

Diagrams in Action: Performative Synapses and Critical Taxonomy of Graphic Operations in BIG

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Abstract

This contribution proposes a critical reading of Bjarke Ingels Group's diagrams as hybrid devices, which are simultaneously operational, narrative, and communicative. Starting from the theme of the σύναψη, the performative synapse is defined not as a general metaphor, but as an analytical model capable of describing the transition from heterogeneous conditions –context, program, constraints, data, and intentions– to verifiable graphic and spatial transformations. The article distinguishes between representation, drawing, and diagram, problematizing the rhetoric with which BIG presents its own processes and proposing a taxonomy of recurring diagrammatic operations: single gesture, negotiation sequence, and programmatic loop. The cases of The Twist, VIA 57 West, and Villa GUG are reinterpreted through a grid that identifies input, operator, transformation, function, and limits of evidence. What emerges is a notion of the diagram that is reducible neither to pure formal generation nor to simple illustration, but is rather positioned within an intermediate field where drawing builds connections, makes decisions legible, and organizes design knowledge.

Keywords: diagram, architectural representation, performative synapse, design storytelling, taxonomy.

Introduction

In recent decades, architectural representation has undergone a profound transformation, which has reshaped its aims, tools, and epistemic status. The integration of digital techniques, information models, and iterative visual strategies has altered the relationship between design thinking and drawing. What was once conceived primarily as a moment of translating the idea now participates in its formation, verification, and progressive transformation. Drawing, therefore, no longer appears as a neutral medium, but rather configures itself as a dynamic operational field in which actions, constraints, and relationships are made visible and constantly negotiated (fig. 1). The diagram occupies a central position in this transformation, condensing heterogeneous conditions into

recognizable graphic sequences. However, its effectiveness demands critical caution: uncritically assuming its generative nature risks confusing the logic of the project with the rhetoric of its presentation. This ambivalence is central to Bjarke Ingels Group (BIG), whose graphic language is an identity trait of contemporary architectural culture.

The present study critically interrogates BIG's diagrams as visual materials, analyzing how they construct a causal chain of form, which relationships they highlight, and which aspects remain post-rationalized. The contribution proposes a reading of the diagram as a performative synapse: an analytical structure capable of connecting heterogeneous elements, activating transformations, and

transferring knowledge. In a landscape dominated by the computational horizon, BIG's diagram acts in a dialectical position as a conceptual interface that simulates algorithmic logic while belonging to a narrative register.

This notion operationally describes the transition between initial conditions, graphic operations, and spatial configurations. In the cases of *The Twist*, *VIA 57 West*, and *Villa GUG*, this transition assumes three taxonomic declinations: a torsion that connects differences in height, a volumetric sequence that mediates urban constraints, and a loop that organizes program and topography. The analysis verifies how BIG's diagrams respond to a critical taxonomy of graphic operations, which constitutes the main contribution of the essay.

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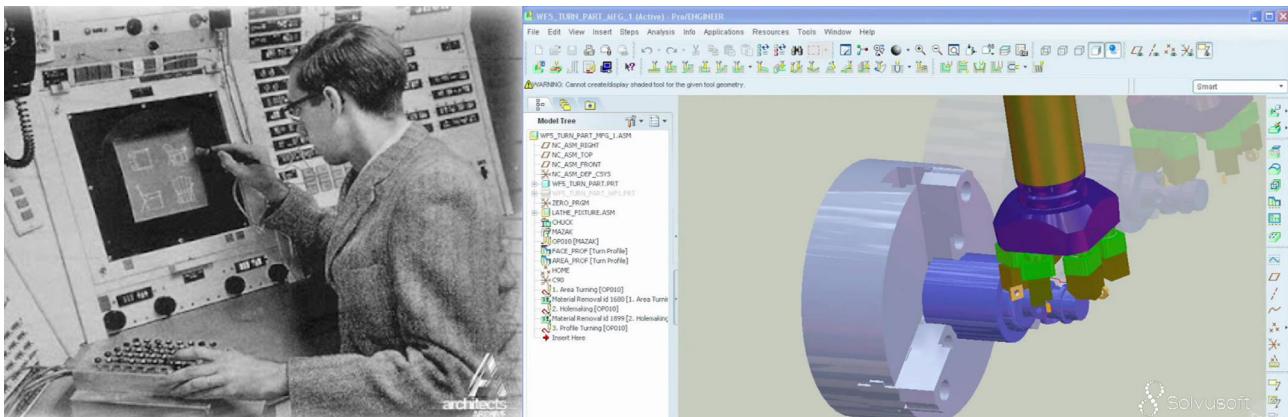
Drawing, diagram, and relationship: theoretical framework and definitions

