msa Year 2 Pavilion Project at Dunham Massey

msa Manchester School of Architecture

Manchester Metropolitan University

MANCHESTER 1824 The University of Manchester

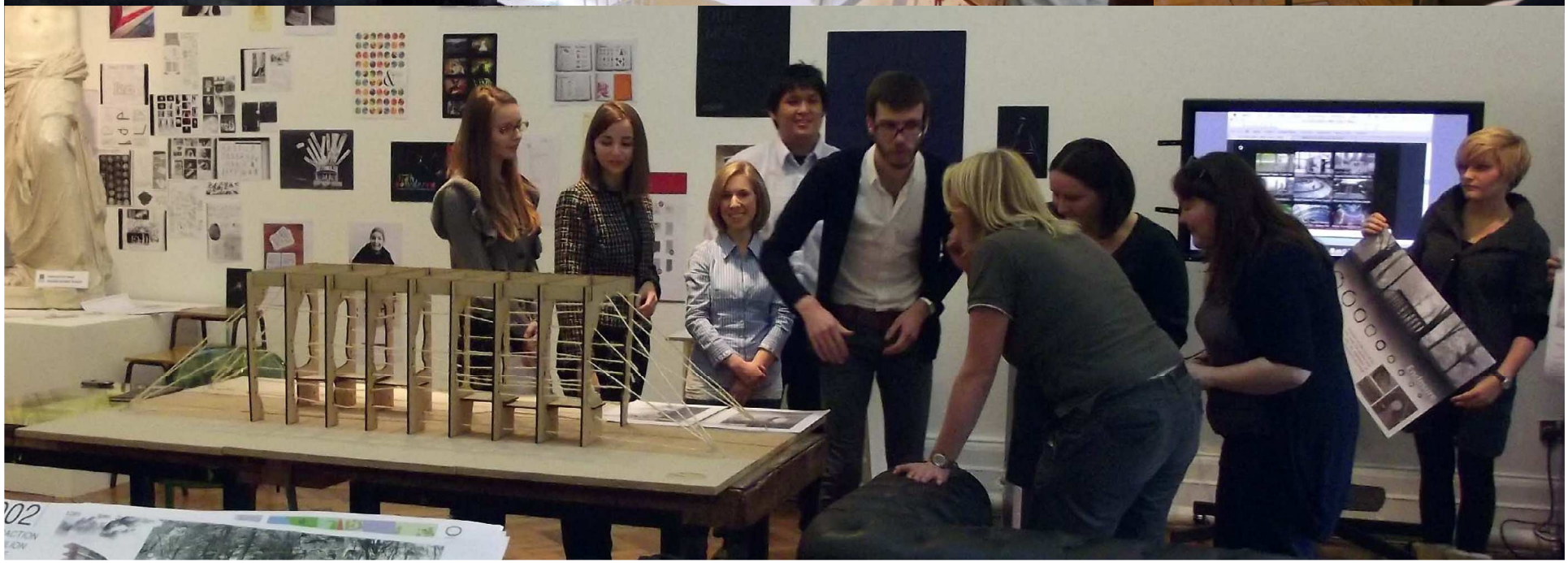
National Trust

During the Autumn of 2011, Year 2 students from the Manchester School of Architecture were asked to design a pavilion to be displayed in the Winter Garden at Dunham Massey in Altrincham, Cheshire. This was the beginning of the most extraordinary construction project we have ever undertaken, providing a unique opportunity for students from the school of architecture to work with The National Trust on a live project, creating a design that would enhance the natural beauty of the Winter Garden, respecting the natural environment of the site and Dunham's architectural heritage, whilst also meeting the demanding levels of rigour, taste and technical skill as demonstrated by the National Trust team at Dunham Massey.

The project is now in its second year.


