COPPER ARCHITECTURE FORUM 35

DEUTSCH

UNVERGLEICHLICHES KUPFER

Diese Ausgabe lädt zu Vergleichen ein – sowohl in Bezug darauf, wie Architekten ihre Gebäude entwerfen, als auch in Bezug auf ihre Einstellung gegenüber Kupfer als modernem Werkstoff der Architektur.

Es ist faszinierend zu sehen, wie ausgesprochen unterschiedlich drei bedeutende Architekturbüros an eine einzige Typologie – das Museum – herangegangen sind und Kupfer und seine Legierungen ebenso unterschiedlich zur Charakterisierung ihrer Entwürfe eingesetzt haben. In Warschau erforschen Lahdelma & Mahlamäki die Lichtdurchlässigkeit von Fassaden mit vorpatiniertem Kupfer, das ihrer 'Laterne im Park' einen zusätzlichen grünen Schimmer verleiht (Seite 24). Foster + Partners in München modulieren dagegen Fassaden mit einem Gitter aus senkrechten Stangen, die vor konkaven Blechen angebracht sind, alles in einer goldfarbenen Kupferlegierung (Seite 28). Schließlich ist das Projekt von Staab Architekten in Ahrenshoop durch traditionelle Bauformen definiert, die nahtlos mit komplexen Profilblechen aus Messing verkleidet sind (Seite 34).

Ein Vergleich, wie Kupfer an zwei gegensätzlichen Gebäuden verwendet wurde, die von demselben Architekturbüro – Wilkinson Eyre – entworfen wurden, ist ebenfalls aufschlussreich (Seite 16). Hier ist Kupfer Teil der selektiven Palette des Architekten von leichten und sich natürlich verändernden Materialien.

Insgesamt sind diese Projekte beispielhaft für eine wachsende Vielfalt innovativer Designs mit Kupfer, die die einzigartigen Eigenschaften des Werkstoffs optimal nutzen. Neben der optischen Fülle und gestalterischen Freiheit lohnt es sich, sich an die unvergleichliche Leistungsfähigkeit und Nachhaltigkeit – einschließlich der Wiederverwertbarkeit – von Kupfer zu erinnern, die wir in unserem letzten Artikel (Seite 38) erörtern.

Zunächst präsentieren wir aber die zehn Finalisten, die für den diesjährigen European Copper in Architecture Award aus den 82 eingereichten Beiträgen von einer Architektenjury ausgewählt wurden. Ihre Entscheidung über die endgültigen Gewinner des Awards wird auf der BATIMAT in Paris im November bekannt gegeben. Sie können jedoch jetzt die Projekte vergleichen und online abstimmen (Näheres auf Seite 4). Und wir hoffen, dass Sie uns auf der Awards Ausstellung während der BATIMAT besuchen können. Bis bald in Paris!

Die Redaktion

Anmelden und mehr erfahren über das Copper Architecture Forum: copperconcept.org
Ausgaben des Copper Architecture Forum als PDF: copperconcept.org
Kontakt zur Redaktion: editorialteam@copperconcept.org
Ihr Projekt-Upload auf der Website: copperconcept.org
Mitmachen beim European Copper in Architecture Award: copperconcept.org

Copper Architecture Forum 35, Oktober 2013

Das Copper Architecture Forum ist Teil der „European Copper In Architecture Campaign". Es erscheint zweimal jährlich und hat eine Auflage von 25.000 Exemplaren.

Die Zeitschrift wendet sich an Architekten und Fachleute in ganz Europa und der Welt und ist in verschiedenen Sprachausgaben verfügbar, wie zum Beispiel auf Englisch, Tschechisch, Dänisch, Finnisch, Französisch, Deutsch, Ungarisch, Italienisch, Norwegisch, Polnisch, Russisch und Schwedisch.

Titelseite Lenbachhaus Museum, München (Seite 28)
Foto Nigel Young, Foster + Partners

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COPPER ARCHITECTURE FORUM 35

Copper Architecture Forum

Copper in Architecture Awards

ATTRAKTIVES KUPFER

Chris Hodson berichtet über die Finalisten des European Copper in Architecture Awards 2013: ein Wettbewerb, dessen Beiträge alle Erwartungen sowohl quantitativ als auch qualitativ übertroffen haben.

Das Format des alle zwei Jahre aufgelegten Award Programms wächst weiter; es feiert nicht nur die beispielhafte und innovative Verwendung von Kupfer und seiner Legierungen in zeitgemäßen Entwürfen, sondern zeigt einem breiten internationalen Publikum die besten europäischen architektonischen Projekte, von denen einigen sonst vielleicht keine Anerkennung zuteilwerden würde. Der sechzehnte Wettbewerb in Folge, der zu einem früheren Zeitpunkt in diesem Jahr bewertet wurde, brachte einen Rekord von 82 eingereichten Beiträgen aus ganz Europa hervor.

CRAIG CASCI
GRID ARCHITECTS, GROSSBRITANNIEN

EINAR JARMUND
JARMUND/VIGSNÆS, NORWEGEN

ANU PUUSTINEN
AVANTO ARCHITECTS, FINNLAND

DAVIDE MACULLO
DAVIDE MACULLO ARCHITECTS, SCHWEIZ

Architektenjury

Die Jury 2013 bestand aus vier Architekten, die alle schon einmal den Copper in Architecture Award erhalten haben – Einar Jarmund (Jarmund/Vigsnæs, Norwegen), Craig Casci (Grid Architects, Großbritannien), Davide Macullo (Davide Macullo Architects, Schweiz), Anu Puustinen (Avanto Architects, Finnland).

Alle Beiträge wurden anhand von Fotos, Zeichnungen und Beschreibungen, die von ihren Architekten eingereicht wurden, bewertet. Anfangs sah sich die Jury vor eine gewaltige Aufgabe gestellt und war beeindruckt von dem allgemein hohen Niveau der Einreichungen; es gab viele Beispiele von Gebäuden, deren Pläne gut umgesetzt wurden und die ihre Umgebung bereichern. Aber schließlich einigte sich die Jury auf zehn Projekte, die gegenüber den anderen herausragend sind und eine wirkliche Vielfalt von Typologien und Herangehensweisen sowie außergewöhnliche architektonische Qualitäten aufzeigen.

Bekanntgabe der Gewinner

Am Montag, 4. November 2013, werden die Projekte der Finalisten von ihren Architekten auf der BATIMAT in Paris präsentiert und die Gewinner des Awards bekannt gegeben. Besucher der französischen Messe können sich während der gesamten Dauer der Messe alle Beiträge für den Award-Wettbewerb auf dem Stand 118 in Halle 5A (Flügel N) ansehen und mit den Architekten ins Gespräch kommen – es geht um die Themen Dach- und Fassadenverkleidung.

Um einen Dialog mit allen Architekturinteressierten über die www.copperconcept.org Webseite anzustoßen, können registrierte Besucher der Webseite nun erstmals online ihren Favoriten für den Award wählen. Jeder Wähler nimmt an einer Verlosung teil und kann ein iPad Mini gewinnen. Das Voting läuft bis zum 31. Oktober 2013 und das Gewinnerprojekt der Umfrage wird auf der BATIMAT in Paris bei der Preisverleihung bekannt gegeben.

Die Preisverleihung und die Ausstellung aller Projekte findet in Zusammenarbeit mit BATIMAT® vom 04. – 08. November 2013 in Paris Nord Villepinte statt.

Alle Einreichungen und nähere Einzelheiten zu der Preisverleihung auf der BATIMAT finden Sie unter:
copperconcept.org/awards

BIBLIOTHEK SEINÄJOKI, FINNLAND

Photo Mika Huisman

Bibliothek Seinäjoki, Finnland

JKMM Architekten

Eine respektvolle und zeitgemäße, kupferverkleidete Ergänzung der umfangreichen Ansammlung von Alvar- Aalto Gebäuden weltweit.
(Vorgestellt in unserer Ausgabe 33/2012)

Photo Martti Kapanen

GEDENKSTÄTTE BESLAN, REPUBLIK NORDOSSETIEN-ALANIEN

Photos Dr Krekeler Generalplaner GmbH

Gedenkstätte Beslan, Republik Nordossetien-Alanien

Dr. Krekeler Generalplaner GmbH

Im Gedenken an die Opfer des Geiseldramas von 2004 in der Schule von Beslan umschließt diese filigrane, perforierte Installation aus einer Kupferlegierung sanft das ursprüngliche Schulgebäude und drückt sowohl Würde als auch emotionale Beteiligung aus.

LCV Gerichtsgebäude, Venedig, Italien

C+S Architekten

Eine kultige, dunkle Kupferform verarbeitet die lokale Typologie von Industriegebäuden und eint die ungleiche Ansammlung von Gebäuden in der Umgebung am Verkehrseinfallstor der Stadt.

