Research Article

Heritage attributes of post-war housing in Amsterdam

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Abstract Modern heritage, particularly post-war social housing estates, is struggling with negative perceptions. Accordingly, this research aims to contribute to a better understanding of the heritage significance of post-war housing estates in general and the Western Garden Cities — a post-war neighborhood in Amsterdam — in particular. A review of the limited body of literature on the heritage significance of modern and post-war housing estates was performed. A significance assessment was conducted on a sample of representative case studies by using expert interviews for data collection. The experts assigned significance levels to attributes based on whether or not they need to be preserved during a sustainable refurbishment. The highest-valued attributes are parcellation, balconies, and semi-public green spaces. The most negative value was assigned to the application of external insulation, replacement of the window frames by PVC-U, and closed character of the facades on the ground floor level. The lack of heritage recognition at the lower scale level may either be due to the important details already being lost or details not yet consistently being recognized as the architecture and buildings are understudied in comparison with the urban qualities of post-war heritage.

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1. Introduction

In 2013, the Getty Conservation Institute identified the lack of recognition and protection of modern architecture and a shared methodological approach as the most commonly cited and interrelated challenges (Macdonald, 2013; Normandin and Mcdonald, 2013). In the same report, this challenge is coined as "protecting the yet-to-be-loved," citing common criticisms of modern heritage as follows: "There is so much of it," "We don’t like it," and "It’s too hard to deal with" (Macdonald, 2013). Bond and Worthing discussed the struggles of most generations to appreciate...
the architecture of their period and those of their immediate predecessors. They pointed to Georgian architecture being berated by Victorians and high Victorian Gothic being denounced as monstrosities only 40 years ago, but both are cherished today. They viewed current debates concerning twentieth century buildings as reinforcements to the argument and stated that suggesting when their value may be recognized is difficult.

In addition to the lack of distance in time to modern heritage, a conceptual paradox seems to exist in the combination of the terms “modern” and “heritage” (Kuipers, 2013). Heritage is generally associated with tradition and history, whereas modernity manifests a strong preference for the new. Such tensions have been frequently discussed (Kuipers, 2013). As a conclusion, the Getty Conservation Institute stated the following recommendations: First, a framework for assessing the significance of modern heritage that can be used nationally or internationally or by organisations performing inventories for modern heritage must be developed. Second, identifying significance must be based on an improved and agreed-upon understanding. Lastly, decisions on managing change (e.g., in balancing energy performance and heritage impacts) must be enhanced.

Although we have not yet achieved widespread recognition and support for the conservation of modern architecture, the last decade has seen considerable progress. In the Netherlands, in 2007, the National Cultural Heritage Agency selected 100 buildings from the 1940–1958 period to be officially listed as national monuments, followed by selecting another 89 buildings from the period of 1959–1965 (Hoogstraten and Vries, 2013). In 2014, the Van Nelle Factory, an icon of modern industrial architecture built in 1930, was assigned a UNESCO world heritage status (“World Heritage List - Van Nellefabriek,” n.d.). In addition, the Rietveld Schröder House has been a UNESCO monument since 2000 (“World Heritage Committee Inscribes 61 New Sites on World Heritage List,” 2000; “World Heritage List - Rietveld Schröderhuis (Rietveld Schröder House),” n.d.), and another modernist building, the health care center called “Zonnestraal,” has been submitted for nomination by UNESCO since 2011 and is currently on the tentative list (“World Heritage Tentative List - Sanatorium Zonnestraal,” n.d.). In addition to these “iconic” buildings, the National Cultural Heritage Agency has conducted an evaluation of the largest of the 14 selected post-war neighborhoods in 2014, the Van Nelle Factory, an icon of modern industrial architecture built in 1930, was assigned a UNESCO world heritage status (“Twenty six new properties added to World Heritage List at Doha meeting,” 2014; “World Heritage List - Van Nellefabriek,” n.d.). In addition, the Rietveld Schröder House has been a UNESCO monument since 2000 (“World Heritage List - Rietveld Schröderhuis (Rietveld Schröder House),” n.d.), and another modernist building, the health care center called “Zonnestraal,” has been submitted for nomination by UNESCO since 2011 and is currently on the tentative list (“World Heritage Tentative List - Sanatorium Zonnestraal,” n.d.). In addition to these “iconic” buildings, the National Cultural Heritage Agency has conducted an evaluation of the potential heritage significance of the construction period after 1965 (Barzilay et al., 2018).

The largest of the 14 selected post-war neighborhoods is the Western Garden Cities of Amsterdam. Although the urban design of this neighborhood has received recognition of significance for some time, this case is not the same for the architecture of the buildings, of which many have been demolished or transformed without consideration of their potential heritage significance. The present research aims to contribute to the understanding of the heritage significance of these buildings and the attributes or features of the buildings that must be preserved through a sustainable refurbishment. These results are discussed in relation to the literature on the heritage significance of post-war housing estates. First, the paper presents a review of the literature on the heritage significance of post-war housing.

Second, it discusses the heritage significance assigned to the Western Garden Cities by the National Cultural Heritage Agency and Department of Monuments and Archaeology of the city of Amsterdam. Third, it describes the case study selection and methods used to assess the significance of attributes. Lastly, it presents the results indicating the attributes with the highest significance and those with the most negative significance.

1.1. Heritage significance of post-war housing

A systematic review of the literature on the heritage significance of housing complexes was conducted, identifying a total of 17 papers (Al-Ragam, 2013; Benko, 2015; Dragutinovic et al., 2017; Duraj et al., 2017; Gatley, 2010; Hanekom, 2016; Harnack and Stollmann, 2016; Hasche, 2016; Marić, 2012; Martin and Dominguez, 2016; Navas-Carrillo et al., 2017; Ottaviani, 2016; Pantet et al., 2017; Roberts, 2017; Sverrild, 2014; Tan, 2014; Yildiz, 2015) that specifically discussed the heritage significance of modernist or post-war housing estates. Some additional publications discuss the following: first, the integration of the local cultural identities of non-Western societies in modern housing developments (D’Auria, 2014; Melhuish, 2017); second, the energy retrofit of these types of buildings, considering their heritage significance but not specifically discussing or evaluating the heritage significance (Behar, 2014; Bruno and Grecea, 2017; De Santoli, Mancini, Nastasi and Ridolfi, 2017; Dukanović et al., 2016; Mancini et al., 2016; Vasiutina and Vatin, 2014); and, lastly, one paper specifically addressing an approach to digitally document modernist housing estates before being demolished (Esmaeili et al., 2016).