sequence_


twotwofour LEAVES

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COLD LIGHT WINTER PAVILION

CUT HERE

twotwofour_LEAVES

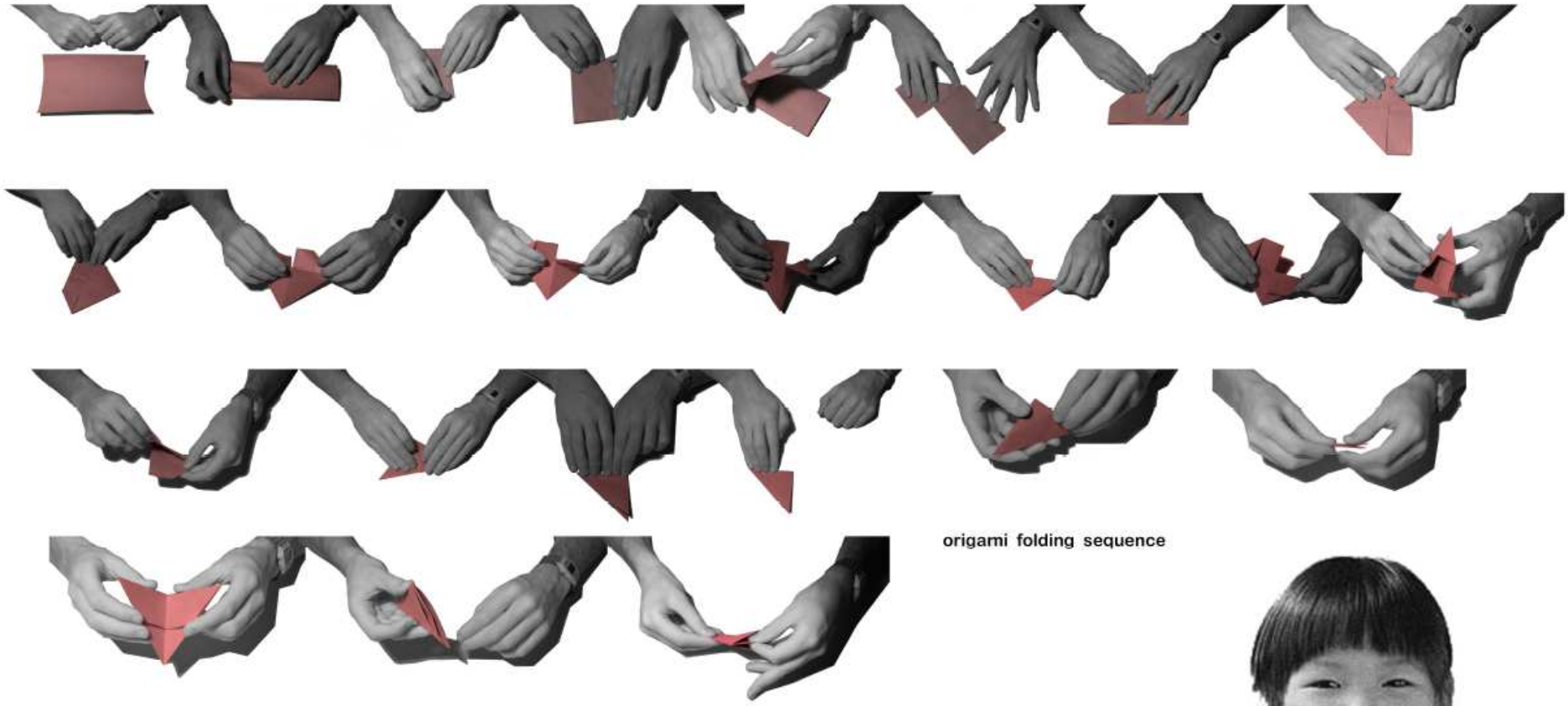
emily fribbance . nick stone . ahmad hakym . xin bi . luke carnaby

Not so long ago, not too far from here, in the woodland of the Dunham Massey Gardens,the beautiful maple trees were showing off their autumnal fiery yellow, orange and red leaves to the squirrels and birds.

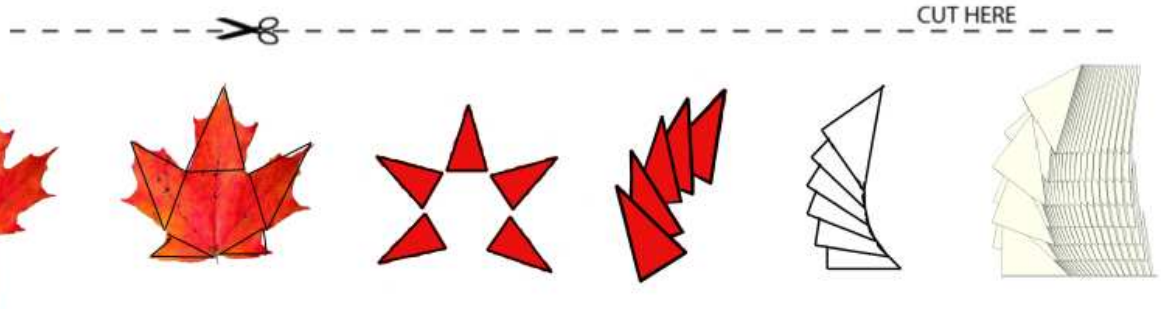
But winter soon came with its chilly breezes, swept all of these leaves to the floor and left the branches bare.The animals dearly missed their friends, the leaves, during the winter, for up high in the canopies they would be cold and exposed.

One night though, a powerful gust of wind swept right through the gardens and weaved through into the woods. It worked silently, gently folding the leaves and knitting them together.

By morning, as the animals peeped open their eyes, they were amazed to see beneath the trees, a wonderful new folly.



origami folding sequence



design_development_

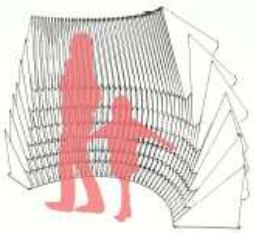
elevations_

spring_

summer_

autumn_

winter_



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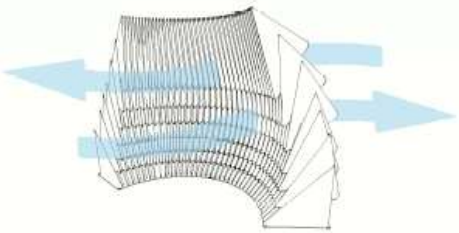
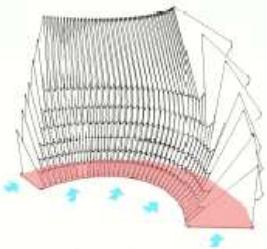
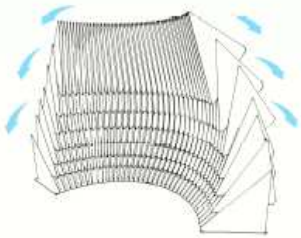