LCV GERICHTSGEBÄUDE, VENEDIG, ITALIEN

Photos Pietro Savorelli

ABDECKUNGEN DER RUNENSTEINE, JELLING, DÄNEMARK

Abdeckungen der Runensteine, Jelling, Dänemark

NOBEL arkitekter

Täuschend einfache, schmuckstückhafte Gebilde aus Bronze und Glas schützen alte Runensteine von nationaler Bedeutung und tragen zum Besuchserlebnis bei. *(Vorgestellt in unserer Ausgabe 33/2012)*

Photos Jens Lindhe

L`ATELIER, GOURNAY EN BRAY, FRANKREICH

Photos Luc Boegly

L`Atelier, Gournay en Bray, Frankreich

Vincent Parreira Atelier Architecture

Ein neues Kultur- und Medienzentrum fühlt sich in seiner Umgebung von ländlicher Stadt und Kleinstbetrieben zuhause; eine moderne Interpretation einheimischer Architektur verhüllt in semitransparente Kupfernetze. *(Vorgestellt in unserer Ausgabe 34/2013)*

CLARION HOTEL POST, GÖTEBORG, SCHWEDEN

Photo Lennart Hyse

Photo Chris Hodson

Clarion Hotel Post, Göteborg, Schweden

Semrén & Månsson

Sympathische und zeitgenössische Anbauten aus Kupfer und Glas machen aus diesem denkmalgeschützten Gebäude von nationaler Bedeutung ein interessantes Hotel, einen städtischen Fokus und einen Katalysator urbaner Erneuerung.
(Vorgestellt in unserer Ausgabe 34/2013)

PLATTFORM FÜR KUNST UND KREATIVITÄT, GUIMARÃES, PORTUGAL

Photos João Morgado - Architecture Photography

Plattform für Kunst und Kreativität, Guimarães, Portugal

Pitágoras Aquitectos

Die Erneuerung des alten Zentrums einer der historisch bedeutendsten Städte Portugals wird bestimmt durch die Vereinigung abstrakter kubischer Formen, die von einem Netz aus Messingprofilen verhüllt sind. *(Vorgestellt in unserer Ausgabe 34/2013)*

PÔLE EDUCATIF ET CULTUREL, PAU, FRANKREICH

Pôle Educatif et Culturel, Pau, Frankreich

Marjan Hessamfar & Joe Vérons Architectes Associés

Goldfarbene Blechbänder aus einer Kupferlegierung, einige perforiert zwecks Lichtdurchlässigkeit, sind Teil einer dezenten Materialpalette, die verschiedene Elemente dieses Schulkomplexes vereint.

Photos David Helman

RADIO-LOG Strahlentherapie, Hof, Deutschland

Hiendl_Schineis Architekten

Die einfachen kubischen Formen distanzieren sich von traditionellen Kupferverkleidungen durch ihre makellosen Oberflächen; diese reflektieren zunächst, verändern sich dann aber mit der Zeit.

RADIO-LOG STRAHLENTHERAPIE, HOF, DEUTSCHLAND

DOLOMITENBLICK, SEXTEN, ITALIEN

Photo Hertha Hurnaus

Dolomitenblick, Sexten, Italien

Plasma Studio

Kupfer und Holz bestimmen dieses Apartmentgebäude in den Dolomiten, das sich aus der natürlichen Topografie erhebt und traditionelle Dachformen widerspiegelt.
(Vorgestellt auf Seite 10 dieser Ausgabe)

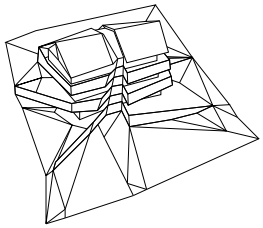
STIMMEN SIE JETZT AB

für Ihren Favoriten unter den Finalisten auf

copperconcept.org/awards

Nehmen Sie an der Verlosung teil
und gewinnen Sie ein iPad Mini.

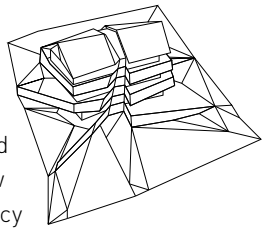
Das Voting endet am 31. Oktober 2013.



ALPINE AESTHETIC

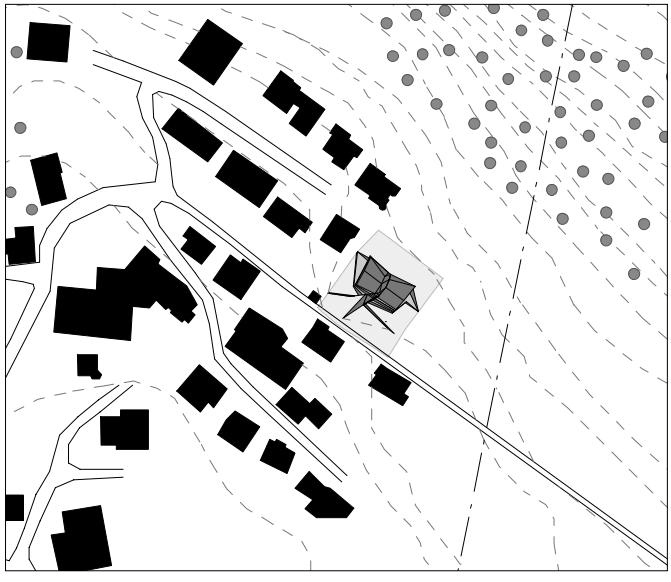
Ulla Hell of Plasma Studio discusses the use of form and geometry in the design of this hillside apartment building in Sesto, Italy, to reflect regional topography and redefine the local vernacular.

Located at the edge of a residential area in the Dolomites, the building's mass was, in part, determined by the functional elements required to host six independent apartments with underground parking and a common circulation core. A formal incision marks the main access and the division of the units, splitting the main volume in two halves. Apart from its functional connotations, this incision becomes the defining element of the building. From either side of the cut, strips unfold to form the balustrades of generous covered balconies that merge with the surrounding topography. Following the steep natural hillside with each floor, the strips and the façade jump back.

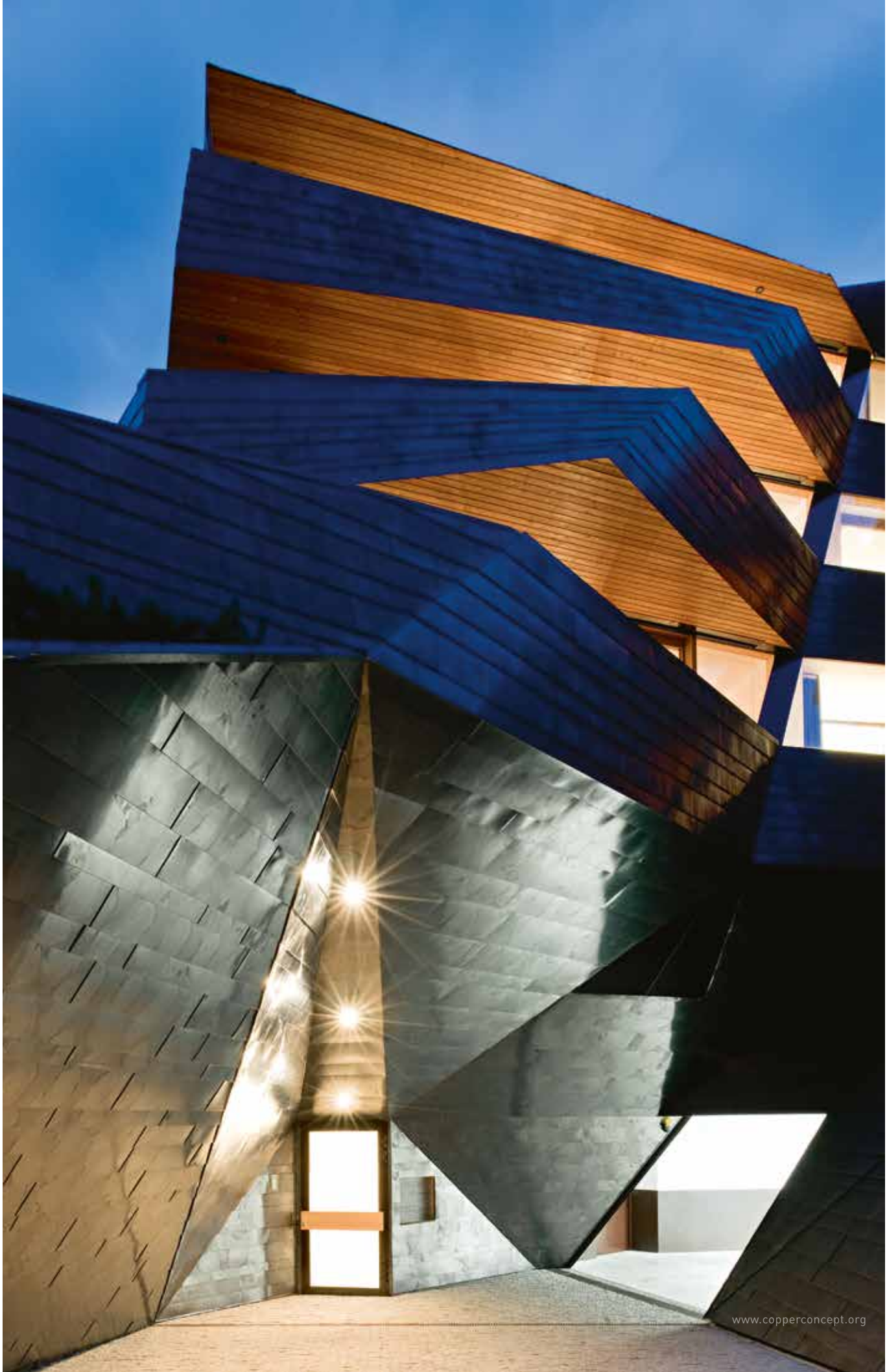


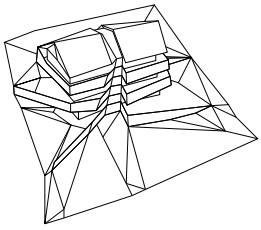
All six, generous holiday homes are orientated to catch the southern sun and panoramic view of the Dolomites. The design maximises privacy through both the splitting of the building volume into two parts and the stepped balustrades, which block views of each terrace space from the unit above and from passers-by. Every apartment enjoys an extension of the internal living area through a covered, sun- and view-facing terrace which terminates in a small private garden.

The residential area location has a very eclectic appearance. We responded by generating a volume which grows naturally out of its surrounding topography and blends into it by limiting the material palette to a very local – almost vernacular – code comprising larch wood and pre-oxidised copper. Both the copper and the larch wood are subject to natural change in colour through the atmospheric influence of sun, rain and snow. By borrowing from the colour palette of nearby farmhouses with their dark, sunburned larch wood façades, the building blends into its natural surroundings. This local larch wood is used to define both internal and external living areas. South facing floor-to-ceiling glazing maximises views and winter solar gain, whilst external 'brise soleil' and the balcony overhangs minimise overheating during summertime.



