Reviewer Comments

The manuscript (MS-2026-174) investigates the structural responses of the boom and stick of a 20-ton backhoe excavator under different load characterization methods. The study is practically relevant, and the comparative analysis of measured excavation resistance, conventional composite excavation force, and ultimate composite excavation force provides useful insights for structural design. The methodology is generally reasonable, and the conclusions are supported by the numerical results. However, several minor revisions are recommended to improve the clarity and presentation of the manuscript.

1. The terms "compound digging force," "composite excavation force," and "ultimate composite excavation force" are used inconsistently throughout the abstract and conclusions. It is recommended that the terminology be unified and clearly defined to avoid potential confusion.
2. The selection criteria for the four typical excavation trajectories and the corresponding critical operating postures should be further clarified. A brief explanation of how the measured excavation resistance is converted into the applied structural loads would improve the reproducibility of the methodology.
3. The discussion of structural stress and deformation is mainly qualitative. It is recommended to provide more quantitative comparisons, such as the percentage differences in maximum equivalent stress and maximum deformation of the boom and stick under the three load schemes, to strengthen the supporting evidence for the conclusions.
4. The non-monotonic variation in stick deformation under different load schemes is an interesting finding. It is recommended to provide a more detailed explanation of the influence of load direction, moment arm, and operating posture on this phenomenon.
5. The font size of the legend below Figure 14 is too small to be clearly readable. Please increase the font size to improve readability.
6. Figure 17(a) could not be found in the submitted manuscript. The figure reference should be verified.
7. There are several apparent issues in the references. For example, the third reference contains two identical DOI links. Please carefully verify the volume, issue, and article number.