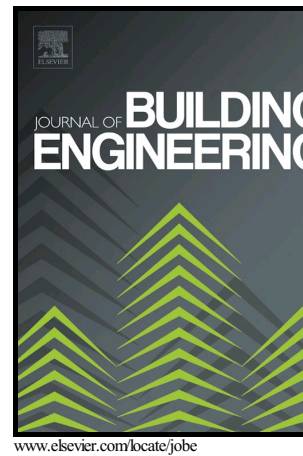


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An innovative approach to manufacture thin-walled glass fibre reinforced concrete for tomorrow's architectural buildings envelopes with complex geometries

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Abstract

Glass fibre reinforced concrete (GFRC) elements have become a sought after cladding material since their introduction as rain screen cladding for buildings. To advance GFRC for a range of complex geometry building envelopes this also requires advances in existing moulding techniques for thin-walled GFRC elements. To do so it is necessary to define the current state of thin-walled GFRC elements and the constraints and limits placed on them by existing production techniques. This paper identifies the current architectural and aesthetic requirements of thin-walled GFRC elements and maps their range of complexity, from 1-D to 3-D, to the limits of the most appropriate production method. This will inform guidelines for the future design development of thin-walled GFRC and enable an innovative approach to further advance the moulding techniques for thin walled GFRC elements for a variety of complex geometry building envelopes. The paper concludes on which further steps need to be taken to advance thin-walled glass fibre reinforced concrete for tomorrow's architectural buildings envelopes with complex geometries.

Keywords: GFRC, GRC, complex geometry, bespoke, edge-returns, flexible moulds, thin-walled

1. Introduction

Glass fibre reinforced concrete (GFRC) elements have become a sought after cladding material since their first introduction as rain screen cladding for buildings. The first buildings in the UK with GFRC cladding were designed in the 1970s. These buildings were designed with geometrically simple GFRC elements based on a flat building pattern. As building envelope geometries become more complex the aesthetic demands of designers become more challenging. This paper presents an innovative approach

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