

This thesis examines how the tectonic strategies employed in the design of the Amsterdam residential building Piraeus (1994) influenced architectural tendencies and design culture in large-scale Dutch residential buildings in the years following its completion. Although Piraeus is widely regarded as a key project within Dutch architectural discourse, its influence has predominantly been framed in stylistic or cultural terms. This research instead adopts a nuanced tectonic perspective, focusing on the relationship between construction, material articulation, and architectural expression.

By establishing a theoretical framework based on the writings of Kollhoff and Garritzmann, the study analyzes Piraeus as a building in which monolithic massing, material weight, and façade depth contribute to a coherent tectonic language. This framework is subsequently applied to a series of Dutch housing projects, enabling a comparative analysis of how these tectonic strategies were translated, adapted, or diluted in later designs.

The findings demonstrate that Piraeus did not generate a singular architectural model, but rather functioned as a reference point for a diverse range of interpretations. Its influence is most evident in the selective adoption of individual tectonic principles rather than in direct formal replication. By reframing the building's impact through a tectonic lens, this thesis contributes to a more precise understanding of architectural influence and knowledge transfer within Dutch housing architecture.

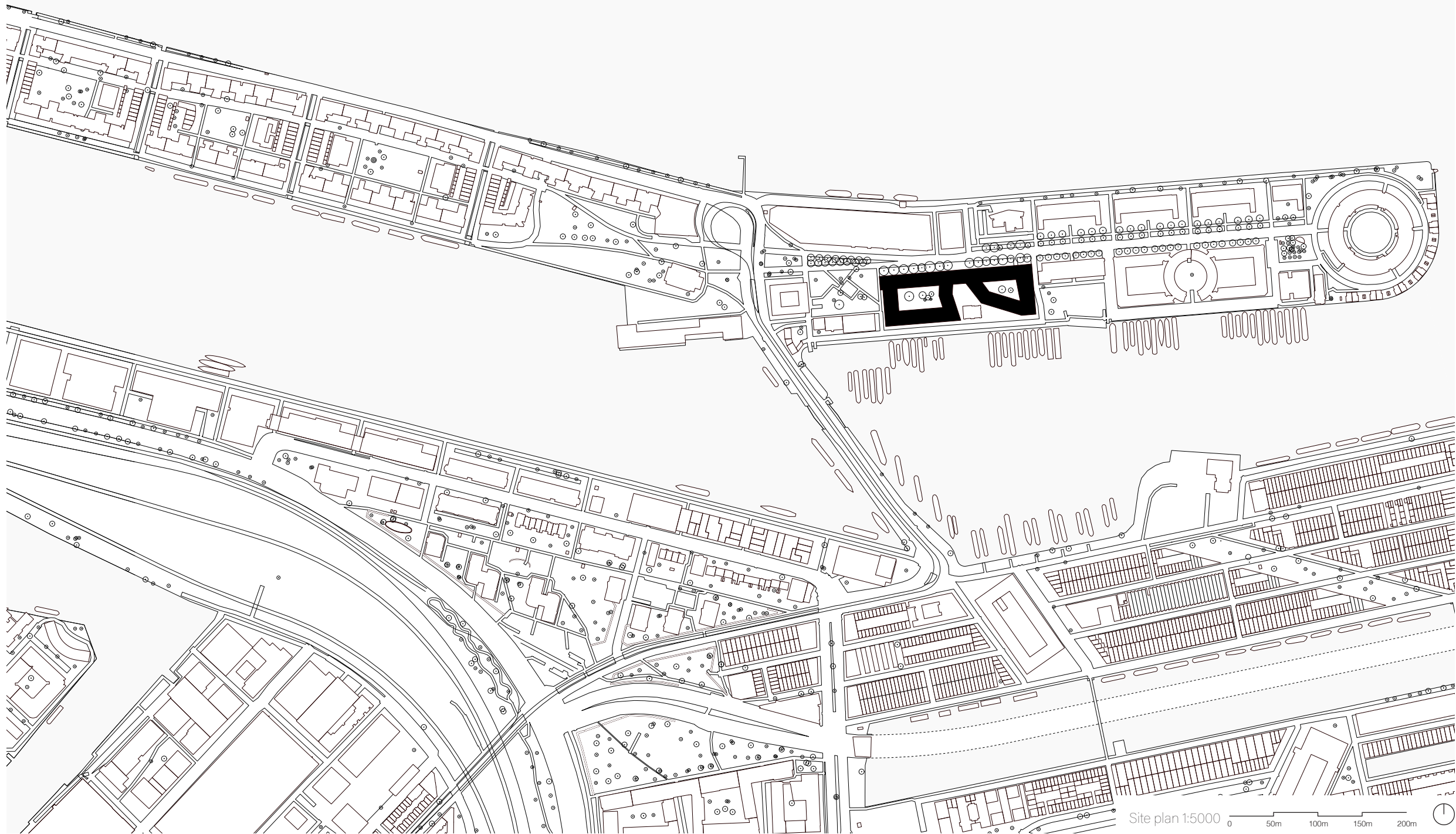
Piraeus, Amsterdam
By: Hans Kollhoff & Christian Rapp



Architecture as Construction

Tectonic Thinking and the Legacy of Piraeus in Dutch Housing Architecture

Bob Gilijamse



Site plan 1:5000 0 50m 100m 150m 200m



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Architecture as Construction

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The 1990's were influential years for Dutch architecture. With the turn of the century - and the millennium for that matter - the Netherlands became internationally recognized for its experimental tendencies within the realm of architecture and urbanism.¹ In 1990, a symposium organised by Rem Koolhaas - joined by several important practitioners of both architecture and urbanism - at the TU Delft raised widespread attention for its critiquing tone against the status quo of Dutch architectural education.¹ Later, several firms split off from the Office for Metropolitan Architecture (OMA) and later became followers of the Superdutch movement. This movement combined both Dutch and international influences in its urban planning and architecture, and sparked a huge change in Dutch architectural standards.¹

As the Netherlands entered a period of economic recovery and demographic growth, large-scale housing developments emerged as a central architectural task.² Nowhere was this more evident than in Amsterdam's Eastern Docklands, where new housing projects became central to the redevelopment of former port infrastructure into dense urban neighbourhoods.³ A product of this continuous experimentation in urbanistic models was the emergence of the KNSM Island in Amsterdam, of which the urban plan by Jo Coenen created possibilities for architectural monumentality alongside the IJ.

When Piraeus (1991-1994) emerged on the island however, it appeared to belong to a totally new architectural vocabulary altogether. Designed for Woonstichting De Doelen by the German architects Hans Kollhoff and Christian Rapp, this residential building's architecture possessed its own unique and polemic qualities which sparked widespread discourse.¹ Piraeus became impactful in a variety of ways: from its sizeable residential envelope of 304 apartments - 95% of which belong in the social sector - to the use of a unusually colored dark brick in its facades. Perhaps the most impactful was the block's monolithic and sculptural nature within the urban context.

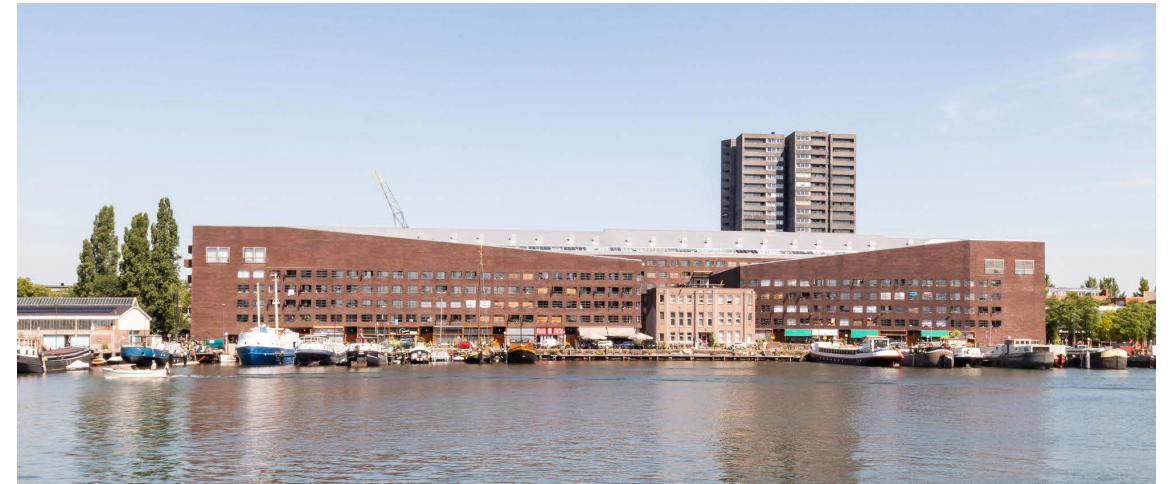
The building did not simply occupy its designated plot within the masterplan; it transformed it. Rising as a massive brick volume along the Levantkade, its facades were characterized by a variety in both flush areas and deep-set openings, pronounced structural rhythm, and a compositional

clarity that emphasized load, support, and enclosure. Piraeus concerned itself with the building's structure as an inseparable part of the building's architecture. At the time, this was an unusual proposition within Dutch residential architecture. The building's tectonic presence, emphasized by its expression of weight and unity within the architectural language, stood in tension with a contemporary design culture increasingly oriented towards light, compositional design.^{4,5}

Frequently cited as a turning point in Dutch architectural discourse, Piraeus is often discussed in broad stylistic or cultural terms, but also in terms of tectonics. The concrete impact of Piraeus' tectonic expressions on Dutch housing architecture has yet to be critically determined. This research focuses on the building's specific tectonic strategies and investigates how these were translated, adapted, or diluted in three subsequent housing projects in the Netherlands, finished in the two decades following Piraeus' completion.