To avoid an indistinct use of terms, it is necessary to clarify from the outset the epistemological relationship between representation, drawing, and diagram. Representation

constitutes the broader field of visual practices through which a project is made knowable, communicable, and debatable within the disciplinary discourse. Drawing, on the other hand, configures itself as a graphic and cognitive practice that can assume descriptive, constructive, ideational, or communicative functions. Finally, the diagram specifies itself as a peculiar form of drawing that privileges relationships, transformations, and logical processes over the figurative rendering of the object. Consequently, while not every drawing can be considered a diagram, the latter is properly defined as a drawing oriented toward making a specific logic of connection and change visible (fig. 2).

Throughout the twentieth century, this function of the diagram was defined through various lines of research, which were not always genealogically connected but converged in redefining drawing as an operational device. Initially rooted in Modernism as an analytical-functional de-structuration –such as the functionalist schematization of urban and building flows (fig. 3)– the diagram underwent a radical reversal of tendency with the neo-avant-gardes of the 1960s and 1970s. In Archigram's urban collages, the image does not describe a completed building, but rather activates mobile, flexible, and technologically imagined scenarios [Cook 1972]; in parallel, within Superstudio's grids, drawing is converted into a critical tool capable of interrogating the relationship between modernism,

Fig. 1. Digital evolution: on the left, *Sketchpad*, MIT, 1963 (source: MIT); on the right, *Pro/ENGINEER*, PTC (source: Parametric Technology Corp).



standardization, and the social imaginary. In both cases, representation ceases to be the document of an object to become a speculative space in which architecture is tested as a cultural possibility [Lang, Menking 2003].

On different theoretical foundations, Peter Eisenman subsequently attributed a generative role to the diagram internal to the construction of form. In his theoretical projects and famous Houses (fig. 4), the diagram does not operate as an a posteriori explanatory synthesis, but as a transformation mechanism in which shifts, rotations, distortions, and recombinations produce the spatial configuration starting from abstract syntactic rules [Eisenman 1999]. The strength of this position lies in having placed the diagram not after the project, but inside its functioning. Precisely for this reason, however, the transition from Eisenman to BIG cannot be assumed as a linear continuity. Eisenman works within a culture of disciplinary autonomy and form as a theoretical problem; BIG, conversely, operates within a pragmatic, media-driven, and highly communicative culture. Trans-

ferring the thesis of the 'form-generating diagram' from Eisenmanian avant-garde architecture to the populist practice of the Danish firm therefore requires problematizing this shift, recognizing that in BIG the formal matrix is always extroverted, meaning it is bent toward the narration of programmatic and contextual demands. With Rem Koolhaas and OMA, indeed, the diagram assumes a further function, transforming into a true grammar of urban complexity. In OMA's projects, flows, densities, programs, economies, and collective behaviors are translated into graphic structures capable of rendering operational those conditions that would otherwise be difficult to govern. The diagram does not reduce urban reality to a simplified image, but selects strategic relationships to transform analysis into design material [Colonnese 2013]. This strategic dimension is fundamental to understanding BIG, a firm that inherits from OMA not a formalist method, but a deeply rooted culture of diagrammatic communication and operational narration.

Fig. 2. Operational distinction between representation, drawing, and diagram (graphic elaboration by the authors).

