SUMMARY

The rapid growth in the use of external wall cladding in Singapore has given rise to a number of problems in connection with the performance, workmanship and maintenance of wall cladding systems. The objectives of this dissertation were said in the light of the facts that the external wall systems are newly imported technology in Singapore from the temperate countries and there is little published literature available. Research in this area is done mainly by the industries and the results are made available only to the architect or potential user through trade talks.

In the first part of this dissertation, a broad view of the current trends in Singapore high-rise wall cladding systems are presented. The problems that are encountered by the lack of technical knowledge on the newly imported cladding technology are then discussed.

This dissertation provides a collection of a spectrum of available data, a more objective view of the information proliferated by the various trade literature, a better understanding of the commonly used wall cladding systems and a design checklist for building designer. It is hoped that through these assembled data, the decision making process of the selection of wall cladding systems can be made easier.
The properties, fabrication of materials and construction of the commonly used external wall cladding systems made of sheet metal, stone and cementitious based materials are then discussed in detail.

Firstly, the aluminium and steel sheet metal wall cladding systems are discussed in view of their aesthetic, functional and economic implications with the help of some illustrations of fabrication methods and construction details.

Secondly, the two commonly used types of stone wall cladding systems, namely the in-situ and pre-cast systems are differentiated. In view of the cost, technical and construction management aspects, both of the systems must be fully understood before selection of an appropriate system can be made.

Thirdly, the three main kinds of cementitious based wall cladding systems mentioned in this dissertation are: lightweight concrete, glass fibre-reinforced cement and fibre-reinforced cement compressed sheet. Each of these are discussed in the frame work of the manufacturing process, type of surface finishes and fixing of these systems.
The later part of this dissertation is devoted to the analysis of some defects on wall cladding systems that are exposed to the hot humid Singapore climate. It is found that most of the defects are not inherent in the material used and that they can be avoided by means of good construction details and good workmanship during fabrication and installation.

This dissertation directs the designer’s attention to twelve important factors, namely, panel size, transportation, wall cladding system, sealant, joint positions, weather tightness, thermal movement, structural input, sound insulation, fire safety, service penetration and maintenance of the wall cladding system. Finally, a design checklist is included to help with the selection of an appropriate system.