

"Preserving Maritime Heritage: Analyzing the Spatial and Cultural Significance of Shipyards in the Waterdriehoek"

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Keywords

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Abstract

This research investigated the structural and operational attributes of shipyards within the Waterdriehoek, emphasizing their historical, socio-cultural and economic significance as maritime heritage. As key maritime elements face increasing threats from urbanization, insufficient protection and limited financial support, this endangers both tangible attributes and the cultural identity of the region. Using the Neptune Marine Repair Wharf in Hardinxveld-Giessendam—formerly Shipyard ‘De Merwede’—as a case study, the study explored how historical events and technological advancements have shaped the design, layout and operational capabilities of shipyards.

Applying a value-based framework introduced by Havinga et al. (2020), this research identified interconnected values across multiple scales. At the area scale, environmental integration and regional impact highlighted the shipyard’s economic and historical importance. At the ensemble scale, the spatial relationships between structures, such as slipways, workshops, and rail networks, emphasized operational efficiency and social cohesion. At the building scale, the distinctive architecture and adaptive reuse of individual structures preserved both industrial functionality and aesthetic legacy.

By addressing the challenges of undervalued and unprotected maritime heritage, this study underscored the role of shipyards in fostering community identity, driving industrial innovation, and shaping regional landscapes. The findings aimed to raise awareness and inform strategies for preserving shipyards as vital cultural assets, ensuring their continuity for future generations.

Introduction

The Netherlands has been a maritime transport nation for centuries. Hosting significant rivers like the Maas, Merwede and Noord, it is known that South Holland has continuously served the largest maritime escort via inland waterways and is connected worldwide via sea. This rich maritime tradition and long history of naval innovation is still strongly present within the landscape and divers structures along the riversides, influencing the identity of the area. A study insinuated by the province of South Holland, called the Erfgoedlijnen, was initiated as a tool to make this maritime heritage more tangible. With this they showcase the historical architectural elements and structures, and their contribution to the distinctive identity of the areas along the rivers starting at De Hoek van Holland towards the Waterdriehoek (Arcadis, 2019).



Active Shipyards within the Waterdriehoek - personal work, 2024

Looking back at the historical developments in the late 19th century, the industrialization of the maritime industry marked a significant shift in the Netherlands. Around the year 1900, there was a significant expansion leading to the establishment of an industrial complex around shipbuilding, dredging and metalworking industries in the Merwedezone (Kramer, 2008). This period of industrialization contrasted with the traditional craftsmanship of shipbuilding and industries that had developed since the late middle ages. Shipyards transitioned from building wooden sail vessels to iron steamships (Alblasserdam & Van Homoet, 2019). Furthermore industrial developments contributed to the expansion of shipbuilding, which gained international recognition for building new ships and conducting repair work. Shipbuilding became the primary source of livelihood for the growing population, with approximately 90 shipyards operating in the area by the early 20th century, making the Netherlands the fourth-largest shipbuilding country globally (Arcadis, 2019).

The Waterdriehoek is an area filled with various typologies that resonate with historical developments. As well as on land as on water these types project the maritime industry and create an identity of the maritime landscape. The TUDelft Landscape course projects the definition of heritage landscape as: “*Landscapes that are defined by certain influences of human use and meaning in time*” (Verschuure, 2024). This can be portrayed as the different typologies along the water side, but also the associated stories, traditions and crafts present within the maritime ensembles.

Problem statement

After the second World War, economic growth resumed in the Merwedezone from 1948 onwards, with shipbuilding, machinery and construction industries dominating along the North. Nevertheless the economic crisis in the 70's and the continuous increase in scale around the 90's affected inland shipping and marked the decline of large-scale industrial activities. Small scale industry found itself unable to accommodate the construction and repair needs of large and heavy vessels (Ned Vereniging Binnenhavens, 2014a). These developments led to shipyards merging together and relocating away from the city centres. Furthermore, many elements like, cranes, man-made docks, railway tracks and shipyard halls started to disappear (Arcadis, 2019). With the increase of urbanization in the area, the risk of disappearance of these important elements along the riverside also increased. Arcadis (2019) shows an inventory of all relevant and valuable maritime heritage assets along the erfgoedlijn, it shows that shipyards do not have any protected status. Van Lier (2023) also states that stories of maritime heritage are largely unknown and maritime heritage lack legal protection and financial support. The central issue concerns preservation of the entire ecosystem of maritime heritage and keeping it relevant. Heritage that remains unused loses its significance and function (Alzer, 2021). The lack of protection could lead to the disappearance of many shipyards along the Waterdriehoek, thus risking losing key-elements and an identity to its surroundings.

To address this challenge, a fresh approach to assessing the value of shipyards is of essence. This research explored the intrinsic values they hold and looked at how they can contribute to the preservation of shipyards.

Research questions

How do structural and operational attributes contribute to the functionality of shipyards in the Waterdriehoek, and what is their value as potential maritime heritage?

- How have historical events or technological advancements driven changes in the structural design, layout and operational capabilities of the shipyards?
- How can these structural and operational attributes be valued as Maritime Heritage?

Research aim

The application of valuation concepts, specifically for shipyards, have not yet been integrated in the Waterdriehoek area. This study aimed to look into historical narratives of intangible values that influenced the spatial qualities of an existing shipyard and provide a new input on valuing maritime industrial heritage. The outcomes could support developing a comprehensive policy for the protection of maritime industrial heritage overall, to determine the long-term social and cultural benefits of sustainable conservation and to support decision-making by fellow architects and related stakeholders.

Methodology

This study mainly focused on defining the relation between intangible values with spatial elements of shipyards that could provide a basis for managing maritime industrial heritage. Da Silva & Roders (2012), emphasize the importance of separating values and attributes to better understand their relation. “The relation between attributes conveying varied values, as well as, values of similar natures conveyed in varied attributes”. Over the years a discussion arose focussing on not solely the physical fabric, but also the significance conveyed by the heritage properties. Havinga et al., (2020) introduced a value-based framework where the physical fabric, distinct through attributes or features of a site, indicates the ‘what’. These attributes then represent the cultural values, indicating ‘why’. Freheim and Khalaf expand on this topic by defining three stages of significance assessment, including first identification of the heritage, then looking at the reason of value and finally where the value is applied. Building upon this foundation, this research incorporated an assessment across four scales to define both tangible and intangible attributes of significance. These scales were: (1) area scale, which examined the district within a broader urban context; (2) ensemble scale, focused on groups of buildings or specific urban configurations; (3) building scale, assessed entire structures; and (4) building elements, analysed individual parts of buildings.

Since the late 20th century, studies started to shift their attention more towards intangible heritage, looking from a traditional focus on only tangible attributes, to a current focus of value-based approach including intangible values. The goal of such assessment is to identify and evaluate the attributes that make a place meaningful to individuals and society. This approach acknowledges that heritage value is inherently linked to the diverse perspectives of those who engage with it, leading to interpretive variations across different contexts. Therefore, heritage embodies a multiplicity of values, reflecting its layered and multifaceted nature (Da Silva & Roders, 2012).

For this research one shipyard located within the Waterdriehoek was assessed. First, showing three examples of a comprehensive analysis of the socio-economical changes through time. Giving insight on the evolution of the ongoing developments, that which *is* and also that which *was*, revealing lost elements, forms and spatial relationships (Clarke et al., 2019). Second, the value-assessment, which was divided into three scales (presenting scale 1, 2, 3, due to limitations in data and documentation, this study excluded 4) showed a list of heritage attributes, followed by a description of the values. This provided a more realistic outcome of what attributes should be protected and more specifically what aspect of the attribute should be preserved in future (re-)design projects.

Theoretical Framework

Heritage is often understood through its connection to significance, a term closely aligned with value. Significance in this context refers to the cultural or heritage importance of a site, encompassing both tangible and intangible attributes. As Armitage and Irons (2013) observe, significance is synonymous with value, representing attributes that establish a sense of belonging, identity, or connection within communities. This multifaceted concept demands careful evaluation to determine how built heritage contributes to cultural, historical, architectural, social, and even ecological contexts. Such assessments transcend the physical attributes of heritage, delving into its symbolic, emotional, and intangible dimensions.

Although nationally listed monuments represent key elements of a regions identity, they are only one aspect of a broader cultural heritage. Similar to this are UNESCO World Heritage Sites, which often dominate discussions of heritage due to their outstanding universal value, thus not all heritage assets achieve monumental status. Yet, these lesser-recognized assets may still hold significant value in terms of cultural identity and social memory. The 1972 UNESCO Convention promotes the aim to preserve for future generations and foster mutual understanding among culture (UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION, 1972). Building on this principle, heritage management has increasingly shifted towards a more inclusive approach, acknowledging the importance of intangible dimensions, setting, context and urban sustainable developments. This evolving perspective emphasizes the social and economic functions of historic cities, as well as the broader integration of urban development with heritage management (Veldpaus et al., 2013). The most recent leading document on heritage management, The Historic Urban Landscape (HUL) approach broadens the framework of heritage management to include topography, geomorphology, and hydrology, as well as the built environment and its social, cultural and economic dimensions. This comprehensive view integrates historic and contemporary elements, emphasizing diversity and identity within heritage (UNESCO, 2011).

The relationship between heritage and identity further enriches this discussion. Smith (2006) highlights how heritage provides meaning to human existence by conveying timeless values that shape cultural and social identities. This interpretation broadens the definition of heritage to encompass not only tangible monuments but also social, ethnic, and cultural dimensions. The interplay between daily life, socio-cultural practices, and built environments becomes central to understanding how communities engage with their heritage. This perspective aligns with Rasouli et al. (2019), who argue that heritage is both shaped by monumental events or structures and also by the day-to-day lives and socio-cultural interactions of the communities that engage with it. “architecture is influenced by socio-cultural factors such as daily lifestyles, social interactions, rituals, and values.” (Rasouli et al., 2019).