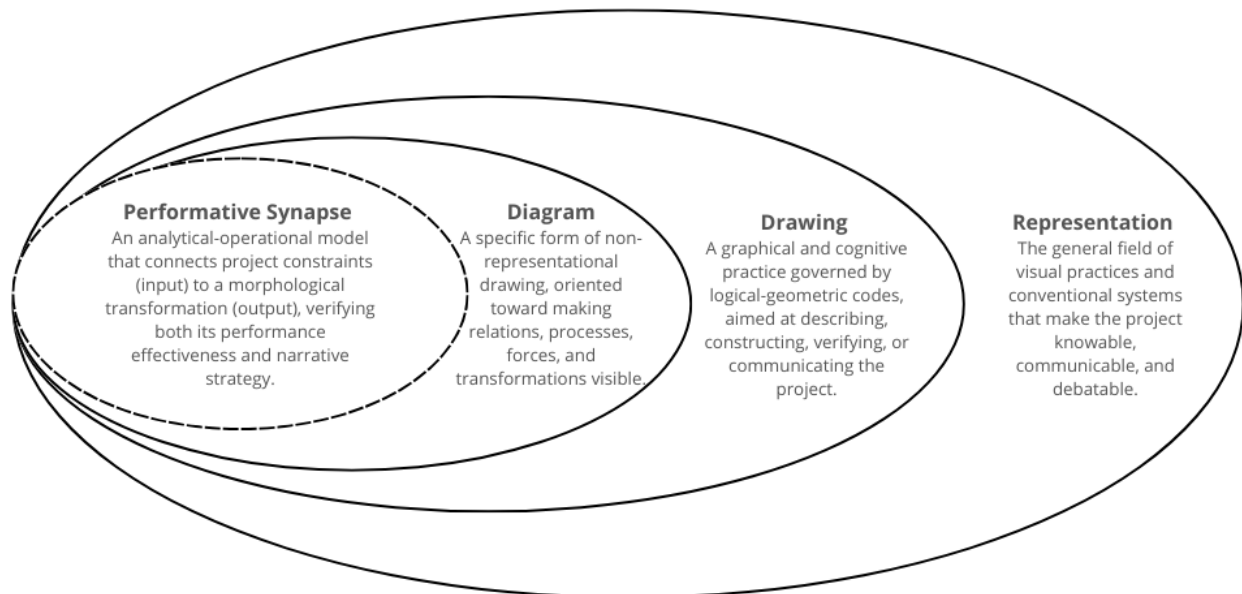


Fig. 3. Le Corbusier, Plan Voisin, 1925: model showing cruciform towers isolated within the greenery of the modern model (source: Fondation Le Corbusier).



The efficacy of the diagram resides precisely in its interstitial nature. In contemporary architectural theory, it acts as an operator of transition: Stan Allen [Allen 1998] clarifies that the diagram does not describe the appearance of things but organizes their functioning, configuring itself as a kinematic device that maps forces before they crystallize into a form. It is within this space that the notion of the performative synapse fits, assumed here in its structural meaning as a space of transition and transmission. Just as in neurobiology the synapse identifies the point where the impulse is transformed and transmitted between distinct entities, so in drawing the performative synapse describes the exact moment when the heterogeneous demands of the project are connected and translated into graphic operations. This operational character recalls Robert Somol's [Somol 1999] reflection on the performance-oriented diagram, understood not as a mirror of a pre-existing reality, but as an activator of real effects.

However, as recalled by Anthony Vidler [Vidler 2000], the diagram constantly oscillates between logical abstraction and the rhetoric of transparency, risking transforming into a tool of persuasion that conceals the complexity of actual choices. To scientifically anchor this oscillation within the disciplinary field of representation, the reflection of Italian manualistics proves invaluable. Authors such as Mario Docci and Diego Maestri, together with the reflections of Livio Sacchi and the readings of Marco Bovati, understand architectural drawing as a code regulated by systems of conventions and logical structures that govern the correspondence between graphic signs and design intention [Sacchi 1994; Docci, Maestri 2009; Bovati 2016]. In this perspective, the diagram reveals itself as a normative and geometric device that orders relationships, establishes priorities, and defines the conditions for the verifiability of form.

The advent of digital modeling and information systems does not erase this tradition, but alters its horizon. In parametric models, geometry depends on constraints, attributes, and algorithmic dependencies, structuring representation as a system of active relationships. This aspect, however, must not be confused with the nature of the diagrams published by BIG. In the cases examined, the original parametric models or the firm's calculation files are not available; what can be analyzed are conceptual and narrative diagrams that construct a linear sequence of the project. For this reason, the reference to the

parametric is to be understood as a cultural framework and conceptual simulation, not as the technical documentation of a digital workflow [Eastman 1975; Picon 2010; Carpo 2011].

