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AALTO SILO

SILO DREAMING

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Factum Foundation & Skene Catling de la Peña

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Inscrutable, sphinx-like silos were objects of fascination for modernist architects at the beginning of the 20th century. They represented a radical break with the past. The AaltoSiilo can now become a new site for radical, positive change.

*'Mountainous silos, incredibly space-conscious, but creating space. A random confusion amidst the chaos of loading and unloading... of railways and bridges, crane monsters with live gestures, hordes of silo cells in concrete, stone and glazed brick. Then suddenly a silo with closed horizontal fronts against stupendous verticals, and all this in the sharp evening light...
...Everything else so far, now seemed to have been shaped interim to my silo dreams.'*

Erich Mendelsohn, letter to his wife, 1924



Our heartfelt thanks to
Paul Nordstrom August, Dr. J. Thomas Nordstrom August, Jean Nordstrom August, and Ariane Brillard
for their pioneering support of the AaltoSiilo.

Front and back cover - Aaltosiilo today, interior, view looking up through the 10cm cast-in-situ concrete. Photograph by Lauri Klemola

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AALTO SILO - SILO DREAMING

INTRODUCTION

In the lockdown of 2020, The Factum Foundation for Digital Technology in Preservation bought an iconic concrete woodchip silo by Alvar Aalto and Marsio-Aalto, the first industrial building designed by Finland's most revered architects. The sulphite cellulose factory thrived when exploitation seemed natural and resources infinite. It closed in 1985 leaving behind a ravaged landscape. Until now, Factum Foundation has focused on preserving cultural heritage. In Oulu, the focus will be the environment.

The project restores and reinvents the 525 sqm Silo as a multi-media performance, exhibition space and 'Tar Bar'. A new 1150 sqm Research Lab promotes the reuse of concrete spolia 'waste' as an architect's toolkit for sustainable construction. Industrial sites once generated and defined communities; physically, socially and economically. The AaltoSiilo is reinvented for a post-industrial era, redefining materiality for the 21st century and the role of industrial heritage in memory, shaping place and cultural identity. Oulu is the European City of Culture 2026, the completion date target for the AaltoSiilo and most of the Research Lab. The AaltoSiilo will be Oulu's great legacy project that will continue to enrich and evolve, as part of a new global network, long after 2026.

SILO DREAMS

The AaltoSiilo, completed in 1931, is a radical concrete construction that pushed engineering tolerances to the limit. 28-metres high, its ultra-thin, cast-in-situ, steel-reinforced concrete shell is held rigid by fins that punctuate its façade. Its surface is painted with bitumen for waterproofing. A conveyor chute carried wood chips to the top for distribution through steel funnels. It is close to one hundred years old, and represents the dreams and priorities of the modernists at the beginning of the 20th century. It can also be used to reveal how much priorities have changed in the 21st century.

Meri Toppila is a neglected suburb of Oulu just below the Arctic Circle on the frontline of climate change. On the northern shore of the Gulf of Bothnia, it is in urgent need of urban regeneration. It has a transient population that includes newcomers, students and the recently divorced, with over 100 different nationalities having passed through it. Refugees, many from Syria and Somalia, arrive as the arctic ice melts and 'post-glacial rebound' causes land to rise by over one centimetre a year.

CONCRETE FUTURES - SUSTAINABLE CONSTRUCTION

The AaltoSiilo project demonstrates the importance and viability of reusing existing concrete industrial heritage. It provides a deconstruction methodology and building protocol for the reuse of local concrete 'spolia' and smaller architectural components. The source buildings for this concrete waste have already been identified with the Oulu planning department. Building with concrete 'spolia' creates a new aesthetic that recalls Aalto's Muuratsalo or 'Experimental House', combining innovative recycling with design excellence.

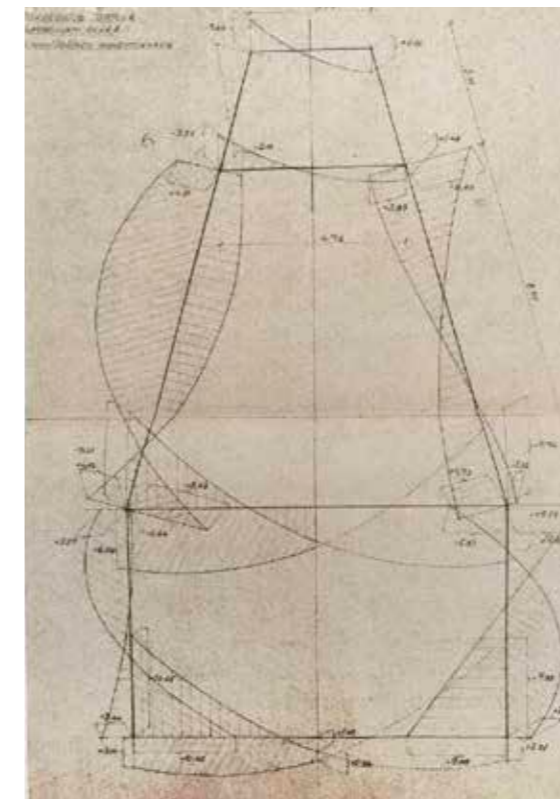
The 'Architect's Toolbox' illustrates the aesthetic potential of the circular economy. Skene Catling de la Peña and Factum Foundation have published articles about this approach in Domus Magazine, national and international press, and have been exploring the potential of carbon sequestering concrete with the Universities of Oulu, Helsinki and Oslo. The AaltoSiilo restoration develops a language that reveals how the building was conceived, deteriorated and how it was repaired.

DESIGN FOR TRANSFORMATION

A central goal of the AaltoSiilo is to create a vibrant place where people want to be and interact. The public sauna, cafe, rooftop 'Tar Bar' and outdoor amphitheatre will provide spaces for social encounters and economic viability. The iconic industrial silo will be the only Aalto building in northern Finland accessible to the public. The building, exhibitions and events will be a source of pride, identity and employment.

The first public performance at the AaltoSiilo was held in September 2022, attracting over 1,000 people. The restoration of the industrial silo will preserve cultural memory and forge a positive new identity. The local community will be empowered and the transfer of knowledge and technology will create a new generation of 'digital artisans'. The Research Lab will offer digital skills at the highest level based on the model Factum developed in the Theban Necropolis Preservation Initiative (2016-present) and restoration of Hassan Fathy's mudbrick building in The Valley of the Kings, Luxor, Egypt. The building was repurposed as a 3D scanning, archiving, and training centre and is run by a fully Egyptian staff and with an Egyptian manager.

The AaltoSiilo will be Oulu's great legacy project that thrives long after 2026



Bending diagram by structural engineers Nyrop and Mattas, 1930. Aalto Foundation Archive



AaltoSiilo, 1980s, shortly after the closure of the Toppila Pulp Mill. Photograph by Raimo Ahonen

ALVAR AALTO & AINO MARSIO-AALTO

Alvar Aalto and Aino Marsio-Aalto were architects, designers, and urbanists who humanised architecture through an unorthodox handling of form and materials, both rational and intuitive. Influenced by 'International Style' modernism and their contemporaries at the Bauhaus school in Germany, their work had a profound impact on the trajectory of modernism before and after World War II. They favoured a more heterogeneous architecture, inspired by Finland's birch and pine forests as well as classical and Renaissance architecture.

In the 1930s, they became identified with wood—the essential, profuse, natural material that served as the backbone of the Finnish economy. Their designs for stacking stools, chairs, tables, and other furnishings continue to be manufactured by Artek, the company they founded and which was run by Aino.

The silo was photographed by Aino and László Moholy-Nagy and published in *Arkki* Magazine in the year of its completion. Because the silo was designed by Aalto, and thanks to the Aalto Foundation, there is a very rich archive of material around the project which is unusual for industrial buildings of this period.



Toppila Pulp Mill shortly after completion (1930's), snow covered wood in the foreground. Finnish Heritage Agency



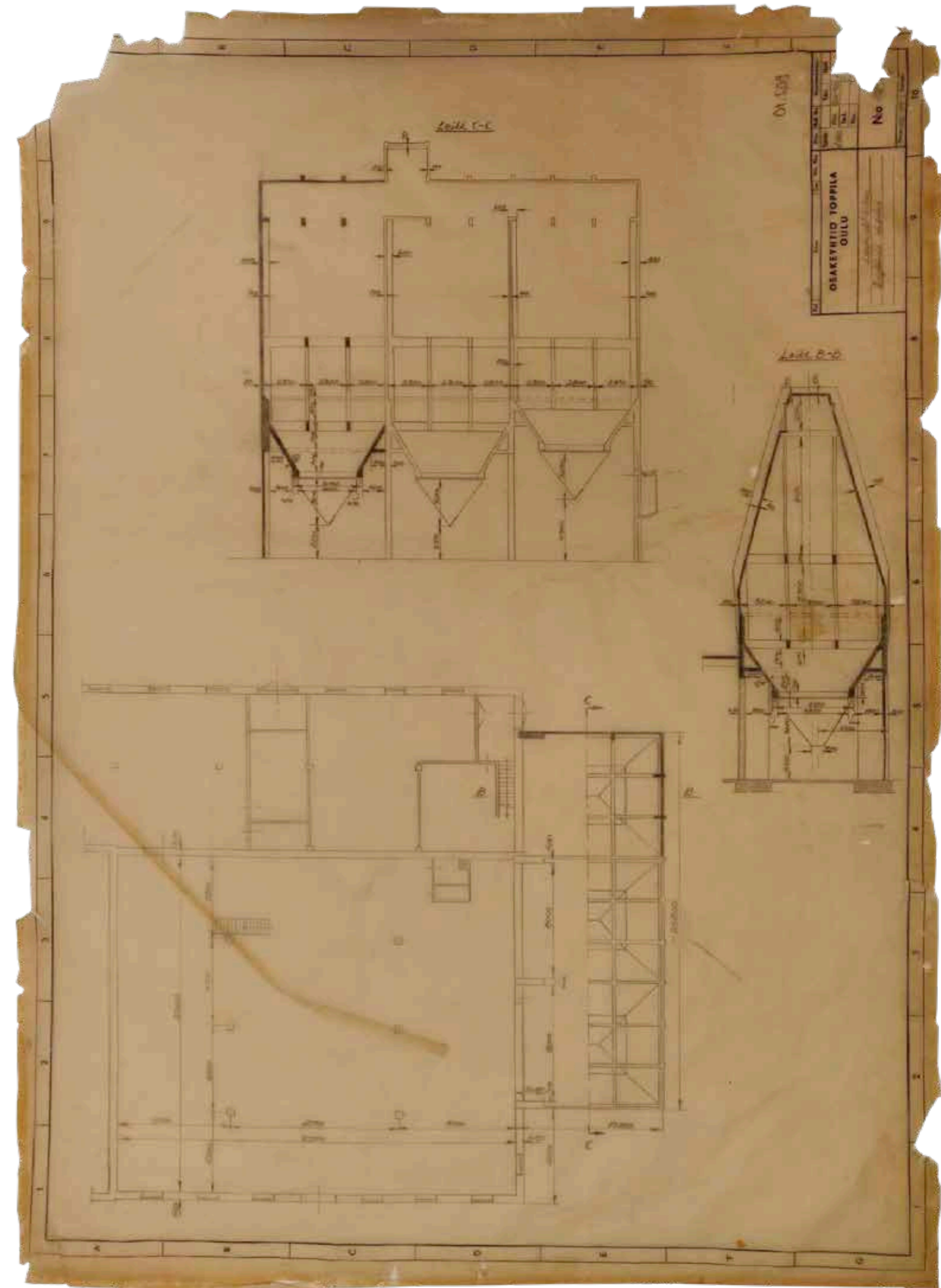
Aino Marsio-Aalto and László Moholy-Nagy arriving at Meri Toppila by boat in 1931



Aerial photo of the Toppila Ltd Factory in 1985. Kaleva archives



Alvar Aalto at the newly completed Toppila Factory



Construction sections and plan of the AaltoSiilo from the rich archive of drawings, models and photographs, held by the Aalto Foundation Archive in Jyväskylä >

OULU - ON THE FRONTLINE OF CLIMATE CHANGE

Oulu sits at the top of the Bothnian gulf, just below the Arctic Circle. An ancient trading site founded in 1605, it is the most populous city in northern Finland with 210,000 inhabitants. Once known for salmon and supplying the pine tar used to waterproof the British boats that established the colonial empire, it has evolved into a major high-tech centre, particularly in IT and wellness technology and is one of Europe's 'living labs', where residents experiment with new technology. The land is rising which has meant that the river that supplied the historic centre has been diverted towards Meri-Toppila, just to the north. As part of the transformation of Meri-Toppila the AaltoSiilo is proposing a new boat route between the historic centre of Oulu and the new marina. Between the two is the site for a major housing fair in 2025. Oulu is the European Capital of Culture, 2026.



FROM TAR TO TECH

Oulu - located at the edge of the Arctic Circle

BOTHNIAN BAY

MERI-TOPPILA

AALTOSIILO

NEW MARINA

TOPPILA

HOUSING FAIR 2025

12 MINS

30 MINS

OULU - HISTORIC CENTRE

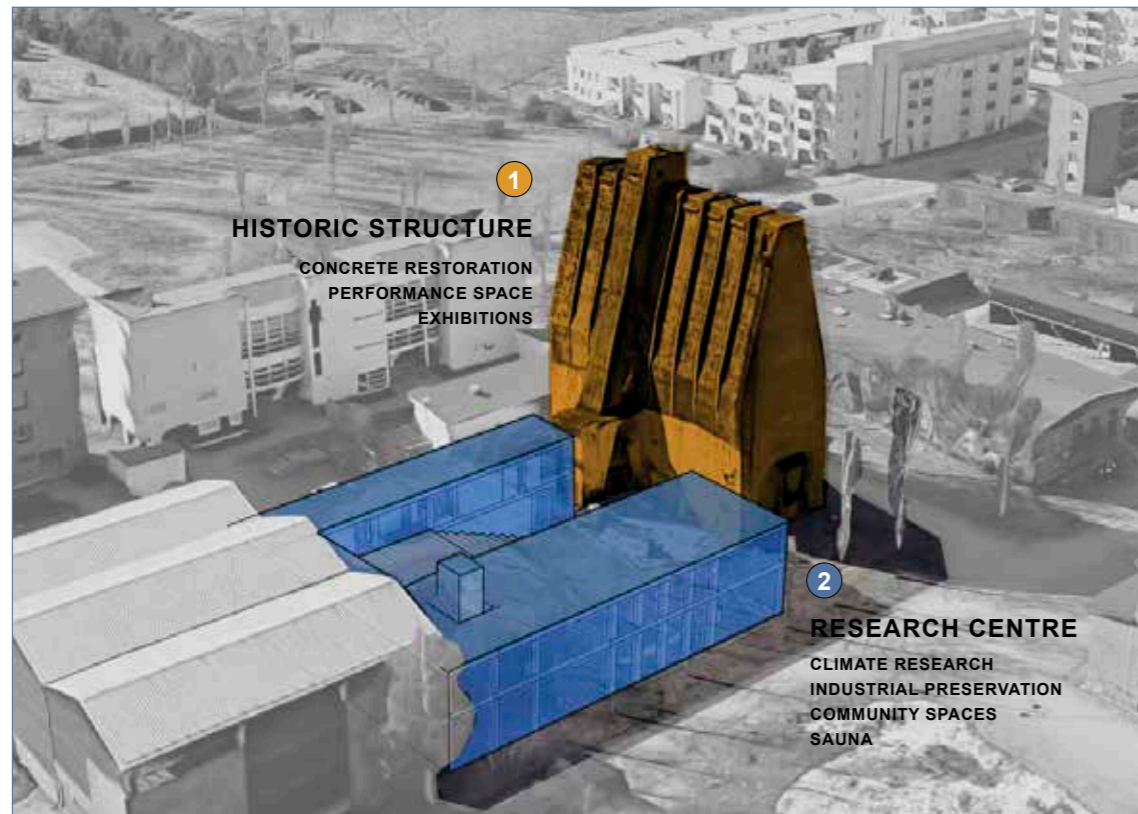
PAST & PRESENT

Founded in 1931, the Toppila Pulp Mill was shut down in the 1980s. The buildings were abandoned, they deteriorated and were vandalised. Parts of the factory were torn down. Left, the original complex of buildings, and right, those outlined in red, are the ones that remain.

