# Integrating Adaptability in the design process of outer dike Industrial Halls

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## Introduction & Problem statement

Human civilization is intricately woven with the thread of progress—a relentless pursuit that has fueled societal advancements, technological breakthroughs, and intellectual evolution. Every quest for improvement is simultaneously reflected in architecture. Every shift in development generates new spatial needs, which would subsequently generate new structural and building typologies. With the arrival of the Industrial era, the need for massive and well-lit spaces where laborers could manufacture and process goods generated a new typology – the industrial halls. These buildings are characterized by a practical, utilitarian architecture, expressed by inexpensive materials, most of the time locally sourced, such as bricks or timber. In many cases, skylights were used to provide light, or a combination of wall and ceiling openings. Given the large volume of materials and need for transportations, a large part of industrial halls would be located close to large port cities and waterbodies, such as canals or rivers, thus being predominantly in outer dike zones (den Boer, A. 2020).

In time, the halls grew larger and taller, answering to the new industrial production challenges, primarily bigger machinery, faster production  and increased workforce. In most of the cases, the old industrial halls would be fully or partially demolished with the goal of enlargement. An unfortunate consequence of production development was the loss of the initial industrial halls  that were on site.

The flourishing industrial period would start its decline in the end of the 20th century, when globalized production would foster the factory owners to move their production to other countries with cheaper material and labor cost, thus rendering many industrial sites abandoned and creating a period of economic uncertainties. Companies like Nedstaal, Kloos, Oude Werf. were either closed or bought off by other companies (den Boer). Neglection and decay would tower over most of these plants.

In the 20th century, Dutch industrial halls represented a whole amplitude of feelings for the settlements around them. In the case of Alblasserwaardt (located in the industrial region of Rotterdam and Dordrecht), the sentiment towards industries transcended into multiple attitudes, them being seen first as a source of income and pride in technological development (den Boer), followed by a negative attitude after the factories migrated to cheaper countries and finally, culminating in a sentiment of nostalgia and pride for the older times and accomplishments. In





the case of Sliedrecht, the dredging industry molded the inhabitants' identity, household culture and belief, every family having at least one member that employed in dredging. The same occurrence is discussed in Ivan Nevzgodin's paper on adaptive reuse of industrial architecture (2016).

Besides the fact that water represented a geographical opportunity (efficient transport of goods), it was still the main threat for industry because of potential floods (Han Meyer 2016). With growing industry, riverbeds have been dredged, more saltwater reached deeper inland and soil deterioration appeared more often in outer dike zones. With the rising sea levels and threat to the Dutch delta regions, outer-dike industrial zones experience an elevated risk of flooding and deterioration (KNMI, 2014). Therefore, it is pivotal to focus on an adaptable architectural strategy conscious towards the flood risk and other outer dike related risks.

The term of adaptability or adaptable reuse is in the research scene for half a century already (B. Plevoets 2014) nevertheless, due to its polyvalent meaning, no precise definition is accepted (Meyer, 2020).  In term of architecture one could see adaptability as a durable transformation design, or perhaps a design that answers to its user's needs in different manners and phases. An exact definition is provided in the methodology of this research. This paper investigates the integration of adaptability as a key value in the transformation design process of outer dike industrial halls, ensuring their continued relevance in the modern urban context. Based on Redeker's research on urban floods in Rhine cities (Redeker, 2018), every development in outer dike zones must have a high degree of adaptation. The term would encompass several fields, notably environment and heritage adaptation. Drawing from architectural, historical, and urban development perspectives, this paper establishes a foundation for understanding adaptability as a key criterion in the building value assessment of industrial heritage.

By proposing design guidelines, it aims to contribute to the discourse surrounding the sustainable and resilient revitalization of these unique and historically rich urban landscapes. Therefore, the research adopts the subsequent question:

**How can adaptability be integrated in the transformation process of the 20th century outer dike industrial halls?**

With the following sub questions:

1. What is the current state of affairs regarding the 20th century outer-dike industrial halls?
2. What challenges are posed when designing in outer dike regions?
3. How can adaptability be integrated in industrial heritage value assessment?

## Methodology

As the main result of this research is to generate a feasible guideline for architects to design an adaptable reuse of the current industrial halls, two fields of focus were chosen - Heritage value assessment and Adaptability. For these subsequent topics, different kinds of sources and data collection methods were employed, such as cartography analysis, literature review, value assessment and projects surveys. The goal of tackling these fields was to observe the current state of the art and propose an alternative way of addressing outer dike industrial hall transformation.

For a better research process comprehension, a diagram is suggested, showing the steps and references used during the research (Fig.1).