porous_structure



ground_water_proofing



resistance_from_rain_and_snow

tensile_structure_support

realistic_rendering

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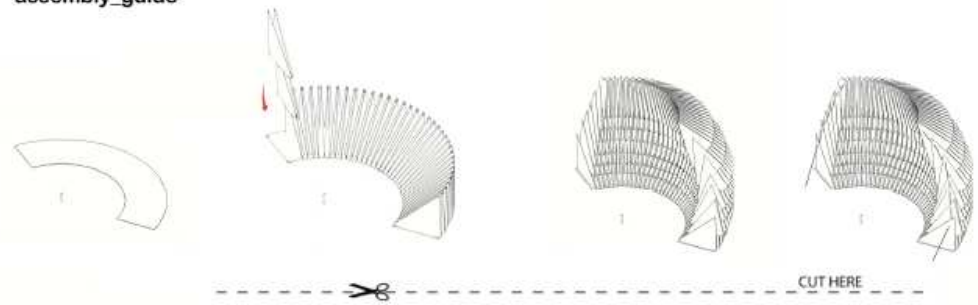
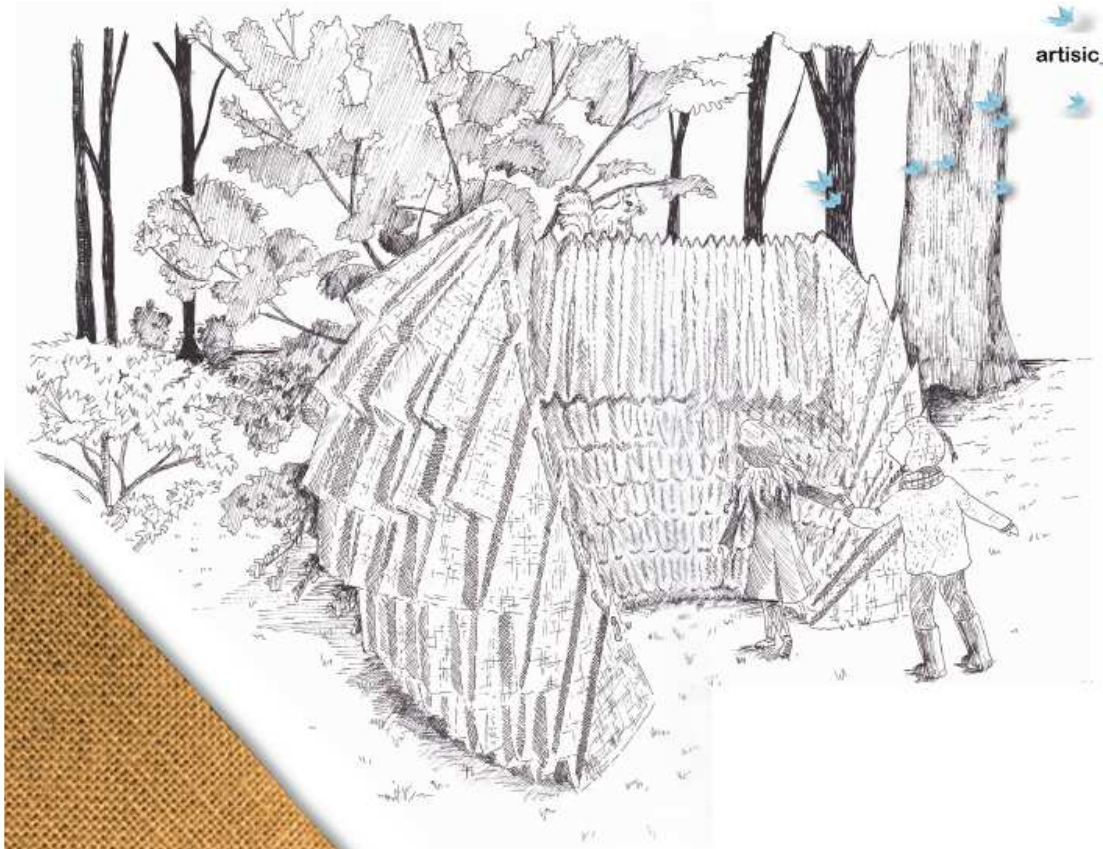
assembly_guide



artisic_visualization



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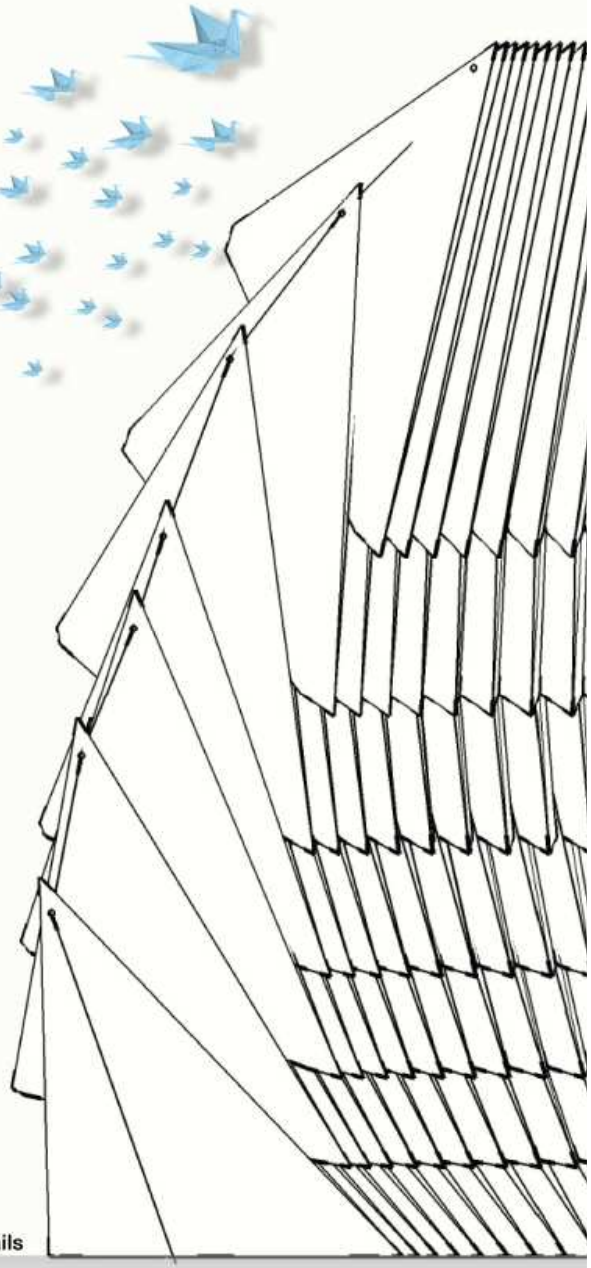

