

# building construction design

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August/September 2019

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Cover image: RMIG  
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# Delta Membrane Systems Limited expands its Waterproofing Systems with BDA Certified DualProof

Delta Membrane Systems Limited is delighted to announce Dualproof has been certified by KIWA (European Institution for Testing, Inspection and Certification).

The BDA Agrément® process is designed to underpin the 'fitness for purpose' of products destined for the European construction market. Products are examined and rigorously tested following precise installation instructions.

It is one of the UK's major authorities recognised by building control, government departments, architects, local authorities, specifiers and industry insurers.

DualProof is a Type A waterproofing pre-applied, sealed two layer highly flexible PVC membrane laminated with a nonwoven PP-fleece, composite waterproofing membrane which forms a permanent mechanical bond with freshly poured concrete preventing the tracking of water between the waterproofing membrane and the concrete sub-structure.

DualProof is a robust, flexible and high-performance waterproof, damp proof, gas proof membrane and gives concrete protection against chemicals. Tough and resistant, quick and easy to install, high compound with shear strength. DualProof can be installed in every season, regardless of temperature and weather condition. One of the many advantages to DualProof is that it prevents any lateral water migration between the waterproofing membrane and the structural concrete.

## Quality assurances

The BDA Agrément strengthens Delta's DualProof brand. BDA Agréments are a mark of excellence, ensuring products are safe, high quality, reliable and regulatory compliant. Products are examined and rigorously tested following precise installation instructions. Agréments confirm the compliance and durability of DualProof under the specified method of installation. The BDA Agrément® process considers:

- European product standards, relevant codes of practice and test reports
- Independently verified product characteristics



- Factory production control
- Annual verification procedures
- Points of attention for the specifier and specific details
- Installation procedure
- Compliance with Building Regulations and any other required standards
- Boundaries of use (restriction to geographical scope)
- Validity

A visible sign of conformity is DualProof's CE Mark. The CE Mark denotes conformity that DualProof satisfies European Laws relating to European CEN Standards.

"Our approach to structural waterproofing utilises research and strategy as the foundation to all design ideas and rationale. Every waterproofing, damp proofing, ground gas or flood resilience project is unique, but all start with one thing in common – the requirement of waterproofing design specialists. The only way to solve a problem is to understand it from every angle. Luckily, we've got a proven process to quench our insatiable curiosity. The BDA certification of Dualproof epitomises the quality in our approach to structural waterproofing solutions."

01992 523 523 [www.deltamembranes.com](http://www.deltamembranes.com)





# TROX air conditioning solution perfect for London project

For the prestigious redevelopment project at 21 Dartmouth Street, London, a premium occupant experience was essential to complement the enviable location. The installation of a TROX air conditioning solution, including TROX X-CUBE air handling units (AHUs), and X-AIRCONTROL modules, with the X-AIRCONTROL Zonemaster, is enabling the building to achieve outstanding levels of efficiency alongside elite levels of comfort.

The 21 Dartmouth Street building is situated in the heart of St. James's Park, between Buckingham Palace and the Palace of Westminster, a short stroll from Sloane Square's series of specialist boutiques. The address features a magnificent new rooftop, a majestic lobby and modern business amenities befitting its architectural grandeur. A total of 53,000 sq ft of office space is offered across nine floors, naturally commanding an extremely high degree of occupant comfort.

When specifying the air conditioning system for the building, the main contractor, mac-group, and their M & E services consultants, Max Fordham, required a solution which would combine optimum comfort conditions with outstanding environmental performance. The solution, provided by air conditioning specialists TROX UK, incorporates precision-engineered air handling units, and provides the latest VAV capability featuring advanced zone control technology to deliver best-in-class energy efficiency and occupant comfort.

At the heart of the system are two TROX X-CUBE air handling units. Each X-CUBE incorporates TROX's integrated controls package, whereby damper actuators, pressure, temperature and humidity sensors as well as heat recovery control and fan control strategy are linked into the X-CUBE digital control network. Both units incorporate thermal wheels with pre-programmed strategies, selected to meet



BVU efficiency in accordance of the ErP 2018 standard. This is the highest level of smart technology, combining pre-set algorithms, developed by TROX, to facilitate rapid reactions to changes in building load.

01842 754545 [www.troxuk.co.uk](http://www.troxuk.co.uk)

# Vicaima bring an added dimension to development

The village of Bramcote in Nottinghamshire, has been a popular place for home owners with discerning taste since Victorian times, so it's little wonder that is now attracting fresh interest for twenty first century living with the select Baxter Green development by William May. Envisioned by internationally recognised Leonard Design Architects and set in the former gardens of Grade II Listed St. Johns College, Baxter Green introduces

outstanding low-density luxury housing surrounded by tranquil countryside. Once complete Baxter Green will have 40 residential properties varying in sizes from apartments to five-bedroom houses, with ample sized living space and all fitted with Vicaima quality interior doors.

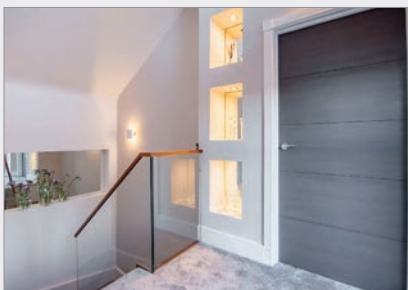
Long established and regional house builder William May Developments have used Vicaima's Dekordor 3D finished doors throughout, alternating within particular house types, between a textured grey face with horizontal decorative grooves and a rich Dark Cedar finish.

Dekordor 3D adds a new dimension to interior design, with highly attractive horizontal grained textured laminates in a range of on-trend and contemporary colour tones. This durable range can be further enhanced, with the addition of glass panel doors, face grooving or even metallic inlays, to create individual statements for apartments or traditional homes. All of the Dekordor 3D



collection come in a choice of cores and can be supplied with added performance including fire doors which are compliant with the most rigorous fire door regulations, acoustics and security doors where required as part of a complete door and door frame kit.

01793 532333 [www.vicaima.com](http://www.vicaima.com)



# UL and Wintech testing and certification combine to provide best in class

**U**L, a global safety science leader, announces the acquisition of Wintech Testing and Certification, a Telford, U.K.-based firm that provides testing and certification services to architects, building owners, manufacturers and others across the built environment community. The acquisition strengthens UL's expertise in the field of building envelope evaluation, testing and certification, and offers greater access to global markets.

Wintech Testing and Certification is a privately-owned firm that offers testing and certification services to the building envelope market. Wintech Testing and Certification's unique laboratory facilities are among the largest in the U.K. and are accredited by the United Kingdom Accreditation Service (UKAS). Wintech Testing and Certification also holds accreditation from UKAS as a certification body operating several schemes involving certification of windows, doors, curtain walls, and rainscreen cladding. Over the last twenty-five years, Wintech Testing and Certification has contributed to many high-caliber projects throughout the United Kingdom and Europe.