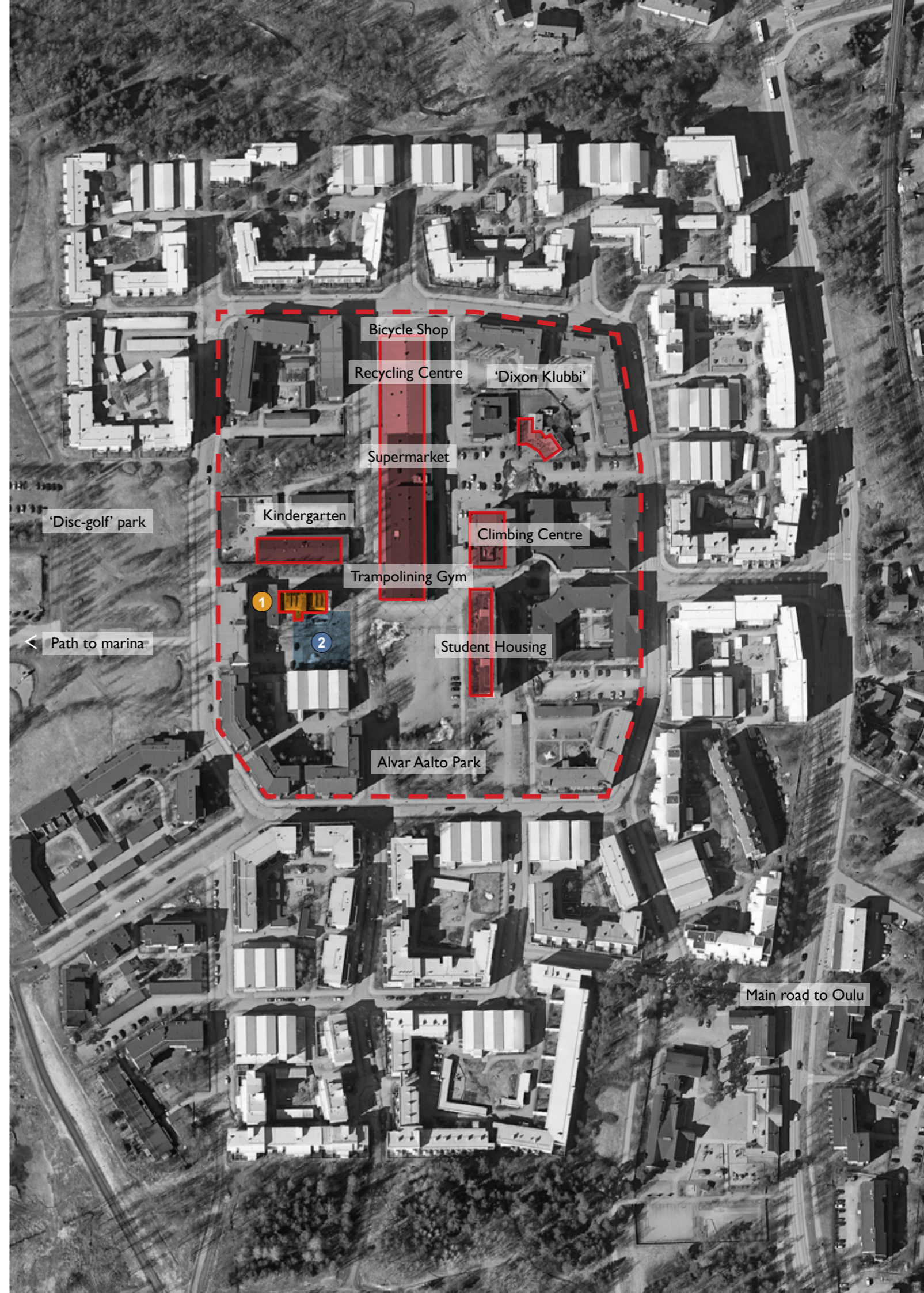
All remaining buildings of the former factory, except for the Silo, have been repurposed. These old buildings are the only ones with character in Meri Toppila and which, as a result, attract life around them.



The Toppila Cellulose Factory and its remaining buildings (outlined in red)



^ The revival of the Silo has been conceived of in two core parts: the restoration of the Aalto Silo, and the construction of a new Research Centre
> Meri-Toppila, Oulu - the dotted line indicates the original factory footprint



Inauguration of the Toppila cellulose pulp mill

1931



Toppila Pulp Mill shortly after completion (1930's), snow covered wood in the foreground. Finnish Heritage Agency

Toppila Oy was considered obsolete and almost completely abandoned.

1979



Demolition of the Toppila Ltd Factory in 1993, Kaleva Archives

City of Oulu buys the industrial facilities after their final closure and carries out demolitions of some of the buildings.

1985



The condition of the Silo building when purchased in 2020

Building of new apartment buildings and renovation of old Toppila Oy facilities

1993



Drone scan of the exterior carried out in collaboration with Arctic drones / OAMK

Factum Foundation acquires the silo

2020

Ongoing negotiations with the Oulu Planning Department and Aalto Foundation

2021

Renovation process of the silo begins with cleaning, budgeting and documentation making



Renovation works begin: cleaning the Silo

Oulu is elected as European Capital of Culture for the year 2026.

2022



Transistori performing at the AaltoSiilo in September 2022. Over 1,000 people attended the event

First public event at the Silo. 'Transistori' play building as instrument. Over 1,000 people attend

2022

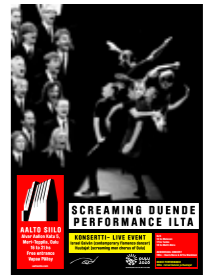
Restoration and construction commences



National and International Press Coverage

Screaming Duende - Israel Galvan and the Screaming Men of Oulu

2023



Poster for the Screaming Duende event, 2023

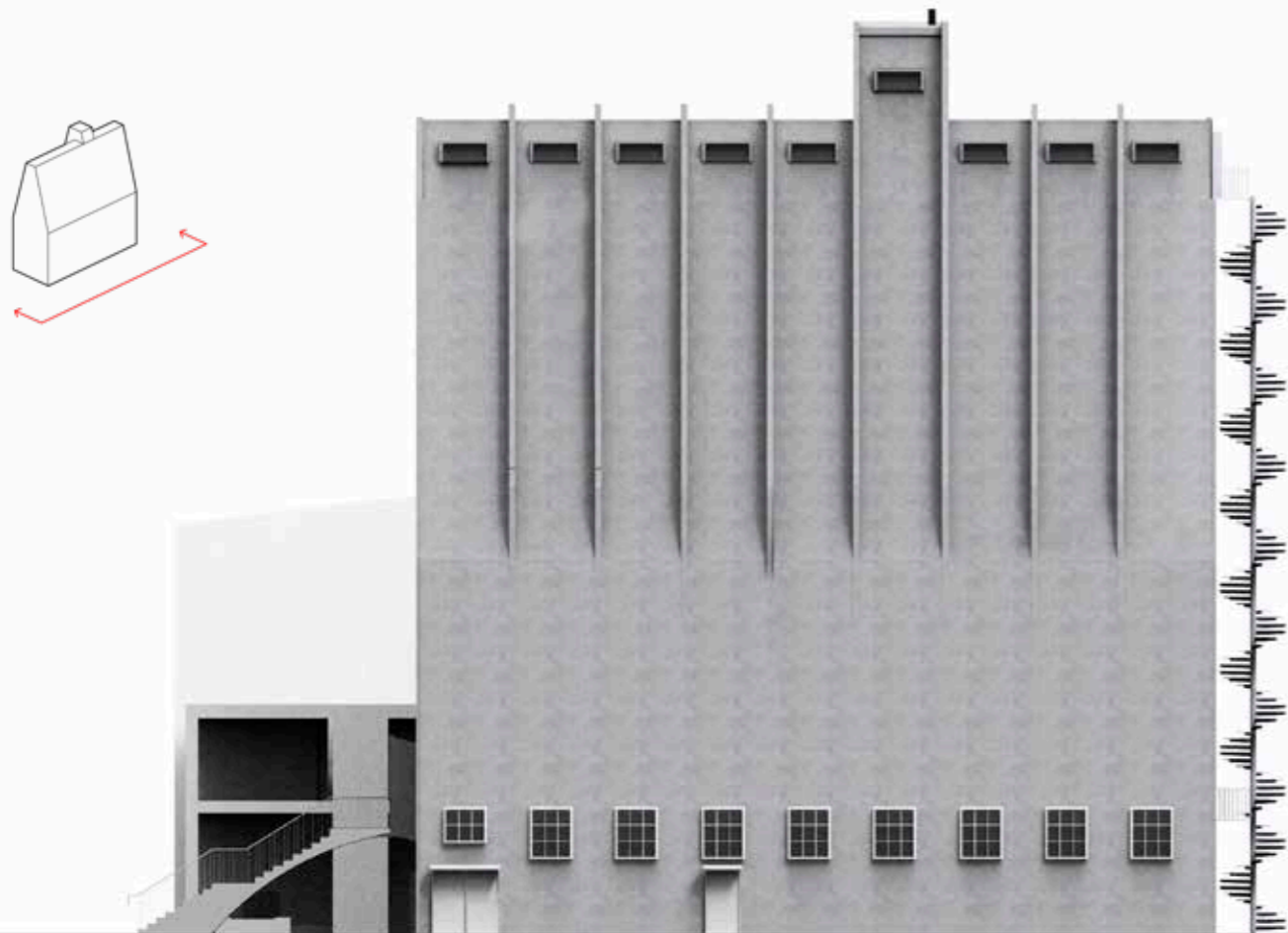


AaltoSiilo restored and open to the public. Part-completion of Research Lab

2026



Screaming Duende article in Kaleva - Finnish national newspaper



Elevation of the AaltoSiilo with new Main Exit stair, Research Lab in background, and new fire escape

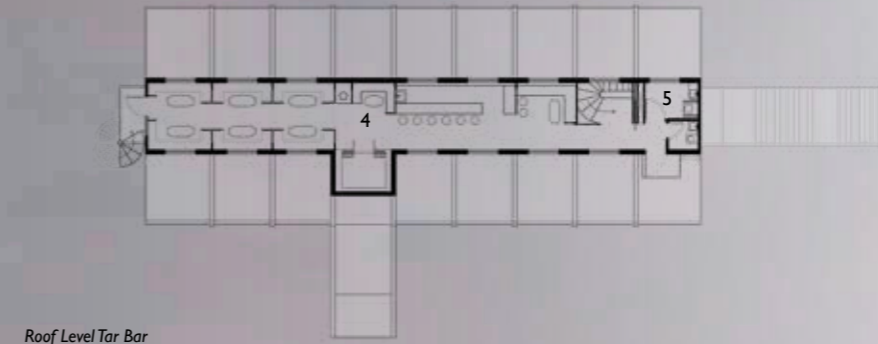


AaltoSiilo - Interior with rooftop Tar Bar, Sculptural Stair threading through the existing structure, hopper, and Cabinet of Curiosity, Mezzanine Viewing Platform and main performance, exhibition and event space on the ground floor.

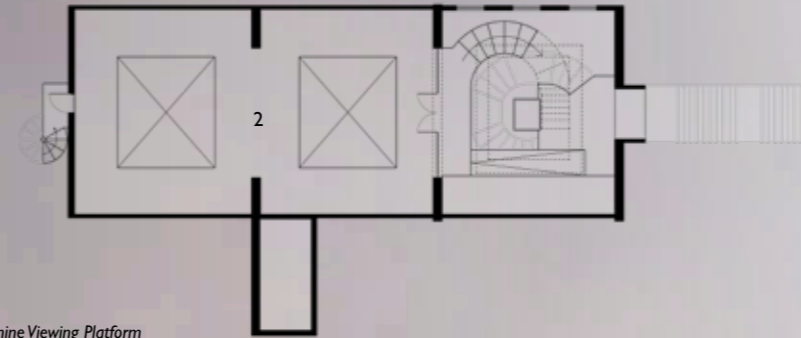
AALTOSIILO: LEGACY PROJECT OULU 2026

SCULPTURAL STAIR

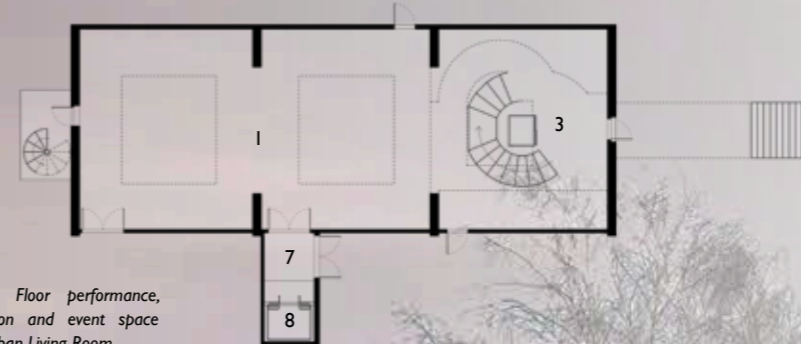
The drama of the Silo building is celebrated through the stair that weaves its way through and around the existing, unchanged structure. The stair takes a different form at each turn, echoing the form of the building that contains it.



Roof Level Tar Bar

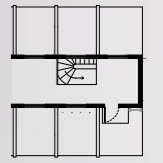


Mezzanine Viewing Platform

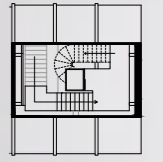


Ground Floor performance, exhibition and event space and Urban Living Room

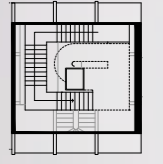
No.	Space	Area (m ²)
1	Performance space	165m ²
2	Mezzanine	115m ²
3	Urban living room	80m ²
4	Tar Bar	75m ²
5	WC's	10m ²
6	Stair Exhibition Spaces	70m ²
7	Stage entrance	9m ²
8	Lift	6m ²
TOTAL		530m²



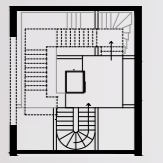
+26m Bar/roof level



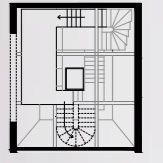
+24m Stair to Roof



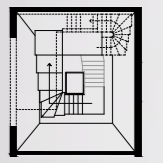
+20.5m Exhibition Space 3



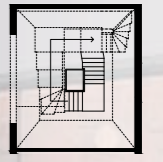
+15.2m Exhibition Space 2



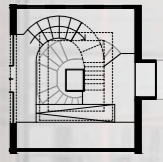
+12.5m Exhibition Space 1



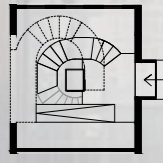
+8.5m Hopper Level



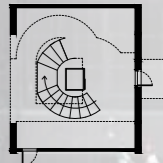
+6.2m Hopper Level



+3.6m Mezzanine Level



+3m First Floor Exit



+2m Ground Floor Level

FROM PROCESS TO PEOPLE

Factory architecture is the direct product of 19th & 20th century capitalism. Industry introduced large scale buildings and building complexes that were designed not for people, but for processes. Silos are a particularly extreme example of this: vast structures, with no windows, built at exaggerated, inhuman scales.

