MASS REUSE: *from* WASTE *to* ARCHITECTURE

HA NHU NGUYEN

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Tutor: Eireen Schreurs
Author: Ha Nhu Nguyen
6013252
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Abstract

This paper is a humanities thesis on the reuse of non-monumental industrial buildings.

Industrial derelicts are the modern-day sandbox for architectural reuse and are celebrated for their hybrid assemblage. This was not always the case in the twentieth century and the early 2000s. The thesis aims to theorize on mass reuse to investigate the meanings these industrial structures acquire through time and obsolescence, as well as the role of the urban context in this paradigm shift in reuse.

Based on a comprehensive review of literature on the buildings and theories of the post-industrial city, tectonic culture, and obsolescence, an analysis of three case studies was carried out involving steps of examining the context and the existing structures, then interpreting its meaning: SESC Pompeía in São Paulo, International Institute of Social History in Amsterdam, and Caixa Forum in Madrid. An archive study, a site visit, and an interview with the architect were carried out for the second case. The three cases were eventually compared to one another to gain a panoramic view of mass reuse.

Three case studies analyzed and compared showed that a reconceived industrial building, representative of obsolescence and disposability, can also evoke acknowledgment, resistance, or even denial. Acknowledging the unique urban context of each case study, the paper closes with some insights: mass accumulates its meaning by circumstances, and these meanings are malleable through time. The findings reveal some insights on obsolescence and shed light on the debate of whether an existing mass inherits a disposability quality that justifies its demolition or not.

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Pacing through the aisles of shelving in the International Institute of Social History (IISH) depot, I was accompanied by the slightly perplexed IISH staff, who seemed curious to know what there was to this back-of-house space I was searching. I wondered the exact same question. Monumental is not a word one uses to describe the archive building on Cruquiusweg. Moreover, the depot's white plastered walls and plastered concrete columns were blatantly architecturally flat. The building was not a typical example of reuse like Tate Modern and was barely written about or known by the public. Why would I choose to study this building in the first place? Perhaps the charm that lured me to this rehabilitated warehouse lay in its mediocrity. Mediocre, not in the sense of simplistic reduction in architectural expression, but in its common non-monumental program, in its industrial root of the mundane.

My naive interest in industrial reuse architecture, like silos and warehouses, dates back to when I was studying architecture in Montréal. The city, often I would call non-jokingly, was the equivalent of a non-Societ capital of Brutalism.[1] The city's many huge industrial structures, often in concrete and in the Brutalist style, were soon due for an upgrade. There, as I was on my usual jogs along La Chine canal, I always caught my eyes wandering, searching for the Silos No. Five, a complex of crumbly-looking malting silos and grain elevators whose imposing presence stretched along the entire length of the Pointe-du-Moulin. *(figure 01*) Once a symbol of technological prowess, the complex was decommissioned in 1996 to remain the last vestige of Montréal's industrial heyday.[2] Only recently has attention been refocused on finding solutions to save the rapidly degrading, non-heritage structures. Silo No. Five reminds me of reuse cases of industrial shells like the Tate Modern by Herzog & de Meuron or, more recently, the rehabilitation project The Silo by Cobe. They beg the question: Since when did industrial remnants become valuable sites for reuse? Are they not just a heap of crumbling mass?

Mass appears to be the key medium in industrial reuse. Reusing a building is precisely reconceiving an accumulation of aged material – a mass. When, what, and how to keep or demolish this solid ensemble, partially or entirely, is a topical question in general reuse practice. Material reuse is one crucial campus that seeks to investigate these questions intensively through material and tectonic lenses. Then, I thought, what about mass in and of itself? Why does nobody talk about reusing mass? This question was specific for industrial reuse since the base structure one starts with is rarely a neutral pile (of material) but one that inherits obsolescence and disposability, which

1. With all its Brutalist buildings like Habitat '67 by Moshe Safdie, the Olumpic Village, Place Bonaveture, among others, and last but not least, Montreal's signature: its Brutalist metro stations.

2. Répertoire du patrimoine culturel du Québec."Silo À Grain No 5."

Fig. 01 Silo No.5 remains the last vestige of Montréal's industrial heyday waiting an overdue refurbishment.

ultimately justifies its demolition. Here, industrial mass resembles waste. How exactly did we transition from the monumental in heritage preservation to the disposable in industrial reuse? Moreover, how does tracing this shift help us better understand the morphology and semantics of mass in time?

Deindustrialization in the late twentieth century signified a paradigm shift from the monumental to the disposable as a prerequisite for reuse. With the economy of scale and the transition to serviced-based societies pushing industrial activities to cities' periphery, existing industrial shells near city centers, such as warehouses and factories, became largely vulnerable to demolition for obsolescence. This relocation incentivized the uncommon idea of rehabilitating a non-monumental industrial structure for a relatively common, new function. One example is the IISH (1987-1989), a former heavyweight cacao warehouse converted into an institute and archive by Atelier Pro.[3] As trading activities slowly vanished from Amsterdam's eastern harbor, the old cocoa warehouse was rendered obsolete only after twenty-five years of occupancy. Simultaneously, its massive heavyweight structure made it unfitting for housing and non-disposable. Described by the architect as a "remembrance of the city," IISH's bifurcated façade and its assiduously metallic-coated svelte columns *(figure 02)* made it a stable point in the changing urban fabric.[4] As mundane as a shell used to be filled and then emptied again, the building no longer remained an obsoleting mass but one whose unflinching solidity resisted urban redevelopment.

The IISH building was the starting point, and two more cases were studied to grasp the panorama of mass reuse. In São Paulo places the second case study, the SESC Pompeía, a former drum factory, transformed into an all-inclusive leisure and cultural center.[5] With the stripped-back existing mass and the three new tectonic masses in the complex, SESC was a sandbox for architectural and cultural experimentations. The last of the three cases is the Caixa Forum in Madrid (2001-2008), a decommissioned power station turned into a levitating solid mass housing arts and cultural events.[6]

On the canvas of a deindustrialized decadent landscape, industrial waste transforms into architecture through multiple underlying forces – urban, social, cultural, and tectonic – and expands their delineation beyond obsolescence and disposability. By perceiving an existing structure as a stripped-back body of solid matter, I strive to unveil layers of social, cultural, and political connotations attached to a neutral mass. Obsolescence and disposability, which are attributes assumed to be inherent to an existing mass, are now irrelevant characters. All of a sudden, a mass lies there, naked and mundane.

3. Atelier Pro. "International Institute of Social History (IISG), Amsterdam."

4. van Beek, Hans. In discussion with the author. March 2024.

5. Bo Bardi, Lina, Marcelo Carvalho Ferraz, P. M. Bardi Instituto Lina Bo e, and Chateaubriand Museu de Arte de São Paulo Assis. Lina Bo Bardi. Milano, São Paulo: Charta ; Instituto Lina Bo e P.M. Bardi, 1994, 158-174.