Site plan

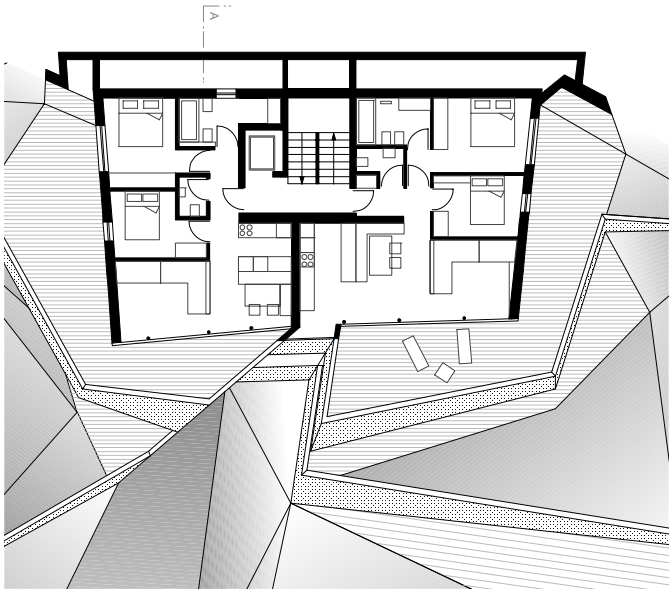




The main circulation – a continuation of the formal incision – is very compact and repeats the use of the local larch wood from the façade. Particular care was taken with the design of the copper balustrades, which stem from the natural topography and wrap around to meet the building at the central incision, then peel off again and end once more in the surrounding landscape. When peeling off, the metal sheets – divided into horizontal strips – describe a curved, hyperbolic-paraboloid geometry. Here, the craftsman's expertise is showcased to its full extent.

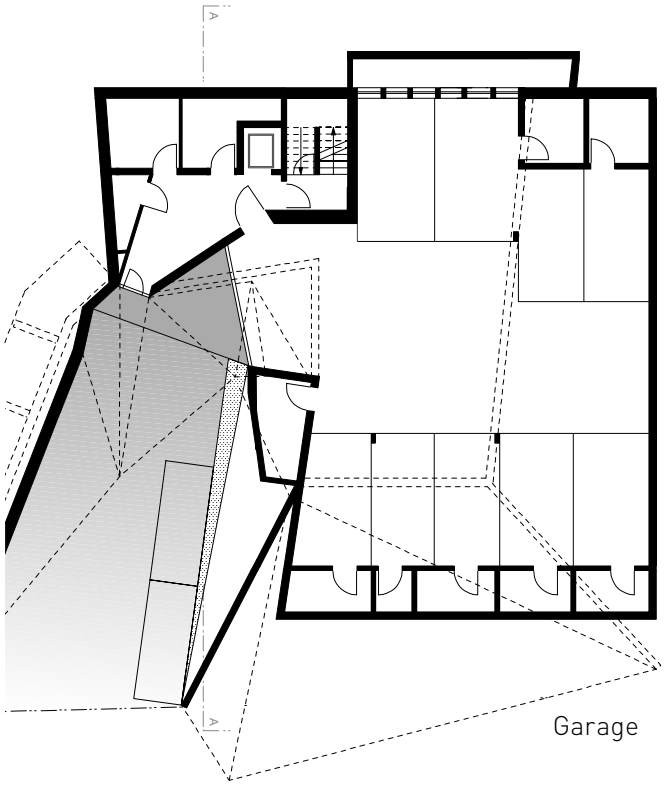
The dark, pre-oxidised copper surrounds the volume from all sides. The copper strips form a second skin, offering shelter and defining the roof as a continuation of the overall façade and building volume. The form of the roof itself draws on a local planning regulation demanding only a pitched roof for this specific building plot. Reinterpreted, it became part of our design concept, referencing the traditional pitched roof typology – not through replication but, rather, by exploring its hidden potential.

The restrained material palette carries through from outside to interior spaces.



1st floor

0 m 5 m

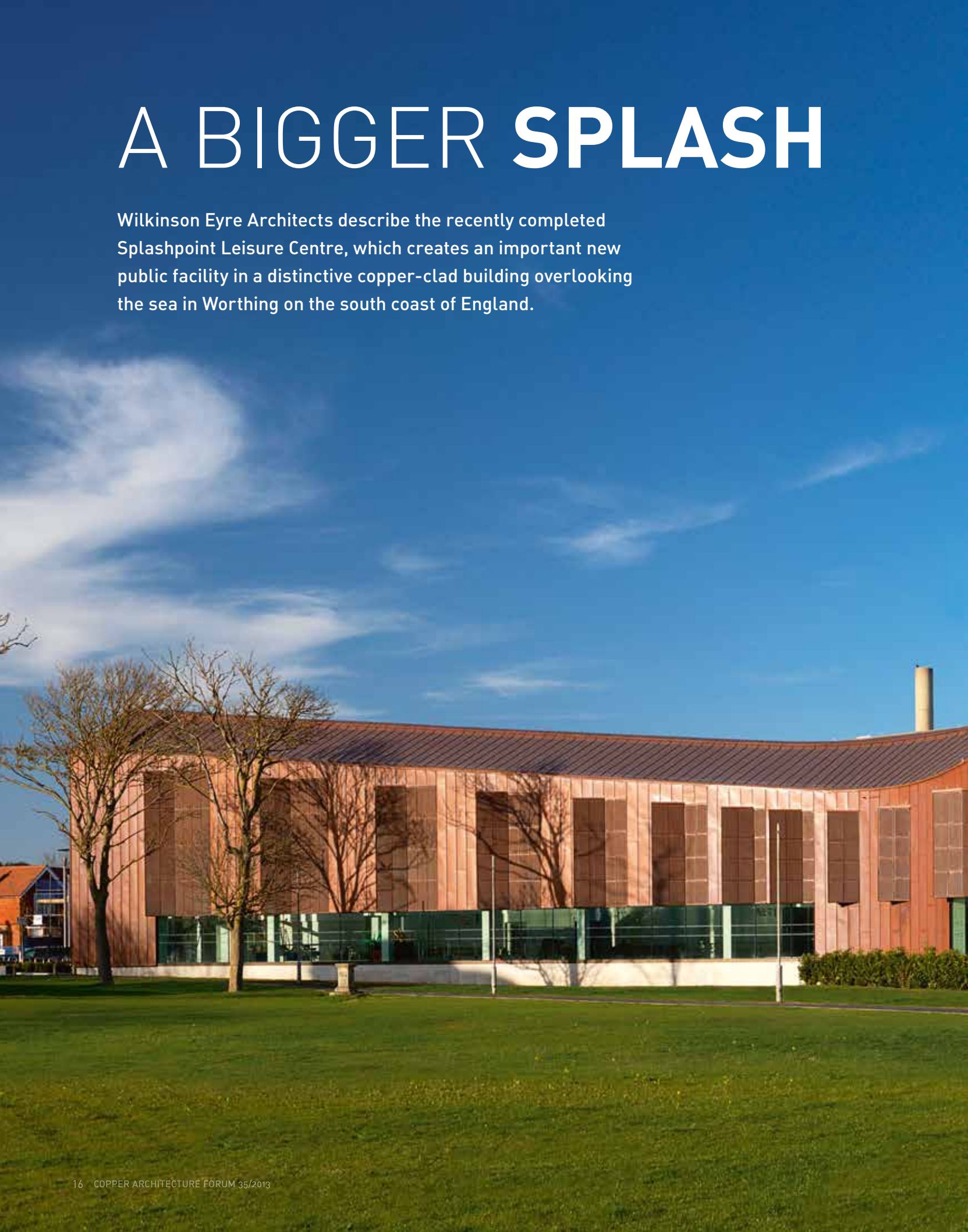


Garage

Architect: Plasma Studio
Copper Installer: Zingerle Bonifaz
Copper Product: Nordic Brown™
Photos: Hertha Hurnaus, www.hurnaus.com

A BIGGER **SPLASH**

Wilkinson Eyre Architects describe the recently completed Splashpoint Leisure Centre, which creates an important new public facility in a distinctive copper-clad building overlooking the sea in Worthing on the south coast of England.



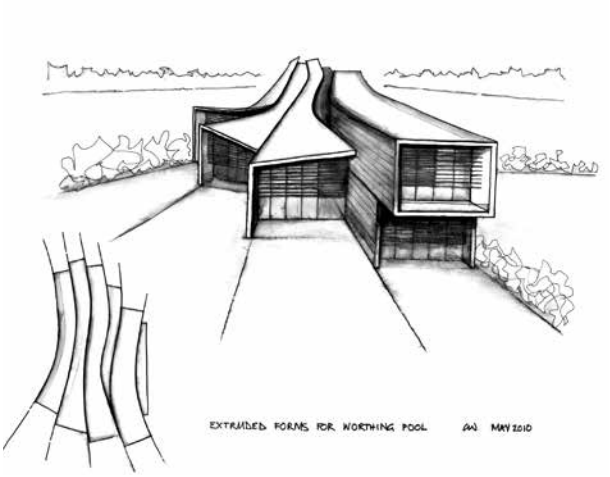
We were appointed to design this new swimming pool for Worthing Borough Council following a hotly contested RIBA competition that attracted over 400 entries. The new complex, located close to the town centre, is an exciting development on a unique seafront site. The new pool complex includes a six lane, 25 metre pool; a combined learner/diving pool; indoor leisure pools with rapids, flumes and outdoor waters; a health and fitness centre; café; crèche and flexible space for other activities.