The topic of the selected 17 papers that discuss the heritage significance of modernist or post-war housing estates has clearly gained interest in recent years. Most of the papers were published in the last two years, and all other papers were published in the last eight years (≥2010).

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1 The Scopus database was searched on April 12, 2018 using the keywords ((reconstruction OR post-war OR modern) AND (heritage OR significance) AND (housing)). This search identified 272 publications, of which 174 were journal articles and 57 were conference papers. This task was considered as the scope of the review. Some publications were unavailable mostly because of their age (non-digital) or local status (language), and some were excluded from the review. Subsequently, only those papers discussing the heritage significance of modernist or post-war housing estates were selected, which resulted in a total of 17 papers.

2 10 out of 17 paper were published in 2016 and 2017. Some papers published in 2018 did meet the selection criteria based on the abstract but were not included because the full papers were not published yet.
These case studies are mostly situated in Western Europe: Spain (2), the United Kingdom (4), France (1), Germany (1), and Denmark (1). In addition, five papers focus on the case studies in Eastern Europe, three of which were constructed in countries that were communist during that time (Benko, 2015; Dragutinovic et al., 2017; Duraj et al., 2017), referencing "socialist–realism" as a specific style of the time. Furthermore, three case studies were conducted outside of Europe, all heavily influenced by British culture: Australia (Hanekom, 2016), New Zealand (Gatley, 2010), and Kuwait (Al-Ragam, 2013).

Almost all case studies focus on social housing. Although social values are only explicitly mentioned in a few publications (e.g., Benko, 2015; Hasche, 2016), most of the papers describe social aspects to be important to the character or identity of such housing estates. In addition to not being explicit about social values, most papers do not explicitly or specifically identify the most important features or attributes with heritage significance. The papers that specify some important features mention the following:

- "architectural composition," "cubist form," and "the truly modernist facades" (Dragutinovic et al., 2017)
- "domestic experience, interior layouts, materials and detailing, light and views, and communal experience" (Roberts, 2017)
- "the significance of the site as the oldest residential and public housing precinct (of the city)," "one of the most architecturally singular buildings (of the city)," "homegrown hybrid of international and local architectural ideas in the city’s housing exemplar continuum" (Hanekom, 2016)
- "the 'realistic' architecture features: urban master plan, humane scale, and triangular and trapezoid open spaces," "galleries as a filter between interior/exterior and private/public realm," "steel construction" which creates "lightness and transparency" (Martin and Dominguez, 2016)
- "the overall layout, the completely enclosed gardens, the traffic-separation, the simplicity and honesty in materials, the communicating construction - characteristic for the ideals of modernism and the more regional functionalism" (Sverrild, 2014)
- "moderate, harmonious, to some extent, also meager and modest, but solidly and unobtrusively fitted into space and city" (Marić, 2012)

More than two-thirds of the papers discuss the negative reputation and/or lack of recognition received by these types of housing estates (Al-Ragam, 2013; Benko, 2015; Gatley, 2010; Hanekom, 2016; Harnack and Stollmann, 2016; Hasche, 2016; Marić, 2012; Martin and Dominguez, 2016; Ottaviani, 2016; Roberts, 2017; Sverrild, 2014; Tan, 2014). For example, Al-Ragam (Al-Ragam, 2013, p.) stated that: "Despite concerted efforts to preserve modern heritage by non-profit organisations such as Docomomo and the Twentieth Century Society, the international attitude towards modern heritage is apathetic at best and at worse destructive." Some authors pointed out that the notion that these housing estates have "failed" is merely a top-down political claim, but the actual residents do not agree with these notions (e.g., Al-Ragam, 2013; Roberts, 2017). Others pointed out that initiatives to educate and raise awareness among locals to create a better understanding of the history of their neighborhood have proven to be very successful in garnering support for the protection of such places (e.g., Macdonald, 2013; Yildiz, 2015).

The lack of maintenance and a state of disrepair are often discussed probably due to the negative reputation (e.g., Al-Ragam, 2013; Dragutinovic et al., 2017; Harnack and Stollmann, 2016; Hasche, 2016; Martin and Dominguez, 2016; Ottaviani, 2016; Roberts, 2017). Moreover, transformations that have occurred over time and the negative effects of these transformations on the heritage significance of these case studies are frequently discussed (e.g., Al-Ragam, 2013; Dragutinovic et al., 2017; Hasche, 2016; Martin and Dominguez, 2016; Navas-Carrillo et al., 2017; Yildiz, 2015). Dragutinovic (Dragutinovic et al., 2017) concluded that the main problems of all modernist buildings in Belgrade are either disrepair or "altering and transformation beyond recognition."

As a result of the lack of recognition and state of disrepair, 10 out of 17 publications discuss the threat of demolition, either as having been a threat in the past or as a current threat (Al-Ragam, 2013; Benko, 2015; Duraj et al., 2017; Hanekom, 2016; Hasche, 2016; Marić, 2012; Martin and Dominguez, 2016; Roberts, 2017; Tan, 2014; Yildiz, 2015). Among the studies that do not discuss demolition, five out of seven are case studies designated or listed with heritage significance in some shape or form (Dragutinovic et al., 2017; Gatley, 2010; Harnack and Stollmann, 2016; Pantet et al., 2017; Sverrild, 2014). In addition, two of the case studies that discuss demolition as a recent threat currently have received a form of heritage protection (Duraj et al., 2017; Roberts, 2017). However, one case study (Yildiz, 2015) discussed a practice of ongoing demolition, whereas the settlement has been declared as "housing areas whose development fabric needs to be preserved." Hasche (2016) stated that "The main challenge in the listing of post-war housing estates as cultural heritage is the fact that potential obsolescence, changed demographics and rapidly growing demands for energy efficiency, as well as new living standards, all threaten these estates with demolition or modification before their historic or artistic values can even be recognized."

Most studies do not describe a methodological approach or the research methods employed in conducting the study. Instead, they focus on a description of the project, albeit from diverse and often multiple perspectives. Only six publications mention research methods to some extent (Benko, 2015; Dragutinovic et al., 2017; Navas-Carrillo et al., 2017; Pantet et al., 2017; Roberts, 2017; Yildiz, 2015), three of which mention archival research and two mention the use of interviews. Only the latter two publications describe the research method in some detail, one focusing on residents (Roberts, 2017) and one including residents and other stakeholders (Yildiz, 2015). The lack of a structured or methodical approach to heritage significance assessment is not exclusive to the literature on modern heritage. A recent review (Lideiów et al., 2019) of the literature on sustainable heritage refurbishment...
concludes that most studies merely refer a buildings’ heritage status or an international convention. They stated that "potentially significant architectural, cultural, and historical factors have been rarely discussed. ... Generally, they provide no further description of the theoretical approach or assessment method." The implicit nature and lack of transparency of heritage significance considerations have also been flagged by other authors (e.g., Fredheim and Khalaf, 2016; Heritage and Copithorne, 2018; Yung and Chan, 2011). In addition, most of the reviewed studies do not introduce a body of relevant international literature outside the local context as part of their paper. As such, the body of the literature on this topic is still very limited and has not yet sufficiently evolved to form a discourse or consensus on the heritage significance of modernist housing estates.

