2021
서울도시건축비엔날레
Seoul Biennale
of Architecture and Urbanism

MEMORIAL TO THE INDUSTRIAL REVOLUTION

CONCEIVED AND DESIGNED:

CSK ARCHITECTS AND **THE BARTLETT UCL** WITH **ARUP**

Matthew Barnett Howland and Oliver Wilton with Andrew Lawrence

SPONSORED:

AMORIM CORK INSULATION

and part-funded by the UCL EPSRC Impact Acceleration Account

PRE-ASSEMBLED IN PORTUGAL:

A+ARCHITECTURE

ASSEMBLED IN SEOUL:

CORKWORLD

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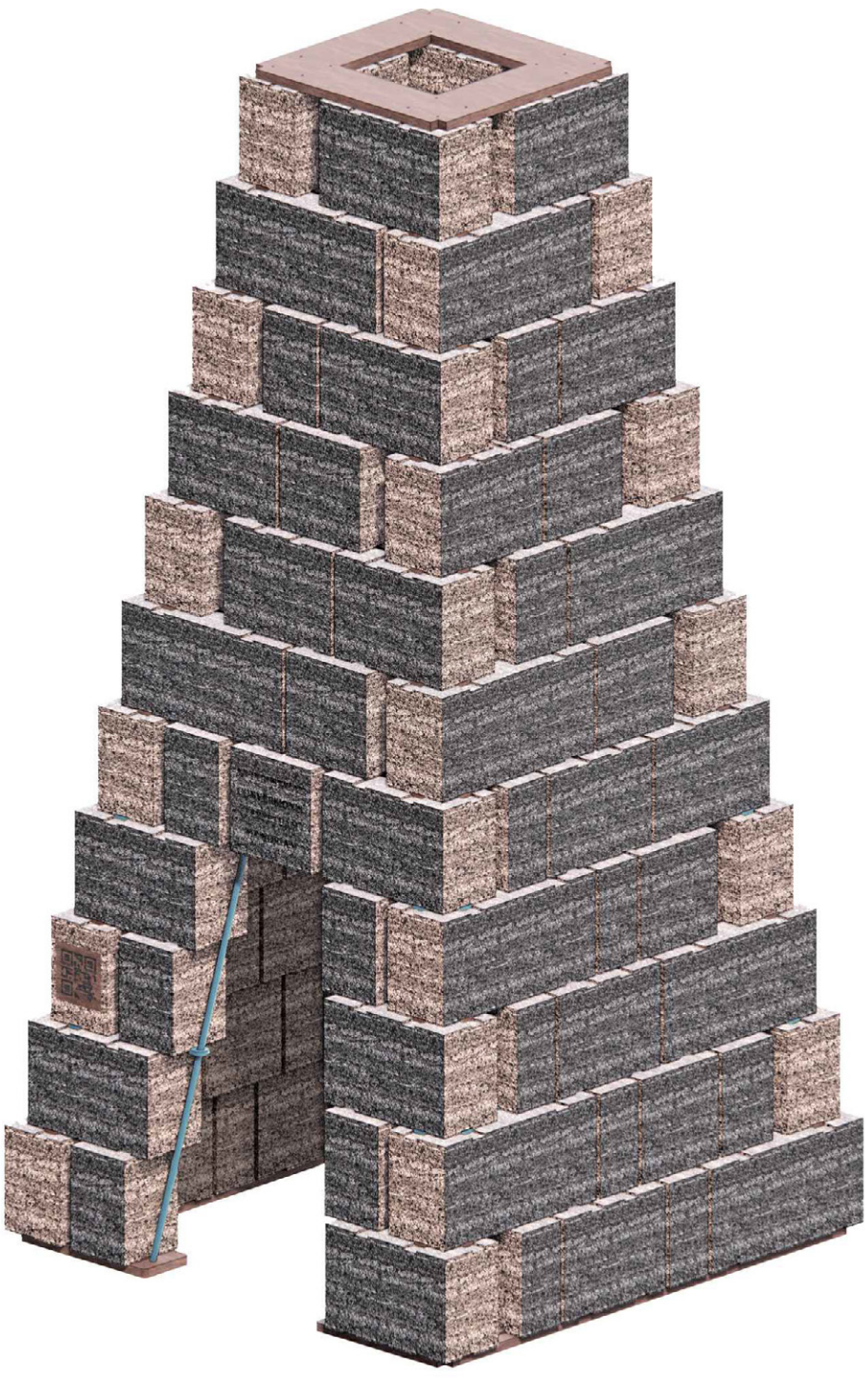

