SAS International

Case Study

Stirling Prize Winner 2009, Maggie's London

architectural metalwork

Maggie's London

SAS International takes lead role in canopy design for Stirling Prize Winner Maggie's London

The bespoke ceiling 'canopy' for 2009 Stirling Prize winner Maggie's London was developed, manufactured and installed by SAS International (SAS) in conjunction with architects Rogers Stirk Harbour + Partners (RSHP).

RSHP designed the first Maggie's Centre in England. Thanks to its dramatic over-sailing canopy roof it provides both seclusion and a bold architectural statement to the outside world.

SAS and RSHP developed the design of the bespoke triangular metal panels for the building which form an integral part of the "floating" canopy (the roof and ceiling; integrating with structural steelwork). SAS also supplied the skylights, solar shading panels and the nosing feature around the canopy's perimeter, as well as taking responsibility for the roof deck and single ply roof membrane.

Stirling Prize Judges commented: "*Conceived as a two-storey pavilion, the centre's positive spirit is signalled with a bold roof canopy that hovers high above the walls to sail protectively over a series of intimate internal gardens, courtyards and roof terraces.*

A deep orange rendered wall serves as a protective arm making it a 'place apart' without denying it is still a part of the city. This antithesis of a hospital provides an open house in the city."

Background

Maggie's London is a sanctuary for cancer patients, commissioned by Maggie's. The Maggie's charity was founded by Maggie and Charles Jencks.

Maggie Jencks learnt from her own experience of cancer. She knew it was paramount that people affected by cancer have access to information, psychological and emotional support and advice on nutrition, exercise and relaxation. She envisaged them receiving such support at a centre located near the hospital that provides their treatment.

Although Maggie's Centres are open to anyone affected by cancer, they are also used by friends or family members providing a place where everyone affected by the disease can receive advise or support. Existing Maggie's are located in Scotland, with a number of other centres currently being planned for England and Wales. All Maggie's buildings are designed to make people feel human when they are at their most vulnerable.

Judges commented: "*Maggie's London exceeds at every level in fulfilling the most demanding of briefs: to create a sanctuary for terminally ill cancer sufferers. The client Charles Jencks has a deep conviction of architecture's power to shape our experience. This has led to a series of cancer care centres creating a fitting memorial to his wife Maggie."*

Project Name: Maggie's London

Client: Maggie's

Architect: Rogers Stirk Harbour + Partners

Main Contractor: ROK Build

Sub-Contractor: SAS Project Management

System Type: Bespoke soffit ceiling canopy, skylights, solar shading panels

Special Requirements: Detail and precision carried from interior to exterior

Area m²: 400m²

Location: London

Completion Year: 2008

how the floating canopy design was achieved

Architectural Concept

The Maggie's Centre site had a series of logistical issues. The site was small and sandwiched between the noisy Fulham Palace Road and the looming bulk of the 1960's Charing Cross hospital. It was apparent that the building design needed to overcome both issues whilst still meeting the clients' demands.

The design that evolved to overcome these circumstances comprised of a blank rendered wall and a large canopy roof that cocooned the centre from its noisy surroundings. A canopy roof was designed to appear as a single element that hovered above the building, running seamlessly from the inside to the outside.

In addition to being a design feature itself, the floating canopy ceiling needed to meet a design criteria that utilised natural light and shading while also reducing views of the neighbouring hospital from within the centre.

This was achieved by skylight openings in the canopy feeding direct sunlight, wind and rain in to the space and to the roof garden.

Will Wimshurst, project architect for Rogers Stirk Harbour + Partners comments: "*Maggie's London has been designed as a homely, welcoming, comfortable and uplifting space where cancer patients – together with their families and friends – will find a conducive environment in which they can meet and share information and advice.*"

SAS International Design

Working from general arrangement drawings and hand-drawn details supplied by RSHP, the task of converting the design into reality fell to SAS International's expertise (Fig 5–9 opposite page).

Richard White, Design Manager for SAS International says: "*The brief from the architects was clear. They were looking for the detail and precision that you would get from a metal ceiling but they wanted that carried through to the exterior; that was the key to the whole design.*"

The canopy's roof itself is built with a diagrid of steel I-beams (Fig 7). Their criss-cross design is highlighted by channels inset into the underside of the roof, and this crisscrossing also generated the pattern of triangular panels used to underclad the entire roof.

The undercladding consists of around 240 triangular aluminium panels that are installed to follow the geometry of the roof (Fig 5).

