elements of architecture

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“WHilst, O Caesar, your god-like mind and genius were engaged in acquiring the dominion of the world, your enemies having been all subdued by your unconquerable valour; whilst the citizens were extolling your victories, and the conquered nations were awaiting your nod; whilst the Roman senate and people, freed from alarm, were enjoying the benefit of your opinions and counsel for their governance; I did not presume, at so unfit a period, to trouble you, thus engaged, with my writings on Architecture, lest I should have incurred your displeasure.”

1ST CENTURY BCE THE ARCHITECTURE OF MARCUS VITRUVIUS POLLIO
TRANSATION 1826 (GWILT)

“I heard that ‘roof above and support below to take shelter from rain and wind’, in I Ching, is about the era of ‘Da Zhuang’; ‘acquiring precise orientation of south and north when building the capital city’ in Chou Rites, is a ceremony when the world is in peace. The name of the official position ‘Gong Gong’ was given in the time of Shun. The official position ‘Da Jiang’ was started in Han Dynasty. These offices have their responsibilities, and did their jobs. For the capital city that is a thousand Li in length, and the palace that has nine levels, the sequence and position of the buildings must be considered. The official buildings must be related to each other, and set according to certain sequence.

“To build a house with Dou, Gong and Column to build, must use compass, rulers, level-meter and ink-line at first. Using a variety of materials, many buildings are completed. Gathering the workers on schedule, then build the house that has a wing-like eave. However, the worker’s hands, though dexterous, sometimes make mistakes. And the administrators are unable to know all about the techniques. They don’t know how to use Cai to measure the building’s proportion and scale. Some even the size of Dou to as a module to decide other lengths. Faced with these problems, accumulated and lack inspection, if someone doesn’t have adequate knowledge about architecture, how can he set new rules?

“The emperor ordered me to write a manual about architecture, and deliver it to be reviewed. Though I have filed writing this manual, I feel that I have failed to live up to his expectation, wasting a lot of time and having little contributions. The emperor is frugal, benevolent, and born wise. Under his reign, the country is tranquil and the people are settled, and everything is kept in order. The offices have capable people, and the regulations are set. The bad climate like Duke Lu Zhuang’s time exists no more, and the good climate like Da Yu’s time has revived.

“The emperor has decreed about construction, and consulted someone has little knowledge like me. I looked into the old regulations, and gathered many people’s wisdom. I set three grades of Gong (work), according to its level of craft need. Amount of labor is calculated according to different daytime of different seasons. Even the softness of timber is categorized. Calculate the earthwork according to the distance, so the labor can be easier to manage. Each issue is listed by category, and set with regulations. Though I studied hard and thought deeply, the text may not be enough. So I made drawings according to the regulations, and hope it will help in the future.”

5TH–7TH CENTURY CE VĀSTUVIĐYĀśASTRA AScribed to MAṆḌUSRĪ
TRANSLATION E. W. MARASINGHE, 1989

“I offer obeisance to Ganesa, to the supreme energy begotten from Adigauri and to Sambhu so as to accomplish the object of the successful completion of writing this treatise without any hindrance.”

12TH CENTURY CE PRASADA MANDANA OF SUTRADHARA
MANDANA

1103 AD YINGZAO FASHI, LIE JIE
“GREAT care ought to be taken, before a building is begun, of the several parts of the plan and elevation of the whole edifice intended to be raised: For three things, according to Vitruvius, ought to be considered in every fabric, without which no edifice will deserve to be commended; and these are utility or convenience, duration and beauty. That work therefore cannot be called perfect which should be useful and not durable, or durable and not useful, or having both there should be without beauty.”

1570 THE FOUR BOOKS ON ARCHITECTURE
ANDREA PALLADIO TRANSLATION 1997

“Imitation is of so extensive and so varied an import, when its relations and effects in all that falls within the scope of the faculty of imitating are considered, a faculty which is one of the distinctive characteristics of man, that ever to have a complete and exhaustive treatise on the subject may well be despaired of.”

1837 AN ESSAY ON THE NATURE, THE END, AND THE MEANS OF IMITATION IN THE FINE ARTS
QUATREMÈRE DE QUINCY TRANSLATION LEVART LODGE, 1837

“Our Ancestors have left us many and various Arts tending to the Pleasure and Convenience of Life, acquired with the greatest Industry and Diligence: Which Arts, though they all pretend, with a Kind of Emulation, to have in. View the great End of being serviceable to Mankind; yet we know that each of them in particular has something in it that seems to promise a distinct and separate Fruit: Some Arts we follow for Necessity, some we approve for their Usefulness, and some we esteem because they lead us to the Knowledge of Things that are delightful. What these Arts are, it is not necessary for me to enumerate; for they are obvious.”

1485 THE ARCHITECTURE OF LEON BATISTA
ALBERTI IN TEN BOOKS
LEON BATTISTA ALBERTI TRANSLATION 1755

“Comrades! It is a long time since we last had a National Conference of Builders and there is now great need for such a conference. It is my opinion that the present meeting will be to the great good not just of construction, but of all our work both in industry and in other sectors of our national economy.”

1954 INDUSTRIALIZED BUILDING
SPEECH NIKITA KRUSHCHEV

...ceasar, buddha, ganesha, comrades, ancestors ... all have had architectural manifestos dedicated to them...
elements of architecture

**elements of architecture** looks at the fundamentals of our buildings, used by any architect, anywhere, anytime: the floor, the wall, the ceiling, the roof, the door, the window, the façade, the balcony, the corridor, the fireplace, the toilet, the stair, the escalator, the elevator, the ramp...

Architecture is a strange mixture of obstinate persistence and constant flux. Just as science has recently shown that all of us carry “inner” Neanderthal genes, each element, too, carries long strands of junk DNA that dates from time immemorial...

Some elements have barely changed in the last 3000–5000 years, others were (re)invented last week (but most inventions are reinventions...). The fact that elements change independently, according to different cycles and economies, and for different reasons, turns each architectural project into a complex collage of the archaic and the current, of the standard and the unique, of mechanical smoothness and bricolage—a complexity revealed in its full extent only by looking at its constituent parts under a microscope.

Previous Biennales have looked at architecture as a whole—trying to project the “full” picture, including context and politics. Here, we present micronarratives revealed by focusing systematically on the scale of the detail or the fragment. We uncover not a single, unified history of architecture, but the multiple histories, origins, contaminations, similarities, and differences of these very ancient elements and how they evolved into their current iterations through technological advances, regulatory requirements, and new digital regimes.

A super short history of architectural elements could read:

— From the age man discovered fire, primitive forms of habitat emerged—partly found, partly created by their own hands—that were slowly codified into a limited number of elements...

— From 5000–3000 BCE, the way these elements were put together to express values suggests the birth of a new art—architecture—focused on the best way to assemble these elements in new and deliberate ways that are original, beautiful, and useful.

— In antiquity, this art developed to heights not seen since then, to create cities and civic complexes where the role and intention of buildings were transparent, compelling, and unquestioned.

— After a long interval in which these societies were brought down by barbarians (and their own decadence), the Renaissance resurrected and refined these qualities, adding a humanist emphasis on the individuality of the creators. Each element was changed, defined, modified, reinvented. Architects were part of a shared system, but also expected to challenge the rules. Originality became an ambition.

— The Enlightenment, by emphasizing rationality, revolutionized architecture... Function became the new beauty. Many elements were “improved” by adding technical, empirical, and regulatory dimensions. New construction methods enabled a new lightness that, in turn, affected each element.

— The steel frame and the elevator abruptly ended the first chapter of the history of architecture—the one we still dwell on—and opened a second modernity, bereft of symbolism and any vestige of solidity. The new provisional, standardized period of architecture has massive repercussions for every element, driving some to the point of extinction—fireplace—and inflating others with exaggerated importance—airport security door.

— Onto this still largely unexplored and unfinished chapter is now grafted a digital era, which offers drastically improved levels of control to feed our obsessive need for security and comfort, though we have not even begun to confront the constantly expanding vastness of its potential dark side...
An exhibition is not a book and a book is not an exhibition. The work on **elements of architecture** ran parallel to the continuing work on the book of the same title, with the Harvard Graduate School of Design, which was initiated in September 2012.

In the exhibition we have looked for physical and tangible evidence of the evolution of individual elements that we have recorded in the book. To enable a back-and-forth between objects and narrative, we first conceived of the book as a physical presence that would snake across the rooms, settling in the end for three forms of presence: the book as an enlarged pivoting book on the wall—inspired by Charlie Koolhaas’s exhibition at Vitra, *Dubai Next*—the book as enlarged object on a stand—inspired by Irma Boom’s *XXL*—and as traditional projections.

The result of two years of work with the Harvard Graduate School of Design, a new body of work on the elements of architecture...