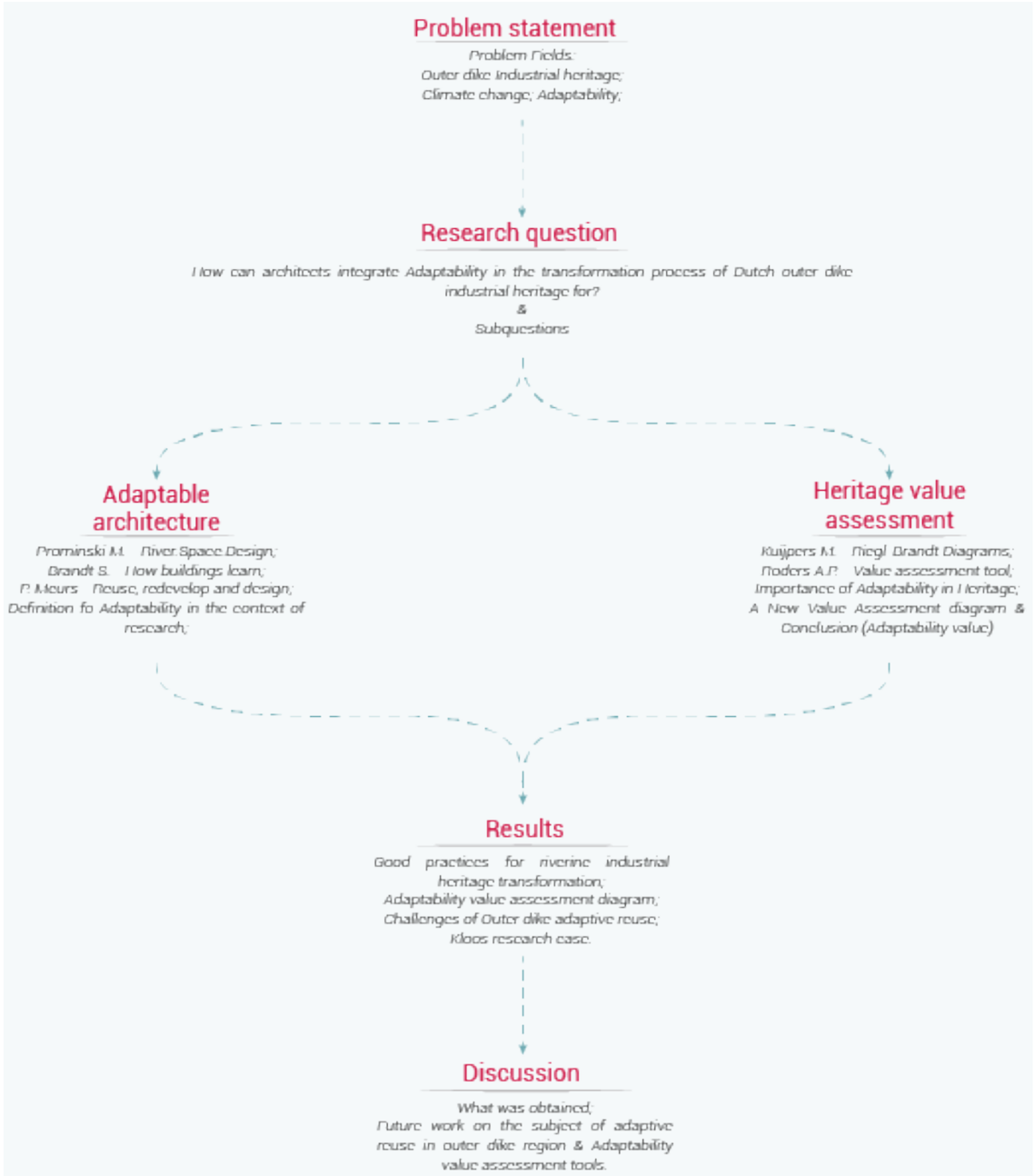


*fig. 1 Research Diagram*





As it can be seen, the process starts with the statement of the problem, it being the need for an adaptable solutions guideline for outer dike industrial halls , followed by the presentation of Research Question and sub-questions. Thereafter an extensive analysis in the fields of Industrial heritage value assessment and Adaptability is undertaken with the goal of creating a value assessment retrofitted for the existing outer dike industrial halls.

### Adaptability in outer dike regions

There are multiple definitions for the term "Adaptability; Robert Schmidt III (n.d.) Defines Adaptability as "a design characteristic that embodies spatial, structural, and service strategies which allow the physical artefact a level of malleability in response to changing operational parameters over time." while Han Meyer (2020) defines it as "adjusting our planning and consumption to the already irreversible effects of climate change, like accelerating sea-level rise" - a definition befitting a research in urban deltas. Nevertheless, it does not do justice to our topic. It becomes obvious that a definition of the adaptability tailored for our research is required, precisely explaining the potential of adaptability in riverine architecture.

Therefore, the definition of Adaptability in the current research is:

*"the ability of a design to resist against challenges associated with outer-dike industrial locations, such as flooding, climate change and future needs "*

To understand how adaptable these industrial halls can be, two scales are proposed: site and building. As Cornelia Redeker states in her publication "Flood Risk Management" (2018), there are three possibilities of flood risk management, notably avoidance, resistance and resilience. Such strategies can be applied to different scales, ranging from terrain to building scale.

When it comes to terrain adaptation, there have been two solutions - a rural and an urban one. The first solution covers expansive measures such as allowing waterbody to flood a certain portion of a terrain. The urban approach tackles the damage potential of the site, thus creating more defensive and intrinsic measures for water adaptation (Redeker, 2018). Most of the industrial sites are located outside the water defenses, however given their spatial qualities, they cannot be placed in either rural or urban typologies. Focusing on one of the approaches would be deemed destructive to either the industrial heritage or flood water discharge of the region, therefore, a combination of both measures is considered.

As multiple papers show, industrial halls are an ideal candidate for adaptive reuse, nevertheless, their materials and age represent a difficulty for outer dike transformation projects. In

the book River, Space, Design, Prominski presents a wide range of solution aimed at water mitigation and adaptation of buildings in Riverlands (2020). This information is used to create a set of guidelines that can help architects create a more adaptive design.

