7. CONCLUSIONS

7.1 Conclusions

Finally, as last comment, and after having carrying out all the interpretations, the author defends the following:

- In the case of the application of small deformations or displacements, the introduction of a fracture (or some kind of flaw) in a simulated model of a soil by means of a finite element code is absolutely required in order to obtain some results to explain formation, development and propagation of a set of fractures.
- The intensity of propagation, in a layer, of a fracture along the direction of this fracture toward a near competent layer, decreases with the increasing fracture spacing in the layer.
- Only the Young moduli of a layer and its thickness have an influence in the propagation of a fracture or a set of fractures. Thus, the intensity of propagation will decrease with the decreasing stiffness, and also with the increasing thickness of the incompetent layer.
- It has been observed a slight stress reduction shadow between the fractures in the models. That is the explanation for the stronger results in the fractures located at the right side of the models, where the displacement was applied.

7.2 Further works

It would be necessary a bigger study of this topic taking into account more variations in the models and in the mechanical parameters of the layers (e.g. vary only the lower competent layer). In order to get this goal, a simulation of the models with real field data would make it more realistic and efficient.

Another one of the works which could point out some features about the mystery of the propagation of fractures would be to carry on the same study in the same models but with different software, in order to extract some general conclusions of the different results obtained.

In order to obtain some explicit results in simulations of a three-layer model, another possible work would be the input of some flaws or fractures, by means of the software, into the model, and the input of higher displacements.

We might work with models where we identify high strain zones, then insert a potential fracture, then simulate further... it could be interesting to input the same Young moduli (Einc=Ecomp), and in this way we would have very good coupling between upper and lower competent layers.