

Supplementary material

Table S.1 Raw material content of construction materials (based on [1], [2], [3] and Bills of Quantities)

Construction material	Raw material ratios (in % based on the mass of the construction material)			
	Stones	Sand	Clay / Marl	Other (e.g. fly ash, water, ...)
Concrete, 4x6, grade 150	62	32	2	5
Concrete, 1x2, grade 250	64	27	4	5
Cement	70		30	
Clay Bricks (vertical kiln)			100	
Clay Bricks (tunnel kiln)			80	max. 20
Clay Bricks (Hoffman kiln)			30	max. 70
Fine asphalt concrete	60	35		5
Rough asphalt concrete	75	20		5

1. Department of Construction Hoa Binh. *Resolution 76/2013/NQ-HDND: Master Plan for Exploitation and Use of Minerals for Construction Materials of Hoa Binh Province: Stones and Sand for Construction Materials, CLAY for Bricks in Hoa Binh Province, Period 2014–2019, with a Vision to 2024*; Department of Construction: Hoa Binh, Vietnam, 2013.
2. Ministry of Construction. *Circular No. 1784/BXD-VP: Descriptions and Guidance Manual of the Application of Construction Materials*; Ministry of Construction: Hanoi, Vietnam, 2007.
3. Ministry of Construction. *TCVN 1450:2009: Hollow Clay Bricks*; Ministry of Construction: Hanoi, Vietnam, 2009.