



ASSOCIATION OF RESEARCHERS IN **CONSTRUCTION MANAGEMENT**

**THIRTY-THIRD  
ANNUAL  
CONFERENCE  
2017**

September 4-6

Cambridge

**PROCEEDINGS**

Association of Researchers in Construction Management (ARCOM)  
**PROCEEDINGS OF THE 33<sup>rd</sup> ANNUAL CONFERENCE**

**Edited by Paul W Chan and Christopher J Neilson**

First published 2017

978-0-9955463-1-8

Published by

ARCOM, Association of Researchers in Construction Management

School of Mechanical, Aerospace and Civil Engineering (MACE)

The University of Manchester

Sackville Street

Manchester

M13 9PL, UK

© Association of Researchers in Construction Management

All rights reserved. No part of this publication may be reproduced in any material form (including photocopying or storing in any medium by electronic means whether or not transient or incidentally to some other use of this publication) without the permission of the copyright holder except in accordance with the provisions of the Copyright Designs and Patents Act 1988. Authors of papers in these proceedings are authorised to use their own material freely. Applications for the copyright holder's written permission to reproduce any part of this publication should be addressed to:

Dr Paul W Chan

School of Mechanical, Aerospace and Civil Engineering (MACE)

The University of Manchester

Sackville Street

Manchester

M13 9PL, UK

Email: paul.chan@manchester.ac.uk

**ARCOM Declaration:**

The papers in these proceedings were double-blind refereed by members of the scientific committee in a process that involved, detailed reading of the papers, reporting of comments to authors, modifications of papers by authors and re-evaluation of re-submitted papers to ensure quality of content.