blow_up_details

realistic_rendering_

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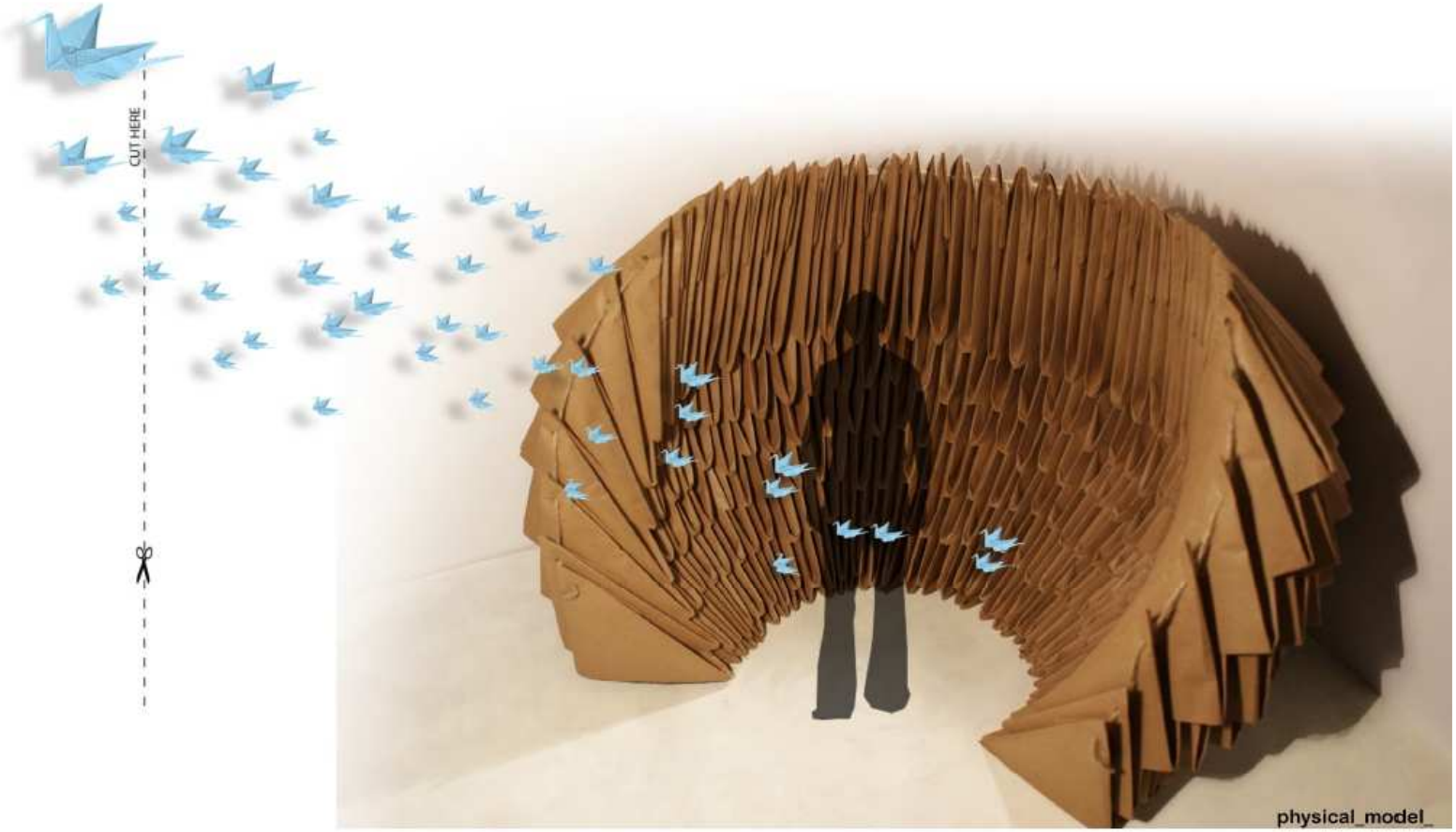
site_plan_

location_plan_

position_on_site_

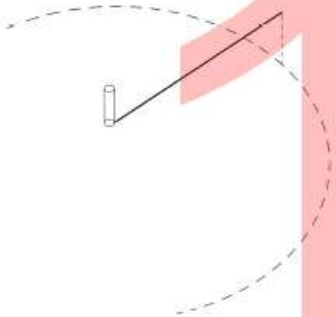
design_development_



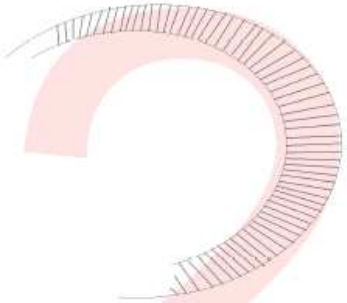
physical_model_

precedent_study : Lydia_Cañizares; paper_modules_22_installation

Assembly Manual

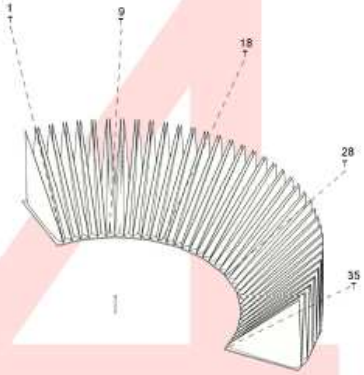


Use a string to create a semi circle and place a marker every 9 cm (2cm)



Place the ground sheet around these markers to act as frost protection, preventing excessive moisture transfer.