The analysis will subsequently be supported by a series of literature about Architectural reuse by Paul Meurs (2021), Ideas of Adaptability from Han Meyer (2016, 2020), Carola Hein (2020).

## Heritage value assessment of industrial halls

Given that the research question mentions outer dike regions, the analysis started with a cartographic analysis of current industrial monuments in outer dike regions. For that the Dutch Map viewer PDOK was used. In this viewer the following maps were layered (fig.2):

1. Rijkswaterstaat map of flood risk zones;
2. RCE map of monuments;


*fig.2 Map of Flood risk over the Map of Monuments from RCE on PDOK map viewer. https://app.pdok.nl/viewer/#x=132939.10&y=440493.06&z=6.3535&background=BRT-A%20standaard&layers=7b8f44b5-6eae-4113-a835-84b8678c3dd5;PS.ProtectedSite,2ca-26f5e-0b39-48a4-9e8d-7b9ffde9a5b0;ror_overstromingsrisico_vlakken*


*fig.3 Rijkswaterstaat river maps from the 19th century showing industrial sites in outer dike regions. https://downloads.rijkswaterstaatdata.nl/rivierkaart/geogegevens/tweede_herziening/Serie_1*

The outcome of this analysis was unexpected it appears that little to no RCE monuments are located in outer dike zones, thus further research of how industrial monuments were assessed was needed. Historical maps from the 19th century onwards was used to look for industrial sites in outer dike regions (fig. 3).

## Heritage value & Adaptability Matrix development

After the cartographic analysis showed unexpected results, it was decided to look at the manner industrial heritage was considered and classified. Nevzgodin relates about the creation of PIE (Projectbureau Industrieel Erfgoed) whose mission was to classify and create a list of industrial heritage sites, and objects , thus organize a value assessment. The PIE value assessment (fig.4) was a pioneer, however with time more diverse and inclusive tools were introduced, such as : Brandt (1994), Riegl (1982) Pereira Roders (2020) and Kuijpers (2017). Kuijpers & De Jonge are combining the first two value assessment methods by creating a Riegl-Brandt diagram. In this diagram, some values are not considered, such as the political, ecological, and scientific values present in Roders' theoretical framework (2020). Besides that, given that the study is focusing on industrial halls, Brandt's layers of surroundings and site become abstract. Thus, a new matrix is proposed that would consist of Brandt's five layers and Roders' values that are missing in the framework of Alois Riegl. To showcase the way the new matrix works, the assessment of the Kloos industrial site is considered.

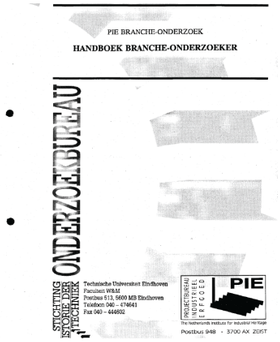


*fig.4 PIE Value assessment handbook*

The pivotal addition for this research is the adaptability value. The integration of these three dimensions provides a multi-dimensional perspective, allowing for a holistic understanding of the intrinsic values associated with the heritage and the practical implications for adaptive reuse (fig.5).

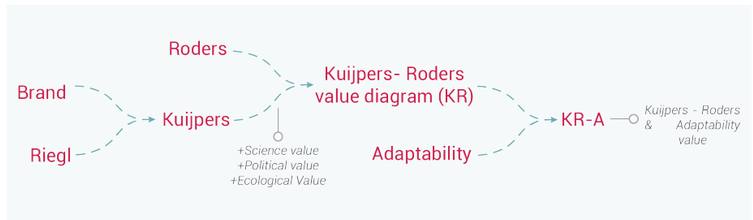


*fig.5 Heritage Value Assessment process diagram*

## Case study: Kloos

Kloos exemplifies the multitude of industrial facilities situated along the riverfronts between Rotterdam and Dordrecht, specializing in maritime and infrastructural steelworks production. Emerging in the late 19th century and thriving until the 1990s, this industrial complex underwent a subsequent period of decline and ambiguity. Its narrative mirrors that of numerous industrial halls across the Netherlands, once pivotal to the nation's economy and prosperity, now relegated to relics of bygone eras. Besides that, this industrial

hall has great potential in terms of adaptive reuse due to its inherent utilitarian structure and spaciousness, thus it was chosen as a case study.

## Results

In this section, the outcome of the source analysis and value assessment will be presented. First the analysis of the current state of the art is presented, followed by the challenges that were outlined for outer dike industrial hall transformation. Thereafter, the adaptability value assessment of Kloos industrial hall is presented and finalized with the list of guidelines that is extracted from the used literature and value assessment.

**What is the current state of affairs regarding the 20th century outer-dike industrial halls?**

The results of the cartographic analysis of PDOK and RCE showed that little to no industrial heritage monuments are present in outer dike regions. To check whether the lack of industrial monuments corelates with the fact that little to no industrial activity was seen in outer dike regions maps from Rijkswaterstaat from different periods  have been employed. It was deduced that there are multiple industrial sites and halls located in outer dike zones, however only an insignificant number of industrial monuments have been found there. To understand the afore mentioned discrepancy, the context of the apparition of industrial heritage as a whole has been analyzed.

