

EXETER
COLLEGE
OXFORD

A New Quad at Walton Street

Planning Condition PP3, LBC 09, LBC10
Metal Roof and Wall Cladding Finish
December 2014

ABA

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This document has been produced by Alison Brooks Architects, as supplementary information in response to the Exeter College, Walton Street Quadrangle planning conditions and stakeholder feedback; to describe the final proposed finish for the external roofing material and vertical sections of metal cladding.

Over the last two years Alison Brooks Architects alongside the Project Team, Planning and Conservation Officers and Stakeholder Groups, have carefully developed the final proposed material finish, the colour and pattern of the metal rainscreen cladding.

The first chapter of this document will explain the proposed rainscreen cladding specification, with a brief description of the manufacturing processes undertaken in order to achieve the proposed finish, colour, pattern and texture of the stainless steel shingles.

The second chapter of this document will address stakeholder feedback in relation to the reflectivity of the material, by explaining the fundamental principles of reflectivity and addressing stakeholder concerns with regards to solar heat radiation onto Worcester Place.

As the law of reflection means that the angle of incidence is equal to the angle of reflection, light will reflect according to this law, regardless of whether the reflection occurs off a flat surface or a curved surface. A convex surface will result in the light splaying off a surface, this is commonly known as a 'diverging reflection'. The second chapter of this document will concentrate on identifying whether there is any significant effect of oblique sun light hitting the vertical elevations of the metal rainscreen cladding, primarily focusing, on the north facing elevations to Worcester Place.

Therefore due to the principle of reflectivity, there is no possibility of reflected light from curved surfaces impacting the local context and streetscape.

In response to local stakeholder feedback, the second section of this chapter will analyse the southerly angle of the sun hitting the pitched sections of the sloping roof, facing north.

The third chapter of this document will analyse the southern elevation of the New Walton Street Quadrangle adjacent to the Worcester College's Grade I listed Gardens, looking at the extent of the visible roofing material and vertical cladding. This roof is interspersed with windows and dormers, and is shaded by the evergreen Holm Oak trees of Worcester College Gardens.

02

Metal Rainscreen
Cladding to the Roof and
Vertical Elevations

2.1 Rimex Stainless Steel Shingles

The proposed roof cladding is a coloured, patterned and textured stainless steel interlocking shingles, in a diamond pattern, that refers to the pattern of the 19th Century leaded fleche of Exeter College's Chapel.

The malleability of metal roofing accommodates complex shapes such as domes or curved roofs. Metal roofing is one of the only craft based technologies remaining within the construction industry. The size of the roof shingles reveals the scale of the material or module manageable by one person.

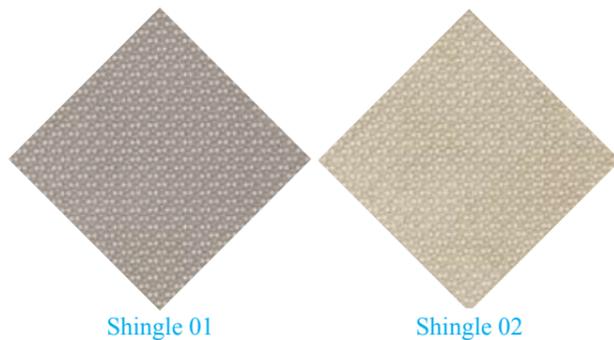
ABA have utilised a traditional metal shingles roofing pattern for the new roofs of Exeter College's, Walton street Quadrangle. They are set in a diagonal format to suit the curved roof form, as seen in historic examples throughout Britain and the world.

Subtle checkerboard patterning adds another layer of reference and meaning to the new roof, reflecting the latticed diagonal lead work of Exeter's College's, Turl St Chapel spire, and the patterned tiles of the Chapel floor. The checkered brick of the artisan cottages of Jericho are a further association one can make with the iconography of the new roof, adding to the layering of histories to be read in the new architecture of Exeter College's, Walton Street Quadrangle.

The curved and patterned form of the new roof and facade can be read as an authentic representation of 21st century construction technology, internal spatial delight, renewed iconography and building craft, designed to enrich both the Walton street context and Oxford's architectural heritage.

The Proposed Specification of the Metal Shingles:

Rimex Stainless Steel, Finish and Colour:
Shingle 01 - Bronze, Paladin, Granex M1A
Shingle 02 - Champagne, Paladin, Granex M1A



Shingle 01

Shingle 02

Rimex Metals Group, have manufactured surface stainless steel since 1959. Their British factory based in Enfield, produce patented stainless steel iridescent sheets, suitable for building claddings and interior linings.