**book-in-space**
initial idea to run the pages of the book through the rooms of the Central Pavilion, like a snake
enlarged book displayed on wall

enlarged big white book as object on folded metal shelf

projection of turning pages in the respective book chapters
Evolution of the elements

Library of historical elemental studies of architecture

A masharabiya balcony connects the balcony room to the introduction room

elements movie by Davide Rapp

182 architecture advertisements
introduction

The central space in the Biennale’s Central Pavilion serves as an introduction to a new body of work on the elements of architecture, generated over two years of intensive research undertaken with the Harvard Graduate School of Design and a host of collaborators from the building industry and academia. The intro space is where the apparently mundane elements of architecture that surround us everyday start resonating with possibilities.

featuring

library of texts from around the world and throughout history that have looked at architecture through the lens of the elements
film featuring the uncanny and constant cameos of the elements in the movies as crucial actors
advertisements from a range of architecture magazines, showing how the elements were a locus of technological development, standardization, and commodification over the course of the twentieth century

elements
davide rapp with lorenzo gangarossa, guido guerzoni
in association with kobalt entertainment
legal consultancy milalegal, elisabetta mina,
letizia nuvoli
production coordinator elisa bramati
film editor davide rapp
assistant editor giorgio zangrandi
second assistant editors mattia barilani,
graziano camelia
clip selectors mattia barilani, marco belloni,
graziano camelia, carlotta capobianco, minkyung han,
davide rapp, giorgio zangrandi
andrea zucchi
sound designers luca bergomi,
massimiliano savino
with the technical support of fantoni
iguzzini
knoll
kef
philips lighting
library: elements in treatises

Most historical writing on architecture was deeply concerned with its fundamental components—the elements. A library and reading area allows visitors to leaf through treatises and texts from different eras and different parts of the world, from De Architectura (Rome, first century BCE) to The Hindu Architecture (Silpa-Sastra; India, 6th–7th century CE), to the Yingzao Fashi (China, 1103) to Henry Wotton’s Elements of Architecture (England, 1624) to Sigfried Giedion’s Mechanization Takes Command (Switzerland, 1948).
elements in advertisements
A series of 182 enlarged advertisements for the elements lays bare the relationship between architecture, industrialization, standardization, and luxury, revealing the changing status of the element itself in face of modernity. The ceiling, door, elevator, façade, floor, hearth, roof, toilet, and window all appear in their newest, most advanced, most appealing forms, often as part of celebrated building projects also featured in the ads. The ads are selected from thousands gathered from some of the major architectural journals of the twentieth century: Architectural Record and Pencil Points/Progressive Architecture from the US; Architectural Review from England; L’Architecture d’aujourd’hui from France; Deutsche Baukunst from Germany; Casabella, Domus, L’Architettura. Cronache e storia from Italy; El Croquis from Spain.
elements in movies

elements is a movie montage of hundreds of short architecture-related clips selected from different movies, from the last hundred years of cinema. The combination of the clips aims to show—through the eyes of a multitude of directors and cinematographers—the fifteen elements of architecture identified by Rem Koolhaas and OMA/AMO and the Harvard Graduate School of Design: balcony, ceiling, corridor, door, elevator, escalator, façade, floor, fireplace, ramp, roof, stair, toilet, wall, and window.

elements is a film about space, a film as a set of spaces. It incorporates scenes from different movie genres, merging the clips one into the other in a continuous flow of images, sounds, and actions. A movie montage is an editing technique in which shots are composed in a fast-paced fashion that compresses time and conveys a lot of information in a relatively short period. The simple act of juxtaposing separate shots of corridors, stairs, or façades evokes connections that cannot be found in a single shot. The various spaces of fiction exist simultaneously in a continuous dynamic.

elements is a film without any plot, story, or characters. Architecture in movies appears frequently as a background of the action and it can be represented in many ways: top views, one-point perspectives, frontal planes, long takes, and close-ups. The framing highlights the proportions and the geometries of the elements, while the presence—or the absence—of sounds, noises, and scores unveils their prerogatives and materialities.

elements asks the viewer to focus on the fifteen elements through the fast transitions between the clips, revealing contrasts and affinities, lines and shapes, recurring patterns and motives, movements and rhythms. In this framework each scene, cut out from the original movies, gets a new meaning and unveils the close and ambivalent connections between cinema and architecture.

Davide Rapp
Recently restored decorated ceiling by Galileo Chini, 1909

Contemporary drop ceiling including systems and embedded projection screen presenting drawings of decorated ceilings
ceiling

There are two types of ceilings: solid and hollow. In the solid kind, the ceiling is just the underside of the floor above, or it is an applied surface—a seal (an etymological origin of ceiling in some languages)—and it is typically iconographic. Solid ceilings are typically old, reassuring, revered, considered honest. Hollow ceilings on the other hand are modern, with a mysterious three dimensionality. Between the underside of the floor above and panels hanging down from it, there is a large inaccessible section used as storage space for services that aid the technological performance of a building. Such a ceiling is considered “false.” It is the sectional equivalent of poche—the cavity usually considered only in plan, in relation to walls. This hidden ceiling space has been off-limits to architecture—and to the imagination of the users of buildings—since the middle of the twentieth century. False ceilings are supposed to be meaningless but contain mysteries beyond their banal uniform modular surfaces; they also still harbor their own suppressed, unconscious iconography—of smoothness, comfort, convenience, even humanity...

The installation aims to represent the two opposite poles that have influenced the ceiling through history: on the one hand, the ambition to display symbolical meanings on its surface, on the other the need to respond to utilitarian demands. The encounter of architecture with modernity dramatically increased the imperatives of utility, usually at the expense of (explicit) symbolism. The first pole is represented in the installation by the existing dome, decorated in 1909 by the painter Galileo Chini. The second pole is represented by a temporary false (or “drop”) ceiling, with standard 60 x 60 cm panels. While the dome has a height of 9.4 meters, the height of the false ceiling is 2.7 meters—the standard for office buildings since the 1950s. The symbolic program displayed on the dome reflects the fashion of Art Nouveau. Each of the sections represents a step in the evolution of art, from “The first smile of the human beast” to “The new Civilization.” The temporary illumination of the dome emphasizes the blues and the gold on which its palette is based, shifting from cold color temperatures to warmer ones.

By contrast, the drop ceiling (apparently) has no meanings. It is an interface between the systems that are installed above and the space below its surface, hosting air diffusers, smoke detectors, sprinklers, CCTV cameras, neon lights. Two screens are encapsulated in the lowered ceiling. In the first a series of drawings for decorated ceilings are projected, including Michelangelo’s mighty first sketch for the Sistine vault. In the second a series of drawings and photos of ceilings by Ludwig Mies van der Rohe are projected, suggesting how in Modern architecture also the utilitarian ceiling has been treated sometimes as an aesthetic theme... Utility vs Symbol but also Utility and Symbol, or Utility as a Symbol.
The ceiling was a plane of iconography, symbolism, decoration, influencing our lives from above.
rationality

1950s Modern ceiling, Eni energy and mining company, San Donato offices

It was replaced by the abstraction of the current system ceiling, seemingly free of iconography. But maybe its grids are equally symbolic. Why are these grids reassuring? Why do we need them? Will we go crazy without this relentless abstraction overhead?
2613-ca. 2494 BCE Reportage drawing by Louis-Pierre Baltard of the Zodiac ceiling of the temple of Tentyris, Ancient Egypt 4th dynasty, 1802

1390s Namdaemun gate, Seoul: The dragon, from the ceiling, welcomes visitors to the city

ca. 1620 Peter Paul Rubens
The Last Supper, study for a ceiling

1686–1703 Print made by Daniel Marot I
Design for a trompe-l'oeil ceiling

1858 Gottfried Semper, Ceiling for the Zurich Polytechnikum (now ETH) conference hall

1927 Theo van Doesburg
The Aubette: composition project for the ceiling of the café-brasserie
1925 Haus Eichstaedt, Berlin, living room, Ludwig Mies van der Rohe

1950 Lake Shore Drive Apartments, Chicago, living room, Ludwig Mies van der Rohe

1954 Commons building at the IIT, Ludwig Mies van der Rohe

1958 Seagram Building, corner office by Phillip Johnson (interior)

1958 Seagram Building, lobby (Philip Johnson interior design)

1958 Seagram Building, office by light designer Richard Kelly

1958 Seagram Building, restroom by light designer Richard Kelly

1968 Neue Nationalgalerie, Ludwig Mies van der Rohe
beauty vs. reality
Windows and window section from the Brooking National Collection

Yakutian Balagan windows

Sobinco window strength test structure

Sobinco mechanical grinding machine
The window used to make space, it asserted place-ness. Window seats, sills, bay windows, verandas, shutters, blinds, curtains all marked the position of the window on the façade and in the room. Since the twentieth century, technological advances in window profiles and glass production have allowed many of these nuanced local components to be internalized in the window’s structures, magically invisible. Glass, which initially seemed the perfect partner for the window, took over entirely, culminating in the invention of the curtain wall—a Western invention, which allowed other regions to stake a claim in architecture, liberated from its historic discourses...

sobinco
An imported window factory from Belgium forms the basis of the installation, where real machines polish components and repeatedly test window fittings, against a backdrop of traditional English windows from the collection of Charles Brooking, salvaged from demolished English heritage, plus a rare Yakutian window from Russia’s Far East, made from birch bark. One wall explores the surrender of the window to the curtain wall through the Seagram building. The history and the contemporary condition of the window in one space...

brooking national collection
The Brooking National Collection contains approximately 500,000 pieces, 5,000 of which are complete windows, 10,000 window sections, and 30,000 sash pulleys. For the Venice Biennale, the collection will show many variations of windows, demonstrating the subtle and fascinating evolution of this important architectural element. The originals are now fast disappearing with the clamor for double glazing.
Birch bark windows used by Yakutians in Balagian dwellings in Russia’s far east. Typical Balagian dwellings have three small carved birch bark windows. The bark is softened by cooking in cow’s milk, carved into shape by male members of the family, and sewn together with tendons from a horse or cow. Two windows, each of around 30cm square, are oriented to the south and one to the west. With glass a precious import affordable only by a few rich families, the birch bark window can be filled with oil paper, fish membranes, mica, and in rare cases small glass shards. In the winter, the carved window is removed from the punctured hole in the wall and replaced by a thick sheet of ice in a wooden frame.
Sobinco’s window frame test structure, in their factory in Zulte, Belgium, where ninety percent of their products are manufactured: chunks of aluminum and zamak are cast, milled, ground, coated, and assembled into the fittings that are typically hidden in the frame but make windows work... Every new fitting is embedded in the window and fitted in the test structure, where it is opened and closed up to 25,000 times by pneumatic machines.

