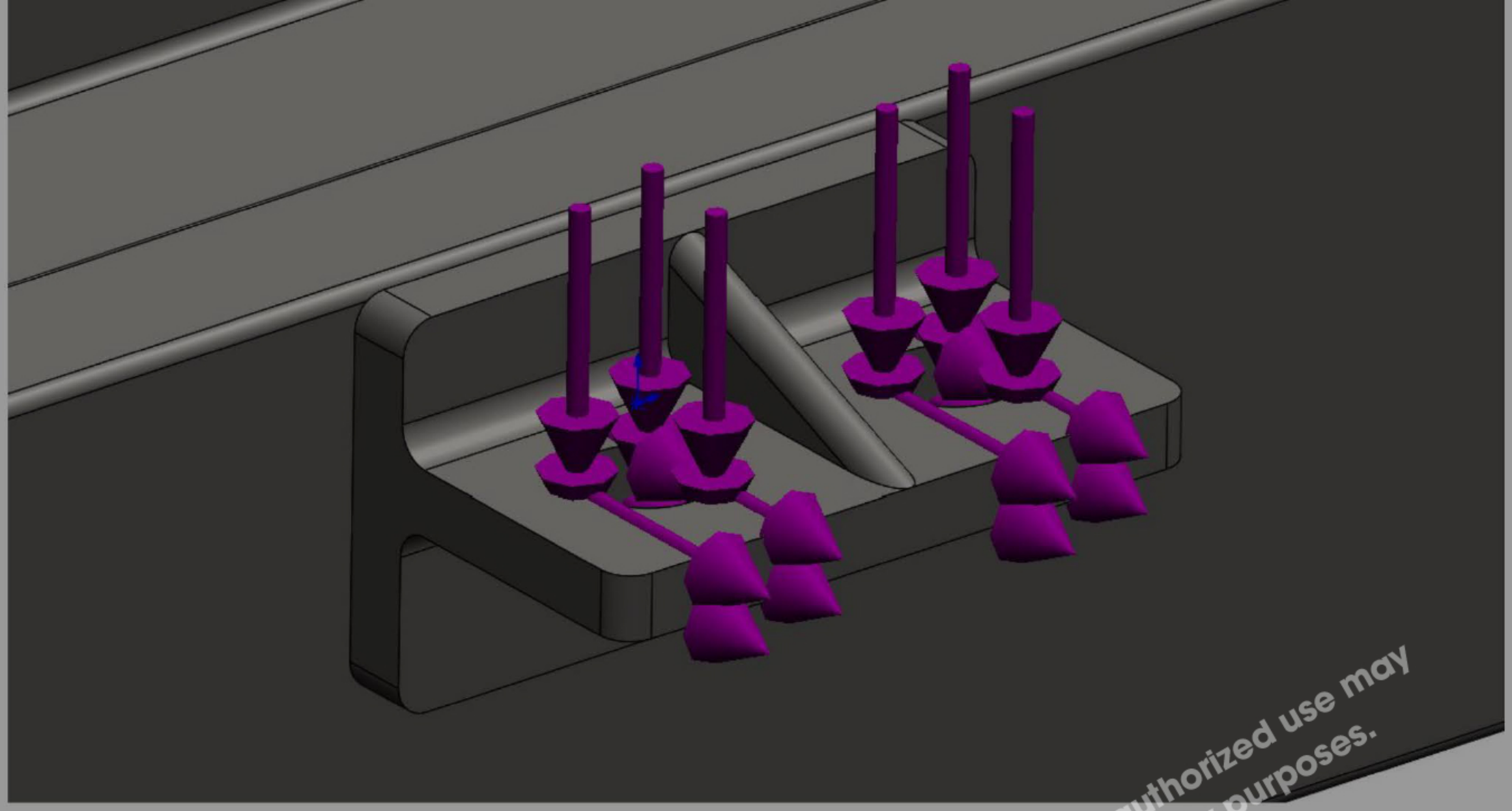


Figure 4: Wind