Virtual Modeling

Because of the complexity of the roof's geometry, SAS built a virtual 3D model of the inverted hipped roof using Autodesk Inventor (Figs 1–3).

The information from this process was later used directly in the manufacturing process for stamping out the panels.

SAS decided that to ensure that required tolerances were achieved all products would be factory manufactured resulting in no site-measured panels. This approach helped solve the puzzle of how the panels would align neatly along the hip lines of the roof structure.

SAS International then mocked up a typical panel joint detail to review (Fig 4).

Fig 1 : 3D Model –Typical Module

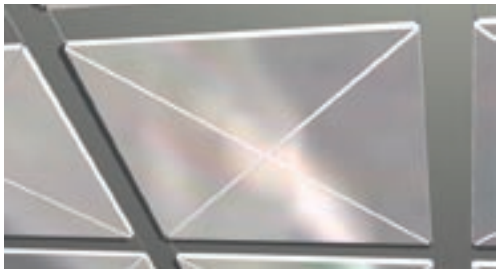


Fig 2 : 3D Model –Crossing Junction

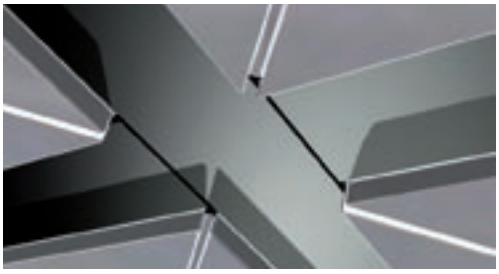


Fig 3: 3D Model –Linear Profile

Fig 4: Mock up –Crossing Junction

Figs 5–9 RSHP Design Intent sketches of roof construction:

Fig 5: Roof Scope – Soffit

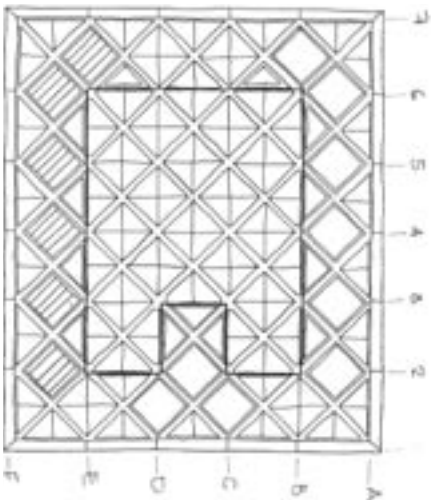


Fig 6: Roof Scope – Soffit Framing

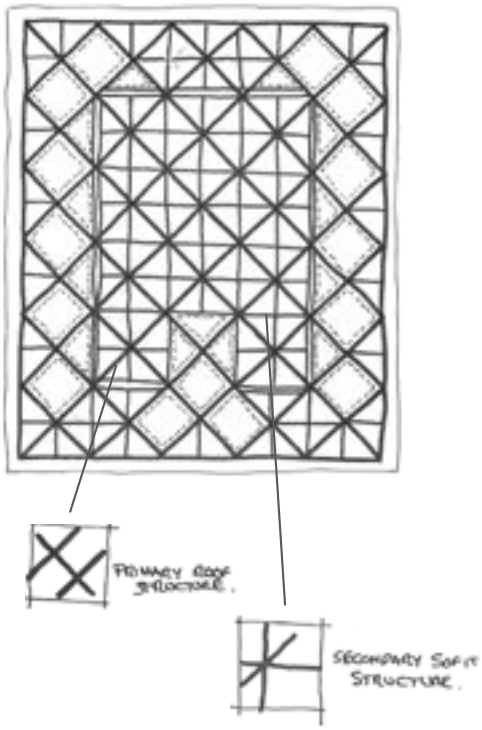


Fig 7: Roof Scope – Structure

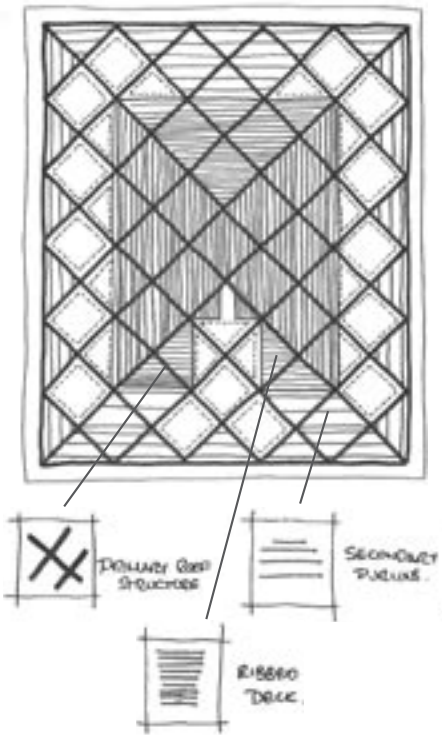


Fig 8: Roof Scope – Substrate

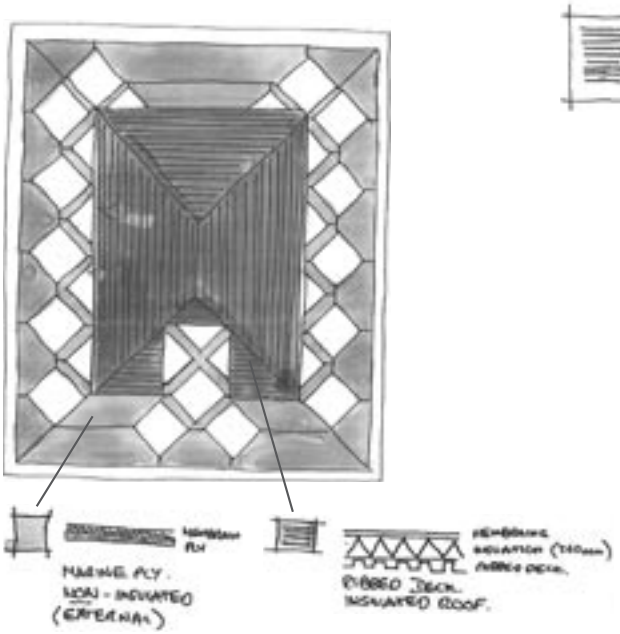
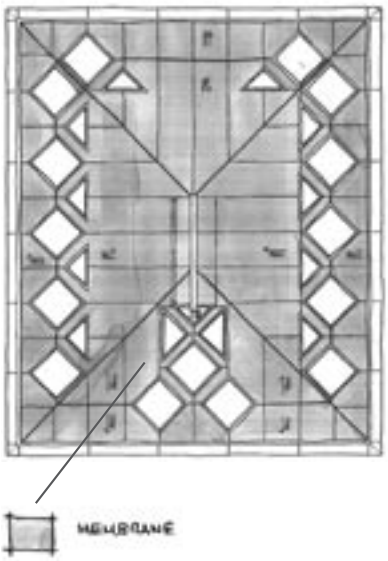


Fig 9: Roof Scope – Surface Finish



Soffit Lining Ceiling Panels

Arup Associates carried out the basic design for the primary steelwork before SAS were on board. This was modified with assistance from SAS to coordinate with the requirements for the cladding and roofing elements and to accommodate the secondary steelwork that formed the 'skeleton' of the structure (Fig 10). The secondary steelwork was designed in conjunction with SAS to fully integrate with the finished cladding and roofing works.

This gave the fixing points for the individual panels, which were then attached to the steelwork using adjustable L-brackets (Figs 10–12). These were aligned using lasers, effectively de-skilling the panel installation. The panels were then mounted to the brackets using self-drilling fixings (Fig 13).

Each module of the roof is made up of four panels that are fixed together using a top hat detail (Fig 14). Each panel was fixed to the module in a certain sequence to ensure accurate alignment (Fig 15).

A further element of the project brief was that there should be no flashings to the roof. SAS took responsibility for the single-ply roofing membrane that has gone on the roof's top surface.

Richard White comments: "*We wanted to make sure the interfaces between the membrane and metal were going to work. Various thicknesses of aluminium were examined at the design stage in order to assess how they would resist any wind loading. In the end, 2mm thick panels were used throughout, as it wasn't worth having different panel thicknesses inside and out.*"

