

## **Groundscrapers. Vitalizing the Tradition of the Urban Low Rise, Mixed Hybrid Building**

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### *Introduction*

The fact that hybrid buildings can be interpreted as extremely condensed urban blocks, increasing the city's density and contributing to its public realm, forms one of the key interests of this research. According to its European interpretation, the "ground scraper" is not only public because of the character of its plinth facing the street, but also due to its interior space, partly accessible to public. As such it potentially extends the city's public domain, horizontally and vertically, into the building's interior and links the public domain inside and outside. Basically it acts as a city within the city.

### *Today's Necessities*

Today, new readings of the city, like the "compact city", ask for innovative interpretations and designs of building types.

Contemporary cities, due to limited energy sources, need the development of sophisticated low energy public transport systems. Therefore highly congested multifunctional spots arise close to traffic junctions. As a consequence, the wish to increase the city's liveability asks for densification of the existing fabric and stacking of functions, often in combination with infrastructure, at least in the Netherlands. For all these reasons, the architectural type of the hybrid building, because of its potential quality of stacking different functions, is certainly an option worth researching, particularly as a way to condense the urban block. Moreover, the urban economist Edward Glaeser states in his book *Triumph of the city*<sup>1</sup> that successful cities of the future should condense in order to encourage face-to-face contact and to facilitate innovation by bringing together different people with panoply of ideas. Next to it, cities need to be greener, reducing the use of energy involved in transportation (distances) as well as the exceptional energy use of urban sprawl.

### *Hybrid Typology*

In regard to hybrid's typologies, Joseph Fenton<sup>2</sup> distinguishes three basic types:

<sup>1</sup> E. Glaeser, *Triumph of the city; how our greatest invention makes us richer, smarter, greener, healthier and happier*. London: Macmillan, 2011. Edward Glaeser's research is acknowledged highly inspired & influenced by the writings on (the economy) of cities of Jane Jacobs

<sup>2</sup> J. Fenton, S. Holl, "Hybrid buildings". *Pamphlet Architecture*, 11, 1985.

1. The fabric hybrid, which derives directly from the structure and measurements of the surrounding urban fabric. The outer performance and composition of the fabric hybrid within the city tissue can vary from being as distinguishable part of the urban block or expressing and composing a whole block as urban unit.
2. The graft hybrid consists of a combination of different building forms within an urban block. It can also present itself as a unity that articulates the different functions of the building in the exterior.
3. The monolith hybrid is usually a high-rise structure. The monolith hybrid carries a unifying skin and stresses the block's unity even more than the fabric hybrid.

All kinds of combinations between these three are thinkable.

Joseph Fenton remarks referring to the American context

[...] the combination of multiple functions within a single structure is a strategy which has been repeated throughout history [...] However, it is crucial to stress that hybrid buildings stand differentiated from other multiple function building by scale and form. The dimension of a city block within the orthogonal grid determines the scale. The form is a direct result of the late Nineteenth Century technological innovations such as structural framing, the elevator, the telephone, electrical wiring, central heating and ventilating systems [...] The hybrid type was a response to the metropolitan pressures of escalating land values and the constraint of the urban grid...<sup>3</sup>

### *Dutch Hybridism*

Already in the 17<sup>th</sup> century the building for the First Stock Exchange in Amsterdam (1609) was located on top of the water of the Rokin due to the lack of space in the fortified city. In the heart of the city, it stacked a diverse program consisting of infrastructure and commerce. The inner court, where the goods were actually traded, supplied the city with a completely new public realm where citizens could meet.

At the end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> in Rotterdam, the new urban hybrid buildings like the shopping arcade at the Coolsingel and the Hofplein Station represented the embellished civil engineers' city, rendering the urban and architectural designs for the new middle-class public sphere in the great Dutch cities. Usually these buildings were – again due to the lack of space – located at the edges of the historical centre in the areas of the former fortifications, which had been dismantled in the middle of the 19<sup>th</sup> century.

The Hofplein station brought together a hotel, the famous Café Loos and the train that connected all the Rotterdam attractions with the inhabitants of the hinterland. Again panoply of disparate functions, as in the case of the Hofplein Station, and infrastructure were integrated.

<sup>3</sup> J. Fenton, S. Holl, "Hybrid buildings". *Pamphlet Architecture*, 11, 1985, 5.

The Atlantic House (1928) as the “head” of a perimeter block facing the Veerhaven in the Scheepvaartskwartier (Shipping district), introduces an innovative arrangement of commercial and office spaces, accessible from beautifully designed galleries at the inner court of the block.