Our design maximises the potential of the site with 'ribbons' of accommodation flowing from north to south to emphasise the connection between land and sea. Each pool form has its own terrace, opening up the façade to animate the beach-front elevation and enlivening this prominent location in line with the Council's aspirations for an Active Beach Zone.

The dynamic, fragmented shape of the new leisure centre is arranged to respond to the surrounding mix of built forms and landscape. The building's dramatic sawtooth roof, with its ranks of sinuous ridges, recalls a series of dunes that curve and twist towards the coast. This shape reduces the visual mass of the buildings and mediates the change in scale from the terraced houses that line the coastal road to the expansiveness of the open sea.

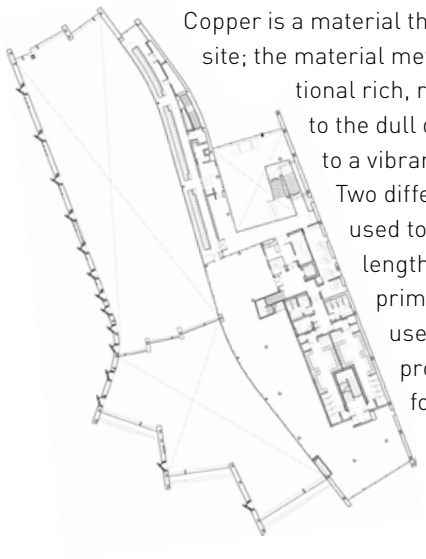
Worthing is one of the most quintessential English seaside towns, a place with an interesting history and a fantastic seafront. Our ambition was to design a building that carefully responded to these surroundings, creating a structure that has both a human and civic scale. Our building seeks to draw on forms already present in the town, taking on the undulating linearity of the ranks of surrounding terraced houses and the breakwater groynes on the beach. The building occupies a prominent location on the seafront, but rather than dominating the site in the style of a grand seaside pavilion, it sits informally, even playfully, within its setting".

Chris Wilkinson



Self-finished Natural Materials

The structure is clad in copper and red cedar – a palette of self-finished natural materials selected to age gracefully in the maritime conditions. The façade integrates a series of substantial glazed panels, creating the effect of "picture frames" to the windows and roof-lights. Copper and timber are materials that are synonymous with the tradition of English seaside culture. These materials are also robust against the fierce coastal elements, complement each other aesthetically and are sensitive to the history of this beautiful seaside town.



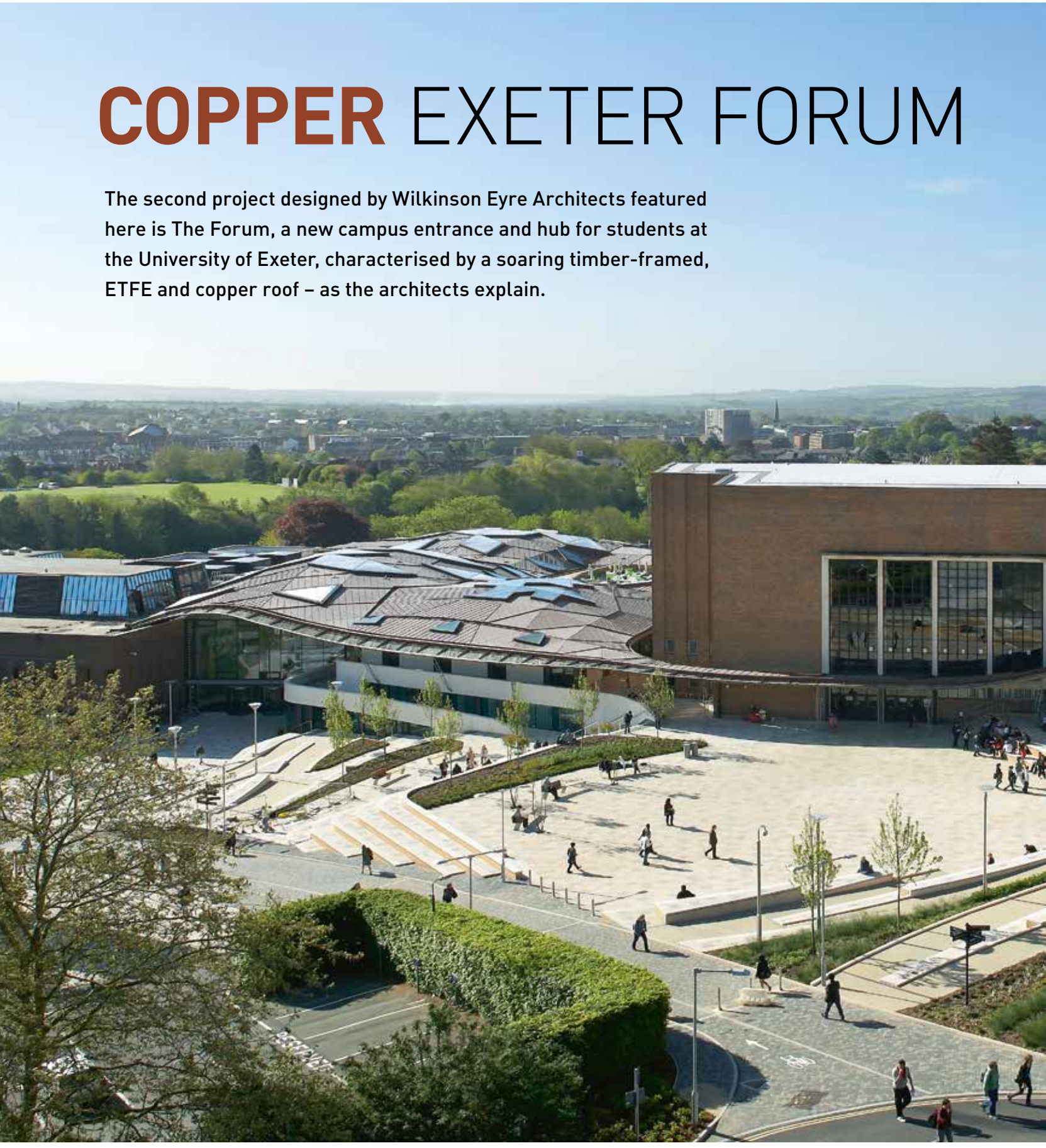
Copper is a material that truly 'roots' itself to the site; the material metamorphoses from its traditional rich, reflective copper red through to the dull dark browns and further to a vibrant green patinated finish. Two different finishes have been used to create variation along the length of the western façade: the primary wall and roof surfaces use flat cladding panels and the projected windows use a perforated rain screen system.

From the inside, the building is emphatically focussed towards the sea. The spans between the longitudinal ridges of the roof widen as the height of the building increases, running towards the sea and terminating in a series of glazed facades that directly overlook the water. The building has been raised so that, from pool level, there is a powerful visual connection between the pool and the sea, creating the impression of an infinity pool.

Architect: Wilkinson Eyre Architects
Copper Product: Nordic Standard
Photos: Julian Abrams

COPPER EXETER FORUM

The second project designed by Wilkinson Eyre Architects featured here is The Forum, a new campus entrance and hub for students at the University of Exeter, characterised by a soaring timber-framed, ETFE and copper roof – as the architects explain.



The Forum links essential facilities such as the Great Hall, lecture theatres and the Student Guild along a galleried, indoor high-street – lined with cafes, a shop and a bank. A student services centre takes a prominent position within the new building, broadening and enhancing the range and availability of pastoral services that the University offers. A newly built state-of-the-art auditorium, specially commissioned public art, landscaped open spaces and refurbished library complete the Forum, making it the heart of the social and academic life of the University.

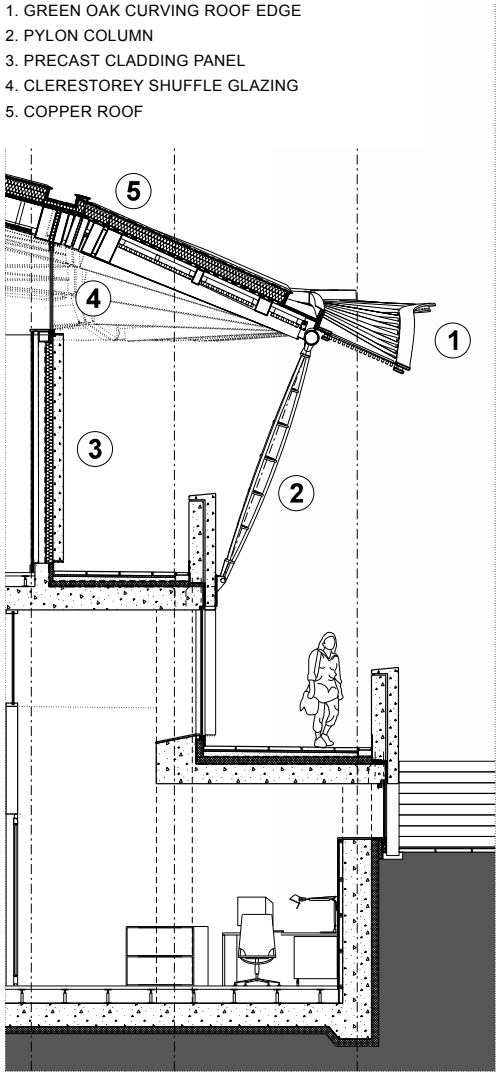
The starting point for our design was the natural features of Exeter's famously hilly Streatham campus. The orientation and arrangement of the building and its adjacent landscaped piazzas respond to the contours of the hillside setting, which are traced by a "green corridor" – the main pedestrian route through the scheme. The steep topography of the hillside has been rationalized into two circulation levels that connect the Library and the Great Hall, unifying two vital centres once separated by a steep slope.