Fig 14: Typical Soffit Face Panel Plan

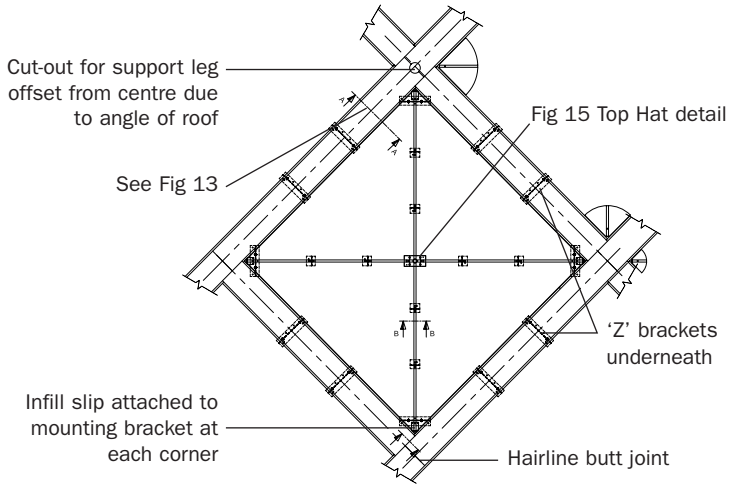


Fig 15: Typical Top Hat Detail

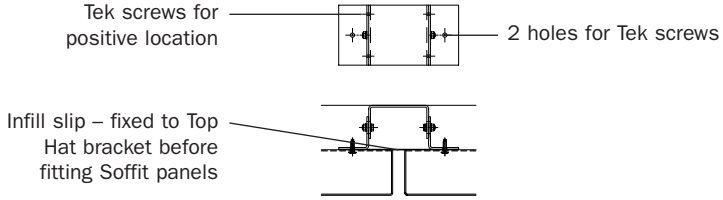


Fig 10: Steelwork Onsite

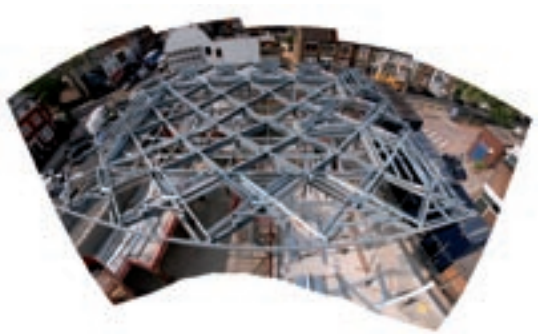
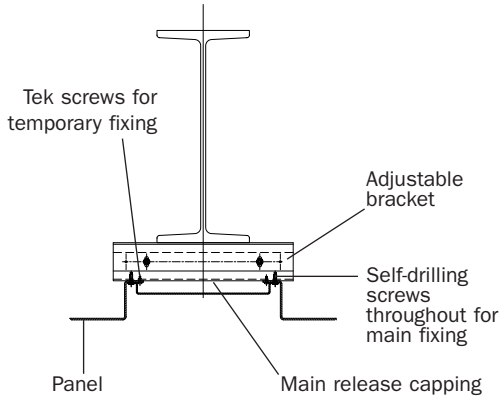


Fig 11: Installation Onsite

Fig 12: Installation Onsite

Fig 13: Typical Panel Joint Support Detail



Skylights and Solar Shading

The external canopy has integrated skylights allowing natural daylight to enter the building and SAS manufactured aluminium solar shading blades within the southern skylights helping to diffuse the sun's direct rays (Figs 16–17).

The skylight and solar shading integration was the most challenging. Skylights were punched through the overhanging section of the roof but the process was made more complex because the roof's upper surface was not parallel to the soffit underneath.

Richard White says: "*We had to create a trapezoidal tapering detail where the membrane folds down into the lightwell and attaches to the aluminium cladding around the inside of the rooflight.*" Anodised aluminium blades were fixed into the lightwells to provide solar shading (Fig 18).

Canopy Perimeter Nosing Feature

Using a support bracket fixed to the end of the structural steelwork a nose profile was fixed in two parts: upper profile panel and underpanel. The resulting joint detail also forms a weathered drip (Fig 19).

Finished Project

Will Wimshurst is pleased with the results: "*The underside of the roof floats above the wall revealing the warm heart of the building. Once inside, the roof shields views of the hospital, whilst allowing the building to be flooded with natural daylight*" (Figs 20–22 on back page).

