

Dutch Water
Defence Lines
UNESCO

Significant Boundary
Modification
Defence Line of
Amsterdam



Dutch Water Defence Lines
Significant Boundary Modification
Defence Line of Amsterdam (WHS 759)

Kingdom of the Netherlands



Ministry of Education, Culture and
Science

Dutch Water Defence Lines

Proposal for a
Significant Boundary
Modification of
the Defence Line
of Amsterdam
(WHS 759)

Dutch Water Defence Lines
Significant Boundary Modification of the Defence Line of Amsterdam (WHS 795)
and proposal for change of the property name to Dutch Water Defence Lines

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Report: Significant Boundary Modification of the Defence Line of Amsterdam WHS (759)

December 2018

By: The program office of the New Dutch Waterline and the program office of the Defence Line of Amsterdam

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Preface

It is with pride that I present to you the proposal for the Significant Boundary Modification of the Defence Line of Amsterdam. The dossier underlines the great cultural and historical value of this military heritage site at national and international level. The Dutch Water Defence Lines illustrate the unique use of water as a means of defence. The New Dutch Waterline complements the story of the Defence Line of Amsterdam in making the Outstanding Universal Value of the heritage site visible and accessible. The desired recognition as a UNESCO World Heritage Site places this Dutch heritage site within the international tradition.

The New Dutch Waterline represents values that are in our national genes: dealing with water is second nature to us. We live off water and we live with water. Water determines where we live, where we work, and how we travel. Water has a major influence on the way we live together in our country. The use of water as a means of defence is in keeping with this scenario. To us, it was the obvious solution to use water to defend our country: water as an ally. A layer of water 50 cm deep – too shallow for ships and too deep for men on horses – would be sufficient to keep the enemy at bay. Vulnerable points in the New Dutch Waterline were reinforced with forts. Because this use of water is unique throughout the world, we want to permanently preserve this originally military heritage site and highlight its special history.

The old military structure – one of the largest infrastructural interventions we have ever undertaken in the Netherlands – is now acquiring a new function. In the past decades, we have invested hundreds of millions of euros in repair and restoration in order to make this new function a reality. It is fantastic and heart-warming to learn how enthusiastically many public authorities, owners and entrepreneurs, civil-society organisations, volunteers, and local residents are working together to achieve this existing and desired World Heritage status. Millions of people now use the Defence Line of Amsterdam and the New Dutch Waterline as an outdoor recreational space, as an oasis of tranquillity and space in the hustle and bustle of the Netherlands and the Delta Metropolis. The extensive network of new entrepreneurs, organisations, owners, volunteers, and users that has been created forms a solid foundation for the conservation and use of this heritage site. In this way, the Defence Line of Amsterdam and the New Dutch Waterline constitute an important and permanent source of inspiration for public and spatial policy for our society and for our country.

The Dutch Water Defence Lines will go forward together, as living heritage.

Josan Meijers

Chair of the New Dutch Water Defenceline Committee,
Provincial Executive Councillor for Gelderland

Prologue

This document is the dossier for a significant modification of the boundaries of the Defence Line of Amsterdam World Heritage Site (759) and a proposal to change the name in Dutch Water Defence Lines. In 1996, the World Heritage Committee placed the Defence Line of Amsterdam on the World Heritage List, as the second World Heritage Site in the Netherlands. At the same time, the Netherlands submitted a supplement to the Tentative List of nominations. This also included the New Dutch Waterline. When the Dutch Tentative List was revised in 2011, the New Dutch Waterline was maintained, and the decision was made to nominate the Waterline as an extension of the Defence Line of Amsterdam. This decision is now being implemented. The government of the Netherlands puts forward the Significant Boundary Modification of the Defence Line of Amsterdam and at the same time proposes to inscribe the extended World Heritage Site under the name: Dutch Water Defence Lines.

Added value

The proposed extension enhances the Outstanding Universal Value, hereinafter referred to as: OUV, of the Defence Line of Amsterdam in two areas. Firstly, the construction of the New Dutch Waterline made greater use of the existing topography than the Defence Line of Amsterdam. The New Dutch Waterline cuts across different types of landscape. This makes the landscape dimension of the heritage site even more visible: the Waterline as an extensive and ingenious system of military defences by means of inundation, using characteristics and elements of the surrounding landscape. Secondly, the construction of the New Dutch Waterline already began in 1815, i.e. 65 years before the Defence Line of Amsterdam. The fortifications of the existing World Heritage Site are exceptional examples of the transitional period from brick construction to the use of non-reinforced and, later, reinforced concrete. The New Dutch Waterline completes this to form a comprehensive overview of military architecture between 1815 and 1940 that is rare in its completeness and spatial coherence.

The starting point for this significant boundary modification is the existing World Heritage Site, the Defence Line of Amsterdam. The precise boundary and area of the World Heritage Site, hereinafter referred to as: property, were recently laid down in a boundary clarification and specified by the World Heritage Committee in Manama (Bahrain) in 2018. The *Retrospective Statement of OUV* of the Defence Line of Amsterdam was specified in 2016 (40 COM 8.E). In addition to the extension to include the New Dutch Waterline, the proposed significant boundary modification includes a number of modifications of the boundary of the Defence Line of Amsterdam: we propose an extension in three locations and a diminution in seven locations.

Advisory Mission 2015

At the request of the submitter (hereinafter: State Party), an Advisory Mission by the advisory body of UNESCO (ICOMOS) took place in 2015. Both components of the proposed significant boundary modification were topic of discussion during this mission: the extension of the New Dutch Waterline and the boundary

modifications of the Defence Line of Amsterdam World Heritage Site. Specific attention was paid to protection and management aspects relating to spatial planning development. This Advisory Mission led to a positive conclusion concerning the extension of the New Dutch Waterline:

'The Defence Line of Amsterdam & the New Dutch Waterline together as an ensemble could show the wholeness of the defence system built during the contemporary historical period, from the early 19th Century to the middle of 20th Century'.

ICOMOS listed three examples of World Heritage Sites that had previously undergone significant expansion:

- The Mines of Rammelsberg, the Historic Town of Goslar, and the Upper Harz Regale Water Management System (Germany);
- The Loire valley between Sully-sur-Loire and Chalonnes (France);
- Levoča, Spišský Hrad, and the Associated Cultural Monuments (Slovakia).

In regard to the Defence Line of Amsterdam, the mission described both the economic pressure on the World Heritage Site and the instrument of protection, which has been significantly expanded and refined since the nomination in 1996. ICOMOS pointed out the importance of support among the stakeholders:

'It is recommended to show the importance of the meaning of heritage and its possible uses and citations within modern projects leading to pay more attention to its environment and to its value'.

On the grounds of this mission, ICOMOS was unable to answer definitively the questions of whether a separate 'minor boundary modification' would be an appropriate method for the proposal of the boundary modification of the Defence Line of Amsterdam, and how the protective effect in relation to developments in the surrounding area could be shaped.

Proposed minor boundary modification Defence Line of Amsterdam (2017)

In January 2017, the Netherlands submitted a proposal for a minor boundary modification of the Defence Line of Amsterdam World Heritage Site. The State Party was of the opinion that the proposal met the criteria listed by ICOMOS in the mission report as conditions for a minor modification boundary:

'A minor modification must not modify the basic parameters of the initial definition of the property relying upon the attributes expressing the OUV, which include (1) The tangible attributes expressing the core features and the history of the defence line: dykes, canal, hydraulic equipment, forts, logistic paths, etc. (2) The inundation zone all along the defence line itself, that is the main surface of the property that expresses continuity of the defensive flood arrangements (polders, water management, hydraulic know-how, etc.).'

ICOMOS evaluated the proposal and recommended that the World Heritage Committee not give its approval, pending a number of recommended actions to further support the protection and management of the World Heritage Site. The draft decision was adopted by the Committee during the meeting in Krakow in 2017 (41 COM 8.B/41). Directly following the rejection of the proposed minor boundary modification of the Defence Line of Amsterdam World Heritage Site by the World Heritage Committee, a consultation process was started with the World Heritage Centre and ICOMOS concerning the actions to be taken, in accordance with the recommendations of the committee. An exploratory meeting took place in Krakow on 10 July and was followed by a second meeting on 15 January 2018 in Paris. A decision was made that the extension and the minor modifications of the Defence Line of Amsterdam could be submitted in one dossier as a significant boundary modification, with the explicit mention that there would be no request to renominate the existing Defence Line of Amsterdam World Heritage Site. A report of the meeting on 15 January 2018 has been attached as appendix 7A.

Following the meeting on 15 January 2018 between the State Party and ICOMOS International and the World Heritage Centre, the proposed extension of the New Dutch Waterline and the small modifications to the boundary from the minor boundary modification of the Defence Line of Amsterdam were integrated in this significant boundary modification. Of course, the other recommendations of the World Heritage Committee and ICOMOS International were also incorporated, in particular those relating to the protection of the Outstanding Universal Value of the site.

Meeting of UNESCO WHC, ICOMOS International, and the Netherlands, 15 January 2018

In its decision in the summer of 2017, the World Heritage Committee, hereinafter referred to as the Committee, also insisted on meeting with and advice from the World Heritage Centre and ICOMOS. The State Party has gladly accepted, in particular any advice on how best to address and interpret the recommendations of the Committee. The Dutch delegation that met in Paris on 15 January 2018 had prepared a presentation on the subject. It included several of the Committees recommendations: character and setting of the two Dutch Water Defence Lines, the method of protection by means of World Heritage protection and spatial planning policy, a proposal to protect the OUV from developments outside of the boundaries ('buffering'). A number of cases that explain the Dutch practice of heritage protection and spatial planning development have also been discussed, the latter in line with UNESCO's recommendation for Historic Urban Landscape. These best practices for dealing with maintenance and development illustrate how the Netherlands preserves heritage sites and gives them a function in today's society.

We brought to mind that the Netherlands is very densely populated and that the Dutch Water Defence Lines are, in part, located in the highly dynamic, urban environment of Amsterdam and Utrecht, where new socioeconomic challenges keep presenting themselves. This is inherent to the nature of the heritage site: at the time, the Dutch Water Defence Lines were constructed to defend the

administrative and economic heart of the country and, since then, this heart has only expanded and begun beating more rapidly. Nevertheless, each time we have been able to apply our system of planning protection for the preservation of the heritage site successfully, exactly as described by UNESCO in the recommendations for the historical built-up environment. Our heritage sites are well protected, well maintained, and their importance has always been considered in decisions regarding new developments. There is broad support for this, among the competent authorities on all levels and among residents and users. Sections 4 and 5 of this dossier focus more closely on the topics discussed and the implementation of the recommendations of the WHC and ICOMOS.

Tradition of heritage protection

In the 26 years since the ratification of the World Heritage Convention, the Netherlands has always had a great deal of attention for World Heritage. At the time as a member of the committee (2003-2007) and continuing in the Netherlands Fund in Trust, through legislation and policy, and by adhering to the obligations of the Convention. All our World Heritage Sites are protected in the correct manner and have a management plan. Since 2013, the Heritage Impact Assessment has been the standard tool for the assessment of the impact of developments. In addition, we report all developments, at our own initiative, in accordance with section 172 of the Operational Guidelines. In order to maintain this level of commitment, we remain dependent on the support of the population and the public administration responsible for spatial planning developments.

We are investing heavily in this. With heritage sites of this size in an urban area, it is inevitable that the desire for preservation occasionally comes into conflict with the desire for further economic and social development. In cases such as these, we go to great lengths to reach an integral and balanced solution. There is, therefore, excellent cooperation between governments, businesses, and NGOs. In the past twenty years, awareness of the universal value of heritage sites has increased significantly. Research methods, approaches to design, and decision-making processes are well equipped for such an integral approach. In this nomination dossier, we describe how this approach has made us successful in the protection of our heritage in its dynamic environment. This requires faith in the precision of our actions, understanding of the context of the site, and a consistent and professional assessment.

Once-only extension

In conclusion: The Netherlands has several defence lines on the basis of inundation. These will be discussed in the comparative analysis (section 3.2). The Dutch government has stated that, following a thorough comparison, it has reached the conclusion that there are justifiable reasons to recommend the New Dutch Waterline to UNESCO as an extension of the Defence Line of Amsterdam. There are no plans to recommend other defence lines as World Heritage Sites at a later stage, either as separate nominations, or as extensions of the Dutch Water Defence Lines.



