For Alejandro Zaera Polo the building volume – the envelope – is currently the most relevant element of architecture because it best expresses the link between technology, representation and politics.

According to Zaera Polo, the outward appearance of a building volume, The Envelope, is probably the oldest and most primitive architectural element. It materialises the division between exterior and interior and is therefore automatically charged politically.

Zaera Polo distinguishes four typological forms: flat horizontal, flat vertical, vertical and spherical/cubic. Each type possesses a number of fundamental characteristics that make the volume suited, in greater or lesser degrees, for certain representations and functions. In addition, the different types can be linked to certain social and political effects.

These four categories are aimed at establishing an effective taxonomy capable of bringing together environmental and political performances in a new discipline of the building envelope.
The flat horizontal typological form is generally found to be spread across the ground line which is low and flat in appearance. Usually no higher than three stories, Zaera Polo relates such forms to Airports, Train stations, industrial buildings and shopping centers. The footprint created by these typologies is the largest of the four and hence impact most significantly.

There are two divergent lineages of this typology: the first is towards a privatized and artificially controlled environment and a sterilized atmosphere, such as your Shopping malls. This type are difficult to successfully ventilate and naturally light throughout, hence the require certain mechanisms to ventilate and draw light in. The envelope/edge condition of this form tends to be less functional with more emphasis placed on its internal function.

The second lineage is towards a more gradual integration of nature and public space within the building. This focus' on the roof of the flat-horizontal envelope which can operate simply as a new ground level. ‘an artificial ground which does not engage in atmospheric continuities, but challenges a uniform concept of nature and alters a politically loaded architectural element.’

Digging the program underground or generating multiple grounds through bifurcation avoids the disruption that flat-horizontal envelopes produce within the urban fabric by connections.
Buildings such as this shopping center are usually solid enclosures that act to ‘contain’. The flat complexion of these typologies allows for the roof to perform as a new ground line as seen in FOA’s Yokohama Port Terminal where the boundaries of both ‘ground’ and ‘roof’ are blurred.
The flat-vertical envelope, better known as a 'slab', is a category that includes those envelopes that have “predominant dimensions parallel to gravity distributed along a line and in which the width of the building is greater than its depth”.

In modern housing typologies, where we can find some of the most illustrative examples of flat-vertical envelopes, orientation, ventilation, salubriousness, constructive rationality, etc., have taken priority over traditional determinations of the urban fabric such as the alignment to the property boundary and the definition of private and public spheres.

The flat-vertical envelope opens up a gradation toward a structure of publicness and ownership that was unavailable within more traditional urban structures. Its position within the urban field affects structures of both representation and property and determines the limits between open public and private spaces.

The most active surfaces in the flat-vertical envelope are the vertical surfaces where technical requirements to insulate, ventilate, light or shade collude with representational concerns.
Zaera Polo drew an interesting comparison between the Silodam in Amsterdam by MVRDV and his residential building in Madrid. Both belong to the flat vertical category. This type, usually housing, often features a representation of the units of which the building is composed, namely the dwellings.

In the Silodam this is done by giving the units contrasting colours. The Madrid building is wrapped in a closed skin of bamboo that residents themselves can open. Here the occupants produce the dynamic representation of the units, while the building itself maintains a homogenous skin. At the same time, the bamboo and balconies behind form a climate buffer between interior and exterior.

Representation, function and climate control form a single unity here. Such a symbiosis would seem to be the core of what Zaera Polo is searching for in his architecture, and that is supported by the descriptions of a number of highrise projects.
The spherical envelope's dimensions are approximately equivalent to each other; cubic, spheroidal and polygonal geometries are also particular cases of this typology.

In principle, the spherical envelope has the lowest ratio between its surface and the volume contained within.

The specificity of this type is precisely the relative independence that the skin acquires in relation to its programmatic determinations, as function is not usually determined by proximity to the outside and therefore by the form of the envelope. This often implies a wider variety of programs inside, each with different environmental requirements.

Spherical envelopes generally enclose a wide range of spatial types with specific functions, rather than being determined by the provision of a repetitive spatial condition.

Unlike other envelope types in which the border between public and private occurs on the surface of the container, the spherical type often contains gradients of publicness within.

Spherical envelopes often correspond to public buildings, buildings that gather a multiplicity of spaces rather than a repetitive type of space: city halls, court houses, libraries, museums, indoor sports facilities, etc.

Advancements in technology and construction methods have enabled the designs of spherical envelop typologies to become more unique and visually representational, design can now go where conventional building once failed to reach.

**TYPOLOCIGAL FORM #3:**

**SPHEREICAL/CUBIC**

**PROGRAMMATIC VARIETY:** Envelope independant of internal program
The spherical envelope features the lowest level of environmental constraints and the highest levels of representational demands.
This building envelope is predominantly vertical in dimension and a multi-directional orientation in the plan. Because of its scale and technical complexity, functional and environmental performances such as sunlight and natural ventilation need to be maximized, while the formal qualities of the envelope play a crucial role in the building’s structural stability.

The collusion between extreme technical performance and high visual impact produces the maximum tension between efficiency and expression. As the envelope increases in visibility and iconographic potential, so do the environmental and structural demands. It also increases its potentials for views and solar exposure. As a result of this intensification of the environmental parameters the vertical envelope has become increasingly complex.

There is a direct relationship between the geometry of the vertical envelope. A higher façade ratio implies more sunlight and ventilation but more heat loss, whereas a more compact envelope means a more artificial environment but less heat loss.

The tower is the typology deployed most often for representative purposes despite the severe technical and climatic restrictions/regulations. These two characteristics conflict with each other, and this in turn produces architectural and technical innovation, which defines the identity of the building.
The tower is the type deployed most often for representative purposes despite the severe technical and climate-control restrictions. These two characteristics conflict with each other, and as a result architectural and technical innovations are often created at the expense of the representational aspect. Zaera-Polo expresses his ambition of deploying architectural tools to organise climate-control aspects such as natural ventilation and, at the same time, define the identity of the building.
Beyond their renewed aesthetic hipness, tall buildings offer a high-density model that helps preserve the green belt from the ever-expanding suburb and has a smaller ecological footprint than alternative urban models. The ecological superiority of the culture of congestion and the green credentials of the elevator core as an alternative to the gas-guzzling six-lane highway are becoming universally accepted facts and this gives the vertical envelope type an initial advantage.

But the environmental impacts of these structures, their relationship with infrastructure and public space, their imposing presence and most of all the scale of resources and development procedures that they imply poses serious questions about their implementation.