As governments aim to preserve building stock, non-designated properties—those without formal heritage recognition—are at risk of losing historical significance through modification or demolition. The attribute significance assessment method seeks to address this by shifting focus from the tangible features of a site to the values those features convey. This broader approach aligns with the movement from object-based conservation toward a more holistic, landscape-based understanding of heritage.

Industrial maritime heritage represents a particularly vulnerable category of heritage, often overlooked due to its complexity, sheer scale, or negative perceptions associated with former

industrial processes (Van Lier, 2023). Despite these challenges, industrial heritage embodies both tangible elements—such as engineering, architecture, and town planning—and intangible dimensions, including the skills, memories and social life of the workers and communities associated with these sites. The structures of the Werkspoorhallen, for instance, exemplify this synthesis. Reflecting the industrial optimism of their era, these structures embody the technological ambition and societal ideals of the industrial revolution in the Netherlands.

"De hallen zijn het directe resultaat van de stormachtige ontwikkeling van werkspoor; van een kleine reparatiewerkplaats voor stoommachines tot een wereldwijd opererend technisch bedrijf. De grote cultuurhistorische waarde van de hallen wordt bepaald door de ontwikkeling van het bedrijf Werkspoor: een van de belangrijkste representanten van de metaalverwerkende industrie in de industriële revolutie in Nederland. Het is de weerspiegeling van deze ondernemingszin en technische bravoure die heeft geleid tot de ontwikkeling van het bedrijf Werkspoor en de gebouwen op Oostenburg" (Koopman et al., 2015, pg. 87).

Their material and immaterial qualities demonstrate how heritage resonates with cultural values and historical narratives, connecting past innovations to future possibilities.

This integration of tangible and intangible dimensions also underscores the importance of industrial heritage within broader cultural frameworks. Organizations such as TICCIH and ICOMOS have emphasized the need to protect industrial sites, framing them as reflections of the interconnectedness of cultural and natural environments. According to the 17th ICOMOS General Assembly (2011), industrial heritage captures the profound link between industrial processes and their surrounding landscapes. Similarly, S. Smith (2006) argues that heritage is fundamentally about the values and meanings it conveys, suggesting that all heritage is, at its core, intangible. This interplay between the tangible and intangible is not static. As Hajirsouli et al. (2019) point out, the craftsmanship required for constructing larger ships illustrates how tangible architecture reflects intangible socio-cultural patterns. Changes in these patterns inevitably alter architecture, highlighting the dynamic nature of heritage. By recognizing these shifts, heritage management can more effectively preserve the essence of places, ensuring that their historical, cultural, and emotional significance endures for future generations.

Research

Anchored change:

The role of historical development and technological advancement in shaping shipyards

“It is suggested that in order to gain a deeper understanding of any architecture, one needs to understand the sociocultural factors of the community that created it and used it.” (Reza Askarizad, 2019)

The selected case study is the Neptune-Marine Repair Wharf, located at Rivierdijk 509 in Hardinxveld-Giesendam. This shipyard, previously known as ‘De Merwede’, currently remains an active participant in the maritime industry within the Waterdriehoek region, embodying significant socio-cultural and economic developments over time.

The study of this site looked into the historical events regarding changes in the physicality and operations of the shipyard. These transformations were explored through three key examples: The origin of the shipyard, its succession and the take-over. These narratives were constructed using both archival materials located at the Archives of Dordrecht and supplementary sources from online archives.

Shipyard ‘De Merwede’ in Hardinxveld-Giesendam

Water has always been central to the lives of Hardinxveld-Giesendam's inhabitants. They were engaged not only in maintaining rivers and dikes but also in using waterworks for agricultural purposes and fishing. A painting depicting Pieter de Roovere, the lord of Hardinxveld, offers a glimpse into the past, showing small wooden boats with sails and livestock grazing along the riverside. While boat and sail-making may not have been prominent in the area, these activities shaped the daily lives of the local community.

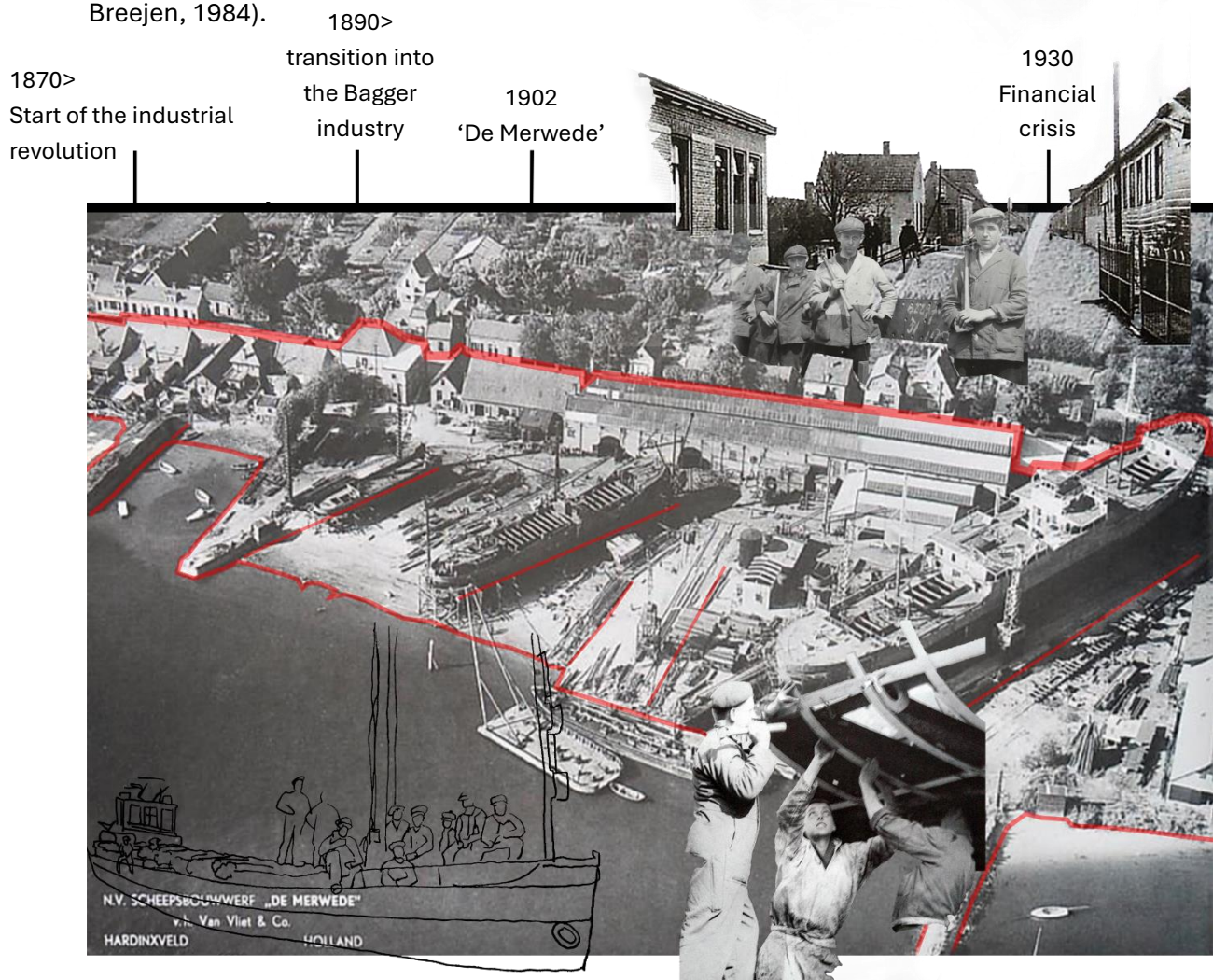


(Pieter de Roovere 1602 – 1652, painted by A. Cuyp - Mauritshuis)



The origin of shipyard Merwede

In 1902, Mr. Van Vliet founded the first large shipyard in Hardinxveld, strategically located along the Merwede River. Partnering with investor Langeveld, a well-known hoop-maker, they established the Langeveld & Van Vliet shipyard (Den Breejen, 1984). The shipyard, oriented towards the river and featured multiple attributes to accompany the craft of shipbuilding. The timeline underneath shows the first workshop, next to the owners residency, constructed from wood and running parallel to the dike providing privacy for workers and nearby residents. Initially, the shipyard produced wooden rowing boats, but soon it expanded to more modern vessels, like steel steamships. This resulted in slipways, oriented side-ways towards the water, expanding over the years for launching various bigger ships into the water. Many locals shifted from agricultural and hoop-making jobs to shipbuilding, marking the shipyard quickly as an important part of the community, providing jobs for 109 workers and garnering technical recognition (Den Breejen, 1984).



