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# The Practice and Enlightenment of Architectural Renovation and Urban Renewal in the Netherlands

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**Abstract:** With the development of local urban renewal in the Netherlands, Dutch architects as Rem Koolhaas, Francine Houben and Kees Kaan, etc. have showed rich practical experiences. As a result, the architectural renovation and urban renewal have presented a thriving scene. In this article, the types of urban renewal in the Netherlands are classified as three main categories: *regional renewal*, *architectural heritage refurbishment*, and *adaptive reuse* [1]. From the perspective of *types* to *strategies*, this study analyzes typical cases including the Westerpark West, Speelhuis theater, Timmerhuis and Villa Industria and so on, exploring the role of Dutch architects, the method of transformation and sustainable meaning of urban renewal. The research tries to summarize the Dutch mode and experiences, providing a new perspective and methodology for relevant transformation practices of urban renewal in China.

## 1. Introduction

The Netherlands ranks first in the European population density with data of nearly 500 people per square kilometre [2]. "Density" has always been a difficult problem of Dutch city builders. Compared with other European countries, the land area of the Netherlands is relatively tension, and most of the land is below sea level, facing the threat of flooding [3]. "Sea Reclamation" has become a primary way for this country to create land for survival [4]. Urban renewal of the Netherlands began in the 19th century, and the promulgation of the housing law also marked the direct link between housing construction and urban renewal. After world war II, modern architecture in Europe entered a boom period, and the development of social productivity, promoted the development of urban renewal. There are three main stages of urban renewal in the Netherlands: small-scale regeneration and physical renewal of historic towns and cities (1970-1988); Large-scale residential regeneration and social renewal of new cities (1989-1995); Urban brownfield reconstruction (since 1996) [5]. After the first and second stages of construction, about 85% of the housing stock in the Netherlands has been maintained with high quality, and most urban residential areas have been restored to vitality and order. Unfortunately, traditional industrial areas have gradually failed to adapt to the requirements of modernization and have been abandoned in the process of regional development. There is no doubt that these decaying industrial areas will be the site of a new round of urban renewal and reconstruction. The housing act of 1901 and the social rental housing management act of 1993 established the basic legal framework of the Dutch housing legislation system. At the end of the 20th century, the Netherlands entered the "golden time" of modern architectural development [2]. After more than a decade of development, the Netherlands have achieved fruitful results from urban renewal and architectural renovation.



In the past few decades, the proportion of existing building renovation projects in the Netherlands has been increasing year by year, with adaptive reuse and renovation projects being the most typical (Fig 1).

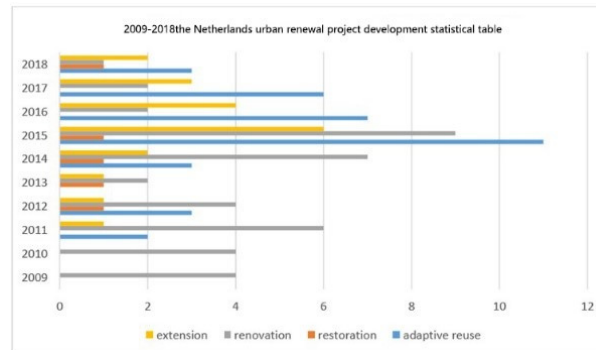


Figure 1. Urban renewal project statistics

In January 2019, the author visited OMA and learned that the internationally renowned firms focusing on public architecture projects have participated in many building renovation projects in the past five years. Obviously, Dutch architects are involved in urban or architectural renewal projects more frequently than ever before. Therefore, their attitudes, positions, and strategies are worth of specific analysis and research. The research and summary of existing cases could also provide some Dutch experiences and modes. Back in China's urban landscape, the pressures on population density and social transformation are clearly enormous. Does the Dutch experience give us a new perspective or some operational strategies?

## 2. The main types of renewal projects in the Netherlands

In the 21st century, the content of urban renewal in the Netherlands is more extensive. Social and cultural progress has led to the formation and change of different types in the concept of urban renewal. With the changes in architectural trends and policies, urban renewal has been transformed from an independent region to a multi-domain complex renewal involving multiple aspects, such as the surrounding environment, historic architecture and urban planning. Taking the 21st century as the time node, this paper divides the urban transformation from 2000 to 2018 into four main types: *Regional renewal*, *architectural heritage refurbishment*, *adaptive reuse* and *industrial building renovation*. Among these four categories, the types of regional renewal, architectural heritage renovation and adaptive reuse are classified according to their respective scale characteristics and renovation strategies. According to the difficulty of the specific function different from general civil building, the classification of industrial building renovation is extracted and divided into separate types.