More recently, the ultimate results of the block transformation aim at combining the qualities of the traditional horizontal building fabric with the vertical layering of repeated artificial entresols, encompassing both public and private functions to enhance urban congestion and building density. Often these buildings replace existing buildings in order to gain space by condensing the existing urban tissue<sup>4</sup>.

*Dutch Hybrids Inspired by European and American Examples:  
GROOT/GREAT in Rotterdam*

To begin with, the city of Rotterdam formed the first test case of the Hybrid’s project to document and discuss statements.

In order to understand the specific and local nature of hybrid buildings within the city of Rotterdam, a series of the city’s “great buildings” were selected from different periods, ranging from the 19th century till today, proving their grandeur during the past and relevance for the city’s public realm.

The urban conditions of the modern city have created unique opportunities for the realizations of hybrid buildings. Because of its size and relatively modest population, the compact Dutch city did not immediately experience the new urban conditions of other European modern cities like London, Paris, Vienna or Berlin.

However, particularly the case of Rotterdam deserves extra attention. Due to the explosive expansion of its harbours, the city developed enormously during the second half of the 19<sup>th</sup> century, quadrupling its inhabitants from 90.000 in 1850 to 400.000 in 1900<sup>5</sup>. For this reason the city was constantly the theatre of new ambitious projects, often accompanied with the strong wish to catch up with other European metropolis.

*Shopping Arcade: “Passage” at the Coolingsingel*

Although roofed shopping complexes are all referring to the typology of the Bazaar, the shopping arcade as covered street for pedestrian finds its origin in England and was exported at the end of the 18<sup>th</sup> century to France, Italy and Germany<sup>6</sup>. The strong spatial relationship between the building and the inner street makes this type suitable for the combinations of several functions. The “Passage” building, also called “Galerie”, is one of the new 19<sup>th</sup> century

<sup>4</sup> This is especially the case in Rotterdam. The morphology of the after war reconstruction of the city centre is – as known – based on CIAM principles that is not only characterized by a division of functions and priority given to transport, but also to a low gross floor area rate (FSI). See also: M. Berghauser Pont, P. Haupt, *Spacematrix, Space, Density and Urban Form*. Rotterdam: NAI Publishing, 2010.

<sup>5</sup> For more information see H. Engel, “Randstad Holland in kaart”. *OverHolland 2*, 2005.

<sup>6</sup> N. Pevsner, *A History of Building Types*. London: Thames & Hudson Ltd, 1976, 257-272.

building types in which the urban block is opening up its interior to the public life. At the same time, by stretching out the shops to the inside, the spatial use of the block is increased, especially on the lowest levels.

This hybrid building par excellence found its Dutch variant in Rotterdam, from the hand of the architect Jan Christiaan van Wijk. The Rotterdam "Passage" (1879) was built in the walking route between the Binnenweg and the Hoogstraat – at that time the shopping street of Rotterdam – in front of a new bridge connecting with the quickly expanding western side of the city. The program contained 28 shops with housing, 56 residential units, hotel, grand café, an indoor market and a beer cellar with aquarium. The Coolsingel Hospital, very close to the passage, was also a major attracting point contributing to the influx of visitors.

Also a luxurious public bath, including steam, electric and rain baths was located in the Passage building. The Passage was a very modern building, including extensive ventilation and cooling system. Already one year after construction, experiments were made with electric lighting.

Unfortunately the complex was destroyed by the bombing of May 1940.

#### *Train Station: Hofplein*

The advent of railways in the modern city offers great opportunities for the design of hybrid buildings. G. Somers Clarke made in 1862 a design for the combination of Rotterdam Central Station with a hotel<sup>7</sup>. The project was never realized but was a remarkable milestone in the discussion about the construction of stations in the city.

The Hofplein line was also the first electric railway in The Netherlands. The line had on the Rotterdam side a remarkable semi-circular terminus station built in 1906 and designed by J.P. Stok.

Café Loos took the biggest part of the station building. The combination of station, café and plaza promoted the area as nationally known spot for nightlife and entertainment. The station building was destroyed by the bombing of May 1940 but viaducts as well as train platforms remained intact and a new station designed by S. van Ravesteyn was realized in 1957<sup>8</sup>, but unfortunately demolished in the early 1990s during the construction of Willemspoortunnel.

#### *Rotterdam Stock exchange Building*

In 1913 the municipality decided to build a range of representative buildings along the Coolsingel, demarking the former fortifications. Next to the town hall and the main post office, also the new stock exchange building had to be located on this new urban boulevard. As the planning of the town hall was considered more urgent, the competition for the construction of the new stock exchange building was organized as late as 1926.

