COPPER ARCHITECTURE FORUM 33

DEUTSCH

Gebäudeerweiterungen mit Kupfer

Das Thema dieser Ausgabe von Copper Forum zeigt beispielhafte Umsetzungen von Gebäudeerweiterungen wo Kupfer und Kupferlegierungen eine wesentliche Rolle in der Architektur spielen. Es kann als eine typologische Tour de Horizon angesehen werden, die die zunehmenden Ansprüche im Materialgebrauch und neue Wege in der Realisierung umreißt.

Die Ansprüche an Kupfer in der modernen Architektur haben sich deutlich verändert – ein Trend, der sich neben der Verwendung von Kupfer an Bauten, bei denen Kupfer eine historische Bedeutung hat, auch in Zukunft weiter fortsetzen wird. Aber häufig bringt ein neuer Ansatz in der Anwendung frischen Wind, wie beispielhaft in der Innenanwendung in der zweiten Hälfte dieser Ausgabe gezeigt wird. Der verbindende Stern eines Atriums verdeutlicht die Möglichkeiten des Materials für innovative und neue zeitgenössische Formen.

Die architektonischen Möglichkeiten mit Kupfer werden noch deutlicher durch ein weiteres Projekt: die Gestaltung eines Clubhauses für einen Yachtclub auf dem Gerat Barrier Reef. Moderne Computer Techniken ermöglichten ein wegweisendes Design an exponiertem Ort. Im Kontrast hierzu die schnörkellose Umsetzung einer Rettungsboot-Station an der stürmischen englischen Küste: form follows function!. Außergewöhnliche Wetterbedingungen und hohe Ansprüche an die Nachhaltigkeit sind für Kupfer kein Problem. In skulpturhafter Qualität werden mit Bronze und Glas für lange, lange Zeit zwei historische Runensteine geschützt (Seite 28-29).

Klar definierte Ansprüche und Formen charakterisieren auch das Marlowe Theater (Seite 16-19), was man auch von der öffentlichen Bibliothek in Seinäjoki sagen kann (Seite 32-35). Inhaltlich eine schöne Ergänzung zu dem Zentrum Alvar Aalto, wo mit Respekt zum architektonischen Zusammenhang eine Abgrenzung auch über den Werkstoff Kupfer vorgenommen wird. Eine weitere Bibliothek – die „Deptford Lounge“ (Seite 24-27) wurde in ein neues, offenes Gemeinschaftsgebäude umgebaut, das sich durch seine semitransparente, goldene Fassade aus einer Kupferlegierung hervorhebt.

Die Vielfalt in der Anwendung entspricht den verschiedenen Oberflächen die heute in Kupfer verfügbar sind wie sie zum Beispiel bei dem mehrgeschossigen Parkhaus auf Seite 20-23 eingesetzt worden sind. Genauso wie das kleine aber feine temporäre Gebäude (Seite 10-11) – einer Bauart, die normalerweise nicht oft mit Kupfer assoziiert wird. Dem Einsatz von Kupfer wurde auch hier sehr viel Aufmerksamkeit gewidmet, die der außerordentlichen Qualität des Projektes zugutekommt. Eine kommunale Gebäudeerweiterung die mehr ist als ein Gebäude (Seite 30-31) zeigt beispielhaft, dass Kupfer eine besondere Qualität von Gebäuden und zu anderen Materialien herstellen kann.

Kupfer in der Architektur ist stetig in der Entwicklung, die durch Architekten und Architekturinteressierte vorangetrieben wird. Auf der Internetseite www.copperconcept.org können Sie sich die besten Beispiele ansehen.

Das Redaktionsteam

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- **Um ein Projekt vorzuschlagen** kontaktieren Sie uns gerne per E-Mail: editorialteam@copperconcept.org

Copper Forum 33, November 2012

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Titelseite: Pavillon zur Ausstellung ‚Goldene Pracht‘, Münster, Deutschland (S. 10-11)
Foto: © KME/Christian Richters

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Die Umgestaltung des Atriums

Ein Hotel in Norwegen hat sich die Umsetzung eines ausdrucksstarken neuen Atriums zum Ziel gesetzt, erklärt Chris Hodson.

Das Clarion Hotel in Trondheim ist eines der größten Hotels in Skandinavien und das Größte in Norwegen. Die Architekten der Space Group gestalteten die verschiedenen Hotelflügel, um die bestmögliche Aussicht für Besucher auf das Meer, die Landschaft sowie die Stadt zu erreichen.

Die Torsionskraft der Flügel ermöglicht, das zentrale Atrium als einen dreidimensionalen Raum mit einem komplexen, facettenförmigen Dach zu formen - ein dekonstruktuistischer goldener Stern, an der Unterseite in Wellen ausgeformt. Das Gebäude wirkt aus jedem Blickwinkel sehr lebendig, insbesondere aus der Luft; ein Anblick, den die Besucher schon bei Ihrer Anreise per Flugzeug genießen können.

„Die auseinanderstrebenden Hotelflügel werden in einem goldenen Stern wieder zusammengeführt"

Exakte Materialität

Das Design zeigt die exemplarische Anwendung verschiedener Materialien und Stilelemente. Der massive Eingangsbereiches steht in starkem Kontrast zu den voll verglasten Hotelzimmern, die mit weißem Siebdruck versehen sind, um die Fenster quasi zu entmaterialisieren und einen weichen, wolkenähnlichen Effekt zu erzielen.

Die auseinanderstrebenden Hotelflügel werden in einem goldenen Stern wieder zusammengeführt, der aus einer Legierung von Kupfer mit Aluminium und Zink gebildet wurde.

Der Projektarchitekt Jens Niehues kommentierte: *"In der Kupferlegierung haben wir ein Material gefunden, welches uns die Möglichkeit gab, eine lebendige Oberfläche herzustellen, die die inhärente Funktion des Sternes reflektiert und ihm die reiche und goldene Farbe verleiht. Neben der Realisierung unserer konzeptionellen Vorstellungen galt es natürlich auch die technische Herausforderung der Beherrschung des anspruchsvollen Klimas an der Westküste Norwegens zu bewältigen."*

„Mit der Zeit entwickelt die Kupferlegierung keine blaue oder grüne Patina, nicht einmal in dem rauen Klima Norwegens, denn sie behält die goldene Farbe. Die Charaktereigenschaften des Materials erlauben eine vertikale, horizontale und eine diagonal angelegte Struktur, die die dreieckige Form des „Star" nochmals hervorhebt.

Außerdem kann das Material zu einer scharfen Kantung gearbeitet werden und ermöglicht damit auch eine klare Linie in der Dachentwässerung. Die Wahl der goldenen Kupferlegierung an diesem Gebäude hat sich definitiv ausbezahlt gemacht."

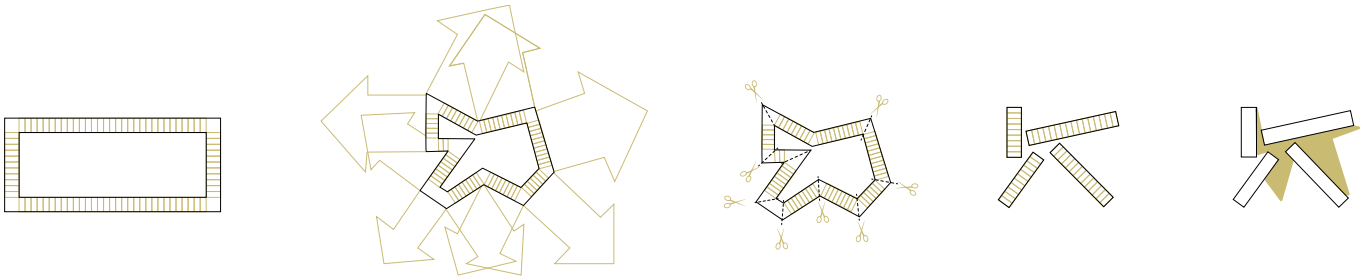
Architekt: Space Group – www.spacegroup.no
Kompetente Informationen für Designer und andere Dienstleister findet man unter www.copperconcept.org

Kupfer Installierer: Mäster Blikk Trondheim

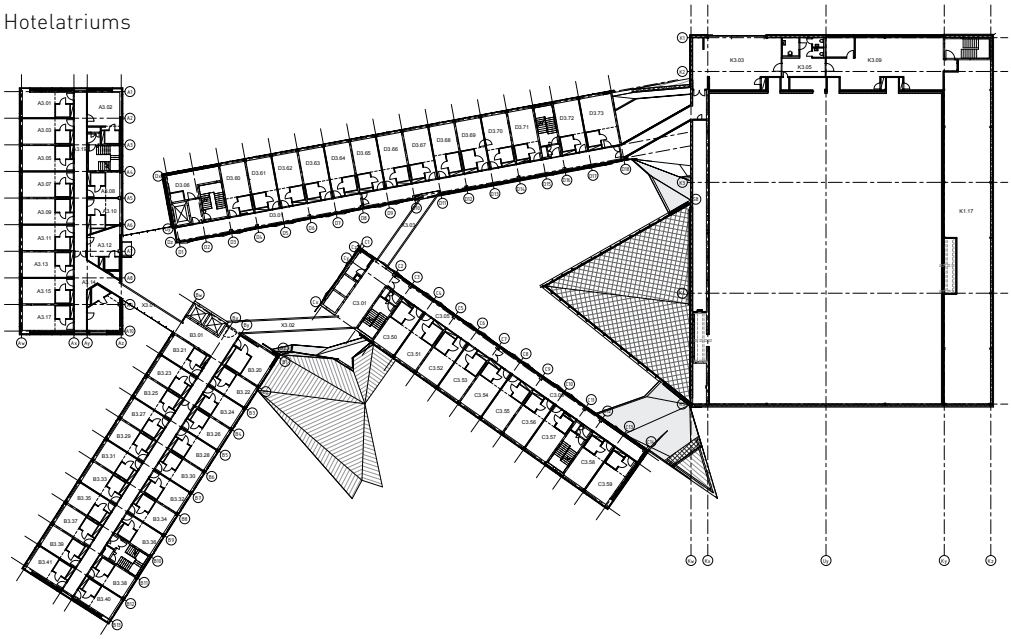
Kupfer Produkt: Nordic Royal™

Fotos: Joern Adde, Peter Hebeisen

Das Zentrum des Goldenen Sterns wurde so gestaltet, dass perfekte Ausblicke möglich sind



Rückbau des konventionellen Hotelatriums



Gebaute Dramatik

Das Atrium erlaubt dramatisch spektakuläre Ausblicke. Je nach Lichteinfall sind wechselnde Stimmungen gewollt und die immer gegenwärtige gestalterische Anlehnung an kristalline Formen verweist auf Eisbildung, Klippen und Eisschollen – über all diesem sind die langen Bänder des kupfergoldenen Sternes ein willkommener Kontrapunkt.

