

RESEARCH BRIEF

2000/001

The Effectiveness of BCA's Construction Quality Assessment System (CONQUAS) in Reducing Building Defects

INTRODUCTION

This joint BCA-NUS research project is a follow-up to an earlier NUS-CIDB joint research project – RP960073 on "The impact and effectiveness of CIDB-PSB ISO 9000 Quality Management Systems in the Singapore Construction Industry" – completed on 6th May 1998. This present research project is an extended study to establish if there is a relationship between high CONQUAS scores and low building defects for projects completed over the last ten years. The knowledge established in this area can serve as feedback to the Building and Construction Authority (BCA) for fine-tuning as well as realizing the benefits of the CONQUAS system.

CONSTRUCTION QUALITY ASSESSMENT

An effective quality assessment system should be able to detect and measure all types of defects and capture all aspects of construction quality that affect the performance of buildings. Comprehensive quality standards alone do not assure the effectiveness of the quality assessment system. The integrity of the tests and inspection methods are as important as the quality standards. Without proper and accurate tests and detection methods, defects cannot be detected. The quality assessment system, as such, should include a mixture of inspection methods, weighting systems and quality standards as adopted by CONQUAS and used in Singapore.

However, although CONQUAS is able to detect and measure workmanship defects very effectively, many defects at the post-construction stage were, however, latent defects. As buildings aged, more latent defects emerge and workmanship defects may become less relevant and less significant.

OBJECTIVE OF STUDY

The primary objective of this study is to compare CONQUAS findings at the construction stage with latent defects that surface in the post-construction stage. The research methodology for this study

adopted a combination of approaches. These relied on both primary and secondary data drawn from defects highlighted in CONQUAS during the construction stage (Category 1); condition surveys of completed buildings which showed post-construction latent defects (Category 2); and information obtained from the database of building defects submitted by residents which showed post-construction latent defects (Category 3). In sum total, the CONQUAS scores for 44 buildings, the condition survey results of 74 buildings and 680 complaints of building defects were analyzed in this study. The conceptual framework for this study is shown in Figure 1. The data sets in Categories 1-3 were analyzed and compared to determine if there are any trends that can be generalized. These data sets covered ten elements ranging from internal walls to roofs. Table 1, for example, shows the differences between residents' complaints and condition survey for external walls.

Table 1: Differences between Residents' Complaints and Condition Survey for External Walls

External wall			
Residential Complaints		Residential Condition Survey	
Defects	(%)	Defects	(%)
Water seepages	33.74	Stains	25.70
Plaster cracks	15.57	Plaster cracks	20.11
Paint peeling	13.43	Paint peeling	16.76
Stains	8.44	Water seepages	11.73
		Algae growth	7.26
		Other cracks	6.70
		Chipped	6.15
		Paint discolourisation	5.03
		Efflorescence	0.56

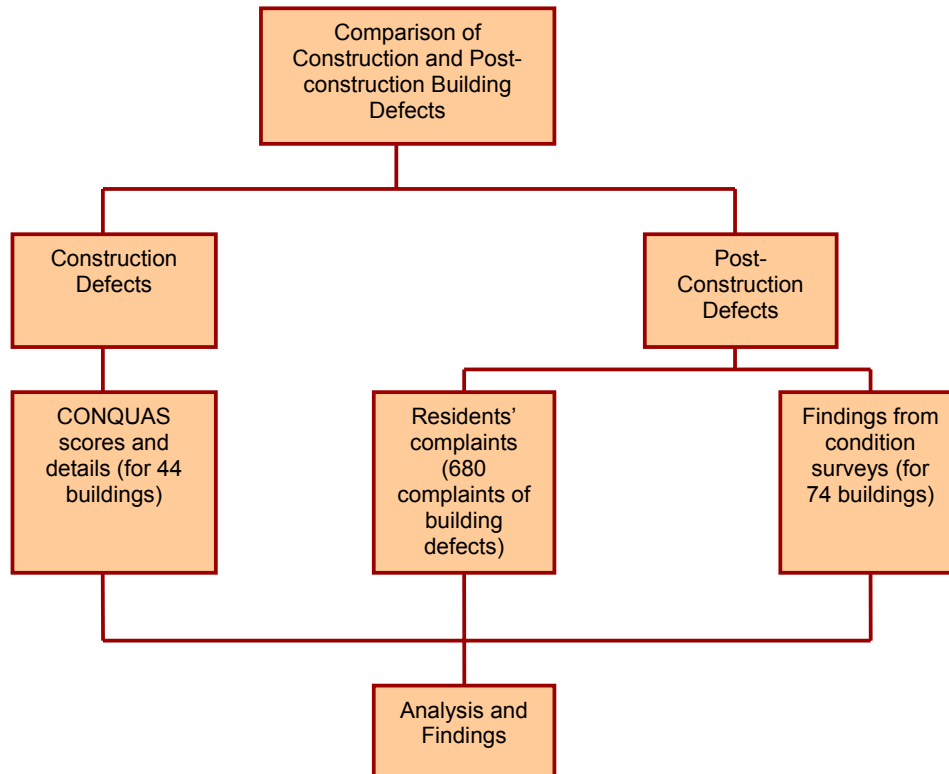


Figure 1. Framework of study

RESEARCH FINDINGS AND CONCLUSION

Among other things, the analysis suggests that the differences between the residents' complaints and the defects detected by building surveyors were mainly due to the different locations where the defects were detected. The residents complained of fewer types of defects than those observed in the condition survey. The defects found in the external wall also suggest that the perceptions of defects were quite similar between the trained surveyors and the residents. The residents were found to complain less on minor defects although similar defects were found by both the residents and building surveyors in the external wall. In conclusion, the study showed the importance of dual information feedback, i.e. information from both the residents and the surveyors. Both perceptions are recommended to further enhance CONQUAS.

This research project is able to conclude that the CONQUAS system remains a very effective system in measuring workmanship quality.

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