Then Dutch architectural design has entered into a flourishing period in the 1990s, and the Dutch architects and institutes have become famous worldwide with a pioneering spirit, a distinctive personality and a group image with open and diverse attitudes [6]. A number of excellent architectural design teams have emerged, such as OMA, MVRDV, KAAAN, MAI, Mecanoo, GroupA, W8 and etc. As a leading representative of the Dutch architectural firms, OMA has long been known for its large-scale public construction design and for Rem Koolhaas' critical thinking as an architectural socialist. As the founder of KAAAN Architecten, Kees Kaan prefers to integrate practical projects with his academic knowledge. Mecanoo's range of work includes interior design, headquarters, museum and educational architecture, with the aim of incorporating native Dutch culture into their architectural design, creating a large number of distinctive landmarks, such as the Delft Railway Station and the Polytechnic University Library. The collective practice and innovative thinking of Dutch native architects have stimulated the new vitality of Dutch architecture in the 21st century. The following is the renovation by building type:

- **Westerpark West:** The Westerpark West project, located in Amsterdam, is a large urban residential area with rich green space and architectural diversity. The architects sought to create more

green space inside and outside the building in many ways. Using the concept of sustainable design, the project extends the landscape to the riverbank, adds a public green park to the whole community, and establishes a new energy and recycling system for the long-term future of the community.

• **Speelhuis Theatre:** The Helmond Speelhuis Theatre designed by Piet Blom was destroyed in a fire in December 2011, and the City Council then decided to renovate the abandoned Assumption Cathedral, replacing the theatre temporarily [7]. The theatre was converted from a Neo-Byzantine domed cathedral. The new theatre was placed near the cathedral and used as a two-story building (Fig 2). There are cargo distribution areas, actors' dressing rooms and toilets, in contrast to the original environment of the historic site. By introducing natural light, the interior of the building echoes the mysterious image of the church as a religious building. All of the new facilities, such as the theatre's stage and auditorium, are non-fixed and movable components to avoid changing the original appearance of the cathedral.

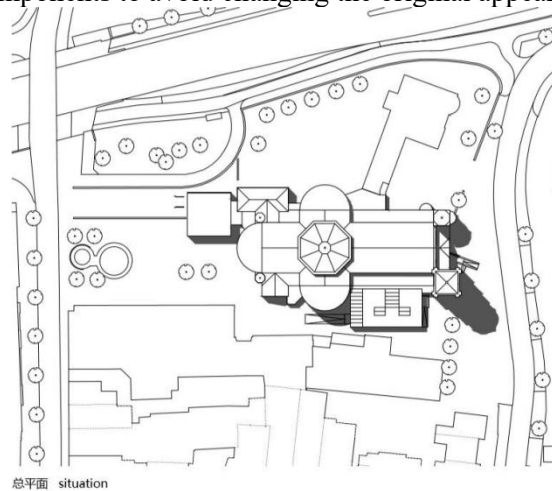


Figure 2. The site-plan of Speelhuis Theatre

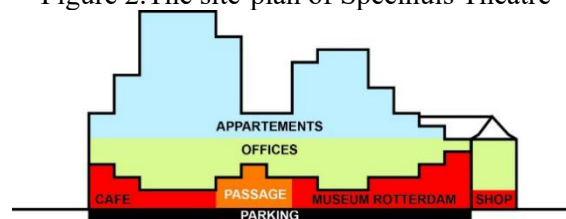


Figure 3. The functional analysis of Timmerhuis

• **Timmerhuis:** Located in Rotterdam, Timmerhuis is a complex of government services, headquarters offices and residential apartments (Fig. 3). Following a modular design, the building grows along the street, gradually stacking up two irregular “peaks”. This Stacked and fragmented architectural volume is more flexible and naturally connected to the eastern Stadstimmerhuis, built in 1953. The design creates an atmosphere of communication between the old and the new constructions and maintains the same architectural height as the surrounding buildings. Timmerhuis is a new building that blends perfectly into the urban environment in Rotterdam by ingeniously connecting with the old Stadstimmerhuis.