The central research question guiding this thesis is: **"How did the tectonic strategies applied in the design of Piraeus influence architectural tendencies and design culture in large-scale Dutch residential buildings in the two decades following its completion?"** By addressing this question, the thesis aims to fill a gap in existing literature, which tends to acknowledge Piraeus's influence without systematically analyzing the mechanisms through which its tectonic strategies entered mainstream housing practice.

F.2



The research is based on a close architectural analysis of tectonics within Piraeus. The criteria necessary for said analysis are derived from architectural theory on tectonics, drawing particularly on Hans Kollhoff's own writings - such as Kollhoff's personal perspective on tectonics⁶ - and on a more recent analytical framework, including Udo Garritzmann's research on brick tectonics.⁷ By comparing these different perspectives on tectonics in architecture, I aim to formulate a framework that will be applied in the analysis of Piraeus itself.

This thesis examines a selection of Dutch residential projects realized in the two decades following the completion of Piraeus, applying the same tectonic criteria in comparative analyses. This allows for a precise assessment of whether later buildings adopted Piraeus's tectonic principles through intentional reinterpretation, contextual adaptation, or gradual dilution of

tectonic ideas within regulatory, economic, and cultural constraints.

The thesis starts with the contextualization of Piraeus by researching the historical redevelopment of Amsterdam's Eastern Docklands and Jo Coenen's urban plan for the KNSM Island. It then defines a framework for discerning tectonic characteristics, followed by a detailed tectonic analysis of Piraeus. The final chapters compare later Dutch residential projects to investigate how its tectonic strategies were translated, adapted, or diluted, in order to critically assess its influence on architectural tendencies in large-scale housing.

¹ Lootsma, 2000, pg. 9, 17, 21.

² Engel et al, 2005.

³ Gautier & Jolles, 2003.

⁴ Zwinkels et al, 1994.

⁵ Klaren & Boekraad, 1994.

⁶ Kollhoff et al, 1993.

⁷ Garritzmann, 2021.

Historical context of Piraeus

History of the Eastern Docklands

The realization of Piraeus must be understood within the broader transformation of Amsterdam's Eastern Docklands (Oostelijk Havengebied), a former port and industrial zone that gradually lost its logistical relevance during the second half of the twentieth century. As containerization shifted harbor activities towards the west, large sections of the docklands became obsolete, leaving behind extensive infrastructural remains and a sparsely inhabited terrain (F. 3). By the late 1970s and 1980s, the municipality identified the area as a strategic location for urban redevelopment.⁸

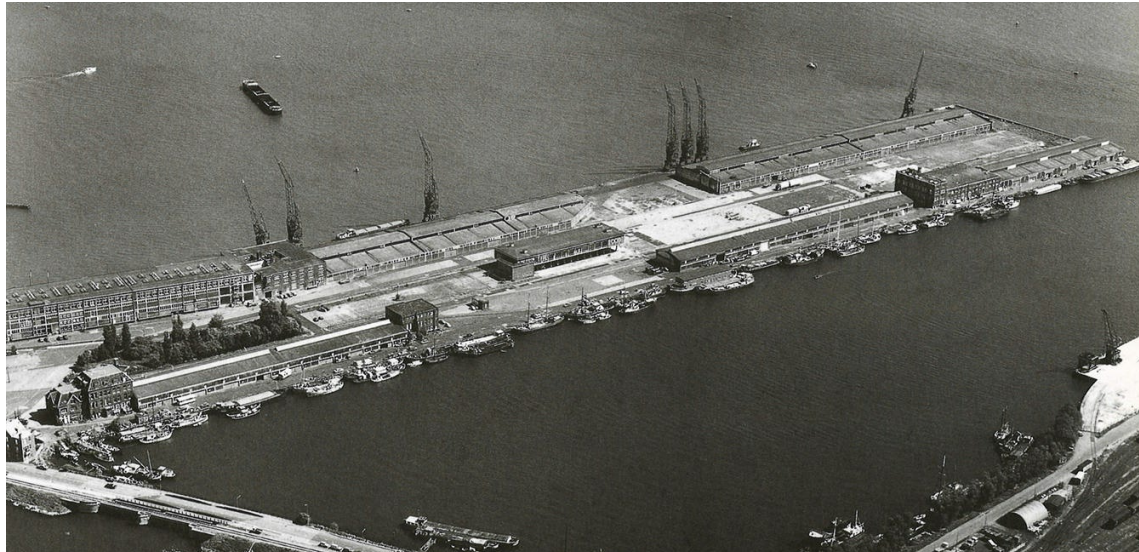
The redevelopment strategy marked a clear departure from modernist planning standards to further experiment on the possibilities within Dutch urbanism. Instead of freestanding slabs in open green fields (like in the Bijlmermeer masterplan for instance), planners reintroduced the perimeter block, continuous street walls, and defined public spaces.⁸ This shift corresponds with what is described as a broader Dutch reconsideration of the "urban block" as a cultural and morphological instrument capable of restoring spatial coherence to the city.⁹ Based on this, the Eastern Docklands could be considered a pilot project in a national debate on urban form and monumentality.

Urban design principles of KNSM island

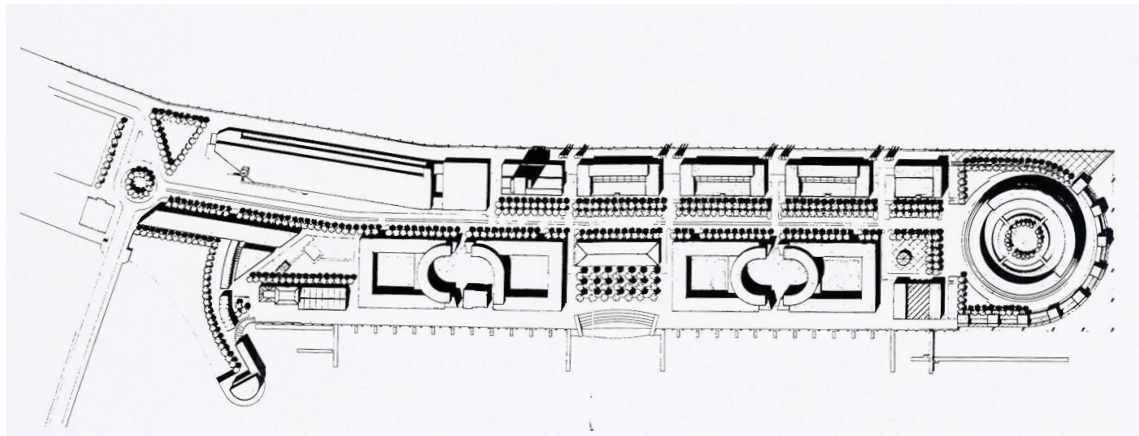
Within the larger docklands redevelopment, KNSM island occupied a distinctive position. The urban plan, developed under the supervision of Jo Coenen, was based on a perimeter-block typology that aimed to facilitate high urban density with a certain respect to the site's context (F. 4). Large, monumental blocks were positioned along the southern quay, referencing the scale of former warehouses while framing interior courtyards and maintaining clear spatial hierarchies.⁸

Heritage also played a defining role in the shaping of the island's urban plan. In the years before its reconstruction, groups of city nomads found refuge in houses and offices on the KNSM island. This period of unauthorized occupation ended in 1989, when a small police force cleared the area and only let "first generation citizens" - artists and squatters - stay.¹⁰ Although most industrial structures had been demolished, the scale and orientation of the new blocks referenced the maritime history of the site.⁸ For example, Coenen's vision for the block which would later become Piraeus was a perimeter block which curved around an existing port office, originally owned by the Koninklijke Nederlandse Stoomboot Maatschappij (KSNM).

F. 3



F. 4



F. 3 KNSM Island, late 1980s. With maritime operations having moved westward, the island was assigned for redevelopment. From: Gautier & Jolles (2003). Photograph provided by Dienst Ruimtelijke Ordening Amsterdam.
F. 4 Jo Coenen's KNSM Island masterplan, 1989. Several former port buildings, including the KNSM port office, remained intact. From: Gautier & Jolles (2003). Photograph provided by Dienst Ruimtelijke Ordening Amsterdam.

⁸ Gautier & Jolles, 2003, pg. 25-26, 49, 59.

⁹ Engel et al, 2005, pg. 14.

¹⁰ Heddema et al, 2002, pg. 15.

Design intentions and institutional framework

The realization of Piraeus was shaped by an institutional framework involving the municipality, housing associations, and private stakeholders. The municipality imposed strict density requirements and programmatic constraints, one of which was the demand for a substantial proportion of social housing within each block. They also took the rising heterogeneity within the population into account by advocating for a large margin of three- and four-room dwellings and both smaller and larger dwellings to fill in the gaps.¹¹

The client - Woonstichting De Doelen - played a mediating role between the public objectives and their own architectural ambition. When commissioning architects Hans Kollhoff and Christian Rapp, De Doelen expected the collaboration with different parties to be different than usual. Although the plan had to be realised based on a relatively fixed PvE (Programme de Requirements), the client opted for a certain degree of creativity and flexibility within the architectural design process. Over time, the PvE would be seen as a clear starting point or guiding instrument rather than a fixed set of requirements.¹¹ This would give the architects more freedom in designing the building as they see fit, and in the case of Piraeus, resulted in a building that polemically responds to its environment (F. 5-7).

