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CASE STUDY

Sustainable strategies applied on commercial architecture in Australia



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Abstract

Recent innovations in modern architectural technology facilitated the development and widespread utilisation of sustainable commercial buildings for sustainable social development. In this research, commercial architecture in Australia is demonstrated as a basis for determining how sustainable technology could be controlled and what the eco-maintenance and materials of major building elements should be. This research also analyzes and describes the sustainable commercial architecture background in Australia. A widely integrated approach is employed in the critical process of general architectural design because commercial buildings must integrate sociology, architecture, and aesthetics.

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1. Introduction

The daily activities and building facilities of humans significantly affect the natural environment and its capacity for flora and fauna. A variety of serious problems such as pollution, natural resource consumption, greenhouse gas emission, loss of natural habitat, and waste disposal remain a daunting challenge, but present a great opportunity for planners and architects. Architects believe good design

improves the quality of life in all areas of work, rest, and play, thus affecting human health. Architects, as professionals, seek to create a healthy built environment that enhances the natural environment, society, and economy. As a result, sustainable commercial buildings have become a focus in the area of sustainable social development.

1.1. Research methods

A widely integrated approach should be employed in the critical building process because commercial buildings have to integrate sociology, architecture, and aesthetics. Considering the drivers of sustainability within a wider context, this paper takes the Rockcote Design Centre in Australia as an example for distinguishing commercial building features

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and sustainability. The methods of research focus on building observation, analysis, and critique.

2. Background of Rockcote design centre

The Rockcote Design Centre is in the center of Nerang, a multi-award winning green building that embodies innovation inspired by nature, located between the Gold Coast (an Australian city) tourist strip and the green grandeur of the hinterland. A mixed use project including offices, industries, and retail stores is designed with diversiform architectural functions into a systematic building (Fig. 1).

Based on the core values of bio-mimicry, radical waste reduction, integration, and non-compromise, the project is planned to achieve the maximum efficiency with the minimum external inputs. The modern architectural style of the Rockcote Design Centre includes numerous large areas with coloured paint and inserted blocks to achieve harmony between the artificial building and the natural environment. The excellent architectural design offers a logical functional layout and various sequential work areas for the staff, consumers, and visitors. The building has a number of passive design features. The design aims at limiting the need for mechanical heating or cooling as far as possible. The result is a commercial development designed and constructed with a passion for the environment and sustainability.

- Year commenced: October, 2003
- Year of completion: October, 2005
- Developer: Rockcote Pty, Ltd.
- Project type (occupation): Mixed commerce, office, and industry building
- Project acquisition value: Approximately AUD\$6.8 million
- Gross areas of the building: Site total area: 5680 m²
- Building area: 2850 m²
- Number of floors: Three to five storeys
- Project location: 6 Indy Court Nerang Gold Coast, Queensland, Australia, adjacent to the center of Gold Coast city, one hour's drive to the rainforest and Mount Tamborine Village.

2.1. Social content

Nerang is a rapidly developing and thriving modern community in Australia that is attracting different businesses and commercial projects while remaining a suburban village

surrounded by farms. Despite the urban sprawl of the Gold Coast, Nerang has retained its natural charm.

General social infrastructures have been offered in the community of Nerang, providing convenient and efficient lifestyles and work conditions for all residents. According to the Nerang Statistical Profile, in 2011, the major industry providing employment was retail trade (13% of employed people), followed by construction (12.1% of employed people) (Australian Bureau of Statistics, 2011). The Rockcote Design Centre has significantly contributed to social capital, which aided in the acceleration of the growth of the community as an industrial and commercial center.

The local government has established an efficient and convenient public transport system including buses and trains, which offer quick and easy access from Nerang to all areas of Gold Coast and Brisbane (ABC, 2007). In addition, people can drive to major beaches and villages through highways and bypass roads in 30 min or less (Table 1).

2.2. Climatic conditions

The regional climatic condition is considered to be the most important factor in architectural design. Rainfall, wind load, and temperature significantly contribute to the performance and maintenance of buildings, particularly high-density commercial buildings. With the increase in various construction activities and functions, more environmental and climatic conditions should be considered in architectural design (Table 2). In case of the Rockcote Design Centre, the subtropical climate features of Nerang (hot, bright summers and warm, mild winters) the design integrated outstanding sustainable strategies to reduce climatic influence and reduce energy consumption. Therefore, a thorough climate analysis could aid in the comprehension of architectural characteristics and ecological steps.

Table 1 Transport content.

Destinations	Travel time (by land) (min)
Surfers Paradise	14
North Burleigh Beach	20
Broadbeach	17
Gold Coast Airport	25
Tamborine Mountain	30
O'Reilley's	28



Fig. 1 Rockcote Design Centre.

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