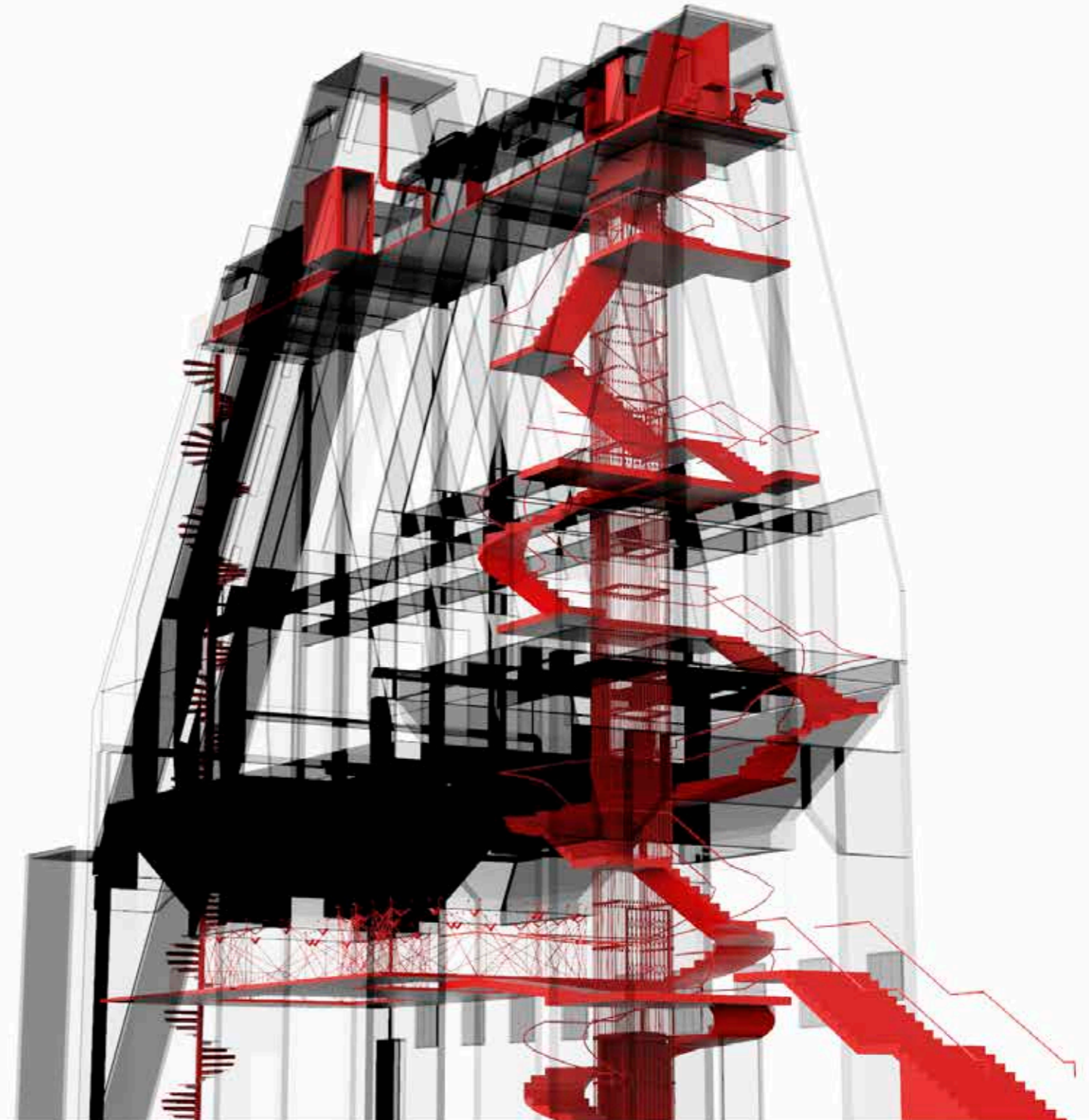
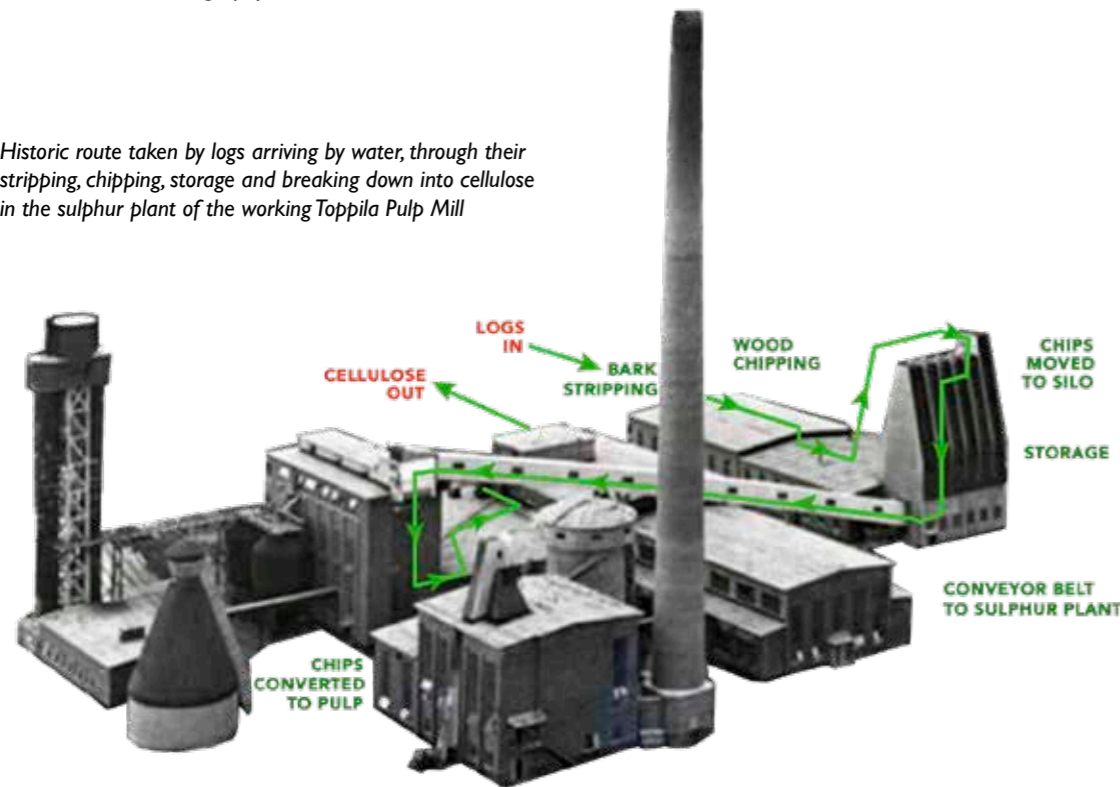
The timber industry in Finland was restructured in the late 1920s, shifting from exports of sawn timber to paper products. Aalto's Toppila factory was published in *Arkkitehti*, magazine in 1931. In it, the engineer L. Nyrop describes the Silo as 'the most structurally interesting building'. He explains that the tapering shape ensured that the hoppers could be completely filled, avoiding 'vaults' forming as the wood chips 'accumulate sharply'. The shape avoids excessive spans on the highest conveyor line and provides a natural, sloping route for chips rising from the wood treatment plant. The use and products made by former industrial buildings also contribute to their legacy and heritage value. The Silo restoration honours these in a number of ways.

ARCHITECTURAL CHOREOGRAPHY

The Silo was once part of an industrial process, it was one event along a prescribed series of events and actions. The trunks of trees arrived from the Bothnian Bay by boat and were stored in stacks between the shore and the factory until needed. In a building adjacent to the Silo, tree trunks were stripped of their bark and chipped, before being taken by conveyor belt to the top of the Silo.

Only some of the buildings in which the original industrial process took place now remain. These have been reused and function today as a climbing centre, a sports hall and trampolining gym, a bike store and second-hand furniture shop. The plant buildings that processed the trees have been demolished, as has the long conveyor belt that once crossed the site which is now a parking lot. The building where the woodchips were broken down with sulphuric acid into cellulose for newspaper stock, is also gone. The intangible navigation of the process can, however, be reanimated as 'architectural choreography'.

Historic route taken by logs arriving by water, through their stripping, chipping, storage and breaking down into cellulose in the sulphur plant of the working Toppila Pulp Mill



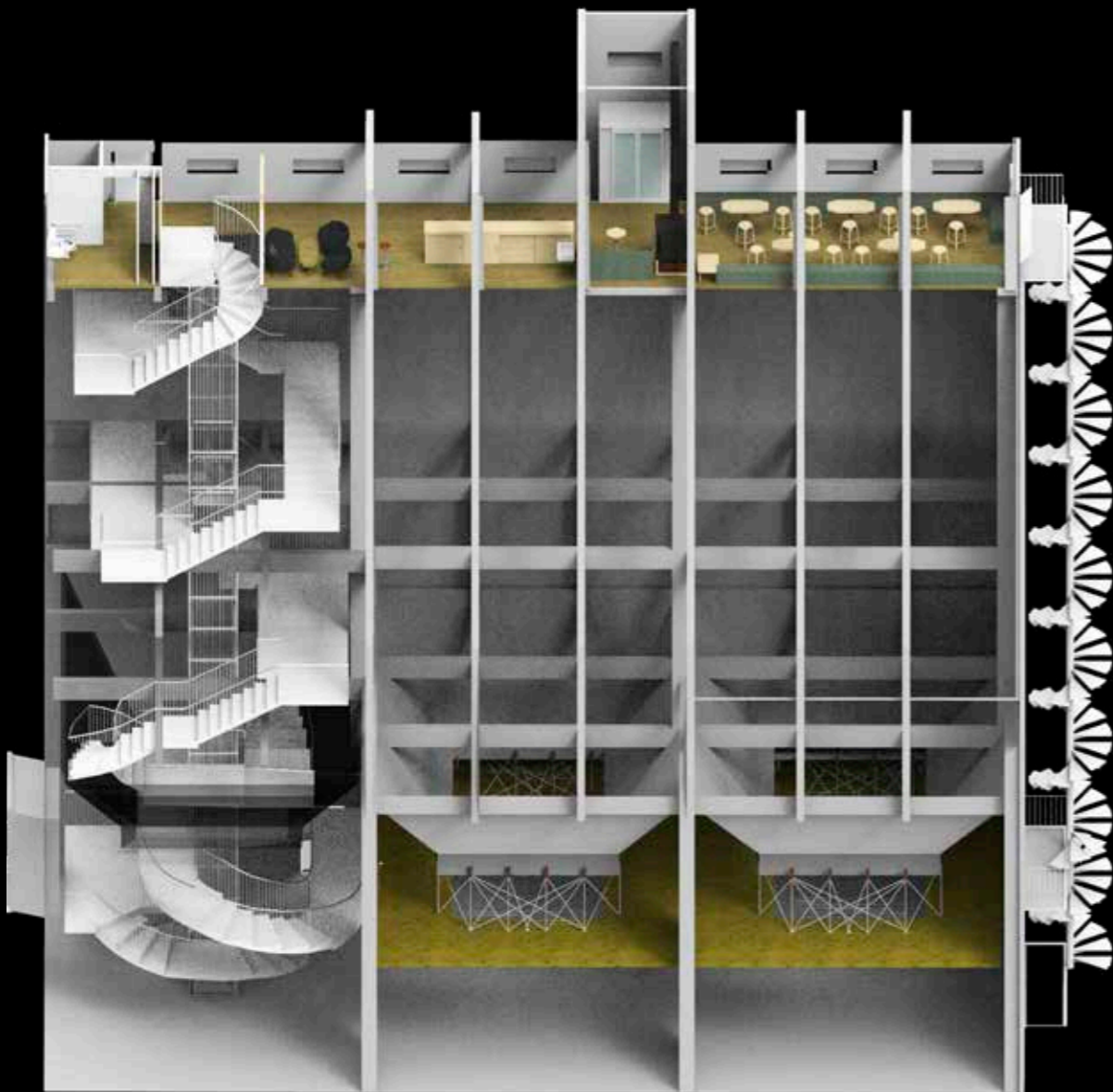
INTEGRATION OF OLD AND NEW

AaltoSilo showing the incline elevator access to the rooftop Tar Bar, the Sculptural Stair, the Mezzanine Viewing Platform and the Main Exit Stair

SCULPTURAL STAIR

The adaptation of the Silo from a structure for moving woodchips into one to be inhabited by people following the same route, has to literally overcome many obstacles. One of the most complex elements of the design has been the circulation, namely, the insertion of a staircase through the existing concrete structure which is remaining unchanged, and which has to deliver the visitor to different levels which are existing and so already fixed. Meeting today's stringent building regulations, addressing disabled access and fire risk, have added further layers of challenge.

The outcome is a very sculptural stair, one that wraps around a central, structural lift and adapts itself to the building form which is very narrow at the top and braced with concrete beams in the centre. The route is finally forced through the narrow mouth of a hopper, before exiting. The result is a stimulating journey that brings the visitor into very close proximity to the building shell while manoeuvring between a highly dramatic structure and series of events along the way.