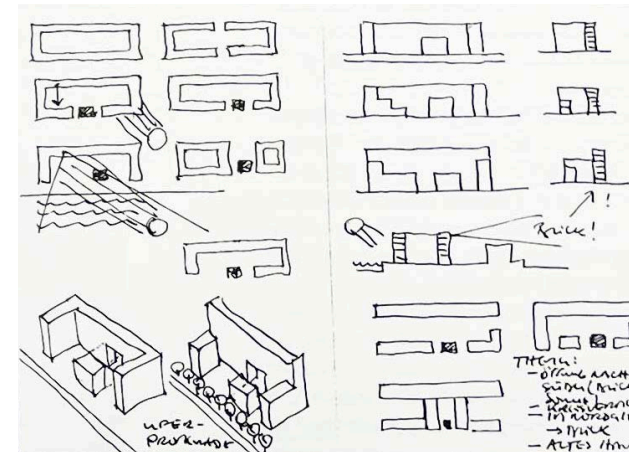
The design sought to articulate the block as a coherent mass with a sculptural nature. This architectural language was a result of a logical design process that always kept

the site's conditions and PvE in mind. The sculptural shape was a result of the preferred waterfront view and optimal sunlight, and the building seemed to wrap around the existing KNSM office to ensure more breathability within the urban ensemble. In relation to Coenen's masterplan, these intentions could be interpreted as both a appreciation of the deviation from the typical closed courtyard building typology to a integrated urban environment, and a critical reaction to the masterplan's unsatisfactory attention to the historical identity of the site.¹¹

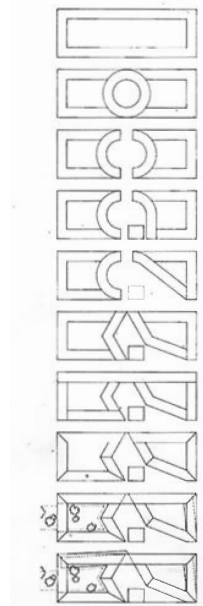
Kollhoff's appeal for a central role of the architect in the design process - as was common in Germany - played a crucial role in the architectural and urbanistic decision-making process. Kollhoff's persistent confidence in his specific ideas as an architect sometimes stood at odds with the ideas of traditional Dutch building standards, often leading to a sense of hierarchical and cultural difference. Some complicating factors were the building's sharp corners and the diversity within the facade design per orientation. With help from the official project group and Coenen personally, Kollhoff's design eventually got approved and construction started in 1991.¹¹

Having established the historical, urban, and institutional conditions from which Piraeus emerged, the following chapter shifts focus toward the theoretical domain, outlining the different tectonic perspectives through which the building's architectural expression can be more accurately understood.

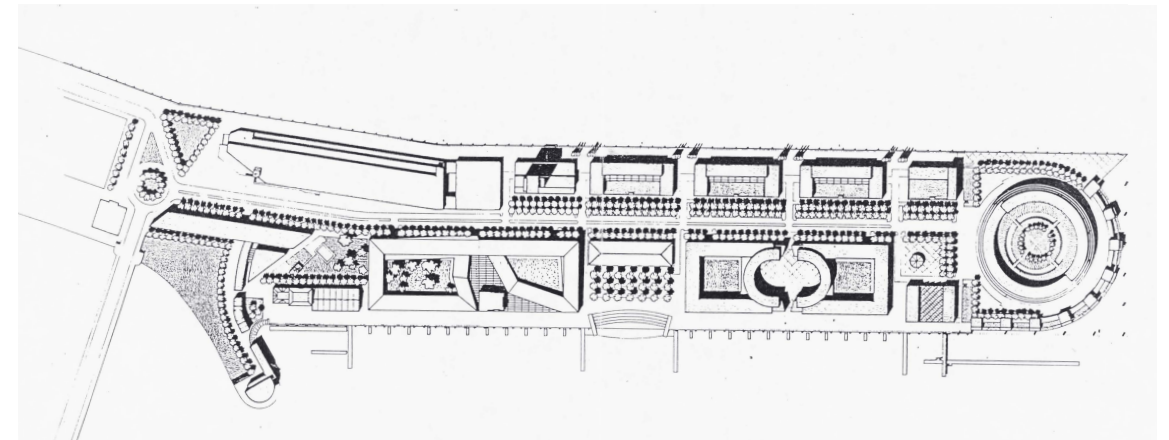
F.5



F.6



F.7



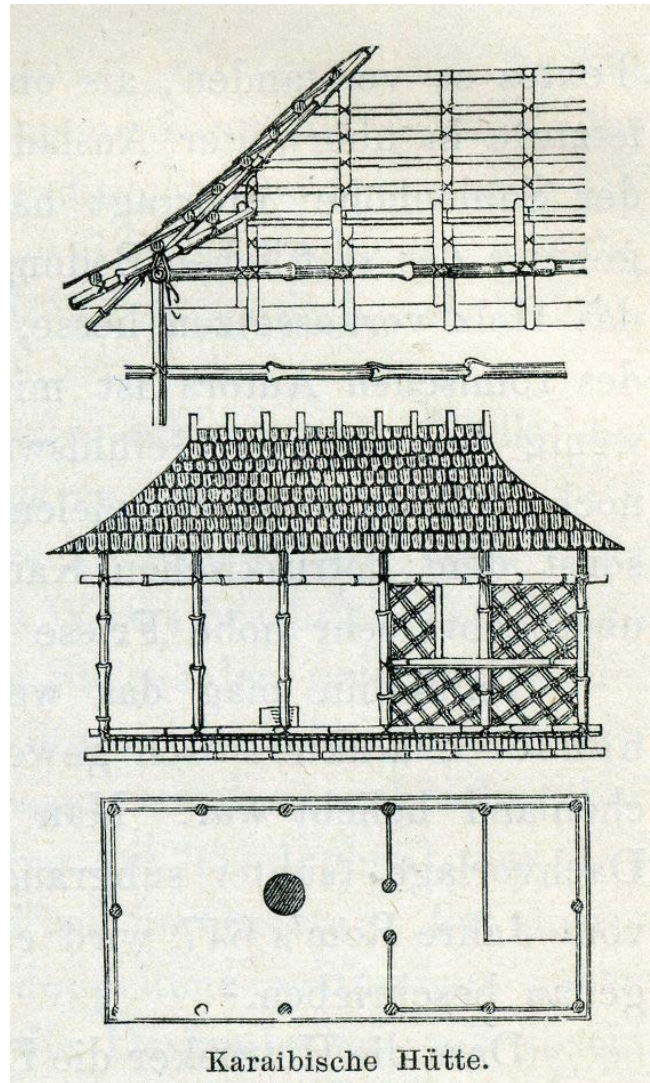
F.5 Sketches from Kollhoff's notebook. From: Klaren & Boekraad (1994).

F.6 Block establishment of Piraeus. From: Klaren & Boekraad (1994).

F.7 Final KSNM Island, 1989. Piraeus diverted from the original masterplan. From: Stadsarchief Amsterdam (1991-1995).

¹¹ Klaren & Boekraad, 1994, pg. 16, 18-20.

F.8



Theoretical framework

Tectonic perspectives within architectural theory

Tectonics is a term of which the definition developed through different practices over time. The term gained its etymological meaning in ancient Greek, where it referred to the act of working hard materials with an axe, but over time became associated with other building trades as well. The architectural introduction of tectonics occurred in the mid 19th century, where Karl Bötticher, an archeologist who specialized in architecture, associated the term with the ornamentation used in Greek temples. Here, the ornamentation articulated the transfer of forces within the load bearing structure, an theoretical account which he believed to be a valid architecture value judgement.¹²

Another important addition to architectural discourse about the term tectonics came from architect and art theorist Gottfried Semper. In the mid 19th century, Semper related tectonics to the existence of four primordial technical crafts - textile, ceramic, stereotomy, and carpentry. This theory suggests that architectural expression emerges from distinct craft traditions rather than from structure alone. He encapsulates this idea in a drawing of a caribbean hut (F. 8) which shows "all the elements of antique architecture in their pure and most original form".¹² Semper also emphasizes the fundamental difference between the German definitions embedded in the word *Wall* - the *Mauer* which addresses the load bearing wall, and the *Wand* which addresses the spatially delineating wall.¹²

The 20th century introduced modernist values in architecture, which preferred buildings without dressing, causing the term "tectonics" to be dismissed for the bigger portion of this time period. The term re-entered architectural discourse in the 1990s mainly because of the Basel Architecture Symposium *Tectonics: Architecture - Art Today?* in 1991. In this symposium, architect Hans Kollhoff's entry - *The Myth of Construction and the Architectural* - sparked the debate once more. Kollhoff argues that in the modern building industry, the architecture of dressing is a fact. This means that the literal translation of a building's construction through its architecture is no longer feasible, given that building policies contain strict requirements and that the market now prefers conventional building methods over traditional methods.¹³

He argues that tectonics should inherently concern itself with the complementary nature of the form of appearance and the material-technical construction.¹² Kollhoff specifically compares these two to the relation between the human skin and human body, and cites Adolf Loos: "the clothing as skin is a part of the body and is thereby withdrawn from the arbitrariness of design".¹³ According to Kollhoff, the ability to relate to a building's proportions and weight of its materials on a personal level makes a building comprehensible.¹⁴ Kollhoff addresses Semper's connotation on the two meanings of the word *Wall* to contextualize tectonics within the modern day building industry: as long as the appearance of a

F. 8 Gottfried Semper's drawing of the caribbean hut, 1863. The hut constitutes a clear example of Semper's four elements of architecture: hearth/masonry, mound/stereotomy, roof/carpentry, and fence/textile. From: Garritzmann (2021).

¹² Garritzmann, 2021, pg. 7, 11, 60, 61.

¹³ Kollhoff et al., 1993, pg. 13, 15.

¹⁴ Lootsma, in Zwinkels et al., 1994, pg. 39.

building gives a resemblance of a sensical way to architecturally explain how different forces are being accounted for, one can speak of a tectonic expression.¹³ F. 9 shows an example of such a complementary relationship.