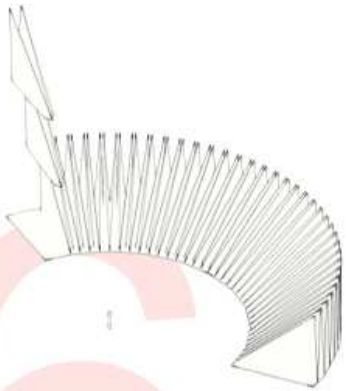
Start to place the 35 bottom pieces on the marker points with the hypotenuse facing inwards and the unattatched points going upwards.



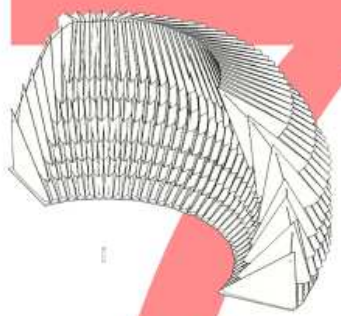
After the pieces have been placed around the markers, the stakes are then inserted into the ground through the hessian fabric of the units at 5 space intervals.

Following on from this the lower 3-4 rows can be placed on top by placing the point of one side of the module into the opposing side of the module on another piece.

To find the amount that need to be placed, simply subtract 1 from the lower level and then commence stacking on the next prong in from the end.



When construction reaches the higher rungs it may be necessary to use a plank ladder to ensure the pieces can be safely fitted



When all the levels have been completed, the structure can be post tensioned to maintain its form by threading rope through modules at the top end using a grommet hole puncher on site, which will also thread the rope through.

The rope is tied off at some point at the first end and is then pulled taught at the other and tied again to keep all the modules in compression. The end of the rope is then looped around a stake and secured into the ground to prevent any chance of movement

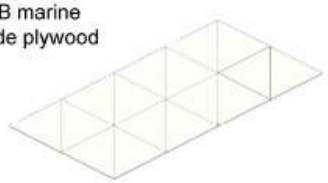
There is also the option of waterproofing the structure to ensure stainlessness but the staining process may actually help anchor the pavilion on the side.

Module construction

Materials list for module construction

28-30 sheets of 4-5mm thickness WPB marine grade plywood

Must be 1220 x2440 to avoid higher cost and waste.



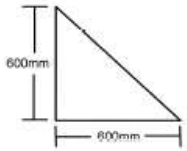
200m x 1.37m roll of Scrim grade Hessian. Again must be 1.2m min. height to avoid wastage.

Industrial stapler e.g. Ace & K 71

1

Cut each 1220 mmx 2440mm board of WBP marine grade ply wood into 16 trangualr pieces

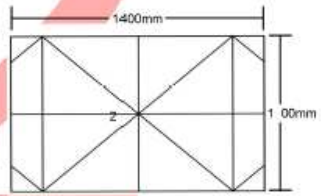
With each triangular piece measuring 600mm by 600mm.



There will be almost no waste wood.

2

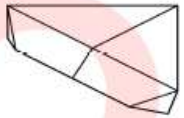
Next cut the scrim grade Hessian into lengths of about 1400mm. We need 244 lengths of this size.



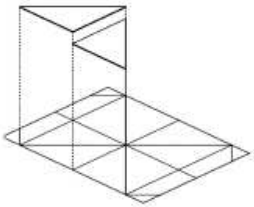
There will be some excess which will later be used to weatherproof the base.

3

At this stage it is helpful, but not necessary, to fold up the sheet of Hessian into the eventual module and then iron in the creases.

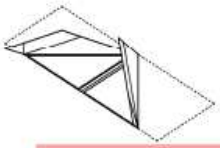


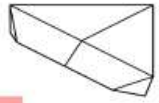
This results in a neater aesthetic.



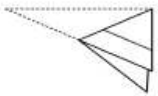
To make one module, first place the cut ply triangles on the Hessian so that their 600mm edges touch, and their bases rest at the edge of the material, now glue down.

4

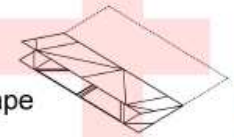




Fold the Hessian along the ply triangle's hypotenuse edge into the middle.



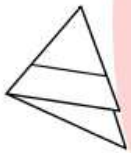
Then fold and glue the remaining flaps inwards and fold the resultant triangle in half again.



Fold in half landscape

5

Finally staple the two pieces of ply together through the Hessian so that it remains rigid at the core.

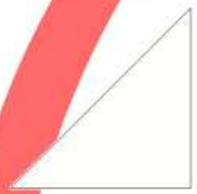


Now the sample of module is completed.

6

Shown here is a cross section of what the module should look like upon completion.

7




construction process

msa Manchester School of Architecture

National Trust

Cold Light Pavilion Exhibition

18th Nov 2011 - 3rd Jan 2012
daily 11 a.m. - 4 p.m.

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MANCHESTER 1824

Manchester Metropolitan University The University of Manchester

National Trust

Exhibition Extended due to popular demand

Cold Light Pavilion Exhibition

18th Nov 2011 - 26th Jan 2012
daily 11 a.m. - 4 p.m.

