Collaboration achieves effective waste management design at Brookfield Place Perth, Western Australia

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Abstract

Waste management in commercial buildings is a critical factor in urban sustainability and is an important element in achieving green building certification. For instance, Green Building Council of Australia’s (GBCA) Green Star rating tools include credit points for waste management. Good waste management performance in new commercial buildings is supported by appropriate design of waste management facilities. This is best achieved by considering waste management early in the design phase. This case study explores the collaborative design process that resulted in a high performing building for waste and recycling at Brookfield Place Perth, a 5 Star Green Star development.

A number of key factors that contributed to successful outcomes are discussed. These include the use of the Green Star Office Material credit for recycling space which set clear baseline parameters; the positive role of the client who, as owner, developer and operator of the building, was committed to ensuring that it is operationally effective; the role of architects who sought to avoid the waste management errors commonly found in other commercial buildings that could result in inefficient or unsafe operations; and the role of specialist waste consultants engaged early in the project and as needed throughout the development of the design so that adequate storage and vehicle access could be accommodated within the design of the main loading dock level.

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1. Introduction

The UN’s Sustainable Development Goals (SDGs), released in September 2015, highlight the importance of focusing on cities to achieve sustainable development. Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable is the only goal that focuses on location-specific outcomes. Cities are critical to sustainable development for a number of reasons, not least of which is that they link to all other regions either directly and/or in terms of their footprint, and since all issues addressed by the other Sustainable Development Goals are present as a microcosm in the urban fabric of cities. Moreover, cities are home to large numbers of people – currently over half of the global human population live in cities, and this figure is expected to rise to 66% by 2050, which equates to around 2.5 billion additional city dwellers [1] [2]. As John Wilmoth, Director of the Population Division of the UN’s Department of Economic and Social Affairs, argues: “Managing urban areas has become one of the most important development challenges of the 21st century. Our success or failure in building sustainable cities will be a major factor in the success of the post-2015 UN development agenda” [2].

Commercial and office buildings are an iconic feature of city infrastructure, typically with large resource footprints [3] [4]. Since commercial buildings and other urban infrastructure have decadal lifespans and will therefore impact on sustainability over the long term, it is important that sustainability is designed-in to commercial buildings for optimum benefit and cost effectiveness since retrofitting can be a costly and comparatively inefficient exercise. It is likely that regulatory and other drivers for sustainability in Australia and elsewhere will increase, possibly rapidly, over the coming years, requiring retrofitting where the structure and function of existing commercial buildings does not produce satisfactory sustainability outcomes. Reputational concerns, regulatory requirements, risk management, the need for corporate culture that attracts and retains talented, dedicated people as employees, and the emergence of strategic approaches to achieving points of difference and competitive advantage when attracting buyers, customers or building tenants are among the factors catalysing engagement with sustainability goals [5].

Waste management is a critical factor in urban sustainability and its importance is noted in the Sustainable Development Goals. Specifically, the SDG Goal 11 target 11.6 is to ‘reduce the adverse per capita environmental impact of cities by 2030, including by paying special attention to air quality and municipal and other waste management’ [6] (emphasis added).

Data on waste streams in Western Australia is limited in terms of its accuracy and scope, however some indication can be gleaned through the broad statistics that are available. Roughly a quarter of the total waste stream in Western Australia is generated from commercial and industrial sources (another quarter is municipal and the remaining half is construction and demolition waste) [7]. Average recycling in the administrative sector in Australia, including tenants of commercial buildings in urban areas, is about 56% [8], leaving significant room for improvement, with attendant cost savings. Sustainability Victoria estimates that up to 90% of office waste can be recycled [9, p. 3]. The total cost of waste services to businesses in Australia is conservatively estimated as $2.2 billion per year for the included industry divisions (of which $1.4 billion is spent on waste to landfill). Avoiding or minimising waste production can also have significant benefits – in Australia, the total cost of material inputs that are ultimately destined for disposal is just over $26.5 billion per year (i.e. the cost of purchasing the ‘disposable’ items) [8]. In addition, refurbishment of commercial buildings, which appears to be undertaken every 20-25 years in Australia, is estimated to produce 130 cubic metres of waste for every 1000 square metres of office refurbished [10, p. 26].

The high volume of readily recyclable waste that is sent to landfill suggests that there is significant opportunity to improve waste management in urban settings in general, and in commercial buildings in particular. The opportunities for high performing waste management are recognised to some extent through the provision of credit points in green building certification frameworks, as outlined below. The case study considered in this paper supports the proposal that the best waste management performance in new commercial buildings is achieved where waste management is considered early in the design phase, and continues to be measured and refined after construction once tenants occupy the building. This case study examines how the design of a 47 storey commercial building in Brookfield Place, Perth, Western Australia contributed to the delivery of a high performing building in terms of operational waste management. The research draws on a literature review and interviews with five key stakeholders who participated in the design of Tower One in Brookfield Place. It does not examine construction and demolition waste management practices that may have occurred during the construction phase, although this is also an important focus for waste management and could be considered in future research.
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