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REVIEWER'S REPORT

Manuscript No.: **IJAR-53333** Date: 16-08-2025

Title: Impulse response method Applied to the ground anchors

Recommendation:
Accept as it is .....YES.....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality			✓	
Clarity			✓	
Significance		✓		

Reviewer Name: Mr Bilal Mir

Reviewer's Comment for Publication.

Method Review:

The method section provides a clear and detailed explanation of the application of the impulse response method for diagnosing tie rods. It situates the research in the Brazilian context, emphasizing its extensive use with a significant dataset of 3,000 tie rods tested over four years, amounting to 24,000 individual tests. This large empirical basis strengthens the reliability of the findings. The section also highlights the complementary use of static tensile test results, which add depth and validation to the dynamic testing procedure.

The technical process is described with clarity. The method involves generating a compression wave through an impact with a hammer equipped with a force sensor, which induces a vibratory response in the anchor system. Attention to measurement accuracy is emphasized, particularly the importance of attaching the geophone securely to a metal plate in contact with the tie rod head. The description of the setup, including the cleaning of the plate, adhesion of a small plate, and proper screwing of the 3D geophone support, underscores the precision required in the procedure.

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The transformation of acquisition data from the time domain to the frequency domain is outlined, leading to the production of a Velocity/Force versus frequency curve. This analytical step provides a quantitative basis for assessing the dynamic stiffness and response characteristics of the anchors.

Figures Review:

- Figure 1 (Test devices): Illustrates the experimental setup, reinforcing the procedural description provided in the text.
- Figure 2 (Velocity/Force as a function of frequency): Presents the relationship between impact force and anchor head velocity in frequency terms, which is central to interpreting the results of the impulse response method.

The accompanying definitions—C (wave velocity in the anchor), F (force of hammer impact), V (velocity of anchor head), and V/F (admittance)—are clearly stated, providing a concise reference for understanding the graphical output.

Overall Assessment:

The section demonstrates methodological rigor supported by substantial empirical evidence. The combination of practical field testing, complementary static analysis, and precise instrumentation conveys both reliability and technical depth. The use of figures strengthens comprehension of the method and highlights the scientific foundation of the diagnostic approach. Overall, the method description is comprehensive, systematic, and rooted in applied engineering practice.