Sobinco mechanical grinding machine for grips, fittings and handles.
Charles Brooking began collecting parts of buildings at an early age to express his passion for design and shape. With encouragement from a tutor, Charles started rescuing those items that he deemed interesting and historically relevant by various, often creative, means. The collection was founded in 1966 and was officially recognized as a charitable trust in 1985. Two London exhibitions helped publicize this unique collection, which has since generated wide interest and become an invaluable resource for conserving the built heritage. The collection also contains doors, stairs, and other elements. The pieces are primarily from the British Isles but with some from Europe for comparing construction techniques.
2014 Remi Van Parys, founder of Sobinco. During the late 1950s, Remi Van Parys became the director of a Belgian ironmongery company in Congo. He travelled through Congo, visiting window and door makers, and heard the same complaint everywhere: the fittings they could buy came from Germany and did not fit in Belgian windows.

In less than one year he conquered eighty percent of the Congolese market with the first fittings specifically designed for the imported Belgian steel windows. Then, in 1961, back in Belgium, implementing the same strategy, he was the first to design fittings for steel and later for aluminum windows, forming the company the family still runs today, Sobinco (Société Belge de l’industrie et de la commerce).

Over the past fifty years what began on small scale in the owner’s back garden has grown into a leading company with 30,000 square meters of production space, offices in Belgium and Portugal and points of sale in Poland and China, and with products exported over sixty countries. In a globalized market of mass produced windows, Sobinco is the only factory in Europe capable of producing every moving part of a window—sixty-nine fittings is typical—in one factory.
Evacuation simulations by One Simulations

Raumfolgen by Walter Niedermayr

Stephan Trüby's History of the corridor

Smart corridor floor by Desso and Phillips

Video of the nineteenth-century corridors of Welbeck Abbey, by Claudi Cornaz and Hans Werlemann
originally, “corridore” referred to a person who ran to transfer a message, and later to the space for running on or next to city walls. When it first appeared in fourteenth-century Europe, the corridor was a rather unique space outside buildings. Only later did it become a fundamental element of architecture in organizing space, finding its apotheosis in the architecture of modernity (asylums, prisons, social housing projects, etc.). Now, corridors are everywhere. They are the paths of trains, planes, and cars, and they are the territories through which today’s economy is sustained. The corridor became a global element, no longer arrested by scale of architecture. And although the corridor is crystallized today as an escape route through increasingly massive buildings, paradoxically, we will never be able to escape from corridor.

The installation brings together exit signs from all over the world, five evacuation simulations by One Simulations—of Rome’s Palazzo Venezia (built ca. 1466), Philadelphia’s Eastern State Penitentiary (1821–1836), the Pentagon, Arlington County, Virginia (1941–1943), Le Corbusier’s Unité d’Habitation, Marseille (1947–1952), plus the Padiglione Centrale—a newly developed smart floor by Desso and a selection of corridor photographs by Italian artist Walter Niedermayr (b. 1952). The selection of eight diptychs from Niedermayr’s Raumfolgen (1991–ongoing) deals with functional spaces in prisons and hospitals. Corridors in this context work as in-between spaces which serve as guidance systems as well as meeting and exchange points for the people forced to be there.

All this is historically anchored in the filmic and photographic reconstruction of the legendary underground corridor network built by William Cavendish-Scott-Bentinck (1800–1879), the Fifth Duke of Portland, on his estate of Welbeck Abbey in Sherwood Forest near Nottingham toward the end of the nineteenth century (by Claudi Cornaz and Hans Werlemann). The Fifth Duke’s work at Welbeck Abbey could be viewed as the culmination of corridor segregation, that was pioneered in the building of prisons at the beginning of the nineteenth century and further developed in the construction of country homes at the end of the nineteenth century.
Welbeck Abbey has been the private family home of the Cavendish-Bentinck family since 1607. Guided tours of Welbeck Abbey's State Rooms take place during August and September each year, offering a unique opportunity to view fine and decorative arts from the internationally renowned Portland Collection in its historic setting. Call 0844 848 8991 or visit www.harleygallery.co.uk to book. Please note that these tours DO NOT include the Underground Ballroom or any tunnels.
The selection of eight diptychs from the series Raumfolgen (1991–ongoing) by Italian artist Walter Niedermayr (b. 1952) deals with functional spaces in prisons and hospitals. Corridors in this context work as in-between spaces which serve as guidance systems as well as meeting and exchange points for the people forced to be there.
exit strategy
... computer programs visualize our exit strategies: is there a sane way to avoid the apocalypse?...
Floor fragments

Kiva systems robot for warehouse logistics

Energy floors installation
Once a surface for symbolic expression—defining the way spaces are used, the “rules of the game”—floors in the twentieth century tended towards a purely Cartesian surface, rational, undecorated, unloved, always perfectly flat, ideally soundless. Simultaneously with our negligence of their programmatic, symbolic, and haptic potential, floorspace became the dominant economic metaphor for architectural space: call it square meterism. But the square meter, in the parlance of real estate, is really a three-dimensional volume through the entire space. And the floor itself is actually a thick slab, sometimes a “false floor” containing mysteries similar to those of the ceiling.

The floor room is entirely taken over by a typical, raised “false” floor used in offices, in 60 x 60 cm panels. On top of this, an energy-harnessing dance floor and video game recall the potential of the floor to trigger activity. A range of objects from Afghani prayer rug featuring Russian helicopters to Uzbek tiling and local Venetian mosaics. A Kiva robot—which reads magnets in the floor to navigate the vast warehouses of Amazon and automatically retrieve products from shelves—will be operating in one section of the room, literally taking its cues from the floor...
Third-fourth century Recuperation: under a military prison in Israel, the oldest Christian Church in the Holy Land is discovered in 2005 by an inmate working on the prison’s expansion—which halted after the find. Dating from the end of the period when Christianity was illegal under the Roman Empire, the revealed 6 x 9 meter mosaic features a medallion of fish and inscriptions in Greek, including: “The god-loving Akeptous has offered the table to God Jesus Christ as a memorial.”

Telltale heart: in an unknown, high-tech office, the apparently solid floor (designed by Kingspan) becomes a secret cavity for hiding the building’s support systems, mostly wiring. The constant flexibility implied by the contemporary open plan office requires a system for easy reengineering, finds its ally in the floor, formerly the most stable element, now also a symbol of impermanence.
2008 “If 2,000 people come to Club Watt and they experience sustainability and say, hey man, this for me was a new way to look at a sustainable lifestyle, this for me is the ideal night,” says Michel Smit of Sustainable Dance Club (now Energy Floors), which manufactured the world’s first energy-producing dance floor, harnessing the movement of Rotterdam’s revelers. It boasts a maximum output of twenty watts per dancer—enough to generate flashing lights, though not enough yet to power the club itself.

2012 Kiva Systems: shelves that come to you. Reading barcodes embedded in the floor, Kiva robots move like orange pac-mans through Amazon’s enormous warehouses collecting shelves and bringing them to human workers for selecting and sorting. Algorithms determine which pod is sent to collect which shelf to be brought to which workers, the system turning “what is normally a serial process into a massively parallel process,” according to the manufacturers. KIVA systems, founded in 2003 by a team of three engineers in Woburn, Massachusetts, are installing the orange robot systems throughout ecommerce logistics centers around the world. In 2012, Amazon, their biggest customer, bought the company outright. KIVA claims its robots, taking over the floor entirely, triple the speed of order-fulfillment, reducing staffing needs by two thirds...
On a factory floor, circular wheel tracks betray the minuet with transponders executed by the Kiva robots, used to retrieve products from shelves in Amazon warehouses; humans are banished from areas where Kiva operates.

...will human beings soon be exiled from the floor? Visit by appointment only?
Reinforcing bars; both ways

#4 reinforcing bars; spaced evenly around perimeter

Isolation joint at highest elevation

Apron

Slope down

10t 3' - 0" 3' - 0" 10t

Section A-A

65 mm

Top slab

Waffle

Rib

Band beam

D_r

D_b

100 mm

1000 mm

1.3E Timberstrand LSL allowed hole zone

Microllam LVL and Parallel PSL allowed hole zone

2 x diameter of the largest hole (minimum)

5/6 depth
1926 Bauhaus, Dessau, Germany

1715 Mashrabiya, Lima, Peru

1954 Balcony by Fernand Pouillon, Diar-es-Saada, Algiers

19th century Cast Iron Haussmann Balcony

Models of political balconies
Intruder, civilizer, “fake appetizer,” (Quatremère de Quincy), but also modern architectural element par-excellence—the balcony has always held a special position within architectural discourse and practice. It has not only been a prime site of architectural innovation and expression, but also a heavily charged element that mediates between public and private realms. In the installation, the visitor experiences the transparency of a modernist balcony and the screened character of a vernacular balcony. In addition, three narrative lines are presented:

the political balcony
A worldwide geography illuminates how balconies are stages for major political speeches and actions (macropolitical), but also accommodators of everyday appropriations or small protests by inhabitants (micropolitical). Well-known balcony scenes, such as the 1951 speech of Eva Perón in Buenos Aires and the first public address of the liberated Nelson Mandela at the Cape Town City Hall in 1990, are combined with more everyday, but no less political, uses in the same cities.

milestones
The balcony has marked several turning points in architectural culture: a full-size model of the typical Haussmann balcony, which articulated a new bourgeois public sphere in nineteenth-century Paris, is confronted with the transparency of a modernist version at the Bauhaus Dessau and an Algerian balcony by Fernand Pouillon, in which vernacular and modern definitions of the public sphere coincide.

limitations
A gallery of social housing projects illustrates how the balcony has been super-charged with the responsibility of mediating between interior and exterior, individual and collective, and private and public realms.