Skulpturale Freiformen in Kupfer

Die Dachformen des Hamilton Island Yacht Club zeigen ein ausdruckstarkes Designs das mit modernster "Building Information Modelling" (BIM) Technik realisiert wurde.

Architekt: Walter Barda Design • **Kupfer Produkt:** TECU® Classic • **Kupfer Verarbeiter:** Copper & Zinc Link • **Fotos:** Courtesy of Trend Magazine
Text: der Text basiert auf einem Artikel des „Trend Magazine" www.trendsideas.com, mit der Hilfe von Morten Pedersen von Copper & Zink Link.

Der Hamilton Island Yacht Club und die dazugehörigen Villen wurden auf den Whitesunday Islands gebaut, die ein Teil des dazugehörigen "Great Barrier Reefs" sind. Der gestalterisch überzeugende Entwurf kann nicht nur von der Insel oder vom Meer aus bewundert werden, sondern auch aus der Luft – einer der bevorzugten Anreisemöglichkeiten der Besucher. Die Architekten haben ein Gebäude konzipiert, welches sich bis zu den Wellenbrechern erstreckt und sich typologisch auf die freie Formen von Schiffen, Yachten und Segeln bezieht. Der Designprozess führte zu skulpturalen, in Kupfer gekleideten Formen, die windgefüllte Segel, bauchige Spinnaker, schlanke Kiele und die wirbelnden Kräfte der Winde, Gezeiten und Ströme aufnehmen.

Der zentrale Kern des Yachtklubs ist eine weit herausgezogene Veranda oder Piazza, welche zu den verschiedenen Privat- und Funktionsräume führt. Mit einer schrittweisen Veränderung des Niveaus von Decke und entsprechender Rampe ergibt sich aus dem Gebäude heraus eine ausdrucksstarke ausladende Plattform über dem Wasser. Das Klubhaus selber enthält viele Freizeitmöglichkeiten wie zum Beispiel Restaurants, Bars, ein Auditorium, Konferenzräume, ein Fitnessstudio, Pools, sowie verschiedene Lesezimmer und Ausstellungsräumen. Die gesamte Anlage wird ergänzt durch 35 freistehende Chalets.

Kupfer in komplexen Formen

Die komplexe Dachlandschaft des Yachtclubs in der Form eines Blütenblattes wird von stählernen Baum-Säulen gestützt. Mit ihren ‚Zweigen' stützen das das gewölbte Dach in einer Vielzahl von Winkeln. Aufliegend wurde ein schlanker Stahl-Gitterrost entwickelt, der von 11 bis 16 Meter spannt und die seitlichen Lasten auf die Hauptwände überträgt. Die schlanke Struktur zwischen Dachbekleidung und Decke war eine der zentralen Anforderungen der gestaltenden Architekten an die komplex geformte Dachlandschaft. Kupfer wurde aufgrund seiner Beständigkeit auch in exponierten klimatischen Bedingungen sowie aufgrund seiner natürlichen optischen Eigenschaften gewählt und – last but not least – aufgrund seiner einzigartigen Fähigkeit zur Gestaltung komplexer dreidimensionaler Formen.

Building Information Modelling (BIM)

BIM unterstütze wirkungsvoll den Design- und den Bauprozess des Hamilton Island Yacht Club – und hier insbesondere der Kupferdachlandschaft. Aufgrund der Vielseitigkeit der Formen und der zahlreiche Sektoren wurden detaillierte Zeichnungen benötigt, um zu veranschaulichen wie die einzelnen Bestandteile zusammen passen. Die Entwurfsdaten wurden digital mit allen an Konstruktion und Realisation Beteiligten ausgetauscht, um beispielsweise die Konstruktion der Stahlkonstruktion des Daches zu beschleunigen und zu vereinfachen.

Die Verfügbarkeit der kompletten digitalen Gesamt- und Detailplanung des Gebäudes in dreidimensionaler Form hatte erheblichen Einfluss auf die Formgestaltung des Gebäudes, da das gesamte Team den Prozess der Formgebung jederzeit zeitgleich nachvollziehen konnte. Aber BIM geht über CAD und die dreidimensionale Modellierung weit hinaus, denn Materialien, Kosten, Umweltgesichtspunkte und das Facility Management fließt für alle Beteiligten zeitgleich in den Gestaltungs-, Konstruktions- und Realisierungsprozess mit ein.
BIM unterstützt den Architekten nachhaltige und exakte Entwürfe zu realisieren.

Es ist zu erwarten, dass der Einsatz von BIM zukünftig bei der Gestaltung und Konstruktion vieler Gebäudetypen zunehmen wird. BIM kann Architekten neue Türen, zu neuen Ausdrucksformen öffnen- und Kupfer ist ideal um die innovativen Gestaltungen zu realisieren.

Ein Pavillon für die „Goldene Pracht“

In exponierter Lage auf dem zentralen Domplatz macht ein mit goldfarbenem Metallkleid ausgestatteter Pavillon durch seine überzeugende Gestaltung und Funktionalität auf ein besonderes Ereignis aufmerksam.

Der temporäre Pavillon setzt einen modernen Kontrapunkt in das historische Stadtzentrum und dient als Bindeglied zwischen den Ausstellungsorten Museum und Domkammer. Der Pavillon für die „Goldene Pracht“ ist das Ergebnis einer Gemeinschaftsarbeit der msa (Münster School of Architecture) und des Büros modulorbeat. Unter der Leitung der Architekten Marc Günnewig und Jan Kampshoff entwickelte ein Team von anfangs 33 Studenten verschiedene Kurzentwürfe für das zu planende Objekt.

Goldene Lösung

Eine Juryentscheidung wurde schließlich zugunsten der „goldenen Lösung“ getroffen: Ein sternförmiger, in der Aufsicht an ein stilisiertes Kreuz erinnernder Baukörper mit aufrechten Vertikalen, der außen mit Ausnahme der Stirnseiten vollflächig mit der goldfarbenen Kupferlegierung bekleidet ist. Ein temporärer Pavillon als Kommunikationselement für ein Kunst-Ereignis ist in Münster keine ganz unbekannte Einrichtung. Bereits vor fünf Jahren realisierte das Büro modulorbeat ein typologisch verwandtes Bauwerk für die skulptur projekte 2007, ebenfalls in der ‚goldenen‘ Kupferlegierung.

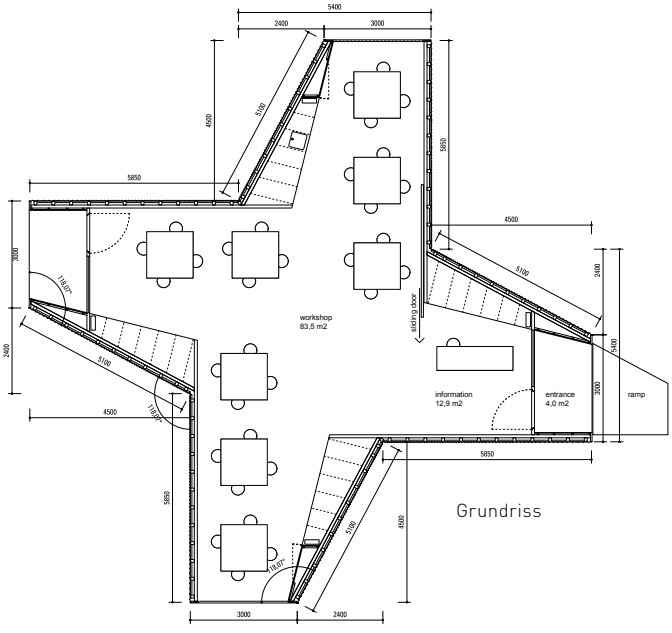
Gerade aufgrund seiner klaren Funktionalität und Formsprache wird der Pavillon als zentraler Ort einer „lebendigen Werkstatt“ für die museumspädagogische Kunstvermittlung in den hier ausstellungsbegleitend stattfindenden Workshops mehr als gerecht.

Beim Blick durch die verglasten Stirnflächen in den Innenbereich wird die Fortsetzung der geradlinigen, einfachen Gestaltung als vollkommen selbstverständlich und konsequent wahrgenommen. Die tragende Konstruktion aus Vollholz bzw. Brettsperrholz liegt völlig frei; Boden, Decken und Wände präsentieren sich demzufolge einheitlich in hellen Holzoberflächen – ebenso wie die acht Werktische, die nach eigenen Entwürfen von Marc Günnewig von den Projektteilnehmern in Eigenarbeit montiert wurden.

Abgestimmte Fassaden

Für den Wellenverlauf der Fassade wurde eine besondere Fertigungslösung genutzt, die es erlaubt, einen hohen Vorfertigungsgrad zu realisieren. So konnte das von den Architekten vorgegebene unregelmäßig verlaufende Wellenprofil den individuellen Vorstellungen entsprechend problemlos produziert werden.

Das temporäre Bauwerk sei eigentlich viel zu schade für den Rückbau! - so der einhellige Kommentar vieler Besucher. Nach erfolgtem Rückbau wurde der Pavillon nun ein zweites Mal aufgebaut und wird heute als Kunst- und Werkraum einer benachbarten Schule genutzt – alles Andere wäre wirklich zu schade gewesen.



