

The School As A Unique Habitat

By Kevin Miller

A sustainable school in Australia lives in a special environment responding to the elements. Here, physical design mirrors a curriculum in environmental education that is reaping big rewards

Introduction

Burgmann Anglican School is a unique school that covers different aspects of sustainability: community pride and interaction, environmental innovation, water efficiency, resource efficiency, sustainable buildings, environmental education and urban habitat. Below is a summary of these initiatives:

Background

Burgmann Anglican School began in 1999 with 24 students from K-3. The school's educational philosophy is based on the premise that "each individual is a unique person created by God with his/her own gifts, strengths, needs and weaknesses." The school endeavors to provide for each person's needs so that he/she can reach full potential - the

idea of excellence is focused on the individual and his/her potential. This philosophy, coupled with the fact that they offer education from preschool to year 12 incorporating a strong values program has made the school very successful. Burgmann is an accessible (low fee) Anglican school in reach to as many people in the community, regardless of their religious and cultural background.

This simple philosophy drives everything about the school, including the design of the master plan, the architecture of the buildings and the landscape plan. For a school that reflects the needs of younger children in Junior School, the architecture here is low scale and residential in nature. The elements used reflect Australian heritage. They align with an adjacent heritage site, "The

Valley." Elements like symmetry, verandahs, corrugated iron and stonework used in "The Valley," have been incorporated into the school's design to make this connection. As children grow and their needs change, so does the design and the scale of the architecture for upper years of the school.

The school's vision is "to be recognized as an outstanding and innovative place of learning by the Canberra community, the Department of Education and Australian tertiary institutions." Burgmann Anglican School has received excellent results in standardized reading tests, offers a solid information technology program, a class and individual music program, teaching of Indonesian as a second language for all students, and a range of extracurricular activities. Burgmann pioneered the development of a unique (hand-held computer-based) assessment and reporting program that has been recognized by schools in Australia and the US. A heritage project developed through the school's Resource Centre acts as part-museum.

Environmental Education Programs

The physical design of the school mirrors students' environmental practice. The curriculum includes environmental education programs that enhance their awareness and attitudes towards local and global environments.





to, particularly small children. Ultimately, the school can develop into patterns of functions and spaces. This promote areas of play into age groups protected by related buildings and reduces incidents of bullying.

The school is a web of identifiable sub-schools or neighborhoods

At this level, a frame is set for the more detailed design of spaces at a lower personal level. It is important that the overall concept has a large palette of shapes and materials to do this well.

An unfortunate aspect of schools in the current climate is a focus on minimizing maintenance at the expense of education. Children are people too, and they respond to their environment as much as we do. The focus of office accommodation currently is to provide better work conditions to improve productivity. It is therefore logical to expect that better environments in schools will pro-

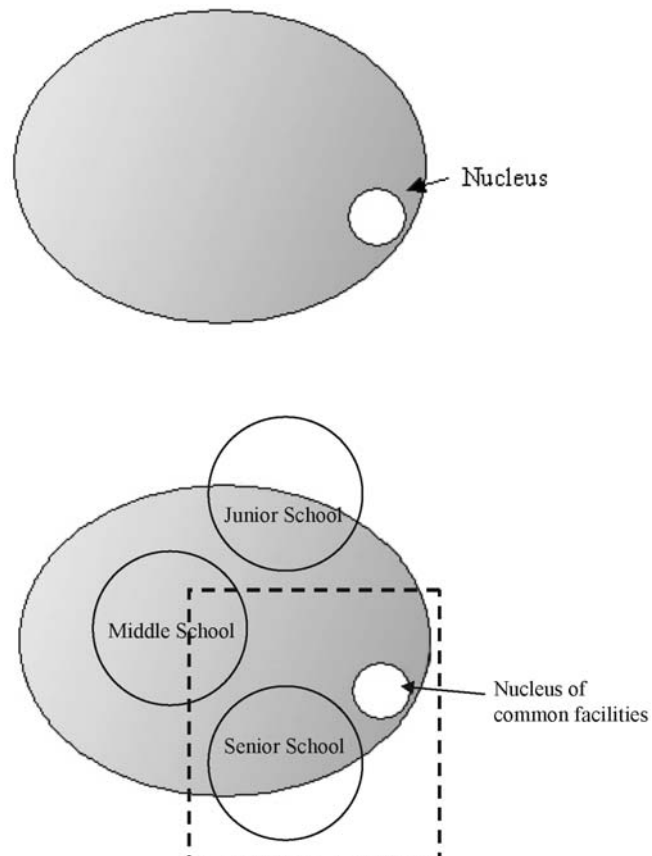
Examples of these programs include:

- Science projects where students monitor water quality and learn about aquatic plant and animal life in the school's dams and water easement
- An environment and technology problem-based unit of work in middle school focuses on Australian environmental successes and disasters. This unit includes an examination of our own ecological footprint and sustainable practices in the Canberra community
- Co-curricular projects involving small groups of students managing areas of the school, removing weeds, rubbish and planting natives
- Manage the adjacent Heritage Site by monitoring and controlling invasive weeds
- Students pot plants and last year they potted 6,000 plants
- Plants are cultivated in the school's green house and shade house

plan was not formulated as a rigid element but as a guide. This allowed the school to develop like a town or community.