The installation is an invitation to rethink the balcony as a full-fledged liminal architectural element, with its own formal semantics, cultural charge, and experiential complexity...
...without the balcony, there would have been no history...
from open...
1907 Queen Alexandra sanitarium, Davos, with canopied balconies to provide consumptive guests with maximum exposure to curative fresh air. One of the inspirations for Thomas Mann’s novel *The Magic Mountain*... “Hans Castorp stayed out on his balcony, looking down on the bewitched valley until late into the night... His splendid lounge chair with its three cushions and neck roll had been pulled up close to the wooden railing, topped along its full length by a little pillow of snow; on the white table at his side stood a lighted electric lamp, a pile of books, and a glass of creamy milk, the ‘evening milk’ that was served to all the residents of the Berghof in their rooms each night and into which Hans Castorp would pour a shot of cognac to make it more palatable.”
—Thomas Mann, *The Magic Mountain*, 1924

from dense...
1890s City of balconies: mashrabiyas of Lahore (now Pakistan) define the entire urban realm.
Upper right: two boys peek from an openable hatch.

from social democratic...
1927 Parallel to the political exploitation of the balcony in the twentieth century as an instrument to exert power, the balcony is discovered by politicians and architects as a tool of mass emancipation. Already associated with bourgeois leisure and health, the balcony is the obvious element for architects to disseminate in their newfound social mission, transforming it into an emblem of social democracy. Generously balanced Karl Marx-Hof, Vienna, by Karl Ehn: largest single block of apartments in the world.
...to closed...
Hanoi’s contemporary balconies—referred to as “tiger cages,” boxed in by mesh and corrugated metal to enclose the space but still allow air-flow—subject to overspill from increasingly prosperous lives and crammed living spaces...

...to sparse...
dubai’s high-end balconies: symptom of thinning
More and more cities are inhabited on a provisional basis. Their low intensity of use is not sad proof of uselessness but the promise of a future usefulness. In Dubai life is registered not by human occupation, but by signs of irregularity on the finished towers—usually on the balconies.

...to social media...
2005 VM Homes, Copenhagen, by PLOT Architects (Bjarke Ingels and Julien de Smidt): each protrusion a transparent platform on which to fabricate, display, and overlook individual identity—realization of the balcony as a type of social network...
2010 a 3D print of a Piranesi fireplace featuring goat’s heads and angel’s heads. Piranesi’s etching of a fire survives in the computer modeling… Fondazione Cini, Venice, Italy

2014 Local Warming, by MIT’s SENSEable Cities Lab: a sensor detects motion, and a series of infrared lasers encapsulate and follow the beneficiary in a moving bubble of warmth, leaving the rest of the space in the cold…

228000 BCE Southern Europe’s Earliest Fireplaces
Part real, part fake: hearths from Bolomor Cave, Spain, postexcavation, made into a cast made so loose objects—stones, bones—can be removed and analyzed; then the (real) section of hearth is further scraped away in hopes of finding older evidence further down. While the composition of soil is then lost forever, the cast is filled in, and the original stones and bones placed back.
The promethean technology of the fireplace—one of the many elements competing for origin-of-architecture status—has now more or less disappeared as a discrete object or place within architecture, and we have hardly noticed this erasure. The former tasks of the fireplace—heating, cooking, lighting, a gathering place and focal point for media and culture—have been divided up among multiple devices, and/or spread like tentacles throughout various building systems. The hearth may become the first architectural element to become extinct, necessarily so.

The fireplace installation is divided into three acts, showing the primal origins of this element (a real excavated 228,000-year-old fireplace, the oldest found in Southern Europe), its evolution into a venerable decorative feature in the aristocratic home (a 3D printed realization of one of Piranesi’s fantastical fireplaces), and “Local Warming,” a project by MIT’s SENSEable Cities lab that sets out a possible future for the fireplace: inverting at least 200,000 years of history, they propose that, instead of people going to the source of heat, and instead of trying to maintain the temperature of entire spaces, heat will now be programmed to follow individuals... A sensor detects motion, and a series of infrared lasers encapsulates the beneficiary in a moving bubble of warmth, leaving the rest of the space in the cold, and no escape for the warmed person...
...no element split off in so many different directions—what started with fire became through the shift/translation into electricity, the most ubiquitous element of all...
local warming
A staggering amount of energy is wasted on heating empty offices, homes, and partially occupied buildings. Local warming addresses this asymmetry in a radical way, by synchronizing human presence with climate control. A rank of responsive infrared heating elements are guided by sophisticated motion tracking, creating a precise personal (and personalized) climate for each occupant. Individual thermal “clouds” follow people through space, ensuring ubiquitous comfort while improving overall energy efficiency by orders of magnitude.

From grotto to fire pit, from Victorian pipes to central heating and suburban thermostats, man exerts more and more control over his temperature.

“The fireside circle could no longer serve as social glue. The old social fabric—tied together by enforced commonalities of location and schedule—no longer coheres. What shall replace it?” (William J. Mitchell). A new paradigm of local warming could spark vibrant encounters as people share their personal climates. The radical inversion of the hearth is complete: man no longer seeks heat—heat seeks man.

MIT SENSEable Cities Lab
the thermostat achieves consciousness: the Nest Learning Thermostat, the first domestic device to be part of the internet of things, records patterns of usage, receives remote instructions from your smartphone, uses motion sensors to detect when users are at home... From this data, the Nest creates a heating program that automatically saves energy when the occupant is away or asleep, and incentivizes the user to adopt more sustainable heating habits... Its design is in the lineage of the classic Honeywell Round (1953) and also of the iPod (2001)—the device has been designed by former Apple designer Tony Fadell, who comments: “Nest’s algorithms are common, but the output of the algorithms are highly personalized, based on habits of the home, the weather around the home, the thermal constants of the home, as well as the heating and cooling systems. All of these things are learned, and we adapt those as we get more data points over the life of the product.”
Wallpaper of news stories with implications for the development of the façade

Selection of contemporary façade mock-ups
façade

Over the past hundred years, the façade has seen the explosive growth of a number of distinct species, each with their own environmental niche, cultural context, virtues and vices, histories, and dynamically evolving narratives. Some species have appeared suddenly, proliferating seemingly overnight, some have taken years of development to achieve a degree of fitness, while others have enjoyed a period of interest and then fallen into obscurity, and even extinction.

The environmental stressors which drive these changes are often forgotten, hidden behind a literally superficial understanding of the façade, which has traditionally focused on style, composition, and representation. Technological advances, cultural contingencies, social orders, economic cycles, and political ideologies are not so much represented in the façades as literally embodied in a layered, three-dimensional entanglement of matter. The understanding of these processes requires us to address material embodiment rather than material representation as the core architectural understanding of the building envelope. These are processes which have less to do with a historical sequence of moments of invention than with the understanding of dynamic ecologies of materials and technologies, their diffusion, application, and environmental adaptation. They cannot be understood as singular artifacts frozen in time and space: they sit within a historical fabric that includes other architectural materials and assemblages that inform our understanding of the evolution of envelope technologies.

The façade installation features real samples of twelve façade assemblages or species which have been developed over the last century. Some of them are generic and some unique. This collection of disembodied façades will be presented alongside materials which aim to capture the cultural, political, and social contexts which they embody rather than represent. Newspaper clippings, film stills, advertising posters, a parade of heroes and villains will reveal a texture of attachments to the physical embodiments in the assemblages. The full scale and high resolution of these artifacts eschews a superficial understanding of the façade as a representation in favor of a series of material ecologies belonging to each assemblage.

Alejandro Zaera Polo
material façades

1940s During World War II, as natural rubber supplies from Southeast Asia were cut off, the United States government undertook a massive program to develop a synthetic rubber to fuel its war engine. As a result of this program, many plastics that we know today were invented and developed.

1960s Precast façade technology was deployed on a massive scale in the post-War era as social programs were developed to quickly house the masses. This technology has since seen a rebirth as a tool to produce phenomenal effects, taking advantage of the adaptable, moldable, and "fake" nature of concrete.

1970s Insulated façades are closely tied to economic cycling. Scarcity and abundance are always reflected in a thickening or thinning of the wall. The oil crises of the 1970s saw a boom in insulating technology, so much so that supply could not meet demand as homeowners scrambled to insulate their property.
barrier façades

1910s A boom in airtight technologies arose during the twentieth century as the exterior environment was increasingly perceived of as toxic. During World War I, the German army’s use of chlorine and mustard gas instilled the fear of weaponized air in the public psyche and brought about a lasting airtight mentality.

1949 airtight façade by Jean Prouvé

1960s In post-War America, social programs such as the G.I. Bill and the R.F.C. encouraged economic growth in many ways, including increased home ownership. At this time, prefabricated metal houses, such as the Lustron House, were seen as the house of the future, and highly desirable for the modern family.

1980s Cold War suspicion and mistrust made commonplace a practice of putting up false façades. Lies, espionage, and secretive government agencies promised another truth hidden just beneath the surface. In the wake of the cold war, inexpensive titanium made the rainscreen a popular building technology.