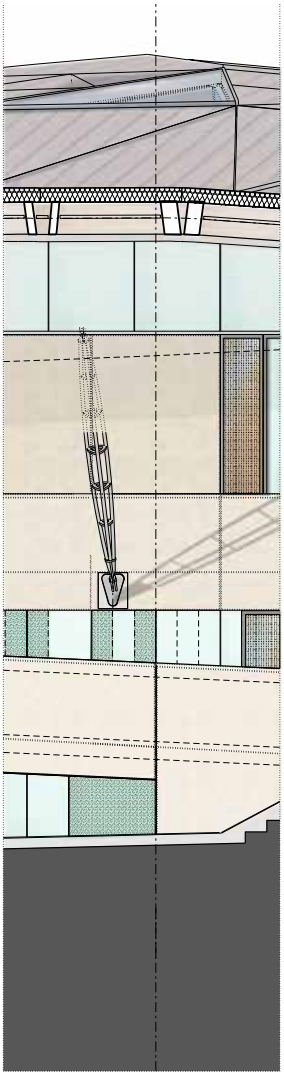
Architect: Wilkinson Eyre Architects
Copper Product: TECU® Classic
Photos: Hufton and Crow

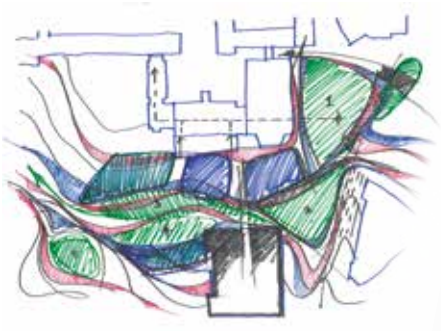
Undulating Copper Clad Roof

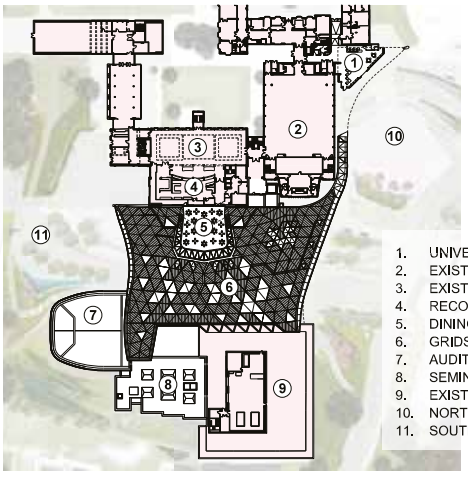
A landscaped Entrance Piazza defines a new front door to the campus and provides students with high quality open space for relaxation at the natural centre of the campus. At the north western end of the Entrance Piazza stands a new entrance building that provides a reception area for the University and Great Hall. The smooth curve of the entrance building rises one storey, tracing the northern elevation of the Great Hall above a covered walkway before merging with the centrepiece of the Forum project: an undulating timber grid-shell roof, clad in copper and ETFE, designed in conjunction with engineering experts, Buro Happold.

1. GREEN OAK CURVING ROOF EDGE
2. PYLON COLUMN
3. PRECAST CLADDING PANEL
4. CLERESTOREY SHUFFLE GLAZING
5. COPPER ROOF









1. UNIVERSITY RECEPTION
2. EXISTING GREAT HALL
3. EXISTING DINING HAL
4. RECONFIGURED KITCHEN
5. DINING ROOF TERRACE
6. GRIDSHELL ROOF
7. AUDITORIUM
8. SEMINAR BLOCK
9. EXISTING LIBRARY
10. NORTH PIAZZA
11. SOUTH PIAZZA

Beneath the roof and behind the glass facades that enclose the space between the existing buildings, the Forum is an airy, galleried hall which shelters and unifies a series of new student-focused spaces. The upper level gives access to the Great Hall, Student Guild and a new suite of learning labs and seminar spaces designed for Harvard-style exploration sessions. The Forum's vertical arrangement unifies the two circulation levels of the plan, creating new accessible routes that make the campus more legible and easier to get around.

At ground level, the "green corridor" runs through the building, creating a covered high street with a bank, shops, cafes, breakout spaces and access to the library, student services centre and auditorium. The auditorium is a new building also designed by Wilkinson Eyre providing a 400-seat lecture theatre with state-of-the-art equipment and seating, and spectacular views out to landscaped lawns.

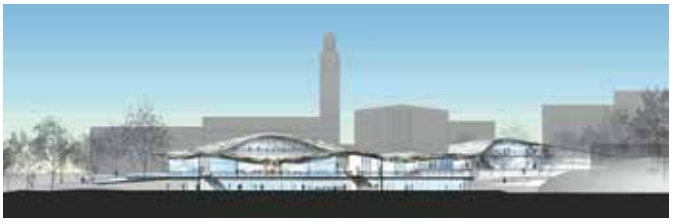
Column-free Floor Area

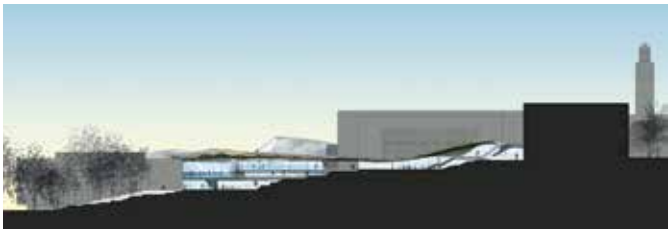
The Forum's roof encloses 3,500 m^2 of airy, column-free floor area making it one of the largest timber roofs of its kind. Its flowing form contrasts with the orthogonal brick architecture of the existing campus, responding to the hillside setting and preserving key views across the city to Dartmoor. Beneath the roof's copper cladding, which will gracefully develop a green patina over the next 15 years or so, lies an innovative hybrid timber structure. A matrix of timber members joined at steel nodes emulates the traditionally all-steel construction of a grid-shell roof, weaving between the existing buildings of the campus.

The triangular cells of the grid are either clad in copper, with oak-slatted acoustic baffling on the interior surface, or filled with ETFE pillows which flood the lofty interior spaces of the Forum with natural light. Smaller panels of conventional glazing are used in the roof windows above teaching areas to mitigate any possible noise caused by falling rain.

Sustainability Credentials

The Forum was designed to achieve a BREEAM "excellent" rating. While the sustainability credentials of the timber structure and copper cladding are apparent, other features such as natural stack ventilation, a labyrinth pipe air-cooling system and energy efficient lighting maximise the environmental performance of the main building in use.





ILLUMINATING COPPER

The recently completed Museum of the History of Polish Jews in Warsaw is defined by a layered, transparent façade design using pre-patinated copper in different forms, combined with decorated glazing.

