



# **Exploring Interdisciplinary Collaboration in Construction: Phases and patterns of interaction in detailed design meetings**

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the degree of

**Doctor of Philosophy**

under the supervision of:

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## **Certificate of Original Authorship**

I, Mona Abd Al-Salam declare that this thesis, is submitted in fulfilment of the requirements for the award of the degree of Doctor of Philosophy, in the School of Built Environment at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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## **Note on the Thesis Format**

This thesis was prepared to fulfil the criteria for Doctor of Philosophy and is in the format of a conventional thesis. It adheres to the guidelines set forth in “Procedures for Preparation and Submission of Thesis for High Degrees - University of Technology, Sydney: Policies and Procedures of the University”. This thesis used a form of intext referencing named UTS Harvard that is an adapted version of the standard Harvard referencing style.

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## List of Abbreviations

AEC	Architectural, Engineering and Construction
BIM	Building information Modelling
CBA	Choosing by advantages
CPDD	Collaboration phases in detailed design
CCF	Closed cavity façade
CM	Construction management
DBB	Design, bid and build
D&C	Design and construct
DC& M	Design construct and maintenance
DGU	Double glazed unit
DIP	Design intent principles
EMP	Estimated maximum price
GMP	Guaranteed maximum price
IFOA	Integrated form of agreements
IPA	Interaction Process Analysis
IPD	Integrated project delivery
RFI	Request for information
SBD	Set based design
SDP	Shop drawing phase
TVD	Target value design

### List of Abbreviations for Bales (1950) modified categories

SS	Shows solidarity
TR	Shows tension release
AE	Agrees
GS	Gives suggestion
GO	Gives opinion
GC	Gives confirmation
GI	Gives information
AI	Asks for information
AC	Asks for confirmation
AO	Asks for opinion
AS	Asks for suggestion
DE	Disagrees
ST	Shows tension
SA	Shows antagonism

## **Abstract**

The research adopts a practice-based inter-organisational perspective to study interdisciplinary collaboration in the detailed design phase in construction projects. The detailed design phase is critical due to the large number of important decisions made to develop the conceptual design into a set of construction documents. It requires input from diverse participants such as contractors, architects, design consultants, and project managers in order to improve value for the client. These participants each bring different backgrounds, skills and expertise and also have differing perspectives that can make the collaborative process problematic. The detailed design phase involves confidential discussions of design tasks and monetary issues, which makes it difficult to gain access to study this environment, and there is little in-depth research in this area. The aim of this research is to understand interdisciplinary collaboration in the detailed design meetings of construction projects and develop insights that guide organisations in improving collaboration in such environments and how it is managed.

This study proposed and refined a model of collaboration phases incorporating two theoretical perspectives: an inter-organisational practice-based approach and a framework for group interaction. The model underpinned the design of a novel data collection approach including non-participant observations and other complementary methods that allowed capturing a broad range of contextual and complex views reflecting multiple realities about interdisciplinary collaboration. The results demonstrate that participants have different ways of viewing their collaboration and reveal patterns of interactions that are associated with positive and negative collaboration. The findings also highlight a range of process and social-reaction factors that may be relevant to the success of the collaboration and provide examples

of management approaches to resolve collaboration problems. These findings suggest a need for a holistic and systematic approach to monitor and evaluate both processes and social reactions to enhance interdisciplinary collaboration in detailed design meetings.