



SDI Review Form 1.6

Journal Name:	<u>British Journal of Applied Science & Technology</u>
Manuscript Number:	Ms_BJAST_30219
Title of the Manuscript:	A numerical procedure of coupled consolidation in saturated soils
Type of the Article	Original Research Article

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	The original research article entitled “A numerical procedure of coupled consolidation in saturated soils” presents an interesting framework and promising conclusions. However, some mandatory revisions are necessary. 1. Introduction needs to be improved. The main purposes of the study are not clearly identified; unsaturated conditions are mentioned in the abstract, but not developed in the draft. Introduction of Terzaghi effective stress does not seem to be a suitable parameter to introduce unsaturated conditions in the consolidation process. Key features regarding unsaturated soils such as suction for example are not mentioned nor taken into account. 2. Authors mention various studies to introduce the background of the study, but the originality of the present study is not obvious; the pragmatic contribution of this work should be presented more clearly. What are the improvements highlighted by this study compared to the ones mentioned? 3. Could you explain how pore water pressure can be negative under the applied load? 4. The physical meaning of the sign of the strains needs to be clarified. 5. The number of manuscript quoted as references is insufficient considering the length of the draft. Moreover, the references should be more recent, and more varied. 6. There could be some grammar mistakes or error	(1) and (2) The introduction section has been rewritten and improved with special attention to its contribution. This paper presents a coupled model for the saturated soil's consolidation, which can be further extended to the unsaturated consolidation because this formulation allows the introduction of Bishop effective stress for unsaturated soils that include the Terzaghi's effective stress ($\sigma - u_a$) and matric stress ($\chi\psi$, which involve parameter χ and soil suction), the last one can be obtained from the soil-water retention curve (SWRC). Also, the variation of permeability with soil suction (hydraulic conductivity) can be obtained from the SWRC. (3) The initial pore pressure value (-32.29 kPa) for the first step time under the slab foundation is near to the value of applied stress -40 kPa (the negative sign only represents the direction of force application) by the foundation. (4) Horizontal displacements: Through Fig. 11 and Table 6, a characteristic phenomenon of symmetrical problems due to applied loads at center is observed. So, from the center line to the left, we have offset values with a negative sign. This is due to the direction in which they occur, given a coordinate system in which the y-axis corresponds to the center line. Moreover, the values of the displacements are



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	along the manuscript; a serious English edition is necessary.	positive, from the center line to the right. Vertical displacements: the sign indicates the direction in which the displacements evolve; negative means that they move down, and positive that they move up. (5) The authors have performed a search, improved and added references of recent years and have been included in the new manuscript version. (6) The paper has been rewritten, improved and errors corrected. Special attention was paid to a native speaker of English.
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Minor REVISION comments	1. Equation 1: stress tensor S could be expressly defined for a better understanding. 2. Equation 2 : could you define more precisely what you call velocity field ? 3. Equation 9 : it could be better for clarity to define the soil stiffness matrix, and what you call coupled and drained matrix. 4. Table 2 : units of pore water pressure are not easy to use and understand. You should use I.S. units. 5. Could you clarify the physical meaning of the - 40kPa applied load? The use of a negative stress as an applied load is confusing. Moreover, description of this load on figure 7 is not consistent with the text description.	Related to equation (1): Stress Tensor (first Piola-Kirckoff Stress Tensor) include in this case, two components: Effective Stress on soil grains, and Hydrostatic stress equation (8). Related to equation (2): Velocity field is mentioned on this terms because is at this time expressed as a continuum, later, we will use the element procedure to obtain a discrete model. On the other hand, the velocity is referred her to the movement of the fluid particles according to the Darcy's Law. Related to equation (9): The equations (11) show the integral associate to every mentioned Matrix. The name of these matrices we have been adopted according to reference [7]. (4) The paper has been rewritten, improved and errors corrected. Special attention was given to the use of units in the international system of units, whereby the units of stress and pressure are kilopascals (kPa). (5) The paper has been rewritten, improved and corrected bugs. Special attention was paid to the proper coordination between the figures and their respective descriptions.
Optional/General comments	1. Authors mentioned results reported by other researchers. It could be interesting and useful to mention the references.	(1) The results of pore pressure and vertical displacements are appropriate and consistent with the results reported by Magaña y Romo [5], Bentler [7], Manzoillo et al. [8], Di-Rado et al. [9] and Krishnamoorthy [10].