### 3. Design strategies of Dutch architects involved in renovation and urban renewal

#### 3.1. Regional Renewal Strategy

In the 21st century, urban renewal in the Netherlands is moving towards a complex pattern. In terms of the development of Westerpark West and NDSM Wharf, regional renewal is not only a response to residential housing issues but also a response to green sustainability; the industrial area of the

Netherlands has a large number of industrial heritages. Through the practice of architects, the degraded traditional urban districts have been transformed into new industrial complex, including commercial and cultural creations, giving new life to the old district. Specifically, we can extract from these cases a general outline of the strategies of Dutch Architects involved in urban renewal.

- MVRDV use the means of interventional pre-planning to analyse the status, characteristics, and relationships of urban renewal. For the repetitive planning of residential areas, it should meet the needs of people with different purchasing power, pay attention to housing diversity, and solve the housing problem that caused by oversize population density. In addition, architects should consider landscaping system as a flexible darning strategy to connect various building groups as a whole.

- Architects also integrate green technology into regional renewal. In 2018, the Rotterdam International Architecture Biennale was based on The Missing Link, focusing on sustainable development such as climate, ecology and nature. They have designed a low-carbon sustainable method for the individual buildings, ensuring green sustainability in building technology and regional renewal.

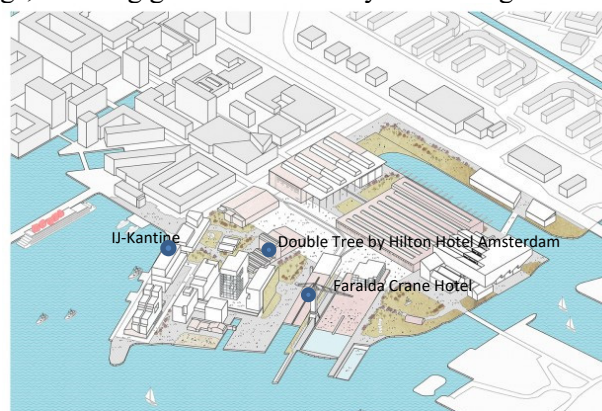


Figure 4. NDSM Wharf program

- Architects use local culture as the basis of their design philosophy, and they put modern culture into the new regional renewals. The IJ-Kantine, Faralda Crane Hotel and DoubleTree by Hilton Hotel Amsterdam (Fig 4) in NDSM Wharf are typical renewal projects in the region. The purpose is to change the industrial structure, increase the diversified functions such as hotels, restaurants, bars, music festivals, etc. and enhance the vitality of the region, while also catering to the urban renewal.

### 3.2. Strategy for Architectural Heritage Refurbishment

Dutch architectural heritage is plentiful. Born in the 17th century Royal Palace, Dam is still standing on the Dam Square. Het Rijksmuseum Amsterdam has continued its life for two centuries [8]. It still plays an important role in society; The renovation of architectural heritage has also become an important part of Dutch urban renewal. To some extent, architects could dominate design principles and strategies for architectural heritage in a certain scope:

- **Distinguish between inside and outside:** Protection and renewal of architectural heritage are differentiated by inside (interior structure and space) and outside (external environment and facades) of the building. The principle is to maintain reversibility, keep the valuable external form, and to repair the exterior Fig shapes of historic buildings such as sculptures, murals, etc. Architects can make suitable changes to the functions and materials in refurbishment work of the interior space.

- **Space Permeability:** For public buildings, architects can enhance the fluidity and openness of space, making the functional space and non-functional space permeability. For monumental ones, architects try to increase the level of space while maintaining the seriousness of the space. The treatment of the interior space can also use some colonnades, walls, decorative statues, windows, creating the mystery, depth, the solemnity of the building, and creating a space

- **Microcosmic Involve:** Architects can focus details, in case of materials and construction. It is also possible to use marble in contrast to the original material, like the atrium of Het Rijksmuseum

Amsterdam (Fig. 5). The construction method can be used by original techniques, or it can be a modern concrete pouring. The key is what style the architect wants; Designers can also focus on architectural details, such as lighting, furniture, color. For example, the color of the exhibition hall wallpaper in the Het Rijksmuseum Amsterdam restores the appearance of the 19th century, and the atrium lamps use metal-shaped geometric ring lights.

