



# The Intelligent Design Centre

*Creative thinking in architecture, engineering and the built environment*

## STRADBROKE SCHOOL CASE STUDY

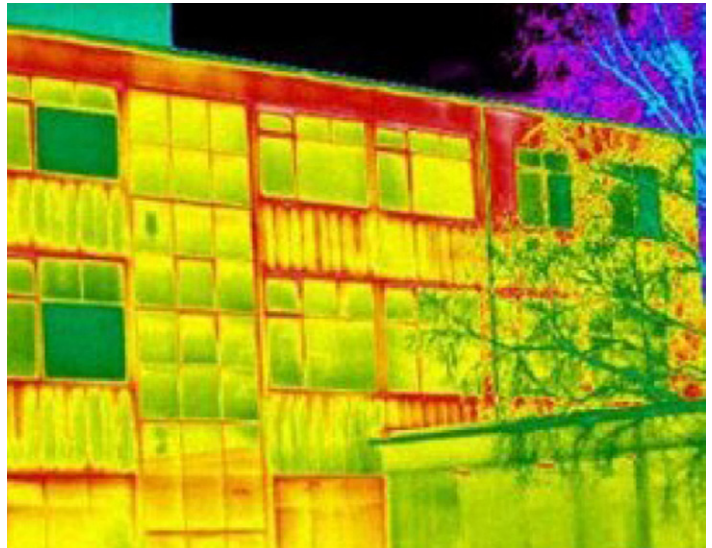
The design process is a complex one, no more so than at the outset of the project, and we recognise that changes to established systems cannot be affected wholesale. We do however believe that a more thorough design integration exercise can be promoted which places true sustainability at the heart of the process. This approach acted as an aide memoir to Stradbroke and provided a backdrop for improving the 'value' of on-going investment, and promotion of a move away from re- active building management.

The school kindly allowed us access to information, particularly in relation to building configuration and energy expenditure which

was subsequently used to establish a baseline position from which to measure improvements in efficiency. The 'design' reviews covered Building Design, Interior Design, Heating and lighting and Environmental Design.

**Location:** Sheffield, Yorkshire

**Key Aspects:** Sustainability, Survey, Finance



### 1.1 Executive Summaries

#### 1.1.3 Mechanical and Electrical Engineering

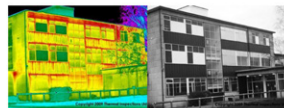
The built environment at Stradbroke School is one that affords a poor comfort index to both pupils and staff, primarily during the heating season. This is a result of a number of influencing factors:

- The existing LPHV heating system generally comprises of cast iron radiators and a single pipe distribution system throughout the school providing both ineffective and inefficient heat distribution.
- The heat source for the above system is a modular boiler installation consisting of two oil fired boilers, the age of which is not confirmed, however it is unlikely they have SEDDBK ratings, are do not have high efficiencies.
- Control of the heating system is via the Council's estates office and by a predetermined time.
- There appears to be little or no control regarding temperature on a zoned basis throughout the building.
- The building fabric offers little opportunity for the efficient retention of heat, in that the walls have no cavity insulation and the single skin glazing throughout the building in numerous cases is not able to be closed

properly. In addition there are many single skin roof lights sited throughout the building.

- Mechanical ventilation to most of the toilets throughout the school would appear to be oversized and poorly controlled. Control to these units is by means of presence sensors, however these are positioned in direct line of the entrance and operate when pupils pass in the corridor, resulting in the fans operating for far longer than required and also extracting warm air at too great a rate.

In addition the reliance upon oil as a heating fuel can produce difficulties. Whilst the "summer" cost per kWh for oil is a little higher than that of gas, the stability of the price of oil is far worse and subject to increases especially during periods of demand i.e. the heating season.



The hall and canteen can be tackled as a single unit, giving them a more communal feel by using appropriate colour and lighting schemes, and looking at how best to manage their multifarious uses, creating bespoke storage solutions to optimise the space.

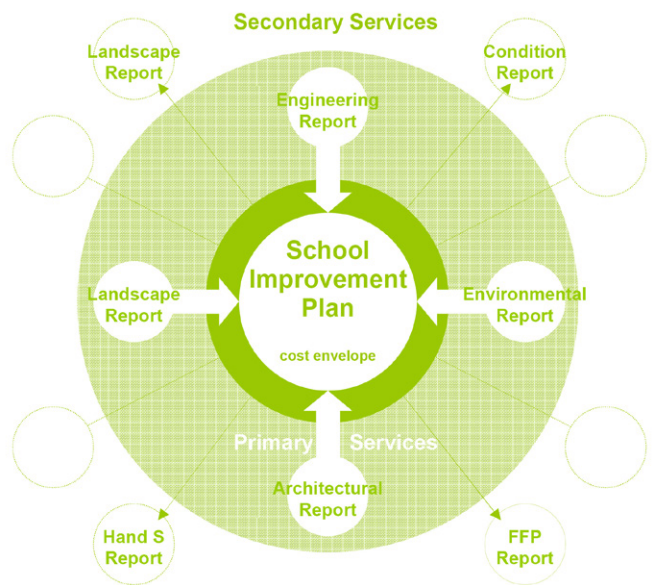
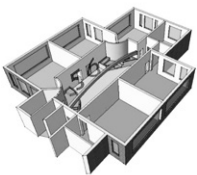
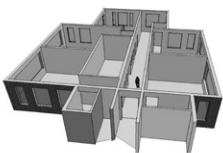
**Whole Building, Integrated Design Solution**  
It seems obvious that the school's architecture defers integration and feeling of community, with classrooms, and almost all other rooms isolated one from the other by the position of the divisive corridors. Whilst the solutions above demonstrate how each specific area can be enhanced independently, the whole school could be made dramatically more cohesive, spatially and socially, by looking holistically at the interior.

To do this we would recommend that the classroom nodes be developed.

Existing layout of classroom 'hub'.

To maximize the potential of each classroom hub as a space of integrated learning, the area can be re-modelled to create impressive and coordinated 'learning zones' for each set of classrooms, reinforcing the feeling of community between year groups and peers a 'home' that they can feel proud of and a space they will want to 'own'.

Major 'social learning area', uniting classrooms into a single integrated unit.



ID4S - Delivery Model