

Dutch complex housing: Design for density

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ABSTRACT: The Netherlands is world renown for its innovative approach to dense housing. The investigation presented in this paper explores a particular form of housing, here called *complex housing*, to understand the design principles that Dutch architects and urban designers employ in its design. The paper discusses two of the nine examples that form the basis for the research. The nine projects are built between 1997 and 2010 with densities ranging from 70 units per hectare (24 units per acre) to 428 units per hectare (144 units per acre).

Complex Housing¹ contrasts with approach to density typically taken in the United States and elsewhere, in that it usually incorporates non-housing functions along with a variety of housing types, income levels, and types of tenure to create a housing project with diversity of inhabitant and a visually rich architectural expression.

The paper employs the typological approach used in the larger study to analyze two housing complexes, De Zilvervloot in Dordrecht (Atelier d'Architecture, d'Urbanism et de l'Informatique: 2005) and La Grande Cour in Amsterdam (Meyer en van Schooten, Cie and Herren 5: 2008).

KEYWORDS: Housing, Typology, Design, Density, Netherlands

INTRODUCTION

Between approximately 1990 and 2010, the Dutch government implemented what is popularly called the VINEX spatial plan². With the national government identifying where housing and development was to be located, regional governments developing the necessary infrastructure, and planners in municipal governments working with developers and architects to implement the plans, the planning process was comprehensive. The VINEX plan was designed to implement a variety of broad principles including:

- maintaining as much of green areas as possible,
- supporting transportation infrastructure (intended to increase public transportation, increase the use of bicycles and reduce automobile use), the construction of housing to be 1/3 social, 1/3 middle income and 1/3 upper income
- reorientation away from public funding toward market funding
- increasing housing for families, and addressing the need for housing especially in the Eastern part of the country or Randstad.³

This has resulted in the creation of dense housing, especially in the Randstad. The most dramatic cases for example, are in the docklands of Amsterdam for which, at the end of this period, the city required a density of 300 units per hectare (or approximately 100 units per acre)⁴. When family housing was built in these areas, it was sometimes coupled with complex housing projects to achieve the required density. The developers for complex housing projects included housing corporations, previously given government subsidies, but now asked to develop and maintain housing with their own funds. While the social housing was designed to be rented with government subsidies, the middle income and upper income housing were intended to be sold, although after the recession of 2008, often ended up as rental units.

Dutch housing is different from housing normally built in the United States for a variety of reasons. One cause is that housing regulations are based on different assumptions. For instance Dutch housing must meet higher standards for light and air than in the US that require more windows or other openings. This results in building blocks that tend to have a much narrower footprint. Also fire regulations are based less on preventing combustion and more on preventing smoke inhalation than are US requirements. Thus the United States favors single loaded corridors that can be closed to prevent access to oxygen whereas the Netherlands favors corridors with access to the outdoors between exit stairs. It is common, therefore to find single-loaded exterior corridors (or galleries) in the Netherlands.

Other sources of difference are less straightforward. Units are typically 20% smaller in size,⁵ which may be due to the scarcity of land and space in this dense country, and/or due to historical precedent. The support of housing for various income levels is somewhat experimental,⁶ but is assumed to be viable because social housing is not stigmatized in the Netherlands. In the past people living in social housing whose incomes increased continued to live in social housing and pay market rates. Therefore, unlike the United States and many other countries, social housing did not exclusively serve low-income people. Additionally, Dutch attitudes toward wealth tend to minimize differences. Likely originating in their Calvinistic traditions the

government has traditionally used tax policy to maintain a relatively small income gap between the richest and poorest citizens, and also many affluent people seem to be uncomfortable displaying their prosperity. Even manor houses built in the 17th-19th centuries are decidedly smaller than those built in other nations. Finally, the use of housing corporations (developed originally as organizations that implemented government housing policy to emancipate the working classes by maintaining rental housing) seems to have generated an orientation to creating long term value in housing. When a developer does not maintain the constructed property, as is usual in the United States, there is a tendency to use short-term investment strategies.