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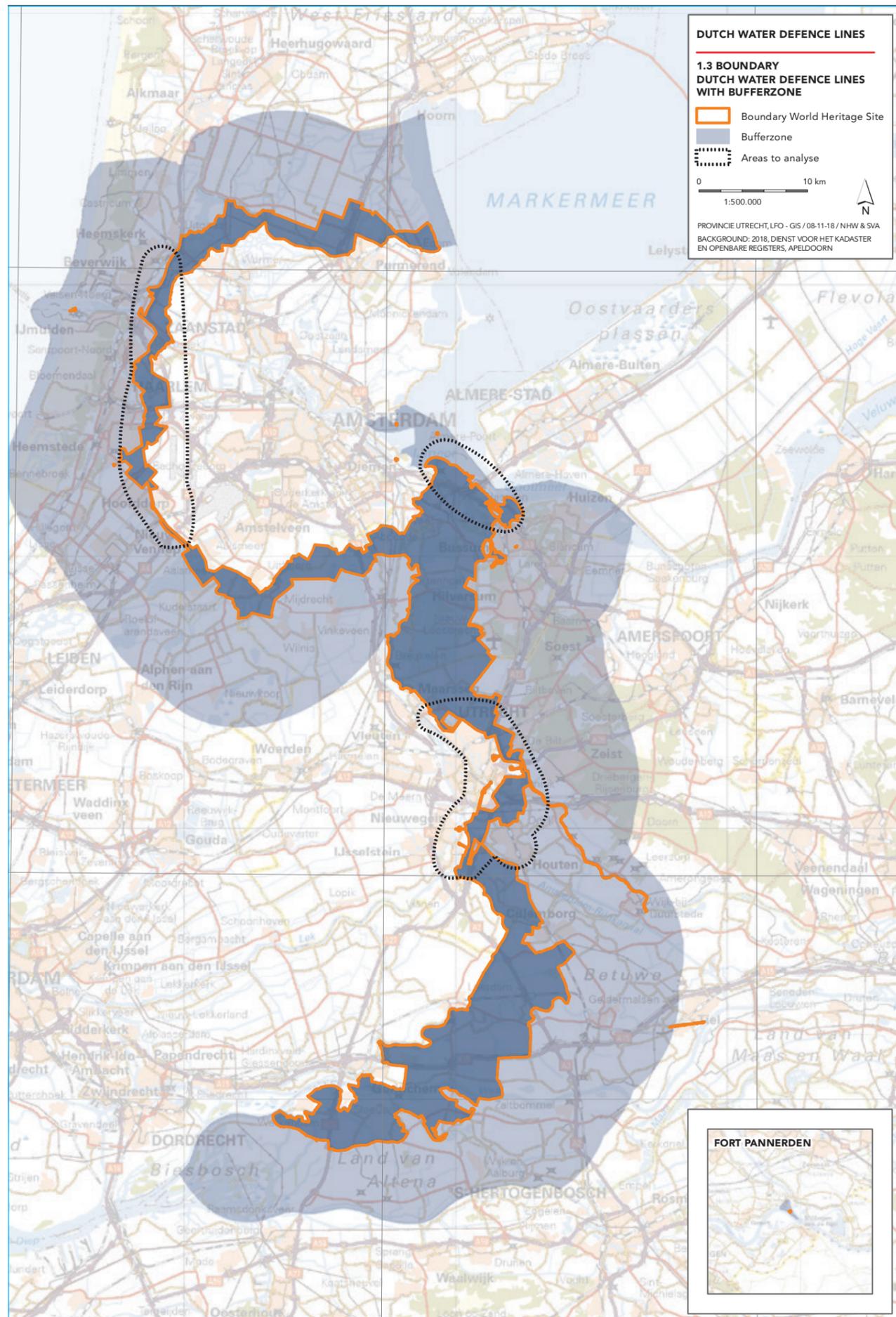
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Executive Summary



Country
Kingdom of the Netherlands

Province
Provinces of Noord-Holland, Utrecht, Gelderland, Noord-Brabant, and Zuid-Holland

Name of the World Heritage Property
Dutch Water Defence Lines

Geographical coordinates
Edam: 52.505556, 5.063889
IJmuiden: 52.458611, 4.619444
Muiden: 52.329167, 5.071389
Fort Vechten: 52.058611, 5.168333
Woudrichem: 51.812778, 5.000278

Textual description of the World Heritage Property
The site consists of the Defence Line of Amsterdam, already a World Heritage Site, extended to include the New Dutch Waterline. The extension mostly consists of a contiguous area stretching from Muiden (in the north) as far as the Biesbosch nature reserve (in the south). Three small separate attributes are also added, in addition to the five separate attributes of the current World Heritage Site: Werk IV in Bussum, Tiel Inundation Canal, and Fort Pannerden.

A4 maps showing the World Heritage Property
Maps 1.4 – 1.12, 2.1 - 2.5, 4.1 en 5.1

Criteria on the basis of which the World Heritage Site has been nominated
Criteria (ii), (iv), and (v)

Statement of Outstanding Universal Value

a) Brief synthesis

The Dutch Water Defence Lines form a complete defence system that extends over 200 km along the edge of the administrative and economic heartland of Holland, consisting of the elongated New Dutch Waterline and the Defence Line of Amsterdam defensive ring. Built between 1815 and 1940, the system consists of an ingenious network of 96 forts, acting in concert with an intricate system of dikes, sluices, pumping stations, canals and inundation polders, and is a major example of a fortification based on the principle of temporary flooding of the land. Since the 16th century, the people in the Netherlands have used their special knowledge of hydraulic engineering for defence purposes. The polders along the line of fortifications each has its own inundation facilities.

The water level was a critical factor in the success of the Dutch Water Defence Lines; the water had to be too deep to wade through and too shallow for boats to sail on.

Because the Dutch Water Defence Lines have continually been adapted to the development of defence techniques and knowledge of hydraulics, they offer a complete and unique insight in a 125-year period of military water management in combination with fortifications. The extraordinary consistency of the Strategically Deployed Landscape, Water Management System, and Military Fortifications is still clearly visible. The New Dutch Waterline contains well-preserved, extraordinary water management structures, including the first fan sluice, a type of sluice that was later used worldwide. The Defence Line of Amsterdam includes forts that have an important place in the development of military engineering worldwide: They mark the shift from the conspicuous brick/stone casemated forts of the Montalembert tradition, in favour of the steel and concrete structures that were to be brought to their highest level of sophistication in the Maginot and Atlantic Wall fortifications. The combination of fixed positions with the deployment of mobile artillery to the intervals between the forts was also advanced in its application.

b) Justification for the criteria

Criterion (ii) The Dutch Water Defence Lines are an exceptional example of an extensive integrated European defence system of the modern period which has survived intact and well conserved since it was created from the beginning of the 19th century. It is part of a continuum of defensive measures that both anticipated its construction and were later to influence some portions of it immediately before and after World War II.

Criterion (iv) The Dutch Water Defence Lines are an outstanding example of an extensive and ingenious system of military defence by inundation, that uses features and elements of the country's landscape. The well-preserved collection of fortifications in the context of the surrounding landscape is unique in the European history of (military) architecture. The forts illustrate the development of military architecture between 1815 and 1940, in particular the transition from brick construction to the use of reinforced concrete in the Defence Line of Amsterdam. This transition, with its experiments in the use of concrete and emphasis on the use of non-reinforced concrete, is an episode in the history of European architecture of which material remains are only rarely preserved.

Criterion (v) The Dutch Water Defence Lines form an extraordinary example of the Dutch expertise in landscape design and hydraulic engineering. They are notable for the unique way in which hydraulic engineering has been incorporated into the defences of the administrative and economic heartland of the country, including the nation's capital city.

c) Statement of integrity

The Dutch Water Defence Lines and their individual attributes are a complete, integrated defence system. The defence system has not been used for military purposes since World War II and is formally out of operation since 1963. The main defence line and inundation fields remain clearly recognisable in the landscape, because many of these attributes also had a civil function. The characteristic openness of the inundation fields is preserved integrally in the parts of the Dutch Water Defence Lines where the pressure of spatial development was low after its military use has ended. Especially in more urbanised areas, policy has been developed to safeguard the visual integrity of the inundation fields and the main defence line. Inundation fields that have lost their visual integrity have not been incorporated in the property.

The range of hydraulic works and the military fortifications that supported the inundation system is a complete and intact entity, in mutual connection and in relation to the landscape. The series of forts, batteries and ramparts make up a group of connected buildings in which the consecutive phases of military architecture are clearly recognisable. As the surrounding area of each fort was a restricted military zone for many decades, its setting has been preserved through planning development control, although it could in the future be vulnerable to development pressures.

d) Statement of authenticity

The Dutch Water Defence Lines still are a coherent man-made landscape, one in which natural elements such as water and soil have been incorporated by man into a built system of engineering works, creating a clearly defined military landscape. The military use has been terminated, but the landscape and built attributes are still present. The large majority of fortifications has been preserved

as they were designed and specified. The Outstanding Universal Value is expressed in the authenticity of the design (the typology of forts, sluices, batteries, line ramparts), of the specific use of building materials (brick, non-reinforced concrete, reinforced concrete), of the workmanship (meticulous construction apparent in its constructional condition and flawlessness), and of the structure in its setting (as an interconnected military functional system in the manmade landscape of the polders and the urbanised landscape).

Since the nineties the defence line and its individual attributes are being maintained, restored, made accessible, put to use and exploited sustainably. There have been no major reconstructions, for educational purposes, some attributes have been refurbished and are recognisable as such. A great number of forts now has an educational, economical or recreational function. The military history remains tangible, because the story of the Dutch Water Defence Lines continues to be told in the area and through various media.

e) Protection and management

The national government obliges provinces and municipalities to include the preservation of Outstanding Universal Value in regional and local plans and legislation. The basis for this obligation lies in the Spatial Planning (General Rules) Decree (*Besluit algemene regels ruimtelijke ordening*, or Barro) and, from 2021, the Environment and Planning Act already adopted. In addition, all structures of the New Dutch Waterline are protected as nationally listed buildings, and the connection with the landscape is also protected through clustering of these structures. A number of built attributes of the Defence Line of Amsterdam are also protected as nationally listed buildings; the remaining built attributes in the Defence Line of Amsterdam are protected as provincially listed buildings. In all these cases, there is a licensing requirement for architectural and spatial planning developments, which is linked to the preservation of the monumental character.

Together, the provinces of Noord-Holland, Utrecht, Gelderland, and Noord-Brabant act as site-holder of the Dutch Water Defence Lines. The administrative portfolio holders of these provinces work together in the Dutch Water Defence Line Committee. Actual implementation is currently in the hands of two project offices, namely the project office for the Defence Line of Amsterdam and the programme office for the New Dutch Waterline. The two management organisations will merge to form one joint executive organisation (starting 1/7/2020), which will be executing the comprehensive management plan.

The Dutch Water Defence Lines protected the economic and administrative heartland of the Netherlands. The pressure of urban development is great in some parts, in particular where the defence system was constructed a short distance from urban areas. Developments are only permitted if they fall within the planning framework and they have been designed in such a way that they preserve or

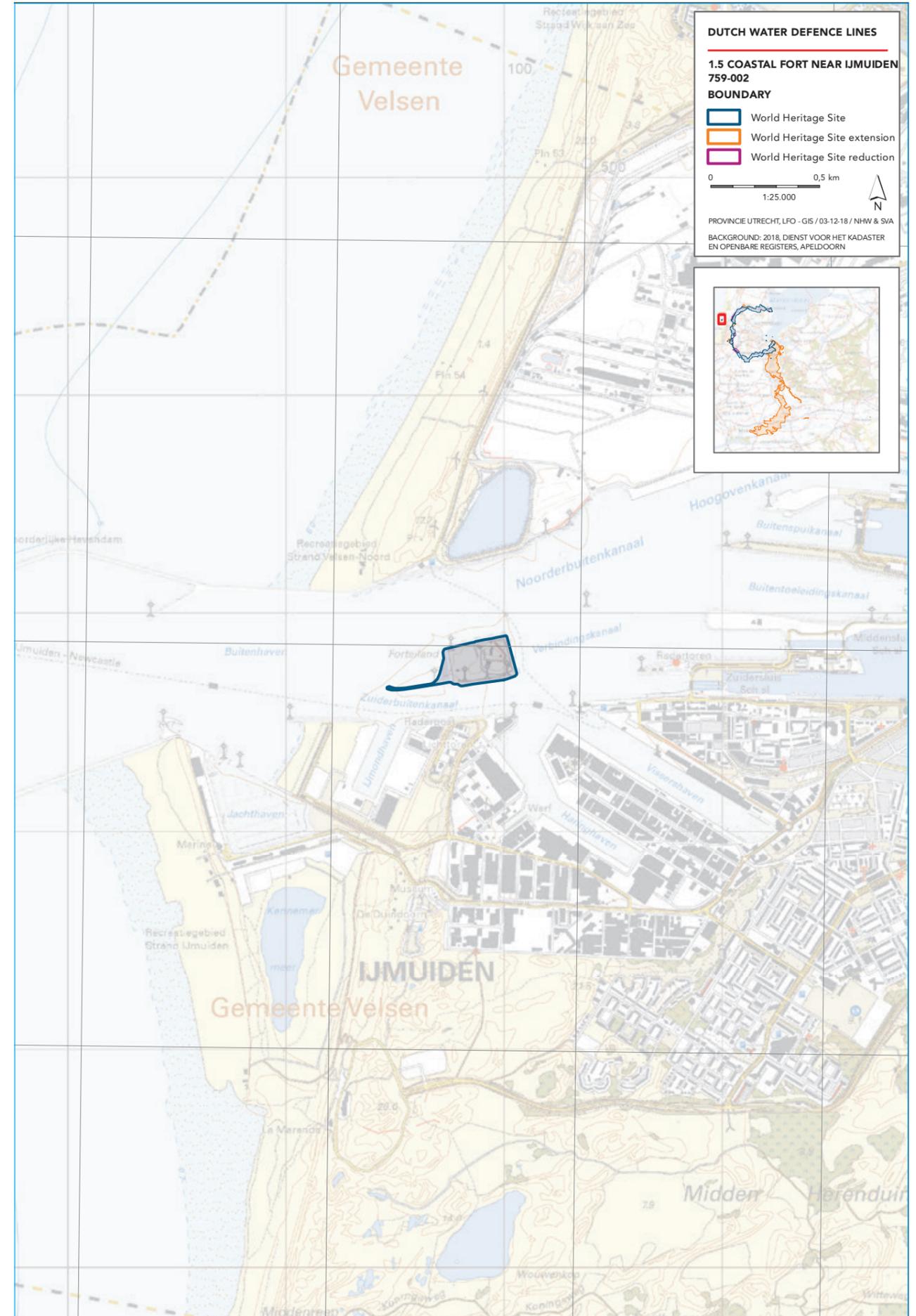
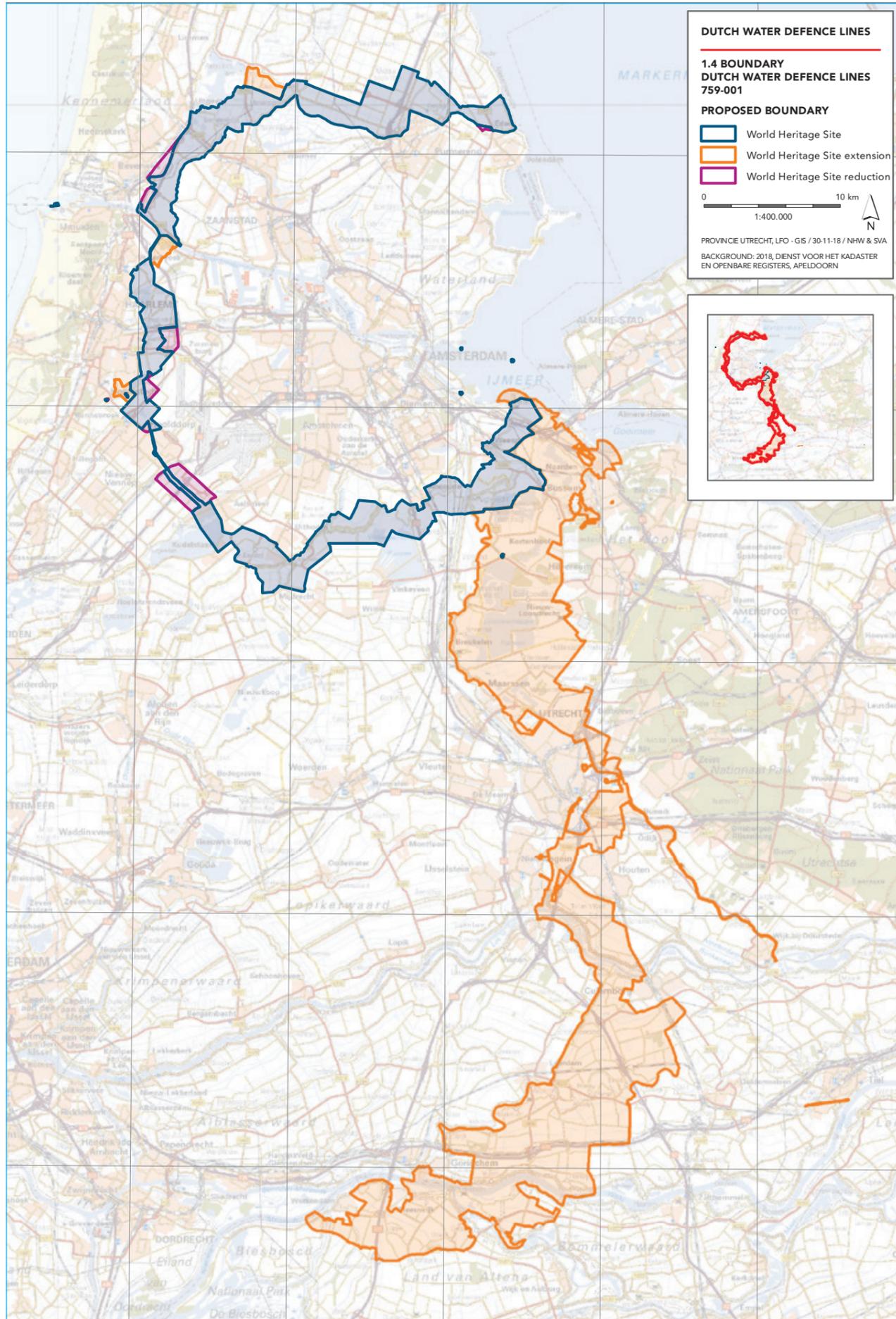
reinforce the OUV. This requires of the site-holder and other governments involved a meticulous consideration and precise assessment against the integrity and authenticity of the World Heritage Site. For this, checks and balances have been integrated. Large-scale initiatives with a potentially large impact are subjected to a Heritage Impact Assessment (HIA). A strategic HIA of the relation to the World Heritage Site is carried out in the case of potentially far-reaching developments (such as energy transition).