6. Herzog & de Meuron ,"201 Caixaforum Madrid."

MASS

The looseness and shapelessness of mass leave immense room for interpretation. As sculpting masses and carving voids is inherently an architectural practice, we, by default, assume one common definition of mass, referring to "a large body of matter with no definite shape."[7] It is crucial to note that mass has a consistent density yet invariant states – solid, liquid, gas – for it reflects the types of composing molecules and atoms and thus, is a fundamental property of matter. In social settings, mass refers to an ensemble of people or objects crowded together. Mass can also be used as a verb and synonymizes "to assemble" or "to accumulate" matter into a single body – a mass. In architecture, the notion of a tectonic mass is relevant, of which the German term architekton was first used in 1830 in Karl Otfried Muller's Handbuch der Archaologie de Kunst.[8] He defined architekton as art forms wherein architecture sat at the apex as a mixed tectonic mass unifying arts and functionality. Here, he departed from the earlier etymology of the word, emphasizing the joint as the tectonic to leave out their forms as tectonic in and of itself. Thenceforth, architekton was extensively elaborated on with various other delineations, from representational to ontological to metaphorical, seen in the architectural mass and between the building and its site. This notion of architekton, alongside the umbrella term mass and its loose definitions, lays the foundation for our discussion of three industrial reuse cases soon to follow.

> "[…] everything turns out as much on exactly how something is realized as on an overt manifestation of its form. This is not to deny spatial ingenuity but rather to heighten its character through its precise realization." [9]

THE POST-INDUSTRIAL CITY

To grasp why industrial reuse is to first peek into the pre-industrial reuse era. Throughout the nineteenth century, heritage preservation was the dominant paradigm of architectural reuse. Amongst the key figures in this discourse of preservation are, on one end, Viollet-le-Duc, who advocates for reconstructing an edifice as the ultimate means of preservation, and on the other end, John Ruskin and William Morris, who adopted a more political stance of anti-restoration by preserving the patina of wear and tear.[10] Their stances, albeit opposite, are heavily engaged with material as the primary medium to convey time. One thing is clear: reuse undertakings

7.Oxford Dictionary

8.Frampton, Kenneth, and John Cava. Studies in Tectonic Culture : The Poetics of Construction in Nineteenth and Twentieth Century Architecture. 9. ed. Cambridge, Mass.: MIT, 1996, 5-27.

9. Frampton, Studies in Tectonic Culture : The Poetics of Construction in Nineteenth and Twentieth Century Architecture, 26.

foregrounded the importance of preserving the age value of an edifice and, thus, mainly revolved around heritage preservation of monuments. In this sense, a building must first be monumental or similarly must bear a specific social or cultural weight reflecting permanence and stability to be considered for reuse. This trend continued into the years following World War II. In short, an edifice's existent monumentality formed the basis for its reuse-worthiness.

The surge in industrial reuse in the late twentieth century contradicted this prerequisite of monumentality in reuse. In a 1973 publication titled The Coming of Post-Industrial Society: A Venture in Social Forecasting, American sociologist Daniel Bell sketched the evolution of society from agrarian to industrial and then de-industrial. [11] Tracing people's flow in the post-industrial city allowed me to grasp this paradigm shift's underlying force. Early in the century, national agendas of economic resurrection and growing populations moving out of city centers brought about a boom in industrial infrastructure construction in the city. Then came the war. In the aftermath of World War II, as people flooded back to the commercialized city centers, industrial facilities were pushed away to the suburban periphery, where regulations were less strict, leaving vast acres of those industrial facilities, including factories, mills, and warehouses, vacant. Thenceforth, the practice of adaptive reuse, although not officially coined until the later years of the 1970s, germinated early in the decade.[12] When the original function was no longer valid, new uses were sought out, and the existing mass was appropriated, usually with the aesthetic of a hybrid assemblage. As monumentality was no longer the sole reason determinant of reuse-worthiness, obsolescence presented new opportunities for salvation. Adaptive reuse is rooted in seeing the obsolete's potential beyond the monumental.

OBSOLESCENCE

As monumentality was no longer the common denominator of architectural reuse, obsolescence presented new opportunities for salvation. The architectural scene of the late 1900s saw a paradigm shift from an age-sick attitude towards an age-driven fascination with modernity. This paradigm shift sowed various theories on obsolescence. Abraham discussed this notion extensively in his book and pointed out that the 1960s was one intense decade when designing for obsolescence was mainly to "fix," "reverse," or "repair" the obsoleting existing structure.[13] Those words signified a cry for architectural resuscitation, as if they implied something was broken. He then introduces Archigram's critical stance against this,

10. Stanley Price, Nicholas, M. Kirby Talley, and Alessandra Melucco Vaccaro. Historical and Philosophical Issues in the Conservation of Cultural Heritage. Readings in Conservation; 1996: 12. Los Angeles, Calif.: Getty Conservation Institute, 1996, 316.

11. Bell, Daniel. The Coming of Post-Industrial Society : A Venture in Social Forecasting. Special anniversary ed. New York: Basic Books, 1999.

12. Abramson, Daniel M. Obsolescence : An Architectural History. Chicago: University of Chicago Press, 2016, 115.

13. Abramson, Obsolescence : An Architectural History, 99.

perceiving obsolescence as an inevitable natural phenomenon, and that it "should happen, freeing people to choose and re- choose the best and latest modes of human living and invention." What is the fine line between merely aging and obsolescence? How does one define what is old and what is outdated, and then what is obsolete and what is modern?

To add another piece to the puzzle, Irénée Scalbert's text 'On the Edge of the Ordinary,' written on Caruso St John's work, proposed the architects' attitude towards obsolescence of "seeing things as they are" since there is "no good or bad site"[14]. The architects, with typical Swiss neutrality, critically regarded obsolescence as merely a social and economic construct that by no means justified demolition.

Before I dwell deeper into my rumination about the obsoleting mass, I now return to the naked, neutral mass. Obsolescence implies an assigned quality; nakedness does not. To investigate mass reuse, I will depart from the naked mass to peel off layers of its preconceptions throughout time, from the disposable to the resisting and then to the commemorative, amongst other unexpected revelations. The discussion of three industrial reuse cases that soon follow serves to explore and construct my thesis that industrial mass, intuitively associated with obsolescence and disposability, bears no such inherent value. It is only through being re-materialized by agencies of multiple forces at play - architectural, urban, social, cultural, and tectonic – that the naked amasses its meanings.

CHAPTER 1
RECONNAISSANCE: A MASS FOR THE MASS

THE UGLY AND A HEAP OF WASTE

One of the early industrial reuse cases experimenting with mass is SESC Pompeía in São Paulo (1977-1986), a paradigmatic project by architect Lina Bo Bardi. The Centro de Lazer Fábrica da Pompéia, now known as SESC Pompéia, is a democratic cultural and leisure center reborn from an abandoned steel barrel factory on the verge of demolition.[15] At that time in Brazil, adaptive reuse of industrial spaces had yet to enter the architectural mainstream. As the nation was approaching the end of a two-decade-long military dictatorship starting in 1964, its architectural scene was constructed on ambitious European imports of modernist visions, somewhat estranged from the Brazilian people's culture and their daily living.[16] Somewhere between brutal and delicate, strange and familiar, but definitely ugly, as per Bo Bard's words, the SESC experimental reuse was unconventional: a stripped-back mass that was preserved almost entirely

14. Scalbert, Irénée. "On the Edge of Ordinary, Two Houses by Caruso St John." Archis, March 1995, 50-61.

15. Bo Bardi and Ferraz, Lina Bo Bardi, 158-174.

16. Motta, Rodrigo Patto SÁ. "The 1964 Coup and the 'Red Menace'." In A Present Past. The Brazilian Military Dictatorship and the 1964 Coup, 7-23: Liverpool University Press, 2023. In 1964, a military coup ousted Brazil's leftist president João Goulart. The subsequent dictatorship, lasting over two decades, restricted freedoms but achieved some economic growth. This period of repression and development continues to shape Brazilian society.