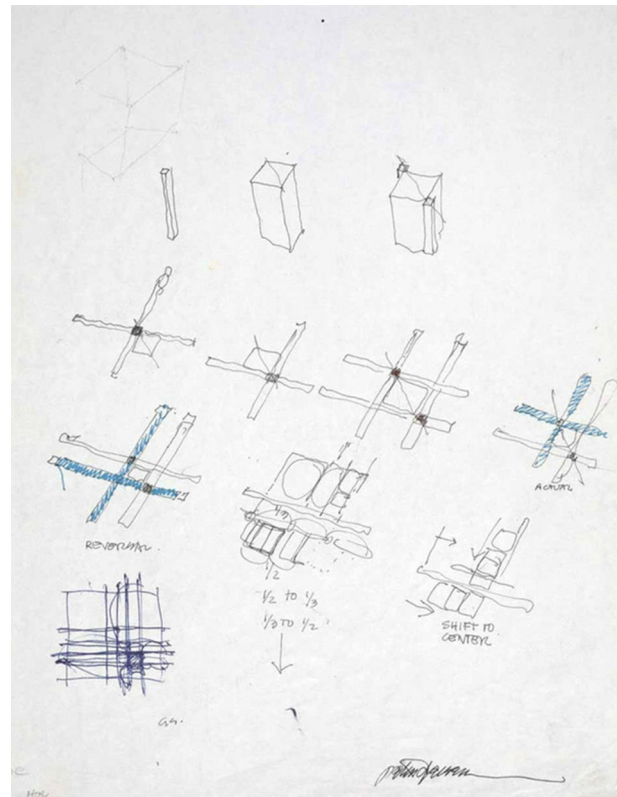
Within this framework, the notion of the diagram as a spatial algorithm must be used with caution. Graphic operations –torsion, lifting, excavation, wrapping– can be read as operational instructions only when it is possible to geometrically demonstrate their effect on the spatial configuration. Their analytical value does not depend on the suggestiveness of the gesture, but on the possibility of identifying input, transformation, and function [Garcia 2010]. The proposed shift thus allows for moving from an uncritical reception of the diagram to a verifiable reading, in which representation is rigorously interrogated in its concrete modes of functioning.

Method: from the metaphor of the synapse to an operational taxonomy

To respond to this methodological need, this contribution adopts the performative synapse as a structured analytical model rather than a purely metaphorical expression. A graphic representation can be defined as synaptic when it connects heterogeneous elements, produces or renders legible a morphological transformation, transfers knowledge between different registers of the project, and allows for a scientific verification of the relationship between initial conditions and the final configuration (fig. 5). Consequently, its performativity does not necessarily coincide with the technical production of form, as it can also decline into the codification of a decision-making sequence, the selection of a clear design causality, or the communicative structuring of a complex process.

The adopted method is articulated in four consequential steps. The first consists in collecting and cataloging the official graphic materials published by BIG, integrated by secondary sources from scientific and critical literature describing the projects. The second step involves the analytical decomposition of the diagrams according to a common reading grid, aimed at tracing the initial conditions, the diagrammatic operator employed, the resulting volumetric transformation, the specific function of the representation, and its relative limit of scientific evidence. The third stage proposes an operational taxonomy of recurring actions, specifically distinguishing between the

Fig. 4. P. Eisenman, diagrammatic sketches for House IV, 1975, (source: Peter Eisenman Archive, CCA).



single transformative gesture, the negotiation volumetric sequence, and the programmatic loop. Finally, the fourth step compares the three chosen case studies to verify whether the taxonomy allows for mapping real differences in the use of drawing, removing the analysis from the simple reception of the firm's official discourse.

This approach also introduces a necessary criterion of methodological caution. The diagrams published by BIG are not treated as neutral documents of the internal process, but rather as constructed and controlled representations, destined to function simultaneously both within the project and in its public communication. The proposed critical reading therefore does not attribute an absolute generative value to the diagrams, but investigates their intermediate position between geometric operability and media narration, recognizing that they possess the capacity to clarify a design logic without necessarily coinciding with the original moment of its production.

The proposed taxonomy (Table 1) does not intend to replace the historical-critical analysis of individual architectural complexes with a rigid grid, functioning instead as a comparative device useful for explaining how analogous graphic operations can fulfill different functions, and how morphologically different operations lead to identical communicative effects. In this sense, the method seeks to shift the discourse from the mere iconographic or stylistic recognition of BIG's diagrams to the critical evaluation of the structural relationships they organize. The question concerns not only the object or the icon that the diagram shows, but invests the connections it

organizes, the transformations it renders plausible on a geometric plane, and the degree of verifiable evidence it places at the reader's disposal.