The processes of transforming the raw Bright Annealed Stainless Steel Roll material into the bespoke, coloured and textured Roofing Shingles specified for the New Walton Street Quadrangle, is described below:

1 - Colouring the Rimex:

The Rimex sheet material is coloured through anodising. The anodising process involves immersing sheets of stainless steel in chemical tanks to thicken the chromium oxide passive film on the stainless steel surface.

Unlike painted or other coloured metal processes, Rimex ColourTex creates an iridescent cladding material, which is responsive to light conditions.

The nature of colouring / anodising stainless steel sheets is that the colour and tone of the metal may vary in different lighting conditions. However by colouring the sheets as the first process, it is possible to create the most stable colour level across the different batches of stainless steel being produced.

2 - Patterning the Rimex:

The pattern is produced by a unique cold rolling process to create a three dimensional pattern or stippling called 13SD.

The patterning process also reduces the oil canning effect, by stiffening the material, improving optical flatness making the product ideal for roofing cladding. The pattern finish can also be used to hide scratches, dents and other imperfections.

Patterning / rolling the sheet material reduces the reflectivity of the flat raw material.

Once the Rimex sheets have been coloured, patterned, and rolled it is possible to carry out one final patterning process. This involves shaving off the tops of the stainless steel stipple that exposes small areas of raw stainless steel. This was carried out on mock up 01.

3 - Bead Blasting the Rimex:

Granex is the name of Rimex's bead blasting finish. The results are a duller stainless steel finish, that absorbs and diffuses light. Reflectivity levels of less than 0.5 RA for roofing applications are achieved. Bead blasting finishes scatter the light and therefore reduce the reflectivity of the material.

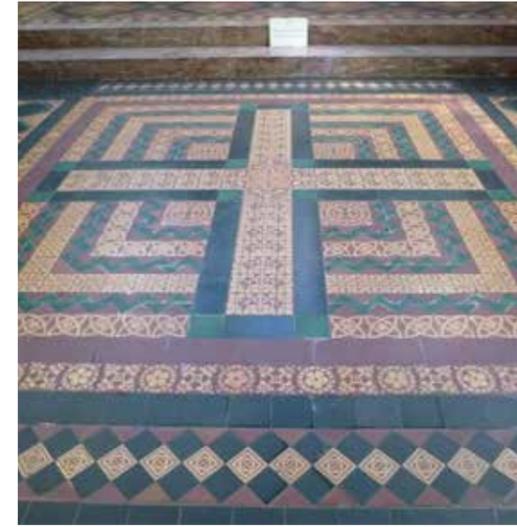
Granex produces a non directional finish. There are a number of different strengths of bead blasting finishes available, from Architectural (as seen on mock up 04) to M1A.

The bead blasting process can take place at any point during the production process. However if the tops of the stippled pattern are to be shaved off to achieve the duller finish possible the bead blasting must be specified as the final process.

Once the sheets are processed they are then cut down to size. The delicate process of forming and folding the stainless steel shingles occurs on site, with the use of jigs, cutting and forming tools.



Exeter College Chapel Spire



Exeter College Chapel Tiled Floor



Jericho Checkered Brick



Unprocessed Stainless Steel Rolls



Bead Blasting the Flat Stainless Steel Sheet - Granex



Rolling out the Unprocessed Stainless Steel Rolls



Oxidising the Sheets to Add the Colour



Flattening and Patterning



Shaving off the Top of the Pattern

Photographs taken during a Rimex factory visit, Edmonton 2013.



Mock Up 01
Commissioned October 2012

- Curved Panel
- Bronze Paladin
- Champagne Paladin
- 335 x 335



Mock Up 02
Commissioned October 2012

- Curved Panel
- Bronze Pagoda
- Champagne Vortex
- 235 x 235



Mock Up 03
Commissioned April 2013

- Flat Panel
- Bronze 6WL
- Granex Architectural
- Champagne 13SD
- Granex Architectural
- 235 x 235



Mock Up 04
Commissioned June 2013

- Flat Panel
- Bronze Pagoda
- Granex Architectural
- Champagne Paladin
- Granex Architectural
- 235 x 235



Mock Up 05
Commissioned June 2014

- Curved Panel
- Bronze Paladi
- Granex Architectural
- Champagne Paladin
- Granex Architectural
- 335 x 335

Since October 2012, a number of roof mock ups have been produced in order to test colour, pattern, finish and reflectivity. The results of these tests are manifested in a set of large scale mock up panels displayed on site.

The feedback gathered by the Project Team during public consultation and OCC meetings seems to be in favour of a stippled, bead blasted finish, as it would result in a subtle range of tones, seen from different angles of view.

The principle concern raised through stakeholder feedback during the planning process has been with regards to the reflectivity of the finished material when seen from Worcester Place. This has resulted in further mock ups being commissioned in order to further test finishes and textures.