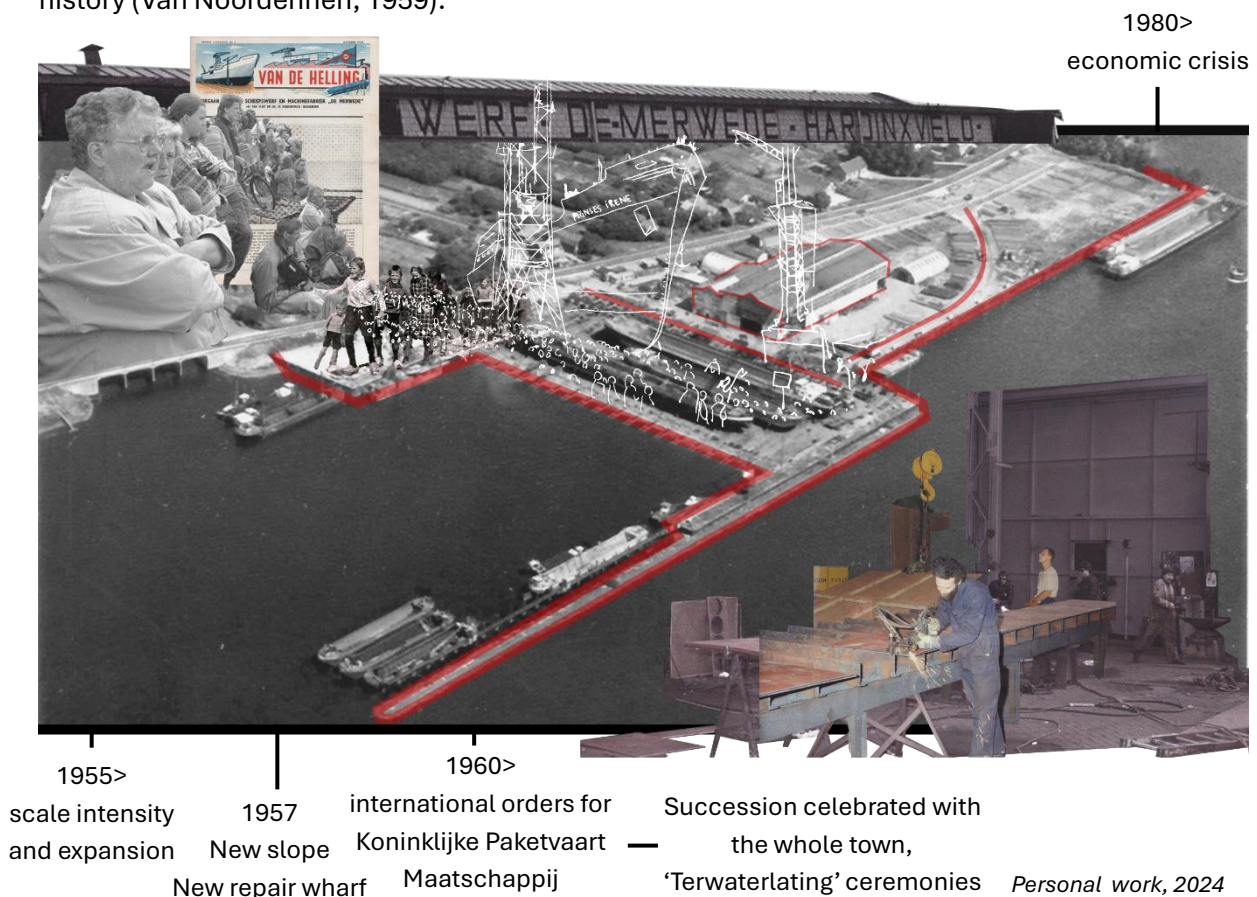


(Van Noordennen, 2009)

The prosperity of maritime industry in de Waterdriehoek

With the company's exponential growth, a new shipyard was constructed across the river in 1957, dedicated to maintaining and repairing ships (Den Breejen, 1984). This shipyard featured a large slipway, office buildings, storage units and a new welding hall further expanding the company's capabilities. The steel-framed hall was created first, aligning the orientation with the Merwede river. The hall, finished with a brick facade, consisted of three volumes and offered a multitude of natural light inside. The new slipway orientated itself towards the original shipyard and hosted ceremonies accompanied by the whole town. These celebrations fostered community bonds through the tradition of the "Terwaterlating" (launching) ceremonies, a celebrated event that brought together the entire town to witness the launching of new ships. Distinguished guests, including royalty, were often invited to christen the vessels, accompanied by performances from the shipyard's choir (Van Noordennen, 1959).

One notable achievement of the Merwede shipyard was the construction of the entire fleet for the Oranjelijn, a shipping line operating between Rotterdam and the Great Lakes of Canada. The fleet included motor ships weighing over 7,000 tons, with Queen Juliana herself performing the naming ceremony for the company's flagship, *Zeeland*, in 1959—a highlight in the shipyard's history (Van Noordennen, 1959).





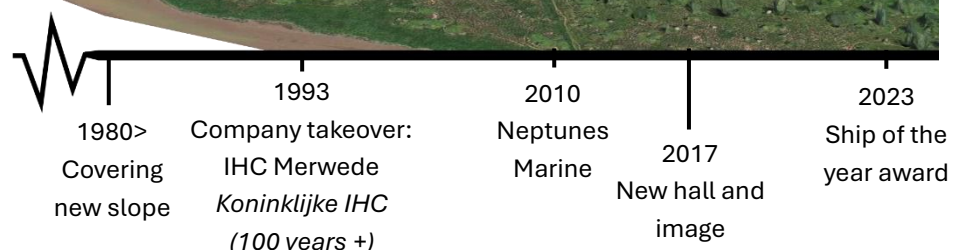
(Personal work, 2024)

New ownership

In 1993, the shipyard merged with IHC, forming IHC Merwede. This integration with Merwede bringing its expertise in offshore supply vessels, cruise ships, ferries, and naval ships, while IHC contributed its product-focused approach. Despite financial difficulties in the 1990s, the shipyard was revitalized and modernized under new ownership, with additional workspace and compliance with environmental regulations (Korteweg, 2014).

Today, under the ownership of Neptune, the shipyard remains an active part of the Waterdriehoek region, continuing its rich tradition of shipbuilding, maintenance, and repair. In 2023, Neptune achieved a major success by winning the prestigious Ship of the Year Award for the innovative RoRo vessel *Canopée*, a hybrid ship combining diesel propulsion and wind assistance, aiming to reduce fuel consumption and CO2 emissions by 30% (Prevljak & Prevjak, 2023).

This also indicated that the repair wharf no longer stands in connection with the original company. The existing structures have been minimized on the wharf and initially conserved by transforming the façade for the upcoming requirements regarding sustainability and management. Next to the existing workhall, a new and bigger workhall had been constructed to accommodate the current market. The new hall is connected to the existing structure and where company 'Merwede' used to showcase it's name, now the shipyard presents a uniform image resembling the Neptune company, showcasing a modern identity of maritime industry.



How have historical events or technological advancements driven changes in the structural design, layout and operational capabilities of the shipyards?

The evolution of Shipyard 'De Merwede' offered a vivid case study in how historical events and technological advancements drive transformations in a shipyard's design layout, and operational capabilities. Throughout its history the shipyard has adapted to changes in industrial demands, ownership, and environmental policies, each phase of which reshaped its structural identity and functional scope.

In its early days the shipyard's design responded to local needs and resources, reflecting an integration of shipbuilding within a community framework. The expansion phase of the 1950's and '60's introduced steel-framed structures and slipways, illustrating a shift towards larger, more efficient operations while maintaining ties with the community through public launch ceremonies. This period captured the mid-20th-century trend towards durable, large-scale industrial architecture that could support complex shipbuilding tasks.

Later, ownership transition and increased environmental awareness brought further modernization, expanding the shipyard's capabilities to meet new technical standards and respond to global shifts towards sustainable practices. The construction of a larger work hall and the adoption of hybrid propulsion systems for vessels like the Canopée exemplified this adaptation, underscoring the influence of environmental regulations and technological advancements on shipyard design and operations.

The case of Shipyard 'De Merwede' demonstrated that the design, layout, and operation of shipyards are not static, but rather dynamic elements that adapt in response to changing economic pressures, technological capabilities, and societal values. This interplay reflected a broader pattern across maritime heritage, where each evolution in shipyard design serves as both a response to immediate industry needs and a reflection of larger, enduring shifts in community identity and industrial priorities.

Attributes and values in Maritime Heritage: A framework for understanding shipyard significance

The identification of ‘what’ the heritage in question is, gives a good impression and base to redirect the question towards ‘why’ the heritage is valuable and eventually how valuable it is. Within this chapter we continued working with our case study to comprehend what values can be corresponding with both tangible and intangible attributes on a shipyard. The appendix shows a complete overview of the value-assessment with included descriptions.



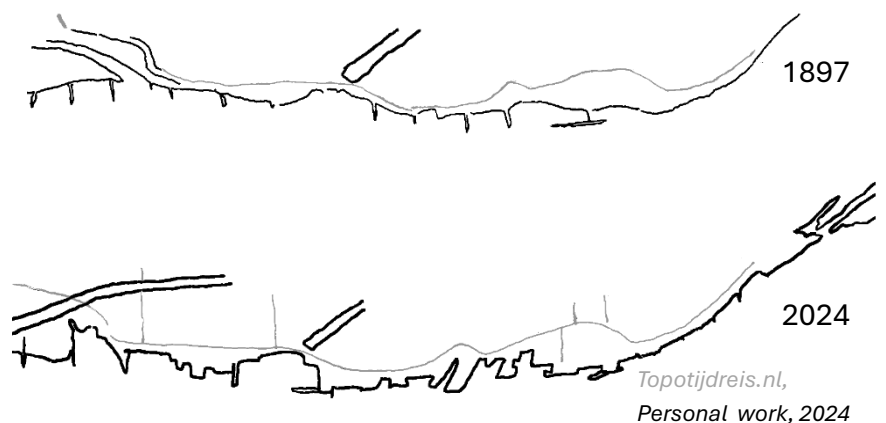
Value assessments – Area

"The area scale considers the shipyard within its broader geographical and environmental context, emphasizing its connection to local waterways, landscapes, and the surrounding community. This perspective highlights how the shipyard's location, spatial layout, and environmental integration contribute to its value as a site of regional and maritime heritage.

(Van Noordennen, 1960)

| | | | |
|--------------------------|------------|-----------------------------|---|
| 1.1 Shipyard de Merwede | Tangible | Industrial maritime company | Historical value |
| | | Heritage and identity | Social, historical value |
| | Intangible | Workforce | Economic value |
| | | Community impact | Social, historical value |
| 1.2 River Merwede | Tangible | Transportational access | Economical, ecological value |
| | | Man-made landscape | Economical, historical value |
| | Intangible | Heritage and identity | Social, historical value |
| | | Connection | Economical, ecological |
| 1.3 Spatial organization | Tangible | Industrial area | Economical value |
| | | Accessibility | Social, historical value |
| 1.4 Greenery | Tangible | Diversity | Aesthetical, economical, ecological value |
| | | Biodiversity | Ecological value |
| | Intangible | Tranquillity | Social value |

Example: 1.2.T.II. Man-made landscape made to prevent flood risks and facilitate maritime industrial activity. This position is places strategically for transporting goods and eventually people, this creates an economic value for the broader context. Also the landscape was drastically formed by the industry.