Fig. 2 The SESC Pompéia in São Paulo. Architect: Lina Bo Bardi

on the exterior side and in the interior, soon joined by three hulking concrete towers to form a leisure complexed for the mass. *(figure 2)*

In 1971, The SESC—Serviço Social do Comércio, translated as Trade Social Services—acquired the the old Irmãos Mauser, a decommissioned steel barrel factory in Pompeía, with the plan of tearing it down (Lima, 2013). *(figure 3)* The SESC was a non-profit organization created in 1946 to provide educational and cultural programs and health services to the working class, ultimately preventing potential uprisings in Brazil's working class.[17] To fulfill its mission, the organization scattered several facilities around the country, amongst which was the next-in-line facility in Pompeia, the traditional immigrant and working-class neighborhood in São Paulo. To the SESC, what it had obtained through the public auction was simply a city lot for a new building designed by a renowned architect, like its previously built facilities. The degrading factory complex was a heap of waste waiting to be cleared out.

The SESC already occupied the old factory in 1973, in an ad-hoc manner, until in 1975, Architect Júlio Neves proposed a scheme for the new leisure center which required complete demolition of the existing sheds and thus rejected "as being too costly" [18]. This turn of events led the SESC to commission Bo Bardi as its principal architect and commenced their decade-long collaboration on the unconventional collective facility.

Bo Bardi saw something in the abandoned site that Neves did not. Describing her first visit to the Pompeía steel barrel factory in 1976, the Italian architect was drawn to the rational structures of the existing sheds, conceived in the British factory style from the beginning of European industrialization in the mid-nineteenth century.[19] With her keen eyes, she appreciated the elegant concrete structure crafted by the French engineer François Hennebique, which turned out to be the only concrete building of its kind in Brazil.[19] Returning a few days later, on a Saturday, the architect encountered a different convivial scene, of which she recalled "a joyous crowd of children, parents, and elderly people moving from one pavilion to the next."[20] There, the solitary Hennebique structure sank into the backdrop as the people became the protagonists of space in the foreground. Awestruck by the concrete structures but even more touched by the lively makeshift occupancy happening on the abandoned site, she knew she must preserve the building to maintain and amplify all that happiness. How exactly did Lina bring the obsoleting structure and people's happiness together. Then, how do we look at this architecture through the lens of mass reuse?

"We know that favelas, slums, and shanty towns offer a sense of community and interaction superior to that of planned neighborhoods […] with a sense of engaged intervention to enhance life as found". [21]

In his seminal work, "L'Archéologie du Savoir", Foucault introduced the concept "L'Histoire est ce qui transforme des Documents en Monuments", translated as "History is what transofrms documents into monuments." He emphasized the crucial link between historical record and how they are interpreted and constructed into narratives by historians, to extend beyond mere documentary. (Foucault, year)

17, Bo Bardi and Ferraz, Lina Bo Bardi, 158-174.

18, Lima, Zeuler Rocha Mello de Almeida, and Barry Bergdoll. Lina Bo Bardi. New Haven: Yale University Press, 2013.

19, Copans, Richard. "La Citadelle Du Loisir : Le Centre Social Pompeia À São Paulo." 2012.

20. Bo Bardi and Ferraz, Lina Bo Bardi, 158-174.

21. Bo Bardi and Ferraz, Lina Bo Bardi, 158-174.

22. Title borrowed a quote from Lina Bo Bardi.

23. Lima and Bergdoll. Lina Bo Bardi.

24. Bo Bardi and Ferraz, Lina Bo Bardi, 158-174.

THE LESS JUNK, THE BETTER [22]

Without erasing the site's history of hard labor, Bo Bardi turned the abandoned complex into a sandbox for her own architectural and social experimentation. Two main parts constituted the entire complex, constructed in two phases: seven reused clusters of nineteenth industrial sheds (1982) and three new tower additions connected by flyovers for the sports complex (1986). In the existing facilities, her insistence on maintaining the integrity of the existing structure meant the simplicity of new interventions. "We just added a few things: a water pond and a fireplace.", the architect commented, "The less junk, the better." [23]. These words, as I interpret them, signify that the existing space of impotence was the whole architecture in and of itself and should be left untampered with. Whatever design interventions were to be made were rather junk added to an already complete whole.

This inverse interpretation of mass and disposability is evident in Bo Bardi's laissez-faire approach to refurbishing the old factory. Akin to industrial archaeology, the architect retained the existing monolithic structure of the workshops, like an emblem of a nineteenth-century industrial blueprint, precisely as it was: an assembly of concrete columns and beams, filled with red bricks to give the façade a reading almost resembling a concrete bas-relief on brickworks. She also preserved the asymmetric pointed roofs, one of whose slopes terminated abruptly and became a vertical glass wall. From afar, one could not tell that the shed had been altered. What is more interesting lay beneath the skin. Bo Bardi's admiration of the Hennebique structure led to the process of stripping the building. The architect pulled down any unnecessary partitions to free up the interior space for the workshops. On the other side of the façade wall, all plaster renderings were stripped off and sandblasted to reveal the red brick infills and the concrete columns behind. Like a search for the buildings' essence, the architect gave the existing mass a new reading by simply revealing their basic structure and tectonics, raw and unpretentious.

There is an unspoken mutual respect that happened where the old met the new. Interiorly, the rows of elegantly designed Hennebique pillars were retained in whole, wider at the base, and tapered off as they met the ceiling. [24] Throughout the main space, differentiation of privacy levels was created by the addition of mezzanines as rooms for library, exhibition, and multifunctional programs, and by the diversity of sizes and forms variations alternatives as seen in the concrete seatings and moveable

Fig. 3 The old Irmãos Mauser, a decommissioned steel barrel factory where the SESC Pompeía now stands

Fig. 4 The interior of SESC with no junctions between the old and the new and the old mass. To the left is the added mezzannine connected by stairs spaced generously between the old Henneique columns. Far back is the existing brickwall stripped off its plaster.

