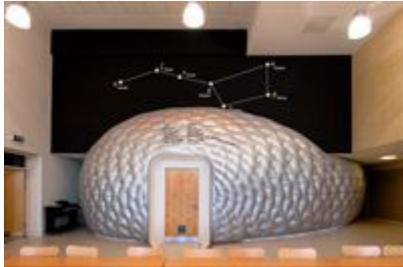


## Dalry Primary School

### General Introduction to Project



North Ayrshire Council were proponents for a unique project where its in house architects worked in close collaboration with artists, building users and other professionals in the design and realisation of a new concept in primary school building. The project started in 1998 culminating in the building of a new primary school in Dalry, North Ayrshire. This is a unique building, embodying the concept of imbedded intelligence in the very design and fabric of its construction.

The school is conceived as a learning prototype, offering multiple opportunities to engage with different organisational and teaching methods, utilising or modifying the facilities and spaces. It does not impose directions or solutions, but offers them as options and developments.

The Council aimed to create a new language of learning - projecting ideas, concepts and data through the fabric of the new school building. The architecture is developed through a "geometry of information", routes tell stories, layout suggest systems of measurement and specific spatial relationships inform about local and global environments. Facts, figures, phrases and fables have been incorporated into the structure and include historical "site specific" text and information.

The school is included as a case study as the design solution provides an innovative approach to internal spaces, and the project also demonstrates the value of extensive consultation with users during the development of the design brief.

## Key Project Data

<b>Name of School</b>	Dalry Primary
<b>Sector</b>	Primary and Nursery
<b>Location</b>	Sharon Street, Dalry, North Ayrshire
<b>Client/Local Authority</b>	North Ayrshire Council Primary:444 pupils
<b>School Capacity</b>	Under 3s Playroom (0-3 years) - 20am/20pm  Nursery Playroom (3-5 years) - 50am/50pm
<b>Procurement Route</b>	Traditional
<b>Project Value</b>	£10.4 million Primary - 4608 sqm
<b>Gross Internal Floor Area</b>	(Ground Floor - 3579 sqm/First Floor - 1129 sqm)  Nursery - 906 sqm <b>Architect</b> - North Ayrshire Council  <b>Artist/Consultant</b> - Professor Bruce McLean  Head of Graduate Painting  Slade School of Fine Art  University College London  William McLean  Senior Lecturer  University of Westminster  School of Architecture  <b>Quantity Surveyor</b> - North Ayrshire Council  <b>Mechanical and Electrical</b>  Pick Everard - Glasgow  <b>Structural Engineer</b>  Grontmij - Glasgow
<b>Contractors</b>	McTaggart Construction
<b>Start Date</b>	July 2005
<b>Completion Date</b>	August 2007

## Design Features



Externally, the school is designed to present a simple, geometric outline that follows the form of the elevated sloping site.

In reference to the vernacular architecture of Ayrshire, the external fabric is predominantly white with black highlighted openings and features. Closer to, and particularly when viewing into or through the building, individual features of anomalous shape and colour indicate the internal detail. It is a building designed as an educational instrument, offering richness and excitement from the inside looking out. The school is conceived as a collection of houses. Each house is ascribed a particular function or thematic description, which suggests patterns of use and occupancy. Connections and routes through the school are implied in both its plan form and that of its vertical elevation.

The design places particular importance on the 14 Class Bases, and these act as "home bases" for each class's general activities, each of these themed classrooms contain unique features and instruments. The advantage of this layout is the enhancement of a feeling of belonging for each class, whether as part of a year group or house group.

Within the school additional special purpose houses contain the full range of resources for a particular range of activities.

The **Environmental House** rises up through the building, and where it extrudes through the roof it takes on the role of observatory designed to monitor and interact with the natural environment.

The **Data House** (popularly know by pupils as "the brain") contains the school's ICT resources in one purposebuilt space, conceived originally by the artist as a crash-landed spaceship.



The **Book House** (Library) is linked on a Pythagorean axis to the data house and explores the architecture of complex geometry with a composite fabricated form describing the interior space of two interlocking geometries.

The **Art House** is a studio space dedicated to the Arts. The interior is fitted out in robust materials able to withstand the rigours of school life. It is not intended that this space is precious and should be viewed as an area for experimentation.

The **Fitness House** is a well equipped fitness room, specifically designed for children under 16 years which provides an environment in which pupils can focus on preparation for physical activity and how their bodies react. The effects can be monitored, measured and theories tested within a controlled environment. Community use of this facility will be managed and supervised by qualified instructors.