"UL and Wintech Testing and Certification have a shared mission and complementary businesses. We are relied upon by the building materials community for the services and knowledge that they need to enhance public safety, meet regulatory demands, protect brand value and successfully access the global market," said Kevin Faltin, vice president of UL Building and Life Safety Technologies division. "Working as one, UL and Wintech Testing and Certification will continue to grow the vision that has brought us together, that of becoming a global leader in the field of building envelope evaluation, testing and certification."

Wintech Testing and Certification's employees will join and strengthen UL's existing building envelope team. The group's building science thought leadership and global center of excellence will be based out of the Telford, U.K. headquarters.

"We are excited by this opportunity to join forces with UL and provide best-in-class services to the building envelope community," said Gailord Nepp, former managing director of Wintech Testing and Certification and now European business development



manager - Building Envelope Services for UL. "Our group's shared reputation for delivering industry leading services and in-depth industry knowledge will continue to strengthen our position as leaders in the field of building envelope evaluation, testing and certification. Joining forces with UL will allow us to significantly accelerate our growth and access to global markets, in addition to providing our clients with a broader range of complimentary services and expertise. Clients can rest assured that customer service and technical quality will remain our top priorities, and that our newly integrated capabilities will deliver even



more value."

The transaction closed on June 28, 2019. Terms of the acquisition were not disclosed.

01952 586580 [www.wintechtesting.com](http://www.wintechtesting.com)





# A decade of heating maintenance support

Managing the varying heating requirements of an average family can be hard enough, but imagine the headache involved when the heating for 238 properties is supplied via a communal, gas-fired, heating system. This is the scenario facing the management team of Courtlands Estate in Richmond, Surrey. This is a large, private estate comprising 11 residential buildings. Of these, half were built in the 1930s and retain much of their distinctive style, with the remainder being constructed in the 1960s. The majority of the flats are in private ownership on long-term leases whilst a few are retained and managed by the Courtlands Estate company.

Ken Hassan, Company Secretary, and latterly Estate Manager, explained more; "The estate has a communal, gas-fired, heating system which is housed in four boiler rooms and which serves all of the buildings, via a 6" district heating main. There are 15 commercial-size boilers, more than two dozen pumps of various sizes, and miles of over ground and underground pipework. The responsibility of the estate team is to maintain reliable communal services for heating and hot water, whilst dealing with the concomitant issues of repairs and maintenance that arise with plant of our complexity and size."

In 2009, the maintenance contract for the heating system was put out to tender and the successful provider was Southern Maintenance Solutions (UK) Ltd, (SMS). Over the intervening years, SMS has provided comprehensive maintenance and servicing

which can be split into three categories:

- a) The provision of reliable regular servicing of the major items of heating plant e.g. boilers, pumps and burners.
- b) Periodic major contract work including the replacement of ten old boilers.
- c) Dealing with service issues, both minor issues and those that are more urgent – e.g. a plant outage, where a prompt service response, seven days a week, is imperative.

Martyn Neves, Operations Manager at SMS, explained more about some of the specific issues the company has faced in the last decade. "A site like Courtlands Estate has two main requirements. The first is when there is a problem with the heating and our main challenge then is often finding the source of the problem. The solution is often relatively straightforward but locating and repairing a fault, say in the pipework, can be difficult, especially if we require access to several separate flats in order to deal with it. Secondly, as plant and equipment ages, regular and thorough servicing is important to make sure that it is kept in good condition throughout its working life."

Work on a site of this size and nature is required throughout the year, with the core element being a programme of scheduled quarterly maintenance. "We don't anticipate refurbishing any of the other boiler houses in the next few years, but this year we have a programme of replacing several old, belt driven pumps with new inverter driven pumps,



which are more efficient and should be more economical to run. We will also be replacing the gas booster sets in the main boiler plant room together with upgrading one of the two burners, again increasing efficiency and saving costs," explained Martyn Neves. "Otherwise we will be carrying out our routine maintenance of all plant rooms, together with water treatment and servicing of the BMS. We'll also be continuously renewing radiator valves as and when required."

Ken Hassan said: "Over the years of working with SMS, they have established a good understanding of our heating system. Their regime of regular and thorough maintenance has helped us to provide a reliable service to residents, with downtime kept to a minimum, which is very important. We also value their advice and guidance when it comes to considering future works; we consider pro-active maintenance very important, and their recommendations about this and plant replacement are always given careful consideration."

Each of the leaseholders on the estate holds a share in the freehold company that owns and manages the site. The elected Board of Directors appoint the staff who run the affairs of the estate from the on-site office. "The shareholders want the most cost-effective servicing of the estate's heating plant while having the confidence that when the weather turns cold, each and every one of the residents will be as comfortable as possible in their own homes. SMS has been able to help the estate meet these objectives and our satisfaction with the service they have provided remains very high," concluded Ken Hassan.

01635 33363 [info@smsmaintenance.com](mailto:info@smsmaintenance.com)



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### McAvoy to showcase latest advancements



The McAvoy Group, one of the UK's leading offsite specialists, will be presenting its full range of offsite solutions and latest innovations at Healthcare Estates 2019. Delegates will also have the opportunity to experience the Group's award-winning

virtual reality technology at the event. A team of offsite healthcare specialists from McAvoy for both permanent and interim hospital buildings will be available throughout the event to assist health service providers, architects and specifiers looking to expand capacity more efficiently, to meet the increasing demand for patient services.

[www.mcavoygroup.com/healthcare](http://www.mcavoygroup.com/healthcare)

### Bathroom pods for UK's first vineyard hotel



Offsite Solutions, a bathroom pod manufacturer, has provided high specification bathrooms for the first vineyard in the UK to open a dedicated hotel. Llanerch Vineyard Hotel is located in the Vale of Glamorgan near Cardiff and offers five-star accommodation, providing a gateway to tourism in Wales. The hotel owners specified two pod designs from Offsite Solutions' extensive library of bathroom solutions. Commenting on the project, Ryan Davies, Director of Llanerch Vineyard Hotel, said: "Pods were recommended to us as being faster on site and good quality. We think the new bathrooms are just fantastic and exceptional quality."

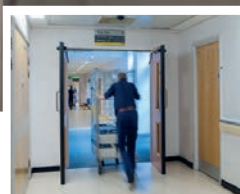
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## A Healthy Choice for Entrance Solutions

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record is the largest supplier, installer and service provider of automated pedestrian doors in the UK, offering door systems for healthcare environments including hermetically sealed sliding doors, where the highest hygiene requirements are essential.