Pressure – Perpendicular to Ridge



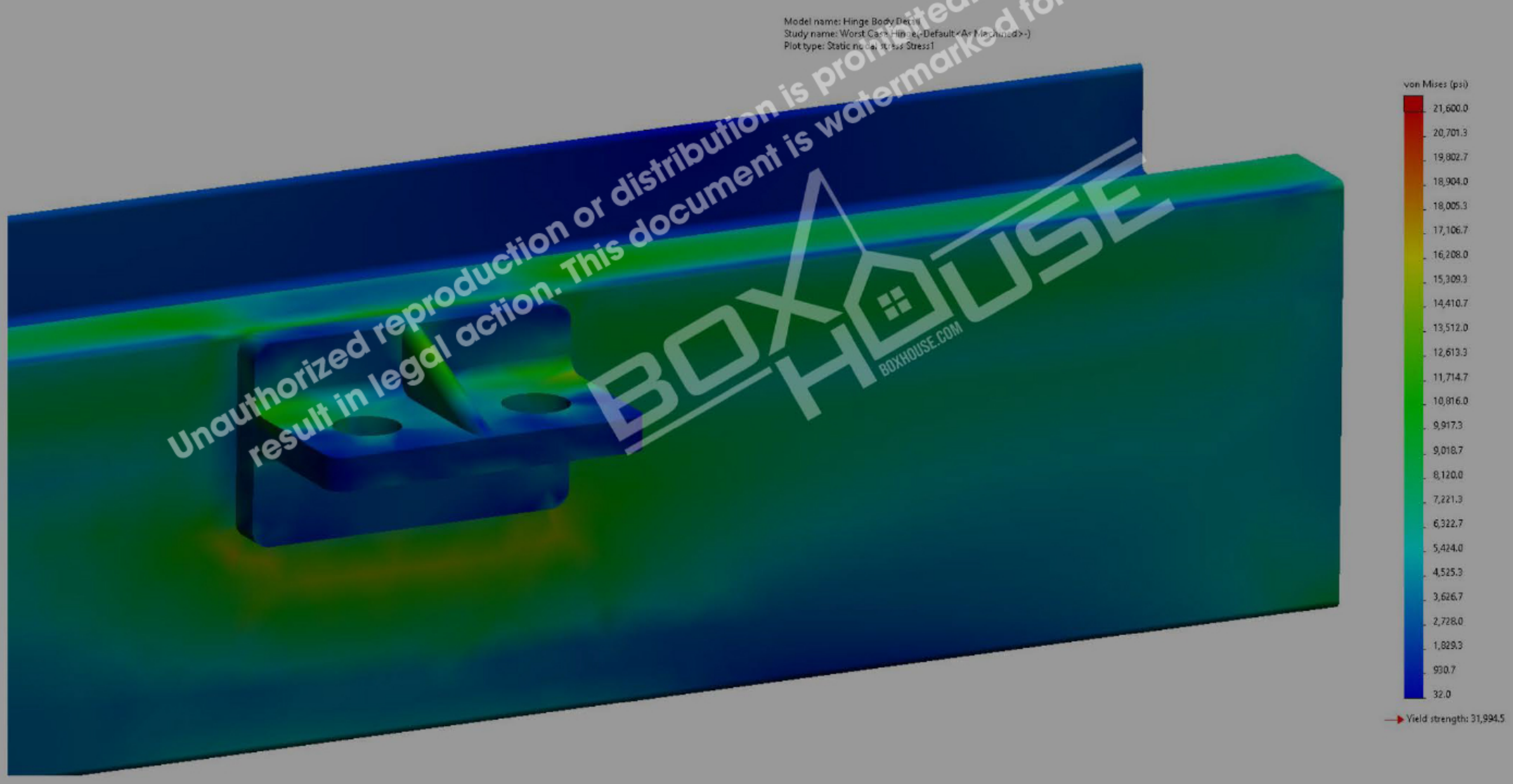