In his research Ivan Nevzgodin (2016) refers to the notion of industrial heritage becoming an important topic in the Netherlands around 1990, with the PIE (Projectbureau Industrieel Erfgoed) being established and inventorying industrial "monuments" by industrial categories, movable or immovable property. This led to one of the first official industrial heritage value assessment tools, which was later published in a form of a handbook (handbook-branche-onderzoeker). This handbook related about the values that were defining an industrial monument. There were five important points that would grant the status of "Monument" to an industrial piece:

1. The movable property must refer to a striking period of the industrial development;
2. The completeness of the piece;
3. Rarity (An object that isn't a typical expression of a phase in the industrial development will receive a low score);
4. Reuse of the immovable property;
5. Clause: If the industry still exists or there are many examples, only a few will be selected;

(Projectbureau Industrieel Erfgoed, 1993)





If an industrial hall out of brickwork and a slender steel structure would be judged according to this criteria, it would never be included as an industrial monument, them being the most widespread typology of industrial buildings. Thankfully, architects and developers still saw the great potential the early 20th century Industrial halls could have in combination with contemporary architecture, by using contrasting facades, extensions and interiors (Nevzgodin). Changes in the later years due to increasing public awareness towards industrial heritage allowed multiple industrial halls to be transformed and reused by architects to house various functions (for example, Van Nelle Fabriek, Strijp S, Willemsoord Industrial zone). Moreover, developers became more interested in the adaptive reuse of industrial sites, as these are currently representing relatively empty, consolidated plots of land that can be redeveloped in a profitable function. The same reason is incentivizing the city councils to reuse these sites and improve the urban plan and quality (Bestemmingsplan Alblasserdam, 2021).  In a survey conducted by the developer Kooijmans regarding their attitude towards Kloos industrial site  it was deduced that although many people consider the site an important landmark for the city, the dangers an abandoned and enclosed outer dike site possesses (vandalism, danger for kids) overweights the nostalgia of the old days, thus a revitalization would be imperative.

Therefore, the industrial halls and complexes as a whole are now seen as opportunities for investment both by developers ,city councils and local population.

**What challenges are posed when designing in outer dike regions?**

The challenges linked to outer dike heritage can be categorized in several parts: legal, technical, environmental and economic, with the legal and technical challenges being the highest.

In 2006, the National Government launched the "Room for the river" program, aimed to address flood risk management and enhance river safety by creating additional space for rivers to accommodate increased water levels during periods of high discharge. This left the industrial sites behind the dikes in a state of uncertainty, them being labeled as potential flood plains. In many cases industrial sites isolated themselves to the point where the century old brick halls were demolished to make more space for the flood plains. This was the case when the new zoning plan of Elst in 2012 decided to demolish the old machinist school and the brick factory located in the outer dike zone (Bestemmingsplan Elst, 2012). In the case of the Ossenwaard brick factory in Vianen, the policy of Room for the River program made the industrial site even more isolated from the inner dike zone. Although the Room for the River program did not directly led to the derelict state of the industrial hall, the fact that it is now located in a floodplain makes it almost impossible for the factory to receive its monument status and raise funds for restoration. Researchers have

already stressed this situation and the conflict between heritage and climate adaptation (Egberts & Riesto, 2021).Unfortunately more industrial sites are reaching a state of ruin since the Water board would not compromise for their program and thus not allow the statehood of monument for these industrial structures that represented in many cases the "Golden Age" of some settlements (den Boer).

The technical challenge linked to industrial hall adaptive reuse lies in the fact that these structures were built in a very practical manner, the steel structures were calculated with the goal of only holding the roof, with no extra reinforcement for additional extensions. Besides that the fact that the halls are close to water, some climatic problems arise, most importantly oxidation (Evans, 2017). Observations on the Kloos Industrial site conveyed that the facades closer to water show bigger signs of metal oxidation and masonry effervescence due to higher relative humidity.

In summary, the "Room for the River" program, while addressing flood risk, inadvertently threatens the preservation of industrial heritage by labeling sites as floodplains. This designation hampers monument status and restoration funding, exacerbating the decay of historic structures. Technical challenges, such as structural limitations and climatic issues, further complicate adaptive reuse efforts. A delicate balance between flood management and heritage preservation is necessary to safeguard industrial heritage amid evolving environmental pressures.

**How can adaptability be integrated in industrial heritage value assessment?**

The idea of adaptability value integration in the heritage value assessment is relatively new, studies from United Kingdom (Evans, 2017) and Australia (Yazdani Mehr & Wilkinson, 2021) already discuss a need to integrate this new concept In the heritage assessment. In this research, a score of high, medium or low adaptability will be given to the valued artifacts (such as structure, façade identity, etc.) that were extrapolated from the Roeders-Riegl-Brand diagram. These values receive their grade whether they would be based on the ease of transformation for any future needs and resistance to outer dike challenges, for example: If the hall would have an open clean space, it would score a high adaptability value due to its versatility in design as opposed to a compartmentalized zone which would demand more interventions.

Out of 59 artifacts and points of value present in the Heritage value assessment of Kloos, only 13 scored a high or low adaptability value, mostly due to their capability to transform easily rather than representing a resistant design choice.

