

DESIGN MAKES IT WORK

Design is central in all aspects of our lives, from the clothes we wear, the cars we drive and the buildings that we occupy or own. Design covers more than just general appearance; it also includes shape, form, colour, feel, texture and durability plus many more aspects which are too numerous to list. Design is the basis for all man-made objects and in order to achieve quality and customer satisfaction it must be done correctly.



Aluminium curved roofing at Warwick Lodge Dental Centre, Essex. Image courtesy of Kalzip Limited.

However, not all design meets the standard that it should and in these circumstances it usually results in irritating faults which cause premature failure and a product which is not fit for purpose. As the late Steve Jobs said, 'Most people make the mistake of thinking design is what it looks like...It's not just what it looks like and feels like. Design is how it works'. This is just as true for the construction sector and the designer or the design team, whether it is a traditional contract or a design and building contract, must adopt a holistic approach to the project.

A written and agreed specification is the key to success. The specification sets out the needs and wishes plus it sets out the parameters which will channel the final design and ensure that it meets with expectations. Cost is also one of the most important parameters within the specification and in today's current economic climate it is a parameter which features high on the list. Cost is also a parameter which is closely linked with specification and without this link construction costs would escalate out of all proportion and the building would never be completed. Harry von Zell once said 'As a designer, the mission with which we have been charged is simple: providing space at the right cost'.

One of the issues associated with the specification/cost link is the term 'equal or approved'. For those downstream of the initial design process it usually provides a loophole to initiate change and perhaps remove an element of cost, remove a degree of quality or improve margins. Such design changes should not be made in isolation and any proposed change should involve the knowledge and agreement of those at the start of the design chain. Without their involvement or the involvement of the client a simple and perhaps misunderstood change can lead to disappointment. However, design changes do not always result in a negative outcome and in many cases if a design is correctly challenged then a more robust solution can frequently be introduced.



Roll formed louvre profile and live louvre cladding were specified for the Queen Elizabeth Diamond Jubilee leisure centre at De Montfort University, Leicester. Image courtesy of Architectural Profiles Limited

Metal roofing and cladding associated with the envelope of industrial or commercial buildings has been used successfully for many years but the demands put on it by modern architecture and sustainability requirements have set new challenges. The envelope must now be regarded as a fully integrated system rather than a series of parts which can be interchanged without further consideration of the other elements or components.

The metal cladding profile, whether it is made from steel or aluminium, not only has to provide a weather proof skin but it also has to provide structural strength to accommodate imposed and service loads throughout the construction phase and operational phase.

Increasingly it has to serve as a working platform or access way for maintenance of PV arrays. The aesthetic service life of the profiled metal sheeting or flat rainscreen panels has also got to be considered at the design phase because it can have a strategic effect on the in-service life of the system and offer long term sustainable solutions.



The AshTech rainscreen cladding system was specified at the Thomas Ferens Academy, Kingston upon Hull. Image courtesy of Ash & Lacy Building Systems Limited

Environmental challenges to reduce our carbon footprint have resulted in the need for integrated triple skin rooflights and the requirement to specify highly thermal efficient insulation. These elements together with the internal and external skin of the cladding must be designed as an integrated assembly to achieve the thermal requirements as set out in the Building Regulations. The design must also recognise the need for thermal isolation between the inner and outer skins plus thermal continuity at junctions and intersections.

The design phase calculations for thermal performance using the National Calculation Methodology which uses the SBEM software provides the designer with an opportunity to accept general psi and alpha values for the construction detail or enhanced values which are system specific. These system specific values are available from the individual profiler or system supplier but the on-site construction must reflect the design assumptions. Design detailing is also important to minimise air permeability at junctions between elevations and intersection with other materials or systems. This should form part of the overall design philosophy and should not be subject to compromise at the design, installation or commissioning phase.

Specific design advice can be obtained from the individual system suppliers and on-site pre and post completion QA inspections can be conducted by the consultants featured on the MCRMA web site at www.mcrma.co.uk

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