

The Conflict as a Tectonic Strategy. Dialectic between Structure and Enclosure in Herman Hertzberger's Muziekcentrum

Jose María García Crespo

DOI:DOI:https://doi.org/10.20868/cpa.2025.15.5603

The Vredenburg Muziekcentrum in Utrecht (1973-1978), designed by the Dutch architect Herman Hertzberger, is a singular work from the constructive point of view, even though the materials and techniques employed are not. A drawing produced by his office, under the heading *knooppunten van prefab-element*¹ (*nodos de elementos prefabricados*), shows 42 different junctions between the concrete pillars and the enclosing elements [Fig. 01]. This axonometric-perspective diagram, made after the completion of the building, had a didactic purpose: to show the permutations of the constructive model or, as Hertzberger usually calls it, the “construction kit”. However, the documentation actually used for the execution —construction sketches and working drawings— reveals a diversity, sophistication and density of approaches far superior to those shown in that diagram.

This study aims at the analysis of the dialectic generated between the structural subsystem (pillars and slabs) and the space-shaping subsystem (enclosures and partitions)², to verify whether this constructive solution incorporates the resources and mechanisms proper and exclusive to this tectonic context. These circumstances raise the hypothesis that this case may be paradigmatic or exemplary of the relationship between structure and enclosure⁴.

Given the magnitude and complexity of the project, this approach excludes other relevant aspects of the building, widely published and documented in at least their general outlines. The main monographs and specialized articles³ do not delve into the details of the constructive system; Hertzberger addresses it in his written work, but within comparative studies that do not detail each case. The most complete publication on the subject is the monograph of the Muziekcentrum —a supplement to the journal *Polytechnisch Tijdschrift* edited by Wim van Heuvel—, composed of ten articles that analyze different aspects of the building. Despite its technical nature and its length of nearly one hundred pages, the thematic breadth

(its main use being a concert hall) prevents a detailed analysis of the dialectic between structure and enclosure. Since Hertzberger is, above all, a builder-architect, the documentation generated before and during the construction acquires a decisive value. The execution drawings have not been published, and although his sketches have been more widely disseminated, those of a design nature predominate over the constructive ones, even though many of the latter were produced during the construction itself.

The requirements of the constructive order

From the outside the complex as a whole looks like a random form, and does not exactly live up to one's expectations concerning a self-contained building. The point of departure in the design — i.e. to avoid the effect of a ‘temple’ of music by integrating the structure as much as possible into the surroundings — and the ensuing principle of accessibility resulted in a peripheral arrangement composed of multiple facets. And because all these facets have been constituted of the same materials they represent, in effect, simply different facets of the same whole⁵.

The Muziekcentrum in Utrecht lies halfway between a building and a fragment of city. This proposal was more an urban operation than a simple building, and therefore the story of its conception was very turbulent and had repercussions in politics and planning⁶.

There is an idea of buildings that emulate cities in miniature. Hertzberger himself had already explored this idea in different ways. The case of the Muziekcentrum, however, presents three aspects that distance it from the usual pattern of mat-building and bring it closer to urban planning: the connection with the surroundings, the conjunction of diverse programs, and the absence of an additive functional and spatial unit⁷.

The building is located between the enormous Hoog Catharijne shopping center and the historic center of Utrecht, formed by small alleyways. The project, however, assumes broader commitments: it incorporates walkways to cross avenues with heavy traffic, extends the interior street of the adjacent shopping arcade, adapts to the irregular contours of the plot, and defines open areas around it, such as the square providing direct access to the theater. Taken as a whole, it allows itself to be crossed by all the possible flows of its surroundings. It does not avoid urban confrontation; on the contrary, it enhances it [Fig. 02]. *Centraal Beheer*, for example, “is incorporated into the urban fabric with no apparent intention of continuing the bordering grid”⁸. Many “building-as-city” works, by contrast, present themselves as highly autonomous with respect to what surrounds them.

