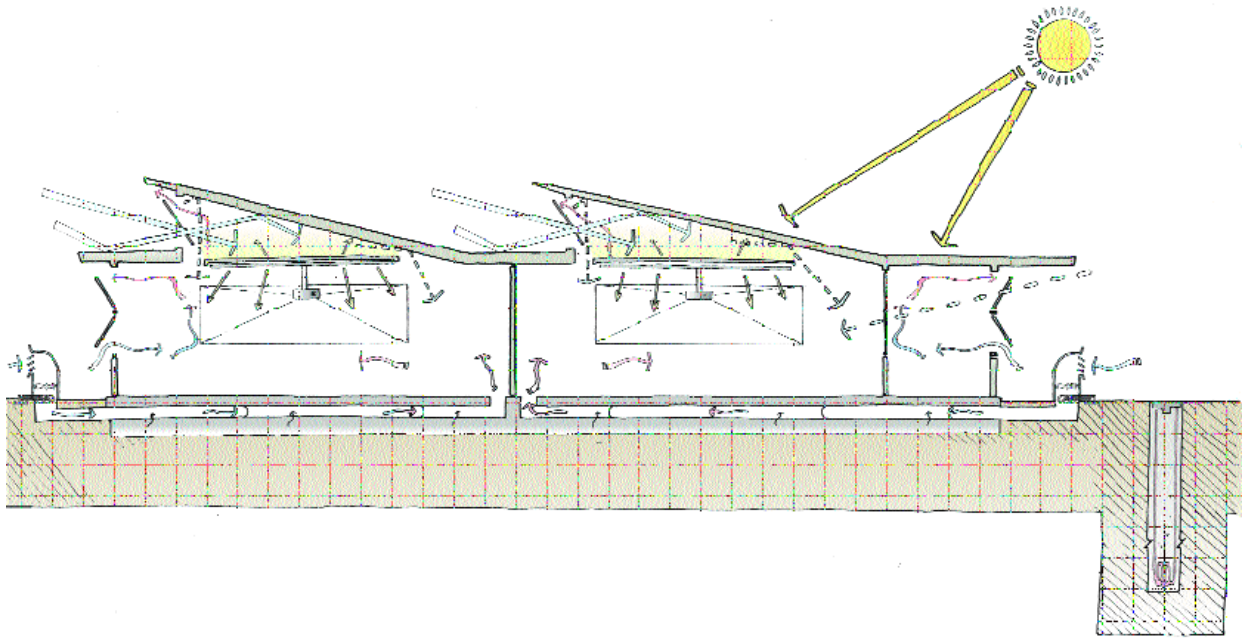
B A T T L E M c C A R T H Y

Consulting Engineers & Landscape Architects



OPERATIONAL BASIS SECTION

PROJECT:
Schools for the Future

CLIENT:
DfES

ARCHITECTS:
RTKL

BM SERVICES:
Multi-disciplinary Design Services

VALUE:
Classified

DESIGN BRIEF

The Department for Education and Skills initiated a design exercise with a number of design teams to produce exemplar designs for the School of the Future as a fore-runner of the £50 billion construction expenditure planned in education over the next 10 years. The purpose of the exemplar was to respond to the present and future educational needs; provide a healthy and comfortable environment and form a robust, adaptable, universal system for the development of new schools across the country.

All of the designs are to become a blue-print and a design checklist for the development of future schools in the UK in the next 25 years. This embryonic form is the basic framework from which further design development should occur.

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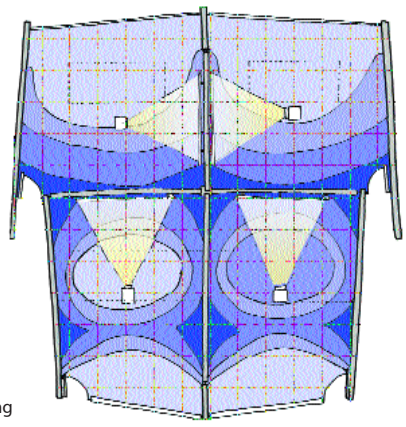
DESIGN INITIATIVES/ACTIONS UNDERTAKEN

The scheme design presented is a snapshot of an embryonic design to demonstrate the servicing and sustainable approaches investigated by the design team.

Introduction - The Process

Whilst any school building must be considered as a whole in terms of its sustainability, both in design and in use it is nevertheless still a kit of parts, and its most important part and fundamental raison d'etre is the classroom.

Classrooms principally require: good lighting levels, air quality, glare control and comfortable thermal and aural environments. Yet, in many schools of today, the classroom is treated as a poor relation to the more specialised areas: often poorly lit with little or no fresh air provision and either too hot or too cold. We believe that the classroom design is fundamental to enhance the learning and teaching environment and to the well-being of students and teachers.



Achieving balanced daylighting

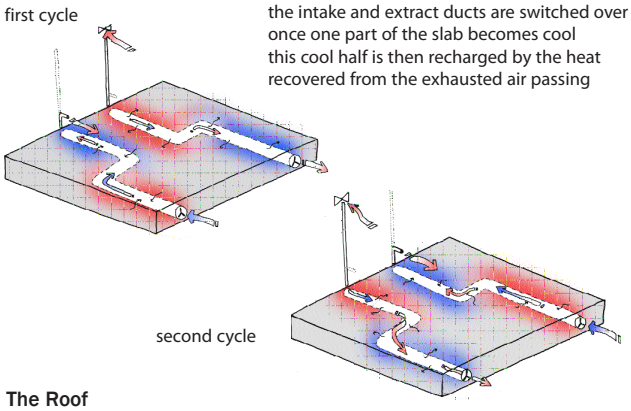
We have conceived a classroom cluster that is a base unit for modular construction and is also self contained to allow for the extension of the classroom block. Services distribution allows for the general teaching spaces to become specialised laboratories by adding piped service provision into pre-formed trenches and the partitions are removable to enable change in classroom size. From this exercise we arrive at the classroom form in its essence as a base module, not only for the development of a school, but also the development of the module itself.

