

Metal ceilings offer exceptional life span and minimal maintenance costs.

Ceiling systems for modern hospital design

With hospitals requiring seven times more services than office buildings, suspended ceiling systems offer an ideal solution for the healthcare environment; they provide a durable hygienic option that provides accessibility for soffit-mounted MEP void services to be maintained. But with hospital design and aesthetic appearance being major considerations for Middle East facilities, **Malcolm Stamper**, SAS International, looks at what considerations need to be taken into account when specifying such ceilings?

There is increased understanding and evidence that hospital design impacts significantly on patient recovery, as well as staff well-being and retention.

With the Middle East health sector growing quickly, such issues are also rising in importance. Related local standards are being reviewed and revised as needed, with one such set of improvements being made by the UAE capital Abu Dhabi.

The city's healthcare sector regulator, Health Authority of Abu Dhabi (HAAD) launched new healthcare facility design standards in January 2011. These cover the requirements for the design and construction of such facilities, plus prequalification of healthcare design consultants. All future healthcare facilities and the refurbishment of existing buildings must comply with these standards in order to be licensed for

practice. They are aimed at minimising potential medical errors caused by inappropriate design of the healthcare facility.

Good light, air quality and acoustic environment have all been identified as key internal elements in a healthcare facility and the type of ceiling installed can have a significant impact on these. The World Health Organisation, for example, recommends that continuous sound levels in patient rooms should not exceed 35dB. However, several studies in the USA and UK have found that continuous background noise levels are commonly in the range of 65-80 dB. High levels of noise have been found to increase stress levels, reduce sleep quality and degrade speech intelligibility, thereby inhibiting patient recovery and reducing staff productivity levels.

Here we explore the use of metal ceiling

solutions in a healthcare environment taking into consideration maintenance and acoustics through to operational needs.

Metal ceilings – the benefits

When hard, sound-reflecting surfaces are used for ceilings this can reflect any noise, causing it to travel long distances and creating nuisance where multiple reflections converge. The creation of such poor acoustic conditions can be alleviated by installing high-performance, sound-absorbing ceilings. While mineral fibre ceilings are often promoted as offering the best acoustic control, the new metal ceiling designs available from manufacturers can offer equally good results through the use of perforations and/or the inclusion of acoustic pads.

Metal ceilings also offer the sophisticated look desired by Middle East clients and are available in a variety of finishes that help to enhance the perceived value of a building and perception of the internal environment by staff, patients and visitors alike.

Metal ceiling solutions can be designed to incorporate other elements of building services such as lighting apertures, PIR Sensors, sprinklers, CCTV.

These ceiling solutions allow ease of access for essential maintenance of integrated building systems.

In addition, air movement between the ceiling void and the main space can generate unsightly staining at the interfaces of a mineral fibre ceiling. A quality metal product that has been properly detailed will not suffer from such pattern staining or air movement defect.

The finish on a ceiling can also impact significantly on the diffusion of light around a space. SAS International has recently launched a low gloss finish that provides a plasterboard effect and diffuses light throughout a room without any unintentional light reflection from internal or external sources.

Operational benefits

One of the points covered in the new HAAD standards is that of hygiene. The standard states that all exposed ceilings and ceiling structures in areas occupied by patients or staff must be finished so they are “readily cleanable with equipment

routinely used in daily housekeeping activities”. A key benefit of metal ceilings is their ease of cleaning, an important factor in both the control of infection and the ease of effective maintenance. All that is required is simple washing.

Most non-metal ceiling systems are manufactured from porous, liquid absorbent materials with a form of paint sealant. On close examination, especially

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after the cutting of service perforations and accidental damage during the construction period, product claims regarding cleaning characteristics are significantly inhibited and become poor in comparison to a powder coated painted metal ceiling product.

In addition, recent advances mean that metal ceilings can now be provided with anti-bacterial coatings that are applied during manufacture. Anti-bacterial coatings, such as SAS AB, effectively inhibit the growth of micro-organisms and control potential risk when used in conjunction with routine cleaning procedures.

One of the most persuasive arguments for specifying metal ceilings is the exceptional life span and minimal maintenance costs. With life cycle costing becoming an increasingly important part of the design process in the Middle East, the ongoing operational costs of every product in a

building must be justified at the earliest stage of the procurement process. The facilities management (FM) of the buildings is also increasingly considered at this stage, with FM operatives now often involved in the selection process and generally seeking long-life products with ease of cleaning and general maintenance.

The lifespan of SAS International metal ceilings in normal interior conditions is in excess of 25 years; whereas the industry consensus is that mineral fibre ceilings would be unserviceable after only 10-15 years. In hospitals, maintenance of the many services requires the ceiling void to be regularly accessed, which results in high demands on the durability of the ceiling. Metal ceilings are polyester powder-coated and are not susceptible to the paint chipping and accidental damage that is normally asso-

ciated with mineral fibre panels. They also have a high level of scratch resistance and do not need redecoration during their expected lifespan.