Since the 2008 recession the situation in the Netherlands has changed. Whereas beginning in 1900, through the VINEX period and up to 2005, the government created and implemented spatial plans every 5-7 years, no spatial plan has been created since 2005. The 2005 spatial plan represented a government move to a market-based system, and the new governments have not overseen its implementation, rather they have largely dismantled the national planning agencies. This may mean that the values represented in the housing discussed here may no longer apply to housing built more recently.

1.0 COMPLEX HOUSING

The term *complex housing* stands for a special kind of large and dense housing project⁷. Similar to what others have sometimes called *hybrid buildings*⁸ it provides moderate or high housing density while engaging other purposes as well, characteristically commercial and/or civic functions. But beyond the mixed-use characteristics typical of hybrid buildings, a complex housing project incorporates:

- Units for rental and for purchase
- Units for low, moderate and high-income residents
- Three or more types of dwelling units ((e.g. row house, maisonette, live-work unit, group home, flat, penthouse);
- Diverse organizational strategies (layers, stacking, various types of access, use of courtyards, etc.)
- Significant urban intervention
- Height predominantly 4-6 stories but sometimes including a tower of no more than 12 stories
- Outstanding architectural design

Such housing is not found exclusively in the Netherlands, but it is unusual elsewhere, and also in the Netherlands, where it is primarily found in the highly populated Western Randstad area (incorporating Amsterdam, Rotterdam, Den Haag, Utrecht and Almere) where dense housing conserves open space. Complex Housing contrasts with an approach to density typically taken in the United States and in other countries, in which a building or block is exclusively housing, made by layering multiple identical floors of flats (one-level apartments) that are lined up along a double-loaded corridor.

2.0 TYPOLOGICAL APPROACH

A typological approach is used to analyze the projects in this study. For this paper, we are examining only two of the nine projects from a larger research investigation, but employing the methodology of the wider study. In the 1970s and 1980s typology was extensively used to study differences in formal organization of both architecture and urban design.⁹ More recently researchers studying urban form and dense housing have taken a similar approach.¹⁰ Since many Dutch architects describe their design approach as based in typology,¹¹ typological analysis was chosen for its power to uncover the formal choices made by designers and reveal the design principles used to create complex housing.

The typological analysis of the study examines the following broad categories which are further subdivided as the analysis reveals more typological levels: site, massing, articulation (materials, fenestration, color), courtyard, programmatic functions, housing types (row houses, maisonettes, flats, penthouses), access, outdoor space, organization, syntactical structure.

3.0 CASE STUDIES: DE ZILVERVLOOT AND LA GRANDE COUR

The two projects selected for discussion, De Zilvervloot and La Grande Cour, while visually contrasting, and with very different histories, represent design strategies found in complex housing. While De Zilvervloot includes one of the tallest towers of the group of nine projects within its block, its density is in the middle range of the nine projects at 41 units per acre with most buildings at five or six stories. At 100 units per acre, La Grande Cour is among the three most dense projects and incorporates three 8 story towers within a six-story block. Both projects have commercial functions at the ground level and parking below ground.

De Zilvervloot was built in Dordrecht in 2005 as part of a plan to revitalize a neighborhood built exclusively for social housing in the 1960s. Woondrecht, the housing corporation that owned the buildings, needed to redesign the project to make it economically viable, and wanted to include the remaining residents in the

redesign process. The architects selected to work with the community, Lucien Kroll and Dag Boutsen of Atelier d'Architecture, d'Urbanisme et d'Informatique (AUA) engaged the community in a design process that resulted in a variety of changes to the neighborhood (renovations of existing buildings, the addition of sports facilities, etc.) including the design and construction of De Zilvervloot and the adjacent public plaza on what had been open land.¹² The new building provides for a mix of income levels, about 50% social housing, 25% middle-income housing and 25% luxury units. Although naysayers were skeptical that the mix would work, the luxury housing was the first to sell.¹³