<sup>7</sup> H. Romers, *Spoorwegarchitectuur in Nederland*. Zutphen: Walburg Pers, 2000, 25.

<sup>8</sup> P. Saal, F. Spangenberg, *Kijk op stations*. Amsterdam/Brussels: Elsevier, 1983, 101.

Staal wins the competition in the second round under the slogan “Thermidor”. The jury expressed great appreciation for the proper interaction between building and surroundings and for the various program components. By placing rentable spaces next to the office program, Staal created the possibility even for future expansion.

### *Office Typologies: Courts and Galleries*

The Atlantic Huis (1928) in Rotterdam follows the typological example of the Bradbury Building, the oldest commercial building in downtown Los Angeles (1893). Both buildings can be typified as “fabric hybrids” according to Fenton. In regard to their internal composition and section, they introduce inner galleries on all floors surrounding a light court. In fact they both extend the public realm of the street into the buildings’ interior courts and galleries.

The impressive Atlantic House<sup>9</sup> in the Scheepvaartkwartier of Rotterdam is one of the first buildings in the Netherlands that collects different firms under one roof, grouped along galleries around an inner court. The firms share collective spaces like an entrance lobby, indoors parking, paternoster lifts, archive spaces in the attic, sport facilities in the basement, maintenance and security. A perfectly regular concrete column structure allows free division and changing arrangements of the office spaces on the upper floors. Only the main lobby, galleries and tower spaces on the corners of the building are “fixed” spaces.

### *Interior Streets*

Also the Groothandelsgebouw (1953), similarly to the Merchandise Mart in Chicago (1930), belongs to the species of courts and galleries, but in a specific way. In this typology the access system becomes independent from the light courts. In fact, galleries were transformed into inner streets.

The Groothandelsgebouw<sup>10</sup> is an icon of post war reconstruction in Rotterdam, next to the “moved” and off-centred central station<sup>11</sup>. Because of the bombing of the city centre during World War II, 388.000 m<sup>2</sup> of working and shopping floor area was lost. Individual entrepreneurs and smaller firms were not able to

<sup>9</sup> The Atlantic House is designed by Piet Buskens and commissioned by W.A.M. Daniëls en H.F. Kerstens. The program enhances shops, a café, a workshop, a parking garage and offices on 1750 m<sup>2</sup>.

<sup>10</sup> The initiative for the Groothandelsgebouw was taken by the businessmen Frits Pot en Cees van der Leeuw who is also known as the commissioner of the Van Nelle Factory. They established a business association that actually commissioned the building.

<sup>11</sup> It took long for the building (and the central station) to settle in the urban tissue. More or less as late as today, 65 years after the war and an enormous amount of building, the density of the surrounding urban tissue and use is high enough for the gigantic building to fulfill its “central” role.

The research theme is developed by the Architecture chair of Public Building (Susanne Kossma, Nicola Marzot and Michiel Riedijk) and the chair of Typology (Roberto Cavallo), Faculty of Architecture TU-Delft in active collaboration with Francesco Cinquini (University of Pisa) and Derk Hofman (TU-Delft), Job Floris and Froukje van de Klundert (Academie van Bouwkunst Rotterdam/Monadnock), Arie Lengkeek and Jos Stoopman (Architecture International Rotterdam - AIR).

finance and re-built the lost space. In 1944 the idea rose to build one big building following the example of Merchandise Mart in Chicago, which brought together a great number of businesses. Nevertheless, in Rotterdam the Groothandelsgebouw was collectively financed and owned by shareholders.

The design by Maaskant and Van Tijen became the biggest trade building in the Netherlands with 3 inner courts and interior streets measuring km 1,5, all together connecting a floor area of m<sup>2</sup> 445.000.

Next to shops and office spaces, the building contains space for wholesale companies, indoor parking, a bank, a post office, rooms for meetings, restaurants and a cinema on the public roof-scape; even a truck was able to enter the building delivering goods on the first floor. In the cinema, after the film performance, the movie screen could be lowered, offering to spectators a marvellous view on the city from the 9<sup>th</sup> floor.

The building is completely constructed out of concrete, again featuring a regular column grid. The façades are composed of prefabricated casted-concrete elements, which are detailed like a filigree screen.

One main entrance lobby and four sub entrances give access to the interior streets and the roof-scape. Around the uncovered interior courts a second gallery system is added which supplies a series of office spaces with a second entrance.

#### *Urban Block Morphological Transformations*

To appreciate the ultimate Dutch hybrid developments it is fundamental to define the term morphology as it is used in Architecture and Urban Design: it describes the process according to which a building configuration transforms itself adapting to new conditions and the related requirements. Typology identifies the different stages through which the transformation process reveals itself via unstable phases.

