(TEMPORARILY?) OUT OF STOCK

CHANGING CONDITIONS OF AVAILABILITY IN THE CONSTRUCTION INDUSTRY

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This special issue is based on the simple idea that building our rapidly urbanizing world is not just a matter of erecting buildings, but also, and above all, of creating the specific conditions that make building possible in the first place. These conditions are not fixed, however, but require constant reassessment. 'Construction,' according to Heine and Rauhut, 'is a highly diverse process, which always has to adjust to social change and technical innovation, while it is also sitting on 'technological paths' and is constrained by the availability of resources, knowledge and experience'[1] and, by extension, the availability of skilled workers, materials, logistical capacity, and so on. Evolutions in the way we build are therefore never solely the result of technological innovation, but depend also on the way in which that technology and everything it entails is made socially available. The question, therefore, is which modalities of availability in the construction industry have been kept alive by society, and which have disappeared over time, and why.

In his contribution to this special issue, for instance, Jesse Foster Honsa convincingly demonstrates how efficient building systems for housing construction nevertheless fell out of use due to a lack of skilled workers to apply them properly. The usability of building materials therefore depends heavily on the availability of [suitably] trained labour(ers). It is precisely this notion of 'constructed availability'[2] that is central to this dossier: what forms of construction were proactively made possible in the twentieth century – based on what choices, and at what cost? These questions are very topical now that we are confronted with planetary boundaries that are constricting today's dominant construction practices.[3] After all, the construction sector's share in the anthropogenic disruption of global climate and ecosystems is considerable, as has been emphatically documented in recent years.[4]

The excessive consumption of energy and materials in the construction process is a particular focus of attention, which explains the increased interest in the availability of building materials and the growing number of publications on (global) material flows and related forms of 'extractivism' – both ecological and in terms of labour conditions.[5] In search of answers to the substantial

environmental impact of construction, solutions are being sought in aspects of 'dematerialization', 'rematerialization' and circularity.[6] Despite the breadth and depth of ongoing research into these practices, it nevertheless contains several gaps and limitations.

For example, the editors of *Material Constraints* (2024), a special issue of *Abe Journal*, argue that contemporary discussions about alternative material use 'rarely really address the deeper historical contexts' in which new materials must become available.[7] The contribution by Arne Vande Capelle and Lionel Devlieger to this special issue of *Bulletin KNOB,* makes it clear that reuse only becomes economically feasible when new construction or renovation projects are able to formulate a specific demand for precisely those materials that are released during the demolition of particular historical heritage sites. It goes without saying that such symmetries do not arise automatically and are highly dependent on place and time. Like *Material Constraints*, the dossier *(Temporarily?) Out of Stock* explicitly aims to delve into the historical dynamics of construction and building materials during the course of the twentieth century. Not only with a view to enriching our historical knowledge, but above all as a necessary condition for better understanding the precise context in which what exactly can or must be made (un)available in order to enable more sustainable building practices. Tom Broes's article in this issue, for instance, shows how more sustainable alternatives will struggle to claim a credible place in the market as long as ready-mix concrete remains so abundantly and cheaply available. As this specific legacy of the Belgian context makes clear, availability and scarcity are not isolated, absolute or natural conditions, but are constructed within specific historical-contingent circumstances and are always related to situated – and therefore, by definition, relative – practices, needs and choices.

Another criticism of academic research into material consumption and the environmental impact of construction was explicitly developed by Jeremy Till in his 2011 essay 'Constructed Scarcity', in which he pointed out that much research focuses on the extraction of a single material in isolation, thereby threatening to reduce the notion of availability to the notion of a series of parallel natural reserves that will inevitably be depleted in the long term – which in turn reduces the idea of 'limits' to inescapable doomsday scenarios.[8] The typical response to this segmented approach is to continue producing (more) with less material – completely in line with the Brundtland definition of 'sustainable development'[9] – but this merely postpones the inevitable moment of unavailability, while resources continue to be depleted. Till concludes that 'instead of seeing actual scarcities [or availabilities] as ever-diminishing buckets of stuff, they have to be seen in relation to other networks and resource flows, and one's creative intervention is not in rearranging the contents of the bucket, but in designing new processes that divert and optimize the resource flows and change values and modes of behaviour, thereby understanding stuff in its social context'.[10] In his essay Till refers to the work of Dougald Hine, who, based on a similar analysis, argues that this reasoning 'is not to deny the force of material conditions, but it is to say that most of the time, there is social and cultural room for manoeuvre'.[11]