1.2. Western Garden Cities of Amsterdam

The Western Garden Cities of Amsterdam have recently been listed by the National Cultural Heritage Agency of the Netherlands to have national importance. However, many of the same problems and threats faced by other post-war housing estates are also faced by the Western Garden Cities. Therefore, this section initially discusses the threats that this area has faced and is still facing and subsequently discusses the evolution of heritage significance recognition that has occurred.

1.2.1. Large-scale demolition and redevelopment

During the last few decades, urban restructuring programs in the Netherlands has primarily focused on the demolition and replacement of the existing housing stock (Gruis et al., 2006). Areas, such as the Western Garden Cities, were heavily affected, with many housing corporations undertaking extensive demolition programs on the less popular post-war social housing estates. This program caused the Western Garden Cities to be one of the four largest demolition areas of the country (Flier and Thomsen, 2006). In 2001, the city of Amsterdam released a document called "Richting Parkstad 2015" (city of Amsterdam, the Netherlands, 2001), which laid out the plan to demolish 13,300 of the post-war dwellings and build 24,300 new dwellings in the Western Garden Cities in from 2001 to 2015. This approach was referred to as "the largest urban renewal in the world."

This development was halted by the economic crisis of 2008, and the estimated demolition and new construction figures were never satisfied. Instead, up to the year 2016, a total of 7000 dwellings have been demolished and 9500 dwellings have been newly constructed (Nio et al., 2017), whereas approximately 38,000 post-war dwellings remain in the Western Garden Cities (Agricola et al., 2013). Over time, a paradigm shift started to occur, with demolition plans being shut down and buildings, which had previously been nominated to be demolished, being designated as a municipal monument (as recounted by Paulus de Wit, city council member representing the district of the Western Garden Cities in a speech in 2013 (Lamslag, 2013)). A local newspaper (Molen, 2016) published at the end of 2016 described this shift in an article with the title "Demolition has almost become a nasty word — Urban renewal has finally reached another stage." The article states that "the world has changed in 2016 numerous complexes for which the demolition permit had already been granted have been or are being refurbished. Demolition was often prevented by an occasional association of residents’ committees, residents, heritage associations and politicians of various backgrounds." Multiple directors of the large housing corporations, who underline the sentiment of preferring renovation over demolition, were interviewed. However, the issue of overdue maintenance of the area is a serious problem that needs to be addressed (as noted by Paulus de Wit in the same speech in 2013 (Lamslag, 2013)).

Although the shift from demolition to refurbishment is in line with the heritage significance recognition of the area, densification remains a threat to the preservation of parts of the Western Garden Cities. The "Structural Vision Amsterdam 2040" (city of Amsterdam, the Netherlands, 2011), which outlined the future development plans of the city, states that "The roll-out of the center area manifests itself most strongly through the large number of extra dwellings that will be built in neighborhoods that are still known as 'garden city' [...] but will in the near future become part of the highly urbanized center area." With this statement, the city expresses that areas currently known as garden cities will lose this characteristic.

In addition, the shift from demolition to refurbishment may not be sufficient to preserve the heritage significance of these post-war neighborhoods. Although relatively few schools and churches in the Western Garden cities have attained monument status, this case is only applicable for two out of the 410 residential ensembles. Therefore, renovations may not always be carried out considering the potential heritage significance of these buildings. These continued threats and the recent recognition of the heritage significance of the area underscore the need to understand the heritage significance impact of large-scale refurbishment programs on the scale level of the area and of the individual (non-designated) buildings.

1.2.2. Recently recognized heritage significance

In 2011, the Western Garden Cities of Amsterdam were selected by the National Cultural Heritage Agency as one of the 15 post-war neighborhoods that are of national importance (Cultural Heritage Agency of the Netherlands, 2011). The listing’s aim states that the post-war construction period (1940–1965) shall remain "recognisable on the level of the area" in future developments. Moreover, “the appreciation of the buildings and areas is not always widely supported, although public support for the preservation of this heritage has arisen in recent years.” Furthermore, “the special characteristics of these areas deserve more public attention and the most special areas deserve public protection.”

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3 Dutch sources are cited throughout this manuscript. All citations were translated by Lisanne Havinga (see Appendix for original versions).
After the initial listing, the National Cultural Heritage Agency published two additional publications outlining the heritage significance of the Western Garden Cities (Cultural Heritage Agency of the Netherlands, 2016; Hendriks and Hoeven, 2016). These publications describe two main overarching principles as highly essential to the heritage significance of most post-war neighborhoods in the Netherlands. First, the so-called "wijkgedachte" ("neighborhood concept") is a concept for organizing districts that was formed in the 1920s and further developed after the war by Studiegroep Bos in a book entitled "De stad der toekomst, de toekomst der stad" ("the city of the future, the future of the city") (Bos, 1946). The concept was developed from a sociological point of view, focusing on the family as the cornerstone of society, because cities were densely populated and lack social cohesion in neighborhoods. This concept requires that the functions of the city should be segregated: living, working, traffic, and recreation should be hierarchically organized and separated from one another. Therefore, every residential district is built up of neighborhoods. Every neighborhood possessed its own services, such as shops for daily needs, a school, and a church, in close proximity to the residents. The notion "licht, lucht en ruimte" (light, air, and space) became a motto to Dutch post-war urban expansions. In contrast to the dense, closed building blocks of traditional urban areas, the new districts were designed as urban compositions of space, in which greenery and public space played important roles. The boundaries among private, communal (semi-public), and public space became less defined. The two concepts, namely, the "neighborhood concept" and "light, air, and space," were closely related to the school of thought developed by the Congrès Internationaux d'Architecture Moderne (CIAM). CIAM is a series of international conferences on modern architecture and urban design. Some of these notions can be traced back to the garden city movement because the members of CIAM were deeply ideologically influenced by Ebenezer Howard (Domhardt, 2012). Cornelis van Eesteren, the chair of the CIAM from 1930 to 1947, designed "het Algemeen Uitbreidingsplan" (the General Expansion Plan) of Amsterdam, of which the Western Garden Cities are a large part. This expansion plan was largely based on these core principles.