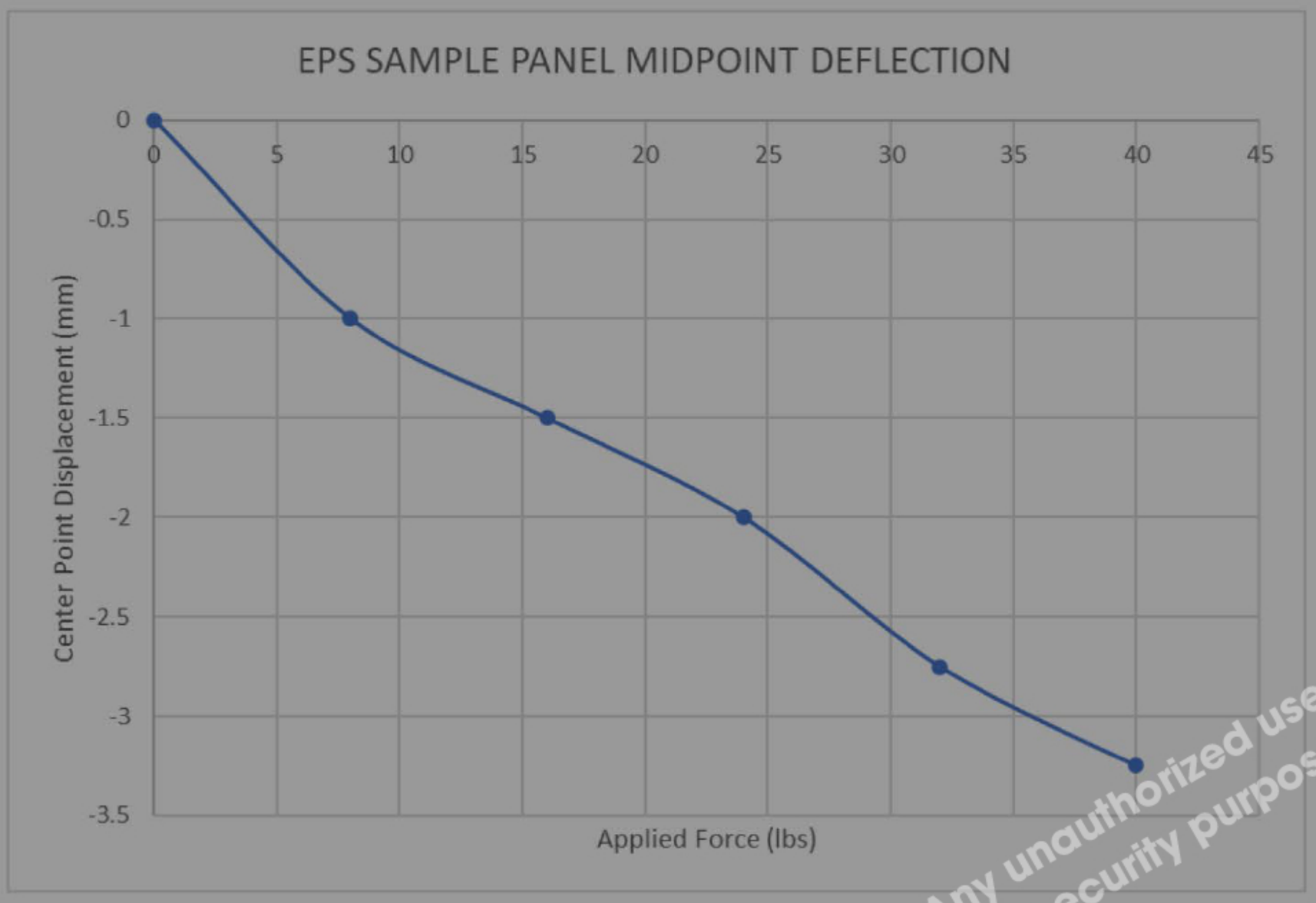