Bay 1 - Urban Living Room

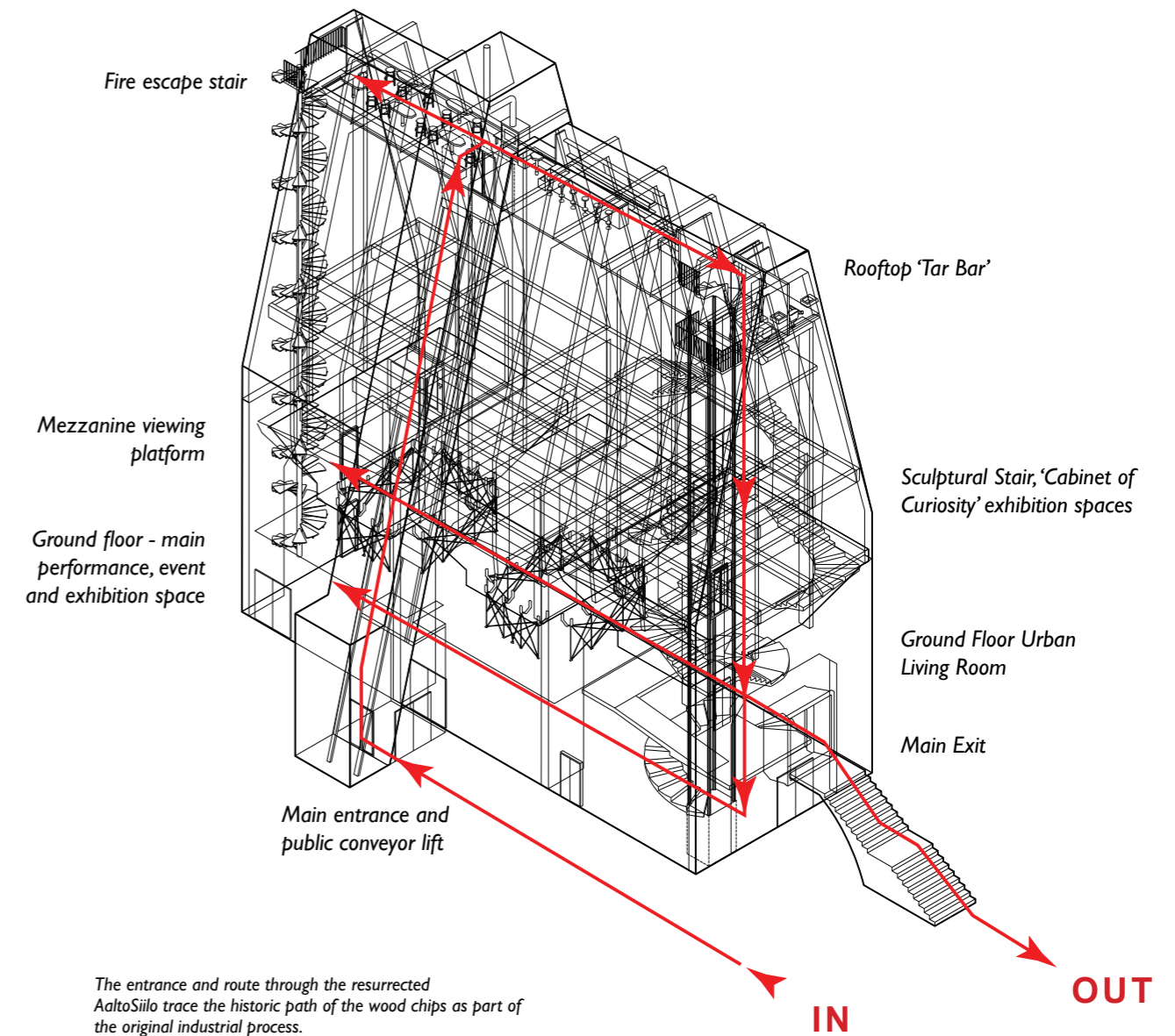
Ground Floor - Bays 2 & 3 - Performance, Exhibition and Event Space

Mezzanine Viewing Platform overlooking the performance spaces

GHOST PATH

The new route through the building will follow the original industrial process. The path the woodchips once took will form the basis for a new 'architectural choreography'. The route begins at ground level where the trees were processed, it then rises to the top of the building by conveyor lift as the woodchips once did, before filtering down around the structure through a 'Cabinet of Curiosity' that is arranged on platforms along the stair route, passing through the concrete hopper and exiting from the opening that once connected the Silo to the next stage of the cellulose production. This 'ghost path' means that each visitor will re-enact the navigation of the industrial process.

In Meri Toppila, the Silo is used to critique itself. The restoration retains the complexities of the building: its past from a very different time in Finland, its present as an evocative ruin, and its future, as a beacon of sustainability. This way the Silo remains exciting, thought-provoking and even disruptive; an entity 'in-between' time.



The entrance and route through the resurrected AaltoSilo trace the historic path of the wood chips as part of the original industrial process.

‘WOUNDED ARTEFACTS...

...SOMETIMES NEED HEROIC SURGERY’



Before any physical works, Factum Foundation for Digital Technology in Preservation made a complete recording of the inside and outside of the Aalto Silo in its current state using LiDAR recording and high resolution photogrammetry. The building can now be explored in detail remotely. The recorded data is freely accessible to the public for all non-commercial uses.

INDUSTRIAL HERITAGE & RESTORATION

The main challenges of industrial building conservation lie in the identification of outstanding values, material treatments and in defining the way the building is reused. The Venice Charter states, 'replacements of missing parts must integrate harmoniously with the whole, but at the same time must be distinguishable from the original so that restoration does not falsify the artistic or historic evidence' (1964).

Functionalist factories, however, are characterised by reproducible materials, cheap, efficient constructions, standardised elements, and reinforced concrete. Expedient changes are often made continuously over the life of a working building. These buildings are a perfect merging between architecture and engineering, making it hard to identify the architects' contribution. Industrial buildings should also be defined by what they once did and produced; by the processes that took place within them. The Silo restoration takes an innovative and highly original approach to reveal the architectural conception. The construction techniques and original industrial process are made tangible through the building's resurrection and navigation.

"The projects of Factum Foundation involve some of the most urgent and exciting developments in contemporary cultural heritage. Documentation through advanced digital recording has the power entirely to transform the worlds of material culture and alter the forms of memory and artistry they sustain. The challenges of these new kinds of digital objects and cultural memories must be collectively understood and productively directed.

Wounded artifacts sometimes need heroic surgery, but they always need nursing, forms of artful care that sustain objects' lives and maintain their vivacity. This is why the Factum Foundation needs every support in its plans to encourage state-of-the-art digital curatorship, and to use this curatorship to help transform the arts of the cultural state."

Simon Schaffer
Professor of History and the Philosophy of Science, University of Cambridge

CARBON SAVED - 933,145kgCO₂

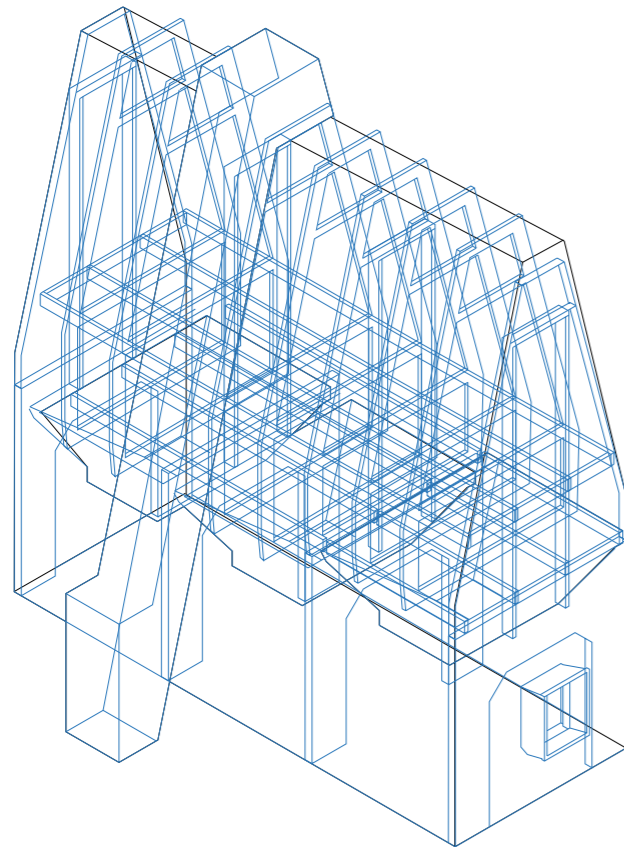
By imaginatively reusing the Aalto-designed concrete Silo, it is possible to almost entirely mitigate the new operational kgCO₂ costs needed to expand the building's lifespan for another 100 years. The renovation of the Silo interior re-uses all the timber platforms and structures, as well as the original doors and windows.

In addition, the new AaltoSiilo Research Lab is built with spolia elements, pieces that are design-picked from demolition sites to reduce the carbon footprint even further. The physical structure of the AaltoSiilo Research Lab will be an experimental structure that generates a new protocol for salvaged concrete architectural elements. As the project progresses, research will be ongoing and the latest, cutting-edge approaches, building and material technologies incorporated.

Item	Total	Material	kgCO ₂	Re-use
Silo Re-use				
Doors & Shafts	x9	Wood & metal	15810	100%
Windows	x27	Wood & glass	729.2	100%
Wood Structures	333m ³	Wood	8,839	100%
Concrete Structures	4498m ³	Concrete	1,052,293	90%
Metal Structures		Metal	2185	100%
Silo Dismantling				
Unusable wood	227m ³	Wood	729	0%
Unusable metal		Wood	8,839	0%
Damaged concrete & brick	54m ³	Concrete & brick	1,052,293	0%

Item	Total	Material	kgCO ₂	Re-use
Silo New Operations				
Fire exit	253m ³	Metal	680	100%
Doors	x10	Metal	740	100%
Elevator	x2	Metal	5,360	100%
Main entrance stair	68m ³	Eco-concrete	15,916	90%
Metal items		Metal	18,973	50%
Circulation stairs, landings	278m ³	Eco-concrete	65,224	90%
Top floor (Bar and WC)	79m ³	Various	4,549	100%

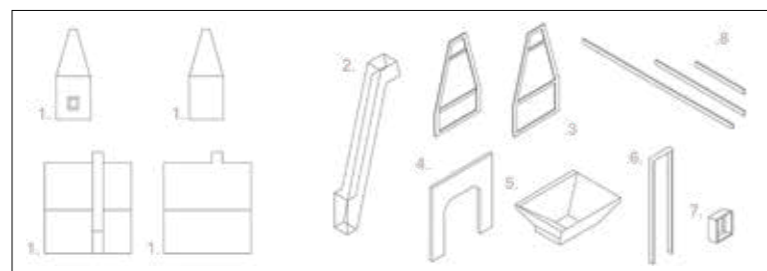
Carbon Saved - 933,145kgCO₂



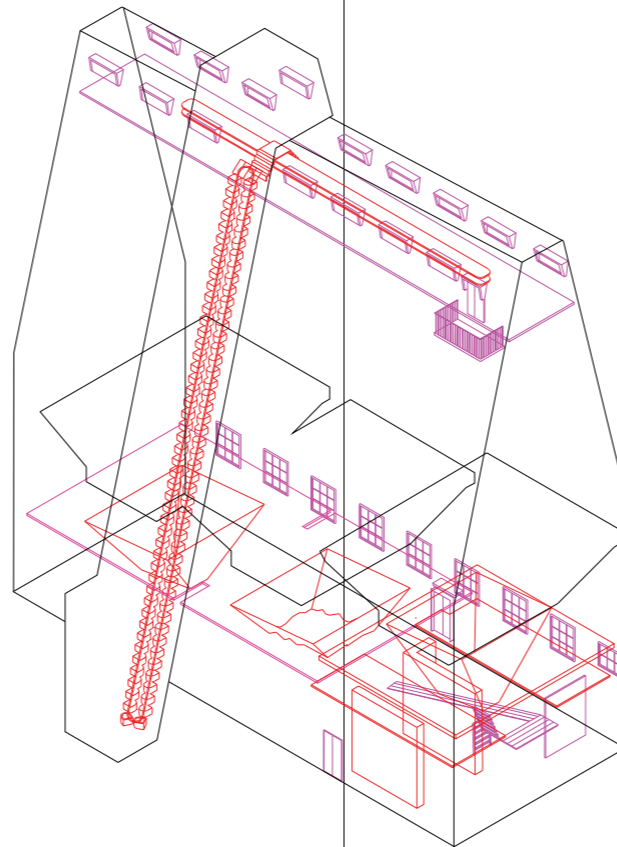
RENOVATE

1,048,077kgCO₂

CO₂ saved from being released by maintaining the building structure



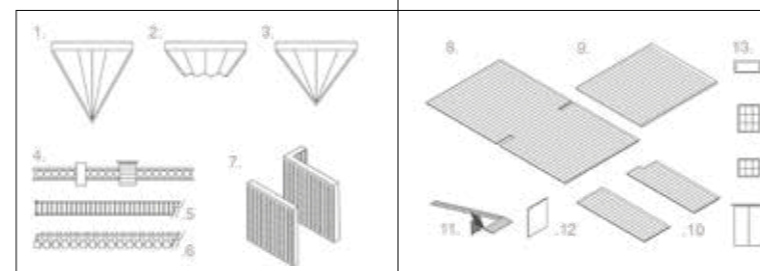
1a-Concrete façades 2-b Concrete envelope of the diagonal lift 3-b structural arches 4-b structural pillars 5-b concrete funnel structure 6-b wall reinforcements 7-b conveyor belt gateway 8-b beams



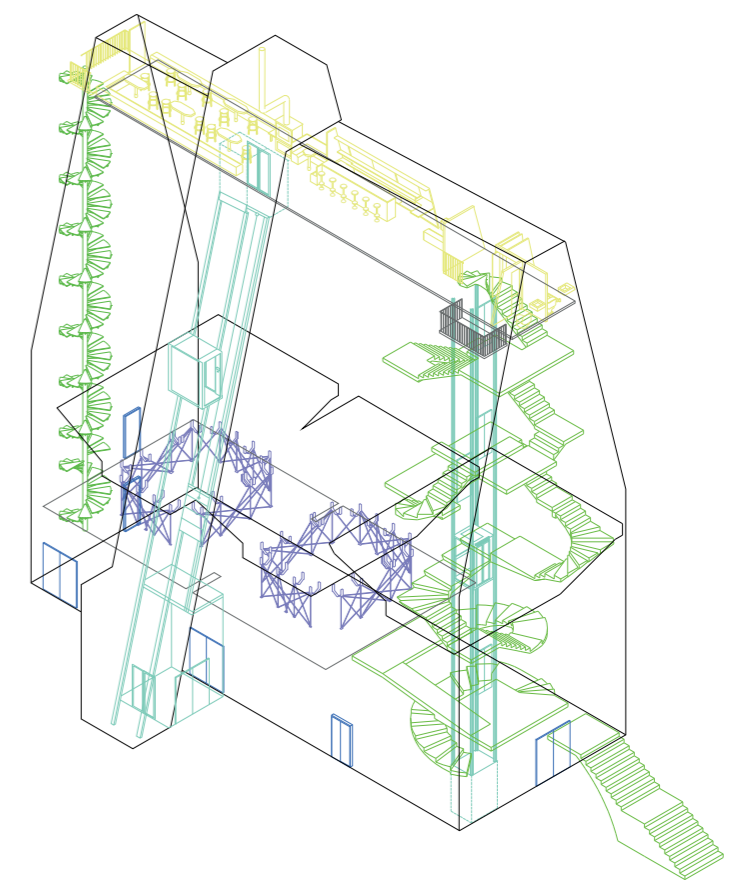
RE-USE

5,009kgCO₂

CO₂ saved from being released by re using the wood and openings on site



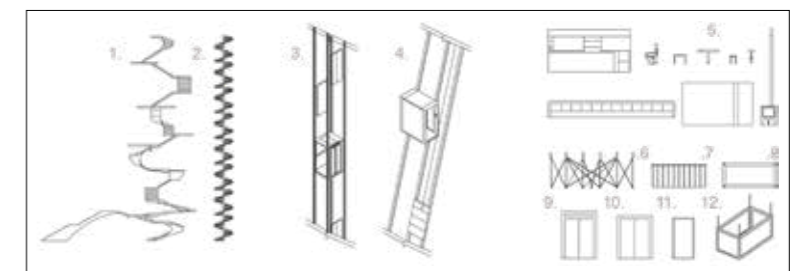
1-c steel funnel bay one 2-c steel funnel bay 2 3-c steel funnel bay 4-c horizontal conveyor top floor 5-c work stair to top floor 6-c diagonal conveyor machinery 7-c brick and dry lined walls groundfloor 8-d platform 1st floor 9-d platform 2nd floor 10-d bridge platforms 1st floor 11-d timber ramps 12-d timber shutter 13-d windows and doors



REVITALISE

119,941kgCO₂

CO₂ value of new materials used to extend the building's life by a further 100 years



1-e circulation stairs, ramps and platform bay 1 2-e fire exit 3-e vertical elevator 4-e diagonal elevator 5-f top floor bar components 6-f woven metal balustrades 7-f stair and platform balustrades 8-f emergency exit platforms 9-f elevator doors 10-f double doors 11-f single door 12-f exhibition display cabinets

MATERIAL RESONANCE

Material choices and treatments add another layer of resonance to the 'ghost route' of the former industrial process. The 'Toppila Oy' was a plant that turned trees into cellulose using sulphuric acid and other corrosive chemicals: a place once destructive and wasteful of resources, becomes an exemplar for imaginative sustainability.