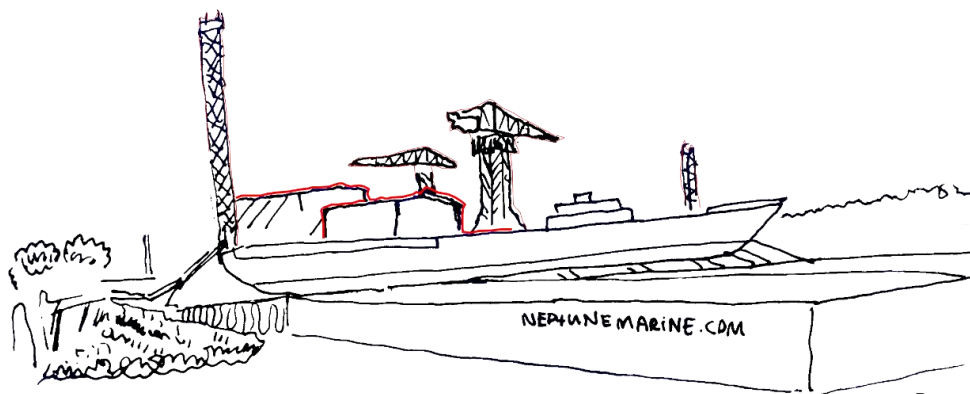
Value assessments – Ensemble

The ensemble scale examines groups of structures within the shipyard, focusing on the collective significance of workshops, slipways, offices and other interconnected spaces. By assessing these elements as a cohesive unit, we reveal how their combined function and spatial relationships contribute to the shipyard's historical and operational heritage value.

(Van Noordennen, 2005)

| | | | |
|---------------------------|------------|------------------------|---|
| 2.1 Slope | Tangible | Accessibility | Economical, social, scientific, aesthetical value |
| | | Angle | Scientific, aesthetic, historical value |
| | | Dimensions | Scientific, historical value |
| | | Material | Economic, aesthetic value |
| | Intangible | Operational efficiency | Economic, scientific value |
| | | Functional utility | Economic, age, historical value |
| | | Spectators engagement | Social, historical value |
| | | Tradition | Social, scientific value |
| | | | |
| 2.2 Rails along the river | Tangible | Accessibility | Economic, scientific, social, aesthetic value |
| | | Material | Economic, aesthetical value |
| | | Connection | Economic, social, aesthetical, historical value |
| | Intangible | Operational efficiency | Economic, scientific value |
| | | Flexibility | Economic value |
| | | Adaptability | Age, economic, scientific value |
| 2.3 Romneyloods | Tangible | Functionality | Economic value |
| | | Spatial arrangement | Aesthetical, economic value |
| | Intangible | Flexibility | Economic value |
| | | Operational efficiency | Economic value, social value |
| 2.4 New Hall | Tangible | Material | Economic, sustainability value |
| | | Accessibility | Economical, aesthetical value |

| | | | |
|------------------|------------|----------------------------------|---------------------------------------|
| | Intangible | Dimensions | Economical value |
| | | Success rate | Social, historical value |
| | | Operational efficiency | Economical, social value |
| | | Identity of the shipyard | Social value |
| | | Privacy | Social, scientific, economical value |
| 2.5 Wharf | Tangible | Orientation | Historical, economic value |
| | | Relation structures and facility | Economic, social, historical value |
| | Intangible | Workforce management | Social value |
| 2.6 Welding Hall | Tangible | Community | Social value |
| | | Material | Aesthetical, historical value |
| | Intangible | Accessibility | Economical, social value |
| | | Dimensions | Economical, historical value |
| | | Operational efficiency | Economical, social value |
| | | Orientation | Historical economical value |
| | | Work | Economical, social value |
| | | Identity | Historical, aesthetical, social value |
| | | Flexibility | Economical, social value |



Personal work, 2024

Example: 2.5.I.II. The shipyard shows a high social value as the new wharf represented an addition to the existing community of 'De Merwede' company. The repair wharf provided new jobs and allowed many open celebrations with the local residents. The launch of new vessels was celebrated along the crane tracks by workers together with proud locals cheering on. The space along all structures created an efficient and tight work community. Now the shipyard continues to pose the same. The structures, like the cranes, existing and new hall and slope, continue providing a workspace for many people that proudly are part of the maritime industry along the Merwede river.

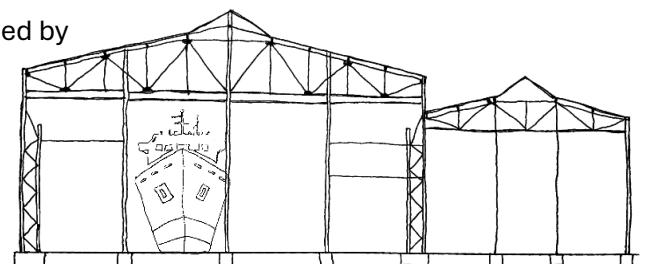


Value assessments – Building

The building scale considers individual structures within the shipyard, such as main workshops, warehouses, and offices, assessing their architectural design, historical usage, and construction techniques. This scale highlights the value of each building as a distinct contributor to the shipyard's overall heritage, showcasing its role in maritime industry evolution.

| | | | |
|----------------|------------|-------------------------|---------------------------------------|
| 3.1 Facade | Tangible | Material | Aesthetical, historical value |
| | | Volume | Social, aesthetical value |
| | | Windows | Economic, aesthetical value |
| | | Openings | Economical, social value |
| | | Layout | Aesthetical value |
| | Intangible | Identity | Social, aesthetical, historical value |
| 3.2 Roof | Tangible | Cultural and historical | Historical value |
| | | Shape | Aesthetical, historical value |
| 3.3 Structure | Intangible | Identity | Aesthetical value |
| | | Material | Aesthetical, historical value |
| | Tangible | Functional capacity | Economic, social value |
| | | Visibility | Aesthetical value |
| | | Adaptability | Social, economical value |
| | | Identity | Aesthetical, historical value |
| 3.4 Space plan | Tangible | Dimensions | Economic value |
| | | Accessibility | Economic, social value |
| | | Layout | Economic, social value |
| | | Flexibility | Social, historical value |
| | Intangible | | |

example: 3.3.T.III. Within the shipyard's open hall, framed by grant steel portals, workers can work easily on vessels of all sizes. This allows for future demands, but this functional capacity also fosters visibility and a connection within the workspace. Creating a real social work environment.



How can these structural and operational attributes be valued as Maritime Heritage?

The comprehensive analysis across the various scales revealed the shipyard as a complex site where tangible and intangible attributes converge to form a distinctive maritime heritage. Each scale of assessment brought forwards unique aspects of value.

At the area scale, the shipyard's geographical and environmental integration connected it to the broader maritime landscape, highlighting its economic relevance and ecological impact. Here, the shipyard functioned not only as an industrial site, but as a vital part of the regional identity, reflecting both the utility and heritage of the area.

The ensemble scale revealed the strength of relationships among structures, such as slipways, workshops and both rails along the river, that together form the operational strength of the shipyard. These interdependent spaces foster an environment of collaboration, enhancing both social and economic value as they support the day-to-day activities of maritime work. This interconnectedness within the ensemble added a communal dimension, where tradition and innovation meets, sustaining the social heritage of the shipyard's workforce and surrounding community.

On the building scale, individual structures showcased the architectural craftsmanship and construction techniques that define the shipyard's historical and functional heritage. The details of facades, roofs, and structural layouts embody both the enduring industrial character and the aesthetic legacy of the site. Together, these elements preserved the visual identity of the shipyard, reinforcing its role as a symbol of maritime industry evolution.

Together, these layers revealed the multidimensional value of the shipyard, especially in its economic, social, and historical contributions, these values emerged as particular prominent, underscoring the shipyard's continued relevance to both its industry and community. The site's ability to foster visibility, operational efficiency, and social engagement reflects an environment that is not just functional but deeply communal, where workers, locals and visitors connect within a shared heritage space.

Conclusion

How do structural and operational attributes contribute to the functionality of shipyards in the Waterdriehoek, and what is their value as potential maritime heritage?

The structural and operational attributes of shipyards in the Waterdriehoek, exemplified by Shipyard 'Neptune Repair,' were integral to their functionality and enduring value as maritime heritage. Historical events and technological advancements have driven the continuous evolution of these shipyards, enabling them to adapt to shifting socio-cultural and economic demands. This adaptability was reflected in Shipyard Neptune Repair's, previously known as 'De Merwede', transformation from a small-scale enterprise providing local employment into a larger prosperous maritime industrial company, contributing significantly to the region's industrial identity and resilience within the maritime sector. Despite periods of economic hardship, the shipyard has maintained its relevance and continued to operate within the maritime industry under new names.

The shipyard's value as maritime heritage lied in its integration of both tangible and intangible attributes across various scales. At the area scale, its environmental integration and historical context underscored its regional significance. The ensemble scale emphasizes the interconnectedness of structures and in-between spaces for their collective operational and social function. The building scale showcased functional architecture and adaptability that have sustained the shipyard over time. Together, these elements not only preserved the functional identity of the shipyard but also reinforced its social and historical importance, making it a living testament to the region's maritime legacy.

Discussion

This research highlighted the importance of a flexible and scalable framework for assessing and preserving maritime heritage, particularly in the context of shipyards. Nevertheless, this study's reliance on a single case study—Shipyard 'Neptune Repair'—limits the generalizability of its findings. While the gained insights provided a valuable framework for understanding maritime heritage, further research is needed to explore how different shipyards across various regions embody and negotiate their values. Comparative studies involving multiple sites could reveal patterns and divergences in how maritime heritage is valued and preserved, offering a broader understanding of best practices in heritage management of shipyards.