If we want to be more conscious of planetary boundaries in construction today, for example by producing in a more CO_2-neutral way or by focusing more on reuse and circularity, we will not only have to develop 'sustainable' material technology, but also consciously create the conditions in which opting for alternatives becomes structurally feasible. In concrete terms, this involves, for example, critically rethinking existing material flows and building the necessary infrastructure

to enable certain local construction practices. Chiara Pradel's contribution exemplifies that circular construction will only really gain a foothold in the construction industry when an ecosystem of 'material gardens for reuse' can claim its rightful place in the urban network. The 'socio-cultural room for manoeuvre' referred to in the work of Till and Hind also invites us to develop a broader understanding of availability, beyond the dominant focus on natural resources. Building materials only become truly available when there is effective consumer interest,[12] when applicable standards and specifications can be met,[13] when there is a sufficient supply of skilled labour to process the materials,[14] and so on. It is therefore important to examine these different aspects in relation to one another, and to incorporate them into a multifaceted understanding of availability. It was precisely against this backdrop that the initiators of this special issue launched a broad call for articles explicitly examining how the 'constructed availability' of building materials, skilled workers and resources, among other things, conditioned construction in Belgium and the Netherlands in the twentieth century – and what lasting consequences this entailed.

In his article, Jesse Foster Honsa examines the availability of labour, essential to enabling certain construction practices. His research shows that organizing material flows to the construction site makes little sense as long as there are insufficient skilled workers to effectively process those materials on site. The article looks in particular at how construction workers found their way to the garden suburbs in Great Britain and Belgium. In both countries, these garden suburbs were built outside the traditional urban labour markets in the first half of the twentieth century.[15] The article also asks whether these residential areas were accessible to the construction workers themselves and highlights the imbalance between affordable housing and the wages paid to the workers who built those homes.[16] The article further highlights how new technologies and materials challenged or even disrupted existing construction practices, and how the rising price of scarce materials had a direct impact on workers' wages in the overall cost structure of construction.[17]

Tom Broes shows how the cement industry in Belgium succeeded in turning concrete into an extremely accessible consumer product.[18] He recounts how the cement sector achieved the urbanization of concrete mainly through the roll-out of a logistics network of concrete plants across the whole of Belgium, at various moments supported by all kinds of government financial injections and interventions.[19] If large parts of the city are built with ready-mixed concrete today, this is partly because the (over)availability of the material was carefully orchestrated between 1960 and 1975 via a combination of economic and institutional interests. The introduction of the concrete plant led to a territorial rescaling and rationalization of dominant material flows (from 'in bags to construction sites' to 'in bulk to plants'), while also requiring the training of entirely new job profiles (from implementation-oriented laboratory researchers to mixer truck drivers). This deep-rooted ready-mixed concrete regime remains to this day one of the core driving forces of the persistent, almost irreversible cement addiction of Belgian construction culture.

Arne Vande Capelle and Lionel Devlieger outline how, on the margins of this rising concrete regime in Belgium, space emerged for alternative material flows and construction practices that in the event never gained structural acceptance. Drawing on the work of Marcel Raymaekers,[20] they outline which industrial waste streams (such as large river stones as a leftover product from

dredging river gravel for the concrete industry) and demolition materials (for example from historical city buildings replaced en masse by concrete apartment blocks) were historically made available for reuse and by whom. Raymaekers's decidedly eclectic oeuvre of salvage architecture was highly dependent on a personal network of 'material miners' who were able to unlock ever-changing flows of recuperation materials. The systematic drying up of these material sources whenever a direct contact disappeared, ultimately drove his search for suitable material ever further afield. The article tellingly illustrates the many modalities of availability entailed by this supply-driven logic of varying materials in limited quantities. Raymaekers's approach depended on a dynamic and labour-intensive link between supply and demand. It required resourceful contractors who were willing to build without a plan,[21] sufficient clients who were open to an ad hoc aesthetic based on random material stocks,[22] and so on.

