CHAPTER VI

CONCLUSION AND SUGGESTION

6.1. Conclusion

In order to do the retrofitting process by applying additional concrete to the structure members, some consideration is needed and one of them is the bond strength between the old concrete members and new concrete members. The retrofitting process is a success if the bond strength is adequate. The concrete-to-concrete bond strength are influenced by the surface condition of the substrate concrete, curing condition, the mechanical properties and the age of the concrete, and the use of the chemical bond. Those four parameters need to be selected wisely in order to get a good bond strength between substrate concrete and overlay concrete. From the discussion of the review paper, the best parameters to ensure the good bond strength are summarized below:

a). For the substrate surface condition, it is better to prepare the substrate surface with intentional roughening method and saturated condition. According to Zhang et al. (2019), the saturated condition can be obtained by putting the specimens at the water tank for 24 hours and it is removed from the water and dried by using air compressing.

b). For curing process, the normal curing and curing with water is the best option to obtain a good bond strength.

c). For the mechanical properties and the age of the concrete itself, the higher strength of the concrete will produce higher bond strength and the age of concrete such as UHPC of 28 days is recommended in order to get a final concrete strength.

d). For the use of the bonding agent, the condition of substrate surface plays an important role. The use of bonding agent on the smooth substrate surface condition is proven more efficiently compared with the rough substrate surface condition.

Besides the bond parameter, the use of mechanical connectors is proven to enhance the bond strength and support the retrofitting process. The use of the mechanical connectors must consider several parameters such the height and diameter of the connectors and the cover thickness of the connectors. The use of longitudinal steel bars reinforcement and the presence of fibre in concrete members is required in order to get a desired ductility provided by the Eurocode-4 and AASHTO.

6.2. Suggestion

There is very limited research about the use of the mechanical connectors considering about the numbers and spacing of the connectors embedded in UHPC. Further research needs to be done in order to see the effect of numbers and spacing of the connectors to the additional strength for the concrete members.

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