Moreover, the findings reinforce the idea that value assessments in heritage are not static but inherently contextual and subjective. As noted in the case of Shipyard 'Neptune Repair' and other heritage sites, the concept of value depends heavily on how various stakeholders interact with and interpret the site. This aligns with broader heritage discourse, where scholars argue that attributes of "authenticity" and "value" are fluid, shaped by cultural, disciplinary, and individual perspectives (Veldpaus et al., 2013). Engaging in interdisciplinary research that includes perspectives from urban planners, architects, historians, and community stakeholders would enrich the discourse on heritage value.

The fluidity of heritage values raises important questions about the long-term sustainability of these attributes. What happens when the physical or intangible elements that embody value are altered, removed, or reinterpreted? Will the original values perish, or will new ones emerge? This dynamic nature of heritage suggests that value is not only tied to preservation, but also to the continuous negotiation of meaning. As highlighted by Havinga et al. (2020), heritage management must account for both positive and negative significances, recognizing that some attributes may detract from the perceived value of a site while others enhance it.

The adaptive reuse of maritime heritage spaces presents both opportunities and challenges. On the one hand, it can revitalize sites, making them relevant to contemporary needs while retaining their historical essence. On the other hand, it requires careful consideration of how changes impact the identity and meaning of the space. Balancing preservation with innovation is critical to ensuring that heritage sites remain dynamic and meaningful to future generations.

In conclusion, this discussion emphasized the need for a nuanced and inclusive approach to maritime heritage management—one that recognizes the fluidity of value and actively involves stakeholders in shaping the future of heritage sites. By doing so, it is possible to foster a deeper respect for maritime spaces and ensure their relevance in an evolving cultural and economic landscape.

Appendix

The following chart shows next to descriptions also the reasoning behind the multifaceted values.

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| 1.1 Shipyard de Merwede | Tangible | <i>Industrial maritime company</i> - The company is part of the historical industrial maritime industry in the Waterdriehoek. | Historical value - The company is active since 1902 and located within the heritage line of the Waterdriehoek. (Arcadis, 2019) (Den Breejen, 1984) |
| | | <i>Heritage and identity</i> - The company is known in the area and is part of the industrial activity of Hardinxveld-Giessendam. | Social value - Hardinxveld-Giessendam was known for its agricultural activities, but slowly changed into an active maritime industrial town where people work and live together. |
| | | | Historical value - the industrial developments on this shipyard throughout the years created a significance for the area and becoming part of the history of the town. Shipyard Merwede was one of the first shipyards in town, making it one of the oldest. (Den Breejen, 1984 – pg. 119) |
| | Intangible | <i>Workforce</i> - Throughout the years, the company provided many jobs related with maritime industry. | Economic value – The active workforce resulted in financial success both for the inland waters as for the international waters and survival throughout the years. (Den Breejen, 1984 – pg. 152) |
| | | <i>Community impact</i> - the work done on the yards was shared and celebrated through media, like papers and magazines. (n.v. Scheepswerf en Machinefabriek “de Merwede” v/h van vliet en co. [Van de Helling], 1957) | Social value - Success in the company were shared with people from town, which creates a proud feeling of accomplishments. Shared through traditional ceremonies called: ‘Terwaterlating’. (Van de Helling – jaargang 1, April 1965) |
| 1.2 River Merwede | Tangible | <i>Transportational access</i> - The river has always been a way of transporting goods and people, it is a strategical location to position the company along the Merwede. | Historical value – Several princesses, including Prinses Irene and Beatrix, would come and celebrate the process of ‘tewaterlating’ of vessels and ships. This marked a memorable event in time for the company. (van Noordennen, 1958 – 1960) |
| | | | Economical value - The strategic position was used for import and export of goods and people. (Den Breejen, 1984 – pg. 53) |
| | | | Ecological value – The existing river was extensively used by creating a man-made landscape. (TuDelft – Landscape coarse, 2024) |

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| | | <i>Man-made landscape</i> - The riverside/ the landscape is man-made showing flood protection, but also facilitation of industrial activity. | Economical value – This man-made landscape has a direct impact on the nature surrounding the area dissecting its economic purpose. |
| | | | Historical value – Throughout the whole Waterdriehoek area the riverside has been transformed gradually to accommodate the needs of socio-economic developments |
| | Intangible | <i>Heritage and identity</i> - The Merwede river has influenced local traditions and cultural practises, starting of with the fishing industry, the maritime industry and continuing with connectivity of the Waterdriehoek area. | Social value - The Merwede river influenced the lives of people that were looking for work, first farmers to fishermen to craftsmen to industrial workers. The river always played an important part in these socio-economic developments. |
| | | | Historical value - The Merwede river was part of a bigger rivernetwork and connected towns, which started to grow along dikes and continue developing further into the dry-land. (Den Breejen, 1984 – pg. 53) |
| | | <i>Connection</i> - The Merwede river is the connector in the Waterdriehoek between Rotterdam port, and international waters and between the villages. | Economical value - The river was cheaper to use as transport and continue to develop relations between international waters. (van Noordennen, De Java-China Lijn) (Van de Helling – jaargang 1, November 1957) |
| 1.3 Spatial organization | Tangible | | Ecological value - The river connects and separates. It is a natural element within the harsh, fast-growing industry. |
| | | <i>Industrial area</i> - The village has three distinct industrial zones, that showcases the socio-economical urban developments of the village. | Economical value - The village gradually shifted from heavy agriculture to combined (maritime) industry, proving many locals and outsiders work. |
| | | <i>Accessibility</i> - The area is well connected through Rivierdijk with the rest of Hardinxveld-Giessendam and the Waterdriehoek. Accessible by car, public transport, walking and cycling. Nevertheless still missing a nice public water connection (<i>waterbus</i>). | Social value - the entrance of the shipyard is mostly through the river and one road along the dike. People can take multiple transport to access the site making the workspace quite accessible for a variety of people, living in town and outside of town. |
| | | | Historical value - The town grew its connection between other towns, but also between parts of the town. The dike, Rivierdijk, being the first one. |

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| 1.4 Greenery | Tangible | <i>Diversity -</i> The Biesbosch is selected as natura 2000 protected sites, other than that a lot of agricultural land is still in use for farming. (Rijkswaterstaat en Ministerie van Landbouw, Visserij, voedselzekerheid en Natuur, z.d.) | Ecological value - The site is surrounded by greenery, which creates a contrasting environment. |
| | Intangible | <i>Biodiversity -</i> There is a lot of potential to exceed the biodiversity in the area. For example: bee-diversity, bird species – connected with Biesbosch, and others. | Ecological value – Due to the vast open space surrounding the village, many species are found and add a natural element in the industry (<i>Natuura2000</i> , z.d.) |
| 2.1 Slope | Tangible | <i>Accessibility -</i> The slope can be entered via the water and land | Economical value – The slope’s accessibility has bolstered the shipyard’s operational efficiency and expanded its capacity for construction and repair. |
| | | | Social value – The accessibility of the slope made it possible for people to witness shared traditions like ‘Terwaterlating’ where vessels were guided into the water. |
| | | | Scientific value – Due to changing technological needs, the accessibility is adapted during the enlargement of the slope, using new technology at that time. This provided safekeep for future demands. |
| | | | Use value – The new slope is accessible from the direction of the original shipyard Merwede, crossing the Kanaal van Steenenbroek. This allows for calm waters, making the use of the slope more accessible from the waterfront. |
| | | <i>Dimensions -</i> The slope has the following dimensions 137x40m and has been expanded in 1985. (Archive Dordrecht, 1985) | Economic value – The space serves as a physical testament to industrial evolution, demonstrating how productivity shapes and sustains local and global economy. |
| | | | Historical value – Over the years, the enlargement of dimensions reflects a conscious investment to meet the demand of larger vessels and increased maritime activity. (Archive Dordrecht) |
| | | <i>Material -</i> | Economic value – The cost-efficiency is resembled by the |

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| | | The slope is made out of steel frames. These frames can uphold multiple vessels and are directed towards the water. | extended use of steel, minimizing maintenance and repair costs for decades of operation supporting large-scale projects |
| | | | Aesthetic value – the extended use of steel enhances the visual appeal of shipyards, marking it along the more natural borders across the river. The material reflects functionality. |
| | Intangible | Operational efficiency - The slope provides a transition from land to water and for vessel launching and retrieval using the assistance of gravity. | Use value – This process reduces the needs for complex machinery and manual labour. |
| | | | Economic value – The design exemplifies an intelligent application of physics and engineering principles. |
| | | Functional utility - A slope is a necessity for shipyards to accommodate the workers with a safe and efficient environment to handle launches and repairs | Economic value – The slope facilitates smooth workflows enhancing worker productivity. |
| | | | Age value – As a long-standing feature of shipyards, the slope embodies maritime tradition and innovation. |
| | | | Historical value – The new shipyard was needed for the bigger slope, marking the slope as one of the first features (1951). Next to this the slope is one of the few attributes that was changed showcasing industrial heritage due to industrial adaptability over time. (van Noordennen, 1950) |
| | | Spectators engagement - The slope's design and surrounding space create opportunities for guests and visitors to witness the process of launching vessels. | Social value - inviting the village to celebrate together this prosperous event fosters a sense of community and pride in local maritime traditions |
| | | | Historical value – the event is visually captivating. The slope's setting and orientation creates an experience for spectators to connect with the craftsmanship and effort involved in shipbuilding. These events mark historical milestones and tradition over the years reflecting the significance of shipbuilding to maritime communities. This commemorates its contribution to industrial and naval history. (Joop Terpstra, 2021) |
| | | Tradition - | Social value – The launch is a moment of celebration, bringing |