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## The ideal background for wetroom construction

**M**anufactured with an extruded polystyrene foam core and a special coating on both sides, JACKOBOARD® construction boards form an ideal base for tiling in wetrooms. The surfaces of the JACKOBOARD® system provide an extremely strong bond and can be used on virtually any substrate. The boards are moisture resistant, waterproof, thermally insulating, lightweight and very strong.

JACKOBOARD® high performance construction boards provide the flexibility to meet modern requirements in wetroom design. Recent changes in British Standards for tiling require the wider use of more appropriate materials for construction, and for receiving tiles in water sensitive and wet areas. This has increased the demand for the JACKOBOARD® range in new build applications as well as in renovation works.

JACKOBOARD® products including CANTO angled elements, WABO bath panels and FLEXO boards allow the bathroom

designer to create customised dream bathrooms. The JACKOBOARD® range can form the basis for a tiled finish, as well as wallpaper, paint or plaster. So any bathroom can be designed with its own individual style.

Due to their robust core made of extruded polystyrene foam (XPS), the JACKOBOARD® PLANO construction boards and the wider product range are all lightweight and waterproof – a key benefit for bathroom new build and renovation.

JACKOBOARD® also makes installation simple and easy; the construction boards, FLEXO boards, bath panels and angle elements can be trimmed to the desired dimensions easily with standard tools. Another key benefit of the construction boards is that their excellent insulation values make them ideal for thermal insulation.

High performance, high quality drain kits, in both linear and point drain styles, are available alongside many variations of shower tray sizes and shapes.



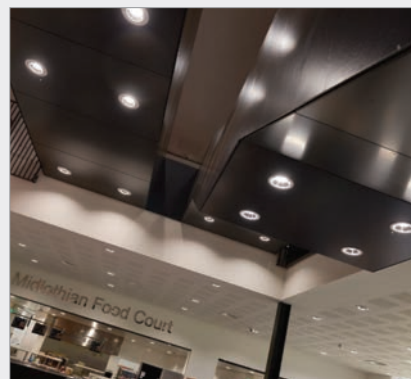
01204 221089 [www.jackon-insulation.co.uk](http://www.jackon-insulation.co.uk)

## Luceco, McCann Electrical and Ameresco partner to relight Edinburgh College

**L**uceco has recently supplied an energy saving LED lighting upgrade to several campuses at Edinburgh College including Sighthill, Milton Road, Granton, and Midlothian. To date there have been over 6000 energy saving LED luminaires installed through a partnership with Ameresco, Luceco and McCann Electrical.

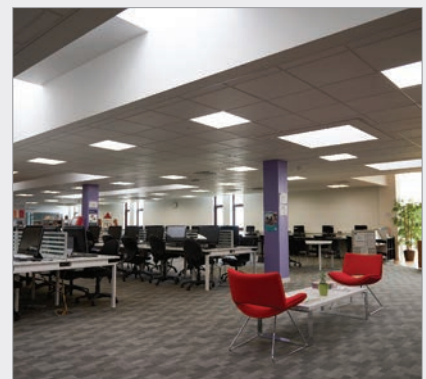
Ameresco is a leading renewable energy and energy efficiency company offering ESPC-funded energy solutions for public and private organisations. ESPC (Energy Saving Performance Contract) is a third-party financing mechanism that allows building owners to fund energy-saving upgrades through savings made from future utility bills. Ameresco chose Luceco as their preferred lighting manufacturer for Edinburgh College.

Platinum LED Downlights were installed in the sports and health facilities at Milton Road along with open plan communal spaces such as cafeterias and foyers, offering possible running cost savings of up to 80 per cent.



LuxPanel luminaires were installed into seminar rooms and lecture theatres, high efficiency Backlit LuxPanels boasts a market leading efficacy of 152 Lm/cW, providing non-obtrusive but effective lighting in high traffic areas and improved glare control.

Edinburgh College is committed to a more energy efficient and cost-effective future



throughout their estate, LED lighting from Luceco being a contributing factor, as well as maintenance on lighting provision being substantially reduced due to the elimination of re-lamping of old luminaires.

01952 238 100  
[www.luceco.com](http://www.luceco.com)

# The quiet fun solution

The London Gunnersbury Park Museum is a perfect example of how high-performance acoustic solutions can solve the problem of noise in public and leisure places. As design trends continue towards minimal furniture and hard surfaces, it becomes increasingly important to reconcile aesthetics with personal comfort.

As part of its Heritage Lottery Funded redevelopment, London's once-neglected Gunnersbury Park Museum has been transformed. It now boasts new gallery and learning spaces as well as a brand-new exhibit telling the stories of local people. A new addition to the Regency Mansion is the pavilion, originally designed to house both the catering facilities and horse-drawn carriages that are a large part of the Park's heritage. When considering its redesign, the architects wanted to create a space that would provide a hub for the Park. It needed to be a space that emotionally connected with visitors to the Museum and regular users of the Park.

With this in mind, the designers decided to specify Troldekt panels. With their natural



look and feel and acoustic properties, they were the ideal solution for the ceiling. It allowed them to use harder surface materials elsewhere to suit the architecture of the pavilion.

Path Design says, "We needed to ensure that we addressed what could be a relatively hard interior because of the heavy floors we needed for high traffic catering and the predominantly glazed elevations. As such, we looked to soften acoustically the space to reduce the

background noise generated by the open kitchen and coffee machines, along with the general noise created by visitors."

Troldekt panels are commonly specified throughout the UK and Europe to improve the interior acoustic environment. They offer high sound absorption, high durability, natural breathability and low cost life cycle performance in addition to inherent sustainability.

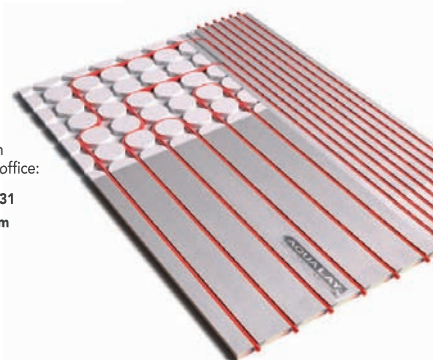
01978 664255 [www.troldekt.com](http://www.troldekt.com)



## The Overlay Panel That Insulates & Dissipates.

Heat transfer overlay panels for waterbased underfloor heating systems

Aqualay is a high performance pipe carrier panel designed for use with water based underfloor heating systems. Aqualay panels are produced with pre-set pipe channels set 100mm, and 150mm centres and comprise of 3 different panel options; Aqualay Master Panel, Aqualay Universal Panel and Aqualay Multiflow Panel. Each panel offers uniquely designed benefits that make Aqualay a superlative system for underfloor heating. Running through the body of each Master Panel is a highly effective heat transfer core, manufactured from a special conducting cement compound; designed to transfer heat from the water pipes to the panel surface. The patented Master Panel is unique in structure; providing insulation against downward heat loss, whilst at the same time effectively transferring heat from the water pipe to the floor surface.