Because the morphological process as such never stops, and building systems constantly perform their adaptability to transformation themselves, the identification of building types is conventionally assumed as existing.

In addition, the morphological process can never be forecasted, because it is impossible to predict the on-going flow of economical and social conditions, which affect it. A certain extent of predictability could be assumed if one accepts the preservation of the original language, or set of rules, due to their wide inner potential. This is the case of the urban block, up to the second half of the 19<sup>th</sup> century in both America and Europe.

In fact, a former major change occurred when the original inner core of the block systematically shifted from the private individual domain to collective or public neighbourhood control. In some cases, the inner court was also covered, letting new residential and public buildings appear.

Later, more radical transformation occurred when, due to technical and material advancements – i.e. the introduction of steel wide spanning structures, electrical lighting systems and elevators – it was suddenly possible to substitute and combine the traditional horizontal experience of the urban block with vertical movement.

*Recent Hybrids*

*Neutelings & Riedijk, Müllerpier Apartment Block, 2003*

Being part of the Müllerpier Masterplan by Kees Christiaanse/KCAP, this proposal shares the urban design strategy of the Collage City. The main idea is to interpret the unused Pier transformation as a patchwork made of building fabrics in the shape of morphologically autonomous but spatially related urban architectures.

Neutelings & Riedijk assume the assignment, encompassing a wide range of functions – housing, restaurant, swimming pool, wellness and medical centre, parking lots – into a covered and stepped urban block of highly sculptural impact.

The block itself combines two typological hypotheses. The cross section reveals its precedents in the balcony like covered urban block, with a consistent tradition in the 19<sup>th</sup> century European city, rooting the twofold dwelling curtains into a public podium and connecting it to the outside. The longitudinal section, emphasizing the stepped profile lowering down onto the Maas River, gives rise to the multilayer consistency of the building, almost nestling the public into the private. The combination of the two enhances the idea that private and public domains are two instable polarities which are reciprocally identified through a continuous negotiation, counteracting any idea of hierarchy or subordination of the former to the latter in the contemporary city.

*MVRDV, Markthal, 2014*

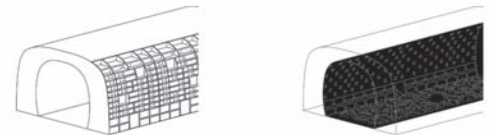
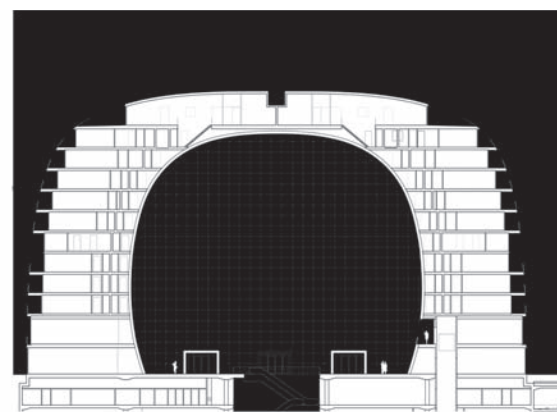
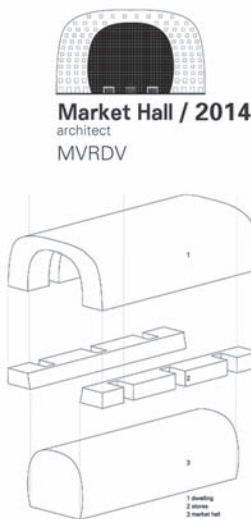
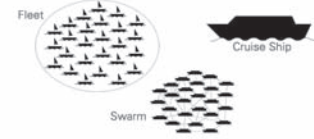
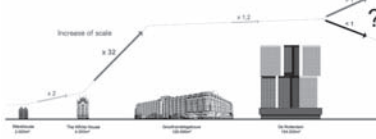
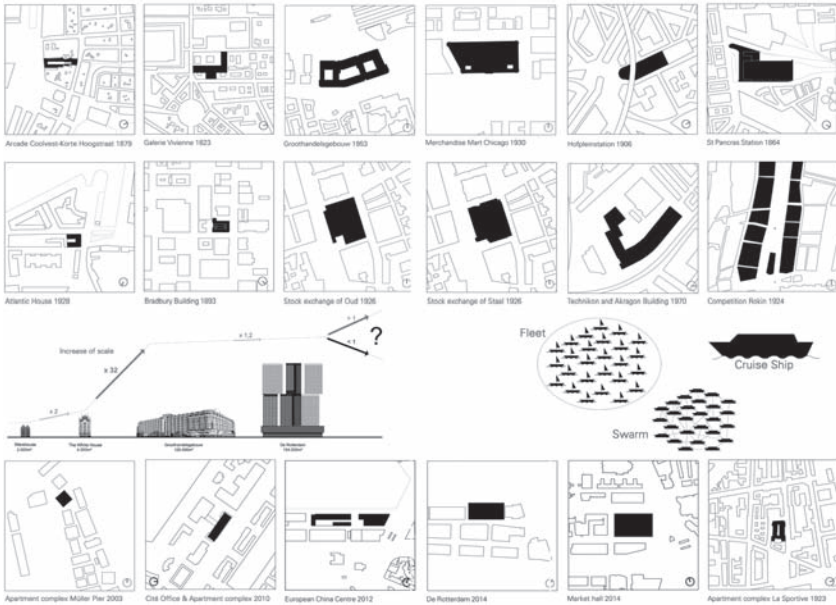
New national regulations, introducing strict limitations to outdoor selling and consumption of fresh food, gave rise to the new market hall as a solution for the Blaak's popular weekly open market. The main functional requirement is enriched and implemented by combining it with dwellings, commercial activities and underground parking. Making explicit the use of a mega structural language, letting the bearing system being inhabitable with balcony like typologies, its cross section is a combination of two clear precedents: the covered urban block, whose edge curtains host dwellings and internally housed public functions, and the previous International Fair Hall and Railroad Head Station, probably as an indirect homage to the proximity of the Blaak station, showing a stepped back profile combined with the shopping mall plinth. The ambiguous relation between the private exterior and the public interior produces a hybrid atmosphere, where again horizontal and vertical connections are combined.