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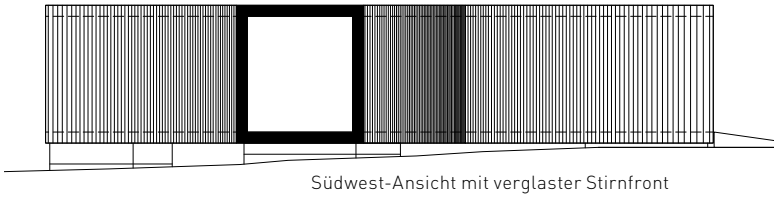
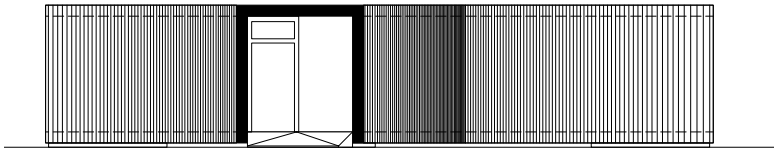


Südwest-Ansicht mit verglaster Stirnfront



Nordost-Ansicht mit geschützem Eingangsbereich

Architekt: Modulorbeat und School of Architecture aus Münster
Kupfer Installierer: Schabos GmbH
Kupfer Verarbeiter: MN Metallverarbeitung Neustadt
Kupfer Produkt: TECU® Gold
Fotos: Christian Richters

Photo: PBWC Architects

COPPER WAVE

by Chris Hodson

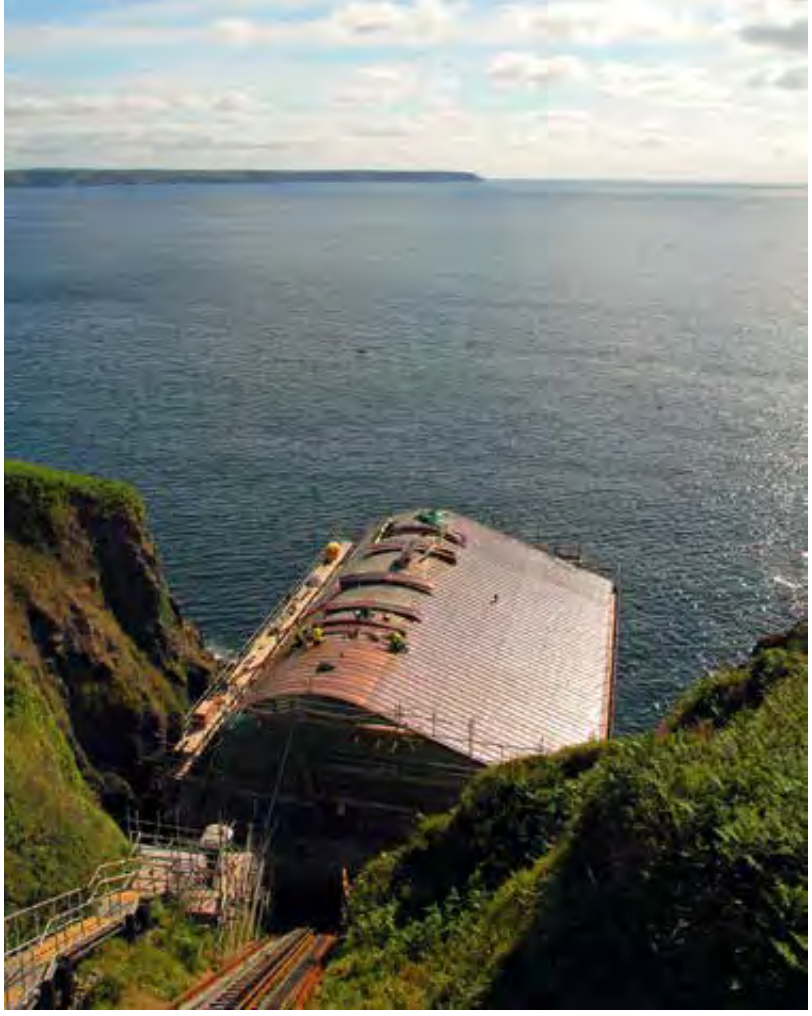
The new RNLI lifeboat station at The Lizard is protected by a curved copper skin to withstand the extremely aggressive coastal environment of its unique location on England's most southerly point. The RNLI charity saves lives at sea. Its volunteers provide a 24-hour search and rescue service around the United Kingdom and Republic of Ireland coasts. The building's design was developed from a previous project, also by PBWC Architects, in Padstow, Cornwall. It is a direct response to the specific technical demands of the new RNLI 'fast slipway' type lifeboat housed there and is an exemplar for future buildings of the type in other locations.

The new structure sits on the footprint of the original building: well-positioned for lifeboat launching in bad weather but also reducing the environmental impact of the scheme. At first sight, the wave profile of The Lizard lifeboat station appears symbolic of its coastal position - but form really does follow function and reflects the arrangement of internal accommodation, focused on the lifeboat itself. Essentially, the vessel is mounted on a tipping cradle, which tilts to align with the slipway, enabling it to be launched and recovered – allowing volunteer crews to reach those in trouble as quickly as possible. The outward raking wall to the side of the building reflects the demand for accommodation at the main floor level with fast access straight onto the lifeboat.

Weather-tight Design

All accommodation is located on one side of the building, which allows the heated and serviced zones to be efficiently grouped together and all ventilation and lighting needs to be met with a strip of ribbon glazing or punched windows within the raked wall. The curve of the roof then encloses the minimum volume required for the lifeboat and creates a simple form that lends itself to a single flexible roof finish. The design aims to maximise roof area while minimising penetrations to ensure a robust, weather-tight finish.


RNLI 16-10



Copper Choice

The selection of metal roofing was a logical progression from the development of the distinctive, wave-like, curved form. PBWC project architect Cian Spowart commented: *"After the Padstow project, we reviewed the roofing material and system for The Lizard lifeboat station. Here, copper was selected for its durability and capability of withstanding the aggressive coastal environment, including the possibility of debris being thrown up from the sea. In addition, the aesthetic choice of copper over other metal roofing was driven by its characteristic weathering over time to give a rich green patina complementing the aqua blue hues of the local coastline."*

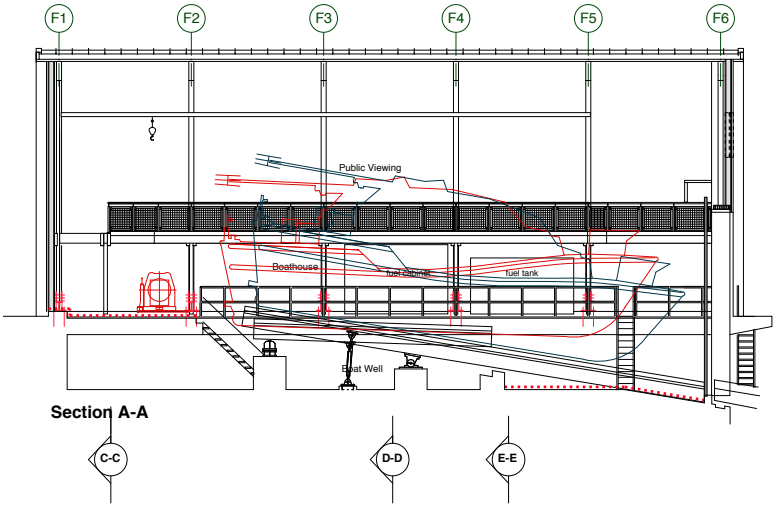
Architects: PBWC Architects
Copper Installer: Full Metal Jacket
Copper product: Nordic Standard
Photos (where indicated) and drawings: PBWC Architects
All other photos: Geoff Squibb (Cornish Pixels Photography)

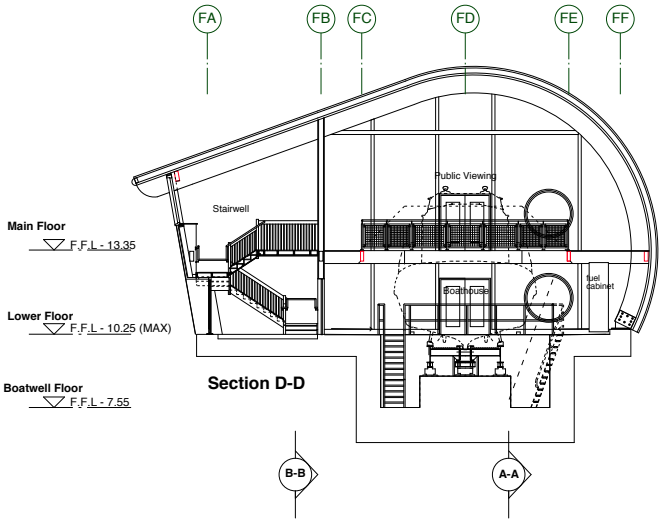
Challenging Construction

Unsurprisingly, the building's site at the bottom of a tight, steep slope presented special challenges with construction. The building is predominately timber frame with glulam-curved members providing the iconic shape. Dry construction and prefabrication techniques are maximised for fast, safe assembly and efficient deliveries to site.

The double skin roof is finished in copper trays with standing seam joints and was installed by copper specialists Full Metal Jacket, who recently won an Award for their work on the project from the National Federation of Roofing Contractors. The long-strip, copper trays were craned down onto the building and installed by hand, displaying a particularly high standard of craftsmanship under challenging conditions.

Photo: PBWC Architects





"Copper plays a distinct role in the composition of the theatre overall"

Canterbury Tales

Standing on the banks of the River Stour and close to Canterbury Cathedral's UNESCO World Heritage Site, the new Marlowe Theatre makes a bold statement on the Canterbury skyline. Architect Keith Williams discusses his practice's competition-winning design and its use of materials.

The Marlowe is, in formal terms, a complex pavilion. It sets up a dynamic relationship with its viewers, giving different architectural and urban emphasis depending from where in the city it is viewed. At street level, its architecture is ordered by an 8m high colonnaded loggia in white cast Dolomite stone, which forms a portal to the multi-level glazed foyer and sets up a civic elevation to the Friars, an important historic street within the city. The foyer connects all the major internal spaces to the riverside terraces and pathways and is seen as a crystal ribbon by day transforming into a blade of light by night. New views of the rooftops of the historic city and its cathedral open up from the main stairs and upper levels.

The colonnaded loggia mediates between the street scale of the Friars (the street which the Marlowe faces) and the necessarily larger forms of the two theatres and the fly tower. The colonnaded

overhang also provides shelter to the south-facing foyer from high angle solar gain and provides an architectural unity to the composition. A new public square has been created by setting the Marlowe back from the existing street edge.

The fly tower of the old theatre, widely regarded as an eyesore, was the second tallest structure in the city after Bell Harry, the medieval Cathedral's principal tower. The new Marlowe's fly tower is 9 m taller than its predecessor, allowing it to be sculpted to create a pinnacle form facing toward the Cathedral, adding accent and silhouette to the city's skyline. Its form can be seen as a prominent symbol of secular architecture within the historic city whilst ensuring that Bell Harry retains its predominance. From the east, the fly tower dominates the street scene announcing this major new cultural project within the city.