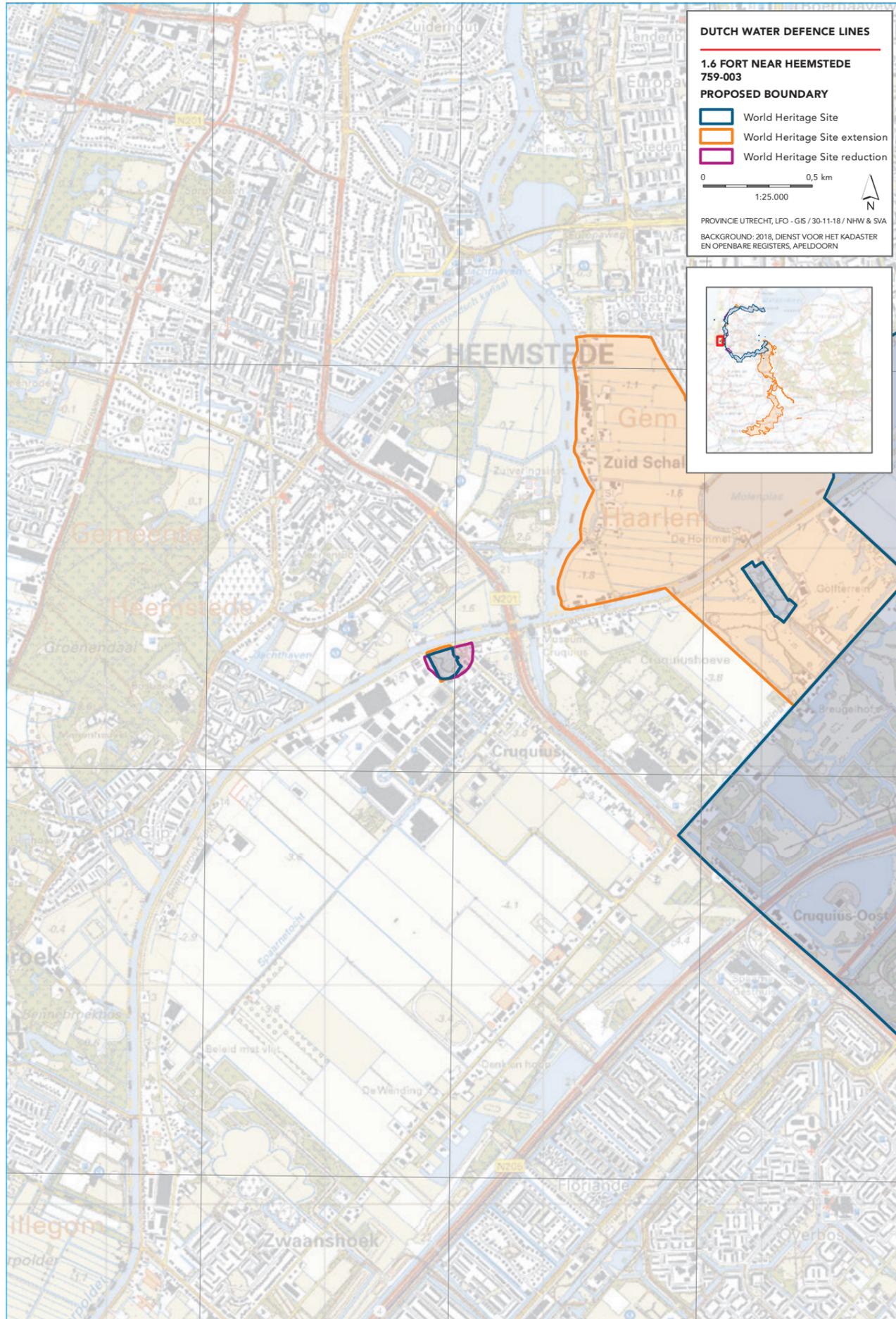
Recommendations from independent experts are structurally enshrined in the process, both on the level of the World Heritage Site (spatial quality advisory team), the provincial level (provincial spatial quality advisor), and the local level (building aesthetics committee and listed buildings committee).

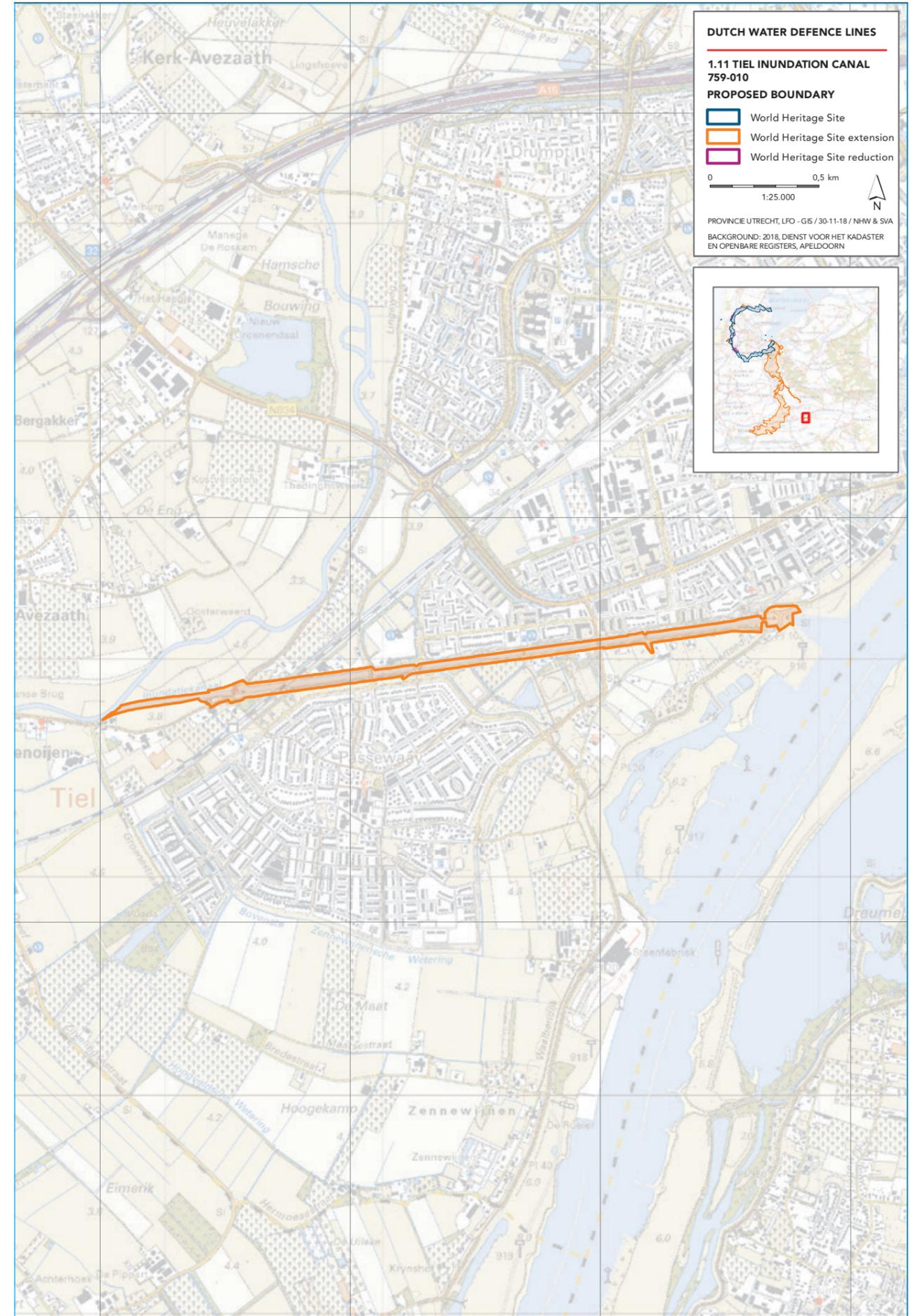
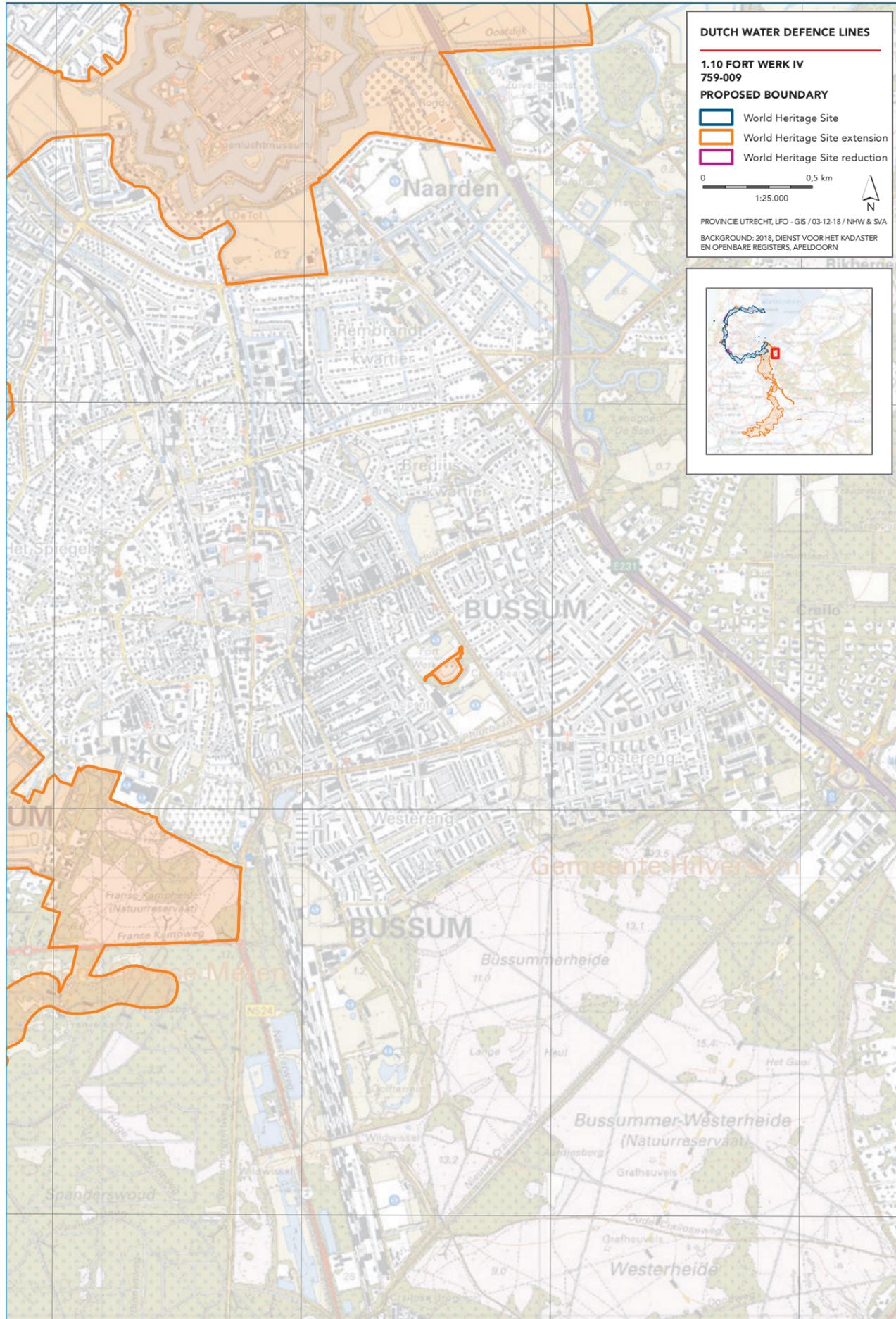
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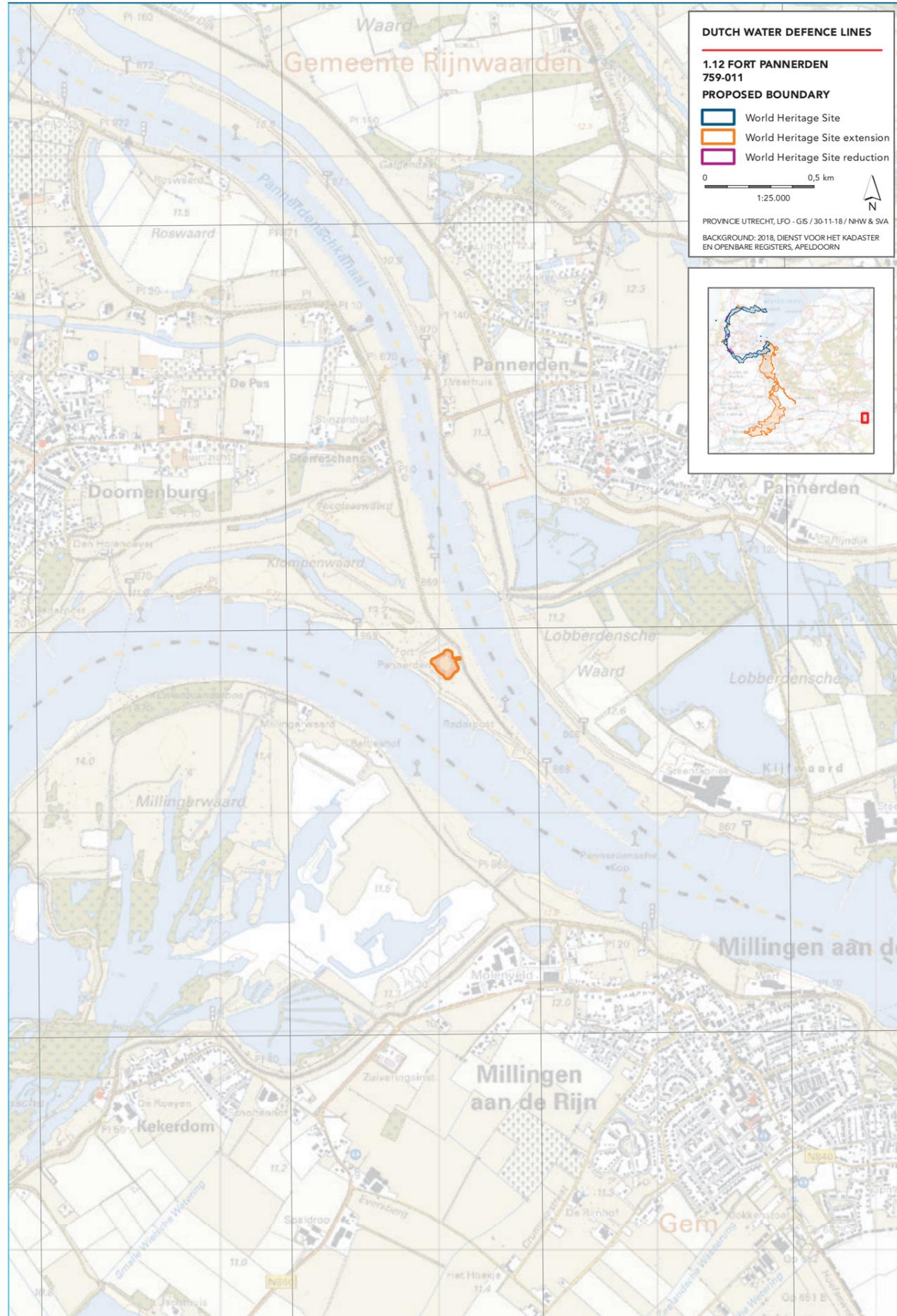
ID No	Name of Component Part	Region(s)/ District(s)	Coordinates of the central point	Area of Nominated component of the Property (ha)	Bufferzone (ha)	Map No
759-001	Dutch Water Defence Lines, consisting of existing The Defence Line of Amsterdam and the extension New Dutch Waterline ID No 759-001: – Fort near Edam (01) – Fort near Marken-Binnen (08) – Fort near Uithoorn (31) – Muiden West Battery (41) – Fortified town of Naarden (47) Including: ID No 759-004: – Advanced fort near Vijfhuizen (22) ID No 759-008: – Fort Kijkuit (42) Extension New Dutch Waterline: ID No 759 Bis – Fort along the Klop (56) – Fort near Rijnauwen (68) – Fort Everdingen (80) – Fort near Asperen (82) – Fort Steurgat (94)	Noord-Holland Utrecht Gelderland Noord-Brabant Zuid-Holland	52 7 45.14 °N 5 1 27.45 °E Coordinates 01: 52 31 4.59 °N 5 4 2.84 °E Coordinates 08: 52 32 1.62 °N 4 46 52.60 °E Coordinates 31: 52 13 40.83 °N 4 50 16.03 °E Coordinates 41: 52 20 9.59 °N 5 4 0.74 °E Coordinates 47: 52 17 42.24 °N 5 9 41.14 °E Coordinates 22: 52 20 23.73 °N 4 39 14.87 °E Coordinates 42: 52 14 9.10 °N 5 3 32.17 °E Coordinates 56: 52 7 10.49 °N 5 5 19.78 °E Coordinates 68: 52 4 30.18 °N 5 10 37.07 °E Coordinates 80: 51 57 43.42 °N 5 10 32.40 °E Coordinates 82: 51 52 37.25 °N 5 7 14.93 °E Coordinates 94: 51 47 59.58 °N 4 52 7.02 °E	54,746.78 ha Defence Line of Amsterdam 17,559.97 ha. including the MBM of – 536.20 ha.) = 17,023.77 ha Extension New Dutch Waterline: +37,723.01 ha	191,630.82 ha.	1.4
759-002	Coastal Fort near IJmuiden (15)	Noord-Holland	52 27 53.73 °N 4 34 33.60 °E	6.30 ha	see bufferzone Main Defence Lines	1.5
759-003	Fort near Heemstede (21)	Noord-Holland	52 20 12.62 °N 4 37 56.36 °E	1.52 ha (2.43 ha – 0.91 ha)	see bufferzone Main Defence Lines	1.6
759-005	Works along the IJ before Diemerdam (43)	Noord-Holland	52 20 34.61 °N 5 0 49.25 °E	2.30 ha	4.53 ha	1.7