furniture. Except for the intensity of colors used to paint the plumbings to enliven the space fitting for leisurely programs, the patina of wear and tear in old architectural elements was kept entirely unaltered. What drew me in is not how she retained the old immaculately but how the old encountered the new in space. The architect refused to add doors or partitions that hindered movement, creating a large span of fluid interior space. The rule of no touching is also evident in areas dedicated to workshop programs, where low walls serve to enclose smaller, circular spaces for collaboration. *(figure 3)* Pacing through space resembles a walk through a museum of labor; minimal junctions were present between the new elements and the old ones. No partition touched the ceiling. No added stairs touched the Hennebique columns. The old structure stood like museum artifacts, whereas humans and furniture were free to be moved around them. *(figure 4)* Even the presence of low walls was somewhat transient. Here, flexibility did not stem from resourcefulness or economy of material; it is an act of honoring the decadent traces of time present in all corners: in the beams, in the columns, in the ceiling. I recall Muller's words on the architekton echoing in Frampton's book,

> "[…] utensils, vases, dwellings, and meeting places of men, which surely form and develop on the one hand due to their application and on the other due to their conformity to sentiments and notions of art. We called this string of mixed activities tectonic; their peak is architecture, which mostly through necessity rises high and can be a powerful representation of the deapest feelings. […]" [26]

Regarding sentiments, yet in another space, the intrigued visitor was delighted with a little surprise: a small stream. The body of water, filled with small pebbles to the bottom, wandered through intentionally placed modular furniture as it simultaneously carved out its path on the harsh concrete floor.[27] Looking more to the right of the serene stream, one found a fireplace, a space for gathering. Like an exception to the rule of non-touching, here, the architect brought attention back to the brut concrete floor with a soft curving gesture. Accompanying water with fire, Bo Bardi transformed two spans of the factories into a sublime landscape unprecedented in the rough industrial shell.

A CONCRETE TRIBUTE TO LABOR

The soft wandering stream is immediately contrasted by the eruption of three hulking concrete towers from the ground, as curious as they are imposing. *(figure 2)* The architect's interpretation of industrial vernacular

25. Plevoets, Bie, and Koenraad Van Cleempoel. Adaptive Reuse of the Built Heritage : Concepts and Cases of an Emerging Discipline. London: Routledge, Taylor & Francis Group, 2019. 132-133.

26. Frampton, Studies in Tectonic Culture : The Poetics of Construction in Nineteenth and Twentieth Century Architecture,

27. Ferraz, Marcelo, "The Making of Sesc Pompéia by Marcelo Ferraz."

was two estranged concrete rectangular prisms with the solidity of military fortresses and a concrete chimney tower serving as a water tank, slightly tapering cylindrical form. The two rectangular towers are connected by a crisscross of pre-stressed concrete walkways, resembling conveyor belts used for transporting grains. Why did the architect create such a disruptive presence in the backdrop of the well-composed redbrick façade of the sheds?

The language of duality was expressed through the materials of the new concrete masses. Bo Bardi purposedly employed material logic as a tool to create an architecture for the people, which she called "poor architecture," where poor "not as penury, but in the artisanal sense of achieving the maximum communication and dignity with minimal, humbler means."[27] Under the umbrella term poor, Codebo related Bo Bardi's material logic to the Italian movement of Arte Povera. [28] This philosophy is echoed in architect Lina Bo Bardi's "Architettura Povera," [29] which emphasizes social awareness through simple and unpretentious materials. The original expression poor of Arte Povera immediately recalls its economic characterization with a negative undertone. Nevertheless, in the Italian language, povera refers to simplicity in describing Poverist art: no jargon, no excessive sophistication, no artificiality, direct and effective. The use of poor material is most evident in SESC windows. Cavernous

Fig. 5 "Poor material" of Lina Bo Bardi. Concrete texture of the chimney tower juxtaposed over the brick shed roofs of the old factory complex.

28. Codebò, A. The architect weaving the city: Lina Bo Bardi's praxis in the SESC Pompeia. V!RUS, 14.

28. The Italian term "architettura povera" literally means "poor art," but the term poor refers to the Arte Povera movement, which originated in the late 1960s in Italy. It refers to the aesthetic preoccupations of the Italian movement, whose artists explored a range of unconventional processes and nontraditional 'everyday' materials to challenge consumerism and engage viewer interaction.

amoeba-shaped apertures punched through unpolished concrete in fluid and varying forms or randomly punctured square openings appeared brut and unintended at first glance but whose corners were carefully beveled to deflect rainwater away from the interior like a drip cap.

Alternatively, poor material was also rationally employed in the concrete chimney. Inspired by Luís Barragán concrete used in his tall sculptures at MoMA's 1976 exhibition, Bo Bardi emulated their irregular, striped, and brut appearance.[30] With the help of engineer Toshio Ueno to devise her wooden system of concrete casting, Bo Bardi created an irregular texturized chimney tower that evoked an image of running concreted around the tower, once again highlighting the act of making and labor.[31] *(Figure 5)*. The tectonics of concrete block, seemingly opposing in their meticulous finishing of the apertures and their unhumbled scales, was rational employment of poor material, not for its resourcefulness in an economic sense, but for its roots in the humus of Brazilian popular culture. Through emulation, Bo Bardi leaned on a preconceived idea of a mass to reverse and question it in her architectural dialectic.

On commemoration, the architect once wrote about Post-modernism and compared it to "Retromania." Quoting Foucault, "History taken as a Monument and not as a Document", [32] she critically emphasized the importance of narrating history through architecture, creating monuments as sites of memories. The architect went on to claim, "Of course, Monument does not only refer to architect but also to the "collective actions of the great social enterprises."[33] What had been conceived at SESC Pompeia manifested the architect's idea of what a modern monument should be.

The old factory was no longer a heap of mass waiting to be swept away. Sometimes heavy, sometimes light. Sometimes serene like the miniaturized landscape the architect created within the old warehouse, sometimes crude like the concrete towers whose images linked to the military fortress as metaphors of war and to the chimney as a tribute of labor. The old factory site became a mass that was no longer disposable but evocative and commemorative. Through languages of reconnaissance, emulation, and then reversal of ultimate waste, SESC Pompeía was converted from waste to architecture. It is the kind of architecture that materializes not through superfluous sophistication but with the simplest means possible.

30. Lima, Zeuler Rocha Mello de Almeida, and Barry Bergdoll. Lina Bo Bardi. New Haven: Yale University Press, 2013.

31. Ferraz, Marcelo, "The Making of Sesc Pompéia by Marcelo Ferraz."

32. In his seminal work, "L'Archéologie du Savoir", Foucault introduced the concept "L'Histoire est ce qui transforme des Documents en Monuments", translated as "History is what transofrms documents into monuments." He emphasized the crucial link between historical record and how they are interpreted and constructed into narratives by historians, to extend beyond mere documentary. (Foucault, year)

33. Bo Bardi and Ferraz, Lina Bo Bardi, 158-174.

Fig.6 The International Institute of Social History in Amsterdam. Architect: Atelier Pro

CHAPTER 2
INERTIA: FROM STABILITY TO RESISTANCE

THE BLACK SHEEP OF THE FAMILY

A year after the SESC Pompeía's completion, over the Atlantic Ocean, the Netherlands saw the refurbishment of a cocoa warehouse underway. The second case study is the International Institute of Social History in Amsterdam, hereby referred to as IISH, a former harbor warehouse converted into an institute and archive by Atelier Pro from 1987 to 1989. *(figure 5)* The IISH was amongst the early examples in Europe of reusing an industrial structure for a common, non-monumental new function. Flicking through the photo archive of the IISH from its industrial heyday as the Koning Willem I to its current house on the Cruquiuseiland, one thing stands out to the wandering eyes: its relationship to mass. *(figure 6)* The architectural typology of an archive store, which once housed stacked cocoa bags, was appropriated to store the confidential papers of Karl Marx.[34] This observation, in fact, marked the point of departure for my thesis on mass reuse. "Was it because the building was too heavy that the city did not want to go through the hassle of demolition?" I asked myself. The building is a mass of – in the most literal sense – masses.