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# Schöck Isokorb for largest UK Passivhaus development

**C**laimed to be the UK's largest Passivhaus development to date and Camden Council's largest community project, Agar Grove Estate is undergoing a major regeneration, due for completion in 2025. It will deliver 493 high-quality homes for existing residents, with ground floor maisonettes and apartments above with full width balconies.

As the project is to Passivhaus standard, the high levels of insulation mean exceptional levels of airtightness; and a critical requirement is the avoidance of thermal bridging. A frequent cause of increased heat and energy loss, condensation and likely mould growth.

The risk of thermal bridging is at connectivity points involving the balconies and parapets. And one of the most effective countermeasures is the Isokorb range of structural thermal breaks from Schöck. The Isokorb type used for the balconies has been awarded the "low thermal bridge construction" certificate by the Passivhaus



Institute in Darmstadt and transfers both negative moments and positive shear forces.

The conventional insulation method for parapets is to wrap the perimeter of the wall with an insulation barrier. However the Schöck Isokorb designed for parapets avoids the need for wrapping. It is more cost-effective than conventional wrapping and

its 120mm insulation dramatically reduces heat loss.. Also there is no risk of any additional thermal bridging through balustrade fixings, it requires no maintenance and no expensive restoration due to waterproofing problems.

In addition to the Isokorb types used at Agar Grove, the comprehensive Schöck range also offers solutions for concrete-to-steel and steel-to-steel situations. When any Isokorb product type is incorporated into residential buildings, the required fRsi value is always comfortably met. Products meet full compliance with the relevant UK building regulations, have NHBC approval and offer LABC Registration. There is also the security of independent BBA Certification.

Contact Schöck or visit the website for a free copy of the Schöck Thermal Bridging Guide; the Schöck Specifiers Guide and to view the full range of downloadable software.

01865 290 890 [www.schoeck.co.uk](http://www.schoeck.co.uk)

# Harrow School has IAAF-standard running track

**T**he re-built athletics facilities at Harrow School included an IAAF-standard running track, facilities for long jump, high jump, discus and all the main athletics events, plus a water jump for the steeplechase and an area for the pole vault event – a relatively rare feature in UK school athletics facilities.

Hauraton SPORTFIX components installed at the Harrow School sports complex include; drainage channels around the edge of the running track, sand

traps and soft kerb edging around the long jump pit and a water jump kit on the steeplechase track.

At any time in the UK, rain can stop play and on tennis hard courts the build-up of water can take some time to run away if attention has not been paid to the surface water drainage requirement. At Harrow School tennis courts this is not a problem as a discreet drainage channel run located just below the net efficiently drains away any excess rainwater.

Over the years Hauraton have built up a fund of knowledge, second to none, of how to drain sports areas be they soccer grounds, athletic tracks or tennis courts.

Other components in the SPORTFIX range include; Electrical distribution shafts, Service channels for cable management, pitch dish edging components and drainage channels specifically designed for artificial turf pitches.

01582 501380 [www.hauraton.co.uk](http://www.hauraton.co.uk)







# Roofing with extremely long wooden elements for an indoor swimming pool

German architectural office Auer Weber designed the roof structure for the new indoor swimming pool at the Sports Centre Cents in Luxembourg. The ceiling was built using extremely long wooden elements, extending up to 23.75 metres. This enabled the long-spans and the attractive design of the roof. The key for making this possible was using fast, light and green Kerto LVL (laminated veneer lumber) products produced by Metsä Wood.

The suspended floating wooden ceiling was structured with slim ribs and an above average web height. The structural design and calculations were done by Knippers Helbig engineers and the implementation was carried out by the wood construction company Holzbau Amann. Use of Metsä Wood's Kerto® LVL Q-panels made the desired roof appearance and the structure possible.

The dimensions of the roof are impressive. The goal of the architecture was to create a wooden rib ceiling with deep cassettes with

long spans to create the large spatial volume. The dimensional stability of the Kerto LVL web was a great advantage here. The structure was produced using the Kerto LVL web with a height of 1.1 metres and a thickness of only 75 millimetres.

Hendrik Pfeffinger, the project manager at Holzbau Amann, explains "We went beyond standards for the ratio of thickness and the height of the beams, so special solutions had to be established which would on the one hand meet the requirements of Knippers Helbig, while conforming to the structural analyses and approvals in Luxembourg." For the implementation of these slim dimensions, the Q-panels were virtually predestined for the job thanks to their high load-bearing capacity.

The wooden roof elements were prefabricated at Holzbau Amann's factory and delivered by extra-long trucks to the construction site. Although the elements are almost 24 metres in length, their installation



was quick and required only two carpenters on site. The end faces were finished off with end panels to finalise the appearance of the roof.

[www.metsawood.com](http://www.metsawood.com)

# University campus gets a facelift



The merger of two educational institutions involved an extensive buildingproject with conversions of existing buildings and the construction of a new one.

The newly constructed 'Building B' is clad with approximately 1,800 m<sup>2</sup> of perforated corten, manufactured and supplied by RMIG. The new building with its eye-catching facade gives the university an architectural identity and visibility in the streetscape and at the same time provide shade from the sun. The raw surface of the corten steel facade fits in well with the raw and edgy part of the city where the university is located.

01925 839610 [www.city-emotion.com](http://www.city-emotion.com)



## TECHNICAL CHARACTERISTICS

Raw material: Corten  
Pattern: R8T10  
Thickness: 2.0 mm  
Finishing operations: Bending

## METROPOL – UNIVERSITY COLLEGE COPENHAGEN

University, Copenhagen, Denmark  
Architects: KANT arkitekter

## Educational Copper

**N**ordic Brown pre-oxidised copper from Aurubis forms part of the restrained palette of natural materials defining the new St John's Primary School, Ealing, London, designed by Conran and Partners with detailed design by executive architects Gibberd.

Conran and Partners' idea for a new school grew out of their proposals for the ongoing regeneration of Green Man Lane estate. With an exchange of land, the existing school could remain operational while a new one was constructed. Configured as a three-storey structure, the new school building sits along the site boundary edge, creating a strong street form and conveying a mature learning environment while giving the school its own distinct identity.

The entrance is demarcated by a floating, oblique form – clad in Nordic Brown copper with defined vertical seams – informing the design detail throughout. A glazed corner

provides transparency and signifies both the main school entrance and the circulation axis through the building. The strong vertical emphasis of the street elevation will set the school apart from the proposed neighbouring residential components of the development.