A school is not a factory for learning

Using a town as a model allows interaction and gives equal importance to external spaces. It also allows each building to have an identity which children can relate



Planning

Burgmann has been designed around a loose framework of a concept and master plan. The master



note better results in both students and teachers

Layering

Burgmann Anglican School has been designed using the form of an eccentric nucleus (refer concept plan). This shape is the basic building form of life derived from elements such as seeds or cells. Forms such as these are repeated at higher level in cities and towns that grow from the nucleus of eccentric central area. In the school, the nucleus forms the entry and the radiating growth forms the neighborhood around this centre of activity.

The overlaying concept provides a layer to the loose framework of the master plan which binds the school together. The danger of a loose framework is that the

school may become too random and have no center or no obvious control.

Layers that overlay Burgmann and help define its identity are:

- Educational philosophy
- Context and the heritage site
- Environmental design
- Landscape

Sustainable Buildings

The school has always developed a concern for the environment within its education and this is reflected in all buildings on the campus. These range from simple incorporation of high levels of insulation and passive ventilation to a BMS control for

more complex buildings. This was built without additional funding.

The controls for night purge operation (natural ventilation) and heating system are displayed to students using a computer controlled weather station within the Resource Center. The integration of manual and automatic controls makes the school 'a living school.' It responds to changes in weather while allowing user input into comfort conditions allowing ultimate flexibility. The conditions reflect on the buildings through wind, sun, rain, heat and cold.

Water Efficiency

Burgmann Anglican School has the lowest water use of any school in the ACT and current rainwater storage stands at approximately 1.5 million liters. This is used for irrigation, toilet flushing, basins and showers. All water used on the Oval for irrigation is recaptured and used again. Garden beds use overland drainage for surface water using swales and dry ponding. Water efficient fixtures are used throughout to further reduce the school's impact on town supply.

Urban Habitat

The school has become a unique habitat in many ways. Its landscape has improved on the original farmland landscape prior to its inception. Water is retained and reused on site. Native landscaping and ponding has increased birdlife. Besides, the programs for the Heritage Site have a direct impact on the education of students in the school and directly contribute to the local community of Gungah.

This school lives within its environment, responding to climate, context and the complexity of life. ■



Buildings and Types of Sustainability

Principles at Burgmann

Preschool

- High levels of insulation
- Hydronic slab heating
- Natural ventilation
- Low energy lighting
- Solar passive heating using a greenhouse
- Rainwater storage
- Low energy lighting
- Rainwater storage (250,000 liters stored directly under the Chapel)
- Recycled timber

(Note: This building won a commendation for Sustainable Architecture 2008.)

Junior & Middle School Classroom Buildings

- High levels of insulation
- Hydronic slab heating
- Natural ventilation
- Low energy lighting
- Rainwater storage (55,000 liters)

Resource Centre

- High levels of insulation
- Thermal mass
- Hydronic slab heating and cooling
- Natural ventilation (both manual and automatic using a BMS control)
- Low energy lighting
- Rainwater storage (45,000 liters + 300,000 liters from other buildings) and reuse for toilets, basins and irrigation
- Building management system that controls all the specialist buildings on site and incorporates a weather station. System controls heating and cooling, natural ventilation and water use.

Chapel & Drama complex

- High levels of insulation
- Thermal mass
- Hydronic slab heating and cooling (includes solar and roof radiator preheat + cooling from the bottom of the rainwater tank)
- Natural ventilation (both manual and automatic using a BMS control)
- Passive day lighting

Art & Design Technology Building

- High levels of insulation (incorporates cool-room panels for the roof)
- Thermal mass
- Hydronic slab heating
- Natural ventilation (both manual and automatic using a BMS control)
- Passive day lighting
- Low energy lighting
- Rainwater storage (25,000 liters for toilets, basins and irrigation)
- Straw insulation panels
- Waterless urinals

Gymnasium & General Purpose Classrooms

- High levels of insulation (incorporates cool-room panels for the roof and walls)
- Thermal mass
- Hydronic slab heating
- Solar hot water
- Natural ventilation (both manual and automatic using a BMS control)
- Radiant cooling using a hydronic system connected to the base of the rainwater tank.
- Passive day lighting
- Low energy lighting
- Rainwater storage (90,000 liters for toilets, showers and irrigation)
- Low water use fixtures