1949 airtight façade by Jean Prouvé

Fédération du Bâtiment
Paris, France

2014 water tight façade by A. Zahner Company

Zahner Engineered Profiled Panel System

2010 rainscreen façade by Agrob Buchtal GmbH + Herzog and de Meuron

Museum der Kulturen
Basel, Switzerland

© buildingscience.com
glass façades

1960s The all-glass façade has always been associated with democratic and societal transparency, though it also has a history in exhibition and consumerism. Advanced glassmaking technology has made available increasingly large and strong panes of glass, allowing the façade to disappear nearly entirely.

1970s Increasing environmental conscientiousness resulting from multiple ecological disasters and the oil crises of the 1970s led to a boom in passive building technology. At first representing a kind of antisocietal trend, passive climatic mediation technologies were quickly adopted by corporations.

1980s The curtain wall as we know it today was formalized by post-War American corporations. Mistrust in corporate power has lead to a recent boom in curtain walls which not only block or transmit light in a certain way, but also tend to warp or distort views, providing new and unique perspectives.

2010 double façade by Permasteelisa + KSP Jürgen Engel Architekten
Deutsche Börse
Eschborn, Germany

2003 curtain wall façade by Cricursa + Permasteelisa + Herzog and de Meuron
Prada Aoyama
Tokyo, Japan

2014 all-glass façade by Octatube
Quattro Node Supports
immaterial façades

1900s The media façade is often associated with advertising and signage, but it also has a history involving massive cultural gatherings and entertainment programs. Coney Island, Las Vegas, and music festivals all feature media façades not only conveying information but also generating atmosphere.

1930s The kinetic façade has always been a dream of architects. In the 1930s, as an onslaught of tiny motors invaded the American home, mechanizing windows, garage doors, heating and cooling, architects desired a fully mechanized home. However, it is only in recent years that this has become possible.

1970s Green façades have become popular in recent years as “green” has become increasingly desirable and necessary. This shift has come as the result of policy changes and environmental movements dating back to the 1970s becoming increasingly influential in the public consciousness.
Translation and construction of a roof based on the first Chinese treatise on architecture *Yingzao Fashi* (1103 CE)

Mix of traditional Indonesian roofs and their advanced geometry relatives
perhaps as a result of our gratitude to the roof-over-our-head, it has always been super-charged with local cultural meaning. the paradox of the roof is that this indelible regionalism—styles are ultrarecognizable (the black forest roof, the chinese roof...)—coexists with universal principles and physical structures that must be adhered to in order to keep out the weather. in the twenty-first century, while most elements are becoming homogenized, a consensus has yet to emerge about the roof.

the roof room features a unique project to produce the first ever english translation of the 1103 chinese architectural manual the Yingzao Fashi, and an attempt to follow its instructions for the assembly of a standard chinese roof using blue foam. juxtaposed with this endeavor: a collection of models from amsterdam’s tropical museum of traditional indonesian dwellings, and advanced geometry roofs being built all over the world today...
Confronted with a lack of knowledge about ancient Chinese architecture, AMO consulted the *Yingzao Fashi*, the first complete treatise of Chinese architecture, written in 1103 CE. Only rediscovered in the 1920s by historian and architect Liang Sicheng, there is still no complete translation into English. AMO, supported by a team of experts including Jiren Feng, Fang Zhening, Jia Zhao, Marieke van den Heuvel, and students from Harvard, Beijing, Shanghai, and Shenzhen, gave it a first stab. Following intricately detailed and precise language, the team set up a workshop at the Shenzhen Hong Kong biennale to reprototype a roof structure described in the *Yingzao Fashi* in blue foam...

Early twentieth century depiction of a Song Dynasty bracket set

1. cap block
2. mud-line arm
3. flower arm
4. long arm
5. melon arm
6. second jump flower arm
7. regular arm
8. long arm
9. regular arm
10. playing head
11. inclined cantilever
12. long arm
13. regular arm
14. playing head
15. lined square head
16. locking pins
17. connection block
18. mid block
19. end block
Amidst technical and bureaucratic descriptions, we found a set of architectural elements developed over centuries to prevent corruption and include value engineering, while embracing complexity and elegance...

A "full heart" construction 計心造 and a "stolen-heart" construction 偷心造 are the Yingzao Fashi technical terms for two types of bracketing structures, which figure as an early form of value engineering.
from the vernacular

5900 BCE–4000 BCE
Tell Al-'Ubaid, Iraq
British Museum

< 1949
Tongkonan
Tropenmuseum, Amsterdam, Netherlands

< 1987
Model of an Indian hut
Tropenmuseum

< 1887
Model of a Karo-Batak skull house
Tropenmuseum

< 1852–1857
Batak-landen
Tropenmuseum

< 1913
Rumah balai-balai
Tropenmuseum

< 1927
Roemah godjak makaram lojang
Tropenmuseum

< 1927
Sungai Mandala, Negara
Tropenmuseum

1852–1857
Batak-landen
Tropenmuseum

< 1821
Model of a Karo-Batak skull house
Tropenmuseum

1980
Model of a house
Tropenmuseum

< 1927
Roemah godjak makaram lojang
Tropenmuseum

< 1927
Sungai Mandala, Negara
Tropenmuseum

1980
Model of a house
Tropenmuseum
to the parametric

1956
Parroquia de San Antonio de las Huerta. Miguel Hidalgo, Mexico. Enrique de la Mora, Fernando López Carmona, Félix Candela
Loan courtesy of Zaha Hadid Architects

1970–1980
Bubble System Fargeau Ponthierry; Büro-Pavillon; Club-Lokal, Heinz Isler Archive

1983
Opera house in Paris, Heinz Isler
Heinz Isler Archive

Unknown
Unnamed model
Zaha Hadid Architects

2006
Wei Wu Ying Center
Mecanoo

2007
Heydar Aliyev Center
Zaha Hadid Architects
A traditional element once invested with physical heft and graphic iconography has turned into a dematerialized zone, a gradual transition between conditions registered by ephemeral technologies (metal detector, card readers, body scanners) rather than physical objects. The transformation took place concurrently with a transformation in society: whereas isolation was once the desired condition, our aspirations now are for movement, flow, transparency, accessibility—which the door, by definition, stands in the way of.

The door room contains 1:1 mock-ups of a series of highly symbolic doors from various architectural texts from around the world, plus a host of relics from two essentially similar door systems: the fourteen gates of Hochosterwitz Castle, Austria, constructed in the fifteenth century, each gate with its own security measure (trap doors with spikes, windows for pouring hot oil...) and the contemporary airport, where travelers run a gauntlet of more or less insidious, biometric security devices. On the walls: a collection of historic architectural drawings of venerable Dutch doors from the Netherlands Institute of Architecture, and a vignette on the “handshake of the building”: the door handle.
**Yingzao Fashi, Qing Structural Regulations**, Chinese treatises 1103 CE–1734 CE

Long lasting tradition of Chinese gate production here depicted by Yao Chenzu following the Western practice of architectural treatises or building guides, written in 1929, published in 1959.

**Aparajitaprccha** (appr.), West Indian text (one of the Vastusastras) late twelfth–early thirteenth century

Based on Sanskrit descriptions, the Uttunga torana as depicted in *The Torana In Indian And Southeast Asian Architecture* by Parul Pandya Dhar, 2010.
The desire came into my mind to form in a visible design several gateways in the Rustic styles, but which were mixed with different Orders, that is, Tuscan, Doric, Ionic, Corinthian, and Composite... And I advanced so far as to make a total of XXX, almost carried away by an architectural frenzy... for the common benefit not only of this fine Kingdom of France... but also for the benefit of all inhabited countries...”

“Doors and doorways provide access from the outside into the interior of a building as well as passage between interior spaces. Doorways should therefore be large enough to move through easily and accommodate the moving of furnishings and equipment. They should be located so that the patterns of movement they create between and within spaces are appropriate to the uses and activities housed by the spaces... From an exterior point of view, doors and windows are important compositional elements in the design of building façades. The manner in which they punctuate or divide exterior wall surfaces affects the massing, visual weight, scale, and articulation of the building form.”
Xiegu Construction will build a late Qing dynasty (nineteenth century) gateway in front of the Central Pavilion. Coming from Suzhou, China, it is a five-meter high granite and brick replica of a gateway demolished in 1999 in the city, recreated by local masters with vivid carvings of unicorns, dragons, waving grass, and calligraphy reading that good virtue brings good luck and commanding all who pass to do good...
As the Ottoman Empire presses west in the sixteenth century against the borders of the Austrian monarchy, a frenzy of fortification-building began. The Khevenhuller family assumes control of the mountaintop Burg Hochosterwitz in 1571, retaining Domenico dell’Aglio, a celebrated Italian designer of fortifications, with the aim of designing an impenetrable system to protect the castle road: fourteen gates, representing the fourteen Stations of the Cross.