The Winter Garden,
Dunham Massey,
Altrincham,
Cheshire WA14 4SJ

Admission:

£6.35 - Standard Entry
£ 7.00 - Gift Aid Admission
Free for National Trust Members

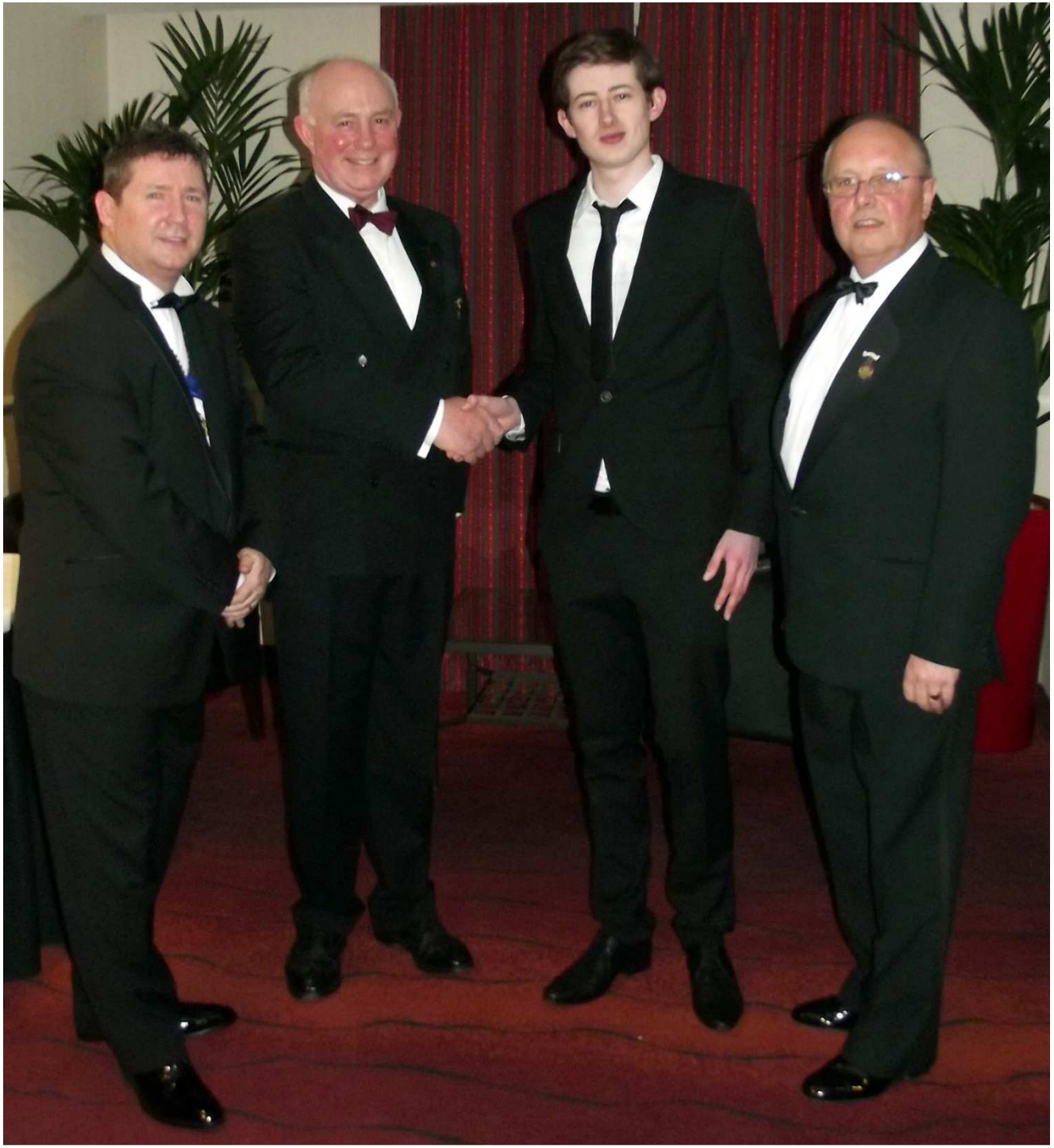
An exhibition of five pavilions inspired by the Winter Garden at Dunham Massey by 2nd Year students from Manchester School of Architecture.

Manchester School of Architecture is an innovative collaboration between the University of Manchester and Manchester Metropolitan University uniting two schools of architecture with over 100 years of educational experience to create one of the largest schools of architecture in the UK.


people and dapple

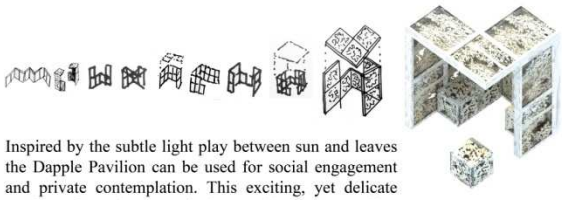
'Children named the pavilion Cinderella's Pumpkin, isn't it cute?'

Jeremy Totton



Dapple Pavilion

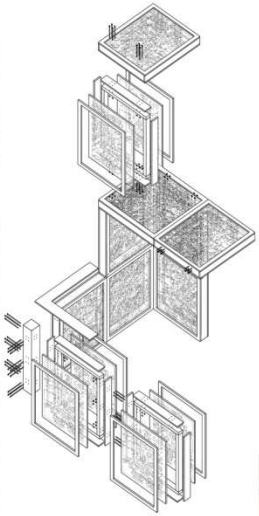
'I was in the woods I lay down on my back and closed my eyes. On opening them I saw a beautiful view of the sunlight piercing through the leaves of the trees.'



Inspired by the subtle light play between sun and leaves the Dapple Pavilion can be used for social engagement and private contemplation. This exciting, yet delicate pavilion formed part of the 'Cold Light Pavilion Exhibition'; an exhibition of five pavilions inspired by the Winter Garden at Dunham Massey by 2nd Year students from Manchester School of Architecture.