The Muziekcentrum is accessible not only in the physical sense, but also in terms of

welcome and proximity to the concert-hall experience. By integrating this use with the city, the elitist image associated with “high” music is diluted. This is achieved because the ensemble is not limited to a music center: it is completed by three buildings (lobes)⁹ that surround it as appendages, connected by covered streets. These house a smaller rehearsal hall, auxiliary rooms for the theater, a library, two restaurants, cafés, shops, a cinema, offices, and a tourist information center. In its conception, it resembles a group of buildings, and for the first time for Hertzberger, these were not intended for permanent users¹⁰.

Finally, and unlike many building-as-city examples, the Muziekcentrum is not developed through an additive functional and spatial unit —as occurs, for example, in Van Eyck's Orphanage—. Although it does not resort to this design resource, it does present a clear constructive order. The building takes on the challenge of responding to multiple constraints while at the same time maintaining its own identity [Fig. 03]. Construction will be responsible for reproducing all these constraints, and it will do so with a single construction kit.

Constructive Seriality and Material Unicity

We will address the variations of this constructive system from a qualitative point of view, although quantitatively the proposal is also highly significant. In this case, the number matters: the building has 512 practically identical columns distributed over four levels. It is striking that the 42 nodes with which we opened this article fall short when compared to the large number of situations and junctions present in the completed building; that initial diagram now reveals itself as the tip of the iceberg. Only with regard to the exterior enclosure, the execution project documents 103 different cases, grouped into four categories: 62 *gevelementen* (facade elements), 23 *gevelementen-vrije puien* (facades with free shopfronts), 13 *gevelementen-trappenhuizen* (stairwell facades), and 5 *gevelementen-passage* (passage facades). These 103 spandrel panels are drawn in plan, elevation, and section. Some correspond to a single specific case, although it is common for one and the same solution to be repeated several times. Even so, these facade elements affect just over one third of all the building's pillars. Another third corresponds to free-standing pillars —although rarely in an absolute sense, since they are usually linked to furniture or suspended ceilings— and the remaining third is related to interior elements such as partitions, railings, or stairs.

Although the project starts from a single construction kit, the incorporation of numerous variations could have weakened its unity. To restore and reinforce the coherence of the whole, Herman Hertzberger resorts to two procedures that return to it a unitary identity: the lack of differentiation between interior and exterior, and the use of a single material.

The enclosures and partitions present the same finish on both faces. While this is common in interior separating elements, on the facade it constitutes a deliberate decision. Moreover, enclosures and partitions are hardly distinguishable in their external appearance. Although an element in contact with the exterior requires higher performance than an interior one, this differentiation leads to the traditional classification between enclosure and envelope, which implies a conceptual limitation for three reasons: the first is that the idea of “enveloping” directly refers to concealment. The second is that assuming that enclosure and partition are distinct establishes a strict boundary between interior and exterior. And finally, as there is no evident distinction between them, the dialectic between the structural subsystem and the space-shaping subsystem is perceived with greater clarity, since fewer ingredients favor an understanding of their combination.

To this is added that both subsystems are materialized in concrete: cast in situ for the structure and in prefabricated blocks for the wall planes. This homogeneity introduces subtlety in the reading of the whole. Colors and textures, although not identical, are very similar, which softens the explicitness of the differences. The two subsystems remain recognizable, but they are perceived as one and the same entity. This device — making the parts evident while at the same time attenuating them— is characteristic not only of the Muziekcentrum, but of much of Hertzberger’s work.

The warp. Pillars and slabs awaiting form

The structural system of the Muziekcentrum is elemental and forceful: a grid of point supports (pillars) and reinforced-concrete slabs [Fig. 04].

The pillars, 47 cm in diameter, vary in height between 2.20 and 2.80 m due to slight level differences between floors. In some specific cases they extend through a double height because of voids in the slabs [Fig. 03]. Resting on these elements are the flat platforms, consisting of a thin solid concrete slab 17 cm thick. This slab is thickened in the form of a flat or tie beam only at the perimeter of the structure (where it will be visible), thereby doubling its thickness and reaching a final depth of 34.2 cm.