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CROSSROADS HERE

MEMORIAL TO THE INDUSTRIAL REVOLUTION

This temporary monument is a memorial to a period of recent history that witnessed enormous technological progress and industrial development, and yet at the same time has ended in an ecological crisis of global proportions. Therefore the installation is designed on the one hand to commemorate the incredible achievements of this period of modernisation, but on the other hand it also declares the necessity to mark the death of the 'late modern period', and its environmentally destructive linear modes of production, consumption and inhabitation.

In this sense, the installation is a space in which to rethink our relationship to the ecosystems that support us, and to reflect on this decisive contemporary moment with the benefit of historical perspective – from an organic economy constrained by photosynthesis, to the potential unleashed by the Industrial Revolution and its intensive extraction of fossil fuels, and now almost back again to the possibility of a world powered entirely by renewable forms of energy.

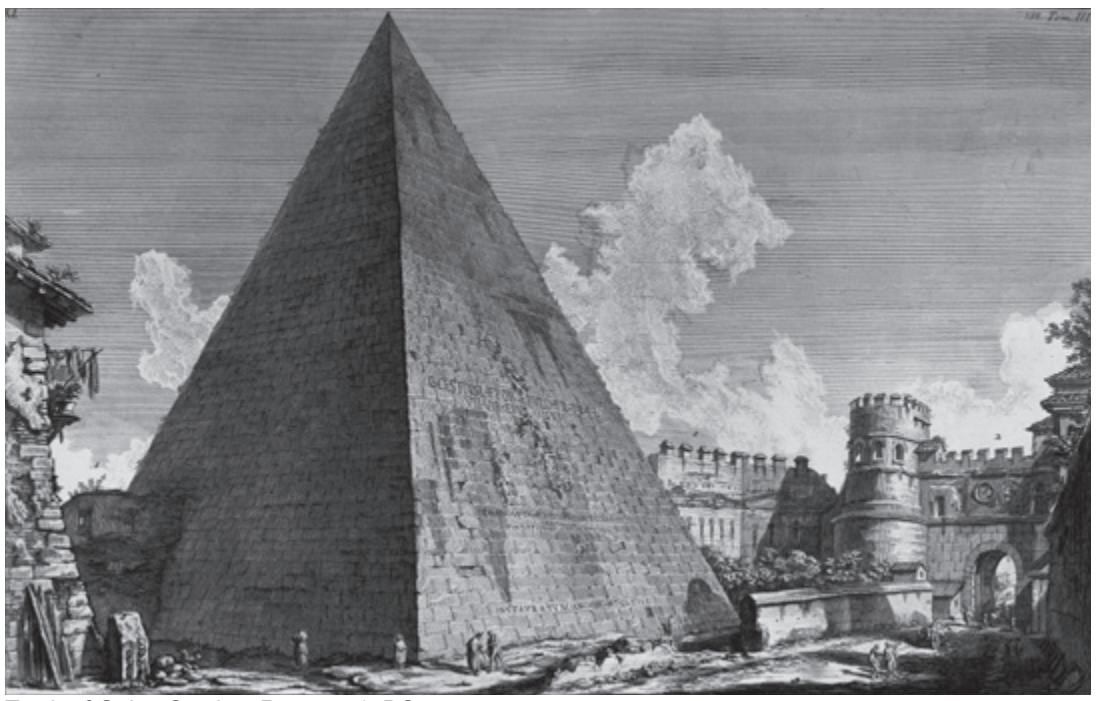
The non-linear nature of these historical relationships is mirrored in the new and yet familiar form of the proposal, in which the tectonic logic of an innovative plant-based building system evokes the ancient forms of dry-stone construction that can be found in many cultures around the world. The resultant pyramidal form is also a playful take on the European architectural heritage of monuments and memorials.