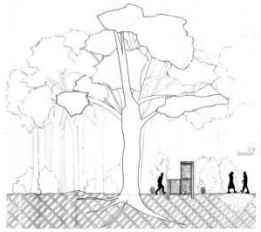
Its panelled, leaf like elements are designed to blend in with the natural surroundings and create a soothing atmosphere to complement the winter garden. With an eye level opening that frames the views of the rest of the garden and also the use of plywood sheets create an enhanced connection between the built and the natural environment.

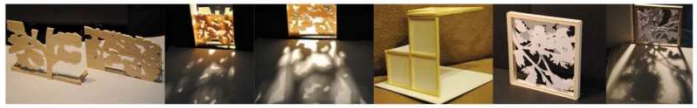
Move the portable seating and immerse yourself in the light, shadows and lovely scenery.



Construction

The structure consists of 11 prefabricated panels. The panels are designed to be prefabricated off site, transported, assembled and disassembled effortlessly. The construction process is simple. A timber post is erected and the panels are fixed onto the post starting from the lowest level. More panels are added to complete the structure. The rigidity of each panel is sufficient to forma self-supporting structure without the use of any additional steel bracing. In general, the pavilion is suitable for any location and is readily constructed without any additional knowledge and skills.





Building Dapple

Dapple Pavilion at The Holy Name R.C. Primary School

'A single sunbeam is enough to drive away many shadows.'

St. Francis of Assisi

The Holy Name R.C. Primary School, has a new centrepiece to its Peace and Reflection Garden. Following the feast day of St. Francis of Assisi, students from Manchester School of Architecture and their Year Leader, Siobhan Barry, assembled the 'Dapple' pavilion in the school grounds.

'Dapple', designed by Daniel Bramah and inspired by the subtle interplay of light piercing through a woodland canopy, had previously been on public display during the Cold Light Pavilion Exhibition in association with the National Trust.

The design is perfectly suited to provide children, staff and parents at the Holy Name with a place to relax, meditate and reflect upon the wonder and beauty of nature surrounding it. As sunlight filters through the trees above and pierces through the beautifully designed laser cut panels of the pavilion, one's spiritual centre cannot fail to be touched by the splendour of nature's display.

'Peace begins with a smile'

Blessed Mother Theresa of Calcutta

'The Sun never knew how wonderful it was until it shone on the wall of a building.'

Louis Kahn, Architect

"Lord, make me an instrument of your peace.
Where there is hatred, let me sow love.
Where there is injury, pardon.
Where there is doubt, faith.
Where there is despair, hope.
Where there is darkness, light.
Where there is sadness, joy."