BIG between design process and graphic storytelling

The critical re-reading of BIG's diagrams requires addressing a central ambiguity that lies at the heart of contemporary architectural culture. The Danish firm has structured one of the most recognizable visual identities on the international scene, founded on elementary graphic sequences, immediate icons, and visual narratives capable of translating complex decisions into linear and understandable stories. The volume *Yes is More*, explicitly defined by Bjarke Ingels as an archicomic, shows this media vocation in which the project is formalized as a chain of logical and rational moves, presented through a pop and accessible register [Ingels 2009]. This communicative effectiveness does not constitute a simple accessory apparatus, but rather represents a structural and foundational element of BIG's design strategy.

Precisely for this reason, however, BIG's diagram cannot be naively assumed as a transparent or indexical proof of the internal generative process. It belongs to a regime of public communication in which narrative clarity becomes an integral part of the construction of the architecture's economic and cultural value. The diagram operates through precise actions of simplification, selection, and retrospective ordering, aimed at making a choice geometrically necessary that, in the real process, might have

Fig. 5. Analytical diagram of the performative synapse (graphic elaboration by the authors).

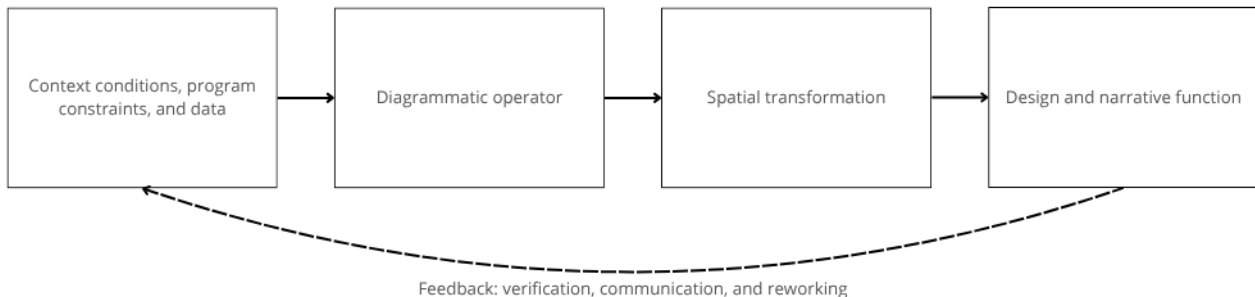
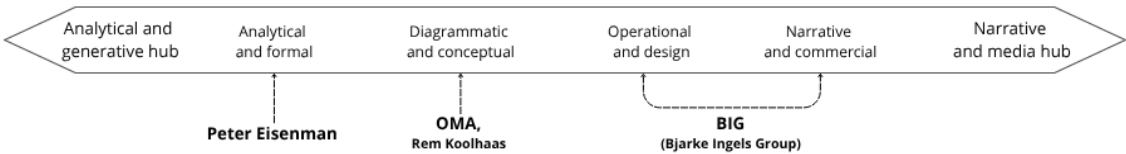


Table 1. Critical taxonomy of BIG's diagrammatic operations (graphic elaboration by the authors).

Category	Case study	Operator	Triggered relations	Predominant function	Critical limit
Single transformative act	The Twist 	Volumetric torsion	Altimetric integration, infrastructural continuity, and exhibition path	Kinematic connection of heterogeneous contextual conditions	Graphical post-rationalization; concealment of the actual structural and constructive complexity of the joint
Negotiated Volumetric Sequence	VIA 57 West 	Decomposition, subtraction, and elevation	Settlement density, courtyard daylighting, urban visual cones, and dialogue with the skyline	Morphological and typological mediation of contextual constraints	Strong narrative and ideological component of the layout
Programmatic loop	Villa GUG 	Continuous fluid enveloping	Vehicular flow, domestic transition, privacy hierarchies, and topographical integration	Topographical synthesis and functional integration of the program	Scientific evidence bound to the studio's official conceptual materials

Fig. 6. Critical axis between generation and narrative (graphic elaboration by the authors).