ID No	Name of Component Part	Region(s)/ District(s)	Coordinates of the central point	Area of Nominated component of the Property (ha)	Bufferzone (ha)	Map No
759-006	Fort along the Pampus (44)	Noord-Holland	52 21 53.24 °N 5 4 8.18 °E	2.64 ha	see bufferzone Main Defence Lines	1.8
759-007	Works along the IJ before Durgerdam (Vuurtoeneiland; 45)	Noord-Holland	52 22 20.58 °N 5 0 49.28 °E	1.81 ha	see bufferzone Main Defence Lines	1.9
759-009	Fort Werk IV (48)	Noord-Holland	52 16 17.03 °N 5 10 33.65 °E	1.13 ha	see bufferzone Main Defence Lines	1.10
759-010	Tiel Inundation Canal	Gelderland	51 52 35.20 °N 5 24 26.17 °E	15.54 ha	see bufferzone Main Defence Lines	1.11
759-011	Fort Pannerden (95)	Gelderland	51 52 51.33 °E 6 1 36.15 °E	1.00 ha	87.29 ha	1.12
Total area				54,779.02 ha	191,722.63 ha	









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1

Identification of
the property

1.a Country

Kingdom of the Netherlands.

1.b State, province or region

Provinces of Noord-Holland, Utrecht, Gelderland, Noord-Brabant and Zuid-Holland.

1.c Name of the site

Dutch Water Defence Lines

1.d Geographical coordinates

The proposed World Heritage Site, the Dutch Water Defence Lines, consists of one large and continuous zone of the Defence Line of Amsterdam and the New Dutch Waterline, and eight small, isolated components.

- Component 759-001: main defence zone, consisting of the Defence Line of Amsterdam and the New Dutch Waterline
- Component 759-002: Coastal Fort near IJmuiden (15)
- Component 759-003: Fort near Heemstede (21)
- Component 759-005: Works along the IJ before Diemerdam (43)
- Component 759-006: Fort along the Pampus (44)
- Component 759-007: Works along the IJ before Durgerdam (Vuurtoreneiland; 45)
- Component 759-009: Fort Werk IV (48)
- Component 759-010: Tiel Inundation Canal
- Component 759-011: Fort Pannerden (95)

Numbers behind the components refer to numbering of the forts on the maps.

Geographical coordinates to the nearest second

ID No	Name of Component Part	Region(s)/ District(s)	Coordinates of the central point	Area of Nominated component of the Property (ha)	Bufferzone (ha)	Map No
759-001	Dutch Water Defence Lines, consisting of existing The Defence Line of Amsterdam and the extension New Dutch Waterline ID No 759-001: - Fort near Edam (01) - Fort near Marken-Binnen (08) - Fort near Uithoorn (31) - Muiden West Battery (41) - Fortified town of Naarden (47) Including: ID No 759-004: - Advanced fort near Vijfhuizen (22) ID No 759-008: - Fort Kijkuit (42) Extension New Dutch Waterline: ID No 759 Bis - Fort along the Klop (56) - Fort near Rijnauwen (68) - Fort Everdingen (80) - Fort near Asperen (82) - Fort Steurgat (94)	Noord-Holland Utrecht Gelderland Noord-Brabant Zuid-Holland	52 7 45.14 °N 5 1 27.45 °E Coordinates 01: 52 31 4.59 °N 5 4 2.84 °E Coordinates 08: 52 32 1.62 °N 4 46 52.60 °E Coordinates 31: 52 13 40.83 °N 4 50 16.03 °E Coordinates 41: 52 20 9.59 °N 5 4 0.74 °E Coordinates 47: 52 17 42.24 °N 5 9 41.14 °E Coordinates 22: 52 20 23.73 °N 4 39 14.87 °E Coordinates 42: 52 14 9.10 °N 5 3 32.17 °E Coordinates 56: 52 7 10.49 °N 5 5 19.78 °E Coordinates 68: 52 4 30.18 °N 5 10 37.07 °E Coordinates 80: 51 57 43.42 °N 5 10 32.40 °E Coordinates 82: 51 52 37.25 °N 5 7 14.93 °E Coordinates 94: 51 47 59.58 °N 4 52 7.02 °E	54,746.78 ha Defence Line of Amsterdam 17,559.97 ha. including the MBM of - 536.20 ha.) = 17,023.77 ha Extension New Dutch Waterline: +37,723.01 ha	191,630.82 ha.	1.4
759-002	Coastal Fort near IJmuiden (15)	Noord-Holland	52 27 53.73 °N 4 34 33.60 °E	6.30 ha	see bufferzone Main Defence Lines	1.5
759-003	Fort near Heemstede (21)	Noord-Holland	52 20 12.62 °N 4 37 56.36 °E	1.52 ha (2.43 ha - 0.91 ha)	see bufferzone Main Defence Lines	1.6
759-005	Works along the IJ before Diemerdam (43)	Noord-Holland	52 20 34.61 °N 5 0 49.25 °E	2.30 ha	4.53 ha	1.7

ID No	Name of Component Part	Region(s)/ District(s)	Coordinates of the central point	Area of Nominated component of the Property (ha)	Bufferzone (ha)	Map No
759-006	Fort along the Pampus (44)	Noord-Holland	52 21 53.24 °N 5 4 8.18 °E	2.64 ha	see bufferzone Main Defence Lines	1.8
759-007	Works along the IJ before Durgerdam (Vuurtooreneiland; 45)	Noord-Holland	52 22 20.58 °N 5 0 49.28 °E	1.81 ha	see bufferzone Main Defence Lines	1.9
759-009	Fort Werk IV (48)	Noord-Holland	52 16 17.03 °N 5 10 33.65 °E	1.13 ha	see bufferzone Main Defence Lines	1.10
759-010	Tiel Inundation Canal	Gelderland	51 52 35.20 °N 5 24 26.17 °E	15.54 ha	see bufferzone Main Defence Lines	1.11
759-011	Fort Pannerden (95)	Gelderland	51 52 51.33 °E 6 1 36.15 °E	1.00 ha	87.29 ha	1.12
Total area				54,779.02 ha	191,722.63 ha	

1.e Maps and plans, showing the boundaries of the nominated property and buffer zone

Maps (A4 and A0):

- 0.1 Europe and the Dutch Water Defence Lines
- 1.1 Netherlands and the Dutch Water Defence Lines
- 1.2 The Defence Line of Amsterdam whs and its proposed extensions and reductions within the Netherlands
- The boundaries of the existing defence line of Amsterdam whs
- 1.3 the Dutch Water Defence Lines and their buffer zone
- 1.4-1.12 detailed maps (1:25,000), showing the boundaries of the nominated property and its buffer zone

1.e.1 Boundary clarification Defence Line of Amsterdam

There have been many years of uncertainty concerning the precise boundaries and the area of the Defence Line of Amsterdam at the time of the inscription on the UNESCO World Heritage List in 1996. In April of 2018, a *definitive boundary clarification* was drawn up by the State Party and submitted to the World Heritage Centre. During the 42nd meeting of the World Heritage Committee in Manama (Bahrain), the boundary clarification was set. The boundary forms the basis for all the map material.

