



The client's point of view on the realisation of a geopolymer concrete bridge with recycled concrete aggregates

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Abstract

The city of Rotterdam in the Netherlands has been involved in the North West European Interreg URBCON program. This program includes the development of geopolymer concrete based on the client demands and the application in demonstration projects. Rotterdam acts as client willing to tender for a geopolymer concrete bridge including recycled concrete aggregates. A major difficulty is that the newly developed material has no track record, there is no tendering and building experience and the existing framework (i.e. EC2) is not formally applicable.

This paper shows the interesting observations and the learnings from the client's point of view, based on being part of the URBCON program and the actual design, tendering process and realisation of the geopolymer concrete bridge.

Keywords: geopolymer, concrete, bridge, decks, client, upscaling, tests, tendering, contract, contractor, supplier.

1 Introduction

The city of Rotterdam is a local governmental organization. A major task is to develop and maintain infrastructures (e.g. transportation, sewers, water barriers) and buildings which involve concrete. The tasks should obey political ambitions, including the reduction of CO₂e (equivalent) exhausts and usage of raw material resources.

The Interreg project URBCON (2019 – 2023) serves the goal to reduce CO₂ (equivalents) production and limiting usage of raw material resources in the process to create concrete. Rotterdam participates in this project to include the role of clients.

On the one hand there is the development of concrete types without (or limited use of) Ordinary Portland Cements (OPC) by use of Alkali Activated Materials (Geopolymer Concrete, GPC) and the use of a considerable amount of secondary (mined) raw materials like sands and aggregates. On the other hand, the society is willing to use these new types of concrete. Clients evidently play an important role as launching customer and acceptance of these developments.

Research projects on new concrete developments have several scales, from molecular, nano, micro to macro levels. From the client's perspective projects involve design, funding, verification, tendering, procurement, permits, project management, construction, usage, maintenance, etc.