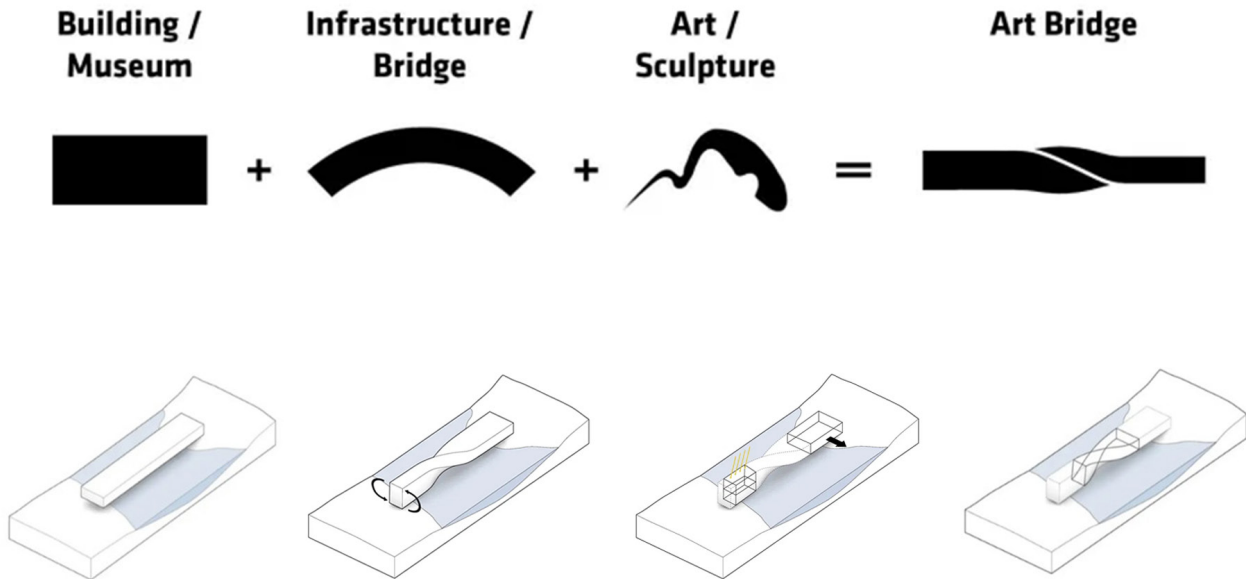
been determined by contingency, uncertainties, or economic negotiations.

This ideological and rhetorical character is brought into focus by the most advanced critique. Douglas Spencer [Spencer 2016] highlights how BIG's diagrams operate a true 'naturalization' of the project. According to Spencer, the firm's engaging and apparently consequential graphics present formal solutions as the only logical and objective outcome possible in the face of contextual constraints, concealing the underlying market logics and ideological choices behind a faked diagrammatic neutrality. In this perspective, as also remarked by Reinier de Graaf [de Graaf 2017], the diagram shifts from the field of heuristics to that of pure post-rationalization once the project is

defined, configuring itself as an effective tool for marketing and commercial seduction [Spencer 2016; de Graaf 2017]. The scientific interest of these materials does not diminish at all in light of this reading, growing on the contrary when drawing is considered a hybrid device that operates constantly on the thin ridge between project, narrative, and legitimization.

This key of interpretation allows for avoiding two opposite and equally ineffective reductions. On one hand, it would be limiting to consider BIG's diagrams as simple promotional or advertising tools, since they effectively organize real and legible spatial and programmatic relationships. On the other, it would be equally problematic to consider them in the manner of pure formal generation,

Fig. 7. Conceptual diagrams and official generative sequence for *The Twist*, 2019 (source: BIG - Bjarke Ingels Group <<https://big.dk/projects/the-twist-2-1337>>).



as if the graphic signs deterministically coincided with the firm's actual operational practice (fig. 6). Their disciplinary specificity resides precisely in the ability to simulate a graphic causality of the project—meaning a sequence of logical-visual steps that makes a spatial thesis communicable—while remaining consciously selective, partial, and oriented toward storytelling.

Three case studies: the diagram as a transformative agent

In the three selected complexes, the proposed taxonomy distinguishes as many modes of drawing, highlighting their limits of evidence. BIG's strategy entrusts the diagrammatic component with the role of simplifying real complexity through immediate and effective formal equations (fig. 7). The Twist responds to the category of the single transformative gesture. The project, in the Kistefos sculpture park, connects two banks at different heights, integrating museum and infrastructure. The diagrammatic operator resides in the geometric torsion of a rectilinear volume, presented as a ninety-degree rotation. This expedient makes the typological shift from bridge to museum legible, structuring a continuity between difference in height and transit. However, the analytical redrawing reveals the gap between narrative and constructive reality: the diagram isolates the plastic gesture but conceals the complexity of the structural nodes. Here, the performative synapse connects infrastructure, landscape, and movement. The torsion is an ex-post graphic operator that connects the

Fig. 8. Official typological diagram for VIA 57 West: fusion between the tower block and the urban courtyard, 2016 (source: BIG - Bjarke Ingels Group <<https://big.dk/projects/via-57-west-2350>>).