Another influential perspective emerged around the same time as Kollhoff's and came from architectural historian and theorist Kenneth Frampton, who wrote about it in his *Studies in Tectonic Culture* (1995). Frampton's idea of tectonics focuses on the expressive articulation of the loadbearing structure in a very literal sense. However, this perspective runs the risk of creating a normative value judgement, implying that "good" architecture must visibly express its structure.^{15,16} Such an interpretation reduces tectonics to a singular architectural ideal and overlooks other possible forms of tectonic expression.

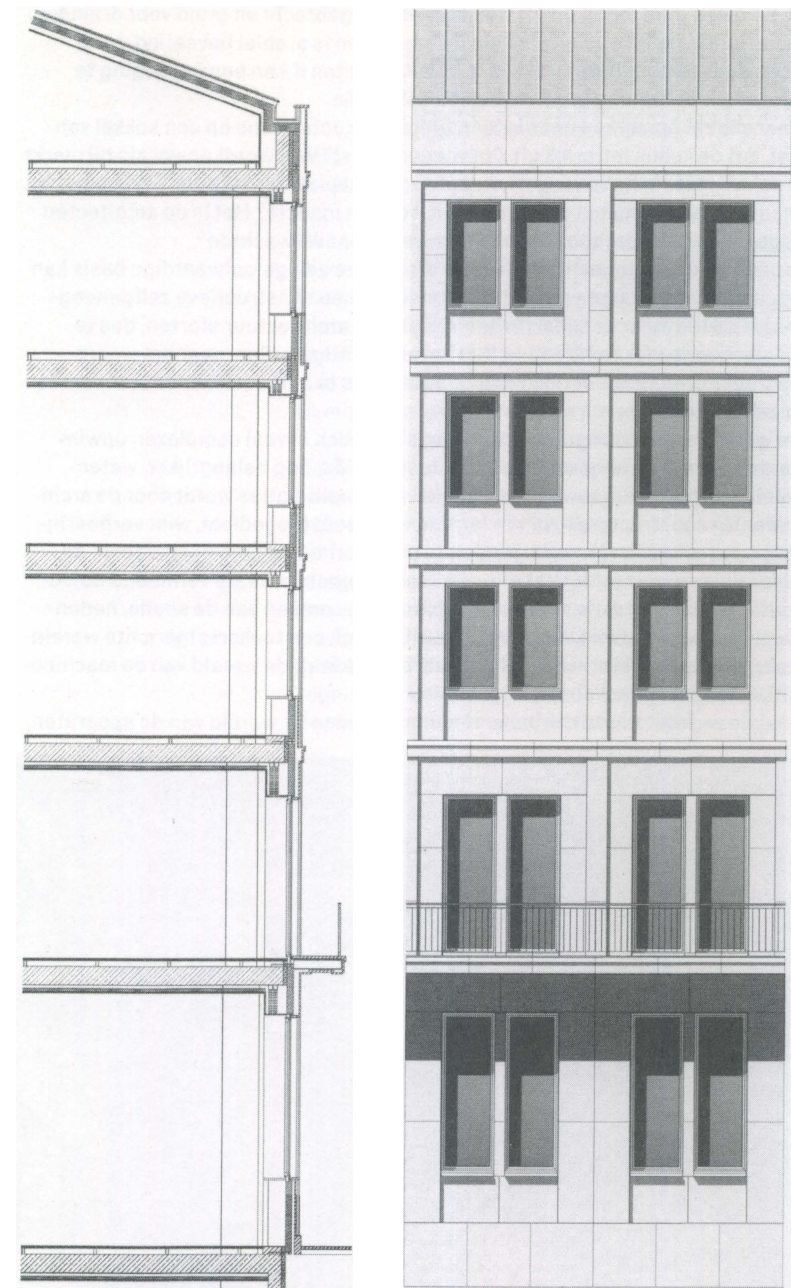
Through the examination of several perspectives on tectonics, it becomes clear that as much as they intend to make sense of tectonics in architecture, they often do so based on a dualistic approach. In turn, this causes a limited range of possibilities in tectonic expression, and possibly even labels certain tectonic expressions as inferior.¹⁶ Alternative theoretical perspectives broaden the understanding of tectonics by allowing tectonic expressions to exist without being marked as "good" or "bad", which leads to a more inclusive lens through which tectonic expressions could be perceived.¹⁶

Framework for interpreting Piraeus' tectonic expression

Building on the theoretical discussion of tectonics, this research adopts the methodological framework primarily informed by the work of Udo Garritzmann (2021). Garritzmann's Diagram for Tectonic Thinking proposes a descriptive approach through which tectonic expression can be understood. Instead of prescribing a single architectural ideal, this framework categorizes tectonic expression through three constructional dimensions: loadbearing construction, conjoining construction, and tectonic expression. F. 10 shows the diagram for tectonic thinking which forms Garritzmann's proposal for a new way of thinking about the possibilities of different tectonic expressions.

On the horizontal axis we find the conjoining construction with the possibilities ranging from a solid construction to a filigree construction, and the vertical axis reads the bearing construction with a distinction between loadbearing or non-loadbearing construction. Garritzmann chooses to integrate these two axes based on the latin etymology behind the word construction - con as a derivative of com, meaning "together", and struction as a derivative of struere, meaning "to pile". This produces a four-field matrix in which each field reflects a different combination of the opposing poles of the constructional aspects.¹⁵

F. 9



F. 9 Facade fragment of the Head Office of the Landeszentralbank in den Freistaaten Sachsen-Thüringen. Although the building has a monolithic expression through its visual weight, the granite facade panels have no load bearing function. From: OASE (1997).

¹³ Kollhoff et al, 1993, pg. 13, 15.

¹⁵ Garritzmann, 2021, pg. 109, 152, 154-155.

¹⁶ Garritzmann, personal communication, March 11, 2026

A third lateral axis represents the tectonic expression, with two poles representing the which emerges as a result of positioning the object in the four-field matrix, and then determining whether the tectonic expression is more concrete or more abstract (F. 10). Note that the diagram in F. 10 calls these expressions tectonic or a-tectonic, but because of the negative connotation the word a-tectonic has, Garritzmann opted for a more inclusive approach instead. Importantly, he emphasizes that these categories should not be interpreted hierarchically; different tectonic strategies are considered equally valid architectural approaches.¹⁷

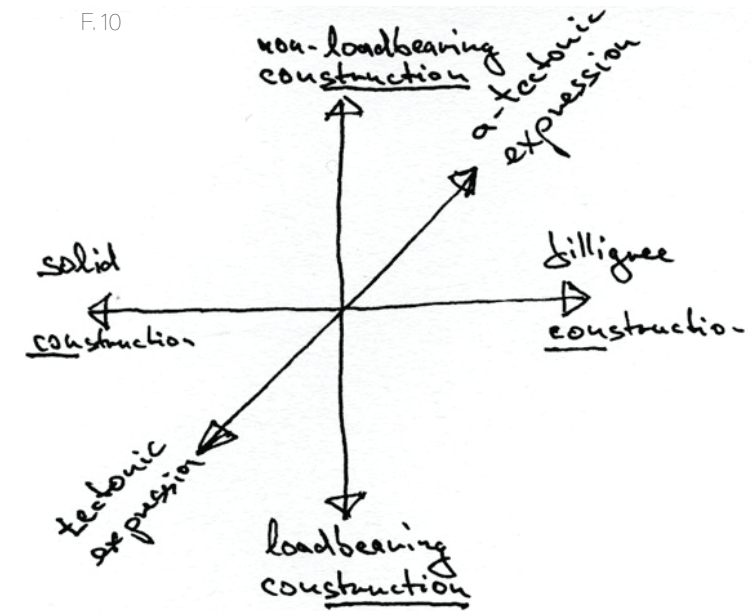
As Garritzmann explained meticulously in his dissertation conducted for this research, tectonics should not be reduced to dualizing interpretations but should instead encompass a broader range of possible relationships between technical-aesthetic expressions. During the interview, he further clarified that the binary opposition between tectonic and a-tectonic architecture is problematic, since every building, or built object for that matter, necessarily relies on construction. Consequently, he notes tectonic analysis should focus on how construction is expressed rather than whether it is expressed at all (F. 11), given that "to this day, a building which truly physically floats has yet to be discovered."¹⁶

Applying this analytical mode of thinking enables a broadened perspective when examining the possible tectonic expressions present in Piraeus. According to Garritzmann, tectonic analysis should examine how constructional logic, material use, and

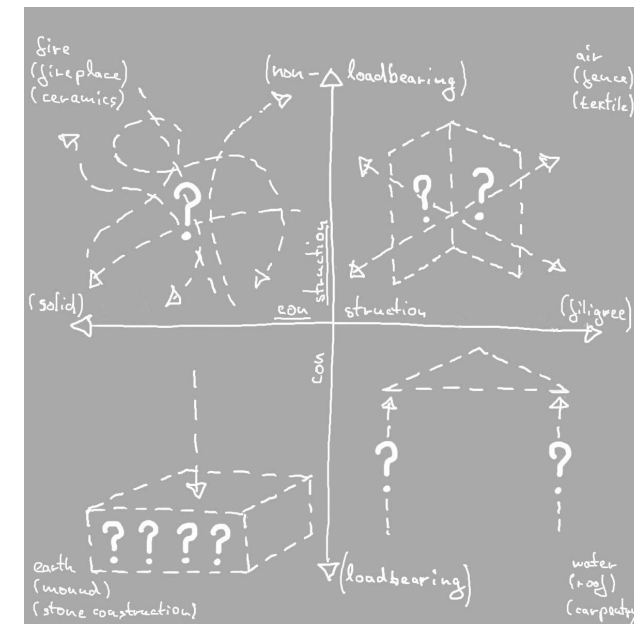
architectural articulation interact within a specific building (Garritzmann interview, 2026). In the case of Piraeus, this involves investigating the relationship between its massive brick construction, the articulation of façade depth through loggias and recesses, and the overall composition of the building block. These elements together contribute to the building's monolithic architectural presence, while simultaneously articulating smaller spatial and structural relationships within the façade. Lastly, he emphasizes to critically assess Kollhoff's tectonic strategies and view them through a non-dualizing lens, considering tectonic expressions ought not to be superior/inferior to one another.