Maintenance considerations

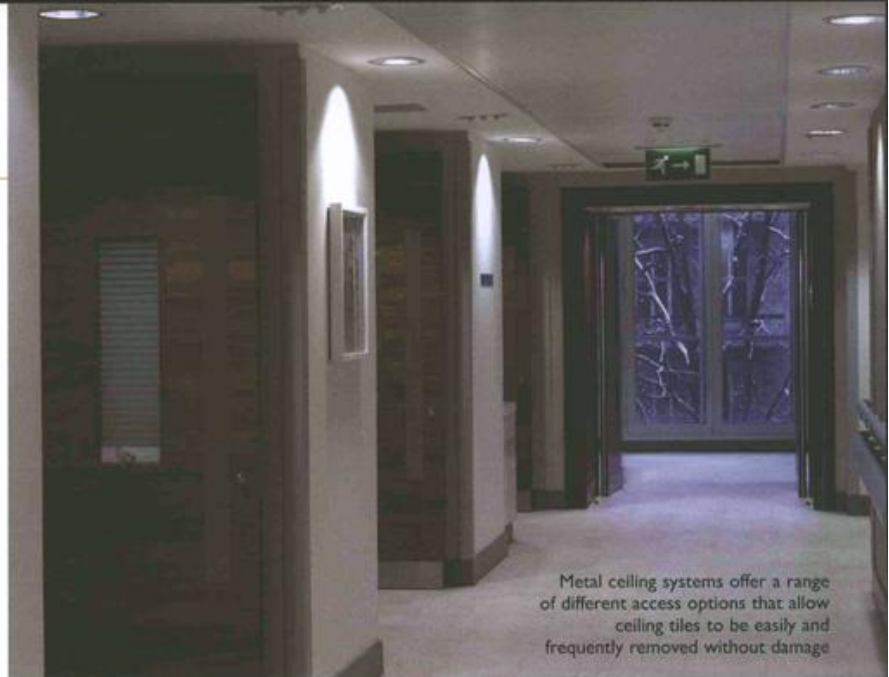
Within a hospital environment there are specific performance criteria that are of increased importance in different areas. While access to the ceiling void is important in all areas, as the major MEP service routes are generally above the corridor ceilings, accessibility is of prime importance in these areas.

The maintenance of MEP services requires the ceiling void to be regularly accessed in numerous positions, which can result in high demands on the durability of the ceiling. Metal ceiling systems offer a range of different access options that allow ceiling tiles to be easily and frequently removed without damage, reducing the risk that general maintenance can cause to the long-term life of a product.

A downward demountable solution with hinge and slide facility to maintain the tile within the ceiling plane is one of the most popular options. This system means that tiles will not be physically removed from the supporting grid and are therefore less susceptible to damage. The facility to slide the tiles along the grid allows the tiles to concertina together to allow access to large areas of the ceiling void.

New to the market is a Double Hook System which means metal ceiling panels and rafts can be demountable from either side allowing greater speed of installation and ease of access for essential maintenance. Total access to the ceiling void and services is provided with the ceiling tiles ability to pivot down either side to enable free access for ongoing maintenance. The practicality of a Double Hook System makes it suitable for environments where regular corridor service access is required, such as hospitals.

Alternatively, plank systems with similar hinge-down mechanisms - where the tiles are supported only on two edges - are also popular; or a traditional plaster margin can be simulated by using plain tiles at the perimeter and full-sized central access tiles. In other areas a lay-in tile with a regular edge that is demountable using a life-and-tilt method is generally sufficient.



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Metal products offer an inert and inherently hardwearing surface, making them both hygienic and a low-maintenance option.

Sound services

Sound also has a tendency to reverberate down corridors, therefore acoustic control is of great importance in these areas. Such acoustic control is achieved through the use of perforations and/or the inclusion of acoustic pads. In these cases, attention must be paid to the detailing of the MEP products and systems incorporated into the ceiling plane as the acoustic performance of the ceiling can be compromised if care is not taken.

Acoustic separation between rooms is also a key concern in hospitals, particularly within ward and accident and emergency areas. Traditionally such separation was achieved by the use of full height partitions, however, this does not offer cost-effective long-term flexibility, as to accommodate changes the reintroduction of wet trades are needed in future refits. Flexible partition head fixing now offers the ability to remove and relocate partitions without having to compromise acoustic performance and aesthetic appearance.

Meeting operational needs

Within areas where high levels of hygiene and infection control are required, such as operating theatres, clean rooms and Intensive Care Units, key points to consider include the use of larger tiles to reduce the number of joints and in some cases the use of non-perforated ceiling tiles. SAS International has developed metal ceiling systems that address such increasingly rigorous hygiene requirements while maintaining access to the ceiling void and offering acoustic control.

Metal products in particular can play a large role in ensuring sustainable construction and reducing the overall energy and environmental impact of a project.

In dust-free areas that need acoustic absorption encapsulated, acoustic pads in cassette form with reinforced aluminium foil stop air movement through the tiles and ensure that during normal maintenance there is no release of particulate matter through handling. Within humid environments the damaging nature of moisture can be combated by coating both sides of the ceiling with polyester powder coating, thereby satisfying the most stringent corrosion tests.

Sustainability

Metal products in particular can play a large role in ensuring sustainable construction and reducing the overall energy and environmental impact of a project. Steel can be continuously recycled without any loss of value or properties.

Metal Ceiling systems manufactured by SAS International for example have a lifespan of more than 25 years while withhold a residual value for clients. At the end of their life they can be recycled into new steel without any loss of properties ensuring environmental sustainability and can count towards LEED (Leadership in Energy & Environmental Design) environmental credits or the Estidama Pearl Rating System.

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