A restrained palette of natural materials has been selected throughout the new school – from weathered buff brick to the Nordic Brown pre-oxidised copper – to reinforce the design narratives. These materials provide robustness and warmth, while blending seamlessly with the material palette of the wider masterplan for Green Man Lane estate.

Nordic Brown products are pre-oxidised at the Aurubis factory to give straightaway the same oxidised brown surface that otherwise develops over time in the environment. The thickness of the oxide layer determines the colour – either Nordic Brown Light or the darker Nordic Brown – and the darkening oxidation process continues in the natural environment.

Other Nordic Copper surfaces include Nordic Standard 'mill finish', Nordic Green and Nordic Blue are factory-applied patinas developed with properties and colours based on the same brochantite mineralogy found in natural patinas all over the world.



© Luke Hayes

Essentially, they enable designers to determine both the colour and intensity of patina for each project with 'living' surfaces: as well as a solid patina colour, other intensities can be created revealing some of the dark oxidised background material.

Aurubis copper alloys include Nordic Brass – also available pre-weathered – Nordic Bronze and the innovative Nordic Royal with a long-lasting golden colour.

01875 812 144 [www.nordiccopper.com](http://www.nordiccopper.com)

## Nordic Copper skyline crowns the new Ram Quarter

**T**he new Ram Quarter mixed-use development at the heart of the London Borough of Wandsworth is highlighted by its rooftop cladding of Nordic Green Living 1 pre-patinated copper, reflecting the site's industrial heritage.

Greenland Group UK, the developer of Ram Quarter, was keen that the site's material specification should help to reflect the history of the site and deliver high-quality design and long-term durability.

EPR Architects, the appointed architectural practice for the scheme, was tasked with ensuring that the development design complemented both the industrial character of the site and its transformation into a residential neighbourhood.

Inspired by old copper brewing vessels, the architects decided to clad the upper two floors of the tallest residential buildings in Nordic Green Living 1 copper. Adjacent to the old brewery complex, a playful vertical expression was added to one of the new

buildings – a nod to the industrial vats that were once housed on the site – raised from the ground, with softer rounded corners and vertically-ribbed profiled Nordic Green copper cladding.

In addition to Nordic Green, extensive Nordic Blue and Nordic Turquoise ranges have been developed. All these surfaces form an integral part of the copper and are not coatings or paint, and ongoing changes will continue over time depending on the local environment. As well as the solid patina colours, 'living' surfaces provide various intensities of patina flecks revealing some of the dark oxidised background material.

Other Nordic Copper ranges from Aurubis include Nordic Standard 'mill finish' and Nordic Brown pre-oxidised copper, offering lighter or darker shades of brown determined by the thickness of the oxide layer. A wide choice of Nordic Decor mechanically applied surface treatments is also available. Nordic Copper alloys include Nordic Brass – which



© Anthony Weller

can also be supplied pre-weathered – Nordic Bronze and the innovative Nordic Royal, an alloy of copper with aluminium and zinc, enjoying a rich golden through-colour which remains very stable.

01875 812 144 [www.nordiccopper.com](http://www.nordiccopper.com)





# SPORTFIX® components installed at redeveloped UCC Mardyke Athletics Track

Excessive rain water has to be removed quickly and reliably from sports fields and competition areas. The SPORTFIX® drainage channels and other components offered by Hauraton comply with the latest standards and also meet IAAF requirements. It is essential sports facilities are designed and equipped to prevent serious injury to sports people if falls or accidents occur.



The University College Cork (UCC) has redeveloped their Mardyke Athletics Track in Cork City, Republic of Ireland. The new facility is part of a €10 million budget included a new synthetic eight lane, fully floodlit, running track built to the IAAF standard with an additional 3720 m<sup>2</sup> (40,000 ft<sup>2</sup>) added to the original arena. The arena now includes an indoor 60 metre running track, a performance analysis suite, two additional gym areas with over 140 additional pieces of the latest gym equipment and three additional fitness studios.

Hauraton SPORTFIX® drainage channels with aluminium finishing edges were installed around the perimeter of the IAAF, 400 metre track and along its straight. A steeple chase water jump kit was also installed plus Hauraton SPORTFIX® Sand traps and soft edging were installed around the long jump pit.

Tim Connolly, Managing Director of Hauraton Limited points out, "Our SPORT-



FIX® range offers products that not only meet the requirements of the IAAF for athletic tracks, there are drainage components for artificial turf playing fields, service channels and retractable shafts for cable management with drainage systems for grassed football fields".

01582 501380 [www.hauraton.co.uk](http://www.hauraton.co.uk)

# Comar Launch the ECO LT Window & Door Systems

Comar profiles have thicker walls providing extra strength and durability for the British market, ensuring that Comar performs. Designed specifically for the British Market and offering a truly British engineered solution.

Comar ECO LT is a newly launched aluminium window and door system designed for the trade and installer market, where a competitive price yet the highest installed performance is required. Sightlines have been minimised whilst not sacrificing product performance. Large sizes come as standard from the same range of profiles.

With low U-values, energy ratings of A++ and Document Q compliance with Secured by Design status this is a feature rich system which guarantees a quality installation.

Comar ECO LT is a lightweight version of the ECO range, but the aluminium profiles wall thickness has not been sacrificed, ensuring guaranteed long-term performance. Due to Comar's robust British design the size

and weight limitations surpass the competition on a size by size basis.

**5Pi ECO LT - Aluminium Window System**

Comar 5Pi ECO LT Aluminium Casement Window System has both internally and externally glazed options. With the resurgence of slim aluminium high security externally beaded with sloped beads minimises the sight lines and maximises daylight. The square chamfered profiles are a distinctive feature of this system, keeping the square look of a truly aluminium solution.

For Ovolo feature the ECO range seamlessly suites in: No matter the situation Comar 5Pi ECO LT delivers.

**7Pi ECO LT - Aluminium Door System**

Comar 7Pi ECO LT Aluminium Door System has both inward and outward opening options in single or double door combinations. There are two thresholds available high weather performance and



low-rise for seamless balcony terrace integration. Comar 7Pi ECO LT door has been designed to provide high performance solutions for today's specification demands. Utilising Comar's trademark Pi. (Polyamide Insulation) thermal break technology, it delivers superior thermal performance with an aesthetic edge.

Aesthetics come from its slim 55mm profiles, seamlessly integrating with the Comar 5Pi ECO LT casement window system. Comar 7Pi ECO LT has been tested to BS 6375 which ensures the door performs well against the rigours of the British weather, reducing draughts and providing excellent weather proofing.