Fig 16: Skylight & Solar Shade Detail

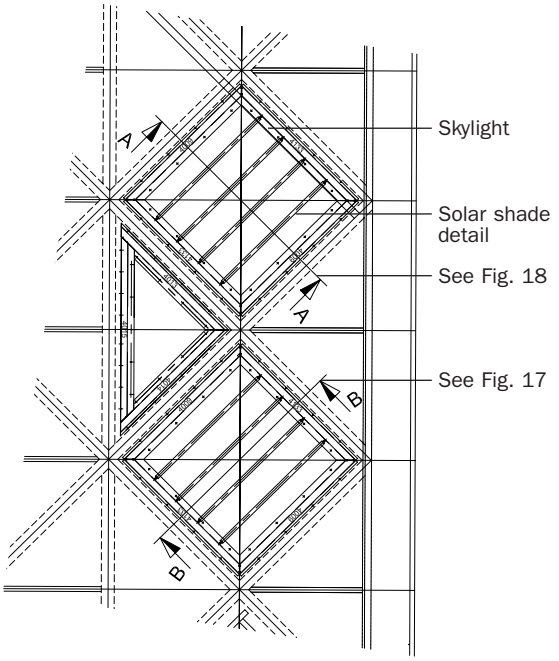


Fig 17: Skylight & Solar Shade Detail

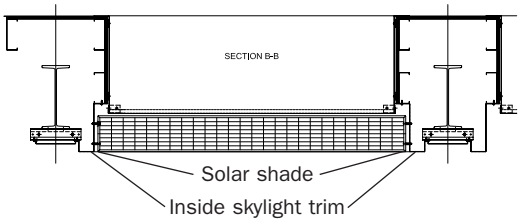


Fig 18: Skylight & Solar Shade Detail

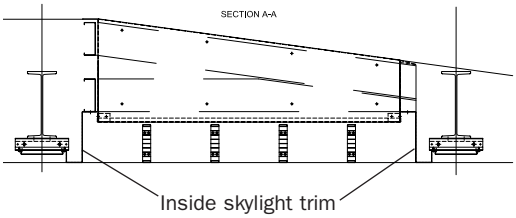
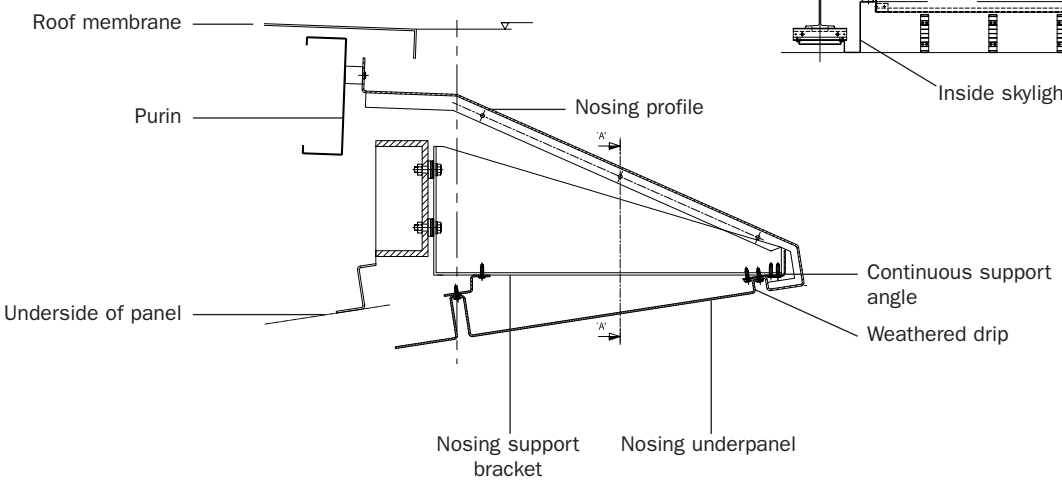


Fig 19: Canopy Nosing Detail



Technical Information:

Fig 20: Section drawing A

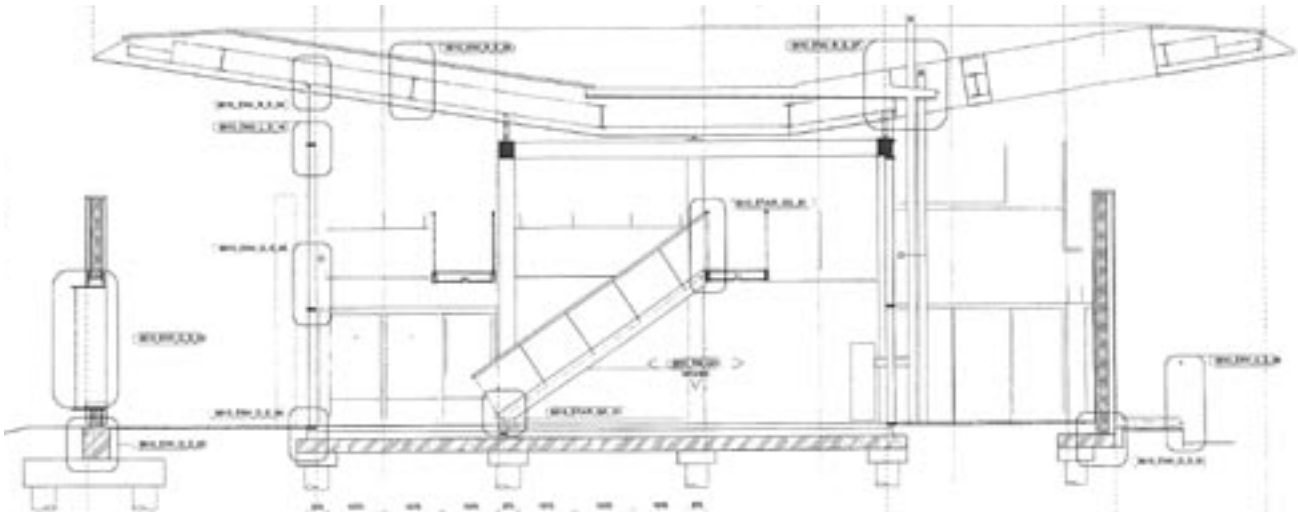


Fig 21: Section drawing B

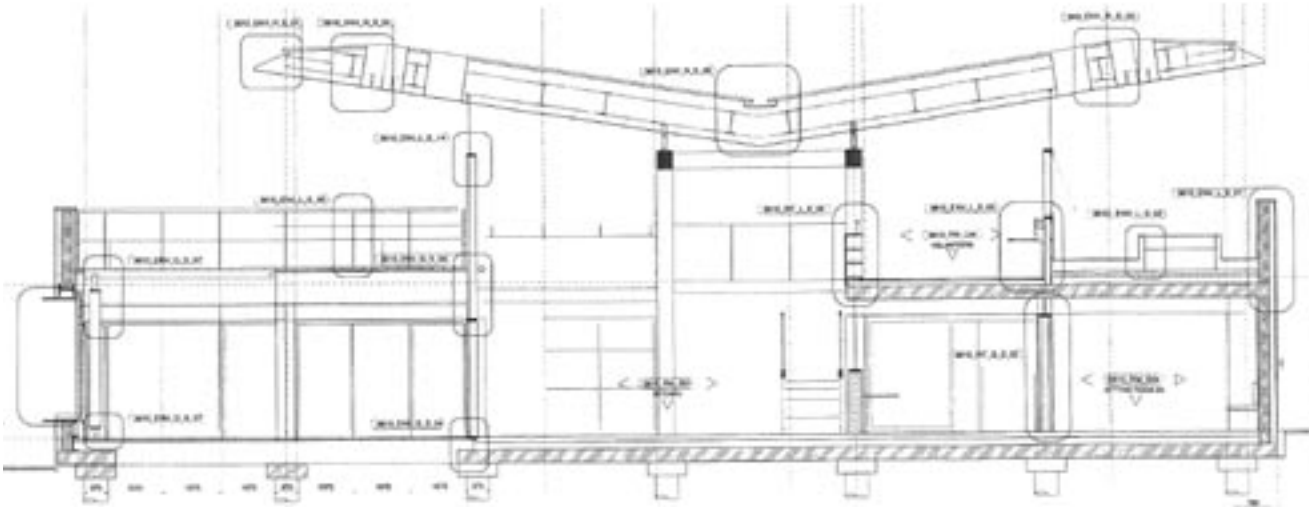
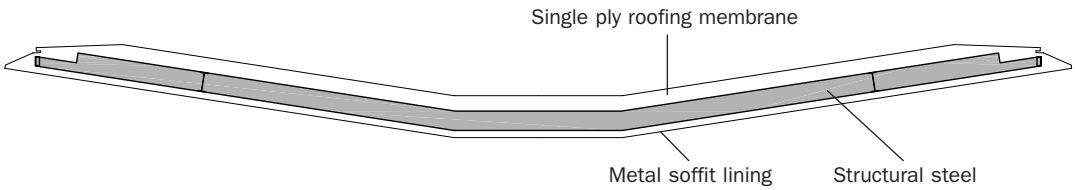


Fig 22: Section drawing



SAS International, 31 Suttons Business Park, London Road, Reading, Berkshire RG6 1AZ
Tel: +44 (0)118 929 0900 Fax: +44 (0)118 929 0901 www.sasint.co.uk

All Information and details in this Leaflet are correct at time of going to press.
Published by SAS International. All rights reserved. Copyright © 2009