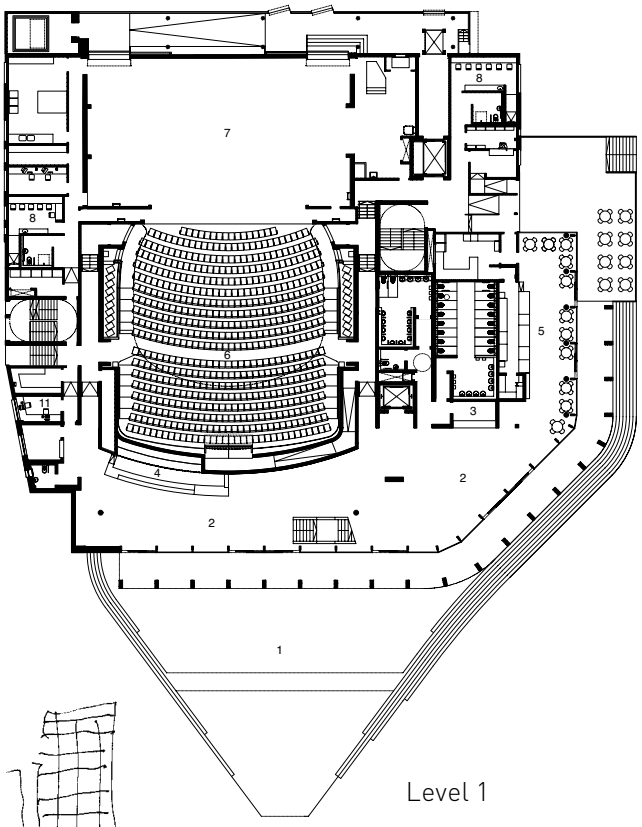
Materiality and Contextuality

The composition and massing of the new Marlowe is rooted in its context. The building is seen to step up in scale gradually from a lower-rise street scale along the Friars, up to the larger volumes of the main auditorium and fly tower beyond. Materiality is also determined to a large degree contextually, in that it borrows the hues and tones of the Canterbury townscape. The reconstituted stone colonnade takes it's cue from the whites and creams of buildings in the city, whilst the pre-oxidised brown copper cladding echoes the colour and hues of the nearby tiled rooftops. Materials are used to create something highly contemporary, whilst at the same time complimentary to the context in terms of texture and colour.

Copper plays a distinct role in the composition of the theatre overall, surrounding the volume of the studio space, which mediates between the entrance scale and the larger volumes beyond. The studio theatre is raised 4 metres above the ground; a volume wrapped entirely in copper. As such it is almost at roof level of the surrounding buildings hence the relationship between the reddish brown copper cladding with the colouration of Canterbury's roofscape. The underside of this volume forms the internal soffit to the restaurant space created beneath. The raising of the volume allows the restaurant to be slid beneath at foyer level, giving views to an adjacent external terrace and the banks of the River Stour.

Architects: Keith Williams Architects
Copper Installer: TR Freeman
Copper product: TECU® Oxid
Photos: Hélène Binet (unless indicated otherwise)

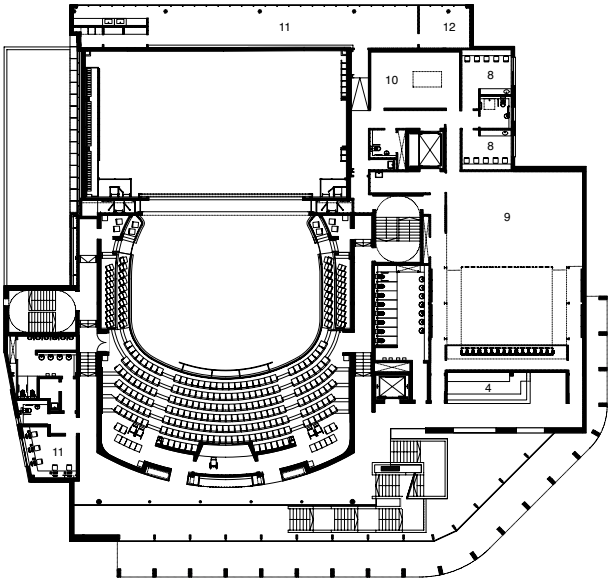
Photo: Keith Williams Architects



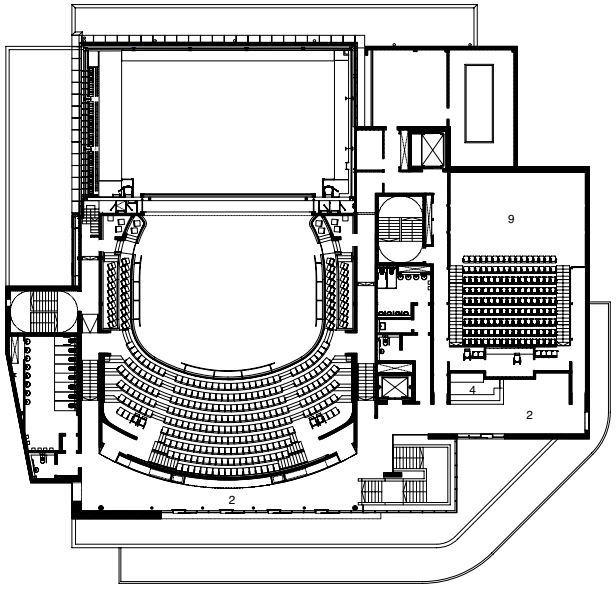
Level 1

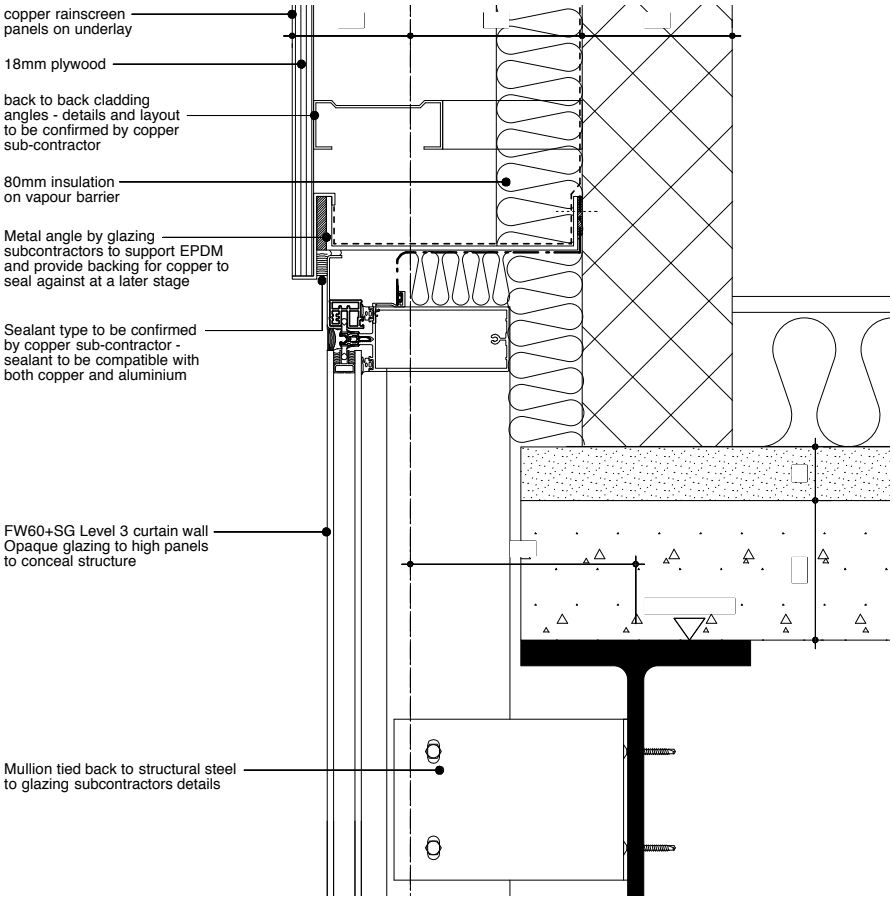
1. Paved Forecourt
2. Foyer
3. Box Office
4. Bar
5. Cafe
6. Auditorium
7. Stage
8. Dressing Rooms
9. Second Space
10. Creative Space
11. Administration Offices
12. Meeting Room

Level 2



Level 3

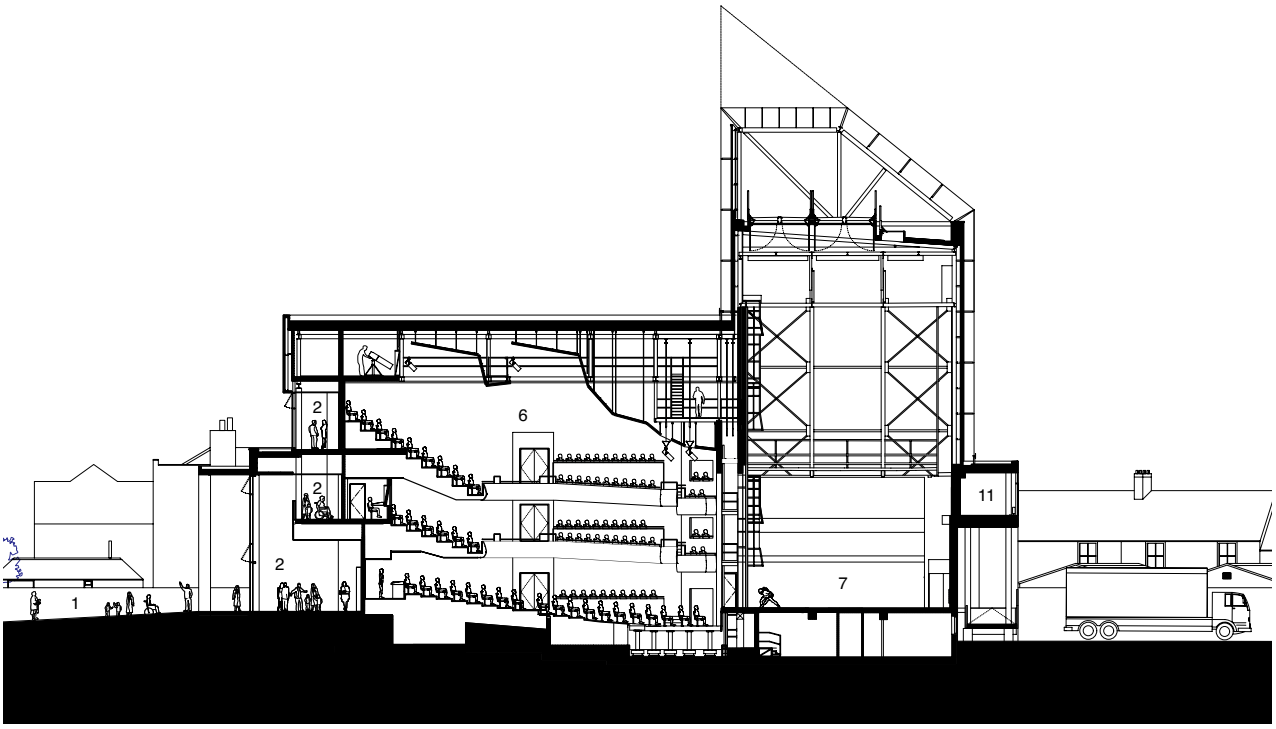




Copper Studio

Horizontal standing seam bands of varying widths (using trays of 230 mm, 430 mm and 600 mm) wrap continuously around the studio volume, with folded 'birds mouth' corner details enabling the horizontality to flow continuously around all sides. At the junction with the main glazed curtain walling, the copper runs cleanly through from outside to inside, with internal openings formed to create a connection between the studio theatre bar areas and the main entrance foyer.