020 8685 9685 [www.comar-alu.co.uk](http://www.comar-alu.co.uk)

## Newview's towering performance impresses London City Airport



Experienced South East installer Newview might be best known for its extensive work on Heathrow's Quieter Homes scheme.

But that's not the limit of the company's commercial expertise.

Right across the capital, you'll find exceptional Newview installation work on a huge variety of commercial and residential developments – including in three twenty-storey tower blocks.

London City Airport, which serves over 4 million passengers every year, called on Newview as Principal Contractor to install nearly 750 windows in 240 flats across the three buildings, plus a further 360 flats in various other blocks and roads around the airport.

Acoustic insulation was a vital consideration on this project – the flats aren't just in very close proximity to the airport itself, but the area is also subject to ongoing and often-noisy construction work.

For that reason, Newview fitted Profile 22's acoustically-exceptional Optima windows, including laminated 10.8mm Optiphon glass from Pilkington.

Optima's five-chambered sash section and

six-chambered outer frame offer excellent structural strength and thermal and acoustic insulation – while Optiphon's PVB interlayer makes it the perfect choice for use in noisy city environments.

What's more, to maximise comfort for building residents, Newview also installed hundreds of Siegenia Mechanical through-wall ventilation units.

"Acoustic insulation is a Newview speciality, and it was great to be working with London City Airport on this project," comments Managing Director Michele Wiestcher.

"Our installers did an amazing job working at height and contending with tight deadlines.

"We're delighted that we've now been asked to continue working for the Airport throughout 2019, with refurbishments to a minimum of 400 more properties scheduled for later this year.

"If you're interested in having some world-class installation work carried out on your next project, please don't hesitate to get in touch!"

01903 244 449

[www.newview-homes.co.uk](http://www.newview-homes.co.uk)



Photo courtesy of Destination Brevard

## Kalwall rockets away

Aerospace company Blue Origin's vast new 70,000 square metre factory in Kennedy Space Centre's Exploration Park in Florida is now manufacturing 'Glenn' rockets for launches at Cape Canaveral 10 miles away. Owned by Amazon founder Jeff Bezos, the Blue Origin building features specially-designed Kalwall® translucent cladding which has been used across the top of the building in a clerestory design. Manufactured with a bespoke face sheet to match the corporate colour scheme, 100's square metres of Kalwall transmits high quality diffused daylight into the structure whilst also solving the twin requirements of privacy and security. Interestingly, the use of a bespoke coloured face sheet does not affect the quality of light internally. Kalwall offers complete line-of-sight protection, maintaining privacy for building occupants and operations while throwing diffused daylighting deep into the interior space. It also eliminates shadows and glare and the stark contrasts of light and shade making it safer for within. The system also enhances simplicity in external design by negating the need for blinds, curtains or solar control.

[www.structura-uk.com/kalwall](http://www.structura-uk.com/kalwall)

## Profile 22 helps transform 1960s building



Over 1,000 Profile 22 Optima Chamfered Windows have been used in a conversion project in Cheadle Hulme, Cheshire. Profile 22 Approved Window Contractor Kingfisher Windows won the contract for the work because it was able to meet the exacting specification at the most competitive price. Kingfisher Windows tendered for the work with Profile 22 Optima Chamfered Windows. The Optima system is often specified on commercial contracts because of its intelligent design, impressive performance and attractive good looks. The system delivers a 1.2 W/m<sup>2</sup>K U-value as standard, with U-values as low as 0.8 W/m<sup>2</sup>K possible, and achieves BS7412 weather performance.

[www.profile22.co.uk](http://www.profile22.co.uk)

## Profile 22 transform housing project



Profile 22 Fully Reversible Windows were specified in the refurbishment of 15 tower blocks in Bristol. The legacy PVC-U windows, doors and curtain walling at 15 high and low-rise blocks owned by Bristol City Council at Eastville, Easton, Clifton, Redcliffe, Shirehampton and Ashton Gate needed to be replaced to improve thermal efficiency, security and aesthetics. The 70mm Optima casement system offers superb design and easy installation. The slim, chamfered shape is clean, contemporary and attractive, making it suitable for a wide range of applications, including casement, tilt and turn, French casement and French doors.

[www.profile22.co.uk](http://www.profile22.co.uk)





# Over 13 Schöck product variants at Hendon Waterside

Minimising energy use in buildings, by improving thermal performance of the building envelope, has become increasingly important in the drive for sustainability and energy efficiency. And the prevention of thermal bridging is critical with structural attachments such as balconies. Ineffective insulation at the connection points means local heat loss, with more energy being required to maintain the internal temperature of the building. This is an important aspect of thermal bridging, but there are other issues. Low internal surface temperatures in the area of the thermal bridge can cause condensation. Leading not only to structural integrity problems with absorbent materials such as insulation products or plasterboard, but the potentially serious occurrence of mould growth. So for any large-scale project involving a variety of different balcony types, the prevention of thermal bridging is particularly important.

## Challenging variety of balcony types

One current project with a challenging variety of balconies is Hendon Waterside in North West London, a mixed tenure development. Situated alongside the Brent Reservoir (known locally as the Welsh Harp after a public house which used to stand nearby), the scheme involves the regeneration of a 1960s housing estate being built in six phases and scheduled for completion in 2027. The masterplan will deliver around 2100 new homes consisting of social, affordable and private housing. These are being constructed



The main Tower from across the Welsh Harp

in twenty-three blocks, varying in height from three to twenty-three storeys – along with an imposing tower building of twenty-eight storeys. Also planned are new public parks, a primary school, community centre and commercial space.

## Hundreds of Isokorb variants in the range

The many balconies involved vary in their design demands and to ensure that thermal bridging is minimised, Schöck has supplied over thirteen different product variants. As the leading international supplier of structural thermal breaks, Schöck has a solution to practically every connectivity detail with the hundreds of variants available in its Isokorb range. The products at Hendon are for concrete-to-concrete and provide optimum solutions by using varying tension bar arrangements. For example, one type provides cantilever balcony connections and



One of the Isokorb types used at Hendon Waterside

transfers both negative moments and positive shear forces. Another is a load-bearing thermal break element for transferring shear forces on supported balconies, recessed balconies and for occasional peak shear forces. Others transfer positive shear forces with point support, or transfer positive shear forces with point support and zero stress connection.

## Totally verifiable performance

In addition to concrete-to-concrete, the comprehensive Isokorb range also offers solutions for concrete-to-steel and steel-to-steel – and even a maintenance free alternative to wrapped parapets. A requirement that the temperature factor used to indicate condensation risk ( $\psi_{SI}$ ) must be greater than, or equal to, 0.75 for residential buildings, is easily met by incorporating the Isokorb. Products meet full compliance with the relevant UK building regulations, have NHBC approval and offer LABC Registration. There is also the security of independent BBA Certification.