Having established the historical, urban, and institutional conditions from which Piraeus emerged, the following chapter shifts focus toward the theoretical domain, outlining the different tectonic perspectives through which the building's architectural expression can be more accurately understood.

F. 10



F. 11



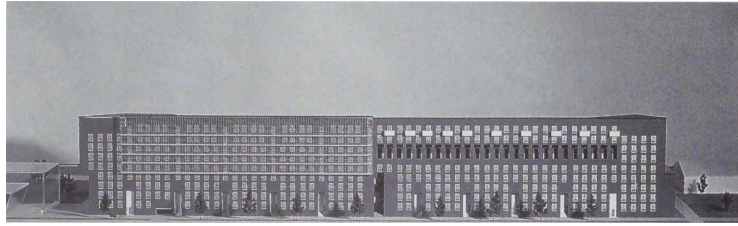
F. 10 Diagram for tectonic thinking including the aspect of tectonic expression. From: Garritzmann (2021).

F. 11 Abstract tectonic expressions of the four elements of architecture. This diagram shows the possibility of abstract tectonic expressions, i.e. distancing from normative assessments of tectonic expressions. From: Garritzmann (2021).

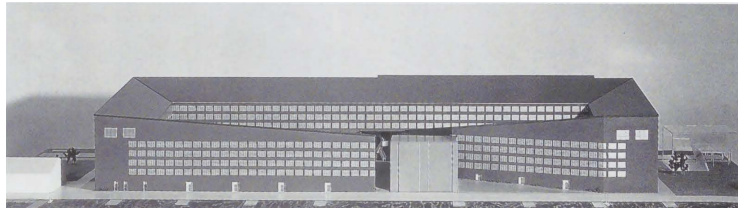
¹⁶ Garritzmann, personal communication, March 11, 2026

¹⁷ Garritzmann, 2021, pg. 155-157.

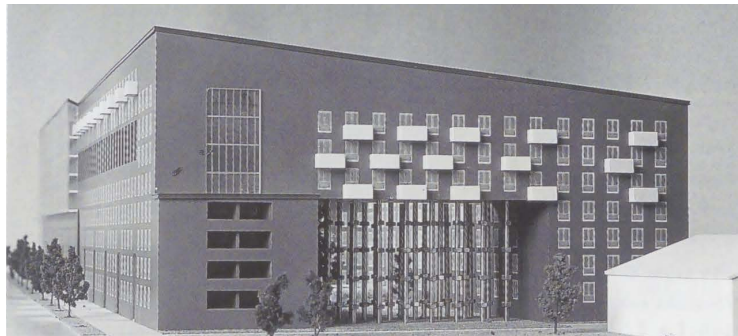
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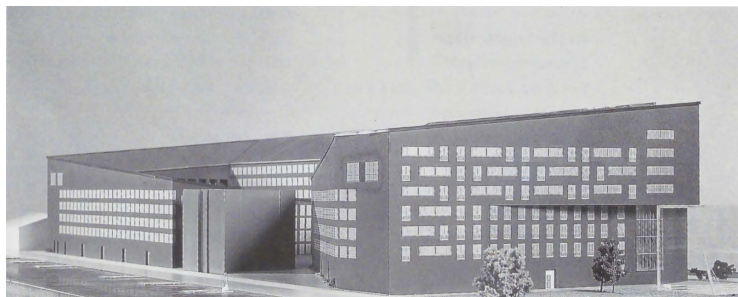
F. 13



F. 14



F. 15



F. 12 Piraeus - facade on the north side. From: Stadsarchief Amsterdam (1991-1995).
 F. 13 Piraeus - facade on the south side. From: Stadsarchief Amsterdam (1991-1995).
 F. 14 Piraeus - facade on the west side. From: Stadsarchief Amsterdam (1991-1995).
 F. 15 Piraeus - facades on the (south-)east side. From: Stadsarchief Amsterdam (1991-1995).

Tectonic expressions in Piraeus

A sculptural block with familiar faces

As previously mentioned in the investigation of Jo Coenen's masterplan and the architects' design intentions, Piraeus used the PvE as a guiding instrument to shape its architecture. In order to react to the PvE, pay homage to the genius loci, and anchor the building in its environment, several design interventions were executed which shaped the identity of the building. These interventions marked a defiance of the original masterplan and resulted in a building which is logically integrated in its urban environment.

To balance the architects' preference for variety in living conditions and the housing association's desire for a financially viable plan, the building's circulation system changes from portico's to a gallery on the fifth floor on the north side.¹⁸ The east facade is split in two, where the first four floors cut into the main volume to make way for the adjacent canteen building of the original KSNM port. To provide residents living alongside the KSNM-laan with enough sunlight and an adequate view of the waterfront, the building's roof line declines towards the south side of the building. Here, the building also cuts inwards to make room for the existing KNSM port office which remained on the site as cultural heritage. The maritime/industrial character of the southern waterfront is further accentuated with steel window frames.¹⁹ Lastly, the west facade has a four story tall passageway to create a connection between the KNSM-park and one of Piraeus' inner courtyards.¹⁸

All of these interventions gave the building several distinct faces with each their own origin and expression. F. 12-15 show the different faces of the building as showcased in a presentation model of the building.

Kollhoff's tectonic strategies applied in Piraeus

To prevent these design interventions from alienating the building from its own environment, certain architectural gestures were made to express a more coherent identity. Kollhoff's view on tectonics came into play as a strategy for unifying the individual architectural elements into a coherent whole. A part of this strategy was the expression of weight by using specific dark colored bricks all throughout the building's facade. The color of this brick was a melange, ranging from a deep blue to a medium brown color. Not only did this specific type of brick give the building a uniform and sober look, it appears as if they firmly anchor the building on the site (F. 16), and as if they logically carry the building's volume - a first sign of tectonic expressions being present in Piraeus.²⁰

According to Kollhoff, the delicacy in traditional material use is a crucial part of architecture's ability to relate to the human experience. Christian Rapp states: "the difference between bad and good materials is that good materials age and bad materials break". Both Kollhoff and Rapp argue that the modern day architect runs the risk of succumbing to mass-production and thus to

¹⁸ Lootsma, in Zwinkels et al, 1994, pg. 35.

¹⁹ Klaren & Boekraad, 1994, pg. 18

²⁰ Melet, in Zwinkels et al, 1994, pg. 48, 49, 50.

F. 16



F. 18



F. 17



F. 19



F. 16 View from Sporenburg. The dark brick carries a lot of weight and makes the building feel monolithic and permanent. From: Rapp+Rapp (around 1994).

F. 17 View from the Piraeusplein. The main volume below the fifth floor folds in on itself to visually carry the volume above. From: Kollhoff & Pols architecten (unknown date).

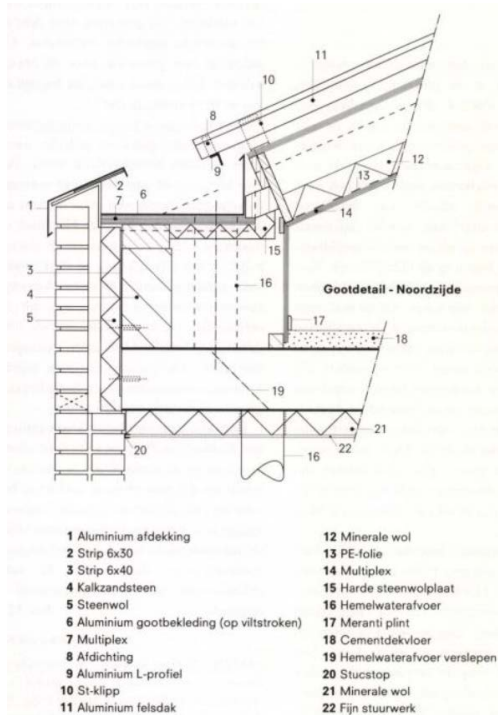
F. 18 View alongside the KNSM-laan/Levantplein. The inset corner of the building resulted in a cantilevered volume on top, which is (visually) carried by the massive volume below. From: Kollhoff & Pols architecten (unknown date).

F. 19 View from the KNSM-park. A series of bolt looking columns visually carry the volume above. From: Architectuur.org (unknown date).

F. 20



F. 21



F. 20 Eaves detail, south side. From: Melet, in Zwinkels et al. (1994).

F. 21 Gutter detail, north side. From: Melet (in Zwinkels et al. (1994).

generalization of materials and applications, and advocate for a more permanent material use. In turn, the material care attributes to the permanent nature which the building aims for, and thus, adheres to Kollhoff's tectonic value of a building's individual parts forming one coherent whole.²⁰

Kollhoff's perspective on tectonics emphasizes a visual play of forces which remained logical to comprehend. This meant that for every force visually present in the building, there had to be a sensible way to architecturally explain how this force was being accounted for (F. 17-19). Piraeus' dark bricks impose a heavy expression on the viewer, and make it look like the aluminium roof is carried with little effort.

However, upon closer examination of the construction details, it becomes clear that the bricks don't actually carry out a load bearing function (F. 20 & 21). Instead, concrete walls reminiscent of the traditional Dutch tunnelkist carry the main loads and the bricks act as the building's visually bearing "skin". A similar instance of incomplete structural honesty occurs on the west side of the building, where a series of bolt looking columns visually carry the volume above (F. 19). In reality, only a portion of these columns are actually loadbearing, yet from the outside they all give the same loadbearing impression.²⁰

One could say these features undermine the concrete tectonic expression of the building. But according to Kollhoff, as long as the building visual loadbearing expression seems logical and reliable, the same tectonic

expression could be achieved as a building which, in an architectural sense, does adhere to its static scheme. F. 22 contextualizes the relation between architectural appearance and the tunnelkist construction. The building's appearance - or "dressing", so to speak - reminds of a legible construction behind it, even if the appearance is no direct translation of the construction. The outside doesn't give the structural dishonesty away, and the building's visual distribution of mass is still comprehensible within the realm of physics as we know them.