The existing King Willem I municipal warehouse was built in 1961 when the Eastern Dockland was a peripheral area with little future. As a result of rapid urban densification in the center and economy of scale along the harbor, the city had already started to relocate its port infrastructures towards the city's west as early as 1913.[35] The vacant industrial sites in the Eastern Docklands were then used to construct storage facilities for inland shipping to avoid import duties, among which was the municipal warehouse King Willem I. Little did the city know that within the next two decades, the port, along with its connecting railroad network, would soon disappear from the harbor for good.

Elaborating on this post-industrial landscape, Bell described the global transition of cities from a productivity-driven society towards a service-based society.[36] Amsterdam, among others, did not escape this reality of deindustrialization. In the 1980s, the Eastern Docklands saw many trading activities and goods vanishing from the harbor, leaving numerous industrial sites degrading. The municipality of Amsterdam saw this as an opportunity and put forward a waterfront redevelopment plan to revitalize its inner city. Here, industrial derelicts were read as flat city plots precious to incentives to market, to sell, to deliver messages, or, particularly in this case, to house. Urban renewal cases such as that of the Shell terrain in Amsterdam-North were amongst the many

34. van Beek, Hans , Jaap Kloosterman, and Anne Lavelle. Moving Marx : The International Institute of Social History at 31 Cruquiusweg, Amsterdam. Amsterdam: Stichting Beheer IISG, 1989.

35. Singels, Han, Geert Mak, and Vertalers Hapax. De Eilanden : Het Amsterdams Oostelijk Havengebied in Stadsgezichten 1974-2002. 1e dr. ed. Amsterdam: De Verbeelding, 2002.

36. Bell, The Coming of Post-Industrial Society : A Venture in Social Forecasting.

examples whose industrial sites, unfortunately, ended up totally wiped out to be replaced with "bland showpiece architecture"[37] *(figure 06)*. Nevertheless, this urban redevelopment achieved positive results in the Eastern Docklands, wherein many warehouses were given new residential functions. Terminating the row of bonded warehouses on Zeeburgerkade next to King Willem I, Pakhuis Zondag was converted from a former tea warehouse into a sixty-unit housing block. Yet our cocoa warehouse saw a different future due to its heavyweight concrete construction deemed unfitting for housing. The "hermetically sealed block" needed to be cut open. [38] *(figure 7)*



Fig. 6 The unloading, loading, and storing of cocoa mass in the former King Willem I warehouse. Archive photos.

THE RESISTING MASS

Willem King, I was a misplaced colossus on Cruquiusweg with its unflinching solidity. Seen in the 1985 Eastern Port Area Structural sketch, to the west of the existing warehouse was the city's rigid plan, envisioning a bridge connecting the islands and a new construction for social housing.[39] *(figure 9)*. This exact structural grid laid out by the city indicated that King Willem I was an impeding mass on Veelan, which hindered the connection between Cruquiuseiland and Borneoeiland. Urbanistically, the monolithic concrete block had to disappear. Two reasons that had emerged thus far pointed towards the IISH's demolition, yet the sturdy mass resisted. Demolition was not an obvious choice due to its heavyweight construction. The building was constructed only twenty-five years prior and was in solid condition. As the original function or residential function was no longer fitting, the city began finding new programs to appropriate the existing mass. The heavyweight warehouse became an ideal shell, weighing many tons, to house the similarly massive archival of the IISH. Thenceforth, Veelan was built around the stubborn mass with a bend. Elaborating on the similarity in function of warehouse and IISH, in the 1989-1990s Yearbook, the authors claimed that "an archive store is not essentially different from a warehouse."[40] While it was used to praise the simple functionality of the IISH, the comparison reduced the building's architecture to plain mediocrity. The intervened façade told us something

37. "Lost Forever: Amsterdam's Shell Terrain Transformed." Failed Architecture.

38. van Beek, Hans, and Marcel Teunissen. Hans Van Beek, Architect : Kracht Door Wisselwerking : Van Couperusduin Tot Meander. Eindhoven: Lecturis, 2017.

39. Abrahamse, Jaap Evert. Eastern Harbour District Amsterdam : Urbanism and Architectura. Rotterdam: Nai Publishers, 2008.

40. Brouwers, Ruud, Bernard Colenbrander, Hans van Dijk, Lily Hermans, and Architectuurinstituut Nederlands. Architectuur in Nederland : Jaarboek 1989/1990. Deventer: Van Loghum Slaterus, 1990, 38. A biennial publication compiled by the Dutch Architectural Institute shows a selected range of buildings constructed in the two-year period, accompanied by short-themed writings.

Fig. 7 The “hermetically sealed block” seen from the South facade.

Fig. 8 The bifurcated mass of the IISH, with temple-like exterior stairs.

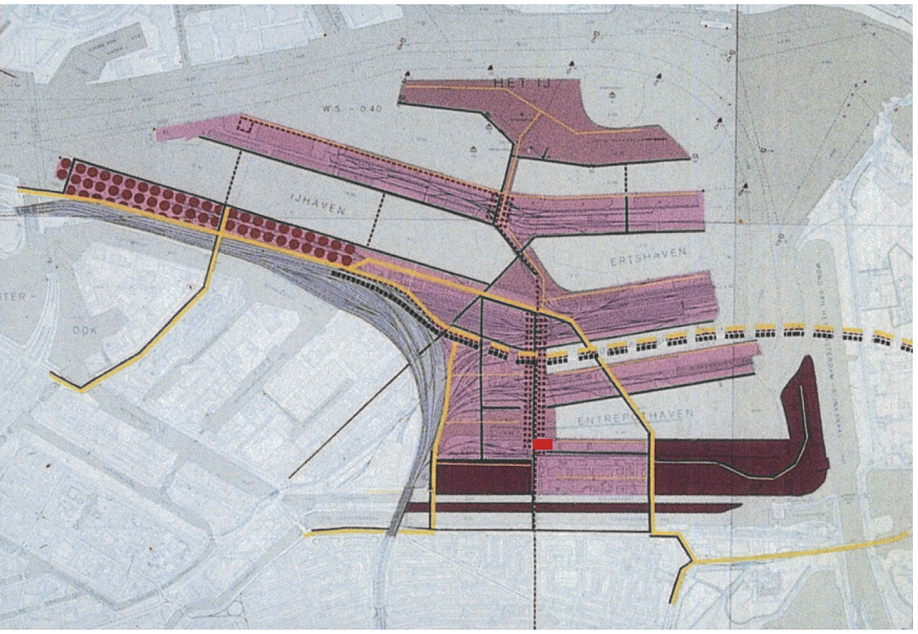

Fig. 9 1985 Structural Sketch of Amsterdam Eastern Harbour with rough position of IISH in red. Annotation by author.

else. With a simple yet effective town-planning gesture, the awkward mass was bifurcated precisely into two spheres – private and public – in a dialogue with its urban context. *(figure 10)* IISG remained a stable point in a changing landscape between Cruquiuseiland and Borneokade, but it was no longer one that impeded. Moreover, this bifurcation of the mass means that Atelier Pro outwardly introduced the new public function to the unaltered existing store of the depot and put them on the same scale of importance. Does the new archive then remain just a warehouse, with the sole purpose of being filled and emptied again, or does its urban mass already tell us a different narrative?