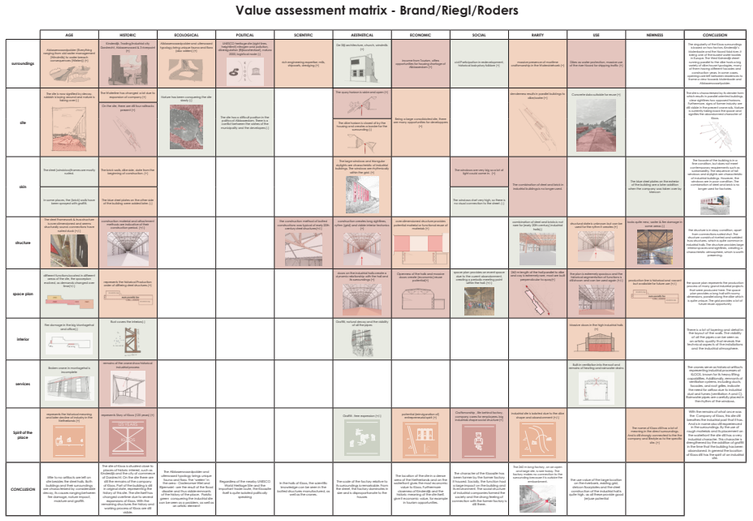


*fig.6 Heritage Value assessment of Kloos industrial site using the Brand-Riegl-Roders matrix (See extended version in Appendix)*

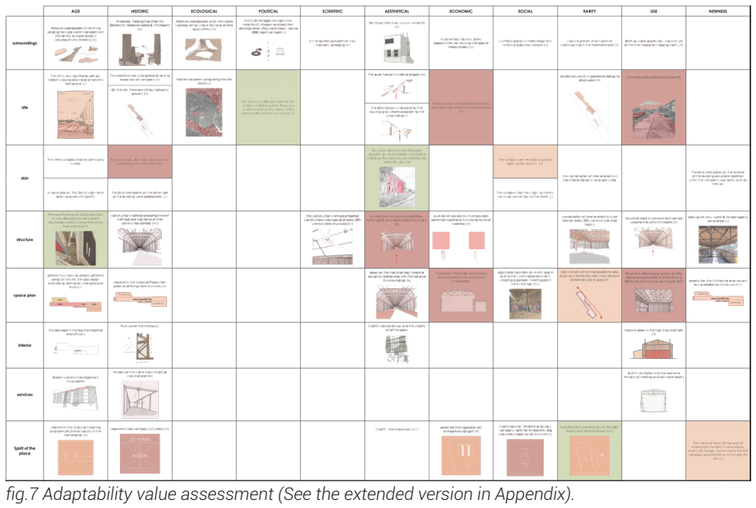


*fig.7 Adaptability value assessment (See the extended version in Appendix).*

| | *Heritage Value Assessment* | *Adaptability Value* |
|---|---|---|
| *High (Red)* | 19 | 6 |
| *Medium (Yellow)* | 22 | 3 |
| *Low (Green)* | 18 | 4 |

*fig.8 Table showcasing the difference in amount of extracted values using the two matrixes.*

The elements that received the highest adaptability value are linked to the steel structure, site consolidation, big window openings and the reuse of concrete slabs and foundation, in other words building elements and the spatial quality.

**How can architects integrate Adaptability in the transformation process of Dutch outer dike industrial heritage for?**

As mentioned earlier, the integration of adaptability will be tackled in two scales – site and building. When it comes to the site adaptability, the main concern regarding outer dike industrial sites are floods . Based on the data provided by the Royal Dutch Meteorological Institute (KNMI), there are several climate challenges that will be prevalent in Dutch flood risk regions, notably:

- a rise in sea level;
- an increase in peak drainage flows from rivers in the win ter months;
- increased seepage pressure and salinization;
- flooding in rural and urban areas;
- aridity in rural areas and low river flows in the summer months;
- reduced water quality due to higher temperatures and water shortages.

(MNP, 2005; KNMI, 2006)

Many industrial sites have been build by land reclamation from the river, straightening it, using willow pontoons and stones to create foundations and leveling the land, thereafter creating rigid embarkment walls either out of steel or concrete with jetties that allowed harboring of barges. This type of riverfront doesn't allow many alterations, moreover the intervention should not lead to lowered water discharge (Prominski et al. 2020). Researchers like Prominski (2020) , Heiko Lieske, Erika Schmidt and Thomas Willd (Willd, 2015) elaborate on different ways to integrate adaptive solutions for various kinds of rivers and river shores. In the case of river embarkment several proposals are nominated:

- **Terracing the riverbank** – this allows a gradual decrease towards the river, making the landscape more natural and simultaneously changing the landscape in response to varying water height;
- **Raising the embarkment** – Movable flood protection elements can supplement protective walls when there is a threat of flooding and also offer an opportunity to create breaks in the walls or build walls of more moderate height;
- **Lowering a section of embarkment** – creating a foreshore near the embarkment to allow people to connect with the water in the most interesting space – the riverbank;
- **Creating a cantilevering structure** - Balconies and pathways over water can be used for narrow sites in order to foster better circulation;
- **Selective terracing** – Allowing sections of natural slope gradient towards the water. This way, different flora and fauna can access a foothold on the terrain.

This means that the site of Kloos can facilitate different interventions and host new potential functions while also protecting itself from the flood.

These solutions not only address flood protection concerns but also emphasize a thoughtful integration of the built environment with the natural dynamics of rivers, fostering a balance between human infrastructure and ecological considerations. The multifaceted strategies outlined offer a nuanced approach to enhancing both the resilience and adaptability of outer dike industrial sites.

In regards to building adaptability, two possible strategies are discussed – resistance and resilience (Redeker, 2016).