The restoration uses all the possibilities inherent in pine tar, timber and cellulose, to resonate with the former use of the building. Pine tar from renewable sources will be used to waterproof the roof rather than fossil-fuel based bitumen. Existing timber structures will be reused in-situ or recycled to form new spaces, while CLT and Hempcrete sourced locally will be used for the internal skin of parts of the new Research Laboratory to reduce carbon emissions. Cellulose nanofibers from wood pulp are now being used to make a clear gel that can be sandwiched between existing windowpanes to make them as insulating as walls. The 'concrete spolia' will produce a radical new aesthetic from the same material the Silo was made from, but rethought to create a sustainable solution.



Flexible 'organic' metal joints - to be repurposed as part of a balustrade system



The star-like piercings in the concrete skin, to be filled with glass pegs



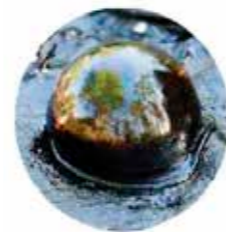
Timber



Hempcrete



Cellulose Insulation



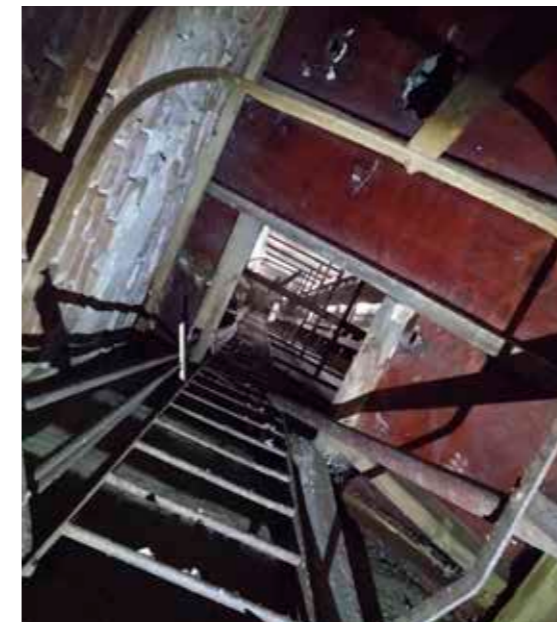
Pine tar

CREATIVE COLLABORATIONS

In 1910, a machine repair shop in Helsinki became known as KONE, Finnish for 'machine'. Harald Herlin bought KONE in 1924 and it dominated the Finnish elevator market in the early 1930s, supplying factories like the Toppila Pulp Mill in Oulu. Over a century later, KONE enables the smooth flow of millions of people across the world and will again supply the AaltoSiilo with its core circulation routes, this time for people rather than woodchips.

The AaltoSiilo and Skene Catling de la Peña are now in discussions with KONE (named one of the world's 20 most sustainable companies) around the public incline elevator. Following the route of the original conveyor elevator, the new incline elevator will take visitors to the roof level Tar Bar with spectacular views over the Bothnian Bay. The AaltoSiilo is hoping to establish creative collaborations with industry partners in Finland that have direct historic links with the AaltoSiilo.

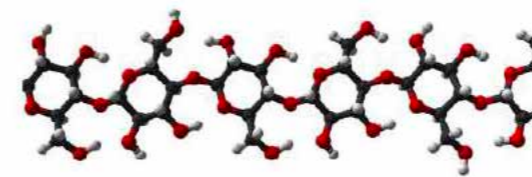
Stora Enso and Nokia are other potential partners who have resonant connections; Stora Enso is still producing wood and cellulose products in the important Aalto-designed Sunila Factory, and Nokia, with its historic ties to Oulu, works at the forefront of digital technologies, as does Factum Foundation. ARTEK would be a great collaborator for the Tar Bar and restaurant, which will become a showcase for Finnish design, old and new.



Looking up the 28 m high conveyor shaft of the AaltoSiilo, the new route for visitors to the building



One of KONE's industrial conveyors, 1930, of the same type used in the AaltoSiilo and Toppila Pulp Mill in 1931.



Nano cellulose



Acrylic One



CLT - Cross Laminated Timber

SOCIAL CONDENSER

The Social Condenser will celebrate art, science and technology in a genuinely 'polytechnic' environment. The aim will be to merge the sustainable preservation of both the natural and the cultural environment.

The AaltoSiilo is conceived as a catalyst. The Research Lab will introduce a world class facility, creating a unique destination that will draw visitors locally and internationally. The rejuvenated Silo will reinforce cultural memory through celebrating its industrial heritage. From 1931 to 1985, Toppila was the hub that drove growth in Oulu. Since 1985, it lost its function and was allowed to deteriorate. It has become the transient district within the city. Its proximity to the sea and the water route into the heart of the historic centre, combined with its open spaces and proximity to nature, are all reasons why, with the proper management, Meri Toppila can once again become the creative driver for the city.

- 1 Research Lab
- 2 Restaurant / Cafe
- 3 'Tar Bar'
- 4 Accommodation
- 5 Amphitheatre
- 6 Social Sauna
- 7 Performance
- 8 Exhibition / Cabinet of Curiosities

PHASED DEVELOPMENT

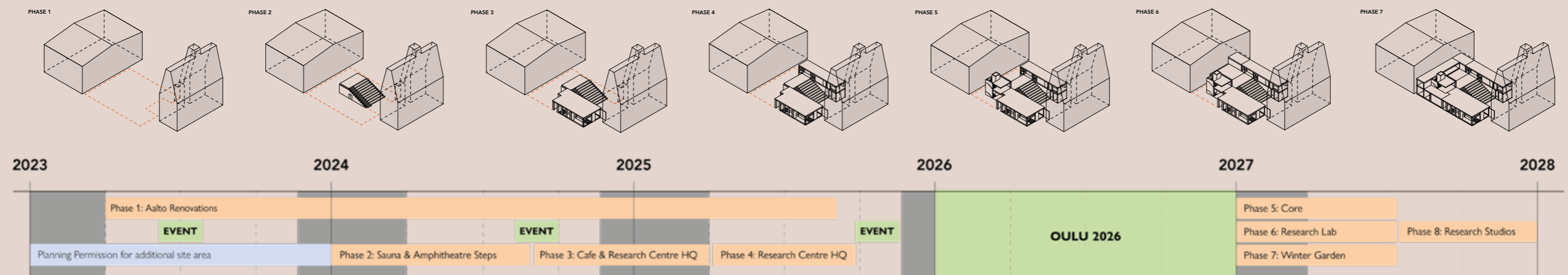
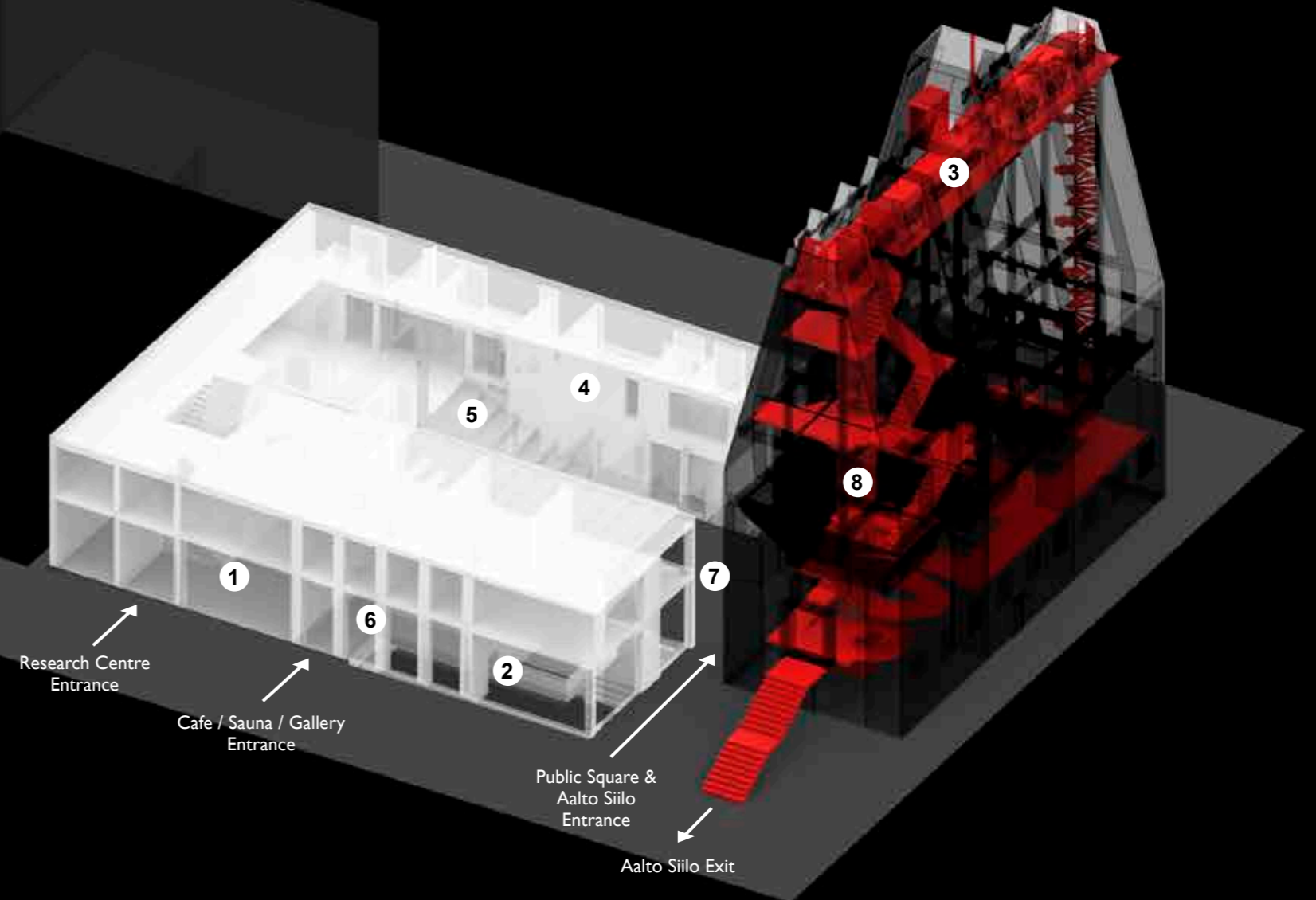
The Social Condenser and Research Lab will be developed through a phased construction. Each year, the community will witness the project progressing, with each element making a positive contribution to Meri Toppila.

The first step will be the Social Sauna and Amphitheatre Steps. Following this, the Cafe and Research Lab HQ will be introduced. The Research Lab HQ will relocate as the building expands.

"The Silo is a truly unusual building in a factory environment. It aroused positive feelings for me, I used to guess at the meaning of the building as I often cycled past it when a high-school boy about 65 years ago. I knew the Toppila factory produced pungent smelling sulphate cellulose from birch, and there were acid tanks or wood chips inside. The building was like a chapel dedicated to God's work, with sacrificial smoke fuming from the chimney. Oulu Oy [another factory in Oulu] produced sulphate cellulose from pine, which had a milder smell - the smell of money. You could see the factory's pulpwood stacks and the movement of the cable conveyor. You could hear the rumbling all the way to the city. It's a shame that such sights are not appreciated.

Aalto's creation would have made a suitable shrine to Finnish art."

Local Resident, Jännä, tyylikäs, upea, Iltä-Sanomat

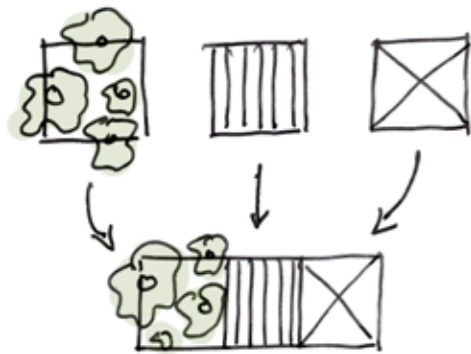


THE AALTO SILO RESEARCH LAB

The Research Laboratory is a courtyard structure that will occupy the space of the demolished factory building where trees were once turned into wood chips. Visitors will be drawn in and reoriented to face the Silo where the building can be either a point of focus, a projection screen or a backdrop for events and performance.

The Research Lab is essentially a 'Frankenstein construction' or 'Franken-architecture'. Built from the stitched-together, assembled pieces of other 'dead' and demolished concrete buildings, it is laid out around a Silo-shaped void, three squares of 10x10 metres. Rather than electricity, it has a sauna at its centre to reanimate it and bring it to life: a warm heart.

At ground level, an entrance to the new diagonal Silo elevator generates an intimate and lively public space for the community. Amphitheatre stairs, leading to a raised planted courtyard, directs attention back towards to the silo, where visitors can appreciate the new urban landscape of Meri-Toppila. The stairs double as seating for outdoor screenings and performances with the newly renovated silo becoming a projection surface.



Garden, Amphitheatre Steps and Public Square make up the centre of the new AaltoSilo Research Lab



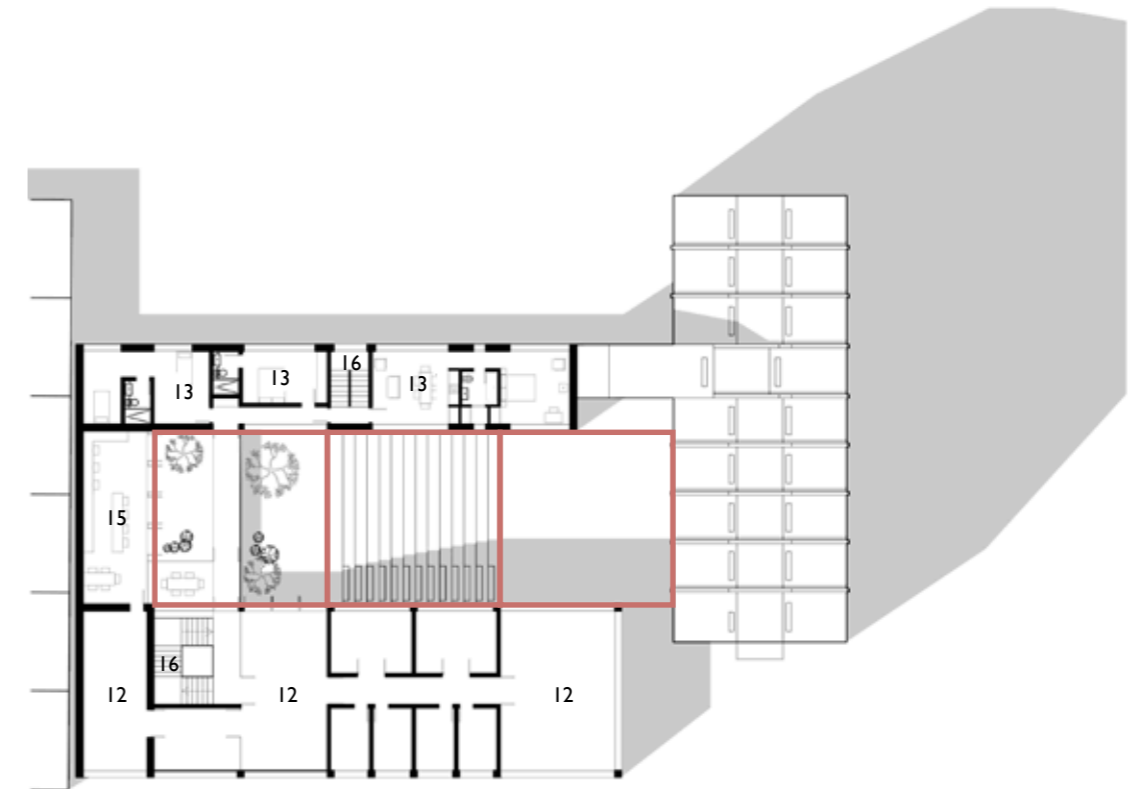
The new Research Lab is designed around a Silo-shaped void, 3 squares, each 10 x 10m