1. shooting holes
2. murder hole, vats of boiling oil
3. shooting holes
4. retractable footbridge, shooting holes
5. retractable footbridge
6. marksman’s windows, murder hole
7. lattice porticulus, vats of boiling oil, murder hole
8. false floor
9. shooting holes
10. watchtower, hot oil windows
11. murder hole
12. drawbridge
13. shooting holes, hot oil windows
14. drawbridge, retractable porticulus, murder holes, vats of boiling oil
US airports: twenty-layer security

As logical entrance and exit points to the city for millions of travelers, airports represent the modern equivalent of the city gate, bearing all its symbolic weight. In the Jet Age 1960s, airports are built as glamorous places; even through the 1970s, after the first modern hijackings, security involves relatively lightweight X-ray equipment. In the US, 9/11 provoked a dramatic escalation of ever more demanding procedures, with each subsequent terror scare provoking new rituals: the removal of shoes, bans on liquids, full body scans. “While security represented 5–8 percent of airport operating costs a decade ago,” notes the International Air Transport Association, “that figure has increased to as much as 35 percent at some airports today and there can be no confidence that this trend will change...” Today, the Transportation Safety Authority boasts no less than twenty separate checks on travelers. Screenings, searches, and scannings are only the most obvious manifestations of a procedure that extends well before and well after arrival. The airport becomes an endless door stretching out ahead of travelers...
Julia Ludwar M.A. conservator–restorer, at the Bavarian building preservation and restoration advice center...
2013 Paul van Duijn, senior curator of furniture at the Rijksmuseum storage in Lelystad looking for doors...
The Elements of Architecture: Wall

A digitally controlled passage ensures an immediate, intimate, and corporal relationship between the kinetic wall and the adjacent (glass) partition wall into a differentiated arch-like space. The limited and changing width of the valleys. This movement transforms the exhibition visitor’s corridor into a topographical section of peaks and valleys. This movement is activated by a series of motorized points which extend and retract that transform an elastic (stretched) surface.

Floor pattern (hidden) showing earlier demolished walls in the room...

THE EPHEMERAL PARTITION

Thanks to the lightweight partition wall, what was once an anomaly is now a common, intentional design feature. Thanks to the lightweight partition wall, what was once an anomaly is now a common, intentional design feature.

THE BANK OF ENGLAND: A VISION OF THE FUTURE?

Walls, which divide spaces with a solemn aura of permanence, trigger a chaos of internal transformation in dozens of transformations over a century through the accretion of new spaces built of masonry walls. The Bank of England evolved through three different architects and between adjacent building projects. The Central Pavilion, home to the Venice Biennale, uses an anomaly is now a common, intentional design feature.

Research spread on the ephemeral partition to match the exhibit space to the current fashion. A VISION OF THE FUTURE? Thanks to the lightweight partition wall, what was once an anomaly is now a common, intentional design feature.

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OVERLAY:

Superimposition reveals the complexity of the partition changes in the Central Pavilion. Between 1732 and 1833 CE the partition to match the exhibit space to the current fashion. A VISION OF THE FUTURE? Thanks to the lightweight partition wall, what was once an anomaly is now a common, intentional design feature. Thanks to the lightweight partition wall, what was once an anomaly is now a common, intentional design feature.
The meaning of the wall is just as diverse as the uses of vertical surface can be, but there are at least two essential functions: providing structure, and dividing space. The two can be separated, and thus the wall itself divides into two, as the bearing wall and the partition wall: the “necessary” wall, separating roof from ground; and the contingent wall, organizing movement within the resulting container. The former, it would seem, is as stable as the human need for shelter; the latter as changeable as our forms of sociability. Seen in time-lapse, the history of the world’s architectural plans would be the history of changing forms of civilization, as new segmentation of spaces is demanded by new forms of society. The single-cell house, with occupants huddled in shared space (probably around a central fireplace), gives way to ever more complex configurations of boxes within boxes. Increasing standards of modesty and individualism demand new walls around new bedrooms; new family norms even divide off the nursery.

With the advance of technology, the wall, no matter how temporary or flimsy, becomes more and more permeated with wiring and plumbing, insulation and acoustic engineering, even as outwardly it becomes increasingly bare, minimal, even transparent.

Walls always have to be made of something. The installation aims to reveal the hidden complexity in the section of the wall—the part we typically never see—through showcasing a series of different wall types, from solid to insubstantial, including a seventeenth-century stone wall from the Huis Huydecoper in the Netherlands, a brick wall made on site in the Central Pavilion, a Russian Yurta mesh partition, and a retractable fire curtain, among others...

The installation also explores the history of the Central Pavilion itself, stripping back the existing plasterboard walls, revealing the solid brick behind, and marking on the floor the shifting positions of the room’s partition walls since the late nineteenth century...
Building a yurta

1. **door jambs and leaves** are the first elements to be put in place.

2. **six keregi** (foldable walls) are tied to the door jambs in a circle. When folded, the height of a keregi is approximately 1.7 meters, and they can be stretched as needed, adjusting the height of the whole structure.

3. **shangarak** (dome) is lifted from the center of the structure, with the help of a special pole called a **bakan**.

4. **seventy uuks** (spokes) are put in place to hold up the dome. The top end of the uuks is inserted in a specially crafted recess in the edge of the shangarak, and the lower end is tied to the top edge of the keregi.

5. ropes + decorated bands are used to pull the structure together and secure.

6. **thatch** the walls are wrapped with thatch braid-ed with colored threads.

7. **woollen coverings** the whole structure is wrapped in five woollen coverings.

8. decorated bands the dome and the walls of the interior are covered with decorated bands which play a structural as well as an important aesthetic role.

Constructed in two to three hours, yurts today are an integral part of life for Kazakhs, nomadic Uzbeks and Turkmens as a dwelling, summer home, and for rituals. Manufacturing of a yurta’s core elements is done by special craftsmen; all other elements are produced by women of the family. The structural elements can last up to 150 years, woollen coverings up to 100 years. For some 1,500 years, the structural elements of a yurta have remained unchanged.

1902 Installing a yurta, Turkmens, Trans-Caspian region.

1906 Kazakhs, Semipalatinsk region.

1902 Interior of a wealthy Kirikz yurta, Alai valley.
1639–1943–2014 Huydecoper House

In 1943, a British military plane crashes into one of the most impressive homes in Amsterdam’s canal district, the Huydecoper House. Built between 1639 and 1642 for city nobleman Joan Huydecoper and designed by famed Dutch classicist architect Philips Vingsboon, the façade is highly un-Dutch. In the context of the brick-based architecture of the Netherlands, this Bentheimer sandstone façade, thirty centimeters thick, is a marvel of its time. After the plane crash, the city council launched an effort to preserve the façade of the building. After an initial period of storage, the façade fragments were moved to several locations throughout the city and were finally dumped in an open storage facility in the late 1980s where the fragments began to rapidly disappear. After failed attempts at reconstructing the original façade, since 2003 they have been in the Dutch Cultural Heritage collection, where only forty-three fragments remain representing less than ten percent of the original...
...anyone looking at a wall today looks at a riddle: is it an immutable object—of heft, solidity, weight—or is it a provisional assembly that can be removed or changed without particular effort...

Plan of all the walls that have radically changed the character of the wall room in the course of 169 years in the Central Pavilion...
beijing 2013
dismantling as industry
Selection of staircase models
Archival records of staircase research and publications by Friedrich Mielke
Staircase parts: steps, balustrades collected by Friedrich Mielke
Reconstruction of historical staircases
The diktat of the fifteenth-century architectural theorist Leon Battista Alberti—“The fewer staircases that are in a house, and the less room they take up, the more convenient they are esteem’d”—has proved to be a prophesy for the contemporary condition. The staircase is considered dangerous—safety requirements limit architects’ ambitions—and is possibly endangered, only still in existence in order to fulfill the requirement of having an exit strategy, though the stair may be making something of a comeback as an aid to fitness.

Yet the stair has an illustrious history as a physically and architecturally demanding element allowing ascent—to upper chambers and heightened spiritual states. According to Friedrich Mielke (born 1921), the stair is “the queen of architecture,” though it never gets the attention it deserves. After sixty years of measuring and theorizing staircases around Europe, authoring twenty-eight books on the staircase, and founding the science of Scalology (staircase studies), Mielke has developed a formidable archive of stairs, models, balustrades, drawings, books, and documentation—imported in its entirety to the Central Pavilion. A new documentary film made for the biennale on Mielke explores the biographical basis for his devotion to stairs and the intricacy of attention to this formerly noble element...
2014 Friedrich Mielke interviewed on his life's work on the staircase.
venice statement
No one can possibly climb a flight of stairs without making contact with one’s foot. Foot and Step are dependent on each other. Their interdependence marks the defining characteristic of Scalology.

In Europe we have adjusted to a riser measuring eighteen to twenty centimeters in height. For the ancient Romans, twenty-five- to thirty-centimeters high risers were considered normal. Meanwhile the steps on the Mayan pyramids measure 40 to 50 cm in height.

Following from these relationships is the theory that cultures are significantly affected by the measurements of their stairs. This is true not only for peoples as a whole, but also for their internal social hierarchies, which are made visible by the steps. Analogous to Scalology, one can, purely based on the measurements and idiosyncracies of a stair, draw conclusions relating to the manufacturer, the user, and all other circumstances surrounding its creation.

Scalology may benefit both builders and clients, manufacturers and users, artists and art historians, psychologists and physiologists, anthropologists and medical doctors, teachers and students.

Scalology differentiates itself in spirit from the purely technical surveying methods employed by Stair Research. Scalology creates the philosophical superstructure to cover all profane accomplishments.