- **Resistance** – in this case the designer should elaborate on an integrated flood prevention construction built in the existing structure For example, using a windowless façade, or precise sealing of openings with the goal of creating watertight walls. Additionally, steel piling walls are added to secure the construction against underflow (Prominski et al. 2020). An example of such flood protection system is in Kampen Midden, built in 2001-2003 (Willd, 2015).
- **Resilience** -the capacity of the design to adapt and cope with a disturbance, or ability to recover quickly and easily (Redeker, 2016). In some cases, the design should accept flood in the building premises, this strategy would impact mostly the ground floor of the building. A solution would be to create waterproof zones while allowing others to be flooded and contain water until the crisis is eliminated. Additionally the use resilient materials that would not deteriorate while flooded such as tiles, epoxy floor covers would be beneficial etc.

Given that the industrial hall of Kloos has a length of 260, it seems not feasible to use the resistance strategy, thus a resilient solution should be found, for example making several “dry“ zones within the building and floodproofing the foundation only.

The interplay of these strategies presents a useful toolkit for architects and urban planners working in outer dike areas, ensuring a comprehensive and adaptive response to the complex dynamics of water management. The examples provided, including the flood protection system in Kampen Midden showcasing their effectiveness in enhancing the building adaptability.

## Conclusion

Multiple methods of research and analysis have been used in this research. A literature review on the subject of adaptive reuse and heritage transformation was undertaken, which fostered the creation of a new method of adaptability assessment. A cartographic analysis of river floodplains and monuments uncovered the serious need for industrial halls preservation as a disappearing typology. Thus, several conclusions are extracted.

The industrial heritage and industrial complexes as a whole are now seen as good opportunities for investment both by developers ,city councils and local population. This was denoted from the survey of Kooijmans Development company as well as the survey of the people of Alblassersdam, the literature by I. Nevzgodin, A. den Boer, P. Meurs, Hanmeyer etc.

The Room for the River and other programs that deem outer dike industrial sites as potential flood plans represent a direct danger and disincentivize any pledge for restauration or adaptive reuse of the sites and halls. This has been seen in various industrial sites located close to riverbanks.

The literature analysis on adaptable reuse of industrial heritage alongside the adaptability value assessment led to the elaboration of the guidelines for Industrial Hall Transformation. Them being organized in two sets, site design guideline and Building design guidelines. Strategies such as “Resistance” and “Resilience” are discussed with he goal of enabling the designer to streamline its decisions into one policy, thus creating a more durable solution for the industrial hall transformation. In terms of site transformation, the guidelines are presenting a set of topographic interventions suitable for embarkments – the most common river shore for industrial sites.

It is important to note that future research is imperative. The adaptability value assessment matrix is only a prototype that needs further elaboration. It has shown that the most important values for adaptability are those linked directly to the building elements, nevertheless it is pivotal to include the age value, spirit of the place and social value, them being overshadowed. Thus the model needs further work. Simultaneously, the guidelines should be extended and provided with more tangible examples.



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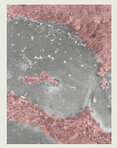
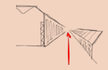
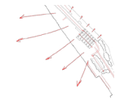
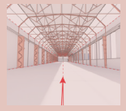
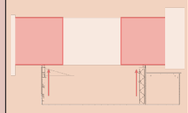
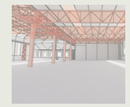
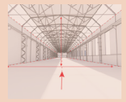
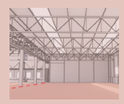
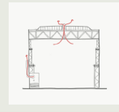
## Appendix