La Grande Cour was built as part of the West Docklands development in 2008. Its unusual configuration is the result of a miscalculation on the part of the developer, Bouwfonds, that was discovered by the project architects Meyer en van Schooten (MVS), when they couldn't fit the required number of units in the envelope that had been accepted by the city.¹⁴ Renegotiations with the city resulted in the insertion of three L-shaped towers called periscope towers. These provided the additional units to reach the city's required 100 units per acre density without adding additional floors to the main housing blocks.¹⁵ The schematic design by MVS included three courtyards, of which they designed one, and invited two other architectural firms, Herren 5 and Cie, to design the remaining two.



Figure 1: De Zilvervloot and the plaza to the East with entrance to the commercial courtyard



Figure 2: La Grande Cour with canal and plaza to the East and the East Periscope Tower

3.1. Siting

Both projects are located in an urban context along a main street and front on a plaza. De Zilvervloot, on a flat site, has a five story building across a street to the North but the other three sides are relatively free of impediments to light and view due to low buildings and open land to the West, and a single narrow eight story building to the South. To the West is an excellent view of the city. Because of its location in the docklands, La Grande Cour has views of water on three sides at the moment. The fourth side is on a constricted street facing an eight-story building that restricts light and view. The sloping site is addressed with change of level in the courtyards. Both buildings provide parking below grade, and access to their commercial spaces at grade. While at La Grande Cour some social housing is directly accessible at grade, the remaining units at La Grande Cour and all of the Units at De Zilvervloot are located at least one level above ground and are reached by elevator either from the garage or from ground level lobbies.

3.2. Massing

Both buildings have interior courtyards that are created by housing walls at the perimeter of the block and in the center. In both cases these walls have openings, although all of the openings in De Zilvervloot, except for the gate to the plaza, are created by a building edge, whereas in La Grande Cour the building totally surrounds the site, and most of the openings are cut within the building wall or framed by building overhangs. The smaller buildings that create the wall at De Zilvervloot are expressed by setbacks and changes in height. At La Grande Cour, the individual buildings are invisible from the exterior, and the overall block reads as one large mass.



Figure 3: The commercial courtyard at De Zilvervloot showing the opening at the North



Figure 4: An opening framed by the middle periscope building which overhangs the

3.3. Courtyards

There are two courtyards in De Zilvervloot, one is a commercial courtyard on the ground level that opens onto the street to the North with a gate to the East plaza that bring the neighborhood to the heart of the project, creating a strong integration. The other courtyard, on the first housing level above a supermarket, provides outdoor gardens for the rowhouse and maisonette units that enter from it, as well as shared open space for the entire project.



Figure 5: The residential courtyard at De Zilvervloot looking northeast toward the three rowhouses.



Figure 6: The West courtyard at De Zilvervloot with social housing on either side.

Each of the three courtyards at La Grande Cour serves as symbolic center for the dwellings that enter from it. They provide outdoor space and direct ground level access to the social housing units and to the elevator lobbies of all the other units.

3.4. Articulation (material, color, fenestration)

De Zilvervloot reads as a complex kit of parts. The base of the building is visible throughout, and the residential buildings are emphasized by changes in material, color and fenestration. On the West, North and East sides, the commercial base is expressed with a setback and use of dark brick, while on the South the residential buildings are set back from the dark brick. Although there is a consistent material palette of gray and tan wood siding, red, white and gray composite panels, and dark red brick, these are varied in such a way that the sense of the overall complex is diminished in favor of the elements that make it up. It is clear that there is also a limited fenestration palette, but this too is applied to emphasize the different buildings. The play of balconies and loggias, unique to each building adds to the visual complexity (see more below).

