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Challenges of engineering design and construction in rurally isolated communities

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Abstract

This paper shares the experiences of three groups of young engineers, who volunteered their spare time to work with the NGO Bridges to Prosperity in the design and construction of two suspension footbridges, in Rwanda and Panama, and a suspended bridge also in Panama. The purpose of this paper, using the context of the authors' experiences in Rwanda and Panama, is to describe the processes involved in making a bridge reality and to highlight some of the key challenges of engineering design and construction in developing countries.

Keywords: Bridges to Prosperity, B2P, Arup, rural, isolated, suspension, challenges, design, engineering, construction

1 Introduction

This paper shares the experiences of three groups of young engineers, who volunteered their spare time to work with the NGO Bridges to Prosperity in the design and construction of two 50m span suspension footbridges in Rwanda and Panama, and one 50m span suspended footbridge in Panama.

Bridges to Prosperity (B2P) works to eliminate poverty caused by rural isolation by providing footbridges to communities that need them most.

They achieve this through collaboration with engineering companies and organisations, who develop the bridge design (from a standardised design), and assist the local community with the construction. The very nature of the bridge projects present inherent challenges from the outset including issues relating to access, material availability, supply and delivery, material properties, language, weather, power, accommodation etc.

Arup have been working with B2P since 2010, with a key objective of the partnership being the development of BridgeTOOL, a learning resource and design tool for the design and construction of suspension footbridges.

Through active participation in the design and construction of two suspension footbridges in two very different countries, the lessons learnt at each stage of the process (procurement, design, construction and maintenance) will be

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