Chiara Pradel demonstrates that we must literally make space to physically and mentally anchor alternative material flows in urban society. Focusing on existing material banks (for the reuse of building materials, soil and trees), she explores how the spatial configuration and presentation of these materials create dynamic landscapes on an urban scale. The central question is how these landscapes might help us to reimagine, reconfigure and safeguard the value and potential uses of old materials – and what kind of design imagination is needed to achieve these goals.[23] The metaphor of the 'material garden' opens up a perspective of curating, caring for, maintaining (*main-tenir*) and revaluing what has recently been degraded to waste elsewhere.[24] The image of the garden as a grounded and demarcated staging post, where new cultures and mentalities of reuse can be cultivated, strips the concept of 'material flow' of all its abstraction. By treating very different 'material gardens' simultaneously, the article unlocks and reassembles a semi-invisible world that nestles in the cracks of dominant and consumptive construction practices as a complementary and ecosystemic landscape, bringing residual flows back into circulation.[25] The juxtaposition of these historical studies in the context of the Low Countries invites the reader to effectively imagine 'availability' as a layered, historically contingent, and relational construct. No boulders for Raymaekers without aggregates for the concrete plants. No meaningful material flows without skilled construction workers. What can the 'material gardens' in Pradel's article learn from the way Raymaekers compiled and cultivated his personal Queen of the South material garden? And perhaps there will be opportunities in the future to transform a number of redundant concrete plants into fascinating material gardens for reuse – against the backdrop of monumental mixing silos that serve as industrial relics of the fossil fuel construction era.

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NOTES

1 E.C. Heine and C. Rauhut (eds.), *Producing non-simultaneity. Construction sites as places of progressiveness and continuity,* London/New York 2018, XXII.

2 On the notion of 'constructed scarcity', see: J. Till, 'Constructed Scarcity', *SCIBE (Scarcity and Creativity in the Built Environment)* working paper *1* (2011), online. See also: J. Till, 'Scarcity and agency', *Journal of Architectural Education* 68 (2014) 1, 9-11; J. Goodbun et al., *The design of scarcity,* London 2014.

3 J. Rockström et al., 'A safe operating space for humanity', *Nature* 461 (2009) 7263, 472–475.

4 M. Kuittinen, 'Building within planetary boundaries. Moving construction to stewardship', *Buildings & Cities 4* (2023) 1, 565-574; N. Francart et al., 'Building within planetary boundaries. Setting and assessing absolute sustainability targets at the building level', *Journal of Physics. Conference Series,* 2600 (2023) 152015, online. Conferences and symposiums on this theme are organized very frequently: 'The International Symposium Building within planetary boundaries – scales and practices of sustainable development', Osaka University, April 25-26, 2025; research seminar 'Designing in a finite world – urbanism, architecture and resource-consciousness', ULB Brussels, October 24, 2025.

5 J. Rowen, 'Pipes, provision, profits, privatization. The materials of water infrastructure in nineteenth-century Kingston, Jamaica, and London, England', *Aggregate* 11 (2023) May, online; J. Ore, 'Workers' bodies and plywood production. The pathological power of a hybrid material,' *Aggregate* 10 (2022) June, online; K. Förster (ed.), *Environmental histories of architecture,* Montreal 2022 (in particular: Hannah le Roux, 'Circulating asbestos. The international AC review, 1956–1985'); P.H. Christensen, *Precious metal. German steel, modernity, and ecology,* Pennsylvania 2022; R. Fivez, 'The rubble in the jungle. A fragmented biography of Lukala's cementscape, DR Congo', *Journal of Landscape Architecture* 15 (2020) 1, 78-87; K. Dawson, 'Geologising urban political ecology (UPE). The urbanisation of sand in Accra, Ghana', *Antipode* 53 (2021) 4, 995-1017; M.A. Miller, 'A transboundary political ecology of volcanic sand mining', *Annals of the American Association of Geographers* 112 (2022) 1, 78-96; V. Pivo, 'Shrouded in dust. The unseen labor of African American cement workers', *Journal of Architectural Education* 74 (2020) 2, 328-331.