Friedrich Mielke, 2014
Catalogue of stair types: German terminology
Collected diagrams and definitions

Gerade einläufig einarmige Treppe
Gerade einläufig zweiarzmige Treppe mit Längspodest
Treppenanlage mit 3 geraden Armen und 1 Podest
Gerade zweiläufig divergierende Treppenanlage mit gemeinsamen Antrittsarm und Zwischen-podest
Gerade zweiläufige Treppenanlage mit 3 Armen und einem Wendepodest (Imperiale Treppe)
Gerade sechszarmige Treppenanlage mit zentralem Verteilerpodest

Gerade zweiläufig parallele Treppenanlage ohne Längspodest
Gerade einläufig zweiarmige Treppe mit Eckpodest
Gerade einläufige Treppe mit Wendepodest
Symmetrische Treppenanlage mit 2 Läufen zu je 2 geraden Armen und einem Verteilerpodest
Gerade zweiläufige Treppenanlage mit 3 Armen und einem Wendepodest (Imperiale Treppe)
Gerade zweiläufige Treppenanlage mit 4 kreuzförmig angeordneten Arment und mit einem zentralen Wendepodest

Spiraltreppe in einem Kegelstumpf mit gleichbleibender Laufbreite und einem Auge, das sich nach oben verengt
Spiraltreppe in einem Kegelstumpf mit steigend verengter Laufbreite und mit gleichbleibendem Durchmesser des Auges
Treppentürme—Turm-Grundrisse
Wendeltreppe mit zylindrischer Spindel auf kreisförmigem Grundriss
Einläufige Wendeltreppe mit Holzspindel und Wangen-säulchen
Fundamentals

Gerade vierarmige Treppe mit 3 Eckpodesten
Negative Pyramidentreppe
An- und Ausgewendelte Treppe
Gerade dreiarmige Treppe mit 2 Eckpodesten
Einläufig poly-zentrisch gestaffelte Wendeltreppe
Symmetrische Treppenanlage mit 2 Läufen zu je 2 geraden Armen und 2 Wendepodesten, sowie 1 gemeinsamen Hauptpodest
Treppenanlage mit 2 geraden parallelen Läufen in entgegengesetzter Steigerichtung
Angewendelte, und Ausgewendelte Treppen Treppenanlage mit 3 geraden, konträr gerichteten Läufen ohne Längspodeste
Gerade dreiarmige Treppe mit 2 Eckpodesten
Negative Pyramidentreppe
Zweiläufig duozentrische Wendeltreppenanlage mit Zwischengang
Einläufige linksgewendelte Wendeltreppe mit Spindelzylinder
Monozentrisch disparadiale Wendeltreppe mit 2 Läufen
Einläufige poly-zentrische Wendeltreppe
Zweiläufig duozentrische Wendeltreppenanlage mit 3 Zentren (Trizentrisch) - Entwurf
Dreiläufige Wendeltreppenanlage mit 3 geraden, konträr gerichteten Läufen ohne Längspodeste
Gerade vierarmige Treppe mit 5 Eckpodesten
Pyramidentreppe
Einläufige linksgewendelte Wendeltreppe mit Spindelzylinder
Einläufige rechts-gewendelte Wendeltreppe mit offenen Spindelzylinder
Monozentrisch isoradiale Wendeltreppen mit Auge, mit 2, 3, und 4 Läufen (Doppel-Trippel- und Quadrupelwendeltreppen)
Einläufig duozentrische Wendeltreppenanlage
Zweiläufig duozentrische Wendeltreppenanlage
Dreiläufige Wendeltreppenanlage mit 4 Zentren (Quattrozentrisch) — Entwurf
Zweiläufig duozentrische Wendeltreppenanlage mit Zwischengang
Kegeltreppe, Hohlkegeltreppe (negative Kegeltreppe) und Doppelkegeltreppe

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1990 “Laurin” stair developed with Friedrich Mielke and the sculptor Werner Bäumler, with steps gradually increasing and, in the end, decreasing in height.

Balustrade archive at Friedrich-Mielke-Institut für Scalalogie, OTH Regensburg.
2014 Staircase models at the Friedrich-Mielke-Institut für Scalalogie.

Folders with dossiers on staircases in Swiss farmhouses from the Friedrich-Mielke-Institut.

One of several wheeled storage cabinets full of records of the world’s staircases...
Reconstruction of Claude Parent’s oblique Neuilly house

Reconstruction of the first wheelchair ramp, by Tim Nugent...
A utilitarian device that actually has the potential to liberate floors from their separate identity, used first for cattle and horses and gaining urgency with the car, the ramp has the potential to fulfill the long-held desire to have a life of uninterrupted continuity. The parametric drive can claim the ramp as a legitimate part of its repertoire: an all-encompassing smooth surface that attempts to eliminate differences between spaces and elements. At its moment of greatest dissemination, the ramp is at the same time severely limited by building codes: codes that make it impossible to handle the ramp architecturally, allowing only the most gradual angle of inclination; and codes that exploit the ramp merely as a provisional, temporary-seeming gesture towards universal accessibility. The ramp is a speculative springboard, constantly pulled down by realities...

The ramp installation explores the work of two key, and opposing, pioneers of the ramp of the twentieth century: Tim Nugent, inventor of the disability access ramp, and Claude Parent, master of the oblique...
Tim Nugent (b. 1923), an American World War II veteran of the who pioneered research into accessibility ramps and campaigned for their universal implementation—a life’s work that has impacted architecture everywhere—is interviewed, his technical work exhibited, and his ideal, low-inclination ramp recreated.
Claude Parent (b. 1923), an architect who imagined daily life lived on a series of domestic ramps, is interviewed, his archive investigated, and his ideal ramp system—betraying a huge optimism about steepness—for his own living room in Neuilly, reconstructed.
1950s Wheelchair access ramp designed and built by Tim Nugent at the Urbana-Champaign campus of the University of Illinois. Nugent pursues a career researching wheelchair ramp design and advocating for disability access.

1961 Inclination limit, Tim Nugent.
1974 Claude Parent’s sloping living room in his house in Neuilly.

Collection of historic toilets including an ancient Roman toilet, a baroque urinal, and a toilet developed for the Bill and Melinda Gates Foundation’s “Reinvent the Toilet Challenge.”


No architectural treatise cites the toilet as the primordial element of architecture, but the toilet is today the fundamental zone of interaction between humans and architecture on the most intimate level. Once a respectable communal activity in Roman cities, going to the toilet gradually became privatized, enclosed within architecture. In the nineteenth century, enabled by flush technology, the S-trap, and modern plumbing, the toilet united in a single room with the bath—a union of the dirty and the clean that had only been safely achieved a handful of times in history. The domestication, privatization, and proliferation of the toilet is the great unspoken driver behind much architecture and urban planning. But at the moment where the globalization of the Euro-American toilet and its attendant behavior is on the brink of completion, the model it depends on—abundant water, sophisticated plumbing, large-scale sewage and purification systems—is increasingly untenable and unaffordable. The toilet is at once the most private and the most political element, subject to government interference at least since King Francois’ 1539 edict instructing the citizens of Paris to take responsibility for the collection and proper disposal of their “waters.” Today, the toilet is the site of cultural superimpositions (sit-toilets with grated sides for squatting on) and resistance, philanthropy (Bill and Melinda Gates Foundation’s challenge to “reinvent the toilet”), and habits that only seem to be intractable...

The toilet room features a range of crucial historical toilets, from a Roman chariot model found at the baths of Caracalla to the latest Japanese washlet, with warming, music, lighting, and deodorizing ordered in advance by smartphone, to a new typology of toilet, the “Blue Diversion,” developed as part of the “Reinvent the Toilet Challenge,” issued by the Bill and Melinda Gates Foundation. On the walls: the groundbreaking ergonomic research of Alexander Kira from his 100,000-selling 1976 book The Bathroom, plus two films on divergent toilet experiences, Peter Greenaway’s 26 Bathrooms (1985) and William E. Jones’s Mansfield 1962.
ca. 211–224 Chariot latrine at baths of Caracalla, Rome

Similar in shape—with its circular cutaway—to earlier communal toilets, the single chariot latrine individuates and exalts the act of defecation, a precursor to modern “thrones”...
2013 Twyford range: Triumph of minimalism

With the strapline “A place that’s all yours. For life.” Twyford launches the latest all-white (except for the art-deco inspired “Clarice,” with black seat) range, free of the decoration that routinely adorned the toilet bowl a century earlier—as if puritanical design can combat the inevitable dirt the toilet will confront. Elaborate molded shapes like the lions and dolphins of the Unitas have also been eradicated in favor of minor variations on a single shape...
1976 Wallpaper based on Alexander Kira’s research for the book *The Bathroom.*
alexander kira and the science of “evacuation”
low-tech

1985 Before urbanization exploded around the turn of the millennium, placing unprecedented pressure on toilets and the sewage and water systems that serve them, Sanitation Without Water, a guide to affordable toilets for the world’s poor, was published, full of cheap toilet designs, prescient solutions for an enduring problem...

baffle
“The baffle directs the latrine input (excreta and refuse) to one of the chambers. When that chamber is full, you turn the baffle plate with a handle. The input then falls into the other chamber.”
—Sanitation Without Water, p. 78

1992 ventilated double pit latrine
The World Health Organization picked up the baton of infrastructure-free toilet design with the manual A Guide to the Development of On-Site Sanitation. One design is the classic two-pit solution. Where groundwater or rock lies one to two meters below the ground, a deep pit toilet can be substituted by two shallow pits lined with bricks, filled and emptied alternately...

low-tech: pour flush

1992 ventilated double pit latrine
The World Health Organization picked up the baton of infrastructure-free toilet design with the manual A Guide to the Development of On-Site Sanitation. One design is the classic two-pit solution. Where groundwater or rock lies one to two meters below the ground, a deep pit toilet can be substituted by two shallow pits lined with bricks, filled and emptied alternately...