# Value assessment matrix - Brand/Riegl/Roders

| | AGE | HISTORIC | ECOLOGICAL | POLITICAL | SCIENTIFIC | AESTHETICAL | ECONOMIC | SOCIAL | RARITY | USE | NEWNESS | *CONCLUSION* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **surroundings** | Ablasserwaardpolder (Everything ranging from old water management (Windmills) to water breach consequences (Wielen)) (+)  | Kinderdijk, Trading/industrial city Dordrecht, Ablasserwaard & 3 riverpoint (+)  | Alblasserwaardpolder and uiterwaard typology bring unique fauna and flora (also wielen) (+)  | UNESCO heritage site (sight lines, heightlimit) nitrogen and pollution, dikeregulation (Rijkswaterstaat), natura 2000, logistical node (-)  | rich engineering expertise; mills, shipwarts, dredging (+) | De Stijl architecture, church, windmills (+)  | income from Tourism, offers opportunities for housing shortage of Alblasserdam (+) | civil Participation in redevelopment, historical babystory folklore (+) | massive presence of maritime craftsmanship in the Waterdriehoek (+) | Dikes as water protection, massive use of the river Noord for shipping traffic (+) | | The singularity of the Kloos surroundings is based on two factors, Kinderdijk's Molenkade and the Noord tidal river, it being one of the busiest water bodies in Europe. The West Kidnerdijk street running parallel to the dike hosts a big variety of dike-house typologies, many of them having different facades and construction years. In some cases, openings are left between residences to frame a view towards Molenkade and Alblasserswaartpolder. |
| **site** | The site is now signified by decay, rubbish is laying around and nature is taking over (-)  | The Waterline has changed a lot due to expansion of company (+)<br>On the site, there are still four railtracks present (+)  | Nature has been conquering the site slowly (-)  | The site has a difficult position in the politics of Alblasserdam. There is a conflict between the wishes of the municipality and the developers (-) | | The quay horizon is wide and open (+)  <br>The dike horizon is closed of by the housing and creates a border for the surrounding (-)  | Being a large consolidated site, there are many opportunities for developpers (+) | | slenderness results in parallel buildings to dike/water (+)  | Concrete slabs suitable for reuse (+)  | | The site is characterised by its slender form which results in parallel oriented buildings, clear sightlines two opposed horizons. Furthermore, signs of former industry are still visible in the present crane rails. Nature is currently taking back the space and signifies the abandonned character of Kloos.  |
| **skin** | The steel (winddow)frames are mostly rusted.<br>In some places, the (brick) walls have been sprayed with graffiti. | The brick walls, dike side, date from the beginning of construction. (+)<br>The blue steel plates on the other side of the building were added later. (-) | | | | The large windows and triangular skylights are characteristic of industrial buildings. The windows are rhythmically within the grid. (+)  | | The windows are very big so a lot of light could come in. (+)<br>The windows start very high, so there is no visual connection to the street. (-) | The combination of steel and brick in industrial buildings is no longer used. | | The blue steel plates on the exterior of the building are a later addition when the company was taken over by Mercon | The facade of the building is in a fine condition, but does not meet contemporary requirements such as sustainability. The sequence of tall windows and skylights are characteristic of industrial buildings. However, the windows are in poor condition. The combination of steel and brick is no longer used for factories.  |
| **structure** | The steel Framework & truss structure is over-dimensioned and seems structurally sound. connections have rusted stuck (+/-)  | construction material and attachment methods are indicative of their construction period. (+/-)  | | | the construction method of bolted constructions was typical of early 20th century steel structures(+/-)  | construction creates long sightlines, rythm (grid) and visible interior tectonics (+)  | over-dimensioned structure provides potential material or functional reuse of materials (+)  | | combination of steel and bricks is not rare for (early 20th century) industrial halls(-)  | structural state is unknown but can be used for the rythm it creates (+)  | looks quite new, water & fire damage in some areas (-)  | the structure is in okay condition, apart from connections rusted shut. The structure consists of riveted and welded truss structures, which is quite common in industrial halls. The structure provides large interior spaces and sightlines, creating a characteristic atmosphere, which is worth preserving. |
| **space plan** | different functions located in different areas of the site, the spaceplan evolved, as demands changed over time(+/-)  | represents the historical Production order of differing steel structures.(+)  | | | | doors on the industrial halls create a dynamic relationship with the hall and its surroundings (+)  | Openness of the halls and massive doors create (economic) reuse potential(+)  | space plan provides an event space due to the curent abandonment, creating a periodic meeting point within the hall. (+/-)  | 260 m length of the hall parallel to dike and cay is extremely rare, most are built perpendicular to quay(+)  | the plan is extremely spacious and the historical segmentation of functions is still shown and can be used again (+/-)  | production line is historical and vacant but available for future use (+/-)  | the space plan represents the production process of many grand industrial projects that were produced here. The space plan provides a long hall with roomy dimensions, parallel along the dike which is quite unique. The grid provides a lot of future reuse opportunity |
| **interior** | Fire damage in the big Montagehal and office(-)  | Rust covers the interiors(-)  | | | | Graffiti, natural decay and the visibility of all the pipes  | | | | Massive doors in the high industrial halls (+)  | | There is a lot of layering and detail in the layout of the walls. The visibility of all the pipes can be seen as an artistic quality that reveals the technical aspects of the installations and the industrial atmosphere. |
| **services** | Broken crane in montagehal is incomplete  | remains of the crane show historical industrial process  | | | | | | | | Built-in ventilation into the roof and remains of heating and rainwater drains  | | The cranes serve as historical artifacts representing industrial processes at KLOOS, known for its heavy lifting capabilities. Additionally, remnants of ventilation systems, including ducts, facades, and roof grilles, indicate the need for airflow due to industrial dust and fumes (ventilation A and C). Rainwater pipes are carefully placed in the rhythm of the windows. |
| **Spirit of the place** | represents the historical meaning and later decline of industry in the Netherlands (+)  | represents Story of Kloos (125 years) (+)   | | | | Graffiti - free expression (+/-)  | potential (reinvigoration of) entrepreneurial spirit (+)  | Craftsmanship , life behind factory, company cares for employees, big industrials shape social structure (+)  | industrial site is isolated due to the dike shape and abandonment (+/-)  | | The name of Kloos still has a lot of meaning in the direct surroundings. And is still strongly connected to the the company and lifestyle as to the specific site. (+) | With the remains of what once was the Company of Kloos, this site still breathes the industrial past that it has. And is in name also still experienced in the surroundings. By the use of rough materials and its placement on the waterfront the site still has a very industrial character. This character is strengthened by the addition of graffiti in the time that the building has been abandoned. In general the location of Kloos still has the spirit of an industrial site. |
| ***CONCLUSION*** | little to no artifacts are left on site besides the steel halls. Both buildings and their surroundings are characterized by considerable decay, its causes ranging between fire damage, nature impact, moisture and graffiti. | The site of Kloos is situated close to places of historic interest, such as Kinderdijk and the city of commerce of Dordrecht. On the site there are still the remains of the company of Kloos. Part of the building is still in original state, representing the history of this site. The site itself has changed overtime due to several expansions of Kloos. With the remaining structures the history and working process of Kloos are still visible. | The Alblasserwaardpolder and uiterwaard typology brings unique fauna and flora. The 'wielen' in the area - Oosteromse Wiel and Rijzenwiel - are the result of the flood disaster and thus visible remnants of the history of the place. Paristic green conquering the industrial site can be seen as a problem, as well as an artistic element | Regardless of the nearby UNESCO World Heritage Site and the important trade route, the Kloossite itself is quite isolated politically speaking | In the halls of Kloos, the scientific knowledge can be seen in the bolted structures manufactured, as well as the cranes. | The scale of the factory relative to its surroundings is remarkable. From the street, the factory dominates in size and is disproportionate to the houses | The location of the site in a dense area of the Netherlands and on the waterfront gives the most economic value to Kloos. Furthermore closeness of Kinderdijk and the historic meaning of the site itself, give it economic value, for example in tourism opportunities. | The character of the Kloossite has been former by the former factory it housed. Socially, the function had a large impact on the building and its environment. The social structure of industrial companies formed the society and the strong feeling of connection with the former factory is still there. | The 260 m long factory, on an open and large site, is rare today. The factory makes no connection to the surrounding because it is outside the embankment.  | the use value of the large location on the riverbank, existing grid, stelcon floorplates and the steel construction of the industrial hall is quite high, as all these provide good (re)use potential | | |