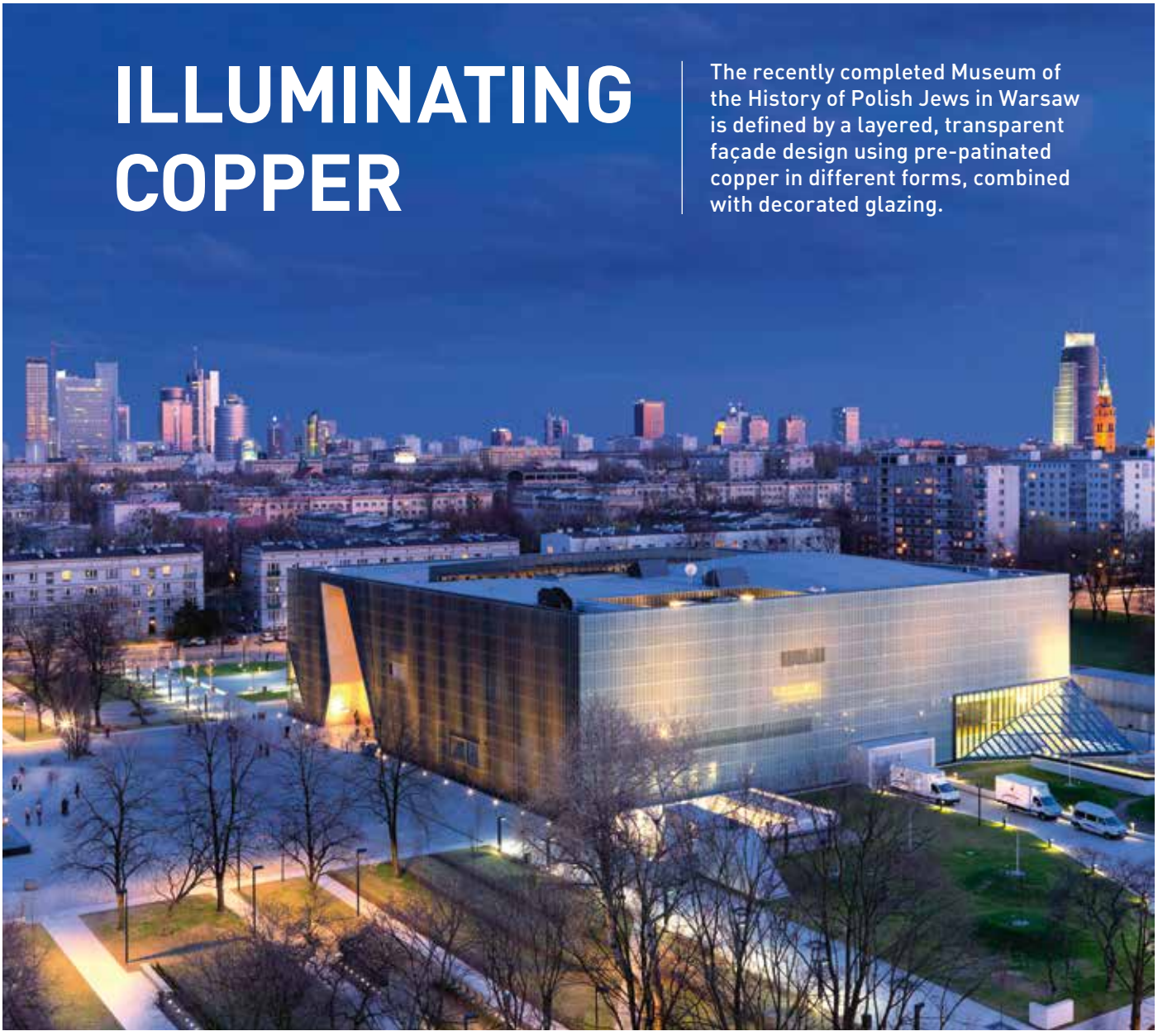


Photo: Wojciech Krynski

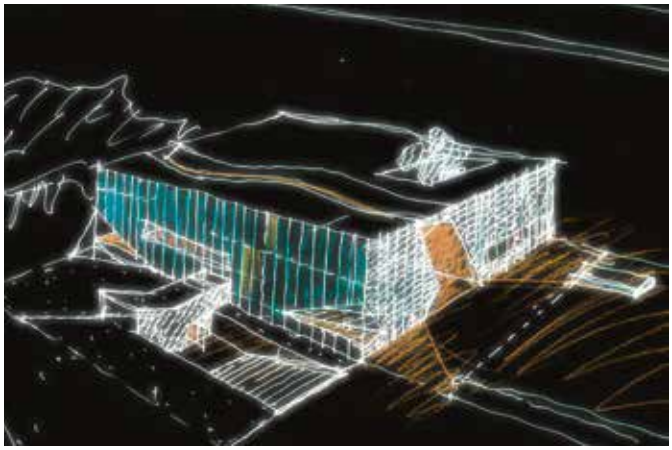
by Chris Hodson

The new building's design, by Lahdelma & Mahlamäki (working in conjunction with Kuryłowicz & Associates in Poland), stems from the architects' 2005 competition-winning entry. The Museum's location in Warsaw's Willy Brandt Park is significant, as it was part of the Jewish ghetto during the war, and the design relates closely to the adjacent memorial to the uprising in the ghetto. However, it is not seen as a museum of the Holocaust but rather a celebration of 1,000 years of shared history. The Museum will act as a multifunctional centre for research and exhibition of Jewish heritage, education and culture.

A Shimmering Green Lantern

Conceived as a simple box, the competition design envisaged a lantern illuminating its park surroundings. The designer's solution is a regular grid of vertical, alternating glass and copper panels, saw-toothed across all four facades, in front of a corrugated copper backdrop. This animates the building, presenting varying degrees of transparency and changing effects from different viewpoints. In sunshine, the gossamer-like glass panels shimmer with a copper green hue. At night, the lantern concept is realised by the play of advanced LED lighting behind the decorated glass onto the green corrugated copper.

Photo: Juha Salminen



The competition-winning design concept has been developed and realised: a copper-green square lantern in the park, pierced by an organic hall space.

Architect: Lahdelma & Mahlamäki (in conjunction with Kurytowicz & Associates) **Copper Product:** Nordic Green™ Living

Photo: Juha Salminen

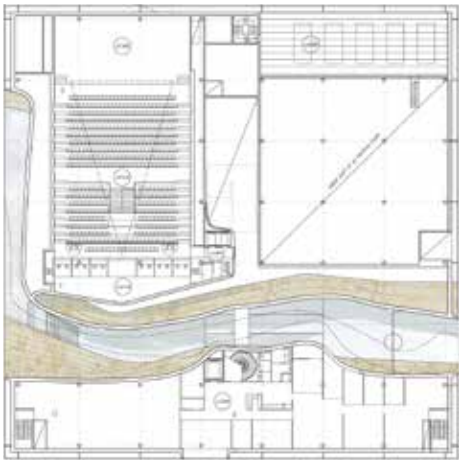
Photo: Wojciech Krynski

"We wanted to make the lobby emotional, warm and soft – and the façades cold and sharp like ice"

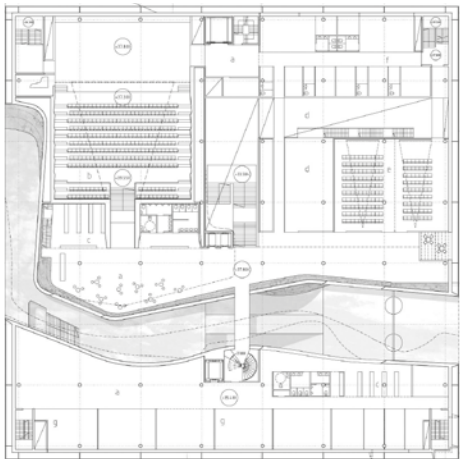
Professor Rainer Mahlamäki

The sharp, engineered rhythm of the copper and glass saw-toothed facades contrasts with a sculptural, curvilinear entrance. This opens into a cavernous 'hall' space – almost an internal biblical landscape – symbolising the parting of the Red Sea and deliverance of the Jews from Egypt. A gently sloping bridge, floating above the permanent exhibition below, brings visitors into the central hall which leads through the building, terminating at a massive, glass wall overlooking the Ghetto Heroes monument.

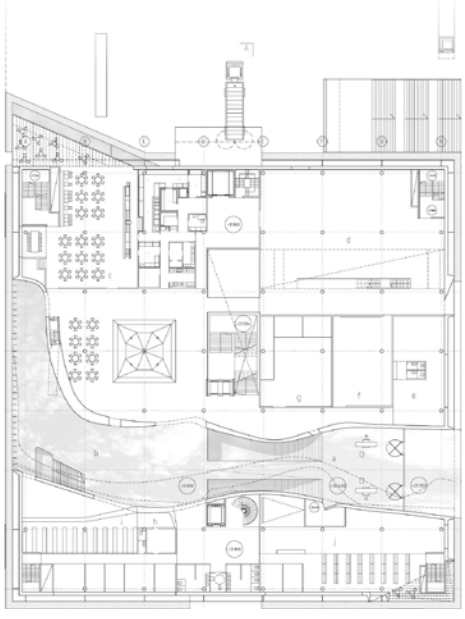
The curved, polished concrete walls rise up some 20 m creating animated, organic forms that embrace the space. The main hall is the most important element of the scheme, intended as a pure and silent space, introducing visitors to the museum. The building also provides an auditorium, cinema, performance hall for five hundred visitors, an educational centre, club, restaurant and café.



Third Floor



First Floor



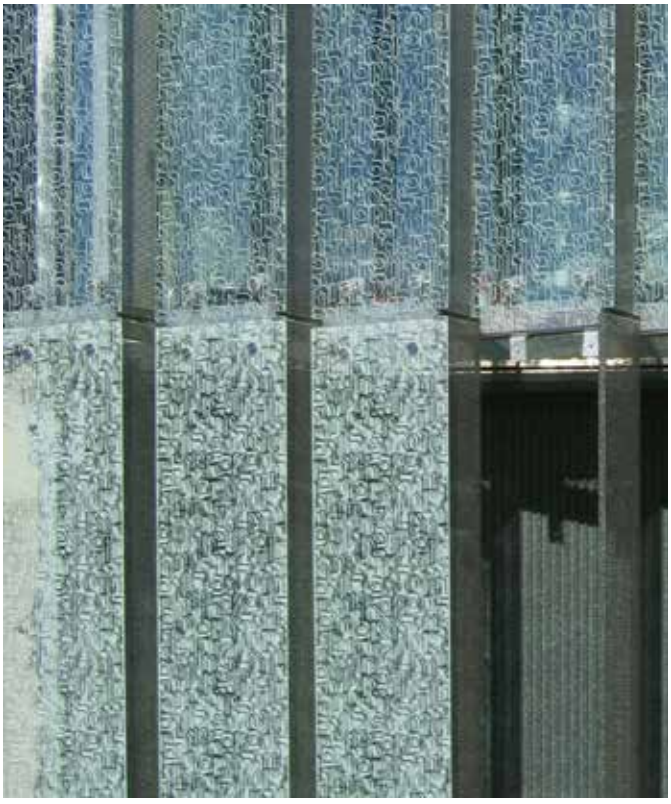
Ground Floor

Photo: Juha Salminen

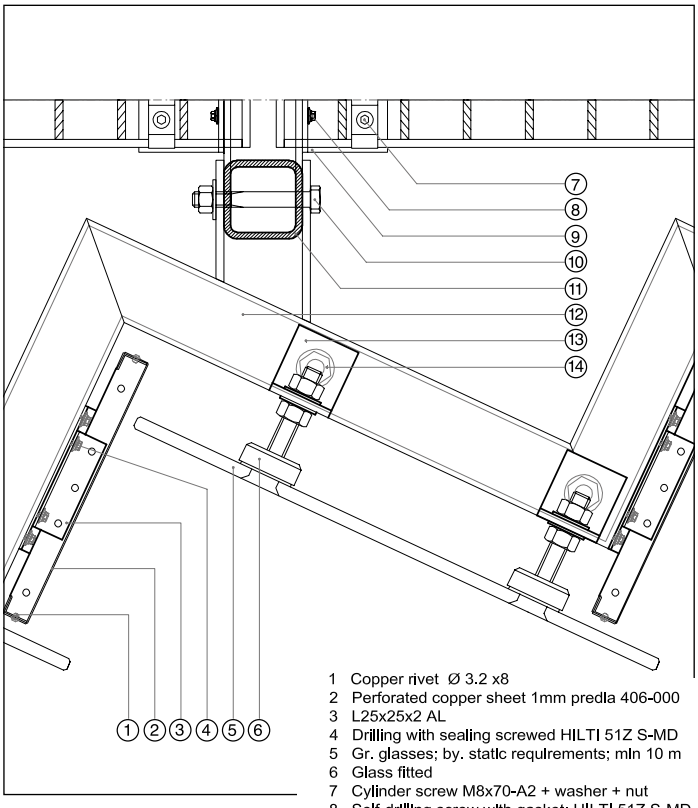
Living Copper Facades

The Museum facades consist of vertical glass and copper panels in a saw-tooth arrangement creating, in effect, a ventilated rain-screen supported by a steel framework in front of the structural walls. The copper panels are pierced with square holes for ventilation, although earlier trials experimented with expanded copper sheet. This contrasts with the glass, which is decorated with a white silk-screen printed abstract design suggesting Hebrew and Latin text motifs. Behind, and separated by a void, the concrete structure is also clad with copper, this time in vertically corrugated sheet form, interspersed with occasional windows also behind the rain-screen.