The memorial is designed with a resource life cycle that challenges the 'take-make-waste' extractive industrial model that was typical of the period it commemorates. Expanded cork blocks are a pure plant-based material that originates from a biodiverse landscape; blocks are assembled without mortar or glue using interlocking timber and metal components, all of which can be disassembled at the end of the building's life; at which point the blocks can be reconfigured to create another small building; and once they eventually drop out of the 'technical sphere', they can be returned directly to the 'biological sphere' to decompose and generate new growth.

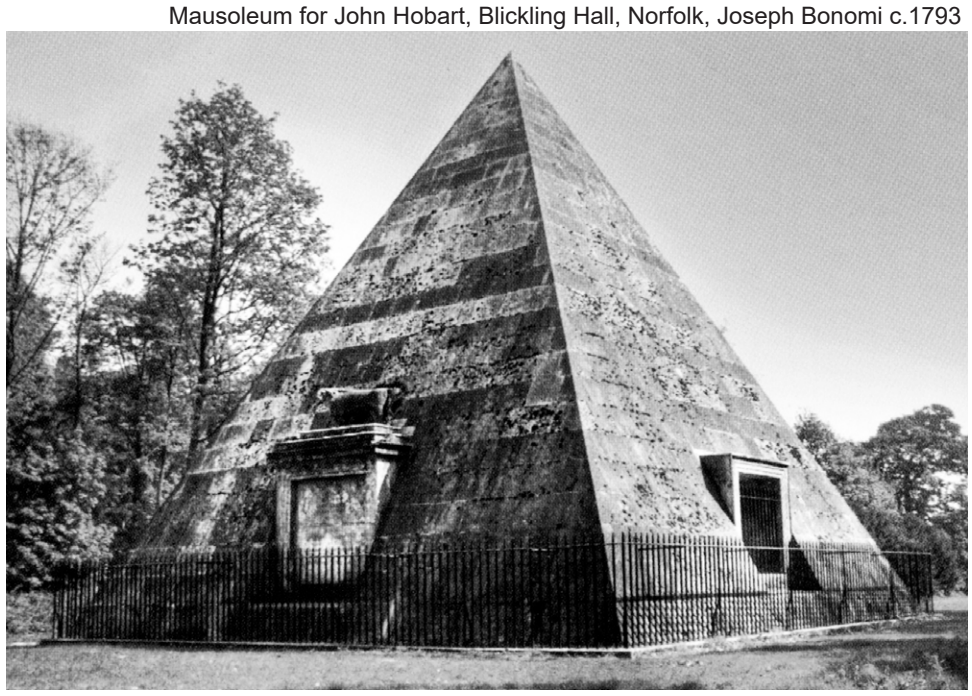
As a result, the installation is a re-useable and biodegradable monument with which to mark the end of an era, as well as an architectural symbol of the way in which we might want our built environments to relate to natural ecosystems in the next.