1.e.2 Boundaries of the Dutch Water Defence Lines

The proposed new boundaries consist of a significant extension to include the New Dutch Waterline and three isolated components, plus a number of modifications to the Defence Line of Amsterdam. The latter includes both small extensions and a few reductions. The extensions and reductions correspond with the proposals previously made in a minor boundary modification (December 2016) and were not approved in 2017 by the World Heritage Committee (41 COM) in Krakow. Section 2.a.4 deals extensively with the proposed extensions and reductions and their justification. An explanation is also offered of how the recommendations of the Committee are to be met.

1.e.3 Buffer zone of the Dutch Water Defence Lines

The recommendations of the World Heritage Committee in decision 41 COM 8B.46 also include the recommendation to take into consideration the establishment of a buffer zone. A similar recommendation was also included in the advice of ICOMOS concerning the Defence Line of Amsterdam and in the report of the ICOMOS Advisory Mission to the Defence Line of Amsterdam and the New Dutch Waterline (2015).

The State Party had seriously studied the possibilities for this, but nevertheless concluded in the minor boundary modification that the establishment of an additional buffer zone was neither necessary nor possible. Now that the Committee has again voiced this recommendation, the Dutch national government and the provincial governments concerned have re-examined this issue. They have concluded that the existing regimes surrounding the entire site have a strongly protective effect and are mapped out as such. The desired protective effect is provided by numerous existing policy frameworks including provincial by-laws, municipal zoning plans, urban and village conservation areas, national and provincial listed buildings, Natura 2000, Natuur Netwerk Nederland [Nature Network Netherlands], and the contours of Schiphol airport.

In addition, the Environment and Planning Act, which comes into effect on 1 January 2021, includes the provision that World Heritage property must be taken into account, both within the boundaries of the site and outside of it. This offers the provinces or the site-holder the option of setting up frameworks for any degradation of the OUV by developments outside of the World Heritage Site. In addition, the site-holder recognises ICOMOS/UNESCO's reasoning that protection in the vicinity of highly dynamic areas deserves additional attention. Therefore, area analyses have been drawn up of the highly dynamic areas. These are further elaborations of the OUV, which may be used for the assessment of future developments in and around the site. These area analyses have an additional effect of creating a framework, if this is necessary for the protection of the OUV. The areas for which these elaborations have been drawn up are shown on the map in the form of an ellipse. The emphasis is on the protection of the visual integrity of the World Heritage Site, including by outside influence. This is based on the recommendation of the Spatial Quality Advisory Team on Visual Integrity. The recommendation emphasised the importance of open sightlines from and between forts, the recognisability of the World Heritage Site from the surroundings, the coherence of the main defence line, and any buildings in the prohibited circles, lines of fire, and inundation areas.

1.f Area of the nominated property and proposed buffer zone

The area of the existing Defence Line of Amsterdam World Heritage Site is 17,576 ha¹. This includes Fort Kijkuit.

The nominated extension consists of:

– Component 759-001: extension with New Dutch Waterline	37,723.01 ha
– Components 759-001 & -003: extension of Defence Line of Amsterdam	705.88 ha
– Component 759-009: Fort Werk IV	1.13 ha
– Component 759-010: Tiel Inundation Canal	15.54 ha
– Component 759-011: Fort Pannerden	1.00 ha

The proposed reduction of the Defence Line of Amsterdam consists of 1,242.99 ha.

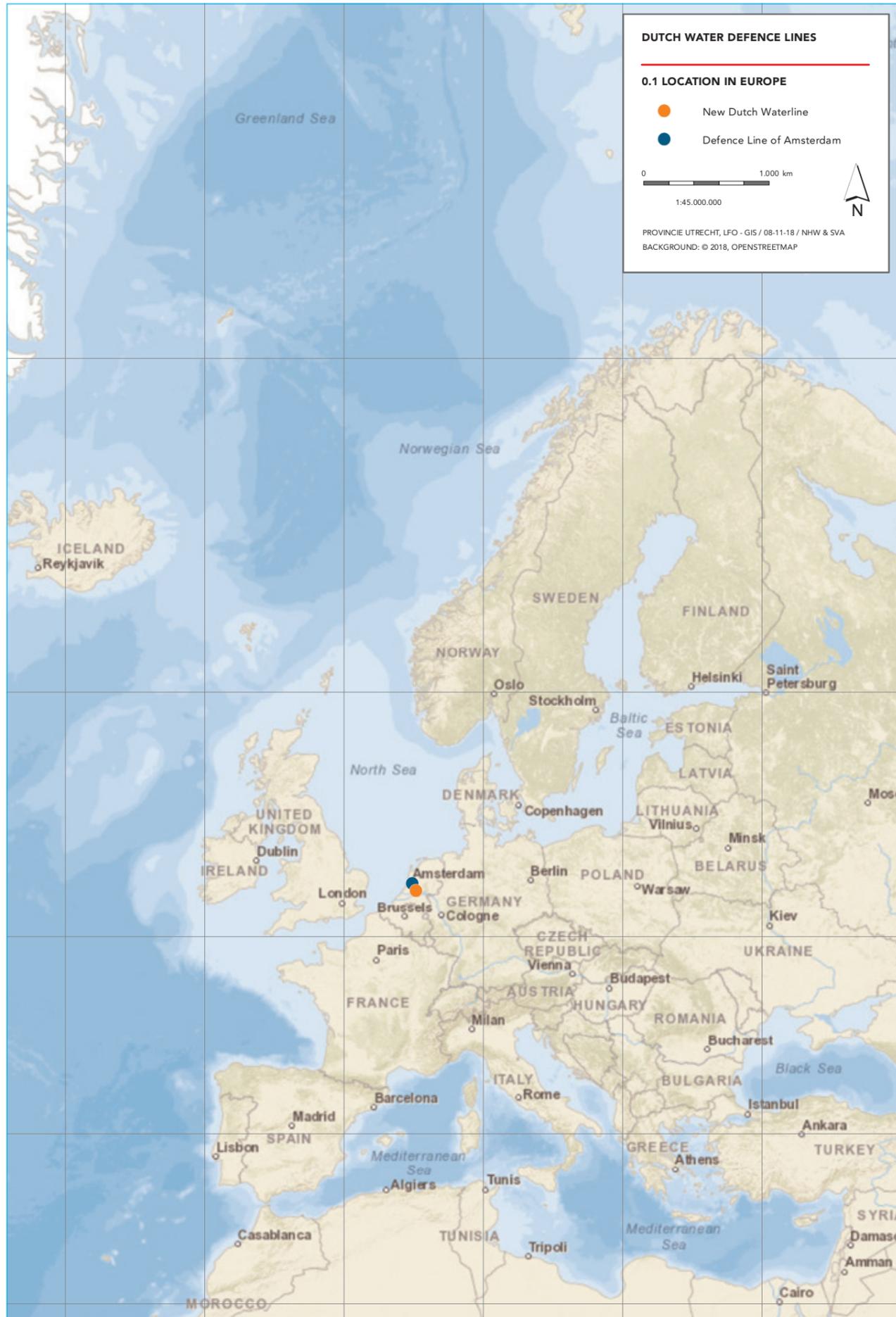
The proposed bufferzone covers an area of 191,722.63 ha.

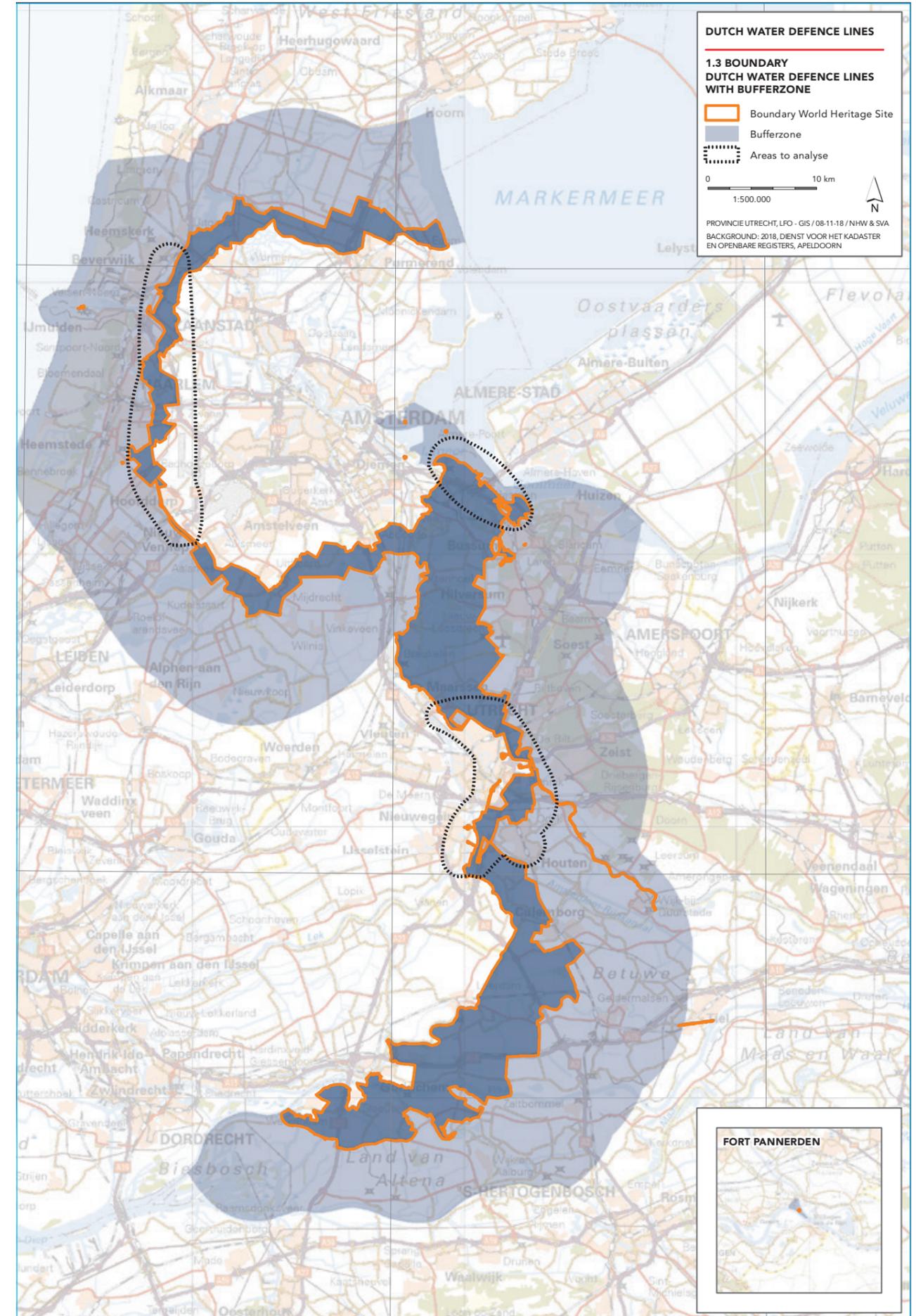
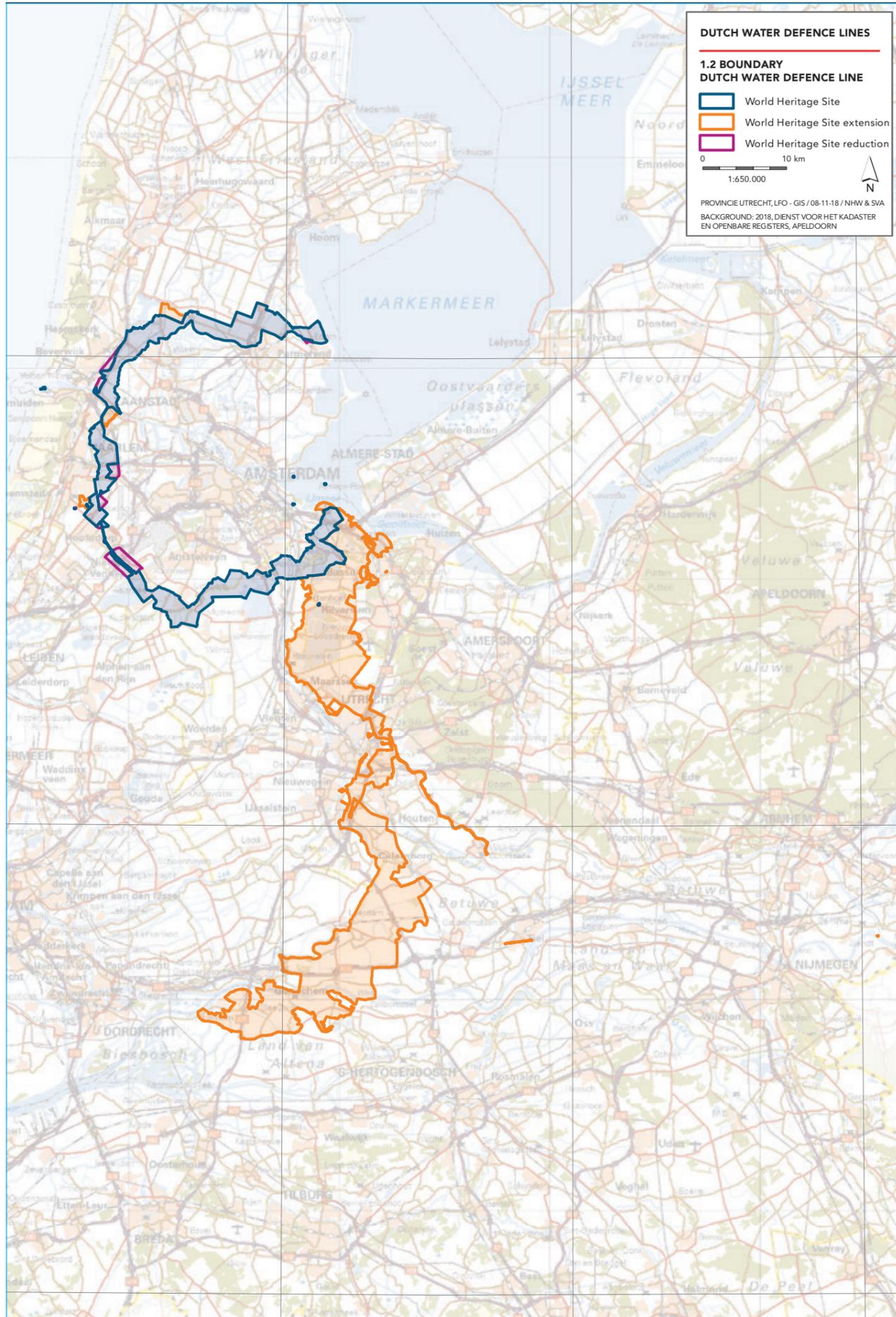
This brings the total proposed significant boundary modification to 37,203.58 ha.