All the façade copper is pre-patinated to give a specific 'living' surface, comprising green flecks against a dark oxidised background, chosen by the architect. The final facade build-up is the result of on-site trials with full-scale mock-ups. It aims to create the luminous green, vertically folded surface envisioned in the competition winning design. Copper and bronze have also been used extensively inside the building for handrails, door handles and specially designed light fittings.



Trial area of façade showing corrugated pre-patinated copper cladding behind acid etched glass and pierced copper end panels.



Detailed drawing showing saw-toothed arrangement of glass and pierced copper with corrugated copper behind.

1 Copper rivet Ø 3.2 x8
2 Perforated copper sheet 1mm predla 406-000
3 L25x25x2 AL
4 Drilling with sealing screwed HILTI 51Z S-MD
5 Gr. glasses; by. statlc requlrements; mln 10 m
6 Glass fitted
7 Cylinder screw M8x70-A2 + washer + nut
8 Self-drllling screw wlth gasket; HILTI 51Z S-MD
9 L60x30x5 steel
10 Screw M12x90-A4 + washer + nut
11 RK60x60x4 steel
12 RP100x60x4 steel
13 L75x55x6 steel L = 50
14 Screw M14x25-A4

GOLDEN TRANSFORMATION

Foster + Partners explain their major project to transform the experience for visitors to Munich's Lenbachhaus Museum, where a golden copper alloy intervention enhances the distinctive, ochre coloured facades of the original building.

The Museum's historic buildings have been carefully restored and the exhibition spaces augmented by a spectacular new wing. As well as radically improving the buildings' environmental performance, the remodelling has created a new entrance and social spaces, including a restaurant, terrace, education facilities and a dramatic full-height atrium, where the old is articulated within the new.

Built in 1891 as a studio and villa for the artist Franz von Lenbach, the Lenbachhaus Museum has been gradually extended over the last century. However, its buildings were in need of renewal and the museum lacked the facilities to cater to a growing audience of 280,000 people a year. Redefining circulation throughout the site, the project has transformed a complex sequence of spaces of different periods into a unified, legible museum that is accessible and open to all.

Our main challenge has been to maintain the same amount of exhibition area, within the museum's footprint, while creating new circulation and visitor spaces. Given the way that the different parts of the museum had evolved, there was no such thing as a typical space – every corner is unique and required individual attention and different design decisions. This has been a fascinating process. Another important aspect of our design has been creating new opportunities for works of art to be exhibited outside the traditional confines of the gallery, such as in the atrium. This space develops the idea of the 'urban room' – it is the museum's public and social heart, and point of connection with the wider city".

Lord Foster

Architect: Foster + Partners **Copper Product**: TECU® Gold **Photos:** Nigel Young, Foster + Partners

Complementary Copper Alloy Intervention

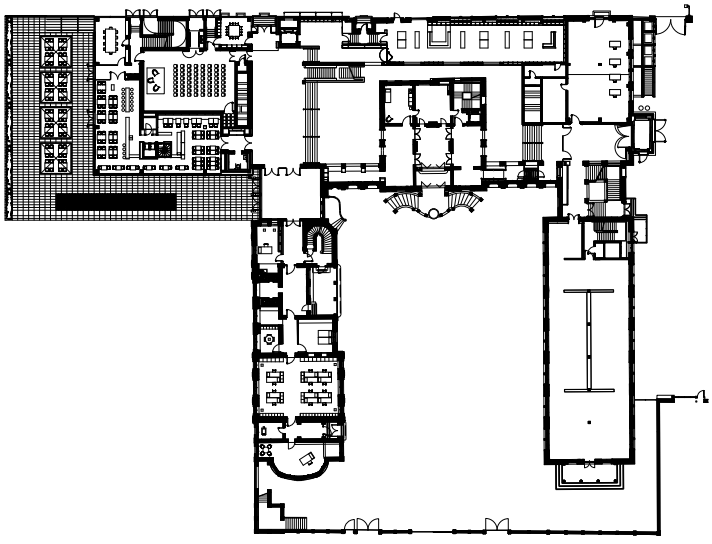
Peeling away the unnecessary historical accretions, a 1972 extension has been removed to reveal the wall of the original villa, which has been sympathetically restored in ochre render. The different historical elements are then unified along Richard-Wagner Street by a new gallery pavilion, containing two levels of exhibition space. The new building is intended as a 'jewel box' for the treasures of the gallery – it is clad in metal tubes of an alloy of copper and aluminium, their colour and form designed to complement the villa's rich ochre hue and textured facades.

Inside the new building, a sequence of intimate galleries display the Museum's internationally renowned 'Blue Rider' collection of early twentieth-century Expressionist paintings, echoing the domestic scale of their original setting in the villa Lenbach. As many of the works of art were painted in 'plein-air', indirect natural light has been deliberately drawn into the upper level galleries to create the optimum environment for their display.

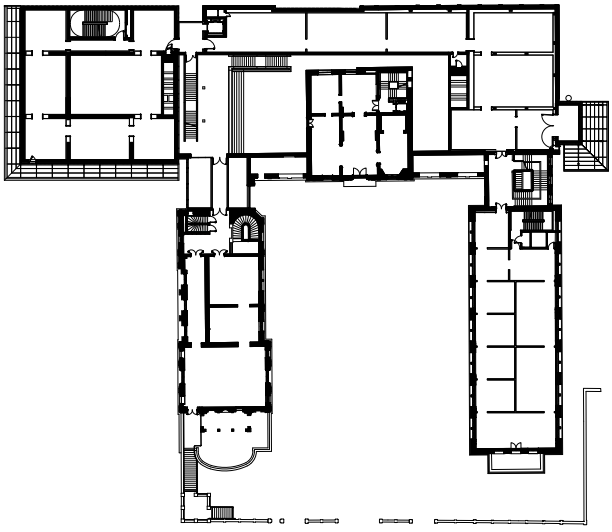
A new entrance has been created adjacent to the restaurant, accessed via a new landscaped piazza to the east of the museum – this move reclaims the courtyard garden, turning it from a pedestrian thoroughfare into a tranquil space for visitors. The restaurant is open outside of the Museum's opening hours and its seating continues outside, helping to enliven the surrounding streets and attracting new visitors into the galleries.

The new social heart of the building is a dramatic top-lit atrium, with ticket and information desks, access to a new temporary exhibition space on the ground floor and a grand, cantilevered stair to the upper level galleries. Clearly articulating the old within the new, its impressive volume incorporates the ochre exterior wall of the original villa and is scaled to accommodate large-scale works of art. The Museum commissioned the artist Olafur Eliasson for a site specific work titled Wirbelwerk. During the day, sunlight washes the white walls via a long, slender opening at roof level and horizontal louvres cast changing patterns of light and shade within the space.

As well as repairing the fabric of the existing buildings, one of the main aims of the project has been to radically improve the museum's environmental performance. A water-based heating and cooling system within the floors has been implemented – using significantly less energy than an air based heating, this represents an innovative step in a gallery context. Rainwater is also collected and recycled and lighting has been replaced and upgraded with low-energy systems.

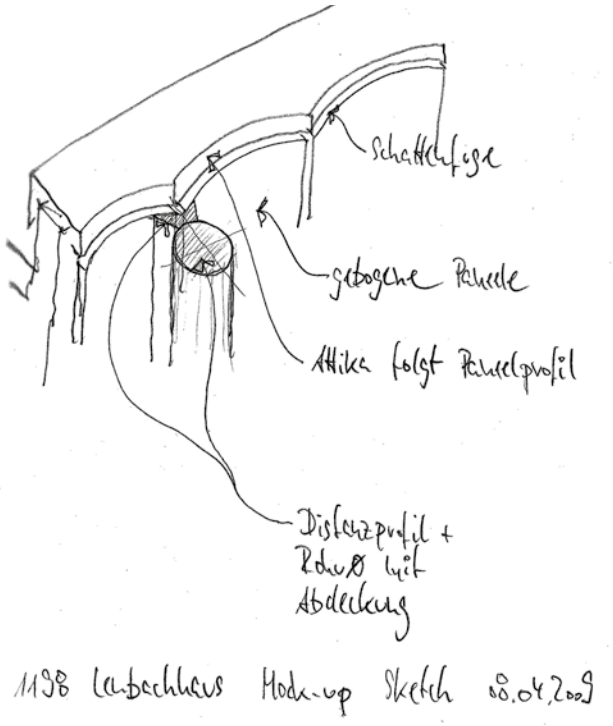


Lenbachhaus Ground Floor Plan / Foster + Partners



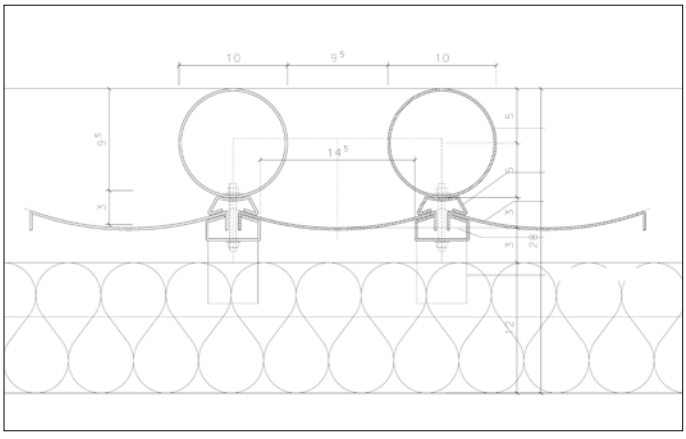
Lenbachhaus First Floor Plan / Foster + Partners