F. 23 adds nuance to this relation by relating the building's structural plan to its outside appearance. The building's main load bearing walls don't strictly adhere to single grid length spacing - instead, the spacing between (parts of) load bearing walls differs between single, double and triple spacing to accommodate a wide variety of dwelling types. This way, the building facilitates a diverse living programme whilst keeping the project financially feasible through the use of the tunnelkist construction as a starting point.²² However, this variety is not readable in the buildings facades, which give off a more rational expression. This expression further contributes to the building's concrete tectonic expression. On the building corners, two orientations of the load bearing walls join and create another special type of dwelling, and is architecturally translated through facade configurations different from the rest of the building.

In order to create an architectural dialogue between traditional detailing and the building's contemporary sculptural language,

²⁰ Melet, in Zwinkels et al, 1994, pg. 48, 49, 50.

²¹ Klaren & Boekraad, 1994, pg. 22.

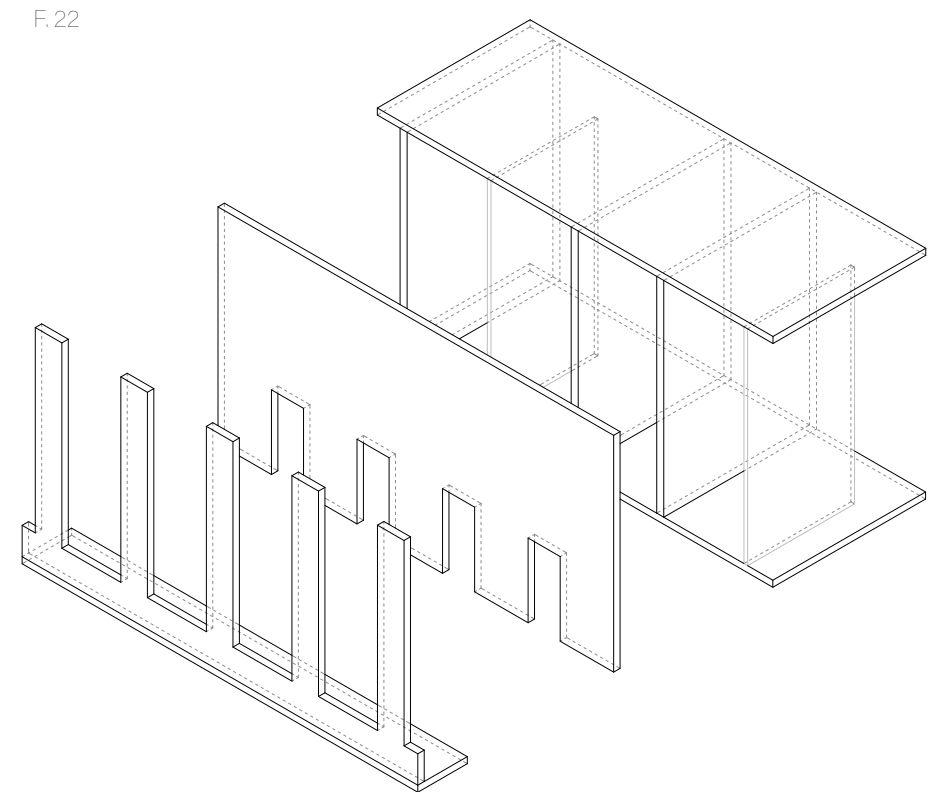
Kollhoff and Rapp introduced diversity in depths of window recesses within the different facades. This difference also results in different tectonic expressions throughout the building. Above the fourth story of the north facade, an offset is made within the masonry to indicate a mass hierarchy (F. 24). Here, the facade detailing creates a logical argument for the visual interplay of forces in the sculptural language. The deeper window and portico recesses applied in the facades hint to a traditional, Berlage-reminiscent expression. On the contrary, the windows shielding the loggias are practically flush with the overall facade surface, creating more of a contemporary expression (F. 25). These windows are also detached from the building's shell with steel profiles to keep the single glazed windows from fogging up,²⁰ whilst keeping the function as dressing according to Semper's notion about the function of the Wand in comparison to the Mauer.

Piraeus' relation to the diagram for tectonic thinking

The apparent massiveness is not a direct expression of a single loadbearing system; rather, it operates as a tectonic image that suggests structural continuity and coherence. In this sense, the building positions itself within what Garritzmann would describe as a mode of concrete tectonic expression, where material and form work together to construct an architectural narrative of stability and permanence. However, it is important to note that the building shifts from this concrete tectonic expression in particular moments. For instance, the glass storefronts appear to somehow carry the

massive brick facades above,²⁰ when the bricks above the facade openings are in fact carried by concealed lintels (F. 24).

According to Garritzmann, buildings can have an unlimited number of tectonic expressions, with the precondition that this expression is in itself is pure.¹⁶ This means that different poles on the Diagram for Tectonic Thinking could create hybrid forms, but could not combine two pure forms (e.g. pure solid and filigree construction), as this would disrupt the overall tectonic expression. This fact makes it difficult to assign a pure concrete tectonic expression to Piraeus, but its tectonic features can still be found in buildings in Dutch housing architecture in the years to come.



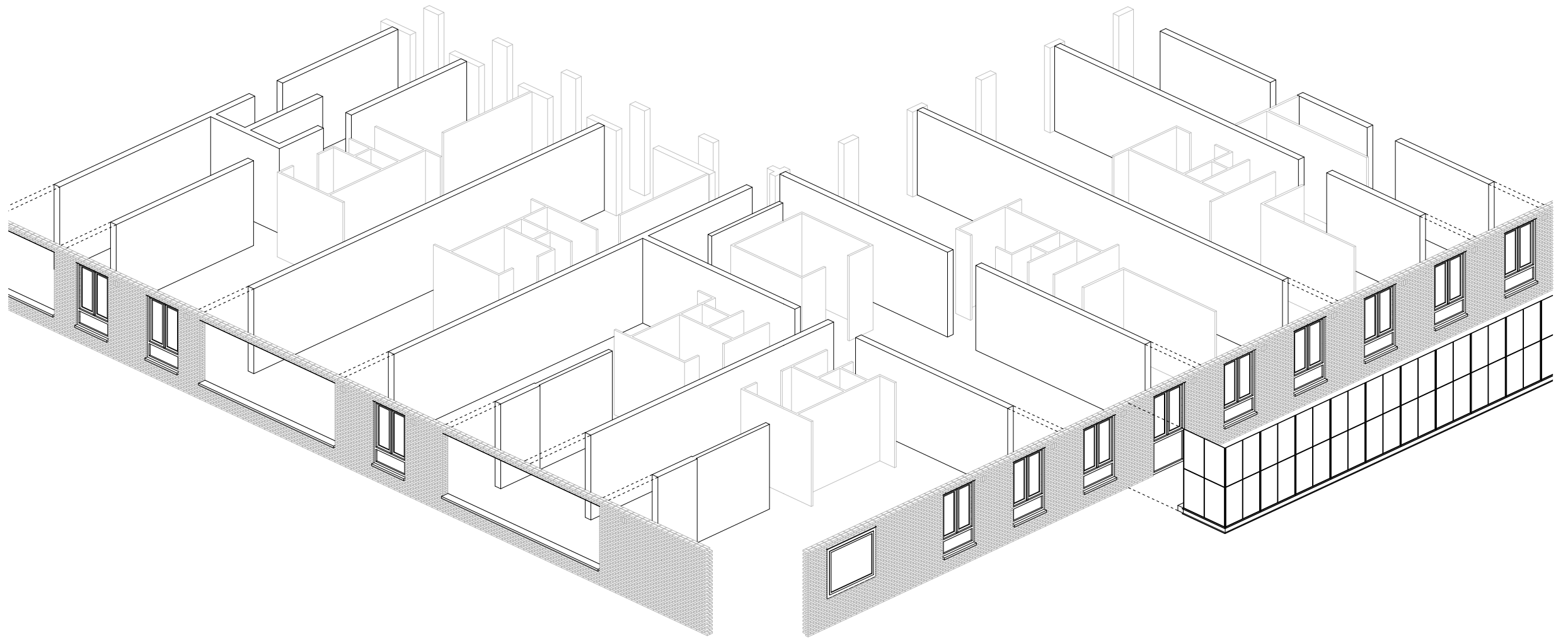
F. 22

F. 22 Conceptual exploded view of a fragment containing the exterior shell, the external wall and the construction behind this "dressing." From: own work (2026).

¹⁶ Garritzmann, personal communication, March 11, 2026

²⁰ Melet, in Zwinkels et al., 1994, pg. 48, 49, 50.