Figure 12: Maximum von Mises Stress at 2x Applied Load

APPENDIX B – PHYSICAL TESTING RESULTS



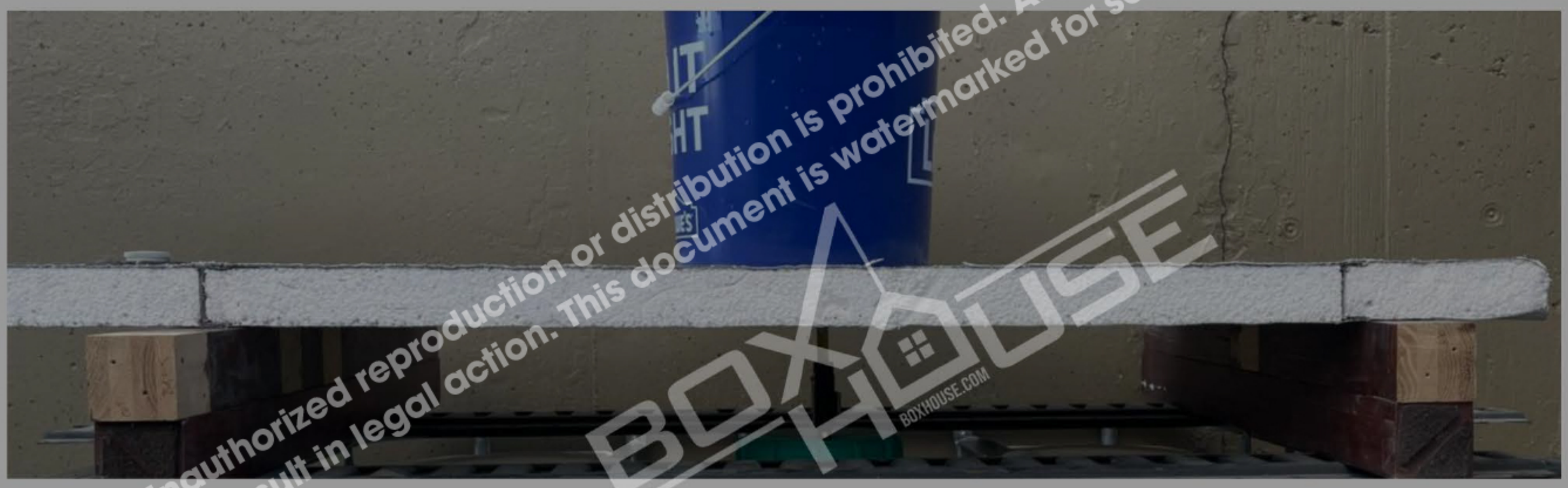


Figure 16: EPS Foam Panel Deflection Testing

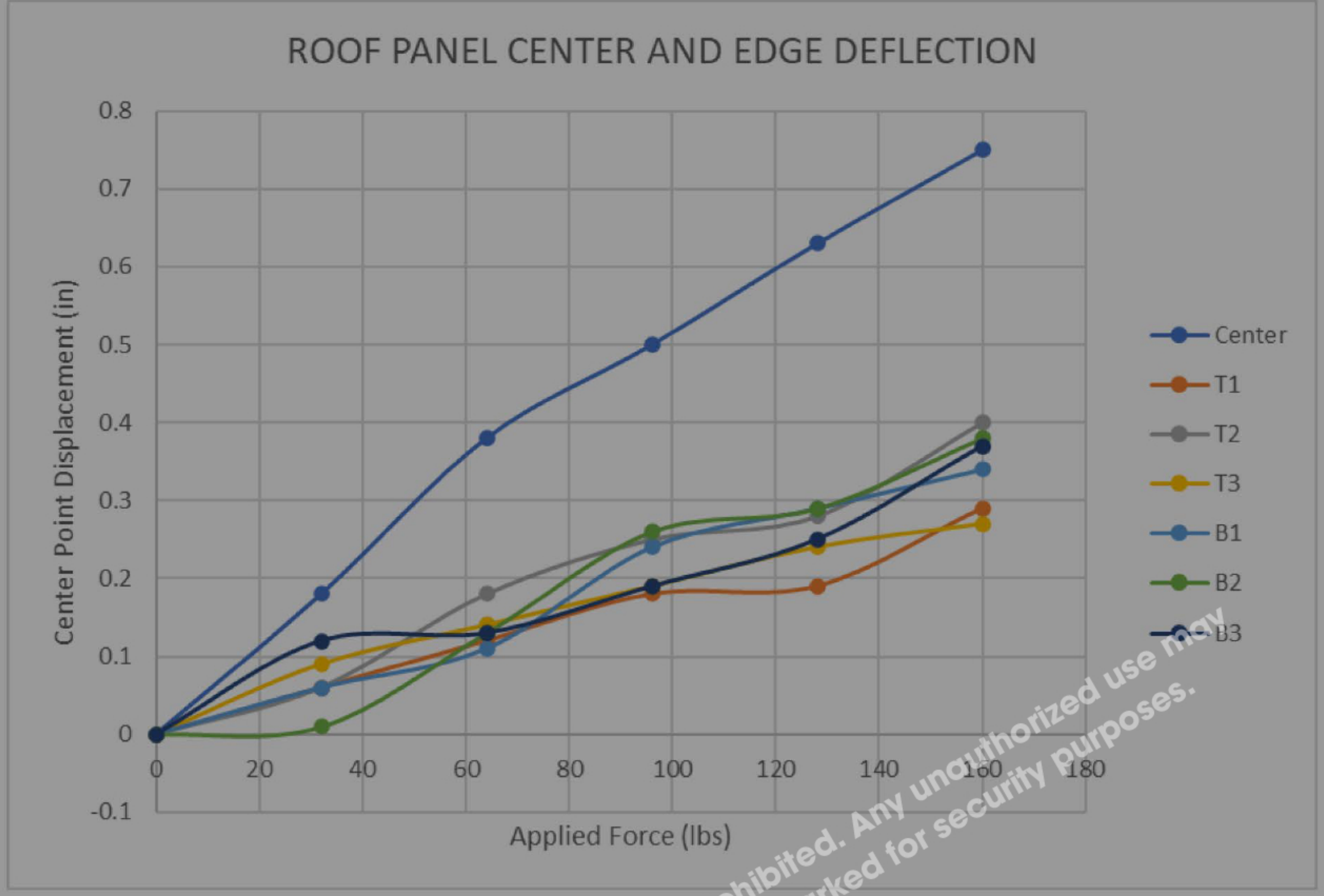


Figure 17: Extension Roof Panel Deflection Testing