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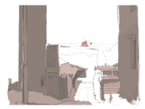
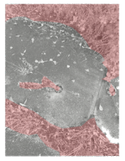
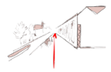
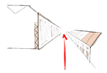
| **surroundings** | Ablasserwaardpolder (Everything ranging from old water management (Windmills) to water breach consequences (Wielen)) (+)  | Kinderdijk, Trading/industrial city Dordrecht, Ablasserwaard & 3 riverpoint (+)  | Ablasserwaardpolder and uiterwaard typology bring unique fauna and flora (also wielen) (+)  | UNESCO heritage site (sight lines, heightlimit) nitrogen and pollution, dikeregulation (Rijkswaterstaat), natura 2000, logistical node (-)   | rich engineering expertise: mills, shipwarfs, dredging (+) | De Stijl architecture, church, windmills (+)  | income from Tourism, offers opportunities for housing shortage of Alblasserdam (+) | civil Participation in redevelopment, historical babystory folklore (+) | massive presence of maritime craftsmanship in the Waterdriehoek (+) | Dikes as water protection, massive use of the river Noord for shipping traffic (+) | |
| **site** | The site is now signified by decay, rubbish is laying around and nature is taking over (-)  | The Waterline has changed a lot due to expansion of company (+)<br>On the site, there are still four railtracks present (+)  | Nature has been conquering the site slowly (-)  | The site has a difficult position in the politics of Alblasserdam. There is a conflict between the wishes of the municipality and the developers (-) | | The quay horizon is wide and open (+)  <br>The dike horizon is closed of by the housing and creates a border for the surrounding (-)  | Being a large consolidated site, there are many opportunities for developpers (+) | | slenderness results in parallel buildings to dike/water (+)  | Concrete slabs suitable for reuse (+)  | |
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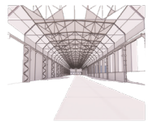
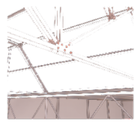
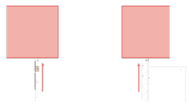
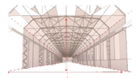
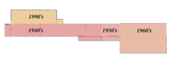
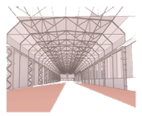
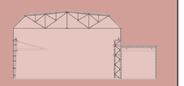
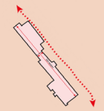
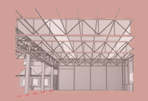
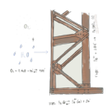
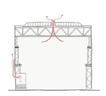
| **structure** | The steel Framework & truss structure is over-dimensioned and seems structurally sound, connections have rusted stuck (+/-)  | construction material and attachment methods are indicative of their construction period. (+/-)  | | | the construction method of bolted constructions was typical of early 20th century steel structures(+/-)  | construction creates long sightlines, rythm (grid) and visible interior tectonics (+)  | over-dimensioned structure provides potential material or functional reuse of materials (+)  | | combination of steel and bricks is not rare for (early 20th century) industrial halls(-)  | structural state is unknown but can be used for the rythm it creates (+)  | looks quite new, water & fire damage in some areas (-)  |
| **space plan** | different functions located in different areas of the site, the spaceplan evolved, as demands changed over time(+/-)   | represents the historical Production order of differing steel structures.(+)   | | | | doors on the industrial halls create a dynamic relationship with the hall and its surroundings (+)  | Openness of the halls and massive doors create (economic) reuse potential(+)  | space plan provides an event space due to the curent abandonment, creating a periodic meeting point within the hall. (+/-)  | 260 m length of the hall parallel to dike and cay is extremely rare, most are built perpendicular to quay(+)  | the plan is extremely spacious and the historical segmentation of functions is still shown and can be used again (+/-)  | production line is historical and vacant but available for future use (+/-)   |
| **interior** | Fire damage in the big Montagehal and office(-)  | Rust covers the interiors(-)  | | | | Graffiti, natural decay and the visibility of all the pipes  | | | | Massive doors in the high industrial halls (+)  | |
| **services** | Broken crane in montagehal is incomplete  | remains of the crane show historical industrial process  | | | | | | | | Built-in ventilation into the roof and remains of heating and rainwater drains  | |
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