F.23

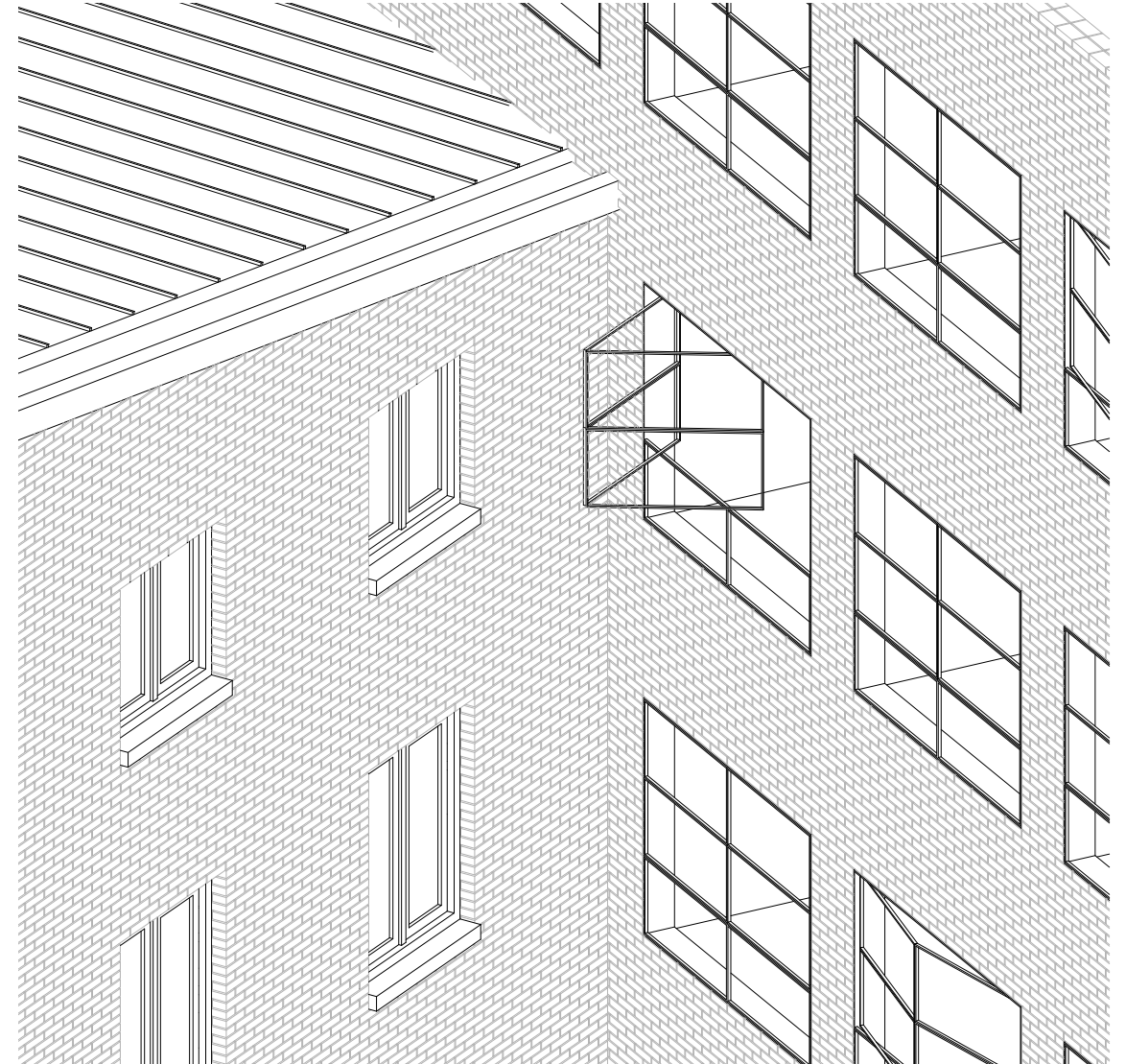


F.23 Exploded view of a fragment of the fourth floor of the north-east corner. From: own work (2026).

F.24



F.25



F. 26



F. 27



F. 28



F. 29



F. 30



F. 31



Post Piraeus: tectonics in Dutch housing architecture

Architectural discourse after Piraeus' emergence

At the time of its completion in 1994, Piraeus immediately attracted attention within Dutch architectural discourse. Newspapers were full with this new architectural landmark in Amsterdam, describing it in terms like "magnetic" or "inevitable."²² Contemporary accounts frame the building as an exceptional intervention within the housing production of the time, describing it as both radically sculptural and materially grounded, and emphasizing the tension between its seemingly fluid geometry and its heavy, almost archaic material expression.²³ This duality was often interpreted as a deliberate reintroduction of tectonic thinking into a context that had become increasingly dominated by lightweight construction and image-driven design.

In 2017, a special edition of *De Architect* got released which included contributions from a range of architects whose work got inspired by Piraeus. In *Post Piraeus*, as the edition is called, a variety of architects wrote about Piraeus' influence on their professional work across a variety of subjects - from mass articulation and provocation, to constructional detailing and function neutrality. Importantly, the architects involved in *Post Piraeus* emphasize that Piraeus did not generate a singular stylistic lineage, but rather inspired a wide spectrum of architectural responses, each selectively engaging with different aspects of the

building. This edition of *De Architect* acts as a source for determining Piraeus' conceptual or abstract influence, and therefore will be combined with independent research on more concrete examples to create a diverse research outcome.

Comparative analyses of tectonics in Dutch housing architecture

The influence of Piraeus becomes more tangible when examined through specific tectonic strategies that reappear in later Dutch housing projects. Rather than direct formal imitation, this influence manifests through the selective adoption and reinterpretation of key tectonic features. Four cases of large-scale Dutch housing projects will be analyzed to determine Piraeus' tectonic influence.

The redevelopment of the *GWL-terrein* (1993-1998) in Amsterdam, designed by KCAP, demonstrates a continuation of Piraeus' monolithic block expression. Large residential volumes are articulated as coherent masses within the urban fabric, which echo the presence of Piraeus as a singular architectural entity (F. 26). *Block 2C* (F. 27), situated on the north side of the site, is visually quite similar to Piraeus in the sense that it has the same massive expression, together with different facade insets at the entrances and a protruding glass volume to cover the gallery. This resembles the intention of Piraeus to let traditional building methods and materials coexist with more

F. 26 GWL-terrein, aerial photo. From: KCAP (unknown date).

F. 27 GWL-terrein, block 2C. From: KCAP (unknown date).

F. 28 Batavia, street side facades. From: de Architecten Cie (unknown date).

F. 29 Batavia, courtyard side facades. From: de Architecten Cie (unknown date).

F. 30 Student hotel, street view showing mass articulation. From: HRH Architecten (unknown date).

F. 31 Student hotel, street view showing facade dynamism. From: HRH Architecten (unknown date).

²² Stadsarchief Amsterdam, 1994.

²³ Klaren & Boekraad, 1994, pg. 47-71.

contemporary counterparts, as long as these elements don't interrupt the overall mass articulation.

A similar engagement with materiality can be observed in *Batavia* (1999-2001) by de Architekten Cie, also in Amsterdam. Here, the use of dark brick, combined with glass volumes and timber detailing, recalls the material palette of Piraeus. The project adopts a tectonic language in which masonry conveys stability and weight (F. 28), while inserted glass elements introduce variation and lightness (F. 29). This juxtaposition reflects a partial continuation of Kollhoff's approach, though with a greater emphasis on contrast rather than the unified material expression found in Piraeus. However, the building is way less prominent in its environment than Piraeus due to the difference in urbanistic intentions.

Finally, the *student hotel* in Delft by HRH Architecten (2004-2012) introduces a more sculptural interpretation of tectonics through the interplay of overlapping volumes (F. 30). The building's form is defined by the interaction of distinct masses, which remain visually legible as separate yet interconnected elements. This approach echoes the sculptural quality of Piraeus, where geometry plays a key role in shaping architectural identity. However, the facade adheres to compositions different than those of Piraeus, resulting in more of a dynamic expression than a static one (F. 31).

Translation, adaptation or possible dilution

The comparative analyses reveal that the influence of Piraeus on subsequent Dutch housing architecture is neither direct nor uniform. Instead, its tectonic strategies have been selectively translated and adapted across different projects. Tectonic facets are expressed in various forms, yet rarely as in complete or coherent system. This observation aligns with the argument presented in *Post Piraeus*,²⁴ which frames the building not as a fixed model, but as a generative reference point whose influence unfolds through multiple, often divergent architectural interpretations.

In some cases, such as the *GWL-terrein*, the monolithic expression of the building block is preserved but modified through the introduction of transparency and lighter materials. This can be understood as an adaptation, where the original tectonic intent is maintained but reinterpreted to align with changing architectural preferences. Similarly, projects like *Batavia* translate the material language of Piraeus while introducing greater contrast between elements, resulting in a more hybrid tectonic expression. These examples reflect what *Post Piraeus* describes as the selective appropriation of architectural strategies, where individual aspects of the building are isolated and recontextualized rather than reproduced in their entirety.

At the same time, certain aspects of Piraeus' tectonic approach appear to be diluted in later interpretations. In the case of the student hotel in Delft, the influence of Piraeus can be identified in the building's sculptural massing and volumetric articulation. The composition of overlapping forms recalls the spatial complexity of Piraeus, yet the tectonic coherence is less pronounced. The articulation of mass is visually expressive, but the relationship between construction, material, and form appears more fragmented. This can be interpreted as a partial dilution of Piraeus' tectonic principles, where formal strategies are retained while the underlying constructional logic becomes less legible.

As emphasized in *Post Piraeus*, the building's legacy lies precisely in this dispersion of its architectural logic across a wide range of projects. The strong coherence between mass, material, and architectural expression that characterizes Piraeus is often fragmented in subsequent designs, where different tectonic strategies are combined without forming a unified whole. This suggests that while Piraeus has had a lasting impact on Dutch housing architecture, its influence is most evident in the distribution of individual tectonic principles, rather than in the replication of its complete tectonic system.

²⁴De Bokx et al, 2017.

Discussion & conclusion

Critical analysis of Piraeus' influence through the use of tectonic strategies

This research set out to critically examine how the tectonic strategies applied in Piraeus influenced architectural tendencies and design culture in large-scale Dutch residential buildings following its completion. This approach revealed that Piraeus' impact is both significant and complex, operating less through direct imitation and more through selective reinterpretation.