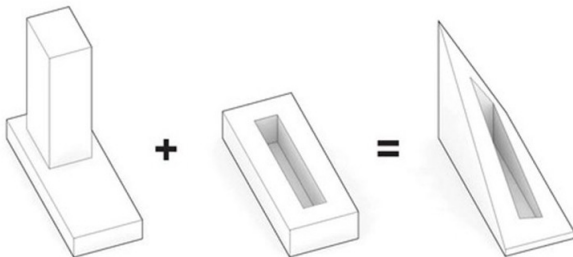
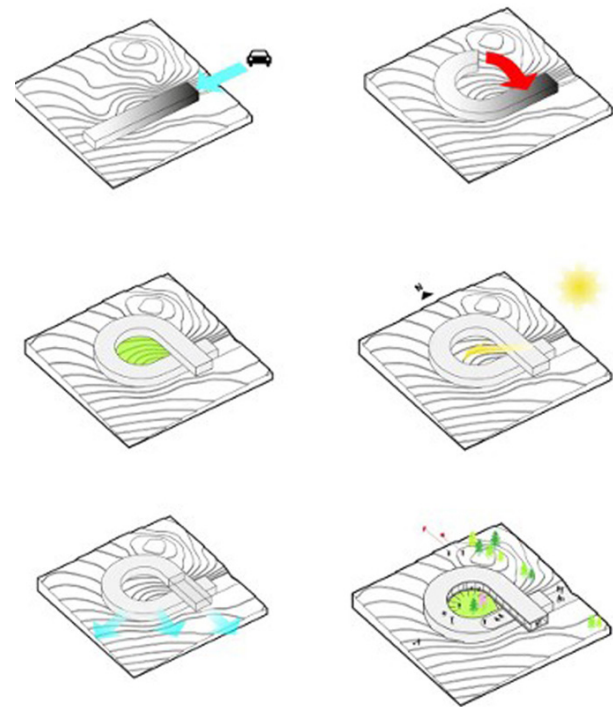


Fig. 9. Official diagrammatic sequence of Villa GUG: genesis of the loop and relations with the topographical context, 2022 (source: BIG - Bjarke Ingels Group <<https://big.dk/projects/villa-gug-2994>>).



site levels, converting a constraint into a memorable and communicable spatial experience.

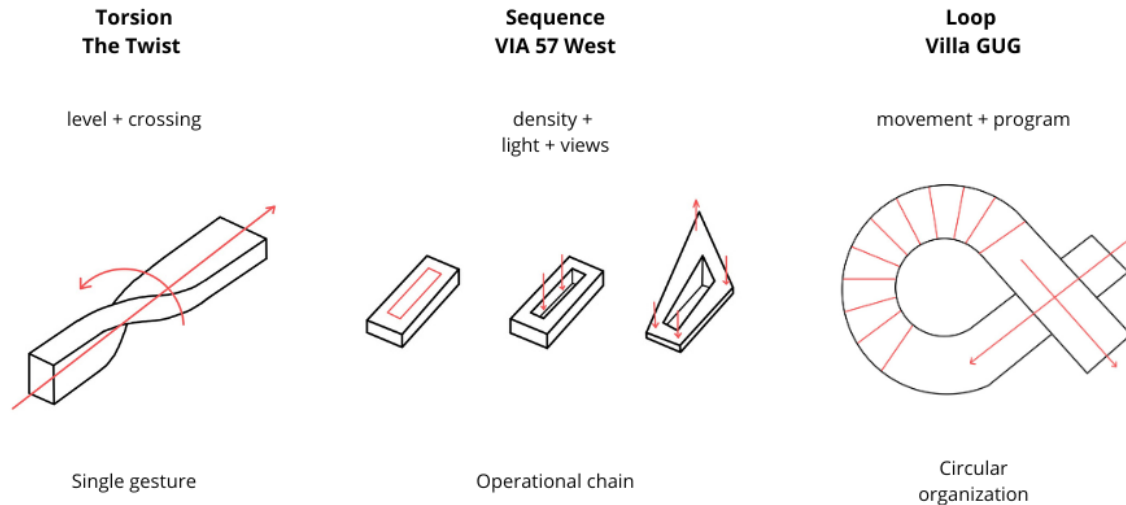
The VIA 57 West complex corresponds to the negotiation volumetric sequence. The project modifies a compact block through graphic operations: lowering three corners, lifting one vertex, and opening a courtyard. Each step responds to urban conditions (density, view corridors, sunlight), defining the courtscaper typology as the outcome of successive mediations (fig. 8). Here too, the scientific evidence oscillates toward storytelling: the sequence suggests a determinism that the real process, conditioned by economic and regulatory parameters, did not possess. The category of the negotiation sequence records this ambivalence, demonstrating that the diagram does not document the real genesis but legitimizes the final outcome.