The National Cultural Heritage Agency further specifies the significance of the Western Garden Cities in accordance with three "spatial distinctive core qualities" (Cultural Heritage Agency of the Netherlands, 2011; Hendriks and Hoeven, 2016). The first core quality is the "characteristic repetition of building blocks and the interspersion of high- and low-rise according to the principles of the CIAM." The second core quality is "the hierarchical structuring of both the infrastructure and the greenery." The hierarchical structure of the infrastructure starts with the so-called "city avenues," which serve as a route connecting the urban expansion to the existing city. The infrastructure branches off from the city avenues to the district roads, neighborhood roads, streets, lanes, and courts. The urban design included a hierarchical structure of the greenery, from landscape, park, park strip, green strip, and green space to front- or backyard. The third core quality is "the balanced relationship between the buildings and the public space." The three "core qualities" are the bases for selecting the Western Garden Cities and are of national importance. These core qualities are strongly related with the innovative urban design of the area.

The National Cultural Heritage Agency briefly refers to the architecture of the buildings in the area although this is excluded from the "spatial distinctive core qualities." The document (Hendriks and Hoeven, 2016) states that the architecture is mostly modern, either made up of brick or industrialized construction systems, with a sober and studious appearance. This document yields special contrasts, for example, traditional brick buildings in the architectural style of the "Bossche School" and experimental industrialized prefab concrete housing (called an Airey system) can be found in the same street.

The significance of the urban design has been widely acknowledged for some time, but the buildings and architecture were neglected to be of importance. An influential study published in 1995 (Vos and Amsterdam, 1995) described the interplay of layered structures of roads, water, greenery, and "building planes" – coined as a "tartan" – as the important aspect of the area. The study demonstrated that these structures can independently be renewed and developed and the buildings can be replaced by new construction. This notion has informed the policy of the cities’ planning department for some time and has been recently used as an argument to demolish and replace large parts of the Western Garden Cities.

This notion has been challenged in recent years and is no longer relevant to those in charge of the protection of heritage significance. Esther Agricola, the director of the Department of Monuments and Archaeology of the city of Amsterdam at that time, described this paradigm shift in a speech in 2013 (Lamslag, 2013). According to Agricola, in 1995, the department hardly paid any attention to the post-war neighborhoods of the city. Only 18 years later, she considered the Western Garden Cities as much worthy of preservation as the canal zone developments in the 17th and 19th centuries, which are UNESCO world heritage sites. Agricola stated that these areas received no heritage significance recognition because of the following reasons: young age (and limited "distance" in time), a disdain for modernism, social housing aspect, riches easier to protect than poverty, issue of size and number, and mass-produced repetitive buildings. Moreover, Agricola considered the shift toward an integral valuation of heritage to be instrumental to the recognition of the significance of these areas, in which societal value is also considered.

In line with this increased recognition of heritage significance, the Department of Monuments and Archaeology of the city of Amsterdam has recently published a collection of valuation maps that keeps record of the heritage significance of the post-war ensembles in the Western Garden Cities (Agricola et al., 2013). Every ensemble of buildings in the neighborhood is assessed at four levels: A) typology or internal organization of the building; B) architectural quality, relating to design, style, construction, material used, and technical detailing; C) ensemble or urban layout, which refers to the connection to the urban space and positioning or grouping of buildings within an ensemble; and D) relation to the garden city character, that is, the quality of the relationship between the object or ensemble and the garden city character.
The four levels are rated from 0 (lowest possible score) to 5 (highest score). After adding the scores, the final score results in the designation of an "order value." First, a score of 18–20 results in a designation of "order 1." Specifically, the ensemble is either a monument or qualified to be one. Second, a score of 15–17 results in a designation of "order 2," which indicates that the ensemble is of high quality. Third, a score of 11–14 results in a designation of "order 3," that is, the ensemble is of average quality. Lastly, a score of 1–10 results in a designation of "order basis," which suggests that the ensemble possesses no recognized added value, either caused by a flawed original design or the transformations that the building has undergone throughout its life.

The inventory of the cultural significance of the post-war housing in the Western Garden Cities provides a basis on which policy is defined. The basis of this score and its consequence for a future transformation are obscured because the "scoring" was purely expressed in a zero to five score without any additional explanation. For example, an ensemble scores very high on architectural quality. Whether this score is based on a special way of detailing, the use of a unique industrialized construction system or the composition of the facade is obscured. Therefore, this method is insufficient for architects and/or policy-makers in evaluating the suitability of transformation proposals.

2. Research aim and context

This work aims to contribute to the understanding of the heritage significance of post-war housing and the structured, transparent, and explicit evaluation of such significance. Specifically, this work aims to add a thorough understanding on the heritage significance of the Western Garden Cities of Amsterdam. Although numerous studies have been conducted on the urban design and spatial qualities of such structures, the architecture and individual buildings have received little attention (Nio et al., 2017). Thus, this work aims to gain an understanding of the features of the post-war housing estates that are considered to be of significance. In addition, this work aims to understand the extent that these transformations have negatively affected the heritage significance of the buildings and those that exhibit the most negative effect because many of these areas have been undergoing significant transformations. Many of these buildings will be renovated in the coming years to meet increasing requirements regarding energy efficiency and comfort. A detailed understanding of the attributes of the heritage significance of these buildings that are of importance and need to be preserved is indispensable to thoughtfully manage these changes.

This research is a part of a broad research on the sustainable refurbishment of post-war heritage, funded by the city of Amsterdam. Although this work only presents the considerations in relation to heritage significance, this is evidently not the only aspect that needs to be considered in refurbishment decisions. Subsequent publications will integrate the following aspects in heritage refurbishment considerations:

- Heritage impact assessment (using the results of the heritage significance assessment as input)
- Environmental impact (sustainability measured through life cycle assessment)
- Hygrothermal risk (risk of mold growth and condensation as a result of applying internal insulation)
- Costs (combining estimated investment costs and yearly energy cost savings)

This work precedes an interdisciplinary evaluation of refurbishment proposals. By contrast, this work conducts no evaluation of the refurbishment proposals but instead aims to independently and separately examine the heritage significance of these assets from plans for development. This work is in line with widely supported guidelines for assessing heritage significance. Kerr (Kerr & National Trust of Australia (N.S.W.), 1996) stated in "Conservation Plan" that "The split into two stages is important for the integrity of the process. It enables significance to be assessed away from extraneous pressures and without regard to those practical requirements which must subsequently be taken into account when developing policies." This notion is also reflected in the Burra Charter Article 6 (in the 1999 and 2013 versions): "Understanding cultural significance comes first, then development of policy and finally management of the place in accordance with the policy." The current version of this charter includes a flow chart process in which "understanding significance" is always the first step before defining policies. In addition, ICOMOS proposed a separate heritage impact assessment (using heritage significance assessment as part of the input) focused on assessing the possible development impacts on the heritage significance (ICOMOS, 2011).