Expanded cork block at Amorim factory, Portugal

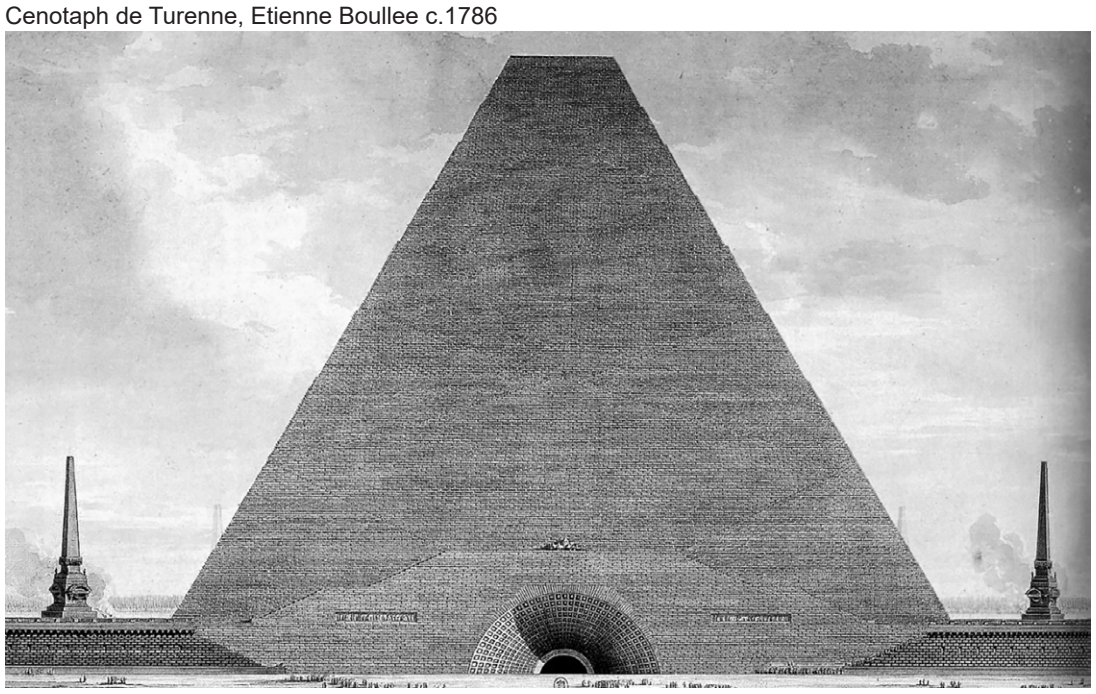

Metropolitan Sepulchre, London, Thomas Willson c.1830


Tomb of Gaius Cestius, Rome, c.15BC

Mausoleum for John Hobart, Blickling Hall, Norfolk, Joseph Bonomi c.1793



Cenotaph de Turenne, Etienne Boullee c.1786



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Cork House, Eton, UK


Design for Disassembly

FORM FOLLOWS LIFE CYCLE

The installation uses many of the same principles of Cork House to generate a similarly intense architectural experience. Thick blocks of pure plant-based material are used to create structure, enclosure, insulation, external surface and internal finish. This radically simple approach to contemporary construction creates both a distinctive tectonic form, and a rich sensory environment of warmth, atmospheric darkness, smoky aroma and material presence.

These strong formal and spatial qualities are the result of taking an explicitly whole life approach to buildings, in which environmental sustainability is considered in relation to every stage of the building life cycle, from resource through to end of life and beyond.

1. Resource and Landscape
   The bark of the Cork Oak (Quercus Suber) is harvested around every nine years using hand tools in a process that does not harm the tree, and this gentle form of forestry is part of a renowned biodiverse ecosystem that has existed around the Mediterranean basin for Millenia.

2. Manufacturing
   Expanded Cork is an engineered material made using low-grade waste from cork forestry and by-product that is left over from the wine-stopper and composite cork industry. Cork granules are ‘cooked’ at high temperature using over 90% energy from waste cork biomass, which causes the natural resin in the cork bark – suberin - to melt and rebond the granules together without the use of any additional ingredients whatsoever, so that expanded cork is a pure plant-based product.

3. Fabrication
   The installation uses a simple modular system of 6no. block lengths (based on fractions of a whole block), which has been specifically designed so that there are no waste off-cuts whatsoever from a total of 62no. blocks required.

4. Assembly
   The cork blocks are combined with interlocking timber and metal connection details to create a kit of parts that is simple to assemble on site by hand without mortar or glue, like a giant organic LEGO® kit.

5. Disassembly - and the Circular Economy
   The dry form of assembly means that the monument can be disassembled at the end of the Biennale, and deployed for re-use elsewhere. The blocks have also been detailed so that they can either be used again as corbelled roof blocks or as vertical wall blocks, which creates design flexibility and thereby increases the potential for re-use. Whether in its current form or in a reconfigured assembly, it is intended to find a second home in Seoul for the building components - otherwise the local construction company that installed the artwork will cut the blocks into breathable insulation boards suitable for use in one of their current projects.