The Floorslab

The floorslab consists of a number of pre-cast elements which incorporate service trenches, as well as cast-in interconnected voids to allow the formation of an underfloor labyrinth. This will allow the thermal mass of the surrounding portion of the slab to be used in tempering the supply air to the classroom block, thereby reducing the reliance on heating and cooling. The upper portion of the slab will be more highly insulated in order to prevent heat transfer directly to the classroom block.

first cycle

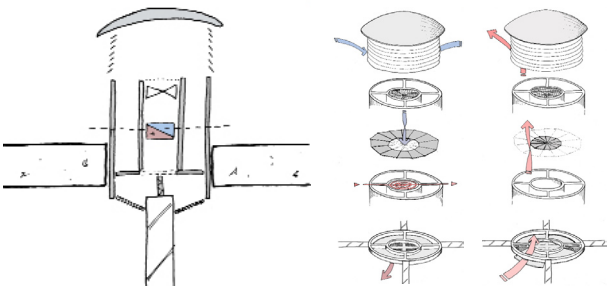
the intake and extract ducts are switched over once one part of the slab becomes cool this cool half is then recharged by the heat recovered from the exhausted air passing



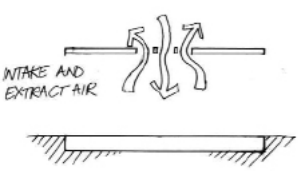
second cycle

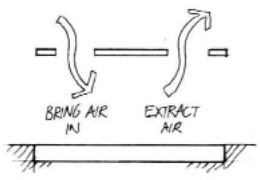
The Roof

The roof will act as the main energy provider and as a distributor. The underside of the roof will incorporate low energy light fittings, wireless LAN points and power outlets. The roof build up itself will be of a high level of thermal performance to reduce fabric losses, whilst the outside of the roof could provide a renewable base surface energy and resource capturer.



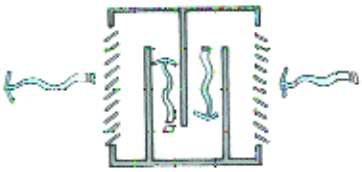
Rooftop ventilator

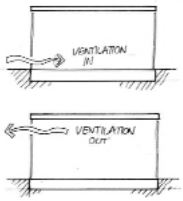




The Facade

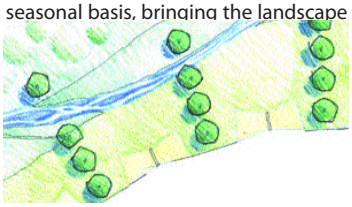
The facade acts a climate modifier and and controls access and views in and out of the classroom. By dividing the facade into three horizontal bands this allows the facade infill panels to be chosen to cater for differing requirements due to pupil age group, orientation and context.



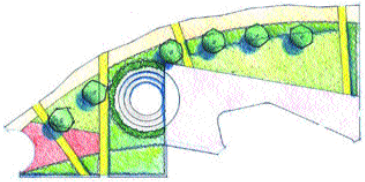


The Landscape

The landscape is an extension of the classroom. The integration and overlap of the landscape, water and teaching environments allows the creation of discovery nodes and learning spaces. The classroom and teaching activities expand to occupy the outdoor spaces on a seasonal basis, bringing the landscape



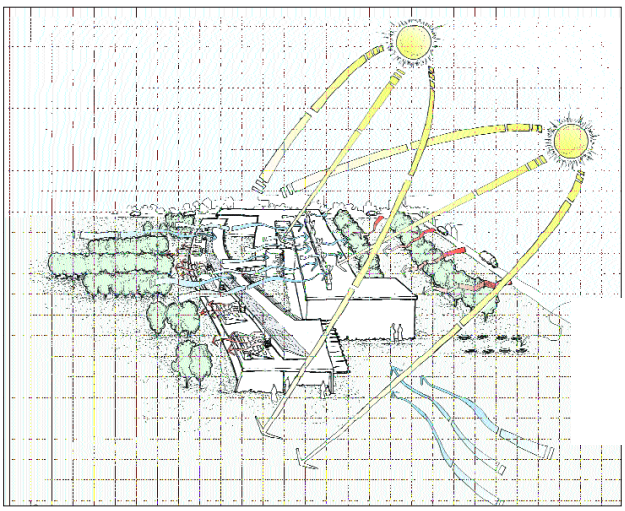
- rainwater drained into natural watercourse
- tree lines for shade and to control winds to create shelter wet and dry wildflower
- meadow areas for biodiversity



- Sheltered breakout spaces and amphitheatre for use by students

Future - Further Research

During this study we have broken down the classroom into 3 component parts that can be further researched in order to improve upon their performance. These are: the floorslab, the facade and the roof. The procedure is to develop the next generation of school designs in a partnering agreement with representatives from industry following the framework set set out by movement for innovation (M4I). This allows productive research to be integrated into further projects, benefiting both the client, manufacturers and design team. This will allow for the integration of new technology and products into the developed system.



Building and landscape interacting with site