6 I. Ruby and A. Ruby (eds.), *The materials book,* Berlin 2020; Space Caviar (ed.), *Non-extractive architecture, 1: On designing without depletion,* Berlin 2021.

7 M. Motylińska et al., 'Swimming in an ocean of materials', *ABE Journal (Dossier: Material Constraints)* 23 (2024), online.

8 According to thinkers such as Harvey, political movements should not simply accept the idea of 'natural limits' as apolitical facts. Instead, they should question and politicize how limits are calibrated, in whose interests, and then socially reconstruct them. D.W. Harvey, *Spaces of hope,* Edinburgh 2000.

9 According to the Brundtland Report, *Our Common Future* (1987), sustainable development meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The criticism of this definition is that it does not sufficiently question the growth and production paradigm itself.

10 Till 2011 (note 2).

11 See also: D. Hine, 'Scarcity and Abundance', online (https://dougald.co.uk/scarcebooks.html).

12 R. Harris, *Building a market. The rise of the home improvement industry, 1914–1960,* Chicago 2021.

13 K.L. Thomas, *Building materials. Material theory and the architectural specification,* London 2021.

14 L. Clarke, *Building capitalism. Historical change andthe labor process in the production of the built environment,* London 1992.

15 J.L. Polasky, *Reforming urban labor. Routes to the city, roots in the country,* Ithaca 2011.

16 C. Wall et al., *Building a community. Construction workers in Stevenage 1950–1970,* London 2011.

17 J.R. Hicks, *The theory of wages,* London 1963 (2nd ed.).

18 On the relationship between industry, architecture and urbanization, see, for example: K.L. Thomas, T. Amhof, and N. Beech (eds.), *Industries of architecture,* London 2015; G. Meyers, 'Political ecology and urbanization. Zanzibar's construction materials industry,' *The Journal of Modern African Studies* 37 (1991) 1, 83–108; P. Mishra, 'Urbanisation through brick kilns. The interrelationship between appropriation of nature and labour regimes,' *Indian Institute for Human Settlements 5* (2020) 1, 17–36.

19 On the relationship between the realization politics of the cement industry and urbanization, see: D.W. Harvey, *Abstract from the concrete,* Berlin 2017.

20 A. Vande Capelle et al., *Ad hoc baroque. Marcel Raymaekers' salvage architecture in postwar Belgium,* Brussels 2023.

21 P. Lefebvre, J. Neeuwels, and J.-P. Possoz, *Thinking-making. When architects engage in construction,* Brussels 2021.

22 B. Sweeting, 'Re-use aesthetics and the architectural roots of ecological crisis', in: D. Baker-Brown and G. Brooker (eds.), *The pedagogies of re-use. The international school of re-construction,* London 2024, 43-55.

23 T. Armborst, D. D'Oca, and G. Theodore, 'Holding pattern,' *OASE* (*Social poetics. The architecture of use and appropriation)* 96 (2016), 19–24.

24 A. Kučan and M. Kurir, *Garden and metaphor. Essays on the essence of the garden,* Basel 2024. For the notion of maintenance as 'main-tenir' (as 'keeping in hand' or 'maintaining now'), see: P. Caye, *Durer.* Éléments pour la transformation du système productif, Paris 2020.

25 S. Massaro, 'Unblackboxing waste management in practice. A set of actions enabling circular city making', in: L. Arboritanza et al. (eds.), *The ecological turn. Design, architecture and aesthetics,* Bologna 2022, 349-364.