### **Sports Hall/Auditorium**

A high level of community use was planned for and this has resulted in the provision of facilities within this school that in the past could not have been justified. The sports hall has been designed to be large enough to accommodate competition (International) standard events. The equipment chosen for this area was supplied by Schelde who provided advice and furnishings for the indoor sporting facilities, in accordance with the latest IAAF standards.

A unique solution to the storage of loose sports equipment requirements was the inclusion of



3 underground retractable platforms with mesh walls, the roof of which can be utilised as a raised stage. Situated on the northern external wall these units can be operated at the control panel situated in the recessed housing adjacent to each unit or by remote control.

The needs of physically disabled people have been considered and met by the provision of purpose-designed toilets and changing facilities, level access throughout, and lift access to first floor areas.

### **Restaurant**

The double height Restaurant is located within the main entrance to the school and is overlooked by the schools entrance gallery. The North facing wall benefits from natural

daylight from full height glazing arranged in a bar code pattern, the top section incorporating artwork designed to read "Dalry Primary School".



The space was designed to accommodate the full school roll in one sitting with seating currently provided for 300.

The location of the restaurant was carefully considered to encourage use as an extension of the activity area, class base and library areas. The surfaces and space are designed to allow children to take resources and books to continue work in an alternative area. This arrangement allows the space to be used for a wider range of functions from an informal meeting space, community use outwith school hours to chess tournaments and aerobic activities undertaken with other schools.

In addition there is the potential to incorporate the adjacent ICT Suite (The Brain) as an Internet Café area.

## **Nursery**



Visits to other establishments and other countries influenced the design of the nursery building with the main focus being the provision of appropriate flexible space for the nursery learning community. To achieve this, floor measurements in each of the playroom areas far exceed Care Commission Standards/Requirements. The design of the nursery centre ensures that the learning needs of young children and their parents/carers are met in an appropriate well-planned environment. Large playrooms were designed to have minimal fixtures and fittings thus allowing the space to be used flexibly by children and staff to promote learning through consultation and responsive planning.

The creation of adjacent quiet rooms also add to the flexibility and enable staff to work with individual or smaller groups of children in a focused environment. The uncluttered spaces help promote the development of physical skills.

The materials chosen for both the internal and external fabric of the Nursery Centre were chosen to meet the specific needs of the 0-5 age group. While some of the fixtures and

fittings are the same as the primary school, the overall colour scheme of the nursery was chosen to create a calm, relaxing environment.

### **Choice of Site**

The school is situated on the site of the old school playing fields. The original Primary School and Nursery were split into three distinct buildings. The design evolved as a response to the sloping site with the building mass echoing the site topography. The site is surrounded on three sides by a combination of private, local authority and sheltered housing. To continue the development of the concept of imbedded intelligence, the building was situated on compass points with the Class Bases facing due South south.

### **Materials**



Consideration of life cycle maintenance was incorporated into the design and influenced the choice and use of materials.

A number of materials were employed to present a variety of textures - insulated metal panels, render, roughcast glazed brick and facing brick. To add warmth and visual interest metallic gold insulated panels together with cedar lining were introduced.

Internal walls are predominately stud partitions finished in a variety of materials offering a stimulating and visually rich interior. Floor coverings are a mix of vinyl, safety vinyl in general areas with carpet in offices. The roof is a steel polyester powder coated trapezoidal insulated roof panel. The external fabric is conceived as an educational instrument, panels sized to allow the building to be used as an instrument of measure and a teaching aid.

### **Viewpoints**

#### **Client's Perspective**

The aim of the project was to transcend accepted functionality and stimulate the imagination of the child and so it was necessary to reasonably question every aspect currently employed in school design and to state or restate what the aims and purposes of a primary school actually are.

To this end the concept of **imbedded intelligence** was adopted.



**Imbedded Intelligence** refers to the implicit information that any structure contains - weight, material, construction, power requirements etc.

This information is made visible through a variety of means, and whilst it may not lead to an instant understanding of how and why the built form has been fabricated in such a way, it is available information which can be used as a learning and teaching aid.

Other intelligences or thoughts are superimposed on the fabric in the form of text, numbers, colour, form, geometry and texture.

Architecture as a learning resource illustrates philosophies, theories, ideas and inspires curiosity. It makes the invisible visible. It may confuse the senses. It is this understanding and misunderstanding which makes an environment stimulating. The design of the new Dalry Primary School reflects the process of learning through discovery. The architecture is developed through the geometry of information.