But the most distinctive elements of the structure are the large square transition pieces, 119 cm on each side and 53.2 cm in height (practically half a cube), which mediate between the thin slab and the circular-section pillars. Perhaps because of our Greco-Roman architectural tradition, we tend to associate this element with a capital, but its proportions, on the one hand, and its close geometric relationship with the slab, on the other, distance it from that idea. In fact, through the project sketches, it can be observed how these elements were, at a certain point, a local thickening of the slab. Soon, slab and

capital would become different elements, although this seems to be mainly for construction and formwork reasons. Whenever the slab meets this element, it aligns with it and replicates its outline. There is, therefore, no intention to emphasize the independence between slab and “capital.”

A difference between a square pillar and one with a circular section is that, while the former coexists more easily with a wall that might abut it, the curved pillar, when free-standing, can be more attractive and favor the flows around it. The pilaster was traditionally a column that was transformed to produce a geometric accord with the wall, or, in other words, to resemble it. The column, with its circular section, deploys all its plastic and haptic potential when it is free-standing. The pillar of the Muziekcentrum possesses the best of these situations because it is both things at once: a pillar and a column. What we call here a capital would in fact be as if the upper part of the column had turned into a large pilaster. Since the capital is larger, a separation of 36 centimeters is created around the column. This clearance will serve to separate the column and keep it free-standing when enclosures, partitions or suspended ceilings abut it.

The layout of the pillars and capitals is determined by a 3×3 m grid. No pillar will move from these structural axes. Nevertheless, the great majority of the supports are arranged in a 6×6 m grid that overlaps the 3×3 m one. In other words, the pillars form a 6×6 m grid, but when the building needs to adapt to the irregularities of the surroundings, they can be placed 3 m apart. The presence of the capitals shortens this distance by more than one meter, so the distance between supports never exceeds a 5 m span.

It follows that, due to the large size of these transition elements (capitals), they fulfill the double function of preventing the punching shear of the pillars through the thin slab and of reducing the span between pillars. Although, as we have already noted, the main role of this element is not so much the transmission of loads as the constructive one.

All the capitals are oriented in the same way. This characteristic underlines the autonomous role of the structure as the support for what is to come, while the wall planes adapt to this circumstance.

The dimensional module of all the structural elements is the height of the concrete block and its corresponding proportion of joint or mortar seam. The slab edge thickness is equivalent to two of these blocks, and what we have called the capital, to three. In the same way, the height of the pillars will be given by a multiple of these blocks. It can therefore be deduced that, in the final sizing of the structural elements, constructive premises prevail once the minimum structural requirements have been met.

Everything is now ready and waiting for the arrival of the space-shaping subsystem. This entity will be responsible for responding to a great number of different requirements. What are the invariants that govern this repertoire of solutions?

The weft. The logic of the fragment

The node diagram prepared by the office itself, with which we began this text, shows various junctions of the column. However, the way these items were described for execution differs notably. In the working drawings, each unit is represented in plan, elevation, and section as an integrated set composed of two pillars, the upper and lower slabs, and the stretch of enclosure between them. In this way, the structure acts as a frame, while the enclosure is configured as a spandrel panel that occupies that space.

Hertzberger himself, in an interview with the author of this text, explained that he had acted constructively in a manner analogous to Gothic architecture¹¹. Thus, the enclosures of the Muziekcentrum can be understood as plementos filling in the structure¹². The relationship between the load-bearing and dividing elements is particularly close, since the constructive module is composed of both. The facade is not presented as a continuous unit, but as a set of fragments resulting from the combination of structure and enclosure. Likewise, the structure, although visible at all times, does not appear in a forceful way and therefore is not perceived as an autonomous entity. Both subsystems, while maintaining their respective identities, are integrated into an indivisible whole.