The purple-red brick covering the facades at La Grande Cour accentuates the building exterior as a single five-story block. Only differences in fenestration (different sizes and proportion, some outlined in white, others simply inserted into the brick envelope) and balconies suggest from the outside that the block is made up of many buildings. The slate color of the periscope buildings, close to the color of the sky, deemphasizes these elements, thus reducing the apparent scale of the building. Within the courtyards, however, the individual residential buildings are expressed in changes of material, color and articulation and in the application of balconies and loggias. The materials on the surfaces of the residential buildings in the courtyards are shades of gray, gray-blue, and white, smooth and pale in color allowing for light reflectance.



Figure 7: Left) De Zilvervloot from the Northwest showing how the massing, color and material choices accentuate the individual buildings. Right) The massing, materials and colors at La Grande Cour emphasize the block over the individual building.



Rather than create a very tall and wide building to generate density, in Dutch complex housing the building is kept relatively low and the wall is modulated with setbacks, overhangs, materials, colors, windows, loggias, balconies and openings to reduce the apparent scale. The designs employ contrast to startle and amuse. Whether the periscope elements and asymmetrical balconies at La Grande Cour or the range of materials and colors at De Zilvervloot, the surprise engages the viewer and brings the buildings to a new level of expression.

3.5. Programmatic function

While complex housing projects vary greatly in the types of non-housing functions they incorporate (in addition to six cases with commercial space, the nine projects include such functions as clinic, library, child care and church), these two buildings are more similar than different, with their ground floor commercial base and parking below. The main difference is the commercial courtyard in De Zilvervloot that makes the commercial functions more integral to the development. In La Grande Cour the commercial space only opens to the exterior, thus making it largely external to the residential life that takes place within the courtyards. However, in both cases, the commercial activities create active street life and embed the project in the adjacent community.

3.6. Access types

The two projects, typical of complex housing, employ diverse modes of access: direct access from the street or courtyard (to row houses), access from elevator vestibules (typically corner locations), access from double-loaded skip stop corridors, and access from single-loaded corridors or galleries with these last three access types used to form walls of units.



Figure 8: Gallery Access at the commercial courtyard



Figure 9: Access galleries at La Grande Cour's East courtyard

3.7. Housing types and unit types

Both De Zilvervloot and La Grande Cour combine several different types of housing: row housing (multi-story units that enter directly from the street or courtyard, share side walls, and typically have front and rear orientation), maisonettes (multi-level apartments), skip-stop apartments (two story apartments that enter on one level and have living spaces on another such that corridors are not on every floor), flats (one-level apartments), and penthouses (flats or maisonettes that have roof gardens). Despite the few broad categories of housing, the number of unit types in each of these buildings is surprisingly large: around 28 for De Zilvervloot, and over 40 for La Grande Cour. In addition to the housing types shared with La Grande Cour, De Zilvervloot incorporates live-work dwellings that while not entered directly from the street, have a large living area and potential office space entered from an internal corridor, bypassing living areas. Both buildings include penthouses at various roof levels.

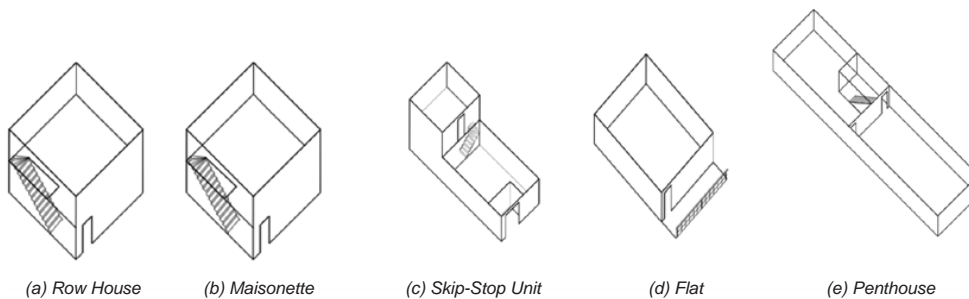


Figure 10: Housing Types Often Found in Dutch Complex Housing (drawing by Erin Lilli).