Ground Floor

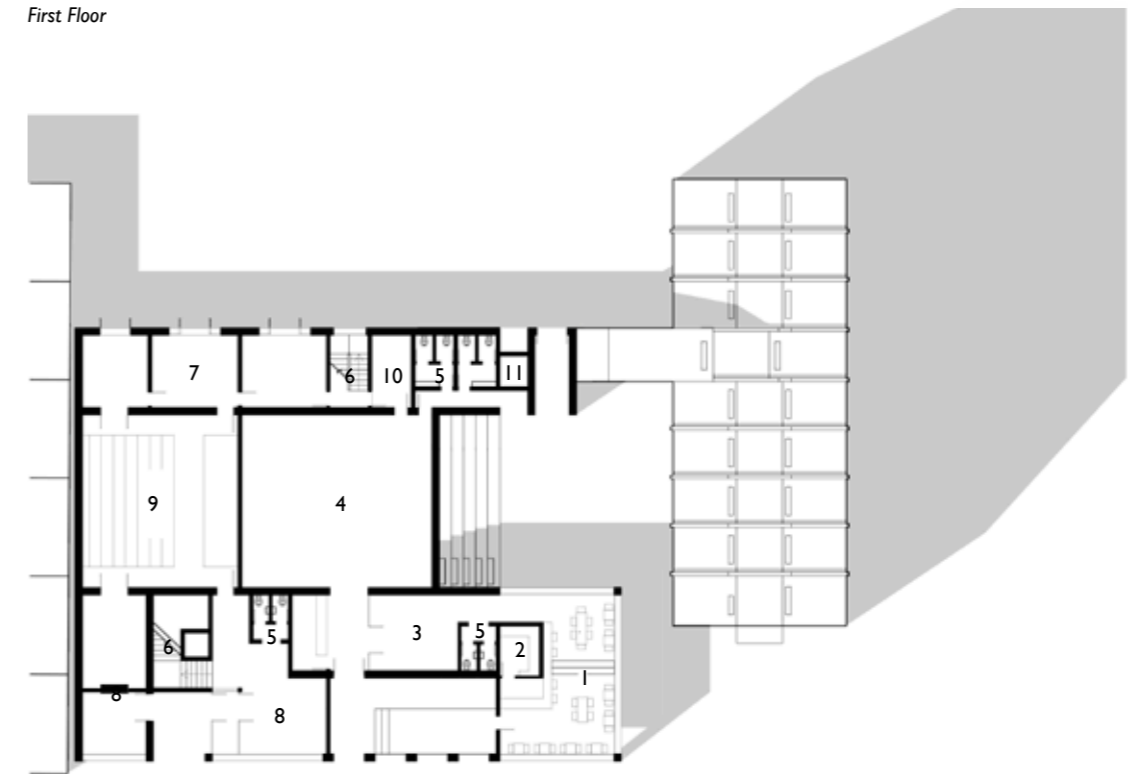
No.	Space	Area (m ²)
1	Cafe / Restaurant	53m ²
2	Kitchen	7m ²
3	Gallery	26m ²
4	Sauna	117m ²
5	WC's	17m ²
6	Circulation	20m ²
7	Workshops	93m ²
8	Research Studio	51m ²
9	Lecture Hall	88m ²
10	Changing Rooms	30m ²
11	Plant	5m ²
	TOTAL	507m²

First Floor

No.	Space	Area (m ²)
12	Research Studio	165m ²
13	Accommodation	115m ²
14	Winter Garden	80m ²
15	Kitchen / Dining	75m ²
16	Circulation	10m ²
	TOTAL	445m²



First Floor



Ground Floor

Factum Foundation is focused on the sustainable preservation of cultural heritage. The new AaltoSilo research centre will focus on environmental sustainability, both natural and cultural, in this rapidly changing part of the world. While Venice sinks, post-glacial rebound is resulting in Oulu rising at an estimated 1cm per year. The pollution in the Gulf of Bothnia, the change in the salinity of the sea and the emergence of new islands are all evidence of the changes taking place. The rapidly melting ice and permafrost and the changes in the Arctic Circle are resulting in the collapse of industrial buildings in the region (many constructed without foundations), but also the potential to study soil, flora and fauna where it was previously impossible. By merging new recording technologies, with both online and offline display, this dynamic environment will attract global interest.

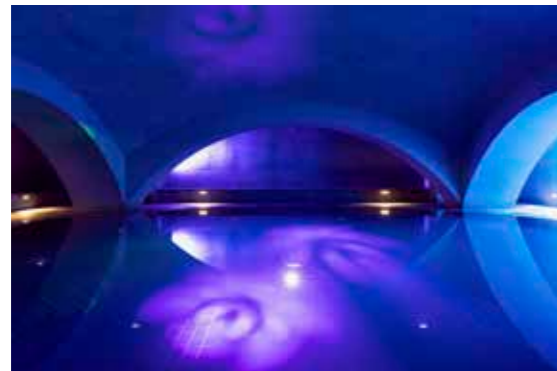
SOCIAL SAUNA

Finland is still considered the heartland of sauna culture where there is a deep-rooted desire to protect the sanctity of traditions and respect for the spiritual dimension of sauna. Renewed interest in ancient rituals and vernacular traditions is nourishing a new sauna consciousness. In particular the renaissance of the public sauna as an urban destination, a social and cultural space with a different tempo from the clothed world. Concurrently, renewed interest in bathing culture has brought a spirit of invention and experimentation to sauna.

Despite all this, there is currently no public sauna in Oulu. The Aalto Sauna and amphitheatre stairs will be the first phase of the new Research Lab. The sauna ritual has become an important part of a growing wellbeing culture. The health benefits of the sauna include benefits to the immune system and cardiac health. But there are other aspects that resonate in today's world. Saunas are a return to the earthy and elemental, an intensely physical experience in contrast to virtual digital environments. They fulfill a longing for slowness, and counter anxieties with heat and steam.



Traditional sauna, Finland



Liquidrom Spa and Sauna, Berlin



Helsinki Sauna

COMMUNITY

The community of Meri Toppila is diverse both culturally and in its religious beliefs, with age differences, a high proportion of students and the recently divorced. Although currently alienated, this rich mix is full of potential to bring new forms of economies to the area. Innovation and preservation focus on cultural and natural sustainability. The various new public spaces and activities will bring life and connections to Meri Toppila. Public bathing in the new sauna is a social equaliser that cuts across all backgrounds and this will be the only public sauna in Oulu. There is no café in Meri Toppila. The new café/restaurant and Urban Living Room in the first bay of the Silo will provide meeting places and employment.



KNOWLEDGE & SKILL SHARING

Collaborations range from academic affiliations to direct approaches for sponsorship of innovative parts of the project that will enable the AaltoSiilo to emerge as a game-changing pioneer in sustainable concrete construction. The AaltoSiilo OY is now established as a Finnish Association and has set up formal projects on 'green concretes' with the Aalto University in Helsinki and Oulu University. Recording projects have already been carried out with the Oulu University of Applied Sciences, OAMK. Adam Lowe is adjunct professor at the Graduate School of Architecture, Planning and Preservation (GSAPP), Columbia University, New York. The Oslo Centre for Critical Architectural Studies (OCCAS) has recently received a grant for 'Provenance Projected. Architecture Past and Future in the Era of Circularity', in which the AaltoSiilo plays a central role. A symposium will take place in Oulu focused on the Silo in 2025.

Tampere Architectural School ran a unit dedicated to the AaltoSiilo, and Charlotte Skene Catling has taken part in crits with the students. Two Masters' theses have been written on the Silo in the last year, and it has been the subject of a number of PhD studies. In 2021, Charlotte Skene Catling and Adam Lowe presented the project at the renowned international Alvar Aalto Symposium on architecture, held every three years in Jyväskylä and intended to arouse discussion about the artistic, social and technical problems of modern architecture. There are collaborations emerging with CLT manufacturer Stora Enso and the Aalto furniture company, ARTEK. The digital technologies developed and used by Factum Foundation make Nokia an obvious partner. Nokia has a long history in Oulu and has recently acquired Bell Labs in New Jersey.



UNIVERSITY OF OSLO



COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK



CONCRETE SPOLIA

The word 'spolia' comes from the Latin for 'spoils' and describes repurposed building stone for new construction or decorative sculpture reused in new monuments. It is the outcome of the ancient and widespread practice whereby stone that has been quarried, cut and used in a built structure is carried away to be used elsewhere. The AaltoSiilo Research Lab is an opportunity to develop the concept of 'Concrete Spolia', where buildings scheduled for demolition are 'surgically' dismantled, and large pieces of them can be reused in new constructions, to beautiful effect.

The structural behaviour of cut-out and reused reinforced, precast and cast-in-situ concrete will be very different to newly formed concrete structures. The team is working closely with structural engineers to develop a new protocol that takes into account the less predictable nature of large-scale, recycled concrete pieces. These will be oversized compared to newly made pieces, contributing to the new aesthetic of the composite architecture that emerges from this technique.



Anchor Stone Blocks (Anker-Steinbaukasten) - were building sets made of quartz sand, chalk and linseed oil in Germany from the late 19th century, marketed as a toy for constructing 'artistic and beautiful models'

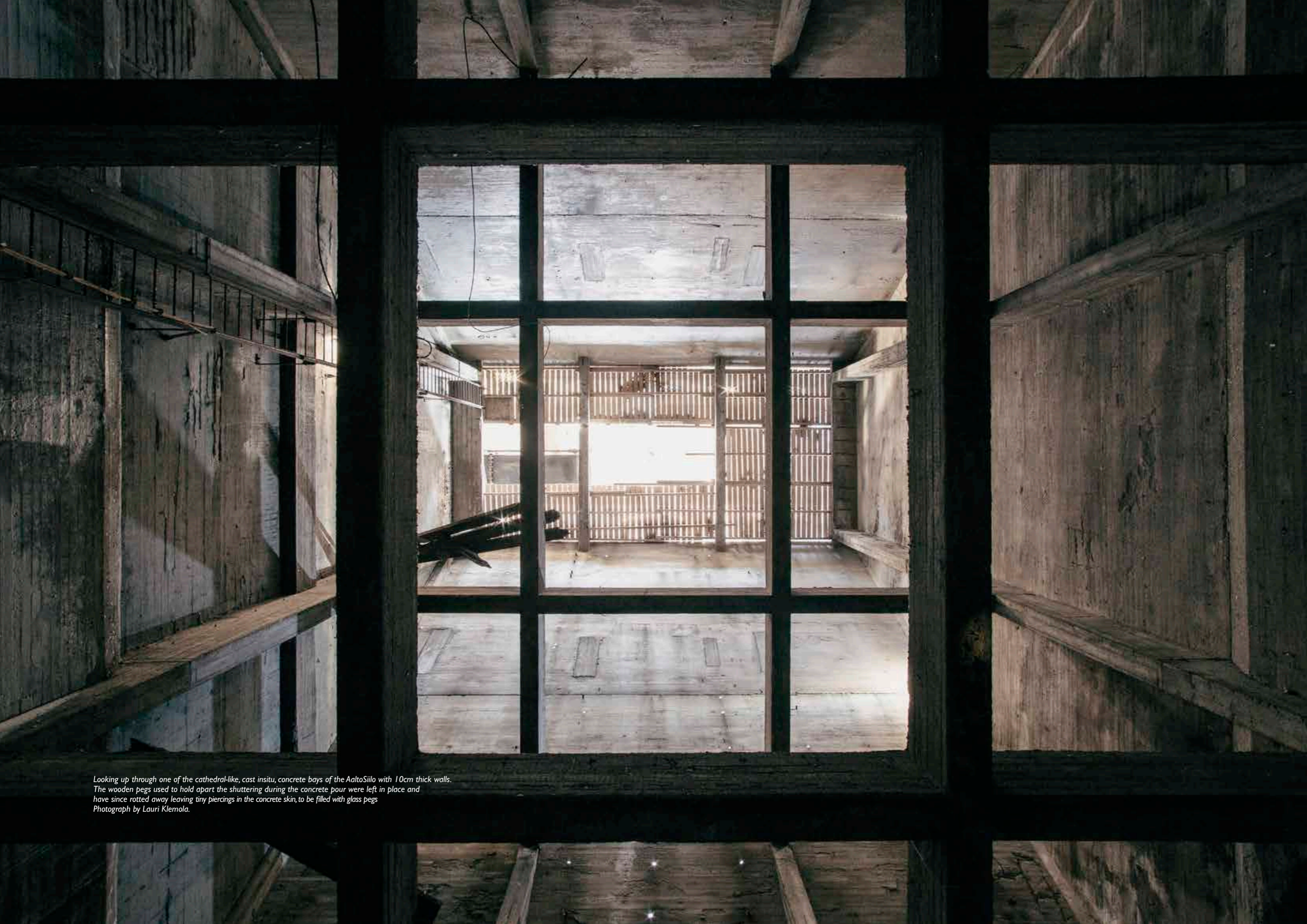


Alvar Aalto's Muuratsalo or Experimental House



The Frankish Castle of Paros, Parikia Island: Built by Venetians in the 1200s from the remains of ancient sanctuaries



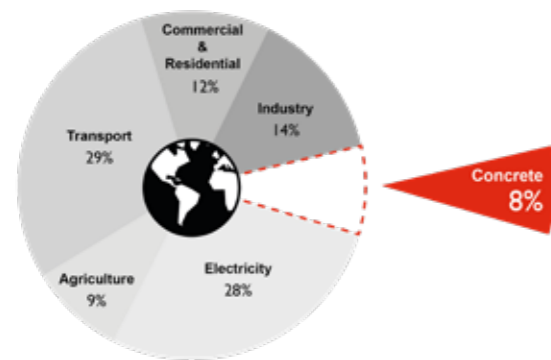


Looking up through one of the cathedral-like, cast insitu, concrete bays of the AaltoSilo with 10cm thick walls. The wooden pegs used to hold apart the shuttering during the concrete pour were left in place and have since rotted away leaving tiny piercings in the concrete skin, to be filled with glass pegs
Photograph by Lauri Klemola.

CONCRETE IN CONSTRUCTION

The AaltoSiilo is a concrete building of radical construction, at the cutting edge of engineering tolerance, that is now nearing its hundredth anniversary. The aim of these proposals is to at least double its lifespan. The ancient Romans used concrete (opus caementicium) in construction, which enabled their innovative new architectural forms. Like its modern equivalent, it was based on a hydraulic-setting cement added to an aggregate. Many buildings and structures still standing today (bridges, reservoirs and aqueducts), were built with this material, attesting to its versatility and durability. Its strength was sometimes enhanced by the incorporation of pozzolanic ash which prevented cracks from spreading. Recent research has shown that it was the incorporation of lime clasts that allowed the concrete to self-repair cracks.

Examples of Roman concrete exposed to harsh marine environments have been found to be 2,000 years old with little or no wear. Scientific studies of Roman concrete have attracted both media and industry attention recently, because of its unusual durability, longevity and lower environmental footprint than concretes of today. Concrete made with fly ash can cost up to 60% less because it requires less cement, has a reduced environmental footprint due to its lower cooking temperature and much longer lifespan. The AaltoSiilo is collaborating with academic and industry partners to incorporate these principles wherever new concrete is used.