These facade units are organized into three families according to the distance between the pillars they span [Fig. 05]. The smallest spandrel panel corresponds to the side of a 6 × 6 m square; the largest, to its diagonal. The third, of intermediate size, equals the diagonal of a 6 × 3 m rectangle. The first family is used on orthogonal perimeters (90°), the second on 45° diagonals, and the third on diagonals of about 32°. These three possibilities are sufficient to adapt to the irregular perimeter of the plot.

The variety of panels is so extensive that, in order to work with all their variations, the office itself produced a verklaring codering (legend of codes) [Fig. 06], which parameterizes a generic model¹³. This legend defines five parameters: the type of enclosure, the floor on which it is located, the height of the base (which may vary within the same floor), the vertical zoning, and the horizontal zoning. The last two parameters focus on the definition of the facade element itself, while the others serve to determine its location within the project. It is the zoning in the vertical direction (from top to bottom) and in the horizontal direction (between columns) that define the different bands of which the element is composed, and therefore the ones that concern us most here.

The *hoogtezonering* (vertical or height zoning) indicates the height of the parapet (borstwering) made of concrete blocks. The most common rule is that each facade element begins with a plinth of variable height, and the opening results from the portion left uncovered. Up to the upper slab, joinery with glazing or glass blocks is used. Except in very exceptional cases, the openings are not created as cutouts within the wall, but as the result of its absence. There are extreme cases in which the concrete block covers the entire height between slabs, or in which that height is completely occupied by the joinery, with its glazing or glass blocks.

As for the *horizontalezonering* (horizontal zoning), it is organized from the center, beginning with the central facade (*middenpui*). On both sides are the intermediate facades (*tussenpui*), and at the junction between these and the pillars is the column facade (*kolompui*). This division by bays is a way of articulating the coexistence between two antithetical elements: the column and the wall, which are none other than the pillar and the wall (in this case, a non-loadbearing wall). In this way, the dialectic operates progressively, transforming the panels gradually as they approach the node.

It seems a very appropriate strategy to atomize the envelope into small units when the building must respond to multiple boundary and programmatic situations. But fragmentation does not serve only this function. In his book *Lessons for Students*¹⁴ Hertzberger speaks of the concept of articulation as a way to combine a large enclosure for general use with small places for specific use. The aim is thus to generate spaces that offer the possibility of accommodating a large group of people, but which can also be used by small, separate groups, even at the same time. To achieve this, Hertzberger resorts to folds and corners that, together, form the perimeter of a larger room [Fig. 07]. These small facade and partition units have the capacity to accommodate smaller stationary uses while at the same time shaping the periphery of larger spaces.

The node. The functional confluence at the contact between warp and weft

The most significant constructive device or mechanism of the Muziekcentrum is to concentrate, at the crossing point between the pillar and the envelope, as many functions as possible [Fig. 08]. This way of acting is, in some sense, counterintuitive. It would seem more practical to relieve a node that already possesses its own specific complexity of further tensions. The usual tendency is to distance the supports from the facade or, in the opposite alternative, to reabsorb or conceal them within the wall itself. Hertzberger does neither; he places the supports and the enclosure in the same plane. Once set on equal terms, that point of tension concentrates support, natural and artificial light, views, passage, occupancy, and the geometric accord between entities.

Once again, as in the general approach of the intervention in enhancing the building's relationship with the city, far from avoiding conflict, it stimulates it. This clever solution is not unprecedented, but it is both by its massive application and by the intensity with which it is carried out.

It is evident that the pillar's function is to support the building, but Hertzberger emphasizes this condition explicitly. The same pillar is always visible both on the exterior and in the interior of the building.