Though the rationale in each case is different, the use of copper at the Marlowe echoes our previous work at the Unicorn Theatre in London, completed in 2005 (UK Award Winner of the Copper in Architecture Awards 13 in 2007).



Section AA

ANIMATING THE UTILITARIAN

by Chris Hodson

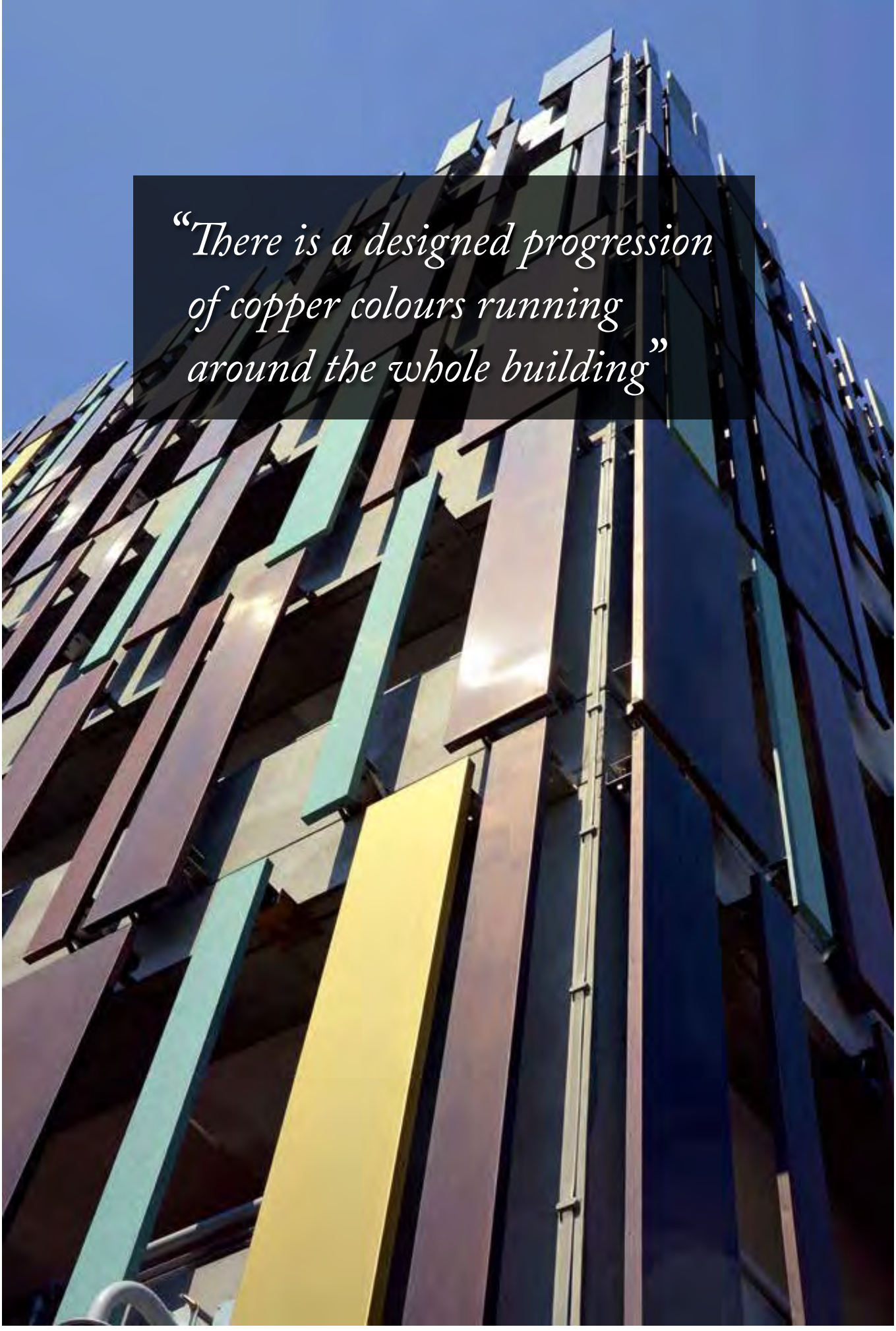
An abstract design using vertical panels of copper with different surfaces animates long, straight facades of an otherwise typical multi-storey car park, adding a sense of movement which reflects its transport interchange setting.

Forming part of the 'Hub' development at Nottingham Railway Station, this 6-storey structure accommodates 950 car spaces. The 112 m long building is sandwiched between the railway to the north and the busy Queens Road to the south with older buildings beyond. Architects Leeds Studio developed an original design by another practice, BDP, (following a successful bid by VINCI Construction UK) adding an array of horizontally banded vertical copper panels to transform this typical parking building. The panels create an architectural language and are continuous over curtain walling as well as conventional open car parking decks, only being broken by the concrete lift core on the West Elevation.

The palette of copper surfaces at Nottingham includes solid green pre-patinated copper and a variant with less intense patination, revealing some background material. Standard 'mill finish' and light brown pre-oxidised copper were also used, together with an alloy of copper and aluminium with a long-lasting golden colour which provides distinctive highlights around the building.

Although creating a random, abstract feel, arrangement of the panels is based on a limited modular language with three panel widths: 210 mm, 420 mm and 840 mm, and spacing between of: 105 mm, 210 mm and 420 mm. Panels are generally 2870 mm high with some reduced to 1470 mm crowning the top of the building and where the base of the cladding is raised up.

Architects: Leeds Studio
Copper Installer: CA Group
Main Contractor: VINCI Construction UK
Copper products: Nordic Green™ Traditional, Nordic Green™ Living 1 Nordic Standard, Nordic Brown™ Light, Nordic Royal™
Photos: Chris Hodson
Drawings: Leeds Studio



"There is a designed progression of copper colours running around the whole building"

A Mosaic of Colour

The composition gives a mosaic of colour that sits in clearly defined horizontal bands along the length of the building, breaking up the subservient concrete frame - typical of multi-storey car park buildings - and curtain walling. The effect is particularly animated on the two long elevations, especially when viewed from moving trains or cars. In addition to the layering of materials, the colour choices are carried through in the design to represent differing aspects of the location.

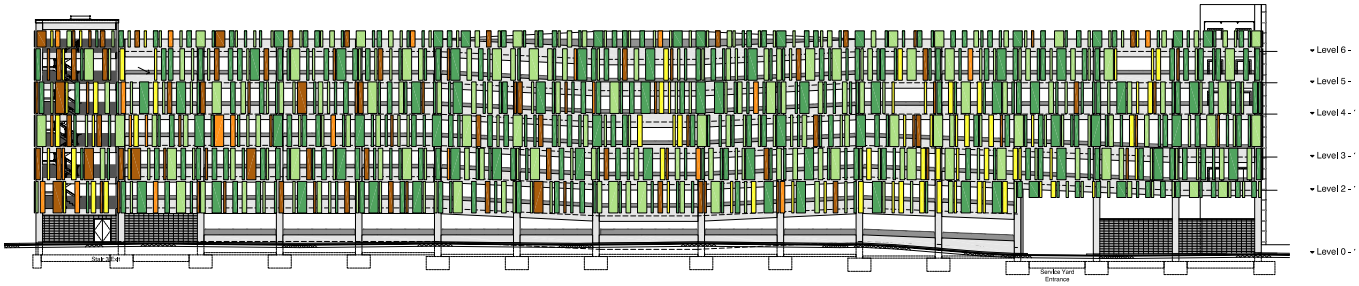
Project architect Antony Hall explained: *"The copper panels to the North are predominantly in green shades and refer to the modern aspect of the adjacent railway. The panels on the South are predominantly in traditional brown copper shades to reference the brick heritage warehouses and other structures lining the conservation area opposite across the busy road. Key viewpoints formed in locations around the building are highlighted with the golden coloured copper alloy. Vertical circulation elements are also highlighted in the same manner. There is a designed progression of copper colours running around the whole building, beginning and ending at the West Elevation lift shaft. We have also anticipated the natural changes to copper in the environment."*

Multi-storey car park architecture is generally constrained by vehicle circulation and other technical demands, reducing it to a utilitarian level. But the numerous permutations of surfaces and forms available with architectural copper today offer designers exciting possibilities to treat bare facades as a blank canvas. The Nottingham project is an inspiring example of this approach.

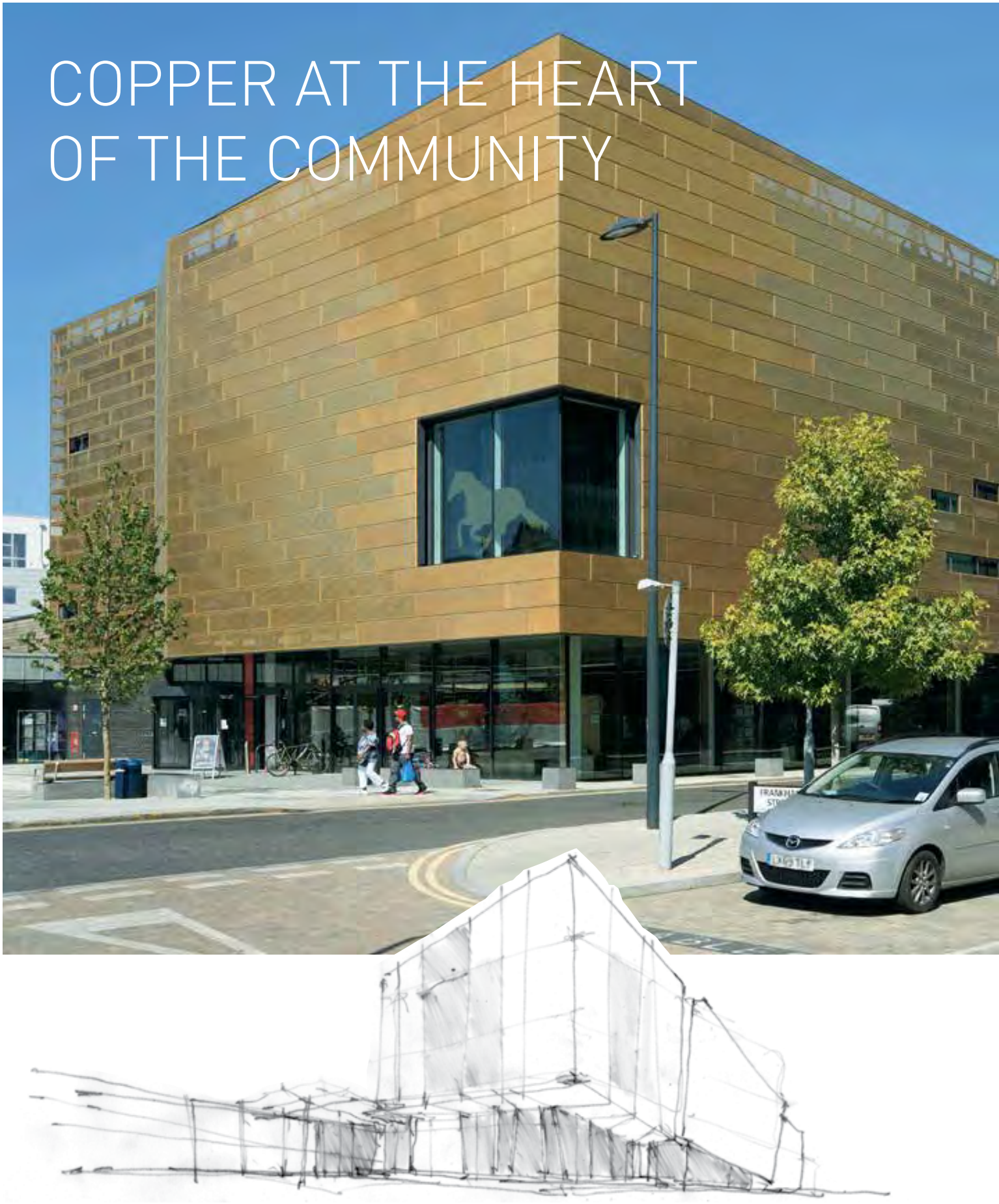
The previous station car park typifies the conventional open concrete deck ▲ design approach, contrasting with that of the new building.