The results presented in this work should be considered as the first step to solve a large puzzle. Although the results may indicate that a certain attribute has to be preserved as part of the heritage significance assessment, this may ultimately not be the case when other aspects, such as sustainability and costs, are also considered in the evaluation of development plans.

3. Materials and methods

3.1. Case study selection

The main dwelling typologies in the Western Garden Cities⁴ consist of tower blocks, slab blocks with gallery access, slab blocks with point access, row houses, and duplex houses (Fig. 1). The research focuses on the dominant typology of the area: almost 60% of the dwellings in the Western Garden Cities consist of "slab blocks with point access" (Davies and Jokiniemi, 2008) (hereinafter referred to as "slab blocks"). A total of 142 ensembles with approximately 21,700 dwellings in the Western Garden Cities consist of this typology.

This work aims to select a number of ensembles to be representative of these 142 ensembles and thus of slab blocks with point access in the Western Garden Cities. This

⁴ All data in this section were retrieved from the database of the city of Amsterdam, which was created for the inventory of the heritage significance of the AUP areas in the valuation maps (Agricola et al., 2013).
selection should cover the diversity of construction types (from traditional to industrialized prefab systems), significance levels (from national monuments to "basic order"), architectural styles (from traditional to modern), and construction years (from early post-war to late post-war). This section describes the main characteristics for the 142 point-access slab blocks in the Western Garden Cities. Part of the Western Garden Cities (the neighborhood called "Bos en Lommer") was already built before the Second World War. After the war, a steady production of on average nine ensembles of slab blocks was conducted per year from 1949 to 1961 (Fig. 2). However, the production of dwellings peaked around 1960 because these ensembles increased in size in the later post-war period. After the Second World War, a great shortage of housing, construction materials, and trained construction workers became evident (Oerlemans and Ham, 2008). Therefore, the Dutch government decided to stimulate the development of non-traditional construction systems (Elk and Priemus, 1970, p. 16). Of the 146 ensembles that consist of slab blocks with point access, 37 were constructed using a non-traditional construction system (Fig. 3). Most slab block ensembles are assigned an order level 2 or 3, and only five ensembles out of the 142 are order 1 (of which 2 are designated monuments) (Fig. 3). Although slab blocks of four stories are also quite common, the slab blocks mostly consist of five stories (Fig. 3). A small part (7%) is only three stories high, and ensembles of seven or eight floors were sporadically observed. The database is incomplete when it comes to having or not having a slanted roof. If a house exhibits a slanted roof, then this floor is excluded as part of the number of stories. In most cases, the ground floor of the slab blocks consists of dwellings and offered room for storages or shops (Fig. 3). In some cases, storages were positioned in the front part, whereas bedrooms (of the first-floor apartment) were positioned in the rear part of the ground floor.

The following initial steps were taken to filter the 142 ensembles: 1) the ensembles with no archival or literary material were removed; 2) an initial selection was made on the basis of the analysis of archival and literary material (xxx ensembles); 3) all ensembles that were planned to be demolished were removed; and 4) all ensembles with an average energy label C or higher were removed because they have probably already been refurbished. After the initial steps, the filtered list was discussed with the head of urban development of the city district and conservation experts at the Department of Monuments and Archaeology of the city of Amsterdam. The aim was to select a palette of ensembles to represent the diversity of slab blocks with point access.

Fig. 1 Among the dwellings in the Western Garden Cities, 60% consist of slab blocks with point access.

Fig. 2 No. of dwellings (left) and ensembles (right) of slab blocks with point access built as per construction year.
point access in the Western Garden Cities. The final selection of the 10 ensembles includes early post-war and late post-war ensembles, order 1 and base order ensembles, traditional and modern architecture, and all types of construction systems. The selected 10 ensembles are presented in Table 1 and Figs. 4–7. This selection was made in collaboration with Noor Mens, who used the same selection as part of her research.

3.2. Attribute significance assessment

As mentioned earlier, this work aims to conduct a heritage significance assessment to contribute to an enhanced understanding of the heritage significance of post-war housing. For this purpose, a specific method for significance assessment was developed, which is focused at defining the significance of attributes in sufficient detail to inform refurbishment design decisions (Havinga, Colenbrander, & Schellen, n.d.-b). Expert interviews were used as the means for data collection. The four experts who currently hold the most influence in assigning heritage significance to these case studies and determining if and the manner by which they are treated when undergoing a sustainable refurbishment were interviewed (see Havinga, Colenbrander, & Schellen, n.d.-a for additional information on the selection of experts). These experts were familiar with the selected case studies. For every case study, the experts were provided with the same graphical

![Graph](image)

**Fig. 3** Construction systems, order of significance, building height, and ground floor function of the 142 ensembles of slab blocks with point access.

<table>
<thead>
<tr>
<th>#</th>
<th>Neighborhood</th>
<th>Constr. Year</th>
<th>Order</th>
<th>Constr. System</th>
<th>Ground Floor Function Front</th>
<th>Ground Floor Function Rear</th>
<th>No. of Stories</th>
<th>Architect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Slotermeer-Noordoost</td>
<td>1953</td>
<td>2</td>
<td>Airey</td>
<td>Storages</td>
<td>Dwellings</td>
<td>3</td>
<td>J. F. Berghoef</td>
</tr>
<tr>
<td>2</td>
<td>Slotermeer-Noordoost</td>
<td>1953</td>
<td>2–3</td>
<td>—</td>
<td>Shops</td>
<td>Storages</td>
<td>4+</td>
<td>A. Staal</td>
</tr>
<tr>
<td>3</td>
<td>Slotermeer-Noordoost</td>
<td>1953</td>
<td>2</td>
<td>RBM</td>
<td>Shops/dwellings</td>
<td>Storages</td>
<td>5</td>
<td>T. J. Lammers</td>
</tr>
<tr>
<td>4</td>
<td>Slotermeer-Zuidwest</td>
<td>1956</td>
<td>3</td>
<td>RBM</td>
<td>Shops/dwellings</td>
<td>Storages</td>
<td>5</td>
<td>J. P. Kloos</td>
</tr>
<tr>
<td>5</td>
<td>Slotervaart-Noord</td>
<td>1958</td>
<td>3</td>
<td>—</td>
<td>Storages</td>
<td>Dwellings</td>
<td>5+</td>
<td>J. Bot</td>
</tr>
<tr>
<td>6</td>
<td>Slotervaart-Noord</td>
<td>1960</td>
<td>1**</td>
<td>Airey</td>
<td>Storages</td>
<td>Storages</td>
<td>5</td>
<td>J. F. Berghoef</td>
</tr>
<tr>
<td>7</td>
<td>Slotervaart-Zuid</td>
<td>1958</td>
<td>1*</td>
<td>—</td>
<td>Storages</td>
<td>Dwellings</td>
<td>5+</td>
<td>A. Komter</td>
</tr>
<tr>
<td>8</td>
<td>Westlandgracht</td>
<td>1961</td>
<td>3</td>
<td>MUWI</td>
<td>Storages</td>
<td>Storages</td>
<td>5</td>
<td>W. F. van Bodegraven</td>
</tr>
<tr>
<td>9</td>
<td>Osdorp-Oost</td>
<td>1960</td>
<td>Base</td>
<td>BMB</td>
<td>Storages</td>
<td>Storages</td>
<td>5</td>
<td>H. van Vreeswijk</td>
</tr>
<tr>
<td>10</td>
<td>Osdorp-Midden</td>
<td>1962</td>
<td>2</td>
<td>—</td>
<td>Storages</td>
<td>Dwellings</td>
<td>5+</td>
<td>J. Brouwer</td>
</tr>
</tbody>
</table>