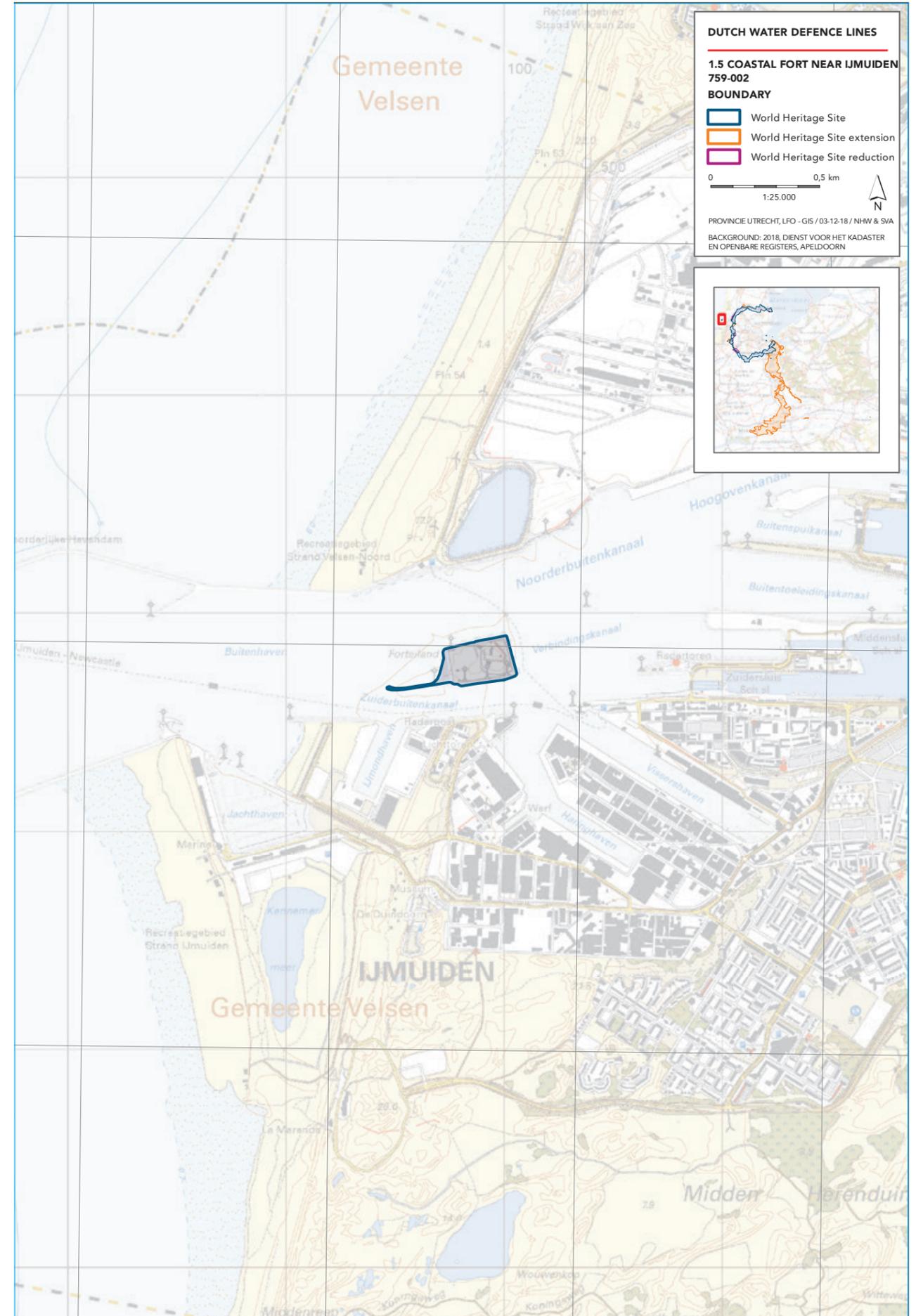
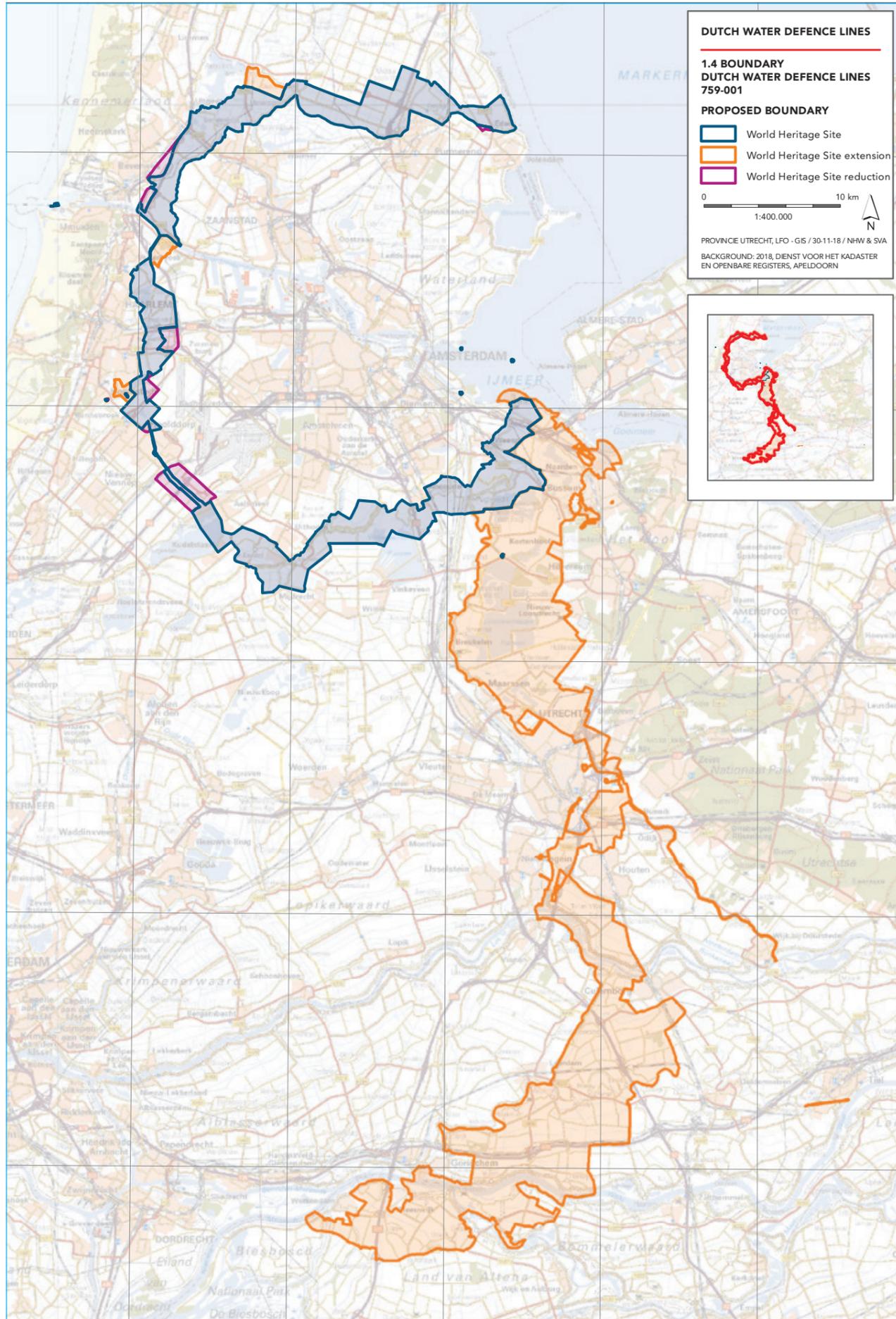
In summary:

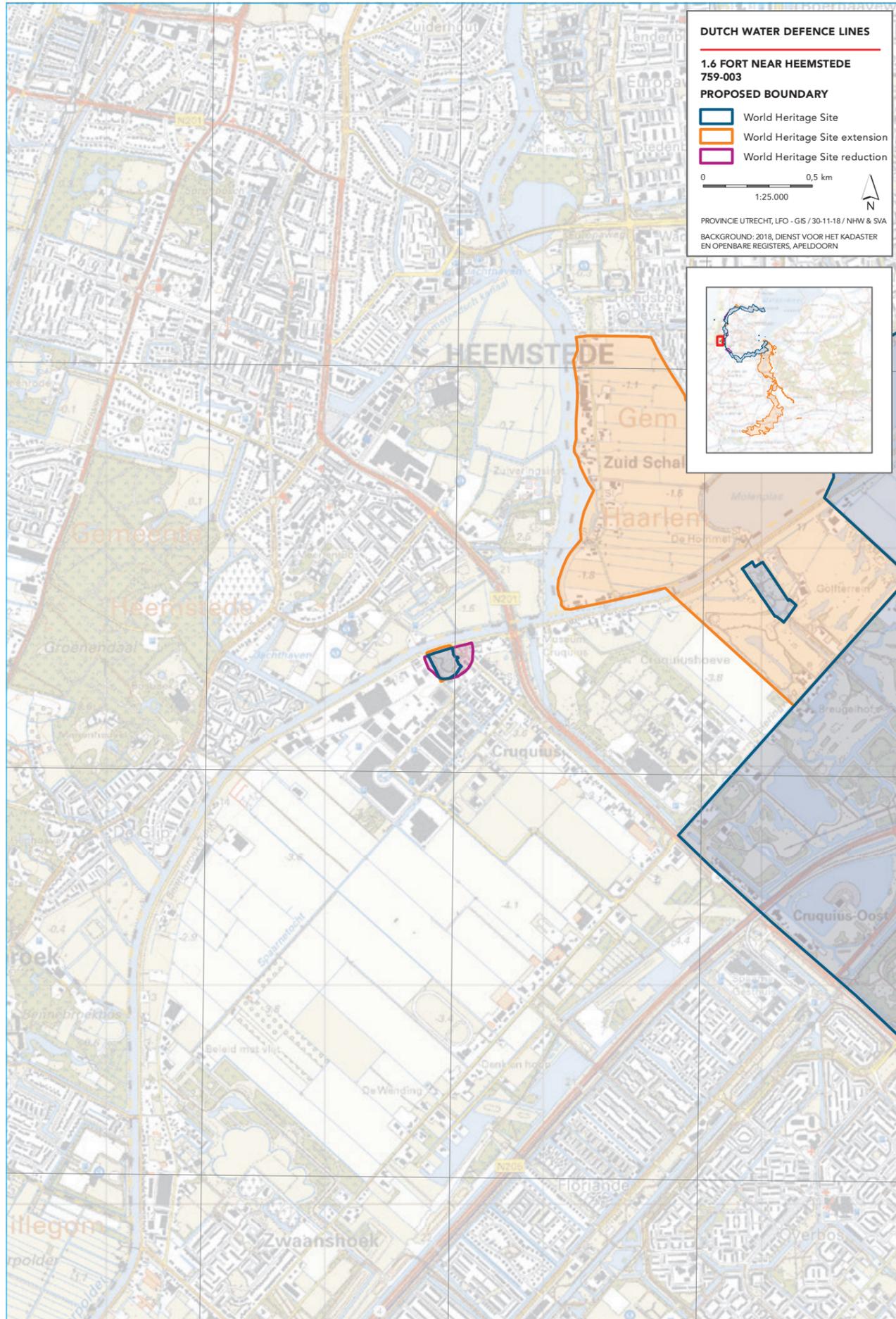
Area of the existing World Heritage Property	17,575.45 ha.
Area of proposed extension	38,446.57 ha.
Area of proposed reduction	1,242.99 ha.
Area of the proposed buffer zone	191,722.63 ha.