◄ South Elevation.

▼ North Elevation showing the disposition of green, gold and brown copper shades.



COPPER AT THE HEART OF THE COMMUNITY



"Deptford Lounge is the jewel in the crown of the regeneration of Deptford. This is a fantastic public space with first-class facilities, which is already proving popular with the community."

- Sir Steve Bullock, Mayor of Lewisham

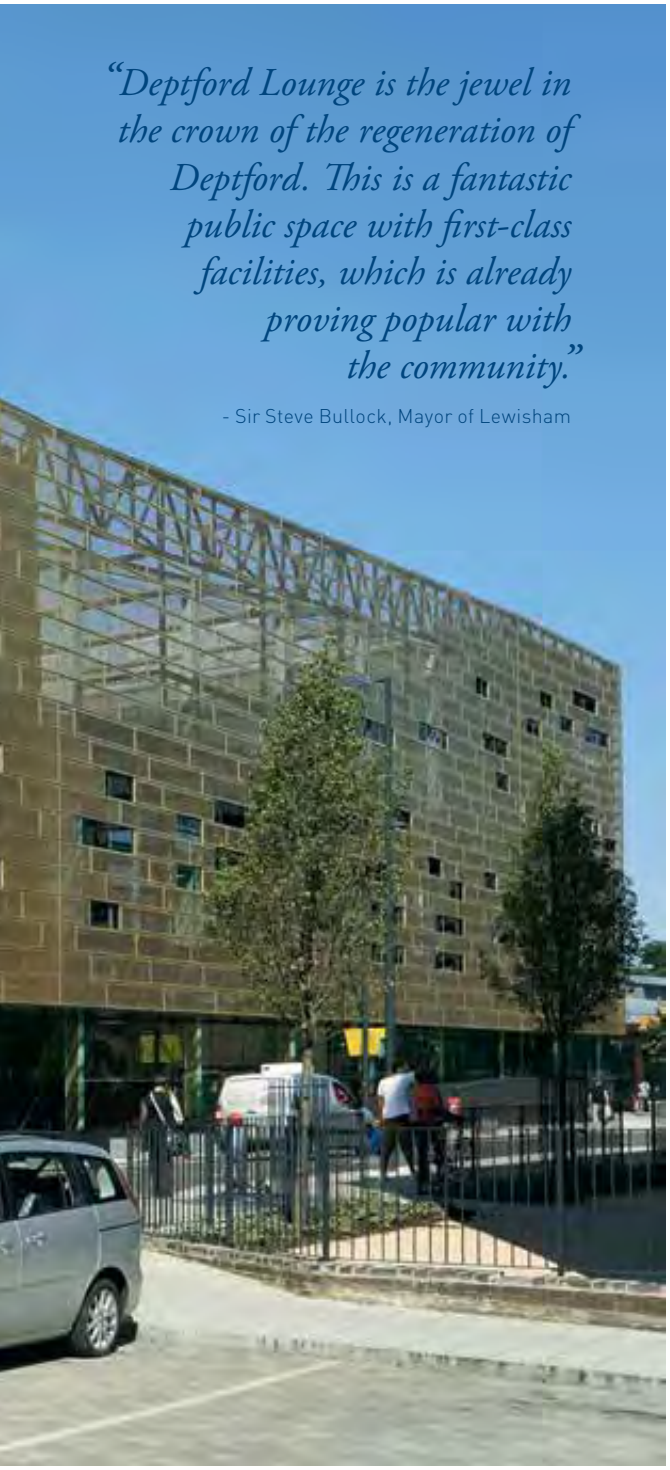


Photo: Chris Hodson

This landmark building makes symbolic as well as functional use of its perforated golden copper alloy facades to generate a new civic focus. Pollard Thomas Edwards architects describe how the programme and design developed a new typology of school and community building.

The brief from the London Borough of Lewisham was to create the centrepiece of their regeneration of Deptford Town Centre – a new civic focus for Deptford. This was to include a state-of-the-art public library, including a resource centre and council services centre – called the Deptford Lounge – with a new building for Tidemill Primary School, relocated from its existing site.

Our scheme, completed in December 2011, created from the bare bones of this brief, a highly innovative mix of co-located uses on a single site: the completed complex houses facilities shared between the new primary school and the whole community via the Deptford Lounge. To this mix we also added apartments over artists' studios and exhibition space – Resolution Studios.

The design was also driven by the aspiration to restore to Deptford something of the grandeur of its past, first as a hub of shipbuilding and later as the location of the first railway station south of the River Thames. Now the golden Lounge building sails galleon-like above Giffin Square, a new public space for Deptford. Tidemill Academy lies within an urban oasis, sheltered on one side by the Deptford Lounge and on the other by Resolution studios, with classrooms grouped around a green and leafy central play space. And new homes look out over the historic St Paul's Church and the railway line leading over the river.

Overall complex with Deptford Lounge on the right.

Photo: © ArcEye Images Ltd / Robert Greshoff 2012

The rooftop sports pitch enclosed by pierced copper alloy panels.

School and Community Use

Shared facilities of Deptford Lounge include a rooftop sports pitch, a flexible suite of assembly spaces and a dining hall and kitchen, which are available for hire. All these facilities are located on the upper floors of the Lounge building and all elements have separate access points both from within the school and from the public realm. This enables the school to have sole use of the shared facilities during the school day. Then, out of school hours, the shared facilities form an integral part of the Deptford Lounge and are open to the whole community.

Architects: Pollard Thomas Edwards architects – www.ptea.co.uk
Copper installer: English Architectural Glass (EAG)
Copper Products: Nordic Royal™
Photos: Chris Hodson, Robert Greshoff (ArcEye Images Ltd)

Photo: © ArcEye Images Ltd / Robert Greshoff 2012

School playground with steps to the Deptford Lounge beyond.

Photo: Chris Hodson

Photo: Chris Hodson

Photo: © ArcEye Images Ltd / Robert Greshoff 2012

Photos: Chris Hodson

INTERVIEW

Chris Hodson discusses the transparency and materiality of the Deptford Lounge facades with Hamish Kilford-Brown, Project Architect at Pollard Thomas Edwards architects.

CH: *How did your selection of the golden copper alloy come about and did you look at other materials?*

HK-B: We wanted a material that related strongly to the conceptual meaning of the Deptford Lounge on a series of levels. It was to be seen as a landmark – a civic focus for all ages and cultures. Initially timber cladding was considered, relating to Deptford's nautical past – but timber requires maintenance. We also sought an inspiring material, with reflective properties that would give the building a jewel-like quality set against its main street context. This meant considering various metals including copper. It also led to the idea of expanded metal meshes or perforated sheets.
We felt that the perforated golden copper alloy cladding offered multiple meanings on a conceptual level. The gold surface symbolises 'wealth' across all cultures, welcoming and bringing together a diverse community into a building that offers a wealth of knowledge and services.

CH: *What about sustainability and environmental considerations when choosing the façade material?*

HK-B: Copper and its alloys have sound sustainable credentials with exceptional durability and lifespan. The weathering characteristics of this copper alloy are important: the material is virtually maintenance free and provides a surface that will change very little over time, which means it will retain its crisp jewel like quality.

CH: *What were the design intentions behind this dramatic statement of a transparent golden skin?*

HK-B: The wrapping of the gold cladding aims to unify the building's complex range of functions, binding them together.
Contextually, it relates to various points of Deptford's rich history, including its growth from a small fishing village into the Royal Naval Dockyard with links to HMS Discovery, Sir Francis Drake and Captain James Cook. So, the wrapping has multiple functions and references. From a distance the golden form appears solid but close-up reveals itself as transparent and light-weight, floating above its glazed base. On a functional level, the wrapping provides solar shading to the large areas of glazing, while also allowing suitable levels of light in.

CH: *How were these intentions realised on the building with the pierced copper alloy panels and how did the detailed design develop?*

HK-B: The panels are rigid folded cassettes that provide sharp and clean joints between panels, rather than something that would buckle and distort. The nautical references continue with the setting-out of the panels in a stretcher bond pattern like historic timber hull construction in ship-building. The perforations are kept back from the edges to help express each panel individually while retaining rigidity. We explored various perforation shapes, from square to raised diamond patterned with a cheese grater appearance, and settled on simple circular holes, again arranged in a stretcher bond pattern. Different levels of perforation were also considered, as the transparency of the wrapping adds another dimension with the play of light. The building responds to its uses and environment, continually changing with light conditions throughout the day and into the evening, becoming more or less revealing – suggesting discovery. The level of transparency increases with distance away from the solid 'ship's bow' corner, with its large symbolic window, gradually blurring solid and void.

CH: *How was the light, floating feel of the pierced copper alloy skin achieved in structural terms?*

HK-B: Initially, the cladding was to be suspended on rods from a ring beam. But due to the building's subtle shifts of form – both in the vertical and horizontal planes – additional support was required, depending on location around the building. The solution was to fix steel brackets back to the main building structure at the top and bottom of the wall. These then support a frame and suspension rods, to which the copper alloy panels were fixed. Additional structure and stays were incorporated where the golden wrapping pulled further away from the building, reducing movement from wind loading. The transparency of the panels also offered further opportunities to express the structure behind with honesty.

