

Responses to RC1

We thank the reviewer for the careful, detailed reading of the manuscript. All corrections and modifications made in response to this review are highlighted in “red” in the revised manuscript file.

Comment 1: English language needs polishing – awkward phrasing and preposition errors throughout (e.g., "subjected to" vs. "exposed to").

Response 1: Thank you for this correction. The manuscript has been reviewed for English language proficiency and awkward phrasing has been corrected where identified (e.g., "subjected to" was changed to "exposed to" in the relevant instances).

Comment 2: Hyphenation is inconsistent ("near-fault," "near-fault," "post earthquake," "post-earthquake") – standardize throughout.

Response 2: We checked hyphenation of these terms throughout the manuscript. "Near-fault" was already used consistently. We found no unhyphenated instances of "post earthquake" remaining; the term is used consistently as "post-earthquake" throughout.

Comment 3: Abstract: change "subjected" to "exposed" and "demand" to "demands" (plural).

Response 3: Done. The Abstract has been updated: "subjected" was changed to "exposed," and "demand" was changed to "demands."

Comment 4: Keywords are awkward – revise to: "Kahramanmaraş earthquakes; reinforced concrete damage patterns; damage classification in new buildings; soil amplification effects."

Response 4: We agree with the suggested keywords and have replaced them exactly as recommended.

Comment 5: Define "code-era" clearly – specify which Turkish code versions (post-1998, 2007, or 2018).

Response 5: We have added the following explicit definition to the manuscript: "In this study, 'code-era' refers specifically to buildings designed and constructed in compliance with the current Turkish Building Earthquake Code (TBEC-2018)." The precise year boundaries used to classify the "older" building category (e.g., pre-1975 / 1975-1998 / 1998-2007 / 2007-2018 regulatory periods) are being finalized among the co-authors against the field records and will be specified explicitly in the revised manuscript.

Comment 6: Figure references vary ("Figure" vs. "Fig.") – standardize to one format.

Response 6: We have standardized in-text figure references to "Figure" throughout the manuscript (e.g., "Fig. 5a,b" -> "Figure 5a,b"; "Fig 10" -> "Figure 10").

Comment 7: Line 103: "dominant and several structural" is confusing – revise to "dominant structural and geotechnical damage patterns."

Response 7: Revised exactly as suggested.

Comment 8: Line 159: "loose bearing capacity of soil due to high ground water table" – rephrase to "loose soils with high groundwater tables reducing bearing capacity."

Response 8: Rephrased as suggested for technical accuracy.

Comment 9: Line 211: "inadequate lap splice regions" – change to "inadequately detailed lap splice regions" or "insufficient lap splice lengths."

Response 9: Changed to "inadequately detailed lap splice regions" as suggested.

Comment 10: Line 374: "such mechanisms reflect" – change to "such mechanisms are characteristic of" for better flow.

Response 10: Revised as suggested.

Comment 11: Line 390: add "ensuring" – "toward ensuring system-level adequacy."

Response 11: The referenced line number did not correspond exactly to this phrase in our working file, but we located the equivalent sentence in Section 5.5 ("the results emphasize the importance of system-level design adequacy...") and inserted "ensuring" there: "...the results emphasize the importance of ensuring system-level design adequacy, construction quality assurance, and site-specific decision-making..."

Comment 12: Line 408: change "site-sensitive" to "site-specific" – standard term.

Response 12: Changed to "site-specific" in both instances where this term appeared (Abstract and Section 5.5).

Comment 13: Conclusion, Line 450: rephrase to "moving beyond code-based approaches and adopting integrated frameworks."

Response 13: Revised exactly as suggested.

Comment 14: Conclusion, Line 454: change "in" to "for" – "intervention for vulnerable existing building stock."

Response 14: Corrected as suggested.

Comment 15: Title is too long – consider shortening.

Response 15: We removed "Seismic" from the title. The revised title reads: "2023 Kahramanmaraş Earthquake Doublet: Performance of RC Buildings, Code Implications and Geotechnical Evaluation."

Comment 16: Mention approximate number of buildings surveyed to contextualize representativeness.

Response 16: We have added the following to Section 2.3 (Field survey strategy): "The field investigation was carried out within the framework of a post-disaster rapid-response project funded by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) following the Kahramanmaraş earthquake sequence of February 6, 2023. Approximately 400 buildings were inspected across the most affected provinces. All field data were collected directly by the authors, each with up to 20 years of specialized professional and academic experience in earthquake engineering and structural/geotechnical damage assessment, which supported consistency across observations and reduced inter-investigator variability."

Comment 17: British vs. American English inconsistency ("storey" vs. "story") – choose one and stick to it.

Response 17: We standardized the manuscript to American English. All instances of "storey/Storey" were changed to "story/Story."

Comment 18: Formatting gap on Page 9 (blank lines) – fix.

Response 18: The manuscript has since undergone substantial restructuring (relocation of introductory content to Section 2.1, expanded Methods and Discussion sections), so the original page 9 no longer corresponds to the same content. We have reviewed the current document for stray blank lines and formatting gaps and found none; we will re-check pagination once more at the final typesetting stage, since page breaks can still shift with further edits.

Comment 19: Some references lack complete details (e.g., Tura et al., 2024) – verify all.

Response 19: We have verified and completed the previously incomplete reference entries. Tura et al. (2024) now reads in full: *Journal of Earthquake Engineering*, 28(1): 1-25, DOI: 10.1080/13632469.2024.2372080 (verified against the publisher record). The SBB (2023) entry has been completed with its full publication details, using the institution's own official English name (Presidency of the Republic of Türkiye, Presidency of Strategy and Budget), published 17 March 2023. The Tanırcan and Eken (2023) entry has been completed to identify it as a report of Boğaziçi University's Kandilli Observatory and Earthquake Research Institute (KOERI/KRDAE), published 13 March 2023, with source URL.

Comment 20: Add a brief note on methodological limitations already acknowledged – but make it more prominent in the conclusions.

Response 20: The study employs an empirical, field-based observational methodology to investigate the seismic performance of reinforced concrete (RC) structures following the February 6, 2023, Kahramanmaraş earthquake doublet in southern Türkiye. Empirical data were collected through post-earthquake field inspections conducted across eleven affected cities. The research utilizes a comparative analysis framework, categorizing surveyed RC structures into two distinct groups: older building stock and current code-era buildings. The analysis evaluates damage patterns, failure modes, and structural vulnerabilities against near-fault seismic demands that locally exceed code design levels. It contrasts pre-existing design/detailing deficiencies in older structures (e.g., poor materials, soft stories, pounding) with system-level and execution-related shortcomings in newer structures (e.g., inadequate shear-wall ratios, asymmetric plan layouts, construction quality flaws). By synthesizing empirical field evidence with code requirements, the study critically assesses the limits of code compliance under extreme shaking, emphasizing the crucial roles of structural system redundancy, construction supervision, and site-specific demands. To make this scope explicit at the point where readers form their final judgment of the study, we have added the following bullet point to the Conclusion section: "This study is based on qualitative field observations rather than a full quantitative damage inventory, material testing, or numerical modeling; the findings should therefore be interpreted within the limits of observational data and complemented by future analytical or quantitative studies."