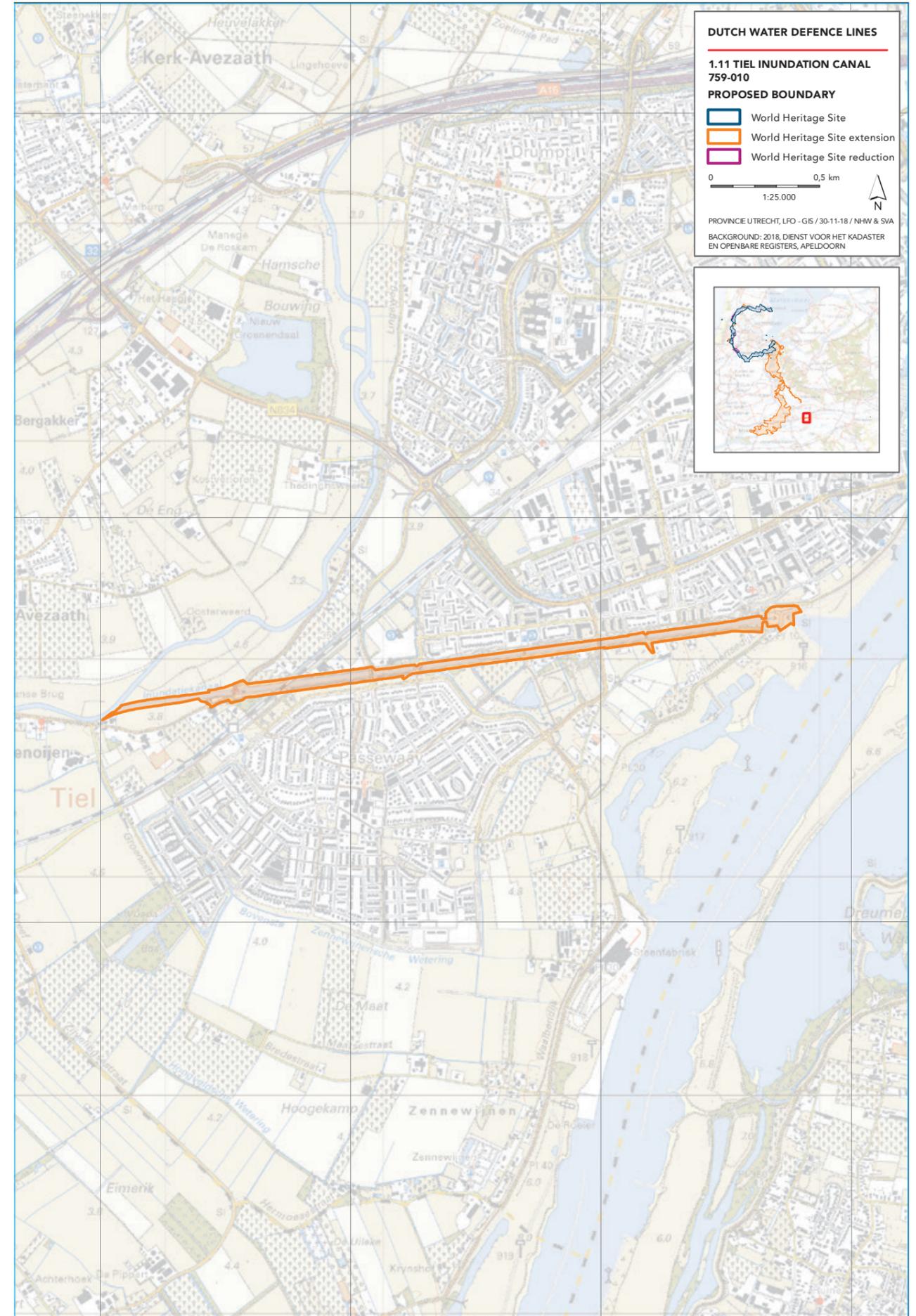
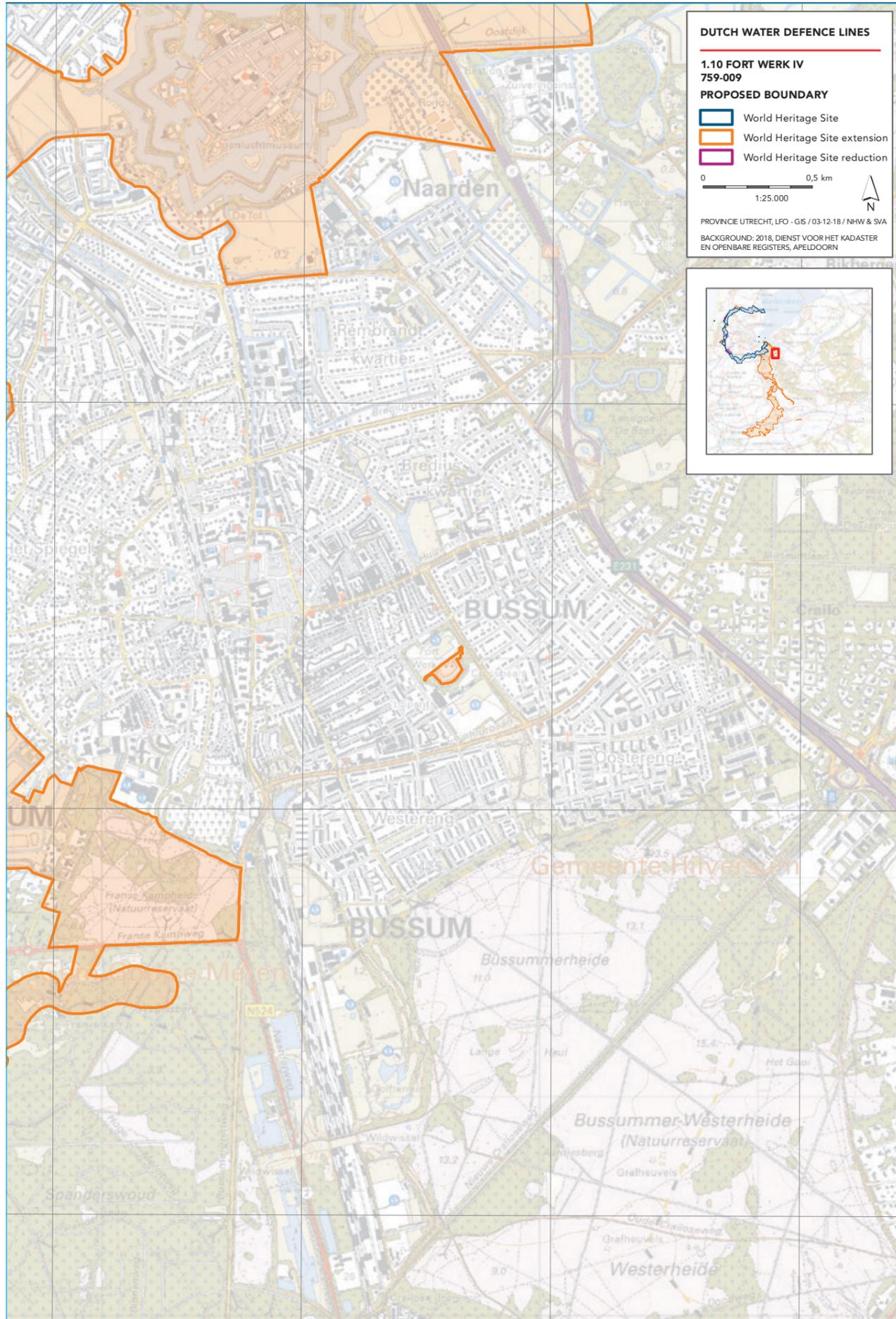
¹ Boundary Clarification, 2018.

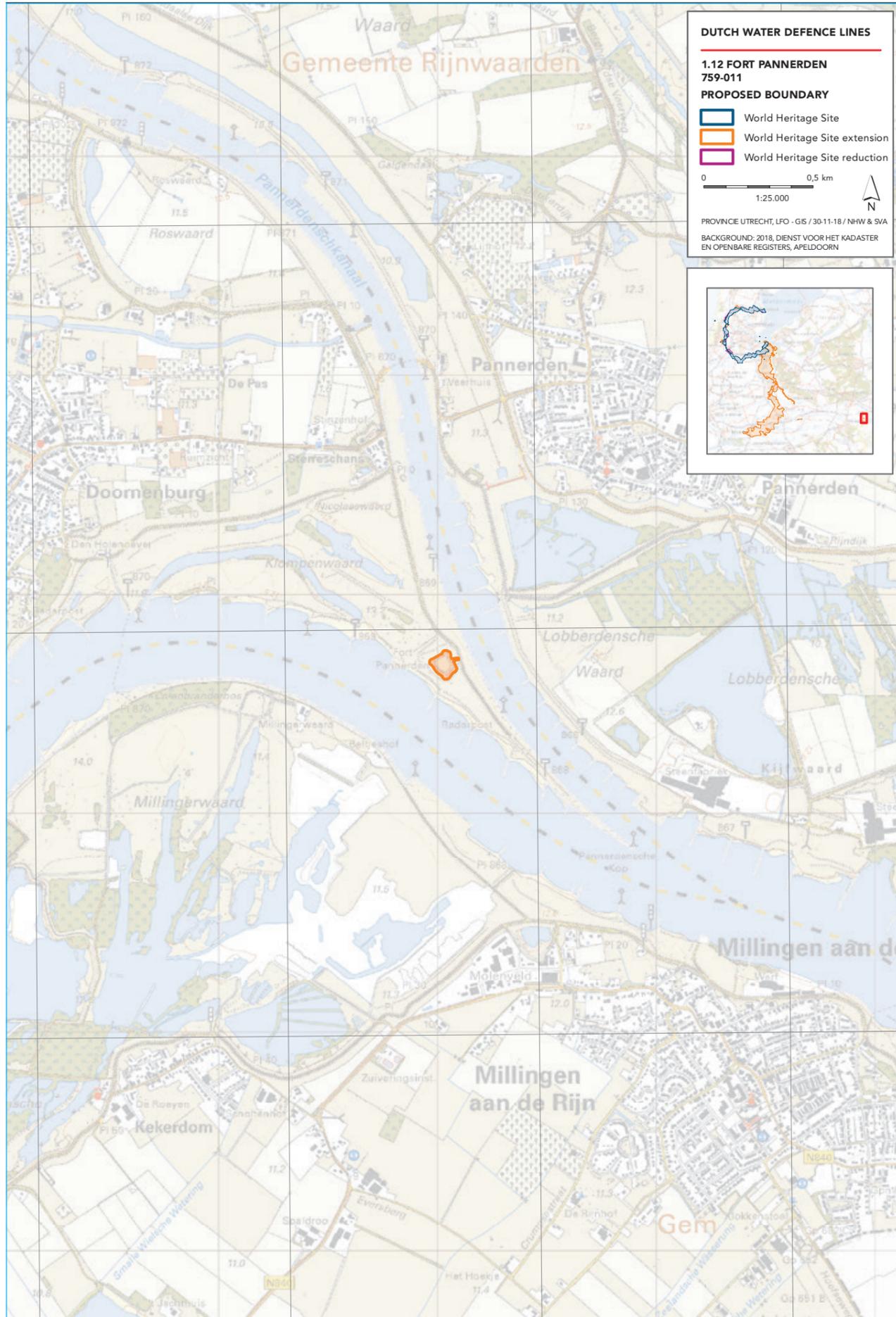








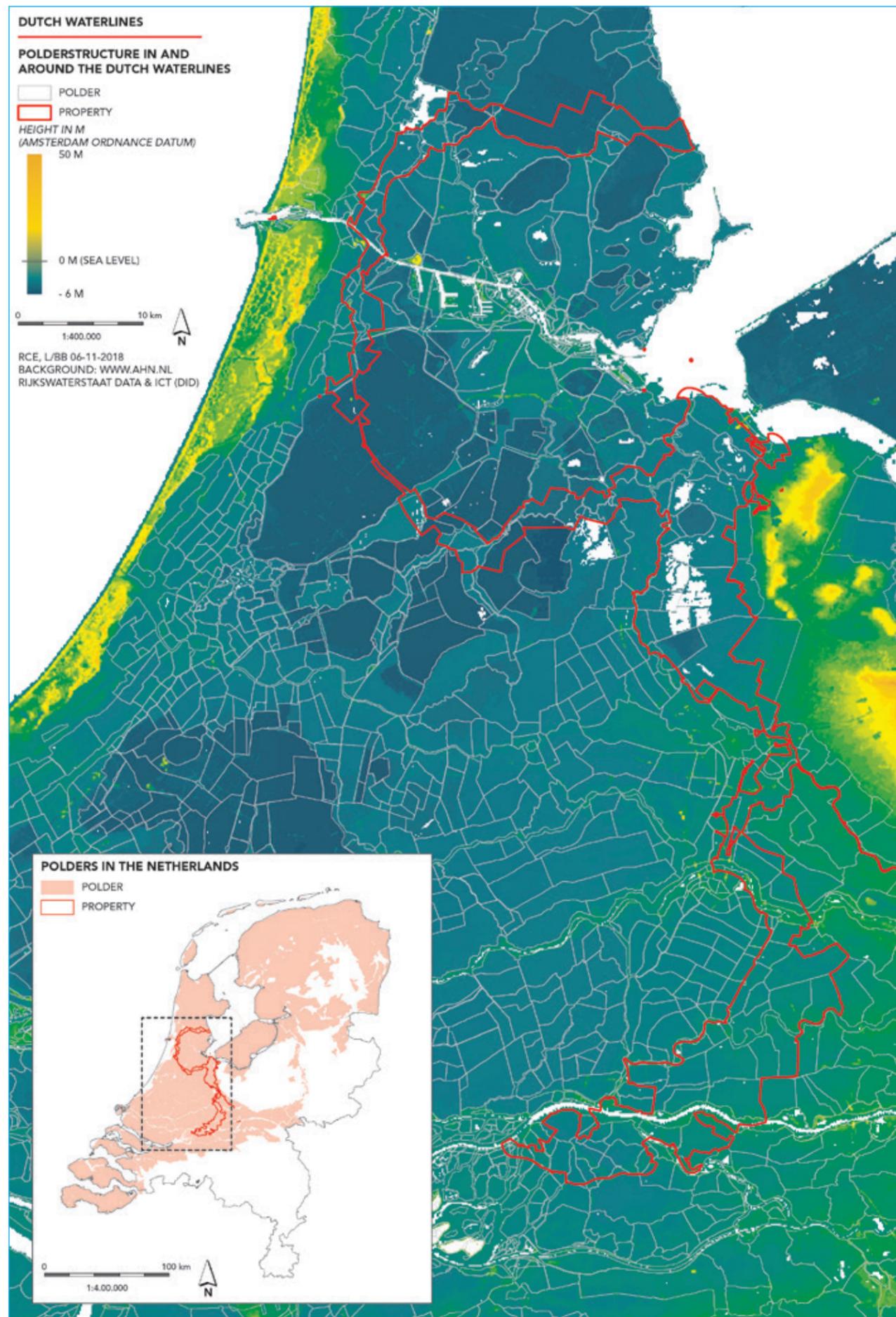






2

Description of
Dutch Water
Defence Lines



2.a Description of property

The proposed World Heritage Site consists of the existing Defence Line of Amsterdam World Heritage Site and a significant extension to include the New Dutch Waterline, plus a number of small modifications in the boundaries of the Defence Line of Amsterdam. Together, the two defence lines form a single military system under a new name: Dutch Water Defence Lines. This system is based on inundation of low-lying polder land. The principle part of section 2.a consists of a description of the New Dutch Waterline as a proposed extension of the World Heritage Site. To gain a clear understanding of the added value of the extension, it is placed explicitly within the context of the existing World Heritage Site.

Section 2.a.1 (Dutch Water Defence Lines: an introduction) covers the full scale of the system: it places the Dutch Water Defence Lines in the tradition of national defence through inundation and describes the relationship between the two sections, the Defence Line of Amsterdam and the New Dutch Waterline. Subsection 2.a.2 summarises the outlines of the existing Defence Line of Amsterdam World Heritage Site. Subsection 2.a.3 describes the outlines of the proposed New Dutch Waterline extension. The two following sections detail the description in terms of the features of the landscape (2.a.4) and the attributes (2.a.5), with the focus on the proposed extension. Finally, section 2.a.6 presents a number of small modifications to the boundaries of the Defence Line of Amsterdam and explains them.