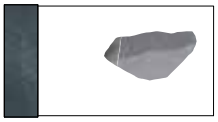
by Chris Hodson

Sheltering Bronze Hands

Deceptively simple bronze and glass structures provide a safe environment for preserving two unique 10th century runic stones – designated a UNESCO World Heritage site - at Jelling Church, Denmark. But these interventions go well beyond conservation, seeking to transform the visitor experience, as architect Erik Nobel explains.

The Jelling runic stones mark Denmark's transition to Christianity in the year 965 and the monument is also known as Denmark's 'birth certificate'. Inaugurated in December 2011, the project is based on the winning competition design by NOBEL arkitekter. Our principal aims were to protect the runic stones for the future and, at the same time, provide an architectural composition allowing spectators to get very close to them.

Photo: NOBEL



Plan arrangement

Elevation

The design forms a stylised dialogue between the two stones, which represent the first two kings of Denmark – Gorm and Harald Bluetooth. The bronze angles form one gable and the roof for each structure, while the other faces are fully glazed. Our objective was to accentuate the runic stones' curved forms by contrasting them with the straight lines of the coverings which, in a metaphorical sense, 'hold protective hands' over them. The cast bronze contrasts with the texture of the ancient stones and highlights their grey and reddish granite surfaces.

The requirement for creating a controlled climate around the stones was a central consideration in the development of the project. Our consulting engineers from Rambøll designed a special heating and ventilation system which ensures a frost-free climate around the runic stones. Artificial lighting has been discreetly added using specially designed fibre-optic light sources, which are integrated in the roof structure.

The lighting emphasises the stones' runic scriptures and visual motifs, and accentuates their shapes. Juxtaposed with the angular bronze forms, the artificial lighting creates a completely new way of viewing the rune stones, enhancing the experience of one of Denmark's most valuable monuments.

Architect: NOBEL arkitekter a/s
Photos: Jens Lindhe (unless indicated otherwise)

Copper over time

This thoroughly modern addition to an existing home in Cardiff, South Wales – discussed by Kristian Hyde of Hyde + Hyde Architects – combines copper with oak and glass in its carefully conceived design to anticipate change.

We were appointed to carefully restore elements of the existing architecture creating a contemporary yet sensitive addition to the rear. To the front of the property the new addition appears as a simple copper box 'peeping' above the layers of existing green glazed tiles of the existing home.

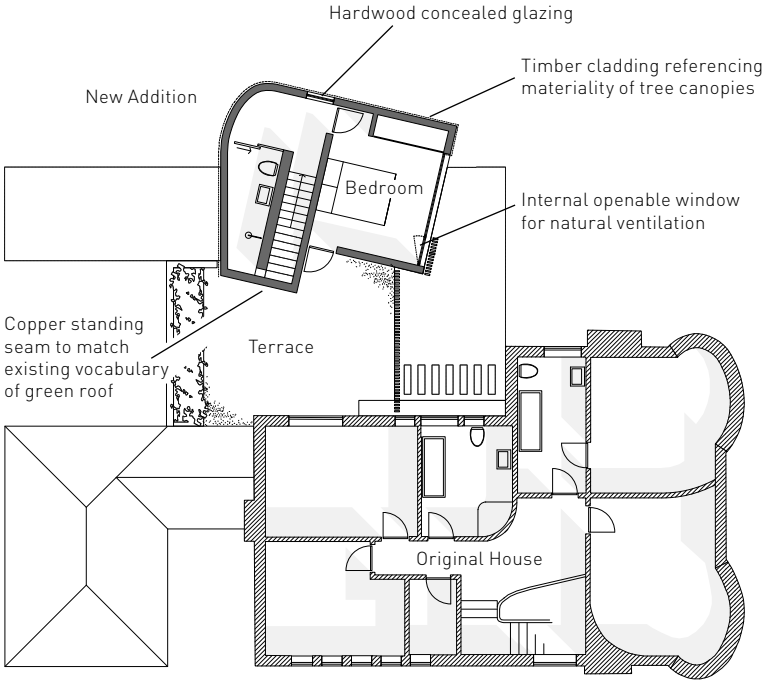
In the refurbishment, living and entertaining space is provided at ground floor through the introduction of a predominantly single storey glazed element. At first floor, a layered copper and oak form appears to delicately hover. Set on a shifted geometry to acknowledge the existing building form, this creates a series of overhangs, cantilevers and canopies to shelter its occupants from the persistent Welsh rain.

The original house is quirky but beautiful. The unknown architect has put a great deal of effort into the detailing, some of which is very playful. There is a certain humour about some of the spaces that continue to make our clients smile. The new addition responds with a singular oak clad curve at first floor which 'mimics' the geometry of the existing curved glazing of the main house. This is introduced to 'turn' the new addition into the main private garden at the rear.

Copper was chosen as a suitable material for facades and other details to converse with the existing 'green glazed' roof tiles of the existing dwelling. After a decade it will begin to relate in colour and tone to the existing tiles nearby, its salmon pink and russet brown tones will be gone forever. That's the beauty of copper, it's timeless and forces us to think about buildings in time. Copper's material character helps buildings feel as if they have always been there.

"That's the beauty of copper, it's timeless and forces us to think about buildings in time"

UPPER LEVEL PLAN



Architects: Hyde + Hyde Architects

Photos: Kristian Alexander Hyde, Warren Orchard.

“copper has been used comprehensively across facades, plinth and roofs – creating a single-material skin”

Photo: Martti Kapanen

Photo: Tuomas Uusheimo

Famous Neighbours

The Finnish town of Seinäjoki hosts the most extensive cluster of buildings designed by Alvar Aalto in the world. Asmo Jaaksi of architects JKMM explains his practice's approach to designing a new addition to this hallowed Aalto Centre.

The Centre displays Aalto's masterful touch, ranging from the area's town planning to the smallest door detail and is an invaluable cultural asset which gives the whole town its identity. Five Aalto buildings make up the Centre: the City Hall, State Office Building, Theatre, the Cross of the Plains Church and the Old Library.

DIALOGUE BETWEEN OLD AND NEW

Built in 1965, the Library needed a modern extension to meet today's demands and JKMM's design, called 'Clover', won the competition for the project. The aim was to create dialogue between old and new. The new library respects the protected cultural environment but, at the same time, takes pride in contemporary architecture. One of the objectives of the design was to find an interface with the typical characteristics of Alvar Aalto's architecture without imitating it.

Photo: Martti Kapanen

Photo: Tuomas Uusheimo

Photo: Tuomas Uusheimo

Photo: Martti Kapanen

VARIED INTERESTING SHAPES

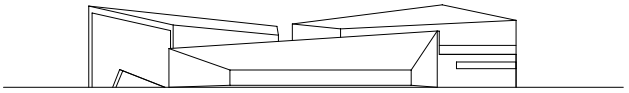
The new library stands separate from Alto's original, although connected by an underground link. Division of the building into three sculptural units was an important decision to be able to blend the large building volume with the surrounding townscape. This generates varied, interesting shapes when viewed from different directions. The exposed boarded-formwork concrete interiors are punctuated by carefully placed windows and larger glazing offering controlled views of the Centre. The view from the glazed wall in the main library hall is dominated by the highlights of the area: the bell tower or the Cross of the Plains Church and the fan-shaped facade of the original Aalto Library. The heart of the building is the wide staircase, intended for different events and as an informal meeting place, which leads to the collection departments on the ground floor and through the connecting underground corridor to the Aalto Library.

LIVELY AND VIVID SURFACE

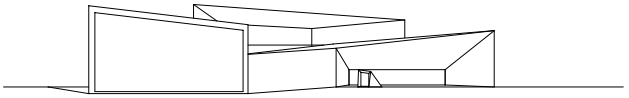
The external skin of the new library is dominated by copper. The darkening pre-oxidised copper sets the new library apart from the whiteness of the surrounding buildings. Copper is not a new material to the area but in the Aalto Centre it is mainly the roofs that feature the material's beautifully patinated green surfaces. In the new library, copper has been used comprehensively across facades, plinth and roofs – creating a single-material skin.

A special shape of copper shingle was specifically designed for the facades to give the building a highly individual, lively and vivid surface. In some situations, the shingle surface is formed into ventilation slots to accommodate air handling. Copper is also used to form vertical grilles and as a door facing to maintain the material continuity.