Inside the complex

01865 290 890 [www.schoeck.co.uk](http://www.schoeck.co.uk)

# The Future of CLT Construction

Buildings are the sum of many parts and we need a full portfolio of materials to achieve the best outcomes in terms of, performance, sustainability, safety, durability, efficiency and cost. Since the new Building Regulations came into force on 21 December 2018, much has been written about cross laminated timber (CLT) – here Andy Goodwin shares with ADF how B&K Structures have planned for such an event and have taken a pragmatic approach to embrace the new protocols



**B**&K Structures are not engineered timber purists. Our business model focuses on hybrid construction solutions – however, CLT is by far the most exciting revolutionary building material of the 21st century and will be significant in our future development plans. Only now are we truly realising the full capabilities of this strong, sustainable and technically advanced structural solution and the new regulations will not stifle innovation.

The UK has a magnificent heritage of timber architecture dating back to the thirteenth century. We are now building on this legacy using ground-breaking engineered timber systems. We develop high quality, low

carbon projects for a wide range of clients throughout the UK and through our robust, integrated supply-chain, B&K Structures are dedicated to finding the best solution.

## Putting the changes in to perspective

Changes in the Building Regulations have restricted the use of engineered timber in the external wall elements over 18m, that is circa six-storeys. To put the changes in to perspective, we have constructed in excess of 50 cross laminated timber projects over the past 15 years, of which only three would have felt the impact of the regulatory change and a cost neutral wall solution would have been simple to implement.

The engineered timber sector by its very nature, is founded on innovation – we are pioneers of sustainable construction and with modifications, B&K Structures will ensure building highly sustainable CLT structures over six-storeys is not only possible but also highly practical.

The restriction applies to the external walls of residential accommodation, care homes, hospitals and school dormitories over 18m. The rest of the building including internal walls, floors and roof can therefore be formed in CLT. This equates to approximately 80-90 per cent of the overall structural frame.

In anticipation of the government





announcement, we have been working in close collaboration with our supply chain partners to develop alternative through-wall solutions that can be implemented with a primary CLT superstructure.

Our non-combustible unitised wall panel systems have been developed with leading industry supply chain partners. These systems replace the cross laminated timber elements from within the external wall line with a hot rolled structural steel carrier frame and non-combustible SFS infill wall panels, the remainder of the structural frame will be constructed in CLT, which is totally compliant with the regulatory changes.

As part of the research and development of these compliant solutions, careful consideration has been given to the design interface between the CLT superstructure and the SFS walling system. The SFS system and associated connection details have been designed to take in to account increased load cases attracted by traditional brickwork, heavier brick slip systems and balcony locations. Importantly the system is cost and programme neutral.

We have been instrumental in the development and growth of the CLT market in the UK, and through continued collaboration with our supply chain and industry stakeholders, this will continue. The latest Building Regulations merely change the way we construct the external walls to residential schemes above 18m. We will continue to work with our clients to ensure that any new projects are designed and delivered in accordance with the new Building Regulations.

Over the last 10 years CLT has been emerging as a sustainable and cost-effective building material of choice and a vital component in the battle to reduce carbon emissions in the construction sector. We must consider the specification of materials when constructing large scale developments to ensure we minimise the impact on the environment, not just for us but for the health and wellbeing of generations to come.

### Products and Services

Operating since 1974, B&K Structures has worked with some of the UK's renowned clients to develop outstanding buildings with green credentials. For more information on their product portfolio and full range of services, please contact the company.

01773 853 400 [www.bkstructures.co.uk](http://www.bkstructures.co.uk)



# Mapei strengthens expectations in University of Essex structural repair



Mapei products have been specified for a structural repair project at the University of Essex in Colchester. The Reinforced Concrete framed podium that provides a link between the university buildings and a roof to the service roads at lower ground was partially demolished, with the remnants of the podium being reused with a new building structure.

In a structural survey commissioned by the University, and undertaken by engineers Mason Navarro Pledge (MNP), it was concluded that the second beam required strengthening to support loads that would be applied in a permanent state due to the heavy use of the link bridge. The beam showed signs of significant corrosion at the support of the existing footbridge, and the columns had areas with steel corrosion and delamination of concrete due to low concrete cover.

Working hand in hand with engineers and specialist contractors Cemplas Waterproofing and Concrete Repairs Ltd, Mapei proposed a complete Concrete Repair and Protection solution in accordance with TR55, Design Guidance for Strengthening Concrete Structures using Carbon Fibre Composite Materials.

Cemplas Waterproofing and Concrete Repairs Ltd completed the works to a very tight schedule thanks to the Fast Track nature of the materials used on site; during the

project, a total of three Mapei systems were used for concrete repairs, structural strengthening and protection.

## Concrete Repairs:

The concrete was found to be badly deteriorated in certain areas of the beam, and the columns had areas where the concrete had spalled due to corrosion of the reinforcement steel caused by low concrete cover. Mapei recommended removing the deteriorated concrete and then cleaning the steel prior to the application of Mapefer 1K, a one-component corrosion-inhibiting protective mortar for the reinforcing steel. The beam was then repaired with Mapemortar HB R3, a high build thixotropic mortar which can be applied on vertical and overhead situations without formwork to a depth of up to 70mm per layer. The columns were repaired with the structural rapid-setting, thixotropic fibre-reinforced mortar Planitop Smooth & Repair R4 which can be applied between 3mm and 40mm in depth.

## Structural Strengthening:

After repairing the beam, it was prepared by rounding the corners. An even coat of Mapewrap Primer 1 was applied to the concrete surface, and whilst still fresh, Mapewrap 31 – the two-component, medium viscosity epoxy resin was applied. Mapewrap

C UNI-AX HM 600, a high-strength, unidirectional carbon fibre fabric with high modulus of elasticity, was laid into the Mapewrap 31, which impregnated and bonded the fabric. Alternate layers of Mapewrap 31 and Mapewrap C UNI-AX HM 600 were applied until the correct build up was achieved to meet the Strengthening design. Once the final layer of Mapewrap 31 was applied, Quartz sand was broadcasted in to the wet resin to provide a key for the protective covering system to be applied on top.

## Protective System:

Mapelast Guard, a protective two-component, flexible cementitious mortar was applied to provide an effective protection for a 50-year design life. It was the ideal choice for the engineer as it protects the concrete against the penetration of aggressive atmospheric agents that can lead to corrosion, and protects the concrete in areas of low cover as a 2mm coating of Mapelast Guard corresponds to 30mm concrete cover. In addition, it helps to protect the Mapewrap C UNI-AX HM 600, and because of its light grey colour gives a uniform concrete appearance, blending the repair into the building.