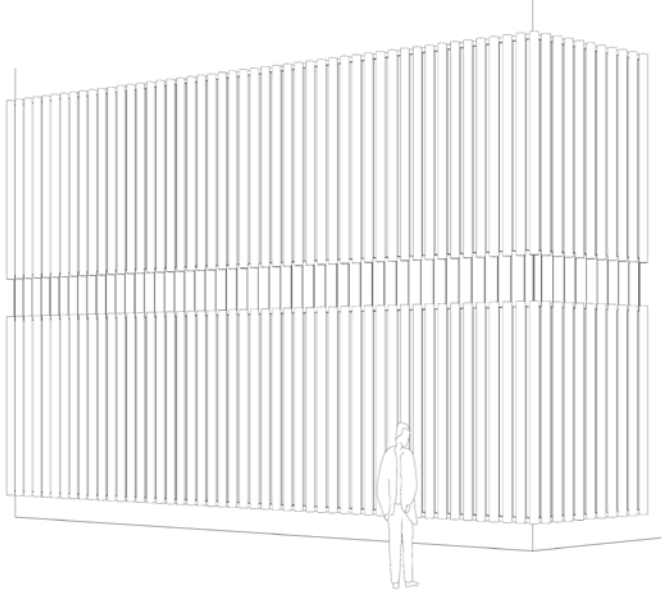
BPR/Foster + Partners



Developing the Facade

Golden copper alloy sheets formed into 10 cm diameter cylindrical bars around 4 m high are the defining feature of the second and third floor façade of the southern extension. Behind these cylindrical bars, the façade is clad in concave sheets of the same copper alloy. The western face of the building, along Richard-Wagner-Straße, offers a particularly compelling view of how this metal façade structures the building. The cylindrical bars highlight the completely new sections of the building, whereas the section based on an underlying historic structure presents a series of concave golden panels and existing structures that have been integrated into the new building are clad in flat sheets.





Drawings: Foster + Partners

BRASS REEDS

based on an article by Klaus Sikora

In this new museum, Staab Architekten introduce modulation and complexity with a profiled brass covering – a contemporary take on reed thatched roofs – enveloping a cluster of distinctive forms, reminiscent of local rural buildings.

Ahrenshoop - located between the Baltic Sea and the salt marsh coast of Germany - is historically important as a former artists' colony and, today, is well known as an attractive tourist destination. The new Kunstmuseum Ahrenshoop will house works of art created locally over the years that display an intense connection with the landscape. The new building itself is destined to become a significant landmark and a magnet for the many visitors who, especially in summer, pass through the isthmus near Ahrenshoop heading for the string of islands off the coast.

Staab Architekten's design was inspired by an old photo of the region, showing an irregular grouping of similarly shaped, traditional, buildings - obviously a farmstead – characterised by steep thatched roofs. From this image, the architecture of the new museum developed from the local agricultural vernacular, resonating with the exhibited artists' strong local connections.

A cluster of houses

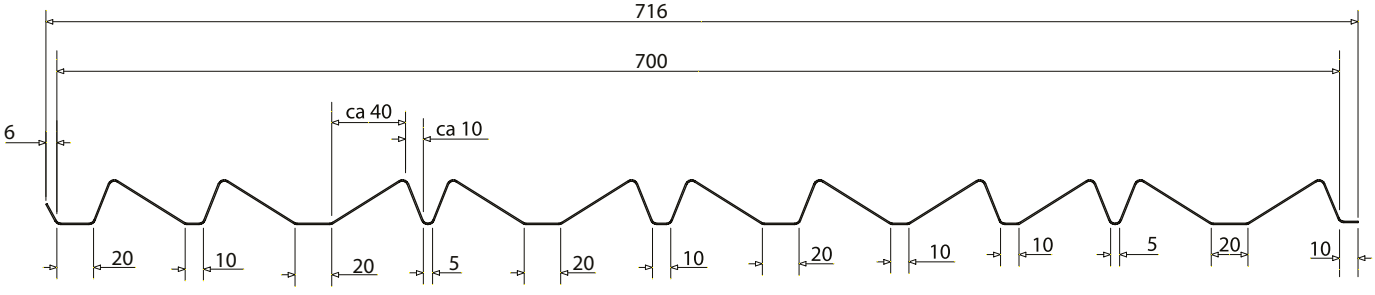
The result is a homogeneous ensemble of five, largely windowless, single-room buildings with hipped roofs virtually cut off below the ridge-line – a device that enables the internal exhibition spaces to be naturally lit. The individual 'houses', constructed entirely from reinforced concrete, are clustered together – as in a traditional village - face different directions and are interlinked by a central flat roof at their eaves. The entire complex is designed as a sculptural whole with a central foyer from which the individual exhibition spaces can be accessed.

From the outset, the architects sought a modern interpretation of the reed thatch used to cover traditional buildings to clad the new museum. A sustainable copper cladding was favoured as it naturally exhibits similar ageing properties. Ultimately, brass was chosen to exhibit colour changes resulting from oxidisation mirroring those of traditional thatch. Initially, the brass is reminiscent of a reed-covered roof glowing in the sunlight. Like the reed, the metal will gradually change with shades of greenish brown, through grey-brown to dark brown-anthracite, caused by the formation of a natural protective layer that guarantees the resistance and longevity of the material.

Animated profiled surface structure

But the architects went a step further with their analogy, seeking a surface form resembling reeds to act as the building's skin. This involved a patented process and close collaboration with specialist metal forming company MN Metallverarbeitung Neustadt. A unique sheet profile was developed that exhibits the depth and complexity of a thatched surface on the prefabricated brass facade.

The apparently random, animated profiled surface structure flows continuously with no visible offset – even in the transition where the eaves meet – giving the impression that the whole has been cast as one piece. The variations of light and shadow on the edges and curves of the brass surface allow the cladding to change in alternating shades, already suggesting how the colour of the surface will alter over time as a result of oxidisation.



Architect: Staab Architekten
Copper Product: TECU® Brass
Photos: Christian Richters / KME / MN

by Nigel Cotton and Irina Dumitrescu

Copper Recycling – Closing the Loop

The red metal is used for its intrinsic qualities of electrical and thermal conductivity, corrosion resistance and workability in the building construction sector. In Copper Forum 34, you read that environmental reporting requirements in the building sector are also steadily increasing. One of the real sustainable benefits of copper is that many of the copper and copper alloy products used in plumbing, heating ventilation and cooling, solar thermal installations and architectural applications, can be produced with 100 % recycled content.

Copper is one of the most valuable materials in modern construction. This value results in the high level of recovery of copper which, in turn, can be recycled for building applications including roofs and facades. According to the International Copper Study Group (ICSG), overall 41.5 % of the copper used in Europe in 2011 came from recycling. Although this rate has been stable for the last decade, the 2012 estimate of 44 % reveals that our copper requirements will increasingly be met by recycling in future. The physical nature of copper means that it can be recycled again and again without loss of performance and copper products for construction can be made of up to 100 % recycled copper content.

For building construction, the demand for 100 % recycled content is also increasingly being satisfied, as suppliers receive more materials back from the recycling chain. Selective dismantling for building demolition or reverse-construction from roof to foundation can result in closed loop recycling. Most of the recovery processes are done manually and although this is not the fastest method, it is the most efficient. Afterwards, in partnership with their architectural copper suppliers, architects can ensure that the copper taken from the building site is transformed into new copper for use in their regeneration projects. The following two case studies demonstrate this closed loop recycling approach.

St Michaelis Church, Hamburg, Germany

The re-roofing of the church roof of St Michaelis Church in Hamburg was necessary because the previous 72 cm wide copper plates were too large to withstand the suction forces of the strong local winds. This was particularly true in the lee of the tower, where the copper sheets were coming loose and even threatened to fly away in a storm. A technical assessment of the copper roof was carried out and recommended replacing the old roof with new, smaller (52 cm wide, 0.7 mm thick) copper roofing panels that could withstand the wind suction. A total of 3,250 m^2 of copper sheets, weighing 44 tonnes, were installed as part of the restoration project.

The old copper was removed from the site, melted down, cast and re-rolled into new sheets ready for installation. Original folding techniques used in the cladding of the original roof design were used to restore the roof. The church – originally built in 1751 and having survived a fire in 1906 and damage from the second world war – is today a distinctive landmark in Hamburg restored to its former glory.

The County Administrative Building in Turku, Finland

Renovation of this 12,500 m^2, typical mid–twentieth century styled civic building included re-cladding using the very same copper material originally installed in the 1960s – an impressive demonstration of the extremely long-term value of copper as an asset to buildings. Technically, there was nothing wrong with the original copper but moisture ingress and a lack of thermal insulation created some problems for the owners. Around 70 tons of copper and 10 tons of brass were stripped and taken back to the original supplier who recycled it back into replica parts for the restoration of the building. Samples for the new cassettes and trim were taken from the dismantled façade and were faithfully reproduced.

Pre-oxidised copper, giving a warm shade of light brown, was used throughout the project. Copper has been re-used here in a versatile way – from cornice to base. The façades now consist of the original brick wall, contrasting with profiled copper panels and protruding pilasters. Major savings resulted from this process – both in financial and environmental terms. This clearly demonstrates how the 'whole life cost' of a project needs to be considered and how copper can save embodied energy or carbon footprint if correctly managed.

Photo: Robert Pinter

For more information on this project, see Copper Architecture Forum 30/2011 or http://copperconcept.org/references/county-administrative-building-finland

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