With regard to natural and artificial light, the node once again takes center stage. The wall planes that meet the column are transparent. There are few points where this is not the case, even if it is only a small strip barely 20 cm wide, which gives the work a kind of drama characteristic of masonry architectures. The capitals, for their part, are equipped with electrical connections, from which luminaires emerge that bathe these elements in light. It is precisely these intersections that Hertzberger wishes to accentuate, both by day and by night. As already mentioned, the meeting point between the two subsystems is transparent, allowing one to see through it. This area is not devoted exclusively to views, but it does constitute an invariant. For example, one of the enclosures has a transparent node, but the center of the enclosure is made of glass block. This creates an unexpected situation: the view is favored where there should be a wall, and the view—though not the light—is blocked where there should be a window.

In the execution project there is a specific section devoted exclusively to the panels located at the entrances and passageways of the building. This situation shows how Hertzberger sought to emphasize this particular quality of the building. The supporting elements are always “in the middle” of the circulation. There is a significant group of panels equipped with accessible circular balconies whose center coincides exactly with the axis of the pillar. The windows that abut the pillar are the ones that open as passageways to the balconies, or else are used for ventilation when such balconies are not present.

It is at the node that the geometric accord between the two entities also occurs. All the capitals of the pillars share the same orientation, and the panels, unlike what is usual, are not arranged perpendicularly to them, as already mentioned. The closing element twists as necessary in order to meet the capitals perpendicularly [Fig. 09].

Conclusions

If Hertzberger can be considered one of the main representatives of structuralism, he is, without a doubt, the one who carried its materialization furthest on the constructive plane. The Muziekcentrum constitutes the most elaborate case of dialectic between structure and enclosure, given the large number of configurations as responses to a single solution. It should be noted that Hertzberger considered the Muziekcentrum

one of his greatest achievements, although it was also a project of enormous demands that required extraordinary effort and a necessary spiritual rest after its completion¹⁵. The constructive complexity of the proposal did not go unnoticed by his contemporaries and, in many cases, gave rise to criticism or skeptical readings precisely regarding this aspect—the tectonic one.

Wessel Reinink points out that the enclosure combines two qualities: a surprising massiveness and an almost nervous articulation of it. In the same paragraph he recounts the following anecdote: “Irritated as he was by the extremely detailed exterior of Vredenburg Music Center, the Italian critic Bruno Zevi could not suppress a disapproving *Taci, mura* (wall be silent!). It comes as no surprise, though, that an Italian should have trouble enduring the restless motion of the eye confronted with such a bustling detail. Hertzberger himself acknowledged that the building lacked a definitive exterior. Along these lines, Herman van Bergeijk described it as a construction without a precise outline, resembling a frayed fabric or “a weave without a hem.”

The frame structure—verbalized for the first time in the Dom-Ino plan¹⁶—carries within its very definition the idea of dialogue or dialectic like no other tectonic model, since it is composed of two antithetical entities obliged to coexist: structure and enclosure. In this tectonic model, one finds precisely the dualities characteristic of what has been called structuralism: general-specific, permanent-mutable, support-complementary, warp-weft, or structure-enclosure. The Muziekcentrum is therefore not only a reference constructive-structural case study within Hertzberger's work and Dutch structuralism, but also within the very tectonic frame structure system (structure and enclosure).

This paradigmatic or model character lies in the presence of two important resources that characterize this tectonic model: First, the pillar is presented as an identity-bearing and functional element. This component, which within the frame structure system has been the most questioned and conflictive, is assumed by Hertzberger deliberately and explicitly, until it becomes the axis around which the constructive strategy of the project is articulated. Second, the manifestation and parity of the two entities—structure and enclosure—reinforce the effectiveness of this dialectic between the two subsystems, as opposed to approaches in which one of them prevails over the other. Hence the Muziekcentrum possesses such an unusual character. The two inherited tectonic worlds—the wall and the column—are recovered and coexist. This coexistence, or conflict, uncommon in modern architecture, may evoke the formal strangeness of the wall surfaces of the vestibule of Michelangelo's Laurentian Library [Fig. 10]. This challenge—to make these two entities coexist—does not constitute merely a constructive problem, but raises a design question of broader scope¹⁷.