Note: * municipal monument, ** national monument, + slanted roof.
material consisting of historical photographs, current photographs, historical maps, current maps and satellite images, and drawings of the current facades and floor plans. The interior of the buildings was excluded from the assessment.

The experts were asked to assign significance levels to attributes of the case study on the basis of whether they need to be preserved during a sustainable refurbishment. Thus, the experts were asked to identify the following: the attributes that are of high significance and those that need to be preserved as much as possible; the attributes that are of medium significance and convey significance, but loss or damage may be considered acceptable under special circumstances; and attributes that are of negative significance and detract from the significance of the case study, and loss would be considered beneficial. The evaluations of preservation are solely based on the perspective of heritage significance. In a subsequent evaluation of refurbishment strategies, other aspects, such as sustainability and costs, may lead to different outcomes in terms of the things that can be preserved in practice.

4. Results and discussion

4.1. What to preserve

4.1.1. Parcellation

Of all attributes, parcellation of the ensembles — the way the buildings are configured — is assigned high
significance the most. A total of 24-fold high significance was assigned to this attribute in nine out of the 10 case studies. The only case study for which this was not the circumstance is the case that consists of a single building instead of an ensemble of buildings. Thus, no intricate configuration of buildings in relation to each other was detected. An expert was asked about the most significant attribute of post-war point-access slab blocks. This expert indicated that the urban compositions are the most important thing, while underlining that this statement does not mean necessarily support the previously considered notion that the parcellation is the only thing that matters and the buildings can be replaced by new construction (as outlined in the introduction). Fig. 8 shows the parcellations that were assigned high significance by the four experts (case studies 1, 3, and 6) or by three out of four experts (case study 7).

In case study 1, certain buildings are positioned at an angle, which makes the green spaces "open up" toward the street. Expert 1 states that "The spatial effect is one of movement of space, which I find very beautiful," and expert 3 expresses that "If you walk along there, it’s great, those spaces." In case study 3, experts 3 and 4 indicate that the parcellation is reminiscent of the first modernist urban design principle, called "open strip parcelling" (known as "strokenbouw" in Dutch and "zeilenbau" in German) (Blom et al., 2004). In addition to this principle, the alternation of street and greenery on opposite sides of the buildings, compactness, inward focus, and configuration of the garages are regarded as important features. In case study 6, the configuration of the 4- and 6-story building blocks is appreciated for creating a strong rhythm. The "other" parts of the ensemble — consisting of freestanding garages, a tower block, and a small pavilion — are also appreciated for their contribution to the configuration. In case study 7, expert 2 indicates that the special parcellation of the ensemble is the reason for its designation as a municipal monument. The large size of the parcellation and height differences of the building blocks and their configuration are important. Experts 3 and 4 point to the "spatial experience" and indicate that this space is "enchanting" and "inventive" and constantly differently experienced while one moves through it.

4.1.2. Balconies

The second highly valued attribute are the balconies, which were assigned a total of 19-fold high significance. In seven out of 10 case studies, at least one expert assigned high significance to the balconies. In three case studies, the balconies play a strong role in the front façade by accentuating the building entrances (Fig. 9). In these cases, the balconies were assigned high significance (cases 3 and 7) or...

Fig. 6  Historical photographs of the 10 selected ensembles (source: historic photographs, Amsterdam City Archives, 2018).

Fig. 7  Current photographs of parts of the front facades of the 10 selected ensembles.
high and medium significance (case 5) by all four experts. In all three cases, this part of the façade is further accentuated by an interruption of the eave, either caused by a recessed part of the façade (cases 3 and 7) or a part of the façade extending through it (case 5). One expert was asked about the most significant attribute of post-war slab blocks with point access. This expert indicates that the rhythm and composition of the façades created by balconies and stairwells are the most important attributes.

In case study 3, the part of the façade surrounding the building entrances and the balconies are assigned high significance. Moreover, three experts assigned significance to the balustrades of the balconies, of which one expert indicates that having them still in place is a miracle. In case study 5, the asymmetrical design of the concrete elements of the balconies is considered to be important because this accentuates the building entrances. Moreover, the concrete elements are said to create a "beautiful concrete graphic" in front of the masonry of the façade. In case study 7, the concrete floor slabs are continued by the balconies, which form a concrete portal structure that accentuates the building entrances. Expert 1 says that this portal "adds a certain plasticity" to the façade, whereas expert 2 expressed that it is an "important graphical element." Experts 3 and 4 argue that the structure provides a certain "appeal" and "guidance" to the entrance.

4.1.3. Green spaces (semi-public)

The semi-public green spaces that were designed part of the ensembles’ configurations were assigned 16-fold high significance, thereby making it the third highest valued attribute. Fig. 10 shows the green spaces that were assigned medium or high significance by all four experts (case studies 8 and 10) or by three out of four experts (case studies 1 and 5).