0121 508 6970 [www.mapei.co.uk](http://www.mapei.co.uk)





# Shelforce - understanding what Local Authorities want



**S**helforce are experienced specialists in providing PVCu windows and doors for Local Authority social housing projects. A leading PVCu windows and doors manufacturer, Shelforce are Birmingham City Council's chosen manufacturer and supplier of choice and have worked on a huge number of local authority projects.

From high rises to new builds, Shelforce have experience with all types of social housing refurbishment and maintenance and have developed a first-class reputation for providing Local Authorities with the highest quality products and finishing each project on time and within budget.

Whether a Local Authority needs casement, reversible or tilt and turn windows, or composite, residential or patio doors, Shelforce provide the best solution that is most cost-effective for you, and more attractive and secure for your tenants.

The reason for their success is simple, according to Howard Trotter, Shelforce's Business Manager.

"We understand the challenges Local Authorities face and what is important for both them and their tenants," said Howard.

"We understand that Local Authorities are under pressure to complete maintenance and refurbishment programmes on time and within budget, and as budgets are cut, they need to deliver more for less.

"They also want to provide the best service

for their department and their tenants, but they want quality at a fair price. We also understand that tenants want to feel safe and secure and have pride in their home."

## SOCIAL RESPONSIBILITY AND VALUES

Shelforce lead the way in inclusivity when it comes to training and employment opportunities in the glazing industry, with 75 per cent of their workforce disabled.

A training facility will also be opening at their factory in Erdington to welcome students from nearby schools, including special needs schools, and offer regular work experience placements.

Howard said: "Investing in the future by helping young adults of all abilities take their first steps into the workplace is one of the keys to both our and the industry's future growth."

Sustainability is also a big consideration for Shelforce, and the company uses new profiles made from recycled material from unwanted PVC-U frames thanks to Eurocell's very own recycling plant.

## INTEGRITY

Shelforce are highly accredited and ensure that all windows and doors surpass the standards of PAS 24. They also work closely with both landlords and tenants if required to ensure that everyone is satisfied with all work undertaken.

Their products are also rigorously tested, and Howard said: "We feel we have that trust element that is vital to Local Authorities.

Because we work for Birmingham City Council, our products are rigorously tested. Instead of just sending the best one we make for testing, the council turn up unannounced and select one at random, so our products must be spot on every single time."

## VALUE FOR MONEY

Shelforce's Eurocell Eurologik profile system not only offers high performance but huge value for money too.

The advanced six-chambered system and innovative PVC-U Thermal Inserts work together to lock in heat which maximises thermal performance making the window incredibly energy efficient. This means that a cheaper glass unit can be used, and the window will still achieve an 'A+' energy rating.

The slim, six-chambered outer frame costs no more than the standard Eurologik outer frame too, so there is no cost barrier to installing the highest energy efficiency-rated profiles.

Howard added: "The local authority market is perfect for us as we can save them money thanks to our quality, quick lead times, delivery and price. This value engineering means that the money saved can then go straight back into the local authority to be reinvested elsewhere.

"When you put this together with our social values, it makes us an attractive proposition for Local Authorities."

0121 603 5262 [www.shelforce.com](http://www.shelforce.com)



## Garador introduces new GRP garage doors

**Garador** has introduced a new range of GRP garage doors, bringing the total number of garage doors in their range to over 60. The GRP range is comprised of both up and over and side hinged garage doors, with nine up and over garage doors and four side hinged garage doors available.

All the GRP up and over garage doors are available in a selection of standard sizes, which is ideal for housing developers looking to specify a standardised and cost effective solution for their development. Garador also offers made to measure door sizes and double doors on certain models, with door sizes going all the way up to 4269mm wide.

GRP up and over doors are available with both canopy and retractable operating gear, with the latter also suitably designed for electric automation with a GaraMatic electric operator.

Browse the complete GRP garage door collection on the Garador website or call for more information.

01935 443794 [www.garador.co.uk](http://www.garador.co.uk)



## Freefoam help Key Partnership Homes reduce wastage

With statistics regularly quoted about the amount of waste we are all sending to landfill, businesses are looking to play their part in reducing waste and operating more efficiently. The housebuilding industry are working to meet these challenges throughout the whole construction process. There are three basic strategies for dealing with waste: reduce, reuse and recycle. Waste reduction is the ideal, identifying possible waste streams early on in the build process. Scheduling and estimation play a big part. Better communication between building professionals to ensure exact calculations of materials can mean that waste is prevented at source. **Freefoam** have recently helped Key Partnership Homes do exactly this at their new site at Caleb Close, Luton. Freefoam Commercial Director Colin St John summarised "Listening and responding to the needs of our customer is part of our DNA. As responsible manufacturers we were delighted that on this occasion we were able to support our Customer to make a significant contribution to the reduction of site waste. This project is just one more example of how Freefoam are willing to work in partnership with our suppliers and house builders to adapt products that will meet the needs of all parts of the supply chain and deliver long lasting sustainable benefits."

01604 591110 [www.freefoam.com](http://www.freefoam.com)

## Housebuilder & Developer website



The Housebuilder & Developer (HBD) website is an online provider of past and present products and news items for the housebuilder and developer. [hbdonline.co.uk](http://hbdonline.co.uk) is a one-stop source for all the latest press releases providing any visitor with access to information about products and services that they may require. From the website, you can find links to digital issues that have live

links to advertisers' sites, as well as daily email alerts to keep you as informed as possible.

[www.hbdonline.co.uk](http://www.hbdonline.co.uk)

## Building solutions for climate change



The vast majority of existing buildings are vulnerable to climate change. Architects are increasingly adopting 'materials in motion' to find new ways of creating dynamic designs that have aesthetically pleasing features. Metal cladding facades are visually captivating and provide a number of performance-related benefits. The metal meets energy-efficient performance specifications and can be integrated into multi-functional designs. Visit the **Vulcan** Cladding Systems website to find out more about their range of composite cladding and weatherboard cladding.

0208 681 0617 [www.vulcansystems.co.uk](http://www.vulcansystems.co.uk)

## Selfbuilder & Homemaker website



The Selfbuilder & Homemaker website is an online provider of past and present products and news items for all those involved in and working on a self-build project. [www.sbhonline.co.uk](http://www.sbhonline.co.uk) is a one-stop source for all the latest press releases, providing visitors with access to information about products and services that they may require. From the website, you can find links to digital issues that have live links to advertisers' sites, as well as daily email alerts to keep you as informed as possible. You

can also subscribe to receive regular copies of the printed and digital versions of the magazine, or sign up to the monthly Selfbuilder & Homemaker newsletter.

[www.sbhonline.co.uk](http://www.sbhonline.co.uk)

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