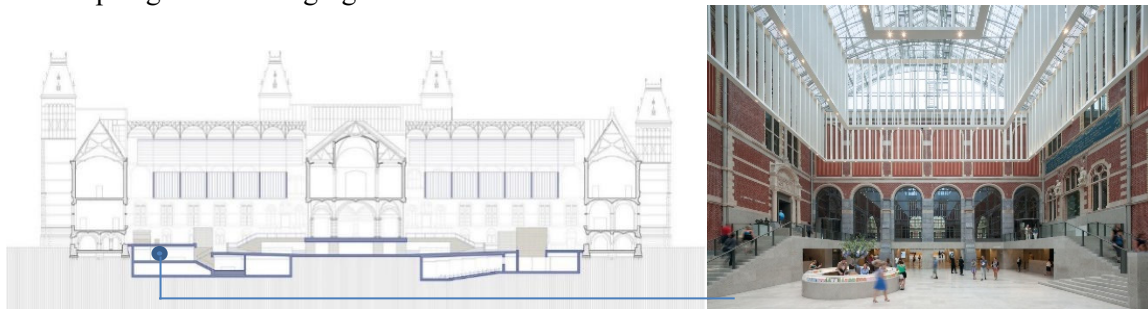


Figure 5. The atrium space of Rijksmuseum

### 3.3. Adaptive reuse

In the history of architectural development, there are still a huge number of generalized historical buildings, but their predictable value is slightly lower than designated architectural heritage. That means the renewal strategy for generalized historical buildings might be more flexible than the heritage ones [9]. As time goes by, more and more buildings have been added to the list of historic buildings, which is inevitable for the built environment. For the transformation of such buildings, adaptive reuse has always been a consensus strategy.

- **Space fusion between new and old:** Architects emphasize the spatial communication and functional symbiosis between old and new buildings. OMA adopts a modular spatial mode in Timmerhuis, which enables new space to echo the original space and eventually reach the realm of harmony. Meanwhile, the juxtaposition between old and new should also be considered. In Deventer City Hall, architect adds new functional plugins (public access) to connect old and new building spaces (Fig. 6). In addition, architects also can bring together old and new functions, incorporate new functions into the old functions and design a reasonable transportation route to connect the old and new functional spaces to achieve the integration of old and new buildings.

- **Comparison of old and new:** It mainly involves the comparison of building materials and shapes. Designers pay attention to the proportion of building scale in adaptive reuse, and use special materials to improve the quality of buildings. In Timmerhuis, the transparency of the glass-maintained structure contrasts sharply with the seriousness of the brick wall of the old house. In the Deventer City Hall, the exterior is decorated with wooden frame, contrasting in color and texture with the facade of the old city hall.

- **Building function replacement:** In contemporary society, the original function of many historical buildings has been abandoned, because it does not meet the needs of society, resulting in waste of resources, which is a disadvantage of urban development. Architects should replace old functions with new ones that meet the needs of the times. It can be communication, entertainment, office, reading, exhibition, enhance the vitality of space, increase communication between people, and promote the adaptive reuse of old architecture.

- **Structure retention:** Architects can retain the structure (beams, slabs, columns) of industrial plants. In the renovation of Villa Industria, the designer retained the steel structure of the gashouse, which became the new building skin. In the De Producent warehouse project, the architect re-established the structural layer and retained the original wooden structure as part of the interior. In addition, the traffic structure of the building can also be preserved and reinforced. Architects combine old structures with new functions to promote the industrial building renovation.