> "Old buildings symbolize a built memory and a tangible mass, thus adding lift to the image of a city of transience." [41]

Atelier Pro's intervention was a mission to shave off some of the heaviness of the stubborn mass. Interiorly, parts of the existing heavy concrete slabs were bulldozed to make place for a new atrium. (figure 16). On the ground floor and first floor, concrete columns of 120mm diameter support the floor, with a load capacity of 4000kg per square meter. In the upper floors, columns' cross-sections diminished in size, with a diameter of 90cm, supporting approximately 2000kg per square meter.[42] Thanks to this sturdy structure, the architect was able to hang a modern glass wall like a curtain, gracing the IISH with a panoramic view of the Entrepothaven. The intervention simultaneously revealed something at stake: the tectonics of

41. Christiaanse, Kees, and Jessica Bridger. Textbook : Collected Texts on the Built Environment, 1990-2018. Rotterdam: Nai010 Publishers, 2018, 76

42. Melis, Liesbeth. "Massiviteit Doorbroken. Atelier Pro Verbouwt Pakhuis." de Architect 20 (1989): 68-73.

the columns did not quite align with their size. Still massive, those tapering concrete columns holding up cacao bags are now three-story svelte slender columns, assiduously coated with metallic paint.[43] Ironic was the attempt to lighten the heavyweight concrete column immediately contrasted by the light steel construction of adjacent stairs, walkways, and railings. To a certain degree of dematerialization, the silver-grey coat of paint could not mask the very massiveness of the column behind. "What happened to these same columns in the depot?" I asked myself. I had to find out.

In the depôt on the upper floors, I was faced with rows of color-coded warehouse shelvings placed in between blatantly white-plastered columns. *(figure 10)* Hardly anything had been altered except for the removed rows of tiny windows and insulated exterior walls for climate control and paper protection. What I learned about the IISH structure from the kind of IISH staff member who offered me the tour of the depot was revealing. This typology of warehouses was specific to cacao and was designed with massiveness as the core principle.[44] The skeleton must be robust, while the shell, including the roof and walls, remains minimal. Similarly, at the IISH, the façade walls consist of a thick concrete slab, and a light steel structure supports the roof. Cocoa is highly inflammable and cannot be extinguished by water once burning. In a fire emergency, this means that the roof could explode vertically and then fall back, but the structure must be as massive as possible to stay undisturbed. Here, the column becomes the most stable point within the building.

A TEMPLE FOR MARX

Despite all this effort of the architect to shave off the heaviness, the building continued to consolidate its stability on the south façade facing Veelan. The effect of the box had not been entirely canceled, or at least it should not be. After all, this is an archive storage, and light penetration was strictly regulated. As one ascended the flights of diagonal exterior stairs, the building gave an impression of a temple. *(figure 8)* Here, once passed through the entrance, the visitor was met with a three-storey atrium filled with light as it opened towards the port in full glaze. *(figure 6)* If he chose to be instead not lured by the light and aimed to reach the study rooms on the former loading dock, he needed to continue ascending. How come such an architecture for social history turned out to resemble a temple so closely? Truth revealed, the interpretation was confirmed as Hans van Beek elaborated on their initial idea behind the dematerialization of the columns.

> "You walk in and you see the columns. You instantly know this is the place to be. This is where you should be at this exact moment." [45]

43. van Beek, Hans , Jaap Kloosterman, and Anne Lavelle. Moving Marx : The International Institute of Social History at 31 Cruquiusweg, Amsterdam. Amsterdam: Stichting Beheer IISG, 1989.

44. van Veen, Ellen. In discussion with the author. March 2024.

45. van Beek, Hans. In discussion with the author. March 2024.

Fig. 10 Interior of the depot section of the IISH with the existing mushroom head concrete columns retained and plastered.

Hans van Beek sketched out the column in pencil, releasing the pressure gradually as he gestured its tapering towards the ceiling. *(figure 13)* To create one unified entity, the architect smoothed three columns into one big tall column and then coated it with a layer of metallic paint. The new combined column was then terminated with the mushroom capital sitting slightly beneath a suspended ceiling, without subtlety, as if to define what was old and what was new clearly, wherein the column belonged to the former. “We wanted to make an Egyptian column in old Egyptian temples. We wanted to make the atrium space as special as possible.” as the architect recalled, “These columns are not the same as those elsewhere in the building.”[46] They contrasted the brutal nakedness of concrete by emulating the aesthetic of steel and making special out of exaggerating artificiality. The initial assumption that this steel-like paint represented an attempt to align with a modern aesthetic soon vanished. Inspired by Egyptian columns seen at Kanak temple, the deliberate tectonic decision was not merely economically driven but a deliberate architectural gesture to accentuate the stability of the mass.

Through dematerialization, the column was not a mere attempt to modernize; it aimed to do the exact opposite: to monumentalize. With such a building as mundane as the King Willem I warehouse, any spatial intervention would have been possible as long as regularity usually implied flexibility. Atelier Pro’s unambiguous intervention to prise open the solid mass testified to its success. The ponderous solid mass was transformed into a new public institution, as welcoming as it was monumental. The stable, concrete mass stood firmly on the ground, but changes revolved around it, and as the architect put it, “These days it is knowledge, not goods, that is transferred here in the reading room.” [47]

46. van Beek, Hans. In discussion with the author. March 2024.

47. “Internationaal Instituut Voor Sociale Geschiedenis (Iisg), Amsterdam.” accessed April 18, 2024, https://www.atelierpro.nl/nl/projects/88/internationaal-instituut-voor-sociale-geschiedenis-iisg.

Fig. 12 Lotus columns at the Temple of Luxor in Egypt.

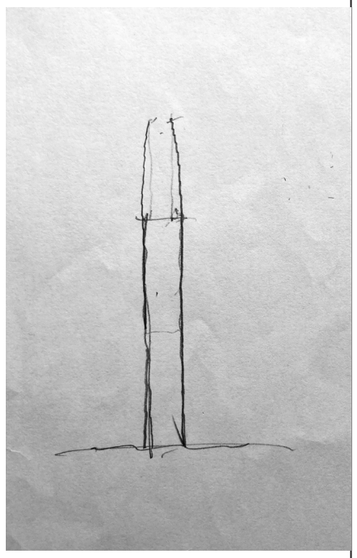

Fig. 11 Hans van Beek quick sketch of the new three-story column.