### **Architect's Perspective**

Art and architecture are different. It is the difference that creates ideas, and trying to smooth the difference results in blandness. Artists discover the nature of the work in making it. In architecture it has to formalise fairly early on in the design process. In creating a team, it was necessary to establish ground rules to maintain a working relationship and to ensure that all parties involved understood each other's wishes.

Artists and architects are not unlikely collaborators. Artists respond to architectural spaces every time they install work or enter into a dialogue relating to context. Architects benefit too. The decorative impact of art can have far reaching consequences and rapidly become an integral element in a project, witnessed at the various projects already entered into by North Ayrshire Council at Beith, Lawthorn, [Mayfield](#) and Dalry Primary Schools.

Yet collaborations can be problematic. Architects can be control freaks who can learn a lot from the more wayward approach of the artist. Architecture is highly controlled and governed by statute, but the sense of serendipity that is vital in art can stimulate the architect to explore previously uncharted territories.



There is the ever-present threat in such collaboration for ego-clashes when the thoughts and ideals of either party are misunderstood. In architecture there is not usually room for another creative source. The challenge is to find a shared territory and resolve any differences in an amicable manner.

Clients normally steer things in a rigid direction, preferring function to dictate the form. In the above noted projects the Design Team and artists were given latitude to work within and expand upon the given themes to present ideas and to explore the possibilities of a new architecture of learning.

What lessons have been learned from these collaborations and what should artists and architects bear in mind when embarking on future ventures?

- Artists and architects should collaborate from the inception of the project. Only then will the structure and artwork mesh organically.
- It is important that original ideas are never compromised, and if the logistics of the project are thrashed out at an early stage then this can be avoided.
- Concern exists over the quality of the artists' involvement, as their work tends to be carried out in isolation. In addition many contractors tend to find some of the specifications bizarre when presented with a medium in which they are unfamiliar.
- Art work needs to be installed at the same time as the buildings are erected to ensure that all details are properly incorporated.
- Art has a tremendously valuable role in animating architectural spaces - making them exciting and dynamic.

### **Arts Project Perspective**



Of great importance to the success of the arts project for Dalry School was the fact that both Educational Services and Technical Services at North Ayrshire Council allowed the arts team to collaborate on concept and design from the very beginning, forming an integral part of the design team. The project was subject to the same statutory and budgetary constraints as any other capital undertaking but it was allowed free rein to question and innovate on every

aspect of the building design, there was a lengthy process of research and consultation working with children, teachers and other specialists.

The underlying concept of Imbedded Intelligence was also crucial - that all of the architecture and integral artworks should have purpose and meaning. This extended from the basic grid dimensions based on the number 7, to the individual artworks in each classroom. It is perfectly legitimate in some cases to ask why is that there? And hopefully, the sense of enquiry engendered by the artwork will lead to discovering of at least one of a range of answers.

Of course, with hindsight, there are always ways in which we could have improved on both the process and the outcomes, and would do it better next time. By the very nature of the project, the sense of innovation and enquiry meant that everyone concerned, was collaborating in this for the first time, and feeling their way through a minefield of practical and strategic problems. Therefore, we would like the project to be seen not as a finite achievement but as one of many ways towards the integration of arts into educational architecture.



### **Users' Perspective**

The concepts and designs were not arrived at arbitrarily. The school community was a key part of the design process. Extended workshops were organised with pupils, staff and consultants using drama, visual arts, film and discussion to explore how existing spaces were used, what accommodation the school should contain and how it would work. This time provided a useful diversion for pupils and is a rich source of research for the design team

During the workshops pupils had clear ideas on areas that are particularly important to them, focusing on toilets and spaces within which to socialise, as well as colour shape and even sounds of the school environment.

The Head Teacher was heavily involved in the consultation and this resulted in a number of alterations to the specification and the finished product. For example, the Head Teacher stressed the importance of instilling pride in the children and this has been exemplified by the development of the school "restaurant" instead of "canteen" Pupils use proper (rather than plastic) cutlery and pupils return their food trays to a service area, so that there is no "slopping out" by them. The restaurant provides a key social space and the space also forms the nucleus for the enhancement and awareness of the benefits of a healthy lifestyle and diet.



The design is inclusive, with features suitable for the pupils and, the wider community. Community use of the building was important and for safety the design separates the part that can be used by the community from the main school. The school is open to the community between 6pm and 9pm during the week and at weekends.

As these spaces have a number of uses and users, flexibility is essential. Retractable seating located within the sports hall accommodates an audience of 264 people, combined with a permanent tiered viewing area located at first floor level, which raises the numbers to 496. This arrangement allows the space to be used for a wider range of functions from full school assemblies, theatre, dance, conferences, lectures, business use, film shows, concerts and conferences to spectators viewing of School and Competition Standard sporting events.