The final proposed finish now incorporates the Granex M1A, maximum bead blasting finish, which reduces the overall reflectivity of the material, to that of a matt metal finish.

This has been combined with specifying a smaller stippling pattern, instead of the larger 6WL pattern as tested on mock up 02, which breaks up the finish of the flat sheet.

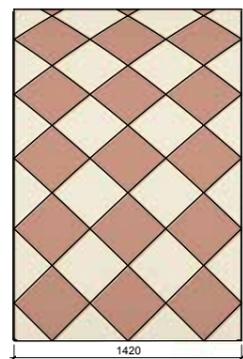
The most recent study has focused on the Paladin / 13 SD patterns. The Paladin and 13SD patterns are the same pattern, with the subtle difference that the Paladin pattern shaves off the tops of the stainless steel stipple.

Mock up 01 (as described during stakeholder reviews as the mock up on the right), shows the bronze and champagne stainless steel shingles with the Paladin pattern, shaving off the tops of the chromium oxide passive film, in order to reveal the un-coloured stainless steel. This seems to visually result in a more notable colour difference between the bronze and champagne shingles. Following Stakeholder feedback in April 2013, further mock ups 02, 03 and 04, were produced incorporating the Granex Architectural bead blast. These panels tested various patterns and tile sizes that were considered unsuccessful in comparison to mock up 01.

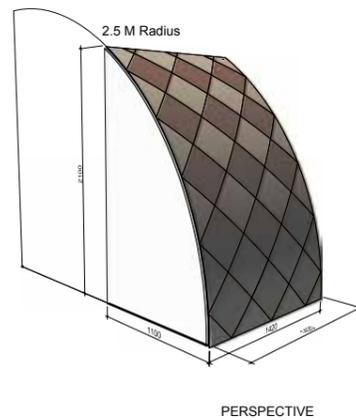
Mock up 05 (as described during stakeholder reviews as the mock up on the left) was commissioned in June 2014, in order to test if using the stippled pattern, with out shaving the tops off the pattern, would further reduce the reflectivity of the mock up. This mock up also incorporated the Granex Architectural bead blasting. However this was found not to be the case.

For this reason the proposed specification of the roof material is more closely represented in Mock up 01. However, we are now proposing to bead blast the sheets at the end of the manufacturing process with the highest M1A Granex finish. Bead blasting at the end of this process will further dull down the exposed stainless steel.

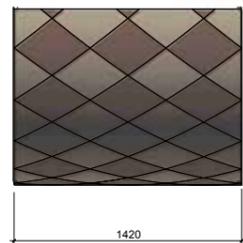
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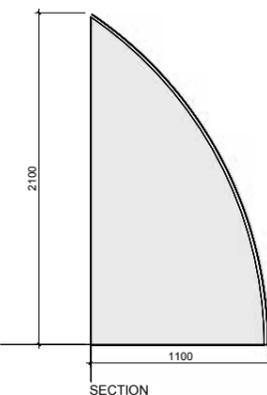
FRONT ELEVATION