At De Zilvervloot, the predominant housing type is flats, which make up 82% of the 130 units, and are evenly distributed across buildings. Maisonettes make up about 16 % of the units (6% skip stop), and row houses 2%. The flats tend to be vestibule-accessed (38%,) versus gallery-accessed flats at 23%. Ground accessed row houses (from the raised courtyard level) are a low 2%. In La Grande Cour the predominant housing type is also flats at about 65% percent of the 253 units, with 37% vestibule-accessed. These are located at the four corners of the building, in the low towers along the South side and as one or two units per floor in the periscope towers. Similar to De Zilvervloot approximately 25% of the units are gallery-accessed flats, but the proportion of skip stop maisonettes that enter from a double-loaded hall is higher at La Grand Cour, at 18% each, and number of row houses is significantly higher at 18%. The remaining 2% are flats that enter from a double-loaded corridor.

In terms of the mix of housing, De Zilvervloot has a greater proportion of social housing than La Grande Cour with 50% of housing serving as social housing, and 25% each for moderate income and luxury dwellings. In contrast La Grande Cour incorporates mostly middle income housing at approximately 50% with 30% social housing and 20% luxury units.

3.8. Outdoor Space

Similar to most other complex housing projects, the outdoor spaces employed at De Zilvervloot and La Grande Cour include gardens (open spaces at ground or roof level), balconies (outdoor spaces that cantilever from the building) and loggias (outdoor areas within the building wall). At De Zilvervloot, fifteen units have gardens, and another eight units have roof gardens. These include the row houses and several units that open onto the residential courtyard, as well as flats from the South gallery access building on that same level. Units along the West, main street side have loggias to protect them from the wind and street noise. Units that open eastward onto the plaza have either loggias or balconies. Units along the South side have gardens or balconies, while Penthouses have roof gardens and/or loggias.

At La Grande Cour about 20 units have roof gardens including most of the penthouses. Most of the penthouses also have loggias. While the row houses have ground access and in theory some private space in front of the units, in fact only about six of the houses, those in the South courtyard have an area



Figure 11: De Zilvervloot from the South showing balconies, loggias (in the corner of the building to the right) and roof gardens on the lowest and penthouse



Figure 12: La Grande Cour has balconies on the North sides of the West periscope building and the East gallery building.

sufficiently protected from passersby (in this case by a planters) to be called garden space. Outdoor spaces for dwellings on the North side facing the river and the main street are loggias. Outdoor spaces that face the courtyard and the East side of the building are balconies, and on the South side facing the canal either balconies or loggias serve as outdoor spaces.

3.9. Organization

At De Zilvervloot, each of the nine residential buildings is different, but all are accessible from the parking garage or from the street. Most buildings combine either middle-income housing or social housing with luxury housing, typically at the top floor in the form of a penthouse. The Southwest tower and the two buildings along the West side are largely made up of vestibule apartments. The building on the North side facing the residential courtyard contains live-work units and gallery access maisonettes. On the East are two vestibule access buildings that contain flats. Between these is a bridge that creates the entrance from the plaza to the commercial courtyard. The bridge is made up of skip-stop maisonettes that enter from a double-loaded corridor. The building on the South side is largely comprised of gallery flats that serve as social housing with penthouses on top.

In addition to the twenty-seven rowhouses at La Grande Cour that enter directly from the three courtyards, there are nine multi-family buildings that house the remaining 223 units. These buildings are entered both from the parking below and from one of the three courtyards. The three buildings to the North, each entering from a different courtyard, form the wall along the street. These contain skip-stop maisonettes that enter from double-loaded corridors on two floors, and vestibule access flats at the corners. The South side of the complex has three towers containing vestibule-access flats. Bridging between the three towers, and entering from the West and Middle towers are two sets of gallery access flats. At the Southeast corner is a gallery access building with flats that forms the remaining South wall and the East wall. On the West side of each courtyard is the entrance to the periscope buildings. The West periscope building cantilevers toward the South over the West social housing. The Middle periscope building bridges to the North over the street wall,

while the East periscope building hangs over the East courtyard to rest on the gallery access building adjacent to the East plaza.