*"It turns the children funny colours"*

**Beth P7- talking about the coloured shapes on the glass reflecting from the sunlight.**



The pupils like the repositioning of the new school adjacent to the nursery; so that they can go and see their younger brother or sister in the playground during breaktimes. Pupils' favourite spaces include "the brain", the library space and the sports facilities. Physical Education should be adventurous and engaging and children at Dalry show expressions of joy, adventure and achievement when using their sports facilities. Many pupils also love the rooftop garden, which gives panoramic views of the surrounding areas and allows them the freedom to learn outdoors. Pupils also enjoy the innovative and



unusual parts of the school such as the soft, tactile balloon material which forms "the brain", whilst acknowledging the improvements made on more fundamental things such as the individual toilets and access to individual lockers. The themed classrooms also offer an

exciting backdrop for learning, and the teachers can use the break out spaces outside the class bases for project work or quiet time with pupils.

### **General evaluation of building**

This school had a delivery programme that lasted over two years, and while this caused some frustration, particularly with teachers and pupils, the protracted programme allowed for extensive consultation with all those who would eventually use the building, including community groups. The result is a building that users feel is their own. To outside observers, the semi-open plan class bases may feel small, but this is in part due to the way in which teaching takes place, spilling out into the larger shared spaces and because furniture (which is height adjustable) was selected to suit pupils of all ages and is larger than might be expected in the infant classroom. Initially, teachers felt that the open plan arrangement would result in acoustic problems, but these have (in the main) settled down.

As described by the architect, the design team included an artist and incorporated many of the users ideas both architecturally and artistically. Such a collaboration can lead to discrepancies between expectation and realisation in that, some of the ideas emerging from the consultation were more successfully articulated than others: the roof garden was a big success with teachers and pupils alike and the ICT facility, 'the brain' really lived up to the pupils' expectations, whereas some were disappointed by the fact that their idea of the school being 'like a tree house' resulted in a tree-like sculpture attached to the building. The class bases incorporated stimulating themes, from art and architecture through to geography, history and Scottish inventors, which encourage the children to ask questions and undertake research.



Some children reported that compared with their old Victorian school, the new building is difficult to navigate. This is in part due to the fact that there are few straight corridors, in some ways a positive, but in terms of sense of where one is in the building, could be a negative feature.

The community of Dalry was really lacking in sports and other recreational facilities such as theatre and meeting rooms and has thus greatly benefited from the new building, which together with the attached nursery and community daytime meeting spaces make the new Dalry Primary school a truly valued community facility.

### **Lessons learned**

The Council feel that the requirement to maintain the operation of the existing education establishments contained on the site resulted in limited scope for the situation of the new build facility. This combined with limited opportunity for access to the site dictated the location and access for the new school.

The Council stresses that for future projects the orientation of, and relationship between the internal and external areas should be given high consideration, to maximise potential for learning and teaching outdoors in fair weather, feeling it will be necessary in the future to develop external planning which makes allowances for hard and soft landscaped formal playing areas, as well as areas of natural and constructed landscape to benefit exploration.

A five year programme of evaluation has been included in the Dalry project, designed to inform and extend future developments, and given the innovative and experimental nature of the project, and its potential impact on the wider field of educational design, it is important that the long term uses and effects of the design are studied and shared with a wider audience.

North Ayrshire also stress the importance of risk taking without accepting failure, and to learn and evolve from experience.

## Further Information

For further information please use the contact details provided in the table below

### **School Contact Details**

#### **Address**

Head Teacher

Dalry Primary School

Sharon Street

Dalry

KA24 5DR

**Telephone:** (01294) 832788

**E-mail:** [contactus@dalry.n-ayrshire.sch.uk](mailto:contactus@dalry.n-ayrshire.sch.uk)

### **Contact Details for additional information**

Lynn Taylor

Principal Officer

Educational Services

North Ayrshire Council

Cunninghame House

Irvine

KA12 8EE

**Telephone:** 01294 324437

**Email:** [ltaylor@north-ayrshire.gov.uk](mailto:ltaylor@north-ayrshire.gov.uk)

**Contact Details for architect**

David Watts

Infrastructure and Design Services

North Ayrshire Council,

Perceton House,

Irvine,

KA11 2AL

Telephone: (01294) 225036

Email: [DWatts@north-ayrshire.gov.uk](mailto:DWatts@north-ayrshire.gov.uk)