CHAPTER V

Conclusions and Recommendations

5.1 Conclusions

The investigation of strain localization of sandy soil samples by using shear wave propagation technique and the Digital Image Analysis (DIA) were performed in the modified triaxial compression test in many packing conditions of sands, i.e. loose and dense state. Local and Silica sands of various grain sizes and shapes were employed in the study. The main results of the study are as follows;

- Shear wave velocity increases as the isotropic confining pressure increases both in loose and dense conditions. The dense samples give slightly higher shear wave velocity than the loose sample at the same confining pressure.

- The propagation of shear wave velocity inside the soils depends primarily on the initial stress state, i.e. packing condition, confining pressure, mechanical response, i.e. contact effects, void ratio coordination number, fabric change as well as the loading history.

- Under shearing stage, the shear wave velocity also increases at the very beginning part of the test. However, at the stress ratio nearly or exceed 1.5, the shear wave velocity tends to decline from its maximum value. Moreover, from the corresponding local strain profile, it can also be seen that the non-uniformity deformation of sample will take place at this point of the reduction of shear wave velocity. We may imply that the onset of strain localization starts from this point.

- At the maximum stress ratio there is no remarkable change of the shear wave velocity. However, the plots of local strain profile show that the strain localization will be fully developed at this stage.

- The formation of strain localization in dense sample exhibits into the narrower zone than in loose sample. In addition, the onset of strain localization in dense sample occurs slower than in loose sample.

5.2 Recommendations for Future Research

- Due to some difficulties in the travel time determination between transmitting and receiving bender elements, a prospective researcher should select a suitable technique to minimize an error of shear wave velocity calculation, i.e. the cross-correlation method.

- The Digital Image Analysis (DIA) of surface membrane of specimen might be clearly observed in plane strain test than in triaxial test because zone of shear band in plane strain test is rather uniform and unique.

- The correlation between void ratio and shear wave velocity before, during and after failure might be clearly established by employing the impregnation technique of tested specimen.

- The local strain profile of the testing sample should be analyzed by the digital image analysis software in order to get more accuracy results.