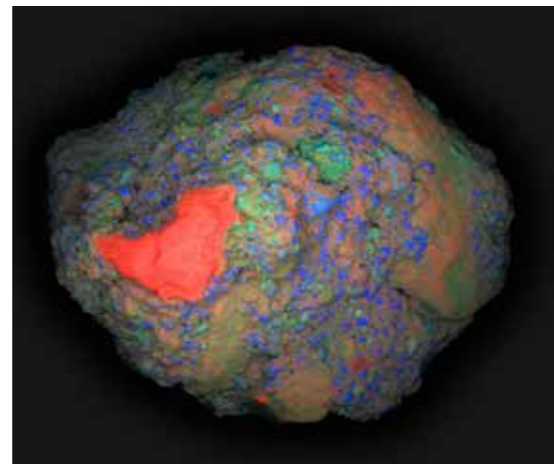
Global CO₂ emissions



Reconstruction of the Pantheon in Rome, seen from the side, cut away to reveal the interior 1553. Source: Metropolitan Museum.



(left) The Barrel Vaulted Market Hall in Ferentino, Italy c. 100 BCE. Source: Media Center for Art History - Columbia University



(right) An elemental map (Calcium: red, Silicon: blue, Aluminum: green) of a 2 cm fragment of ancient Roman concrete collected from the archaeological site of Privernum in Italy. A calcium-rich lime clast (in red, clearly visible in the lower region of the image) is responsible for the unique self-healing properties of this ancient material. Source: Dezeen.

SURGICAL DEMOLITION

Concrete structures have one of the longest useful lives among building materials, yet they account for an overwhelming majority of demolition projects. Concrete is usually completely crushed, and if reused at all, only as landfill or aggregate. Where possible, the reuse of existing buildings (as with the Silo) is preferable to demolition. If not, a solution to the wastefulness of the demolition process lies in a method of salvaging concrete waste, and developing an architectural language that celebrates its re-use.

The architectural elements for reuse are identified for 'surgical' removal. Waterjet cutting is one of the most effective ways of cleanly and efficiently slicing through concrete. A demolition strategy is agreed between the contractor and the design team and the demolition programme is coordinated. Small, portable waterjet cutting tools are brought to site and used to carefully dismantle the structure, with the use of props if necessary. The large pieces are then removed either to storage or directly to the new site for reuse.

LOCAL DECONSTRUCTION

The team are working closely with the Oulu planning department to identify buildings in the city scheduled for demolition to provide the concrete 'waste' that will be used to construct the new research centre. Here the planners, architects and engineers visit the first 'supply site': a transport hub and school that will be part-demolished in 2023 to make way for the Finnish Housing Fair in 2025.

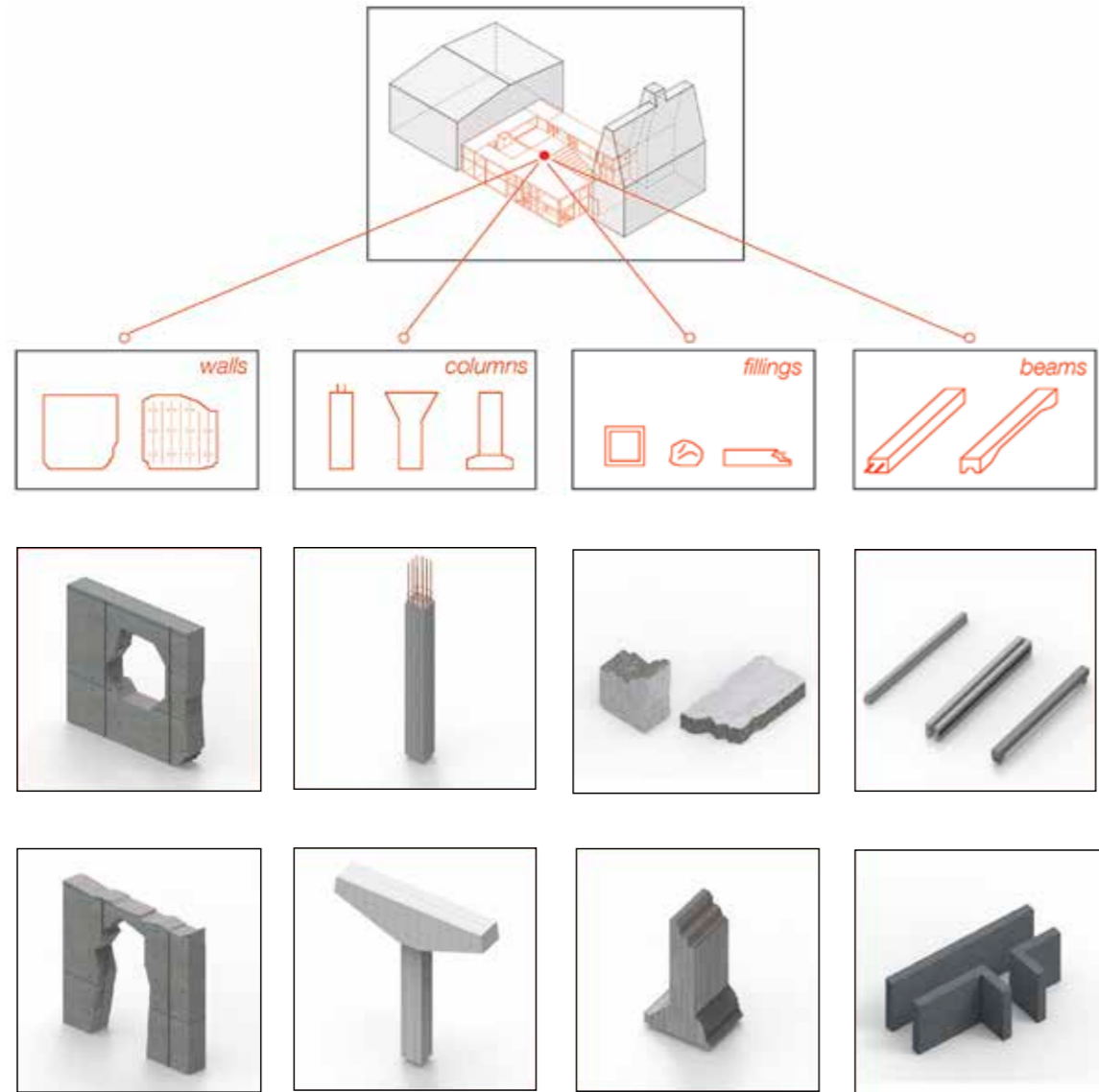
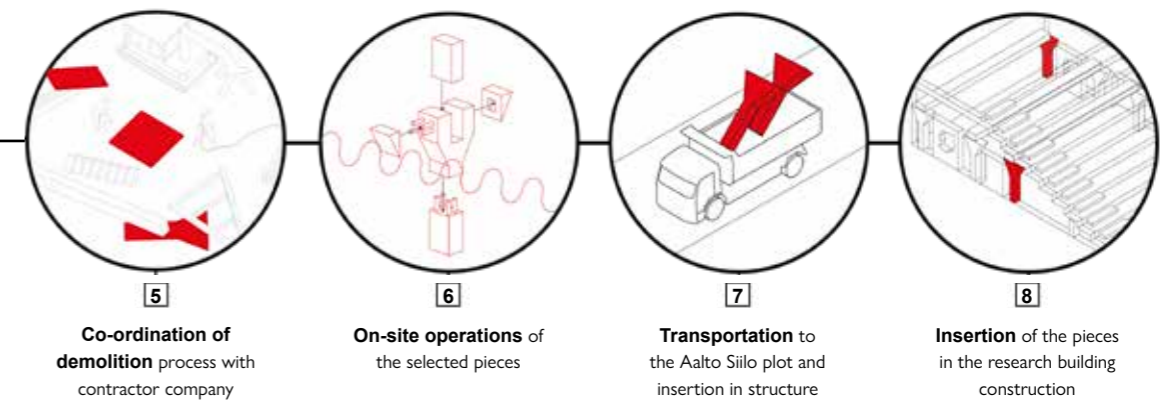
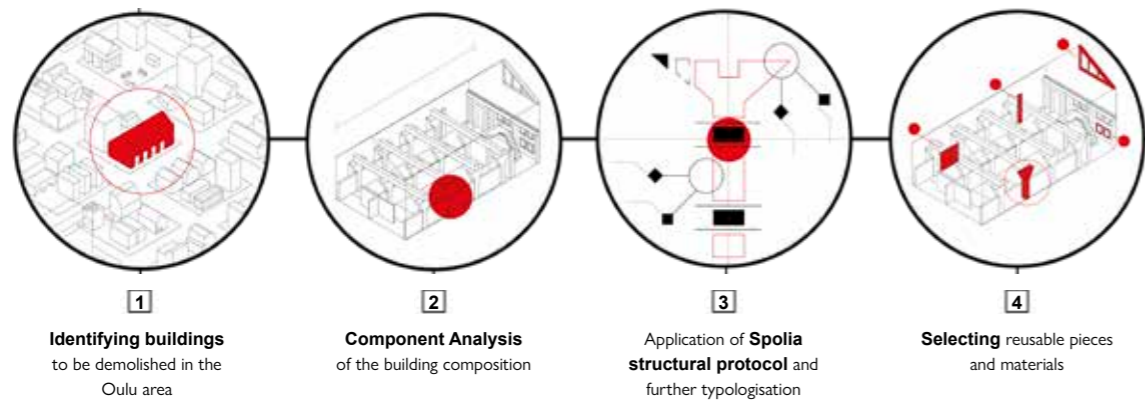


Site visit of the design team and the planners to the Varikko Building in Oulu destined for demolition later this year

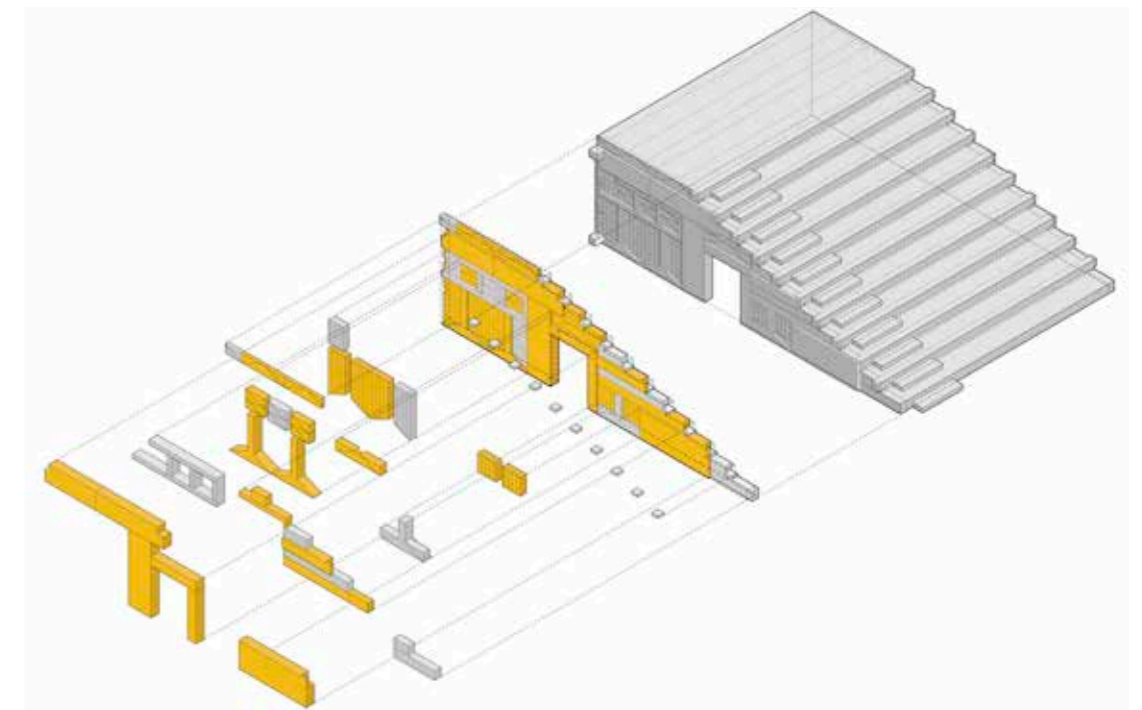
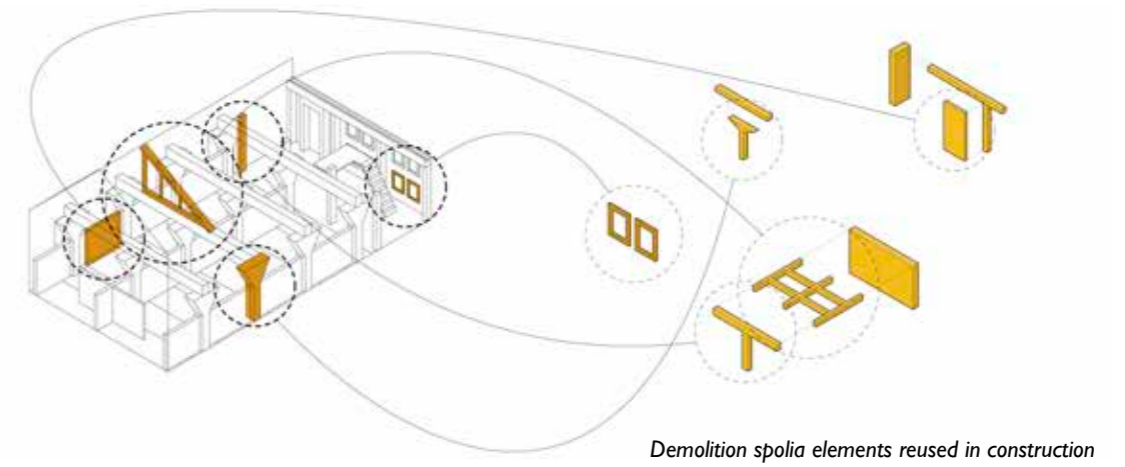


Concrete waste used as landfill for the new marina in Meri-Toppila, Oulu

SPOLIA PROTOCOL



Spolia elements - walls, columns, filler pieces, and beams



Sauna and amphitheatre stairs - The second phase of building works will be constructed of spolia elements

DESIGN FOR TRANSFORMATION

Positive change is in the air. Tech- and gaming-related startups thrived in Oulu with the growth of Nokia and now have their own identities. Research into sustainable building materials is ongoing in Oulu University and OAMK (Oulu University of Applied Sciences). With the rise of mobile telephones, cellulose is being used once again for communication, but in nano-structured form in 5G and 6G technologies. Oulu has been made the European Capital of Culture, 2026 and the AaltoSiilo is an integral part of the events planned to celebrate this.

There is a rising awareness of the urgent need for a new approach to the global role of this overlooked locality. The world is now being forced to confront its deepest prejudices as national boundaries, identity, consumption, materiality, preservation and sharing are all being renegotiated. There is global rethinking about what is valuable and even the nature of value itself. The Silo is on the frontline of change and...

...Oulu is rising. Both literally and metaphorically.



Transistori performing at the AaltoSiilo in September 2022. Over 1,000 people attended the event

TRANSISTORI EVENT

Factum Foundation is collaborating with Oulu 2026 to fund a series of events leading up to and including 2026 and the official launch of the AaltoSiilo project. The first public performance at the Silo took place on the 14th of September, 2022, which over 1,000 people attended. The event was headlined by Transistori who turned the entire Silo building into a musical instrument. The performance was filmed, broadcast live, displayed on LED screens and projected onto the building as a taste of how the Silo will be used in the future.