6. Cradle to Cradle
   Expanded cork is a pure plant-based building product and the system is designed so that this integrity is not compromised during its use in construction, which means that if and when these blocks fall out of the human cycle of use, they can be returned directly to the biosphere at any point to biodegrade and generate new growth.

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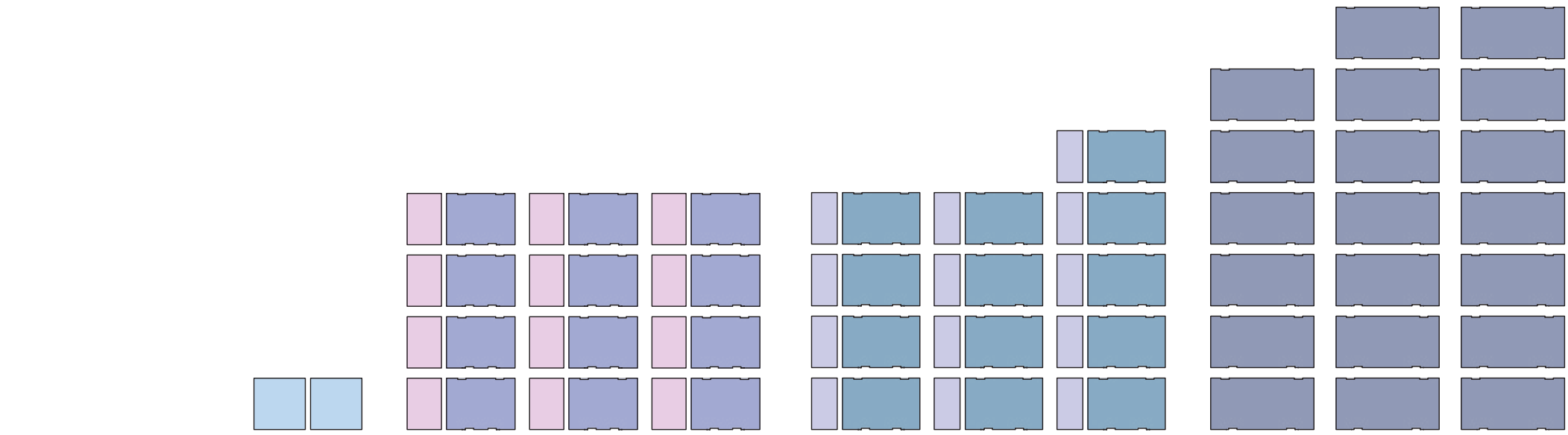
CROSSROADS

MODULAR . PREFABRICATED . NO WASTE

The installation uses a modular system of 6no. block lengths all based on fractions of a whole block, comprising 93no. components from 62no. expanded cork blocks with no waste off-cuts whatsoever.

The blocks have been detailed so that they can be re-used either as corbelled roof blocks or as vertical wall blocks. Combined with the dimensional modularity of the system, this would enable a variety of different configurations that maximise its flexibility and thereby increase the potential for its ongoing re-use.