3.10. Syntactical Structure

Space syntax gamma analysis diagrams are used to study the syntactical structure of the housing in this project using space syntax diagrams that address the circulation spaces. The diagrams shown in Figures 12 and 13 focus on the circulation space as experienced by a visitor entering from the street.

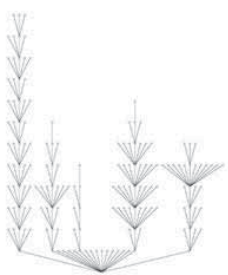


Figure 12: Space syntax diagram of De Zilvervloot (drawing by Jennifer Asp)

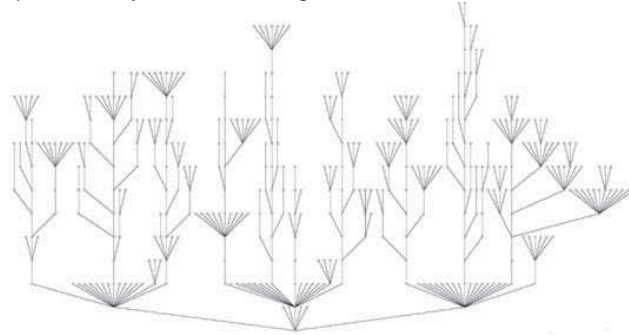


Figure 13: Space syntax diagram of La Grande Cour (drawing by Jennifer Asp)

The first visible difference between the two projects is the size of the project, with De Zilvervloot being half the size of La Grande Cour (129 units versus 253). The general pattern of the circulation in De Zilvervloot does not reveal the nine buildings that are identified from the outside, but rather five entries, some of which are shared between two adjacent buildings that read as one branch in the diagram. However, the building arrangement of La Grande Cour is evident from the diagram. We see the three courtyards with rowhouses and three or four buildings branching from them. In both buildings each branch has a slightly different pattern, indicating that the designers are addressing the unique condition of each building. The pattern of the branches in De Zilvervloot however is more regular than the branches of La Grande Cour because most floors have circulation spaces on them, and each De Zilvervloot building has a similar number of units on each level. The structure of De Zilvervloot has less hierarchy and more regularity than La Grande Cour.

In contrast, La Grande Cour has a complex, hierarchical, and apparently idiosyncratic arrangement of space. The fan-shaped patterns in both diagrams show where circulation spaces connect to a set of units. Some of the sparse branches in La Grande Cour represent the floors without circulation in the skip-stop arrangement. The fan shaped double-loaded corridor arrangement of the floors that do have unit access interrupts these branches. Other sparse branches represent the two periscope buildings that have one or two units on each level but many units at the top. The two sparse branches with fans at the very top are the periscope buildings with one flat per floor and skip stop units on the top three floors that have only one access level. The sparse branch with few units at the top is the periscope building with one building on each level and two penthouses on each of the top three floors. Here, while the hierarchy of courtyard and building is clearly expressed, the branches representing buildings each show unique patterns.

CONCLUSION

Complex housing demonstrates the potential for dense housing to be more than a tall and wide building with identical dwellings layered one on top of the other in a repetitive and uniform pattern. These projects incorporate social and programmatic diversity with a variety of formal expression. Having non-housing programmatic uses ties a project to its community. Having many different types of housing creates the potential for many different life styles to reside side by side. Dutch developers create housing they intend to maintain over time, rather than a quick turnover, resulting in wise long-term investments. The special conditions of the Netherlands may make some aspects of the projects difficult to replicate in other places, but the overall principles of mixed use, mixed housing type and lively architectural expression can be widely applied.

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ENDNOTES

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