*OMA/Rem Koolhaas, De Rotterdam, 2014*

The complex is part of the Wilhelmina Pier transformation. The area is the former terminal of the famous Holland America Line, from which the Dutch immigrants used to leave their native land to join New York. Nowadays it hosts a luxurious residential district. OMA/Rem Koolhaas aim is to perform on the Pier the high congestion qualities formerly discovered in New York, but also to establish a metaphorical link to the Atlantic Ocean's two-sided connection. The design



Site Plans



1. TU-Delft, Historical twins & new kids on the block, morphological foot print, 1:16.000, Rotterdam, and Theo Deutinger, Schemes "Increase of Scale" and "Cruise ship & Fleet", TD Netherlands Austria
2. MVRDV, Market hall, a way of drawing & analysing, 2014: Section, Façade, Axonometric View, Inner View, Exploded View



tries to combine the horizontal quality of the European block, which hosts the most public facilities such as congress and fitness centre intertwined with parking, rooting the complex in the pier, with the vertical quality of the high-rise buildings, each of them used differently as hotel, offices and dwellings. As a tribute to their geographical Patron, the parts are literally grafted upon the common plinth, matching in an unexpected hybrid solution.

#### *Common Aspects*

Comparing the different exemplary solutions, it seems that Rotterdam is consciously experimenting with new proposals to enhance urban congestion, combining the international high-rise development with a more local concern for the traditional public/private relationship, where the city block pattern plays a crucial role as an actively gluing interface.

Leading the public inside the building curtains, and letting people flow between the private functions without loosing the relation with the street surface level, seems also to be a common base to solve the potential conflict between the horizontal and the vertical city profile. In addition, research for hot spot junctions of the infrastructural network appears to be another facilitating condition for success.

#### *Conclusion*

In order to document, analyse and compare historical and contemporary representatives of the hybrid species, we developed a special way of drawing. The method includes panoply of scales ranging from the morphological arrangement on the scale of the city and the surrounding urban tissue, a comparison in size of the façades as well as footprints, and axonometric drawings that show the way in which volumes and functions are stacked.

As a result, main typologies can be detected, especially in the transformation of the urban block. They can transform slowly due to the spatial arrangement of the city, for example the lack of space within the fortified city, and economical needs like the recent call for densification. Types once developed for an urban context within a specific historical period, can reappear in another. Moreover, they evolve in unexpected ways. Detailed sections document the way in which diverse spaces are stacked, visualising the building's typology or combinations of typologies.

Basically the features analysed within the series of drawings are also the categories to be taken into account for every future hybrid building. The drawings allow detecting the models and rules that are constitutional for the ground-scraper as a hybrid urban block. At the same time the research guides a design practice build up on research of typology, morphology and the everyday use, to stress once again the relationship between architecture and the city.