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| | | The launch of a vessel is a big celebration for the shipyard and visitors. –‘Tewaterlatings’ process | together workers, families and collective effort. The sense of belonging and pride, keeps the shipyard’s cultural heritage alive in these traditions. (Van de Helling, April 1957) |
| | | | Scientific value - The launch process is also a demonstration of scientific precision. Every vessel launch involves meticulous calculations to ensure safety and success, showcasing the applied knowledge of hydrodynamics, material sciences, and structural engineering. Observing and understanding this process offers valuable insights into the interplay of science and tradition. |
| 2.2 Rails along the river | Tangible | <i>Accessibility</i> - The rails are easy to access on land and water, due to the position along the riverside | Economic value - The position along the riverside ensures efficient logistics, enabling smooth movement of goods and vessels, reducing time and costs. |
| | | | Aesthetical value – The rails are positioned along the riverside, creating a long axis from one end of the wharf towards the other. |
| | | <i>Material</i> - The rails have a steel frame to accommodate a moving crane | Economic value - Steel frames accommodate a moving crane, offering durability and reducing maintenance costs. |
| | | | Aesthetical value – industrial appearance |
| | | <i>Connection</i> - The rails connects one end of the shipyard with the other. This is due to the direction and alignment with the halls. This has been changed over the years. (Archive Dordrecht, 1985) | Economic value - The alignment of the rails improves workflow, reducing inefficiencies in transporting materials across the site. |
| | | | Social value - By physically connecting different parts of the shipyard, the rails foster collaboration and interaction among workers, both on land and water. |
| | | | Aesthetical value – Order and continuity. |
| | | | Historical value – changes in orientation of the rails reflect the shipyard’s evolution. First connecting the river with the dike, but now aligning just along the river. |

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| | Intangible | <i>Operational efficiency</i> - The rails enhance efficiency of moving vessels, materials and machinery | Economic value - Enhances the speed and cost-efficiency of material handling and vessel movement. Optimizing workflow |
| | | <i>Flexibility</i> - The rails accommodate a moving crane that can handle various sizes of vessels, materials and machinery. | Economic value – The flexibility in operating projects is necessary for adapting towards evolving operational demands within the maritime industry. The rails continue to function effectively even during renovations or upgrades. |
| | | | Use value – The endurance of orientation and use within harsh conditions shows effective function |
| 2.3 Romneyloods | Tangible | <i>Functionality</i> - These romney hall are being used as storage space, and have a round shape. | Economic value - Their use as storage supports efficient operations, reducing clutter and preserving materials. |
| | | <i>Spatial arrangement</i> - These romney halls have been present on site since, these structures are not permanent | Aesthetical value - Their round shape adds architectural diversity and charm to the site. |
| | Intangible | <i>Flexibility</i> - Open structures that are flexible to use, transform and reposition for the current/future uses within a shipyard. | Economic value - The temporary nature of these structures allows cost-effective adjustments to changing needs. |
| | | | Economic value - Open structures can be easily repurposed or relocated, maximizing their utility. |
| | | <i>Operational efficiency</i> - The position of these are close to the big halls. | Use-value - The ability to transform these halls ensures their relevance for future needs. |
| | | | Economic value - Their proximity to larger halls minimizes travel time for workers, streamlining workflows. |
| 2.4 New Hall | Tangible | <i>Material</i> - The hall is covered in grey facade panel, without any openings, other than the entrances. | Social value - Promotes better workforce coordination, creating a sense of camaraderie. |
| | | | Economic value - The steel structure and facade panels reduce maintenance costs while ensuring durability. |
| | | <i>Accessibility</i> - The hall is connected with the existing hall, and is accessible from the inside. The east facade also holds a huge slide door that provides accessibility towards the back | Sustainability value - The choice of panels over brick may contribute to energy efficiency or reduced environmental impact. |
| | | | Economical value - Multiple access points, including sliding doors, enhance logistics and usability. |
| | | | Aesthetical value - The seamless integration with existing halls maintains a coherent and |

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| | | od the wharf. Two more doors opening towards the riverside. | modern industrial design. |
| | | <i>Dimensions -</i> The structure is similar towards the existing hall, but exceeds current dimensions. The hall reaches 30 meter high and poses a floorplan of 1490 m2. | Economic value - Larger dimensions allow for more extensive projects, boosting productivity and revenue. |
| | | | Use-value - The increased height and floor space accommodate a wider variety of vessel sizes and operations. – Neptune-Marine introduces Cruise ships. (Neptune, z.d.) |
| | intangible | <i>Operational efficiency -</i> The new bigger hall, represents a new era for the wharf and represents the new company, Neptune. This hall is much better visible from all sides and thus speaking for the identity of the area. | Economic value - Represents an upgrade in the shipyard's capabilities, supporting larger and more complex projects. |
| | | | Aesthetical value - Its visibility symbolizes the modernization and progress of the shipyard. |
| | | <i>Identity of the shipyard -</i> This new hall provides the wharf a controlled space to make, maintain and repair in one go. | Economic value - Strengthens the shipyard's reputation as a state-of-the-art facility. |
| | | | Social value - Reflects the pride and tradition associated with Neptune's rebranding and expansion. |
| | | <i>Success rate -</i> A new bigger hall, is represented in the success of the company and the current needs. A bigger hall reflects bigger and heavier projects, more workspace. | Economic value - The hall's larger size and advanced features mirror the shipyard's financial success and growing demand. |
| | | | Aesthetical value - The prominent structure serves as a visual statement of the company's achievements. |
| | | <i>Privacy -</i> The hall is orientated towards the riverside. The dike side is closed off. | Economic value - The orientation towards the river provides a functional workspace while shielding sensitive operations from public view. |
| Wharf | Tangible | <i>Orientation -</i> Focused on the waterfront – in connection with the original Merwede wharf | Historical value - Aligning with the original Merwede wharf preserves a connection to the shipyard's legacy. |
| | | <i>Relation between present structures and facilities -</i> each structure and facilities has its own purpose on site and needs to be able to perform the spatial, operational demand. | Economic value - Efficient integration with other structures maximizes the utility of the site. |
| | | | Operational Use Value - The purposeful arrangement of structures ensures that all facilities fulfil their spatial and functional demands effectively. |

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| | | <i>workforce management</i> - The management of the workflow insight the wharf, and with other additional companies, or even the wharf on the other side. | Economic value - Efficient workflow management within the wharf reduces operational costs and maximizes productivity. |
| | | <i>Community</i> - | Social value - Collaboration fosters a sense of teamwork and shared purpose among the workforce, improving morale and communication. This connectivity extends beyond the shipyard, enhancing professional relationships within the maritime industry. |
| | | | Social value - A closed-off yet inclusive work environment fosters camaraderie and mutual support among employees. Providing a safe and pleasant space for interaction builds a strong sense of belonging and enhances overall job satisfaction. |
| | | | Historical value - As a site where workers have come together over decades, the shipyard’s community represents a living legacy of maritime tradition and craftsmanship, maintaining a strong connection between generations of workers. |
| Welding hall | | | |
| 3.1 Façade | Tangible | <i>Material</i> - Steel beams are in contrast with the red-brown brick and glass windows, popular building materials in the 60's. No loadbearing elements | Aesthetical value - Distinctive rhythmic appearance of green against brick creates a classical industrial look. |
| | | <i>Volume</i> - Three volumes shape the building, with the lowest facade facing the dike creating a human-scale approach towards people. | Historical value - Reflecting building materials popular in the 60's, also they do not suffice anymore looking at the sustainability requirements. |
| | | | Social value - Human-scale towards the dike and indication of functionality of building. |
| | | <i>Windows</i> - The windows span the entire width, creating a horizontal direction, the skylight enhances natural light and forms the highest point of the building. | Aesthetical value - Unique shape that sticks out with surrounding structures. |
| | | | Economic value - Integration of natural light, possible due to the non-loadbearing elements in the facade |
| | | <i>Openings</i> - | Aesthetical value - Horizontal orientation spread over the whole façade. |
| | | | Economical value - ability to enter from all sides, possible due to the |

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| | | Large doors and numerous openings from all sides. | non-loadbearing elements in the façade. – accessibility. |
| | | | Social value – reflects on the work processes on the shipyard. Openings near the riverfronts were bigger, the opening on the dike side is elevated with a stairs indicating a second floor for offices. |
| | | <i>Layout -</i> Horizontal orientation with indication of levelling for different heights. Also a clear division is visible due to the green coloured steel beams. | Aesthetical value - The façade is recognizable contributing to the companies presence in the community. This provides a distinctive rhythmic appearance. |
| | Intangible | <i>Identity -</i> The name of the company is clearly visible on the facade, from the water side. Over time the facade changed and the identity shifted also. The facade got a new exterior look that created a cohesion and an interpretation of a new era, new company, new identity. | Social value - The facade is recognizable contributing to the companies presence in the working community, representing the functionality of the work behind the façade. |
| | | <i>Cultural and historical -</i> The use of glass maximized daylight, changed into a more private closed facade due to the ability to provide light from the inside. | Aesthetical value – façade design contributing to the company landmark status in the area, by implementing a visible name. |
| | | | Historical value – Technologie is presented that was needed and available in that time. This changed over time to sustain the current needs. |
| 3.2 Roof | Tangible | <i>Shape -</i> The roof is slanted with a distinct skylight. Three heights, shape the building. | Aesthetical value - The slanted roof with a distinctive skylight creates a striking profile visible from both land and water, making it a prominent and recognizable feature of the shipyard's skyline. This distinct characterization enhances the shipyard's visual identity, blending functionality with architectural interest. |
| | | | Historical value - The roof's unique shape reflects the design of older structures from the original shipyard. This was the final traditional roof design before newer buildings were constructed with flat roofs, characteristic of the subsequent era |