2014 blue diversion toilet
A winner of the Bill and Melinda Gates “Reinvent the Toilet Challenge,” the Blue Diversion toilet by Eawag and EOOS is one of a new generation of stand-alone toilets, not reliant on scarce water or expensive sewage infrastructure. “The core of the blue diversion toilet is the back wall containing the compact water recovery technology,” the makers explain. “Feces and urine are separately collected under the separating pan. The soiled water from hand-washing, pan cleaning, anal cleansing, and menstrual hygiene is also separated and fully recycled on-site to be used for the same purposes. The blue diversion toilet features an innovative dry source-separating pan, which can be cleaned with on-site recovered water without the use of mechanical parts for cleaning. The squatting pan can be transformed by 90 degrees rotation into a washing pan by foot activation.”
A working model was installed in two informal settlements in Kampala, Uganda in 2013...
Closed loop toilet: NASA’s water recovery system recycles ninety-three percent of the liquids it receives, including urine and sweat, into drinking water. Boiling alone does not remove contaminants without gravity, so the keg-sized distiller also rotates, producing an artificial gravity field that removes impurities...

The Inax Satis, a tankless “integrated” model introduced by Lixil, controlled by a wall-mounted digital control unit. Functions include: automatic seat opening and closing (triggered by a body sensor), automatic deodorizing (air in the bowl is sucked through a charcoal filter and pumped out the back) plus “Plasmacluster,” an ion generator designed to create “fresh air [as] in a forest or near a waterfall,” adjustable front and rear washing, music, nightlight, and emergency alarm.

Big data enters the toilet: TOTO’s Intelligence Toilet II features a urine “sample catcher” that can measure glucose levels (useful for diabetics), urine temperature, and hormone levels (for women trying to conceive). The washlet (which also has the standard features of spray-jet and heated seat etc.) gathers data and communicates with the user’s computer by WiFi, compiling a health report.
Elevator section projected on the wall showing its delicate detailing.

Maps on Hong Kong’s escalator network from *Cities Without Ground* by Adam Frampton, Jonathan D. Solomon, and Clara Wong.

1940s drawings of the Moscow underground highlighting the escalator.

Playable simulation test for a new subway escalator system in Hong Kong.
esculator

Born with the rush of industrial inventiveness and the science fiction of the 1800s, the escalator is at first a literal attraction at the great Expositions and at the Coney Island of the turn of the century. Seamless assisted ascent becomes a universal standard for shoppers. The escalator’s placid movement makes possible the transition from industrial to consumer capitalism, by enabling the shopping mall, as well as the transition from town to metropolis, by knitting together the unforgivingly immense spaces of mass transit. Today we ride a device that is outwardly the same as the device we were riding fifty years ago. As developing countries have risen in recent years, vast new terrains have been conquered by its familiar rhythm, and more people than ever are learning to ride the escalator—though the escalators they ride are basically the same in Buenos Aires or Bangkok, Los Angeles or Lagos. Just as its steady rhythm seamlessly connects different levels of architectural space, so its steady typology aesthetically connects the world. The escalator is a particularly efficient symbol of the state of our global system, churning with continuous dynamism, offering the exact same thing everywhere, while haunted in its hidden guts by the suspicion that business as usual can’t go on forever...

A detailed sectional drawing of a standard escalator—used anywhere around the world—dominates the room, revealing the space this enormous machine takes up within architecture. The installation also presents snapshots of the escalator’s history and possible futures: from its origins in the moving walkway at the 1900 Paris Expo to the exalted escalators of Moscow’s subway in 1940s propaganda, to a mock-up of the evolution of escalator steps from wood to steel, to a playable simulation test for a new subway escalator system in Hong Kong. Also, a road not taken: the only known documentation of a spiral escalator, installed in the London Underground at Holloway Road in 1902...
the myth of the curved escalator

1906 Two workmen stand on a double spiral moving walkway at Holloway Road tube station, London, built by Jesse Reno, the only known working version of a spiral moving walkway at the time.
supervision

2014 Playable simulation for a new subway escalator system in Hong Kong by Arup Realtime Synthetic Environment.

simulation
...by offering smooth transitions from one level to another, the escalator has, more than any other element, transformed our architecture, our urbanism, our infrastructures, our movements, ultimately, our consciousness...
Cities Without Ground, Adam Frampton, Jonathan Solomon, Clare Wong

Central

Escalators have been developed over time to link high-end shopping malls with hotels and corporate lobbies.

Causeway Bay

Originally designed with escalators that extended vertically past a maximum number of shops, both Tower Trigna and New World Centre in Causeway Bay were subsequently equipped with "express escalators" that provide direct connections along lines of efficient flow.
...the escalator as an enabler of further urban extensions...
Improved prototype of a patented horizontally moving elevator by Eindhoven University of Technology Robotics

Capsule used in 2010 to rescue trapped miners in Chile

Scaled prototype of a circular elevator by Lerch Bates
The history of the elevator is one where existing technologies—the safety trap, traction, electric propulsion—combined to trigger a revolution of architecture and the city. As the enabler of the skyscraper (and therefore the modern metropolis), the elevator’s origins first in the mining industry and later in theater scenography were mostly forgotten as it disappeared into the core. Its potential for visual drama diminished in favor of a disconnected experience shuttling between floors, a system that has remained fundamentally unchanged since 1853. In the mid-1990s Otis, one of the pioneers of the original elevator, experimented with a radical new type which would be able to move both horizontally and vertically—a long-held dream of architects—called the Odyssey. After two years of testing, the project was abandoned due to a perceived lack of interest from the market—the patents filed for this event now lie expired in the desk drawers of history.

Together with the engineering department of the Technical University of Eindhoven, a new prototype of the world’s first horizontally moving elevator will be built and tested in the room. Based on the original expired patent by Otis and updated with the use of robot technology, the potential still remains to break the monotony of the box-on-a-rope principle and revolutionize the way we think about architectural and urban infrastructure.

A second invention that promises to end the monopoly of the vertical presented in the room is the Skytrack system developed with Lerch Bates: a motor-driven elevator able to move around buildings in a loop.

Recalling the heroic origins of the elevator in mining, the room also features the capsule used to rescue trapped Chilean miners in 2010.
going down the rope
Throughout history the rope has remained the most important component of the elevator. Known and used from prehistory, the rope reveals a fundamental common misunderstanding and semantic mistake in the origin of the elevator: going down actually preceded going up. While in New York, the alleged “birthplace” of the elevator, elevators reached forty meters in height, elevators in the mineshafts in Central Europe were breaching one kilometer in depth... They have something in common though, in that they both suffer from a law of diminishing returns: what critical floor efficiency ratios (the number of elevators needed to reach a height vs. the available floor area) are for going up, heat and climate control are for mineshafts going down...

-2500 BCE
Grime’s Graves (flint mines)
Norfolk, Britain.
15 m deep

2000 BCE
Great Orme (copper mines)
Wales, Britain.
70 m deep

-300 BCE
Laurion silver mines
Athens, Greece.
92 m deep

Job 28:1-12
1 “People know where to mine silver
and how to refine gold.
2 They know where to dig iron from the earth
and how to smelt copper from rock.
3 They know how to shine light in the darkness
and explore the farthest regions of the earth
as they search in the dark for ore.
4 They sink a mine shaft into the earth
far from where anyone lives.
They descend on ropes, swinging back and forth.
5 Food is grown on the earth above,
but down below, the earth is melted as by fire.
6 Here the rocks contain precious lapis lazuli,
and the dust contains gold.

New Living Translation (NLT), 2007.
Hauling machines are of varied and diverse forms, some of them being made with great skill, and if I am not mistaken, they were unknown to the Ancients. They have been invented in order that water may be drawn from the depths of the earth to which no tunnels reach, and also the excavated material from shafts which are likewise not connected with a tunnel, or if so, only with very long ones. Since shafts are not all of the same depth, there is a great variety among these hauling machines.


In the afternoon of August 5, 2010, thirty-three miners were trapped in the San José copper–gold mine in Chile. After drilling several new shafts, rescue teams were able to send down Fenix rescue modules sixty-nine days after the accident...

The journey to the rock face can take one hour from surface level. The lift cage that transports the workers from the surface to the bottom travels at sixteen metres per second (58 km/h)...
1. Passengers enters the shuttle cabin and the lobby goes up in shaft L3.

2. Shuttle cab arrives at the transit floor.

3. Transit doors open, the shuttle wheels unlock.

4. The shuttle leaves the shaft on to a wheeled platform...
Fundamentals

5. The platform drives in to an orthogonal grid powered by linear motors ...

6. zigzags using the rotation points ...

Reengineering the Odyssey: testing the horizontal elevator car at TU Eindhoven

Central processing unit

Powered swivel wheels

Chassis
Power packs

Range finders
from book for architects

Architecture is an expression of desires, hopes, and ambitions, but also practical needs and financial limitations. Over the past ten years, I have photographed buildings in ordinary and extraordinary contexts. When I look back at these pictures, I am always taken aback by the madness, the complexity, and the irrationality—neither ironic nor bleak, they seem to me a little daunting, but always taken with a kind eye.

Book for Architects is presented in Venice as a projected sequence of still images displayed on two screens, the majority of which have never before been published. Rather than isolating individual buildings, which is commonly seen in architectural photography, my interest is in making images that echo what the built environment actually looks like to me. I don’t use wide-angle or shift lenses, but a standard lens that most closely approximates the perspective of the human eye. The various elements of architecture encountered in the previous fourteen rooms appear here at times clearly and cleanly, and at other times in a layered and convoluted fashion. As such, the photographs represent the impurity and randomness as well as the beauty and imperfection that typify built reality, both past and present.

The following thirty-two page insert entitled from book for architects is a work conceived and designed for this Venice Biennale catalogue. It does not represent the actual projected work.