1. The office itself would produce two other similar construction node diagrams for the Apolloscholen – Montessorischool in Willemsspark school, Amsterdam (1980-1983), and the Ministerie van Sociale Zaken en Werkgelegenheid, The Hague (1979-1990).

2. The main concert hall and the rehearsal hall use steel trusses to span their large spans, which interrupts the building's frame structure in those areas. These structural elements are not part of the object of analysis of the present research.

3. This project was widely published in architectural magazines around the year of its completion. We can highlight articles in specialized journals such as *L'Architecture d'Aujourd'hui* (1978), *Domus* (1979), *Bauen + Wohnen* (1979), *L'Architecture d'Aujourd'hui* (1980), *Wonen TABK* (1980), *Baumeister* (1980), *Bouw* (1981), and *Spazio e Società* (1980). The latter, although the most extensive of all, addresses the constructive system only from a very general standpoint.

4. Winn van Heuvel et al., *Muziekcentrum Vredenburg*, vol. n° 7, PT monografie, (Polytechnisch tijdschrift, 1979). The monograph deals with the following topics: the design process and its early versions, the important archaeological findings discovered and integrated into the work, the acoustic aspects of the concert and rehearsal halls, climatic aspects, costs and quality control, the execution of materials, municipal participation, and even an article devoted to the building's electrotechnics.

5. Herman Hertzberger, *Lessons for Students in Architecture*. (Rotterdam: 010 Publishers, 1991). "From the outside the complex as a whole looks like a random form, and does not exactly live up to one's expectations concerning a self-contained building. The point of departure in the design – i.e. to avoid the effect of a 'temple' of music by integrating the structure as much as possible into the surroundings – and the ensuing principle of accessibility resulted in a peripheral arrangement composed of multiple facets. And because all these facets have been constituted of the same materials they represent, in effect, simply different facets of the same whole."

6. Wessel Reinink, *Herman Hertzberger: Architect* (Rotterdam: 010 Uitgeverij, 1990).

7. Oriol Bohigas, "Variaciones de Hertzberger sobre temas del Team 10," *Arquitecturas Bis*, no. 11 (1976).

8. Rebeca Merino del Rio and Julio Grijalba Bengoetxea, "Central Beheer: Los límites del estructuralismo en la configuración de un espacio-soporte." Article, *Proyecto Progreso Arquitectura*, no. 19 (Nov 2018).

9. The three buildings that surround the auditorium are referred to in the execution project as lobes: Noorlob (north lobe), Pleinlob (square lobe), and Westlob (west lobe).

10. Reinink, *Herman Hertzberger: Architect*.

11. Interview conducted with Herman Hertzberger by the author of this text at his home in Sarphatipark, Amsterdam, on March 7, 2024.

12. It has been noted that the Italian term *campata* designates more precisely the autonomous unit formed by the structure and its corresponding panel.

Alfonso Díaz Segura, *La disolución del pilar en la arquitectura moderna: un proemio, siete mecanismos y un epílogo* (Doctoral Thesis, Universitat Politècnica de València, Escuela Técnica Superior de Arquitectura, 2012).

13. It cannot be confirmed that this attempt at organization had an effective use, since many of the drawings make no reference to these codes. This may be because, given the large number of exceptions, systematization was not possible.

14. Hertzberger, *Lessons for Students in Architecture*.

15. M. Behm, M. Kloos, and Amsterdam Centre for Architecture, *Hertzberger's Amsterdam* (ARCAM, 2007).

16. Ignacio Paricio, *La construcción de la arquitectura. Vol 3, La composición* (Barcelona:

Institut de Tecnologia de la Construcció de Catalunya - ITeC, 1995).

17. Rafael Moneo, "La llegada de una nueva técnica a la arquitectura. Las estructuras reticulares de hormigón." (Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos. Madrid, 1975).

Muziekcentrum
Frame structure
Systems
Constructive dialectic
Permutations