VII. CONCLUSION AND RECOMMENDATION

VII.1. CONCLUSION

FLAC interface module, requires the use of the Mohr-Coulomb law in modeling the behaviour of soil-structure interface. The model proposed in this study was therefore mainly based on the law and the criterion of Mohr-Coulomb. Changes have been proposed and then new equations have been introduced to better model the behaviour of the interface during a monotonic and cyclical solicitation.

Through all the results of simulations, it could be observed that the proposed model provides a model that simulate correctly the behaviour of the interface, including the phenomena of softening and contractancy-dilatancy during a monotonic solicitation also the hysteresis loop and the normal displacement after N cycle, during cyclic loading.

In this study, several comments and observations can still be drawn:

- The assumption of similarity between the sand and the rough interface, especially for dense sand was reverified and maintained during this work.
- During the modeling, the influence of confinement on the parameters is often ignored. Through various simulations of constant normal stress test, it hax however found that some parameters and models are probably depend to the initial confinement, the parameters of the refer states ϕ_{car}, ϕ_{max} and the shear stress softening model.
- The proposed model does not take into account the increment of normal stress, which makes the model applicabel only to a simulation at constant normal stress, CNL.

In a cyclical solicitation, the implementation of two laws of soil (Ramberg-Osgood and Byrne) to model the hysteresis loop provides also a correct results. However, it was observed that the criterion of Mohr Coulomb overestimates the surface of the hysteresis loop for rough interface. The use of these two laws coupled with the law Mohr Coulomb alone is not sufficient to take into account hardening or softening of the hysteresis loop.

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VII.2. RECOMMENDATION

The model developed in the context of this study is far from being usable. Some improvements and validations have yet to be achieved. Regarding to possible improvements, adjustment of parameters, as mentioned in the conclusion should be made first. Another parallel study, conducted by Rinaldy (2009) can provide a first approach to understand the dependencies between the initial confinement and the parameters of the proposed model.

In a second step, the approach would be to validate the model from another test. Because of the abnormalities observed in this study, a second simulation with a new series of different tests would be beneficial to verify the model and parameters proposed. Finally, a simulation of various types of direct shear test, as CNV and CNS, is to be carried out to analyze the limits of this model and validate it. Therefore, a further study on the dependency of this model on the variation of initial normal stress must first be achieved.

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