Fig. 13 Caixa Forum in Madrid. Architect: Herzog & de Meuron

CHAPTER 3
GRAVITY: BETWEEN DEFIANCE AND ACKNOWLEDGEMENT

DECONGEST THE SITE

The third reused industrial building is in Madrid, The Caixa Forum, conceived by Herzog & de Meuron from 2001 to 2008.[48] Squeezed in between the tight grids of Madrid, it is a cultural center converted from the defunct Central Eléctrica Power Station and an adjacent gas station. The old structure laid right at the centroid of the city`s art triangle including the Thyssen-Bornemisza Museum further north, the Museo Nacional del Prado, and the Museo Reina Sofía to the south, all along the cultural spine of Paseo del Prada, like an eyesore. To build yet another museum was already a courageous undertaking and at odds with the surrounding historic buildings, let alone refurbishing from industrial derelicts. A difficult task led to a bold intervention: Caixa Forum is a levitating sculpture of brick skin suspended above a habitable void. *(figure 13)*

> "The attraction will not only be CaixaForum's cultural program, but also the building itself, insofar that *its heavy mass* is detached from the ground in apparent defiance of the laws of gravity and, in a real sense, draws the visitors inside." [49]

At the turn of the century, the hesitation faced in rehabilitating industrial shells common in the previous decades had already subsided. The more receptive attitude made way for a surge in the recycling of industrial infrastructures, especially in the category of cultural spaces, such as the Vienna Gasometers in Vienna and the Tate Modern Museum in London, respectively, in 2000 and 2001.[50] In fact, the immediate success of Tate Modern was among the main reasons for the client to commission Herzog de Meuron, given that the prompt was to build on the site of a decommissioned power plant. This existing site reflected an obsolete image of Madrid, which Jacques Herzog claimed to have "narrow little streets, very remote, very nice as a piece, but totally unpublic."[51] The narrowness of the streets turned out to be an enabling constraint that morphed the solid mass. Like Atelier Pro's mission at the IISH, Herzog & de Meuron's first idea for the Caixa was to free the building and make it accessible from the Paseo del Prado. To this end, the architect, once having convinced the client to purchase the service station, dismantled the existing gas station—an urban obstruction—to open a spacious public plaza. Architectural record This was the first major subtraction of an old mass, decongested the site, and relinked Caixa Forum to the city's main spine. *(figure 16)*

48. "201 Caixaforum Madrid." Herzog & de Meuron.

49. "201 Caixaforum Madrid." Herzog & de Meuron.

50. Wong, Liliane. Adaptive Reuse in Architecture : A Typological Index. Basel: Birkhäuser, 2023. https://doi.org/10.1515/9783035625646. https://doi.org/10.1515/9783035625646.

51. Herzog, Jacques. "Herzog & De Meuron - Interview by Studio Banana Tv." By Studio Banana TV. 2011. https://www.youtube.com/watch?v=TD7zEbD_Azk&ab_channel=TheStudioBananaTV.

THE FLOATING MASS

Now that the first obstructing urban mass was deleted, what stood next in line? The surgical operation of the existing did not stop there at the public plaza. The Swiss architects were confronted with an equation to solve: the old brick façade, *(figure 14)* despite bearing little historical significance, had to be maintained, but at the same time, new program requirements meant that its current floor area must be multiplied by five.[52] Moreover, the architects did not want to build on top of or on earth but to investigate what they referred to as "two worlds": the underworld and the one above.[54] To this end, they voided the heavy stone base and left a void. By cutting away the base, Herzog & de Meuron created an illusion of a levitating solid mass in midair over an open void, as open as it was compressive. As the entire upper volume rested on three structural cores, a non-solid urban plinth carried the public square on a ramp that, in this case, started at the axis of the Paseo del Prado, into the building, and became accessible from almost any urban orientation. Here, architectural identity and urbanistic questions were resolved by one single gesture.

> "This is a building that appears to defy gravity, it is full of wonder, ambiguity and whimsy."[54]

Of the three case studies discussed thus far, this is the only one that denies and acknowledges the existing mass in simultaneity. Here at Caixa Forum, the architects inverted the common perception of demolition: to subtract is not to cancel, but to amplify the presence and the weight of a mass, and thus, make aware of the nakedness of solid matter and its layered meanings obtained throughout time. A mass but also a void. Openness but also compression. Denial but also recognition. Herzog & de Meuron appeared to have purposedly used this subtraction language to sit us in a puzzling duality of effortless weightlessness and reflective compression – between solid and void – not for the sake of reminiscence or commemoration but rather for a dialectic recognition of solid matter in its urban presence.

Beneath the singular solid mass lay a hidden structural mesh, whose three-dimensional complexity made the solid mass float. As the visitor ascended the central staircase from the core to land on the first floor, he would soon realize that the floor he was standing on was suspended entirely from the structure. From that point, he would also recall the void he had just journeyed through a few minutes ago, now lying beneath his feet. Here in the interior, steel tension rods pulled and supported the floors instead of compressive columns. Designed by the structural consultancy led by

52. Garnica, Julio. "H Y M: Franquicia Madrileña Subtítulo: Caixaforum Madrid. Jacques Herzog Y Pierre De Meuron, 2001-2008. 73. " Universitat Politècnica de Catalunya, 2010. https://scholar.google.es/scholar?oi=bibs&clus

53. "201 Caixaforum Madrid." Herzog & de Meuron.

54. Stone, Sally. Undoing Buildings: Adaptive Reuse and Cultural Memory. 2019. 171-172 doi:10.4324/9781315397221.

Fig. 14 The decommissioned Central Eléctrica Power Station with its granite stone base. and filled-in decoration windows.

Fig. 15 The decommissioned Central Eléctrica Power Station with its granite stone base. and filled-in decoration windows.

engineer Jesús Jiménez, the principle of this structural mesh relied on the system's capability of collecting vertical loads and transferring them through ground floor cores into the foundation.[55] Within this structural mesh exists another system—the post-tensioned concrete perimeter walls, attached and connected to the existing exterior interiorly. A combination of various systems meshed into a three-dimensional constructive singularity enables several possibilities besides the floating illusion, one of which was to bear the structural load of the roof volume addition. The building levitates, but its aspiring weightlessness certainly was not effortless.

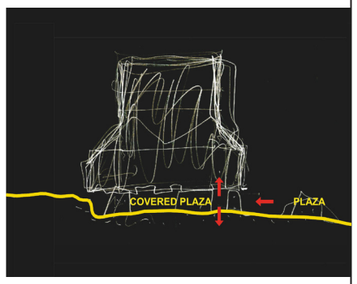

Fig. 16 The architects' concept sketch of the levitating mass.

55. Garnica, "H Y M: Franquicia Madrileña Subtítulo: Caixaforum Madrid. Jacques Herzog Y Pierre De Meuron, 76.

56. Herzog, Jacques. "Herzog & De Meuron - Interview by Studio Banana Tv."

THE MASS DOES NOT LIE!