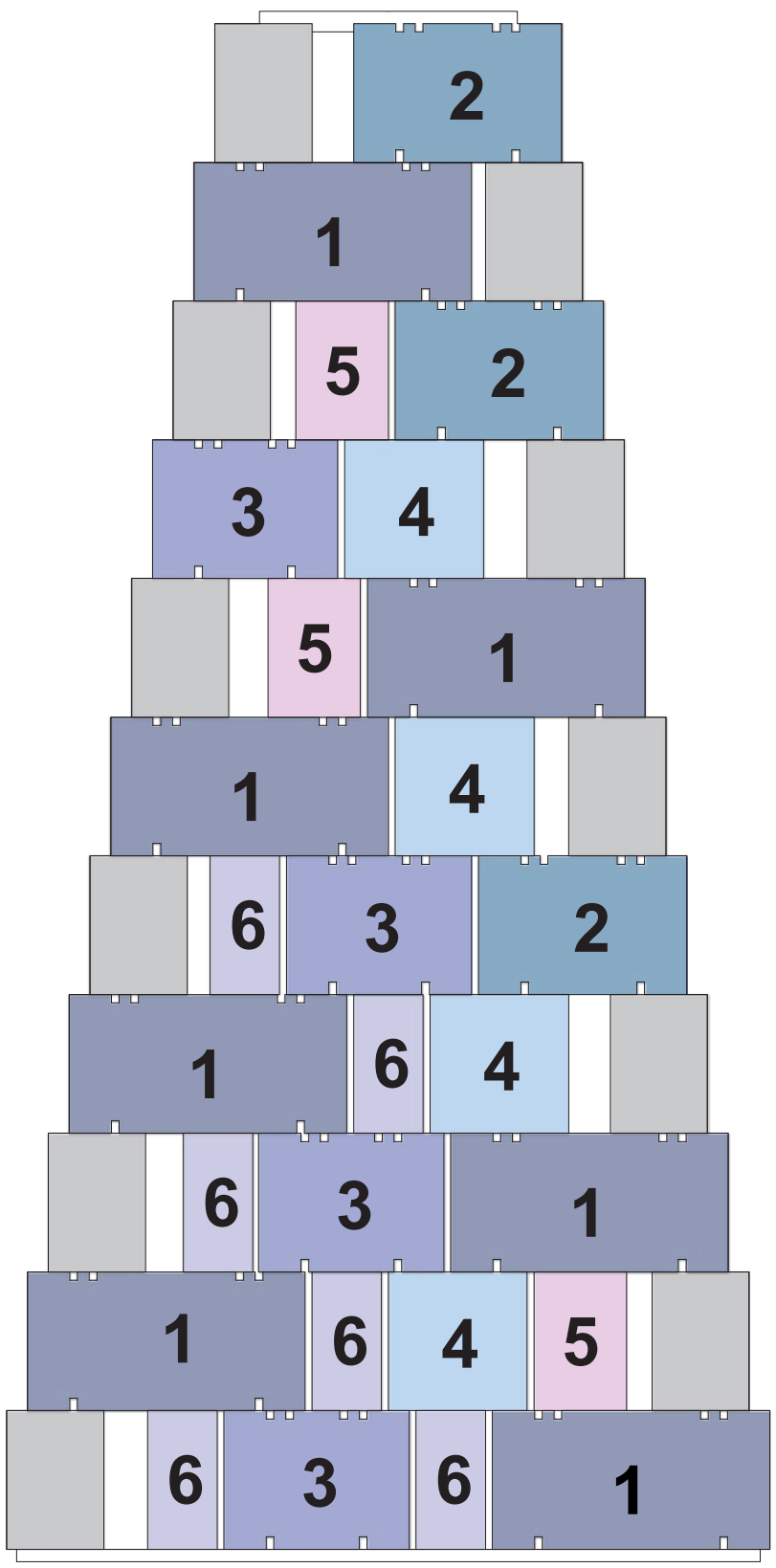


8NO. TYPE 4 (1/2)