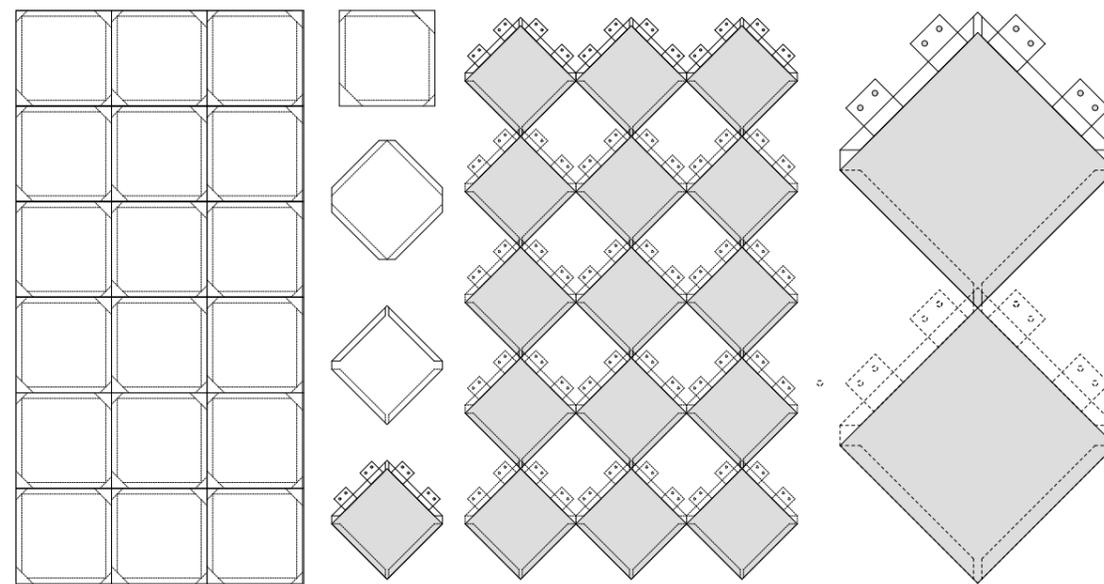
PERSPECTIVE



PLAN



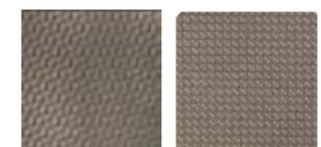
SECTION



Roof Shingle Setting Out

The Unfolded shingle

Setting Out of the Mock Up Panels



13SD

Paladin

2.3 Mock Up - Site Photographs Typical Day, North Elevation

The two most recent mock up panels under analysis were displayed on site over the hoarding line, in order to allow local stakeholders and OCC Planning Officers to review the two most significant mock up panels under review.

The diagrams below describe the finishes applied to both these panels (mock up 01 and 05), with the final specification for the proposed roofing cladding below for comparison.

The photographs to the left of this page are a series of images taken during a single day to capture the dynamic nature of the panels over a typical day.



Mock Up 05
'The Mock Up on the Left'

Mock Up 05 - Curved Panel
Commissioned June 2014

Shingle 01 - Bronze Paladin, Granex Architectural
335 x 335

Shingle 02 - Champagne Paladin, Granex Architectural
335 x 335



Mock Up 01
'The Mock Up on the Right'

Mock Up 01 - Curved Panel
Commissioned October 2012

Shingle 01 - Bronze Paladin
335 x 335

Shingle 02 - Champagne Paladin
335 x 335

The Proposed Specification of the Rimex Shingles:

Shingle 01 - Bronze, Paladin, Granex M1A
335 x 335

Shingle 02 - Champagne, Paladin, Granex M1A
335 x 335



Shingle 01

Shingle 02



Image 01
28.10.14 - 10.15am



Image 04
28.10.14 - 2.30pm



Image 02
28.10.14 - 12.30pm



Image 05
28.10.14 - 4.00pm



Image 03
28.10.14 - 1.00pm

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Rimex Vertical Elevation 4m

Stone Wall 5m

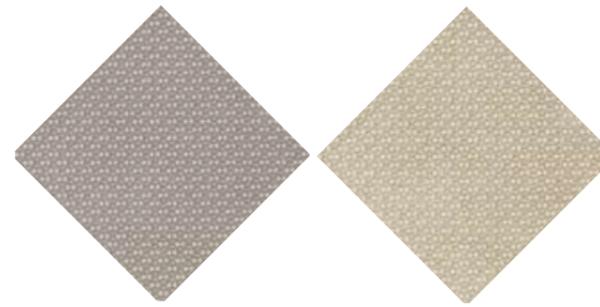
Worcester Place Elevation



Stone

The Proposed Stone Specification:

Hartham Park Quarry - Lime Stone



Tile 01

Tile 02

The Proposed Tile Specification:

Finish and Colour:

Tile 01 - Bronze, Paladin, Granex M1A

Tile 02 - Champagne, Paladin, Granex M1A



Worcester Place Elevation

Elevation Extract

3m
3.5m

The Material Palette:

The colour palette for the two different Rimex shingles specified has been designed in coordination with the new stone cladding proposed for the ground floor of the New Walton Street Quadrangle.

The proposed Hartham Park limestone, will provide a warm, creamy - beige tone to the base of the building.

The Bronze and Champagne colours of the Rimex shingles will complement the tones of the Hartham Park (Bath Stone) lime stone.

The proposed lime stone is a Bath Stone, sourced at the Hartham Park Quarry, in Corsham.

The Hartham Park stone has been used most recently within Oxford on the Gateway Building, completed in 2013 for St Anthony's College.

2.5 Rimex Building Precedents

Below is a selection of images of some of Rimex's most recent project undertaken within Europe. The precedents below, demonstrate the variety of the finishes which can be achieved by Rimex. The final proposed specification for the New Quadrangle at Walton Street roofing and vertical cladding shingles, has been intensively developed over the last two years in order to achieve a bespoke finish appropriate for the local urban context.



Images 01
Cardiff Millenium Centre - Bronze Canvas and Bronze 6WL



Images 02
Cardiff Millenium Centre - Bronze Canvas and Bronze 6WL



Images 03
Sherman Theatre, Cardiff - 316 Millenium Champagne Pegaus



Images 04
Brand Building, Eindhoven Holland - Bronze Paladin



Images 05
Brand Building, Eindhoven Holland - Bronze Paladin



Images 06
Sherman Theatre, Cardiff - 316 Millenium Champagne Pegaus

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