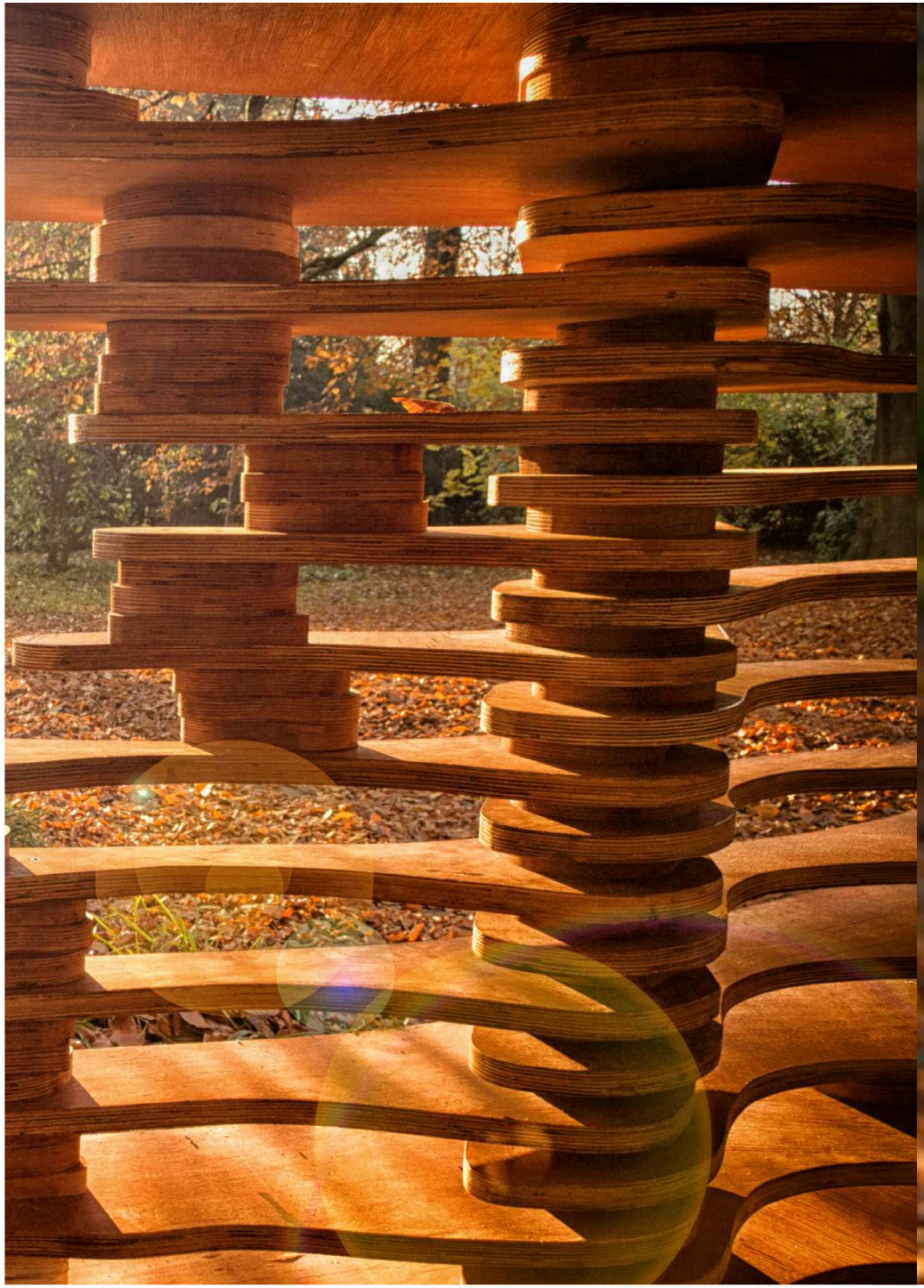
Prayer of St. Francis

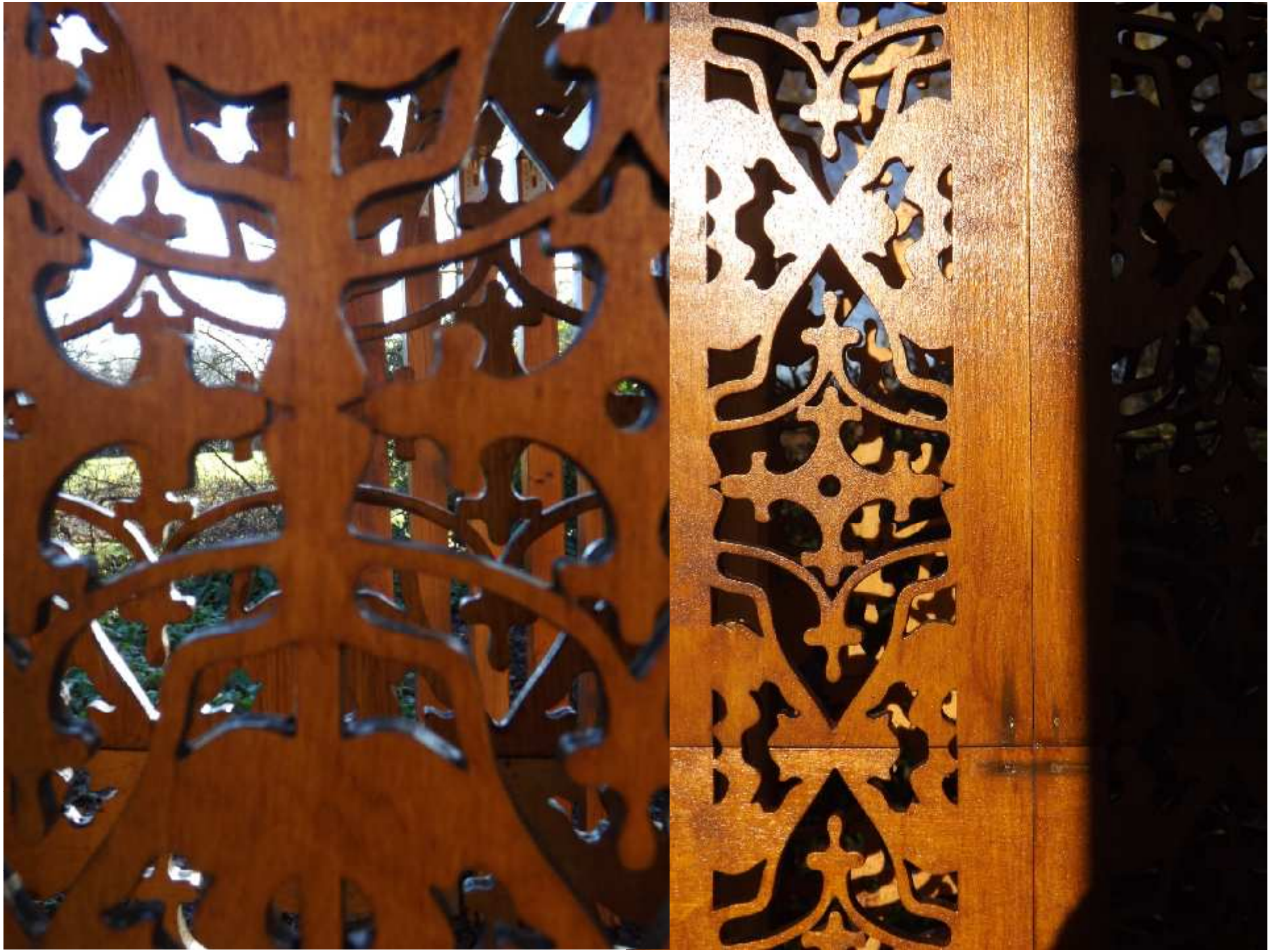
Manchester School of Architecture 'Dapple' build team: Flora Hodson, Anastasia Orphanidou, Lee Goddard, Shenpei Ha, Daniel Bramah, Siobhan Barry and Peter Dew, at the Holy Name R.C. Primary School, Friday 5th October 2012.

Concept

- The site is located on the Serpentine Border. Unlike other available sites, it is enclosed and secluded meaning visitors stumble upon it, rather than consciously seek it out. In this way it is similar to a secret cave shelter on a mountain face. Whilst the exterior views are surrounded by vegetation, the interior of the pavilion will take precedent. This is where we want the structure to come alive.
- Heavy rain and harsh conditions dominated our individual experiences of the site, so we decided providing shelter was essential to our design. With this in mind we explored the idea of naturally formed caves and rock forms. Such organic structures often provide captivating, beautiful and dynamic interiors. Formed through gradual water erosion and rain, a cave seemed suited to the immediate context of the adjacent canal and the wet Manchester climate.
- The layered modular planes of our design will form a solid shelter, allow dramatically framed exterior views through openings and between slits and generate dynamic lighting. All this connects the pavilion further with the changing conditions of the natural context.

CONCEPT DEVELOPMENT



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