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| | Intangible | <i>Identity -</i> | Aesthetical value - The roof is with three distinct heights, accentuated with a distinctive border. This creates a visually dynamic form that underscores the industrial character of the shipyard, making it a standout element that aligns with its maritime identity. |
| 3. 3 Structure | Tangible | <i>Material -</i> Using extensive steel for large industrial halls, 65 years old original material. | Aesthetical value - The exposed steel, visible both inside and outside, highlights the structural integrity and industrial aesthetic of the building. Its raw, unembellished appearance emphasizes the functional beauty of maritime architecture, linking past and present. |
| | | | Historical value - Constructed 65 years ago, the extensive use of steel reflects the material advancements of the 1960s, when larger scales and new technologies revolutionized industrial building practices. The steel's durability and relevance today exemplify the innovative thinking of that period. (Kramer, 2008) |
| | | <i>Functional capacity -</i> Ability to support the load requirements whilst shipbuilding, maintaining and repairing. | Economic value - economically beneficial, due to costs, and the results |
| | | | Social value - The steel structure reflects the importance of creating robust, purpose-driven spaces that cater to the workforce's needs, reinforcing the functionality essential in a shipyard environment. |
| | | <i>Visibility -</i> The structure is left visible from the inside and a part is visible from the outside. exposed steel beams and columns providing a clear visual rhythm | Aesthetical value - The exposed steel beams and columns create a visually rhythmic and coherent design language. This industrial aesthetic not only adds character but also reinforces the transparency and openness of the shipyard's design ethos, celebrating its functionality. |
| | | | Economical value – The structure provides economically many possibility, like hanging big and small elements for repair. |
| | | <i>Identity -</i> The structure can be adaptable for various maritime | Aesthetical value - The structure's robust and adaptable design creates a bold, easily recognizable volume |

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| | | industrial needs and shows a clear shape, indicating the identity of the building., this is recognizable design that embodies the shipyards industrial character | that embodies the industrial essence of the shipyard. Its prominent visibility contributes to the overall maritime identity of the space. |
| | | | Historical value - Shows a clear image of the past, where steel was used for structures, and yet are still needed in current times – ageless. |
| 3.4 Space plan | Tangible | <i>Dimensions -</i> The open space plan is 37 m wide and over 65 m long. Separating 3 zones, including the big welding hall (1560 m2), the smaller storage hall (432 m2) and the double floorplan with offices (360 m2) | Use value – These dimensions provide enough space for the various workflow that is necessary on site. |
| | | | Aesthetical Value: The spaciousness itself conveys an industrial grandeur, creating a sense of openness and purpose. This highlights the functional beauty of a work environment designed for maritime craftsmanship. |
| | | <i>Accessibility -</i> The open space plan is accessible from multiple sides, with each entrance serving a distinct function. Also facilitating easy entry and exit for both people and materials. | Economic value – the open space plan has bigger accesses towards the riverfront, activating that side for the main work. |
| | | | Social value – less bigger openings reflect on a more human-scaled function like office and storage. This creates a sense of privacy for the company where outsiders are not interacting with the work. |
| | | <i>Layout -</i> This layout is not changed over time, reflecting the needs of the workers in that time frame, the space is an open layout where distinct zones are implemented by the three volumes. | Economic value – an open space plan optimizes operational efficiency and streamlines workflows and productivity. Also a harmonious relationship between floor plan and the surrounding building, enhancing overall site functionality. |
| | | | Social value – The open space plan fosters engagement and interaction among workers, which enhances collaboration and a sense of community. |
| | Intangible | <i>Flexibility -</i> Open space plan allows flexible use suitable for various activities. Next to this it has potential to support multiple levels, like added floors. | Social value - The adaptable design of the open space allows for adjustments to accommodate vessels of varying sizes, which has historically been a critical requirement for shipyards. |
| | | | Historical value - The layout's inherent flexibility reflects the forward-thinking design of its time, addressing both contemporary and |

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| | | | future needs. However, as ships and operations have scaled up, this space now symbolizes how the shipyard has outgrown its original dimensions, a testament to its evolving success and demands. |
| 3.5 Surfaces | Intangible | <i>Operational efficiency</i> - Performance surfaces, exposed structures and raw materiality. | Economic value – Exposed structures and ceilings reduce material use and allow for easy inspection and maintenance, for checking and repairing the visible structural components. |
| | | <i>Identity</i> - The raw, unfinished surfaces contribute to an industrial aesthetic and is appropriate to operational needs. This has not changed over time, reflecting the buildings historical authenticity. | Aesthetical value - The raw, utilitarian design aligns seamlessly with the shipyard's functional purpose, creating a work-focused atmosphere. This industrial aesthetic has become a defining characteristic of the space, reinforcing its association with maritime work. |
| | | | Historical value - The preservation of original materials and finishes reflects the authenticity and heritage of the building, grounding it in a specific historical period. This connection to its past ensures that the space remains a living representation of the shipyard's legacy. |

Bibliography

- Alblasserdam, S., & Van Homoet, C. (2019). *Alblasserdam [Scheepsbouw Alblasserdam]*. <https://www.scheepsbouw-alblasserdam.nl/>
- Alzer, P. (2021, 6 juli). *Het gaat erom dat we erfgoed ook relevant houden*. BOEi. <https://www.boei.nl/25jaar/paul-meurs/>
- Amsing, E. (2019). Verkenning erfgoedlijn IJzeren eeuw: Maritieme industrie van Hoek van Holland tot en met Gorinchem. In Arcadis, *Provincie Zuid Holland*. Geraadpleegd op 12 maart 2024, van https://www.zuid-holland.nl/publish/pages/24906/a1_bijlage_3_verkenning_erfgoedlijn_maritieme_industrie_incl_bijlagen.pdf
- Armitage, L., & Irons, J. (2013). The values of built heritage. *Property Management*, 31(3), 246–259. <https://doi.org/10.1108/02637471311321487>
- Beeldbank Regionaal Archief Dordrecht [Gemeentelijke prentverzameling 552_454346]. (1970). *Scheepswerf De Merwede vanaf de Rivierdijk t.h.v. de Sluisweg in Hardinxveld-Giessendam*. Regionaal Archief Dordrecht. <https://beeldbank.regionaalarchiefdordrecht.nl/index.cfm?action=search.detail&showbrowse&id=BD761C0CAC8711E489FB00163E535DC5>
- Clarke, N., Kuipers, M., & Stroux, S. (2019). Embedding built heritage values in architectural design education. *International Journal Of Technology And Design Education*, 30(5), 867–883. <https://doi.org/10.1007/s10798-019-09534-4>
- Da Silva, A. T. P., & Roders, A. P. (2012). Cultural heritage management and heritage (impact) assessments. *Proceedings Of The Joint CIB W*, 70. <https://research.tue.nl/en/publications/cultural-heritage-management-and-heritage-impact-assessments>
- de Merwede 5*. (z.d.). https://www.varenisfijner.nl/de_merwede-05.htm
- Den Breejen, P. (1983). *Hardinxveld en Giessendam, van vissers- en Hoepmakersdorpen naar industriegemeente: De sociaal-economische koerswijziging van twee Hollandse dijkdorpen van de 19e naar de 20e eeuw*. Historische Vereniging Hardinxveld-Giessendam.
- Den Breejen, P. (1984). *Hardinxveld en Giessendam van Vissers en Hoepmakersdorpen naar industriegemeente* (Door Historische Vereniging Hardinxveld-Giessendam).
- Hajirsouli, A., Kumarasuriyar, A., & Nielsen, D. (2019). Tangible outcomes of intangible socio-cultural changes: The case study of Kandovan. *Green Lines Institute*, 59–70. <https://eprints.qut.edu.au/131632/>
- Havinga, L., Colenbrander, B., & Schellen, H. (2019). Heritage significance and the identification of attributes to preserve in a sustainable refurbishment. *Journal Of Cultural Heritage*, 43, 282–293. <https://doi.org/10.1016/j.culher.2019.08.011>
- Havinga, L., Colenbrander, B., & Schellen, H. (2020). Heritage significance and the identification of attributes to preserve in a sustainable refurbishment. *Journal Of Cultural Heritage*, 43, 282–293. <https://doi.org/10.1016/j.culher.2019.08.011>

- Historische vereniging. (2006). *Groeten uit Nederhardingsveld van de Historische Vereniging Hardinxveld-Giessendam*.
<https://arievnoordennen.jalbum.net/Merwede%20Scheepswerf/index.html#img=Rivierdijk%20596%201902%2002.JPG>
- Joop Terpstra. (2021, 28 februari). *1972 Prinsendam van Stapel bij Merwedewerf* [Video]. YouTube. <https://www.youtube.com/watch?v=nfKVQzeaJLc>
- Koopman, F., Michel, H., Roos, J., Stroux, S., Quist, W., & Heritage & Architecture. (2015). De Werkspoorhallen op Oostenburg - verleden heden toekomst. In *TU Delft Repository* [Book]. Technische Universiteit Delft - Faculteit Bouwkunde. https://buurt-organisatie.squarespace.com/s/Werkspoorhallen-op-Oostenburg_Verleden-heden-toekomst_-TU_Delft7-sept-2015.pdf
- Korteweg, J. (2014). *70 jaar IHC Merwede* (W. Botman, Red.). Ihc Merwede Holding B.V.
- Kramer, J. (2008). *De Merwedezone in bedrijf: Speurtochten langs industrieel erfgoed*. Stichting Groene Hart.
- Kramer, J. (2021). *Het verhaal van Mercon Kloos*. Geschiedenis van Zuid Holland. <https://geschiedenisvanzuidholland.nl/verhalen/verhalen/het-verhaal-van-kloos/>
- Maritshuis. (z.d.). *Aelbert Cuyp Equestrian Portrait of Pieter de Roovere (1602-1652)*. Mauritshuis. <https://www.mauritshuis.nl/en/our-collection/artworks/25-equestrian-portrait-of-pieter-de-roovere-1602-1652/>
- n.v. Scheepswerf en Machinefabriek “de Merwede” v/h van vliet en co. [Van de Helling]. (1957). Orgaan van n.v. scheepswerf en machinefabriek “de Merwede”. *Varenisfijner*.
- Natuur. (z.d.). Atlas Leefomgeving. <https://www.atlasleefomgeving.nl/thema/groen-en-water/natuur>
- Ned Vereniging Binnenhavens. (2014a, oktober 6). *Scheepswerf Hoebee bv, De Kooiman Groep* [Video]. YouTube. <https://www.youtube.com/watch?v=1Wf7vdLpeAg>
- Orgaan van N.V. Scheepswerf en Machinefabriek, “De Merwede”. (1957). Grote belangstelling voor tewaterlating “Van Heemskerck”. *Van de Helling*, 8.
<https://www.varenisfijner.nl/PDF/Merwede/1957-11-nov.pdf>
- Prevljak, N. H., & Prevljak, N. H. (2023, 10 november). *World's 1st wind-powered hybrid industrial cargo ship wins Ship of the Year Award*. Offshore Energy. <https://www.offshore-energy.biz/worlds-1st-wind-powered-hybrid-industrial-cargo-ship-wins-ship-of-the-year-award/>
- Rijkswaterstaat en Ministerie van Landbouw, Visserij, voedselzekerheid en Natuur. (z.d.). *Biesbosch | natura 2000*. Ministerie van Landbouw, Visserij, Voedselzekerheid en Natuur. <https://www.natura2000.nl/gebieden/noord-brabant/biesbosch>
- Scheepswerf de Biesbosch - Monumentenzorg Dordrecht*. (z.d.). <https://www.monumentenzorgdordrecht.nl/bouwhistorische-rapporten/scheepswerf-de-biesbosch>
- Smith, L. J. (2006). *Uses of Heritage*. Routledge. <https://rbb85.wordpress.com/wp-content/uploads/2015/11/laurajane-smith-uses-of-heritage.pdf>