A critical reading of the case studies demonstrates that Piraeus did not establish a singular architectural model, but instead introduced a set of tectonic strategies that could be deployed in different ways. Its monolithic expression, achieved through the use of dark brick and volumetric coherence, reappears in later projects, though often modified through the incorporation of transparency or lighter materials. Similarly, its emphasis on façade depth and spatial articulation is echoed in buildings that explore layered envelopes and transitions between interior and exterior space. However, these strategies are rarely combined with the same level of coherence found in Piraeus. Instead, they are frequently isolated, adapted, or hybridized, resulting in a more fragmented tectonic language.

This observation points to a key distinction between direct and indirect influence. While few projects replicate the formal or

material unity of Piraeus, many engage with its underlying principles at a conceptual level. In this sense, the building's influence operates through what can be described as a process of translation and adaptation, in which architects reinterpret specific tectonic ideas within new contexts. At the same time, this process often leads to a dilution of tectonic coherence, as the strong alignment between construction, material, and architectural expression that characterizes Piraeus becomes dispersed across different design strategies.

The findings of this research therefore suggest that Piraeus should be understood not as a stylistic turning point, but as a tectonic reference framework within Dutch housing architecture. Its significance lies in the way it reintroduced a mode of architectural thinking that foregrounds the relationship between construction and form, while simultaneously demonstrating how this relationship can be expressed at multiple scales - from detail to urban block. By applying a systematic analytical framework, this study has been able to move beyond generalized claims of influence and provide a more precise understanding of how tectonic strategies are transmitted and transformed within architectural practice.

Possible contribution to future studies on architectural history and/or Dutch housing

In terms of its contribution to architectural history, this research highlights the importance of tectonic analysis as a methodological tool. By focusing on constructional logic and material articulation, it offers an alternative to predominantly stylistic or cultural interpretations of architectural influence. This approach could be extended to other case studies within Dutch housing or to broader international contexts, where similar questions of translation and adaptation arise.

Ultimately, Piraeus emerges as a building whose influence is not defined by replication, but by its capacity to generate diverse architectural responses. Its legacy within Dutch housing architecture lies in the continued reinterpretation of its tectonic principles, confirming its role as a pivotal yet open-ended reference point within contemporary architectural discourse.

Bibliography

De Bokx, M., Van Velzen, E., De Brouwer, J., Cornelisse, F., Floris, J., Geurst, J., Van der Heijden, H., Janssen, J., Pols, A., Tielens, G., Tilman, H., Wingender, J.P. (2017). *Post Piraeus. Over de bouwplaats en de stad*. De Architect.

Engel, H., Barbieri, S.C., Cavallo, R., Claessens, F., Diesfeldt, O., Geerts, F., Marzot, N., Wilms Floet, W. (2005). *OverHolland 1*. Architectonische studies voor de Hollandse stad. SUN.

Garritzmann, U. (2021). *Modes of Tectonic Thinking: Proposal for a Non-Dualistic Understanding of Tectonic Expression in Architecture*. Arkitektuskolen Aarhus.

Garritzmann, U. (March 11, 2026). *Interview with author*.

Gautier, C., Jolles, A. (2003). *Oostelijk Havengebied Amsterdam: stedenbouw en architectuur*. NAI Uitgevers.

Heddema, F., Mak, G., Singels, H. (2002). *De Eilanden: Het Amsterdams Oostelijk Havengebied in stadsgezichten 1974-2002*. De Verbeelding.

Klaren, M., Boekraad, C. (1994). *Piraeus, een woongebouw van Kollhoff*. NAI Uitgevers.

Koster, E. (1995). *Oostelijk Havengebied Amsterdam – Eastern Docklands*. Architectura & Natura.

Kollhoff, H., Polónyi, S., Klinkott, M., Neumeyer, F., Kapfinger, O., Bach, F. T. (1993). *Über Tektonik in der Baukunst: Beiträge*. Vieweg.

Lootsma, B. (2000). *Superdutch: de tweede moderniteit van de Nederlandse architectuur*. SUN.

OASE. (1997). *OASE 47 / Bekleding*. SUN.

Stadsarchief Amsterdam. (1995). *Ontwikkeling van het Plan Kollhoff, een appartementencomplex aan de Levantkade*. Stadsarchief Amsterdam.

Zwinkels, C., Rodermond, J., Melis, L., Melet, E., Lootsma, B., Ligtenberg, C. (1994). *De Architect 1994-05*. Ten Hagen & Stam.

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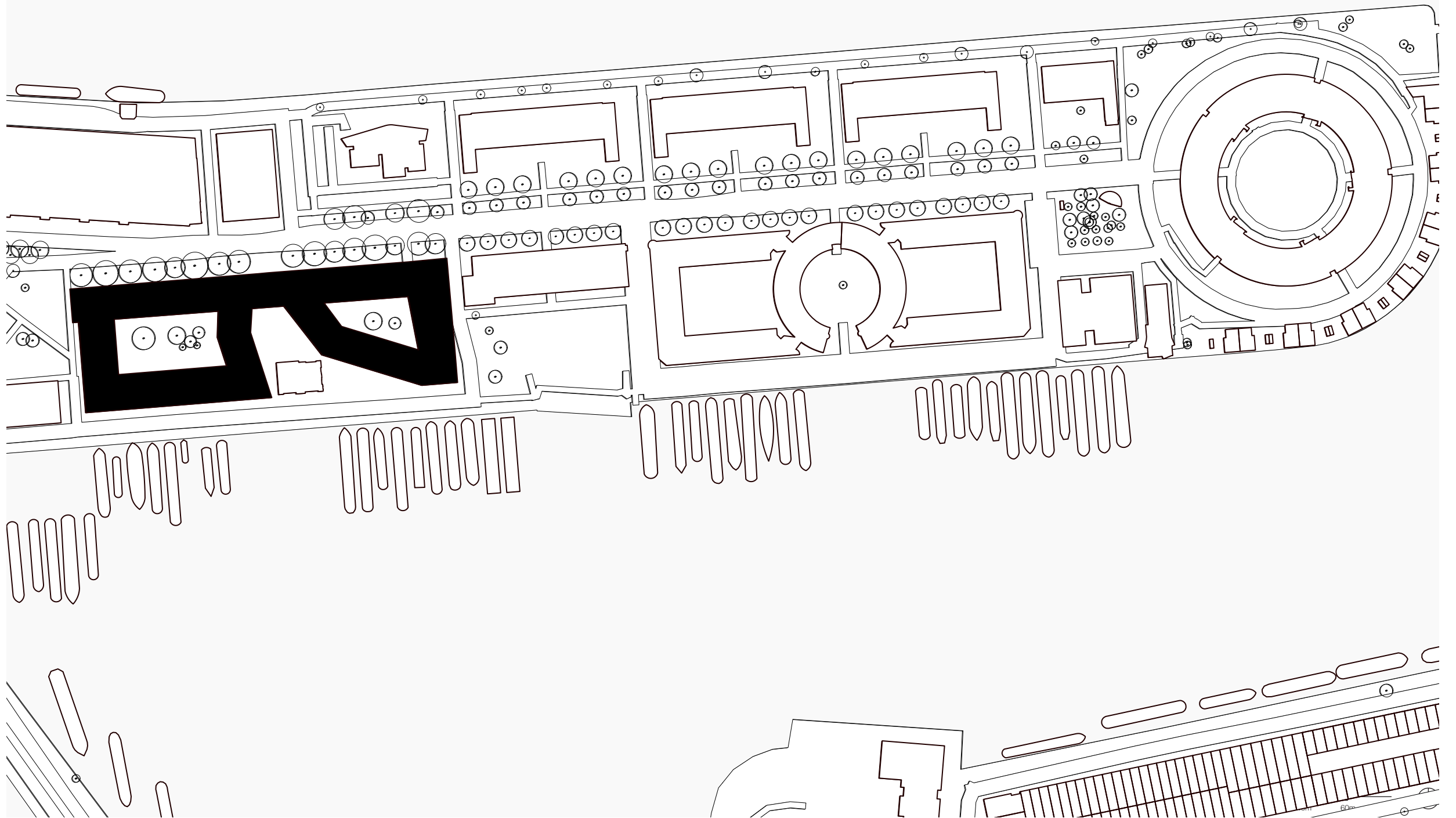
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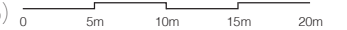
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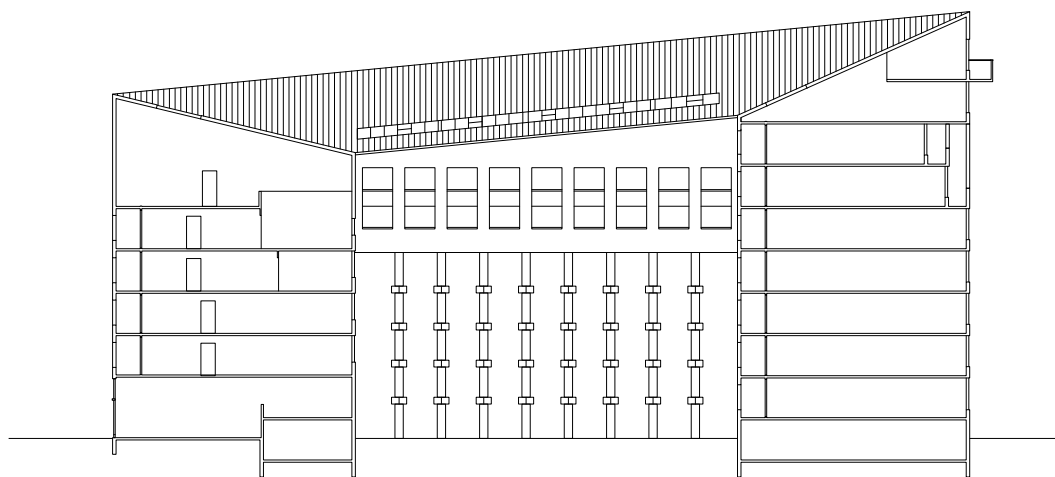
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