In case study 1, the green spaces are assigned high significance because of their spatial effect toward the road, as has been described in the section discussing the high significance of the parcellation. In addition to this aspect, the gradual transition from the private gardens to the green spaces is highly valued by the experts. Similar to many cases, this transition has been abolished by the adoption of fencing around the private gardens. The large size of the courts, playful configuration of the courts created by the parcellation, and semi-public character of the courts are appreciated in case study 5. Moreover, the large size and its southwest orientation in relation to the hook parcellation are appreciated in case study 8 because this allows light to enter the dwellings through the green spaces. Furthermore, the large size of the green spaces is appreciated in case study 10. The experts indicate that the size of post-war ensembles increases over time, and these late-post-war green spaces are the "maximum size," even referring to the size as "absurd."

4.1.4. Overall results of high significance

In addition to the three attributes that were highly valued by the experts, numerous other attributes were also often assigned high significance. Fig. 11 shows all attributes that were assigned high significance a minimum of fourfold. On the scale level of the area, the ensemble as a whole, public green spaces (distinct from the green spaces of the
ensembles themselves), relation to neighboring ensembles or a neighboring square, and connection to the street layout of the area are considered important attributes. On the scale level of the ensemble, the height differences of buildings and “other” buildings that play a role as part of the ensemble are assigned high significance in addition to parcellation and semi-public green spaces. On the scale level of the building block, the front and rear façades are mostly assigned high significance in relation to their layout and rhythm. The layout of the side façade was often assigned high significance in relation to the openness of the façade because the former are completely closed in some case studies, which is considered to be of negative significance.

On the scale level of the building elements, the chimneys and eaves are often assigned high significance in addition to the balconies. In the present case study, raised stoops and steel window frames were assigned high significance.

As one of the final questions of the interviews, the experts were asked about that thing that they regard as the most important attribute when considering the heritage significance of the combined case studies. One expert mentioned parcellation, and one answered rhythm and composition of the façades. In addition to this notion, one expert stated that social housing in the case studies is the most significant, although he did not mind if part of it is sold to private owners to preserve its remaining areas.
Lastly, one expert seemed to be focused on the things that have been lost. This expert expressed that the things that have been lost are the most significant ones to preserve. Moreover, the expert indicated that the details of the buildings are the most important because the architecture of the buildings is "sleek and simple." For instance, the expert indicates that fenestration (the arrangement of the subdivision of the windows) is particularly important in relation to the overall architectural design. However, fenestration is one of the attributes that has been lost in most case studies, which will be discussed in the following section.

4.2. What to restore or transform

4.2.1. External wall cladding: external insulation

Two of the most negatively valued attributes are external insulation and wall cladding, which have been applied to the side façades (see Fig. 12). Although this attribute is only present in four out of the 10 case studies, it was assigned 16-fold negative significance. Specifically, every expert assigned negative significance at every instance that it occurred. This treatment of the side façade is indicative of the attitude toward these buildings at the time of the interventions: no consideration was given to the design, materiality, color, or detailing of the interventions. Accordingly, the experts indicate this to be "the familiar problem," "deadly," and "ruined." When refurbishing an existing building, external insulation is the easiest (and from the perspective of building physics, the safest) way to achieve a low thermal conductivity. In the Netherlands, the façades of housing are generally made up of brick masonry (pre-war solid masonry, post-war brick veneer) regardless of the construction period. The aesthetical effect of applying external insulation with a layer of plaster is high. Nevertheless, the experts did not often explicitly assign high significance to the brick masonry probably because this was assumed to be understood (this is further discussed in Havinga et al., n.d.-a).

4.2.2. Loss of fenestration and window frames replaced by PVC-U

The other negatively valued attribute was also assigned a total of 16-fold negative significance. This attribute is the loss of the fenestration (the arrangement of the subdivision of the windows). In addition, these window frames were generally replaced by PVC-U window frames, which were assigned a total of 14-fold negative significance. In case study 4, this factor was considered to exhibit the most negative effect (see Fig. 13). All experts assigned negative significance to both attributes and strongly expressed themselves in their condemnation of this effect. Expert 2 stated that "In this case, just about everything that could possibly go wrong, did, in terms of fenestration." Expert 3 expressed that "This is truly a classic example of how a building can be utterly annihilated by renovations." Expert 4 explained that "The refinement has been abolished." Expert 1 explained that "one of the most essential things that are lost in all these renovations are the fenestrations … while this is what makes these buildings interesting, the interplay of the lines of the bigger picture, and once you zoom in you have all this movement ... rhythm" (see Fig. 14).

In addition to case study 4, these attributes were assigned negative significance in all but two case studies. In the two case studies, the original steel window frames
are still in place. In all case studies where wooden window frames were originally installed, the original frames have been replaced, which caused the arrangement of the windows to be lost, and replaced by PVC-U window frames in most cases. Fig. 15 shows the before and after photographs of two of the additional case studies. Case study 8 is one of the other cases in which the experts feel exceptionally strong about the negative effect. The experts refer to the original window frames as a work of art, “like a Mondrian painting,” and having “a Rietveld-like quality.” In addition, the experts discussed the disregard with which these window frames were replaced and stated that no architect was involved and the chosen windows are “the ugliest in existence.” One of the experts ponders the consequences that such an intervention can have on the recognition of heritage significance and thus on the continued existence of these buildings: “You see here how quickly a building like this deteriorates ... It’s kind of a mystery why this is a matter of such delicacy. But it is interesting when you realize, that a building that used to have a certain quality, if you do this, it suddenly gets put on the demolition list.” Case study 2 is an example of a much smaller change, which is nevertheless considered to have a negative effect. Three experts assigned negative significance. Expert 1 said that “It’s a pity it’s been changed, it used to be more exciting. Here you can see very beautifully how the subdivision of the windows played a part in the entire composition.” Expert 2 stated that “the original subdivision was also a lot better than it is now.” Expert 4 found it “disturbing.”

4.2.3. Storages on the ground floor level
The third most negatively valued attribute relates to storages positioned on the ground floor of the apartment buildings. Case studies 7 and 10 are representatives of the storages positioned on the ground floor, creating a closed character in the front façade of the buildings. This attribute was assigned a total of 13-fold negative significance over seven case studies (see the top pictures of Fig. 15). Case studies 2 and 4 are representatives of the storages positioned on the ground floor as rear extension to the buildings, which was only the case in the two case studies and assigned negative significance by three out of four experts in both cases, who indicated that this creates “a very unpleasant space.”

This attribute is different from the other two most negatively valued attributes because it does not relate to something of significance that has been lost or affected but
instead relates to something that was originally designed to be this way. The negative significance that is assigned to this aspect is caused by a changed perspective on the manner by which these buildings should be related to public space. The closed character of the ground floor is a consequence of the concept introduced by the CIAM (1946), which promoted dwellings to be raised above ground level, creating a different relation to the street:

"From then on, the house will never again be fused to the street by a sidewalk. Each dwelling 'will rise in its own surroundings, in which it will enjoy sunshine, clear air, and silence" (article 16). "High buildings, set far apart from one another, must free the ground for broad verdant areas" (article 29).