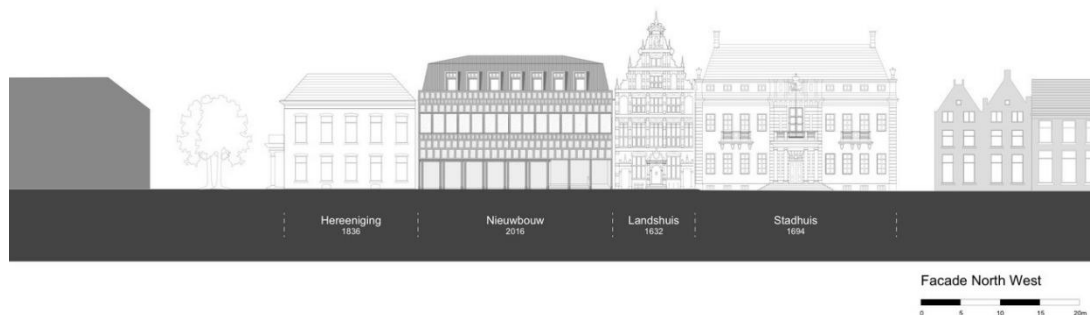


Figure 6. the contrast between old and new of Deventer City Hall

#### 4. Conclusion

In the past ten years, Dutch urban renewal and development has gradually formed its own mode. This paper mainly sorts out the most representative four types and strategies. In the analysis of the collective practice of different scales or types, the author summarizes the Dutch experience and pattern from the perspective of architects, and proposes common solutions. Whatever it is about Old Antique and New Revolution, context and identity, space and form, structure and construction, there are indeed some methods that contemporary architects could learn from. In a sense, innovation and compromise are inseparable, and restriction and creation are mutually constrained. Architects who work in a historical environment need more wisdom and courage.

Especially now, China has entered a new era. Under the background of the development of new economy, China's architectural education mode, construction laws and regulations, architects' responsibility and so on are constantly improving. Urban renewal requires architects, government and society to participate in the design, however, architects still play a dominant role in the design. Their attitude and position would create diverse and vibrant living environment for the future. Dutch mode can provide concrete and multidimensional prospective and guiding experience for similar reform practices of urban renewal in contemporary China. If we could retrieve the historical memory in new time and space, it might be the best answer for the architectural renovation and urban renewal.

#### Acknowledgments

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**Citation1:** ARCHDAILY (<https://www.archdaily.com/>) classifies the transformation project as Adaptive reuse, Restoration, Renovation, Extension, but urban renewal is not in it. According to scale characteristics and transformation strategies of Dutch built environment, the study makes a slight adjustment of the classification for better discussion. However, there may be a possibility that some project might span types.

#### Image Source

F1 Author painted

F2 Linders, J. Van Woerkom, L. (2015) Speelhuis Theatr. World Architecture Review, 30(04):62-69.

F3 <https://www.archdaily.com/778654/timmerhuis-oma/566ad2a5e58ece93a3000034-timmerhuis-oma-diagram>

F4 <https://www.iamsterdam.com/en/about-amsterdam/amsterdam-neighbourhoods/ndsm>

F5 <https://www.archdaily.com/357590/rijksmuseum-cruz-y-ortiz-arquitectos>

F6 <https://www.gooood.cn/city-hall-deventer-by-neutelings-riedijk-architects.htm>

#### References

[1] [https://boty.archdaily.com/us/2019?ad\\_name=main-menu](https://boty.archdaily.com/us/2019?ad_name=main-menu)

- [2] Chu Dongzhu, D. (2018) Post-Super: RE-Observation of Dutch Architects and Modern Architecture. *THE ARCHITECT*, 01:81-89.
- [3] Huting, M. (2010) Modern Dutch urban and architectural development. *Urban Environmental Design*, 01: 16-19.
- [4] Zhang Zhihui, Z.H. (2013) Integration of national spatial planning and ecological protection: Inspiration from the land reclamation project in the Netherlands. *China Three Gorges*, 05:66-71+4.
- [5] Chen Xiaoxi, X. (2011) The three stages and multiple strategies of urban renewal and revival in the Netherland. *Urban Planning International*, 26(04):74-78.
- [6] Chu Dongzhu, D.Z. (2011) One way to get involved: Dutch contemporary architects observe. *Architectural Journal*, 03:12-17.
- [7] Linders, J. Van Woerkom, L. (2015) Speelhuis Theatr. *World Architecture Review*, 30(04):62-69.
- [8] Kuipers, M. & de Jonge, W. (2017). *Designing from Heritage: Strategies for Conservation and Conversion*. Delft University of Technology.
- [9] Meng Fanlei, F. L. (2017) The Overview of the Conservation and Reuse of Industrial Heritage in the Netherlands. *Urban Planning International*, 32(02):108-113.