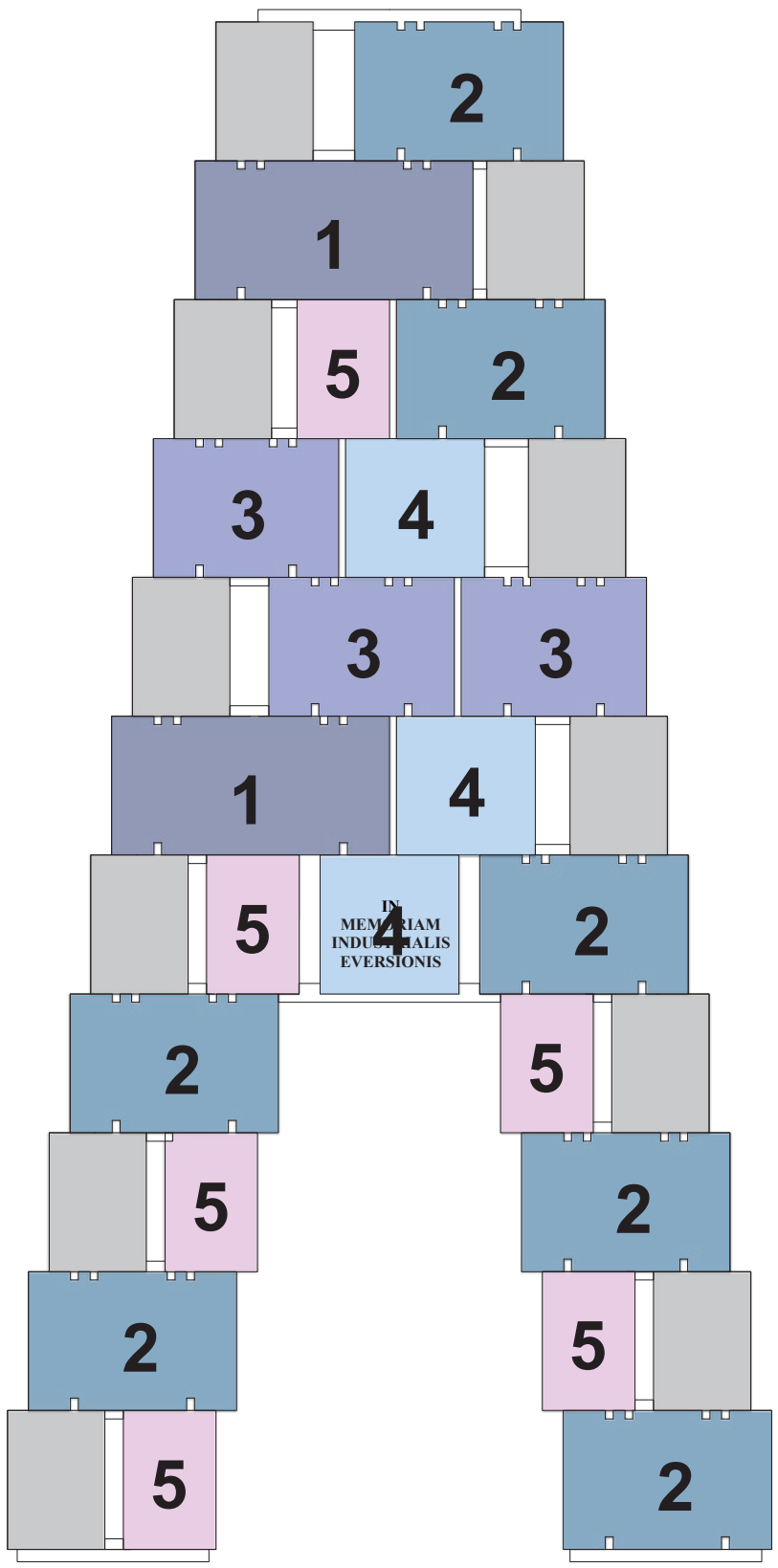
15NO. TYPE 3 (2/3) + 15NO. TYPE 5 (1/3)

16NO. TYPE 2 (3/4) + 16NO. TYPE 6 (1/4)

23NO. TYPE 1 (WHOLE BLOCKS)



3NO. TYPICAL ELEVATIONS



ENTRANCE ELEVATION

CIRCULAR ECONOMY

The expanded cork blocks are combined with interlocking timber and metal connection details to create a kit of parts that is simple to assemble on site by hand without mortar or glue, like a giant organic LEGO® kit.

This dry form of assembly means that the monument can be disassembled at the end of the Biennale, and deployed for re-use elsewhere - and because the integrity of the pure cork is not compromised during its use in construction, if and when the blocks fall out of the human cycle of use they can be returned directly to the biosphere to biodegrade and generate new growth.