The duality of denial and recognition is revisited in the building façade at the apertures. Here, denial became the foundation for recognition. Herzog de Meuron added new windows that did not obey the existing opening but were dictated by the internal programs. Wong, 2016. The old openings were filled in with bricks in lighter colors to maintain their legibility, evoking a sense of a solid, non-hollow mass. Ironic was the fact that these existing windows were never real windows in the first place. The original building was a power station, and its windows served as decoration rather than real apertures. *(figure 14)* The filling-in of brick windows could be due to by the requirement for climate control in the gallery environment, yet the tectonic underlying cause provided a more insightful narrative. Was the infilling of windows an attempt to deny its past, or was it an act of recognition?

Furthermore, Herzog & de Meuron placed three irregularly punched windows superimposed onto the existing envelope, in full disregard of the existing infilled ones. *(figure 13)* This decision to purposedly cut out windows in the brickworks was an honest confession that delineates beyond denial or recognition. They used pure facadism to announce that the building had been altered. No negotiation, no pretension, no excuse. The architects laid bare that the solidity they attempted to convey was merely an illusion once examined up close. The new inhabitable mass was the opposite of any attempt to emulate the old power station or to mummify the existing shell, as seen in many cases of facadism. The truth lay exposed, hollow, and naked.

The last piece of the puzzle remains the added corten steel roof volume. Above the characteristic roofline of the original building was a newly built volume in red corten steel with an irregular top crown, up to two levels above the initial one. *(figure 15)* This deliberately and irregularly cut top silhouette of the roof mimicked its neighbors and, as the architect put it, "immediate reactions to the roofscapes around it." [56] This roof addition at Caixa showed a mass reminiscent of the "remuntas" of Barcelona itself. Seen in many cases along the Rambla de Catalunya in the Eixample district, "remuntas" are considered a natural way of densifying the cities. [58] . Elaborating on the roofline, author García mentioned the Fundació Tàpies, in the heart of the Eixample district in Barcelona, the first one to have integrated the industrial typology in reuse in Spain by combining brick and metal. [57] Using a similar language of mass addition atop of an existing structure, its refurbishment by architects Roser Amadó and Lluís Domènech Girbau was opposite to what one saw at Caixa Forum. The installation above the original façade of the metal sculpture "Núvol i cadira" by Tàpies himself crowns the building in an ethereal way and constitutes the sign of the identity of the institution. Nevertheless, the original façade was preserved in pristine condition and appears to sink into the backdrop for the new sculpture to shine. Two separate entities competed. In contrast, Caixa Forum's new roof did not compete but merged with the existing one, though in between them sat a metal plate clearly marking the boundary where the old met the new. As the existing mass was cut away and punctured through on the old façade, the new addition leaned against the old roof lines while reflecting its surrounding urban fabric. The result was a sculptural monument in the form of a unified hybrid assembly.

> "Situation at the interface of culture and nature, the building is as much about the ground as it is about built form. […] Hence the notion of "building the site," in Mario Botta's memorable phrase, is of greater import than the creation of free-standing objects, and in this regard, building is as much about the topos as it is about technique." [59]

Before bone, now skin. Sandwiched between the void and the new roof mass, the old façade is resuscitated as a levitating mass of the Caixa Forum, as defiant as it is reminiscent. Here, the mass acknowledges but does not commemorate, for the past is not patrimony or legacy but merely a trace of time. Herzog & de Meuron embraces the transience and impermanence of time and lets it pass through the building without nostalgia. The duality of denial and recognition was laid out and inversed throughout corners of the building, exemplifying Herzog & de Meuron's typical dialectics. Jacques Herzog spoke unhesitantly in an interview, "We like the monumentality." [60] Indeed, another cultural monument was born on the Paseo del Prada for the Madrileños.

57. Garnica, "H Y M: Franquicia Madrileña Subtítulo: Caixaforum Madrid. Jacques Herzog Y Pierre De Meuron, 76.

58. Further research brought me to the Spanish term "remuntas," which refers to vertical extensions by building an extra floor–or more–on top of the existing one. This is common in Barcelona, mostly in residential architecture, where more space is needed for less financial investment, with a kind of hybrid assemblage.

59. Frampton, Studies in Tectonic Culture : The Poetics of Construction in Nineteenth and Twentieth Century Architecture, 27.

60. Herzog, Jacques. "Herzog & De Meuron - Interview by Studio Banana Tv."

The three case studies of industrial reuse above make clear one thing about mass: it does inherit a certain degree of obsolescence and disposability in all industrial structures, and it could never be truly naked. The stripping-off of the mass is a personally insightful exercise to unveil its embedded meanings, which have been consolidated throughout the thesis as not a fixed legacy but malleable qualities shaped by circumstances and time. In the end, to revive an existing structure is not to start with a blank canvas but a heap of unwanted materials. Throughout the three cases, reuse mass means to materialize its meaning in many alternatives: through obsolescence to reconnaissance, resistance, duality, and back all over again. Monumentality was a surprising revelation I have come to reflect upon studying the three buildings, yet not initially assumed. It is striking that the three architects ultimately attributed unique qualities to the mass that transforms waste into architecture in their unique architectural languages.

Regarding the methods used in this thesis, there is a variety. The thesis started with IISH in Amsterdam as the initial primary case study with the intention of visiting the site, so I did archival research and spent a day in the library. Since little has been written on the case beyond mere informative introduction text scattered here and there, I decided to interview the architect Hans Van Beek at his office in The Hague, Atelier Pro. It was a pleasant talk about things beyond just the building but also about architecture, urban renewal, and the act of designing for diversity and humanity. As for SESC Pompeia and Caixa Forum Madrid, I relied on literature reviews and drawing analysis thanks to the large repertoire of publications on famous architects' works, digital and in print. While Lina Bo Bardi began her career in Rome on the pages of Italian magazines and worked intensively with theoretical debates, Herzog de Meuron had published extensively as theorists, educators, and practitioners. As such, their theoretical positions are equally as crucial to the design process as their realized works. Their words are at this moment interpreted as a type of building material in and of itself, beyond concrete and steel, and should not be detached from the architecture under study.

I had some thoughts about Jane Jacobs's The Death and Life of Great American Cities quite often while writing this thesis. The reason why architectural reuse of non-monumental buildings remains pertinent, and it will continue to be, lies in the humanity of its principle, one that is seen in the precedents of Bo Bardi, Atelier Pro, and Herzog & de Meuron. To this end, I will close off with a quote from the book:

"Cities need old buildings so badly it is probably impossible for vigorous streets and districts to grow without them. By old buildings, I mean not museum-piece old buildings, not old buildings in an excellent and expensive state of rehabilitation–although these make fine ingredients–but also a good lot of plain, ordinary, low-value old buildings, including some rundown old buildings.[…] **Old ideas can sometimes use new buildings. New ideas must use old buildings.**" [61]

61. Jacobs, Jane. The Death and Life of Great American Cities. 1st Vintage books edition ed. New York: Vintage Books, 1992. 188

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