Finally, Villa GUG introduces the programmatic loop, aimed at integrating the garage into domestic life. The main operator is a continuous path that wraps around a

courtyard, organizing the transitions between public and private, car and home. The loop produces spatial hierarchies and topographic relationships. The official diagrams (fig. 9) codified by formulas such as garage to living room or optimize views— show a distributive succession in which movement generates the building. The limit of scientific evidence remains analogous: the graphic materials deconstruct the communicative logic but do not reveal the actual office practice. The loop acts as a conceptual matrix capable of synthesizing program and morphology into a single icon.

The comparative comparison, made explicit by the redrawing of the geometric operators (fig. 10), highlights that BIG's diagrams assume the configuration of the gesture, the sequence, or the loop, differently articulating the relationship between constraints and form. Their real performativity resides in constructing a clear field of visual relationships, within which the project is ordered and legitimized before the public.

Fig. 10. Comparative redrawing of the three graphic operators (graphic elaboration by rge authors).



This shift maps the distance from historical experiences. Compared to Eisenman, BIG does not claim a syntactic autonomy; compared to OMA, it does not reduce the sign to pure strategic analysis; compared to the neo-avant-gardes, it does not place it on the plane of utopia. The specificity of BIG lies in a highly legible graphic sequence, in which complexity is made accessible without losing operational value (Table 2). This hybrid density, suspended between generation and narrative, renders the firm's diagrams a fundamental object of investigation for contemporary drawing theory.

Conclusions

The critical deconstruction of BIG's materials clarifies the status of contemporary drawing, moving beyond celebratory readings of the diagram as an automated generative mechanism. This essay demonstrates the operability of the performative synapse, highlighting the gap between the geometric-spatial efficacy of the sign and its rhetorical superstructure. Through the tripartite taxonomy (single gesture, sequence, loop), the investigation shows that drawing does not merely record a linear process, but rather acts

as a device for selection and post-rationalization, aimed at legitimizing the work within the media circuit. In the cases of The Twist, VIA 57 West, and Villa GUG, the diagram is not an indexical trace of parametric genesis, but a conceptual simulation. Performativity shifts from the technical plane of formal production to the cultural plane of consensus, where the reduction of complexity into a visual icon becomes a tool for negotiation with both clients and the context. This dual nature, balancing between the logic of constraints and storytelling, reaffirms the centrality of the diagram as an observatory of disciplinary shifts. The research opens three future trajectories: the transferability of the taxonomy to other firms of the same generation; the structuring of a critical archive of analytical redrawings for education, aimed at decoding contemporary visual inflation; and finally, the comparison between the communicative regimes of the diagram and processes driven by Generative Artificial Intelligence. In a landscape where image production risks detaching from any graphic or tectonic causality, the critical investigation of the relational devices of drawing stands as an essential scientific safeguard to reclaim representation as an autonomous structure of knowledge and thought.

Table 2. Comparative matrix of the three case studies, structured according to the procedural categories of the synapse analytical model (graphic elaboration by rge authors).

	The Twist	VIA 57 West	Villa GUG
Input	two banks, different levels	high-density site, illumination, and views	topography domestic program
Operator	torsion	lifting and excavation	loop
Transformation	bridge-museum	courtscraper	path-house
Function	to blend	to negotiate	to configure
Critical limit	official reconstructed	official interpreted	official interpreted

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