The poster promoting the Transistori event hosted at AaltoSiilo



Adam Lowe being filmed for the documentary by Tapio Snellman and Anna Niemelä on the resurrection of the AaltoSiilo. Photograph by Otto Lowe for Factum Foundation

PRESS

From the world-renowned architectural journal DOMUS, who published a feature essay on the project and the original concept of sustainable concrete spolia, to full, front-page national coverage in the Finnish newspaper Kaleva, the Silo has captured the public imagination. Every online architectural journal has published on the Silo, and wants more news. The events that are currently being organized in the Silo as pre-promotion for Oulu, Capital of Culture 2026, make it a new local venue and point of focus. The attention has come from Finnish and international media, PHD researchers, documentary filmmakers, artists, musicians and radio.

Press interest in cellulose, traditional methods of tar production, climate change, preservation and the natural environment has been extensive and spontaneous. The Silo is both a local talking point – people either love it or hate it - and an example of innovative architectural preservation.



SCREAMING DUENDE

SCREAMING DUENDE is a world premiere, pairing the radical Sevillian flamenco master, Isráel Galván, with the world-famous Screaming Men of Oulu, Mieskuoro Huutajat, in the spirit of Federico García Lorca's concept of El Duende. García Lorca gave his famous lecture called 'Theory and Play of the Duende' (*Juego y Teoría del Duende*) in Buenos Aires, Argentina in 1933, two years after the AaltoSiilo was completed. 'El Duende' is usually associated with flamenco culture, but Lorca defines it as a universal artistic concept. All quotes here are his.

SCREAMING DUENDE at the AALTOSIILLO is the second event staged by Factum Foundation and Oulu 2026 Capital of Culture, on June 3rd, 2023. It is a central part of the AALTOSIILLO project that is using art and the reinvention of industrial cultural heritage to transform a neglected part of a city on the edge of the Arctic Circle and the frontline of climate change. There will also be performances by vinyl DJs Malsson, Tenko, and Matti Aikio and an audiovisual concert by Veera Neva & Arttu Nieminen. The event is free and will be live streamed and projected outside the Silo itself.

'El duende, then, is a power, not a work. It is a struggle, not a thought.'

'We are reminded that originality is truly radical, that it comes from the root, from the mythic origins of the art.'

The art of Flamenco has a long established and passionate following in Finland, with a network that stretches across the country. This may be because both the Spanish and Finnish share a sense of 'el duende', the spirit of evocation that García Lorca describes as a state of 'tragedy-inspired ecstasy, a poetic emotion which is uncontrolled'. El duende is an earth spirit from Andalusian folklore, to be released through the meeting of Galván's flamenco and Oulu's screaming choir. The 'duende' figure of Spanish folklore has its mischievous counterpart in Finland's 'Tonttu'.

'The artist doesn't simply surrender to the duende; they have to battle it skillfully, on the rim of the well, in hand-to-hand combat.'

SCREAMING DUENDE becomes part of the new lifeblood of Meri Toppila, creating excitement locally and internationally. It follows the first event in 2022, when Finnish group Transistori 'played' the Silo building as a vast, urban-scale musical instrument. These events feed the AALTOSIILLO as it transforms into a multimedia performance and exhibition space, with its future neighbour, the AALTOSIILLO Research Laboratory, public AALTO-SAUNA and amphitheatre to follow. The restoration plans by Skene Catling de la Peña have recently been approved by the City Council and the next stages of the transformation of the site are now in motion.

'Duende is not a question of ability, but of true living style, of blood, of the most ancient culture, of spontaneous creation.'



03
JUNE
2023

SCREAMING DUENDE LIVE PERFORMANCE



AALTOSIILLO
Alvar Aallon Katu 5,
Meri-Toppila, Oulu
16 to 21 hs
Free entrance
Vapaa pääsy

aaltosillo.com

KONSERTTI- LIVE EVENT
Israel Galván (Spanish Flamenco Bailaor, Seville)
Huutajat (Screaming Men's Choir, Oulu)

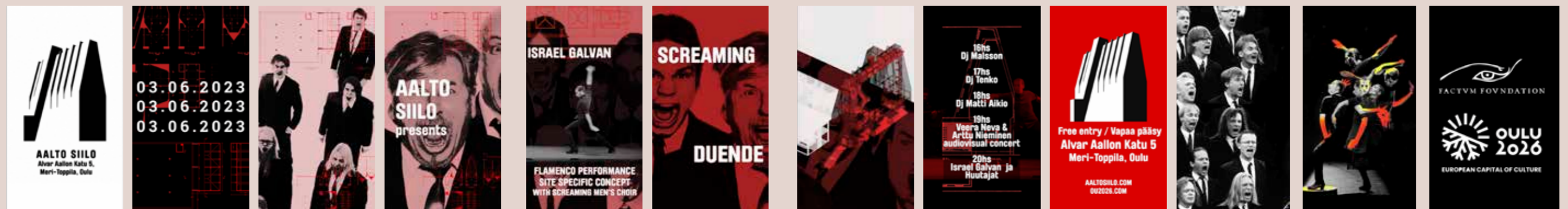
DJs
16 hs Malsson
17 hs Tenko
18 hs Matti Aikio

AUDIOVISUAL CONCERT
19hs - Veera Neva & Arttu Nieminen

DANCE PERFORMANCE
20hs - Israel Galván ja Huutajat

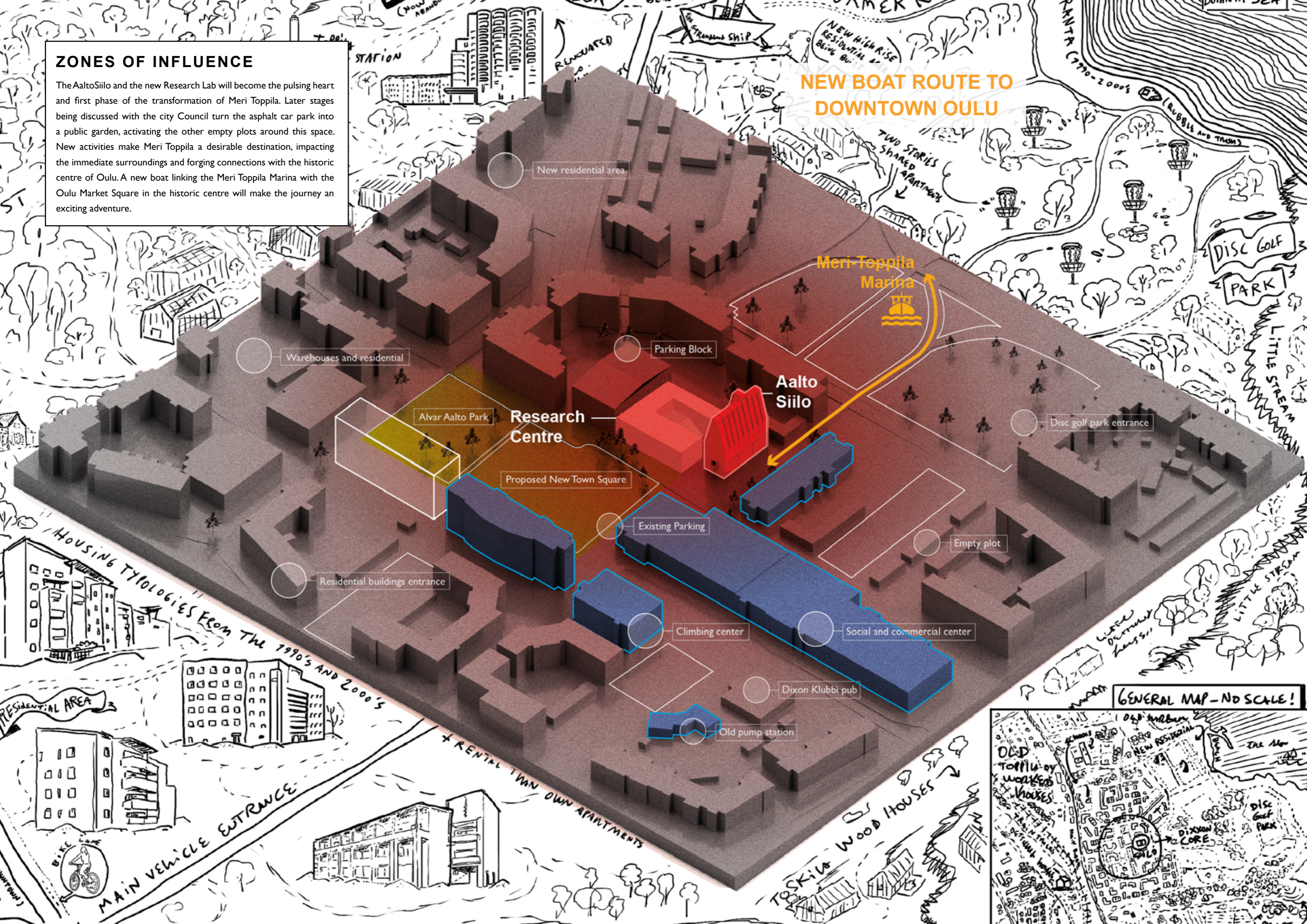


Stills from the promotional 'teaser' film for SCREAMING DUENDE



ZONES OF INFLUENCE

The AaltoSiilo and the new Research Lab will become the pulsing heart and first phase of the transformation of Meri Toppila. Later stages being discussed with the city Council turn the asphalt car park into a public garden, activating the other empty plots around this space. New activities make Meri Toppila a desirable destination, impacting the immediate surroundings and forging connections with the historic centre of Oulu. A new boat linking the Meri Toppila Marina with the Oulu Market Square in the historic centre will make the journey an exciting adventure.



NEW BOAT ROUTE TO DOWNTOWN OULU

New residential area

Warehouses and residential

Parking Block

Meri-Toppila Marina

Alvar Aalto Park

Research Centre

Aalto Siilo

Disc golf park entrance

Proposed New Town Square

Existing Parking

Empty plot

Residential buildings entrance

Climbing center

Social and commercial center

Dixon Klubbi pub

Old pump station

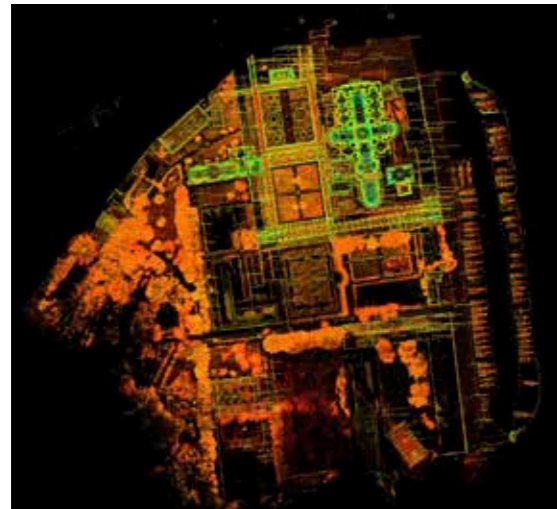
GENERAL MAP - NO SCALE!

GLOBAL NETWORK

Creating new local economies based on sustainable preservation is at the core of Factum Foundation's work. The AaltoSiilo Research Centre will focus on the application of technology in the preservation of culture and the environment. The range of activities will relate to the work carried out globally by Factum Foundation and will involve digital technologies, 3D scanning, Machine Learning (AI) and creative software design.

The AaltoSiilo Research Lab will be linked to the other centres around the world operated by Factum Foundation. These are: ARCHiVe (the Analysis and Recording of Cultural Heritage in Venice, located on the island of San Giorgio Maggiore), ARCHiOX, (the Analysis and Recording of Cultural Heritage in Oxford) in collaboration with the Bodleian Library and Oxford University, Colnaghi-Factum, based in London, and the Theban Necropolis Preservation Initiative (TNPI) located in the Valley of the Kings, Luxor, Egypt. In the Valley of the Kings, Hassan Fathy's prominent mudbrick building was fully restored by a local team working with Tarek Waly, an Egyptian Architect commissioned by Factum. The result was shortlisted for the Aga Khan award, and the TNPI is now run by an entirely Egyptian team carrying out ultra-high-resolution recording in 3D and colour for the Ministry of Tourism and Antiquities. In Nigeria a similar programme of empowerment and sharing is underway.

The AaltoSiilo project is based on the same principles that Factum Foundation has developed over the past 21 years, that have really proven to work: local people must gain, both socially and economically, from sustainable preservation.



The island of San Giorgio Maggiore, Venice, the HQ of ARCHiVe. Point-cloud render. Recorded by Factum Foundation



Restored Hassan Fathy building, Valley of the Kings, Luxor. HQ of the Theban Necropolis Preservation Initiative.



The Factum studios in Madrid
Photograph by Oak Taylor-Smith for Factum Foundation



ARCHiOx at the Bodleian Library, Oxford University

PROJECT TEAM

AaltoSiilo ry

Director, Otto Lowe, Project Manager, Valentino Tignanelli

Factum Foundation

Factum Foundation for Digital Technology in Preservation is a not-for-profit founded by Adam Lowe in Madrid, in 2009. It works alongside sister company Factum Arte, a multidisciplinary workshop dedicated to digital mediation, producing works for contemporary artists as well as facsimiles for preservation purposes. Factum Foundation demonstrates the importance of documenting, monitoring, studying, re-creating and disseminating the world's cultural heritage through the rigorous development of high-resolution recording and re-materialisation techniques. The Foundation is leading the AALTOSIILO project in collaboration with Skene Catling de la Peña. Adam Lowe, Sol Costales Doulton, Blanca Nieto, Nicolas Beliard, Giulia Fornaciari
www.factumfoundation.org

Skene Catling de la Peña, Lead Architect

Skene Catling de la Peña have a unique approach they call 'Geoarchaeology', excavating meaning from the geology of the site and its historical human occupation. They are experienced in the design and integration of contemporary projects into sensitive historic contexts such as the Perm World Heritage Site, Russia. Skene Catling writes about architecture in The Architectural Review, ARCH+ and DOMUS magazine and co-launched the biennial architectural film festival, ArchFilmFest, in London. She taught architecture at the Royal College of Art (RCA) and at the Karlsruhe Institute of Technology (KIT), Germany, and was on the jury of the World Architecture Festival (WAF) for many years. The practice has won numerous awards and has been extensively published internationally. Charlotte Skene Catling, Daniel Barrett
www.scdlp.net

Engineers HRW, Structural Design

Stephen Haskins, Adam Redgrove

Max Fordham Engineers, Services Engineer

Neil Smith

Arkitehdit Mustonen Oy, Consulting Studio

Tapani Mustonen

Snowhow, Structural Design

Seppo Makkinen



AaltoSiilo ry is collaborating with:

Samu Forsblom at the Oulu 2026 City of Culture Foundation, Tommi Lindh and Jonas Malmberg at the Alvar Aalto Foundation, Anneli Pakkari in the Oulu City Planning Department, Raimo Tikka at the Northern Ostrobothnia Museum, Oulu University, University of Tampere, Arctic Drone Labs, Oulu University of Applied Sciences (OAMK), Nordic Academic Alliance, Oslo School of Architecture and Design (AHO), Future Events Oulu organization and filmmakers Tapio Snellman and Anna Niemelä.

Further Ideas are being discussed and developed with:

Stora Enso, Territorial Agency: Oceans in Transformation, Divirod, Niclas Ahlström of Made by Choice, Juha Niemelä from Chill Films Oulu and the Kuulturivoimala Cultural Association, Heikki Myllylahti from Oulu Urban Culture (OUC), The Photowalk Team and the Northern Photographic Centre, Business Oulu, Juhani Oivo from J-productions and AO-lehti (Publication of the Architecture Student Guild of the University of Oulu).

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