Rasouli, A. H., Kumarasuriyar, A., & Nielsen, D. (2019). Tangible outcomes of intangible socio-cultural changes: The case study of Kandovan. *ResearchGate*.
https://www.researchgate.net/publication/343601223_Tangible_outcomes_of_intangible_socio-cultural_changes_The_case_study_of_Kandovan/references

17th ICOMOS. (2011). TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes: The Dublin Principles. In *ICOMOS*.
https://www.icomos.org/images/DOCUMENTS/Charters/GA2011_ICOMOS_TICCIH_joint_principles_EN_FR_final_20120110.pdf

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION. (1972). CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE. In *UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION*.
<https://whc.unesco.org/archive/convention-en.pdf>

Van Lier, M. (2023). *Maritiem-industriële erfgoedensembles*. Erfgoedhuis Zuid-Holland.
<https://www.erfgoedhuis-zh.nl/nieuws/2023/erfgoeddag-essay-maritiem-industrieel-erfgoedensembles/>

United Nations Educational, Scientific and Cultural Organization [UNESCO]. (2011). Recommendation on the historic urban landscape. In *UNESCO world heritage convention*.
<https://whc.unesco.org/en/hul/#publications>

Van Noordennen, A. (1960). *Merwede Scheepswerf*. <https://arievnoordennen.jalbum.net>.
Geraadpleegd op 10 mei 2024, van
<https://arievnoordennen.jalbum.net/Merwede%20Scheepswerf/index.html#img=z%20Rivierdijk%20509%2035.jpg>

Van Noordennen, A. (2005). *Merwede Scheepswerf*. <https://arievnoordennen.jalbum.net>.
Geraadpleegd op 13 mei 2024, van
<https://arievnoordennen.jalbum.net/Merwede%20Scheepswerf/index.html#img=z%20Rivierdijk%20509%2024.JPG>

Van Noordennen, A. (2009). *Merwede Scheepswerf*. <https://arievnoordennen.jalbum.net>.
Geraadpleegd op 10 mei 2024, van
<https://arievnoordennen.jalbum.net/Merwede%20Scheepswerf/index.html#img=z%20Rivierdijk%20509%2041.jpg>

Veldpaus, L., Roders, A. R. P., & Colenbrander, B. J. F. (2013). Urban Heritage: Putting the Past into the Future. *The Historic Environment Policy & Practice*, 4(1), 3–18.
<https://doi.org/10.1179/1756750513z.00000000022>

Verschuure, G. (2024). *Landscape coarse, The Waterdriehoek* [Presentatieslides; Lecture].

An architect doesn't merely preserve structures; they safeguard the stories, the courage, and the connections embedded within our heritage. But what exactly forms our maritime legacy, and which values deserve preservation as we reshape it for the future generations?

My graduation projects falls right into the thematic of the MsC Heritage and Architecture: Revitalizing heritage. The projects is located within the boundaries of the Waterdriehoek, an area filled with visible remains of our rich maritime history. This unique area continues to develop and brings various stories where floods, water management, shipbuilders and dredgers come together. Nevertheless, the area also faces challenges as the disappearance of various structures heavily influences the identity of this area. Our graduation studio created the space to examine the built environment in this area, first in a group work by researching various typologies along the dykes, but also within our own graduation projects. Inspired by the shipyard typology analyses and essence model of the Biesboschhal, my interest started to peak at the definition and essentially the essence of the shipyard typology. My graduation project focuses on discovering both tangible and intangible attributes and their coordinated values of shipyards, a typology that continues to adapt to the socio-economical needs of the maritime industry. By doing so the results provide a better understanding of what exactly we value within the physical realm and why. For architects this is viewed as starting points to get inspiration and evaluate their design choices.

My research addresses the question: *'How do structural and operational attributes contribute to the functionality of shipyards in the Waterdriehoek, and what is their value as potential maritime heritage?'*

The results emphasize the significance of shipyards not only as industrial sites but as symbols embedded in the socio-economic fabric of the Waterdriehoek, where maritime heritage remains integral to cultural identity. Sites like these must stay relevant and integrated within the modern landscape to ensure their continuity for future generations.

These findings provide a foundation for heritage management practices in similar industrial contexts within the Waterdriehoek and outside. The findings aim to raise awareness and inform strategies for preserving shipyards as vital cultural assets, ensuring their continuity for future generations. Promoting the preservation of essential structures like, slopes, crane rails, docks, etc. The fluidity of heritage values raises important questions about the long-term sustainability of these attributes. What happens when the physical or intangible elements that embody value are altered, removed, or reinterpreted? Will the original values perish, or will new ones emerge? This dynamic nature of heritage suggests that value is not only tied to preservation but also to the continuous negotiation of meaning.

With this the design phase was used to experiment how to deal with shipyards, whilst introducing a complete new function. Over the years the adaptability of shipyards provided the necessary steps to accommodate modern demands, preventing bankruptcy. Providing a future scenario the design projects looked upon an extreme situation. A situation where unfortunately the industry could not uphold the demands and was required to relocate, leaving empty traces of their presence in the area.

The primary goal of my graduation project was to explore how heritage can be designed with new users in mind, specifically within the context of a community-based neighborhood offering alternative housing solutions. The case study focused on Hardinxveld-Giessendam, a village characterized by its unique combination of maritime industry and small-town life. Although the shipyard in question does not currently face bankruptcy nor has it been earmarked for residential redevelopment, the project served as a hypothetical scenario to test the adaptability of shipyards and their integration into a residential context. This approach provided a methodological framework that could be applied to similar contexts elsewhere.

From the outset, my research and design processes were deeply interwoven, with each influencing the other throughout the year. My research offered a profound understanding of the shipyard's attributes and values, which formed the foundation of my design interventions. This exploration revealed the tension between the maritime industry and housing as two distinct functions, each requiring its own program of requirements, often clashing in certain contexts. This tension became a driving force in the design, where new functions were carefully embedded within or connected to the existing structures, ensuring a dialogue between the past and the present.

A key challenge was understanding how introducing new attributes would influence and potentially transform the existing values. I observed that the shipyard's industrial identity permeates the site, both tangibly and intangibly. When the industrial function is removed, its essence begins to evolve, shaping itself in response to the new values associated with residential use. This transformation highlights the dual nature of adaptive reuse: the shipyard's foundational character serves as a starting point for the design, yet the introduction of new functions inevitably redefines its identity.

For instance, the social dynamics of the shipyard provided a compelling lens through which to understand this transformation. Historically, the shipyard fostered a sense of camaraderie among professionals and like-minded individuals, celebrating their achievements in a shared workspace. In its new role as a residential neighbourhood, this sense of community evolves into a more private, intimate form. While residents may not know their neighbours as well as workers once did, the site still fosters communal activities, albeit in a different, more domestic capacity.

Ultimately, the physical elements of the shipyard served as a starting point, ensuring the historical character remains recognizable. However, the intangible values—such as the spirit of industry and community—transformed into something new, inspired by the past but adapted for a future context. This process underscores the essence of adaptive reuse: preserving the narrative of a place while allowing it to evolve in response to contemporary demands.

This reflective journey demonstrated the intricate balance required to design within heritage contexts, where every intervention must respect the past while embracing the possibilities of the future. My research and design, entwined at every stage, revealed that heritage is not static but an evolving dialogue between the old and the new—a principle that guided my project to its conclusion.

My project views the importance of maritime heritage to local identity, underlining the societal benefits of adaptive reuse of significant structures without erasing their history. Next steps I believe that the following step to this project elaborating my own scope, is to present this to the

communities involved. Introducing new stakeholders, like owners and local residents, and view their take on the future of maritime heritage.

Reflecting back on the decision making of the location I noticed that due to the size of the site it became difficult to grasp reality of the Waterdriehoek. Every part of the area has its own specification, which makes it remarkable, but without any knowledge I remember thinking where to start. So viewing my case study choice at that moment, for me felt like a leap of fate and hoping for the best. I misread that a lack of data, such as floorplans, sections and accessibility, would be a challenge during the design process, but also research. This can be of influence for the transferability of the project results, due to assumptions. Nevertheless, this project was chosen with a desire and inspiration for the maritime heritage.