The CIAM did not envision the ground floor level to be made up of storage spaces, but the notion of raising the dwellings above ground floor level ultimately resulted in this development. At present, the closed character of the ground floor level — as perceived from the public space — is considered unpleasant (Karssenberg, Laven, Glaser, & van’t Hoff, 2016). This criticism already manifested itself in 1961 when Jane Jacobs published “The Death and Life of Great American Cities” and argued that this can cause an unsafe public space because no “eyes on the street” are present (Jacobs, 1992).

The experts indicated that this part of the façade is architecturally "independent" from the upper floors and argued that transforming the ground floor does not
necessarily affect the integrity of the architecture if it is conducted in a modest way. One of the experts argues that this notion can be considered of great future value for the Western Garden Cities because the entire ground floor of the area can offer flexibility of functions and be adapted to current and future needs.

4.2.4. Overall results of negative significance

In addition to the three negatively valued attributes, other attributes were often assigned negative significance (see Fig. 16). On the scale level of the area, the surrounding ensembles have been sometimes demolished and replaced by new construction. This situation is seen as a negative effect to the case study at hand. In certain cases, experts even use this situation as an argument to “give up,” thereby indicating that no argument exists for the fighting for an ensemble to be restored because its context had been destroyed. On the scale level of the ensemble, the semi-public green spaces were often simultaneously assigned negative significance even though they are one of the most highly valued attributes. This condition was mostly related to poor maintenance or loss of greenery that was once there or to the placing of fences in the greenery to guard off private gardens. The green spaces were designed to be semi-public communal gardens. Although the ground floor apartments were allotted a small “private garden,” these were supposed to be part of the larger green spaces, gradually submerged in the semi-public greenery. At present, two types of fencing have been placed: either fencing around the privately owned gardens on the ground floor or fencing around the entirety of the green spaces, guarding them from public access, or both. All types of fencing are assigned negative significance. On the scale level of the building, the closed character of certain side façades was assigned negative significance in addition to the external insulation considered a negative type of external wall cladding intervention. Moreover, other building elements were assigned negative significance in addition to the negative significance designated in relation to the replacement of the window frames. The building entrances were assigned negative significance because they are small and cramped. This situation is another instance where negative significance is unassigned to an attribute that has been changed over time but to the original design of the attribute. In addition, the doors of the entrances and those of storages and garages are assigned negative significance. In relation to the elements, certain additions (e.g., canopies and stoops) and changes regarding paint (e.g., balconies and eaves) are considered to have negatively affected the significance.

As one of the final questions of the interviews, the experts were asked about that thing that they regarded as the most negative attribute when considering the heritage significance of the combined case studies. Most experts repeated the three most negatively valued elements and mentioned the building entrances. Although the building entrances may not have been assigned negative significance as often as the three other attributes, they are mentioned as one of the “main problems.”

4.3. Representativeness

All experts indicated that the 10 selected case studies are a good representation of the diversity of post-war point-access blocks in the Western Garden Cities of Amsterdam. Two experts pointed out that they appreciate the inclusion of “average” case studies because their significance is less studied or recognized although the entire area basically consists of these types of buildings. One expert indicated that although he thinks it is a good selection, he would like to add a specific case study to it, which was excluded from the selection because it was scheduled to be demolished.
Such work was ultimately delayed, and no final decisions have been made to date on whether it will be demolished.

4.4. Selection of case study for future research

The experts were asked to indicate the case study that they think should be included in the follow-up research of integrating heritage impact evaluations in a sustainable refurbishment design process. Three out of the four experts indicate that they will be most interested in a “typical” case study that will be representative of the “issues” that these buildings face and the “austere” architecture of the time period. For example, the experts suggest case studies 5 (2 × ), 7 (3 × ), and 8 (2 × ). The fourth expert expresses interest in finding a solution for a specific type of construction system (the Airey system). This notion indicates that a good solution for making these buildings sustainable is yet to be found.

5. Conclusion

The results of the attribute significance assessment reveal the highly and negatively valued attributes of post-war point-access slab blocks in the Western Garden Cities of Amsterdam. Although this work reveals the attributes on which a strong consensus was achieved, such was not the case for all case studies and attributes. Such notions are further elaborated in an additional publication (see Havinga et al., n.d.-a). The highly valued attributes are mostly on the higher scale levels (parcellation, green spaces, and rhythm of the façade). The negative valued attributes are mostly on the lower scale levels (window frames and profiles, external insulation on the side façade, and building entrances). This idea can be possibly explained by the higher scale level that has received heritage significance recognition for quite some time, but this has not been the case for the lower scale levels. Accordingly, thoughtless change has led previous interventions to have negatively impacted the heritage significance on the lower scale levels. The experts indicate that this type of significance is delicate and lies in the detailing of the architecture. For example, the negative effect of the original window frames being replaced, elements painted, and external insulation added on the side façade exhibit a strong consensus. In line with this narrative, the focus of assigning high significance is not necessarily on the “delicate details” that remain but rather on the higher scale levels. This situation may be due to the important details already lost or to such details yet to be consistently recognized.

The loss of significance due to thoughtless change and interventions is in line with the literature that was reviewed as part of this research. The post-war and modernist building stock is faced with upcoming transformations because the EU is developing large-scale refurbishment strategies to achieve a carbon-neutral built environment by 2050. Although officially protected buildings may be adequately protected and their heritage significance sufficiently studied and understood, this is clearly not yet the case for post-war and modernist housing estates. The results presented in this research are a first step in understanding and recognizing the attributes that need...
to be considered for preservation in sustainable refurbishments. Substantial work, with the involvement of other stakeholders and experts and consideration of a wide range of locations and case studies, needs to be conducted. If a methodical, structured, and explicit approach is adopted, then opportunities for synthesizing the outcomes could arise. Heritage significance considerations are only part of a wide range of considerations that go into the decision-making regarding the development of assets. Development decisions are always a complex balancing act of interdisciplinary requirements and objectives. However, substantial research in this area is indispensable to integrate heritage significance in such considerations.

Acknowledgements

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jfoar.2019.04.002

References


Twenty six new properties added to World Heritage List at Doha meeting, 2014, June 25. UNESCO World Heritage Centre, (Website News).


World Heritage Committee Inscribes 61 New Sites on World Heritage List, 2000, November 30. UNESCO World Heritage Centre (Website News).