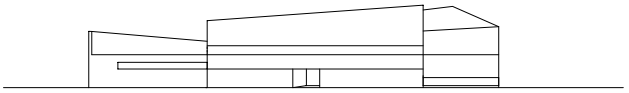
Photo: Martti Kapanen



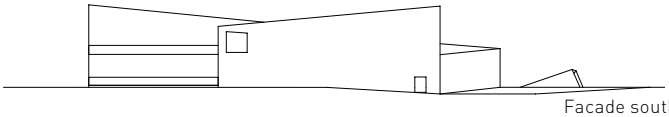
Facade northwest



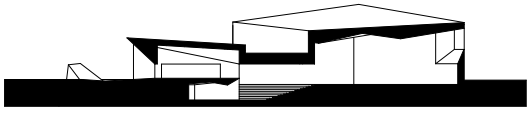
Facade northeast



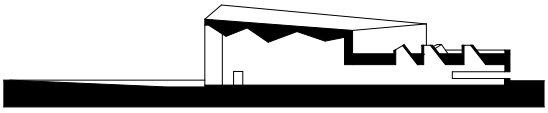
Facade southwest



Facade southeast

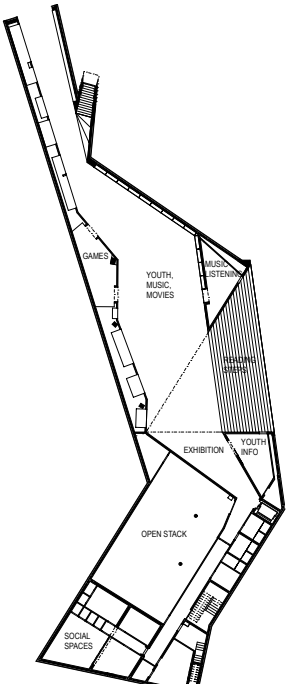


Section A

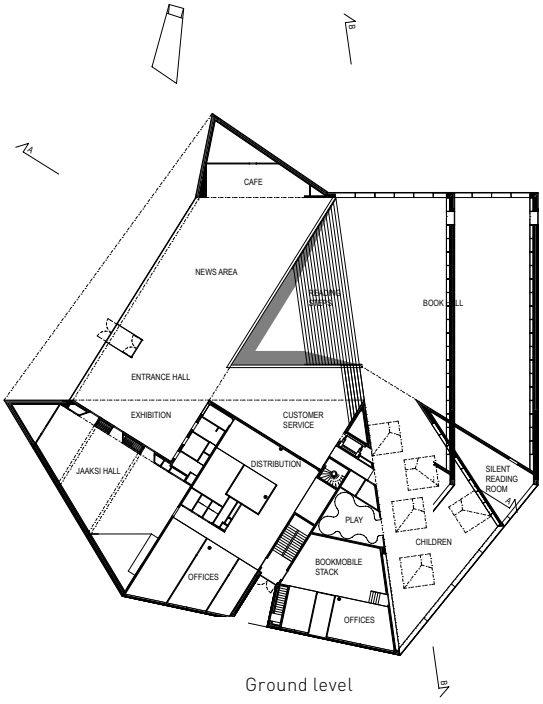


Section B

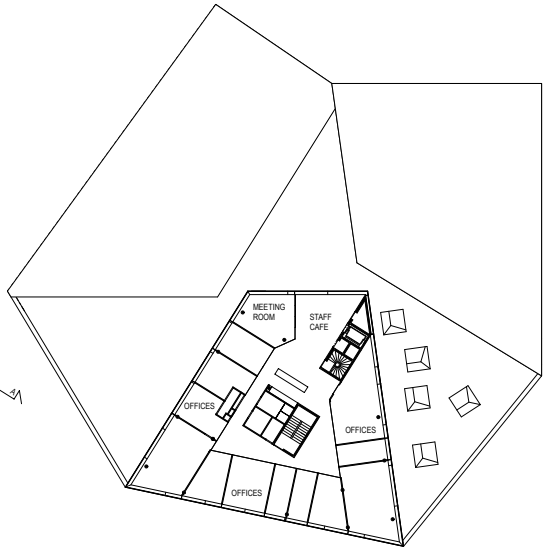
Architects: JKMM
Copper Installer: Pohjanmaan Pelti
Copper Product: Nordic Brown® Light
Photos: Tuomas Uusheimo, Martti Kapanen



Cellar



Ground level



1st Floor


I have come so that you may have life

CONICAL COPPER

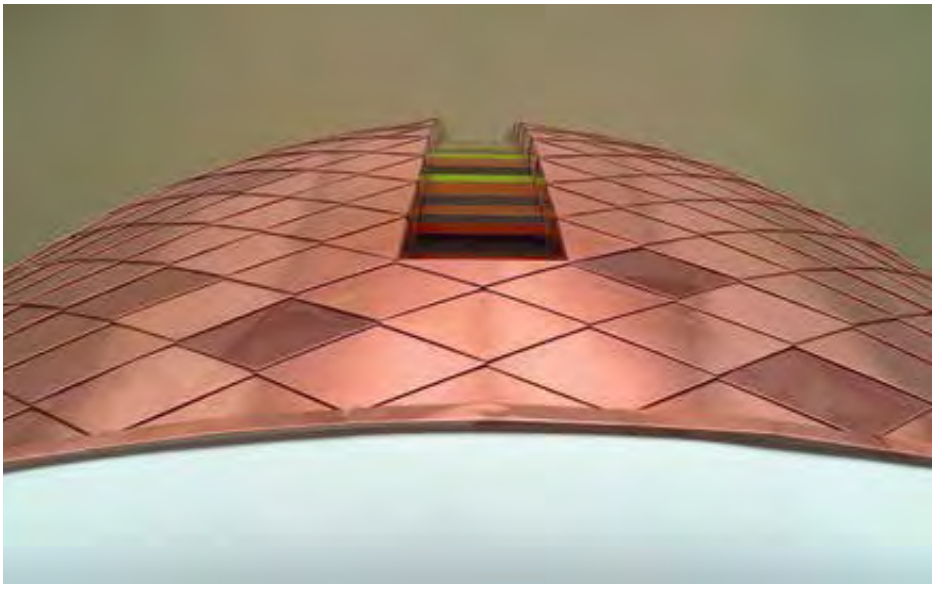
A chapel in the distinctive form of a copper-clad cone is at the heart of the glazed atrium welcoming visitors to this new school. Russel Hayden of Nicholas Hare Architects discusses the design concept and how it was realised.

All Saints' Academy is a church school for the community in Cheltenham, UK. It provides secondary education for 900 pupils and 250 sixth-form students. The building's striking form curves around an impressive external plaza with an elegant canopy and three-storey high glazed atrium at its centre. The design developed around the concept of a hand, the atrium acting as a unifying device from which key internal and external areas are accessed. Curved open galleries within lead to three radiating learning wings providing most of the classroom accommodation.

A Visible Beacon

The entrance atrium forms the heart of the building and the public face of the Academy. Above the reception area rises the distinctive conical form of the copper-clad chapel. It acts as a visible beacon reflecting the Christian ethos of the Academy. The building is clad with a limited palette of materials. The ground floor is brickwork to provide a human scale to the Academy as well as being durable. Upper levels are clad with an insulated render system. The copper shingles to the chapel and the confident use of colour offer a lively counterpoint to the refined facades.

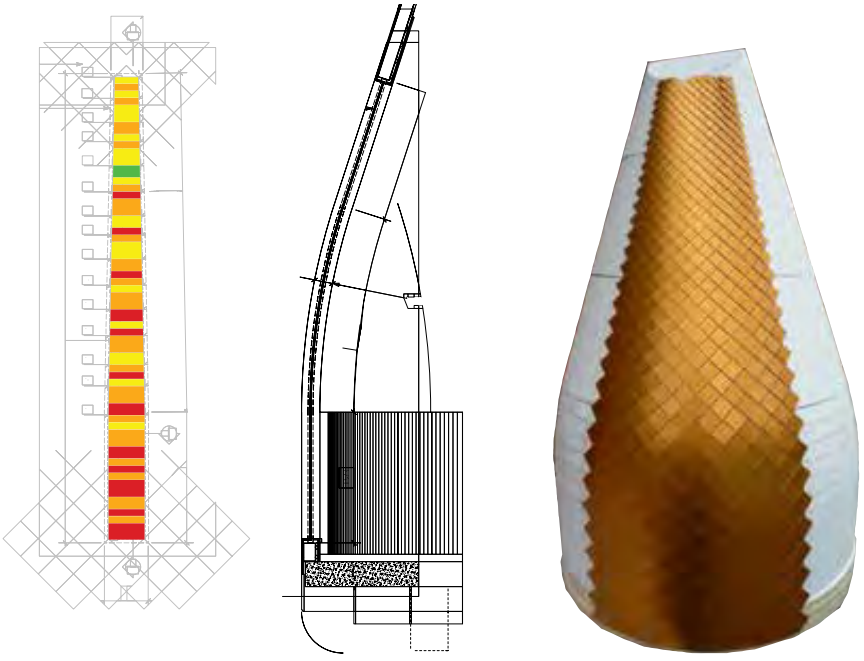
Sculpting of the chapel brings light pouring into the space from above. A single slot window with a coloured glass design provides a focus within the contemplative space. At roof level, the cone is truncated and a large opening formed in the vertical face, infilled with glazing. A separate, lower copper clad form completes the composition and encloses mechanical plant servicing the chapel.

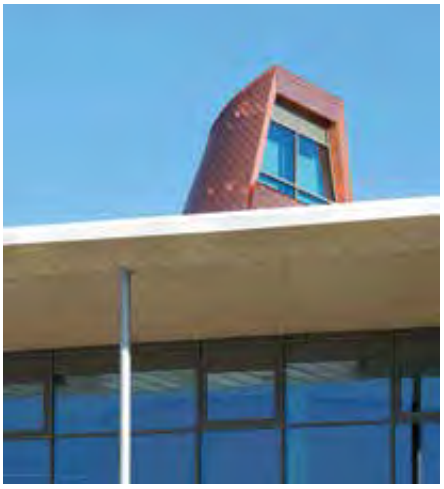


Covering the Cone with Copper

A key element of the concept was for the chapel to appear monolithic – both within the space and externally as it reached through the atrium roof. The original proposal was for timber cladding, but the design team recognised the difficulty of ensuring the internal and external elements would weather consistently. Bright copper was selected with a special, anti-weathering coating to minimise any change as the surface aged.

Shingles were chosen to deal with the complex form that curves in both plan and section. The cladding of the chapel was undertaken – with real craftsmanship – by NDM, the copper shingles gradually reducing in size to accommodate the conical shape. The form was computer modelled, as the size of each row of shingles had to be calculated to suit the diminishing diameter.





Architects: Nicholas Hare Architects
www.nicholashare.co.uk
Copper Installer: NDM Metal Roofing & Cladding
Copper Product: TECU® Classic (coated)
Photos: © Hufton+Crow

Copper Architecture on-line

Experience copper architecture online- a definitive resource for architectural inspiration, including electronic versions of Copper Architecture Forum, the European Copper in Architecture Awards and many other helpful publications available at www.copperconcept.org

Copperconcept.org is organised into 17 separate language sections, each edited locally. The website features an extensive selection of regularly updated project references, demonstrating different uses of copper and highlighting some of the best examples of copper architecture from around Europe and beyond. Of course, information on the European Copper in Architecture Awards can be found there, alongside articles on topical issues, such as the antimicrobial capabilities of copper.

As well as design inspiration, Copperconcept.org gives access to a range of architectural and technical publications, and links to other organisations including copper fabricators. Journalists and editors can also access press releases, articles and images for publication. Finally – and most importantly – the website hosts Copper Architecture Forum and you can register for your free subscription there, as well as download the latest, and previous, issues of the magazine.

Explore the world of copper architecture now at – http://www.copperconcept.org

The **Copperconcept App**

Free & available for iPhone and iPad.
Inspiration and information combined in one app.

- Reference projects
- Architectural city maps
- Design Awards
- Copper Architecture Forum
- Articles

Available on the App Store

ARCHITECTURAL AWARDS LAUNCH

Entries are invited for the 2013 European Copper in Architecture Awards – a showcase for architects designing with copper and its alloys to promote their work to an international audience.

All entries must incorporate facades, roofing or other architectural elements of copper or copper alloys. Any scale or type of project can be entered – from major landmark buildings to modest schemes.

Architects and critics, drawn from a panel including some of the most influential designers in Europe, will judge all the entries on their architectural qualities from graphic submissions.

Final deadline for receipt of entries: 31st May 2013

For more information on entering the 2013 Awards-16 and on previous awards entries and results, visit: **www.copperconcept.org/awards**

european copper in architecture campaign