2.a.1 Dutch Water Defence Lines: an introduction

Completely inundating fields to knee height and thereby denying enemy troops passage. Until the Second World War, this was a tried and tested means of defence in the low-lying parts of the Netherlands, where the economic and administrative centres were located. The Dutch Water Defence Lines demonstrate this system in its most refined state.

For centuries, the residents of this naturally marshy land were used to determining the water level in the ditches themselves. This was necessary to develop the land for farming and to grow crops. From the Middle Ages onward, the land was impoldered bit by bit. A parcel of land was partitioned off by digging a canal or ditch around it and watercourses were dug through the partitioned parcel. Using a pumping station, the water was drained into the surrounding watercourse, which was connected to a river or canal. The Netherlands has such thousands of polders.

If the land can be kept dry, it can – of course – also be flooded (inundated). Even in the Middle Ages, it was known that this was an effective tool against advancing hostile troops. In the struggle of William of Orange and his supporters against the Spanish during the Eighty Years' War (1568-1648), both sides breached dykes to protect their own strongholds. The price is high, however: the



Horse and cannon in inundation, Mobilisation 1939

inundated land is unusable and impassable for a long period of time; famine strikes in the fortified towns that lie in the flooded farmlands like islands. The pro-Spanish troops were the first to build a dyke between two fortified towns to enable transport and communication in times of inundation. This is how the first waterline was born.

Throughout history, more waterlines appeared in the landscape, in response to various threats of war. They had in common that they never followed the administrative boundaries of the republic, the province or of another administrative unit to be defended. The location depended on the topography, on the possibilities for letting in and keeping in water offered by the landscape. Defence of the territory also meant giving up part of the territory, or at least temporarily.

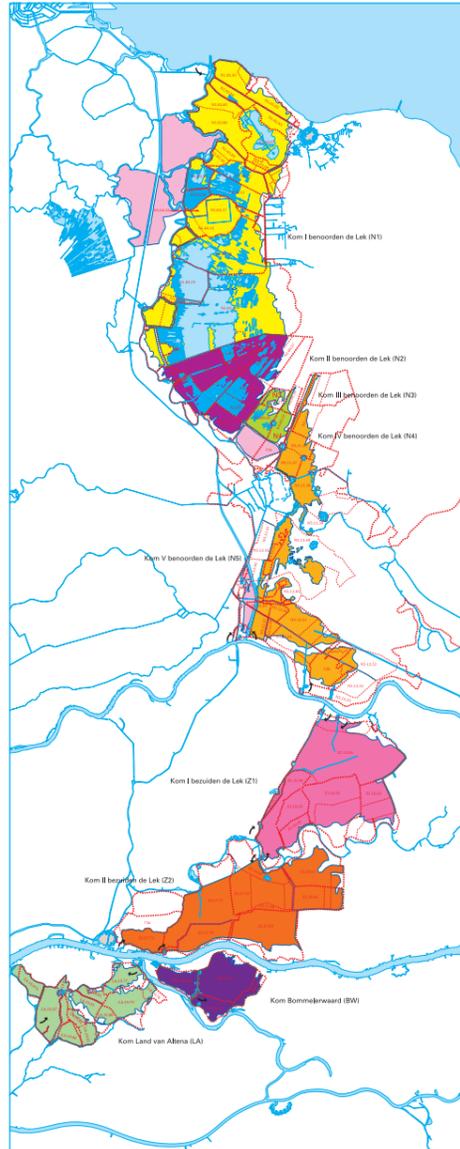
For many years, the Old Dutch Waterline was the most important in strategic terms. This structure protected the trading centre of Amsterdam and the administrative centre of The Hague. At the end of the eighteenth century, there was an increasing need to include the city of Utrecht within the area to be defended. Ideas on this were formed under French rule (1794-1813: French troops invaded the then Republic of the Seven United Provinces of the Netherlands during a period of severe frost, which made inundation impossible). The actual construction started in 1815 after the fall of Napoleon,



Waterlines in The Netherlands

during the reign of the first king of the current Dutch monarchy (William I). This 'New Dutch Waterline' protected and defended the Kingdom of the Netherlands during its first 125 years.

The New Dutch Waterline is much more systematic and advanced than the Old Dutch Waterline. The new waterline is one system with nine inundation basins, spread out over a distance of 85 kilometres. Forts and other fortifications defended the vulnerable points:



Overview of Inundation basins

elevated segments that could not be inundated and intersecting land and water-based access routes, known as accesses. Existing fortified towns were integrated into the system. Since its construction, the New Dutch Waterline has been modernised continually, in step with developments in techniques of war, architecture, and water management. Inundations could be carried out increasingly quickly and with greater precision. At the same time, the system had to be able to withstand increasingly powerful enemy weapons and increasingly heavy enemy transport vehicles.

In 1880, the New Dutch Waterline was extended to include the Defence Line of Amsterdam. The Defence Line became the national redoubt: in times of need, if the New Dutch Waterline were to fall, the national army and the available civilian population could hold out in the capital. The Defence Line of Amsterdam is a defensive ring, as opposed to the linear trajectory of the New Dutch Waterline. This made higher demands on water management. The Defence Line of Amsterdam could not use the small height differences in the landscape and the direction of the current of rivers as systematically as the New Dutch Waterline could. In addition, the Defence Line of Amsterdam used landscape elements as much as possible, but, as a landscape structure, it is more artificial in nature. The number of forts for the defence of accesses is much higher.

In 1885, shortly after the start of the construction of the first new fort, the destructive high-explosive shell was introduced. Brick as the most important building material was no longer sufficient. Concrete was required; a building material with which not much experience had been gained. However, as soon as concrete construction on the weak soil of the Dutch lowlands was mastered, the forts of the Waterline were constructed at a rapid rate. Forts in the Defence Line of Amsterdam, therefore, show greater uniformity than the forts in the New Dutch Waterline, which took much longer to develop and was more adapted to the different landscapes.

In 1939 and 1940, Dutch armed forces readied the New Dutch Waterline for quick inundation, in response to the threat from Nazi Germany. There was great consternation when the German bombers simply flew over the waterline. Inundation had become less effective; the Defence Line of Amsterdam no longer offered solace. After liberation by the Allies in 1945, the system was no longer maintained, until it finally lost its military function in 1963. In the mid-nineties, the cultural and historical significance of the lines was rediscovered.

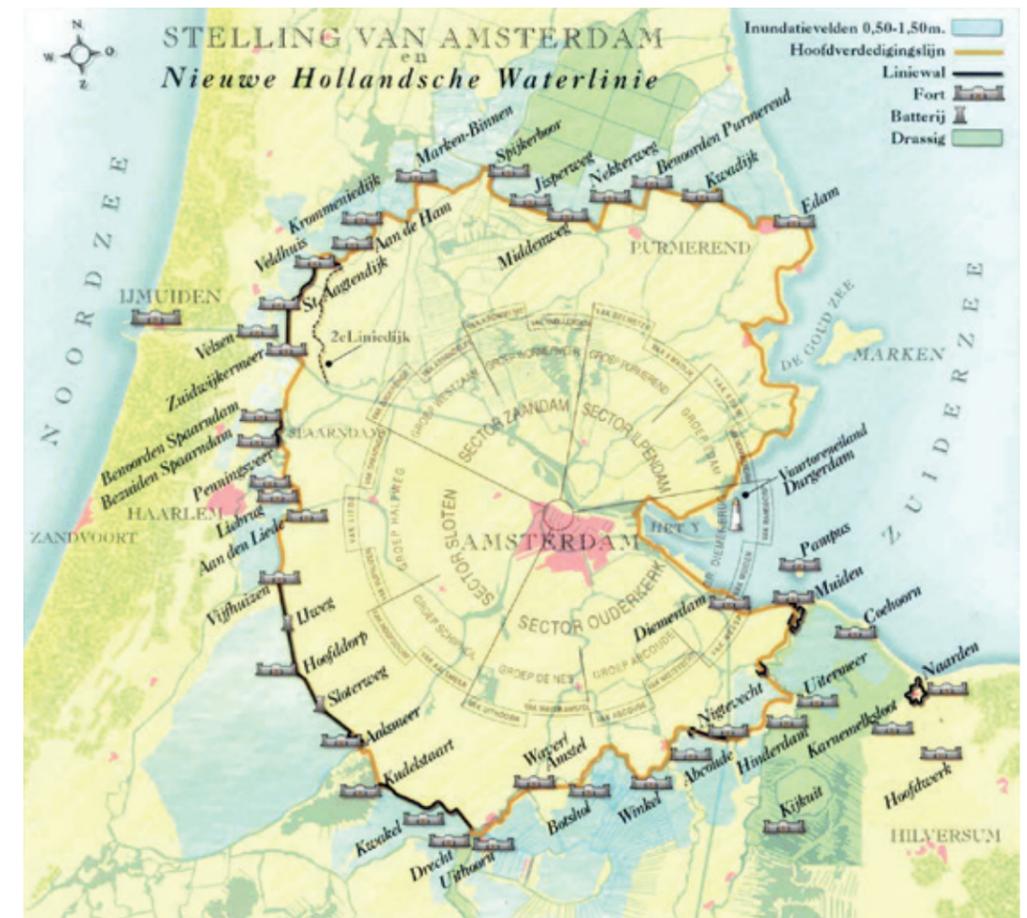
Outstanding features and component parts

The Dutch Water Defence Lines together constitute a major example of military defence by inundation. Construction of the New Dutch Waterline began in 1815 and, until 1940, it was continually modified to meet new military requirements and technical possibilities. In 1874 the decision was taken to add the Defence Line of Amsterdam to the main defences inside the New Dutch Waterline

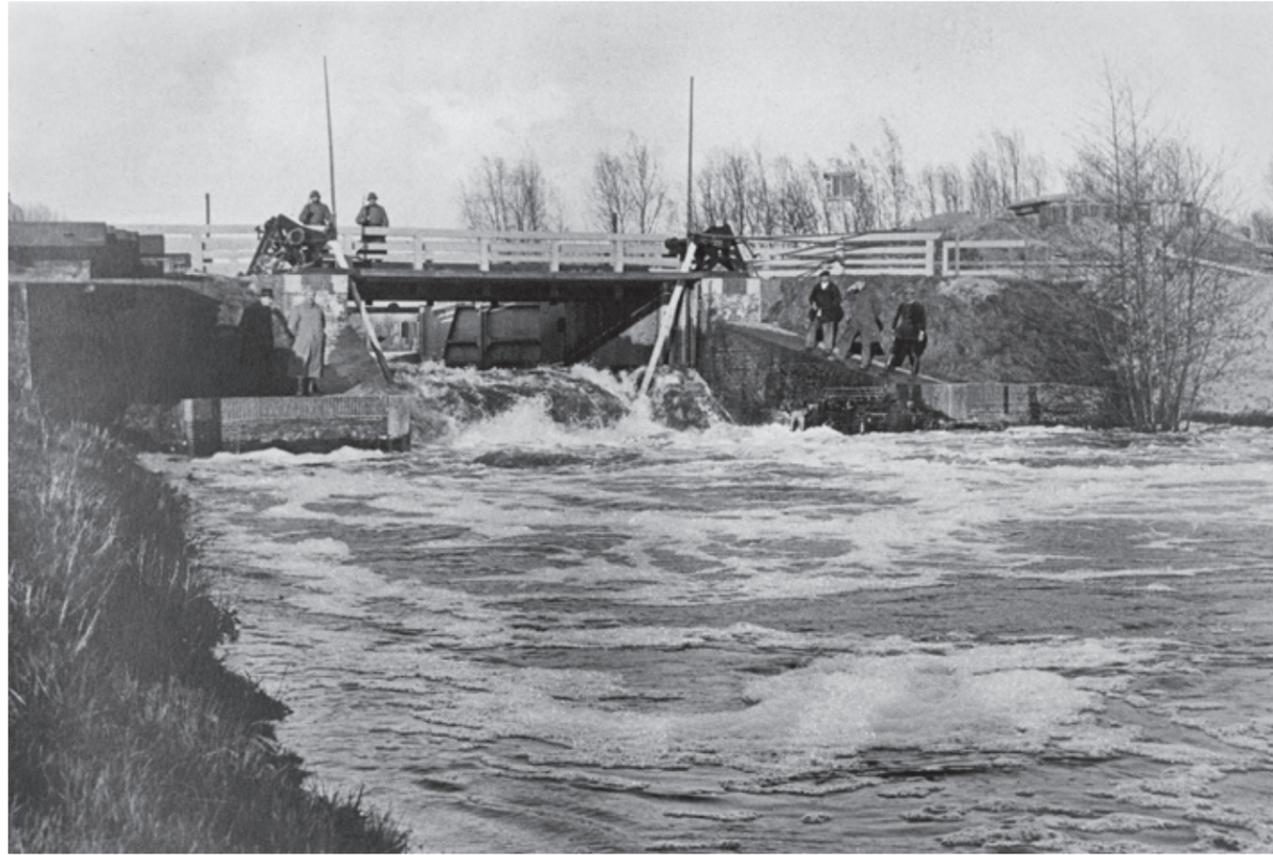
2.a.2 Defence Line of Amsterdam World Heritage Site

to encircle the capital. The Defence Line of Amsterdam was constructed between approximately 1880 and 1920. The construction of the Dutch Water Defence Lines is one of the largest infrastructure projects ever undertaken in the Netherlands. The military systems of the two lines overlapped and shared the use of the same water management system. The added value of the current extension is that, together, the New Dutch Waterline and the Defence Line of Amsterdam tell the story, completely and logically, of the development of what was at the time the most important defence system in the Netherlands. The New Dutch Waterline forms a meaningful extension of the World Heritage Site because it successfully demonstrates how the ingenious and expansive system of national defence takes advantage of elements and features of the four different landscapes, and because it offers a complete collection of the architecture of military fortifications between 1815 and 1880. This is the period prior to early concrete construction that sets apart the Defence Line of Amsterdam. The addition is described in detail in section 3.

The Defence Line of Amsterdam has been on the UNESCO World Heritage List since 1996. The Defence Line of Amsterdam is an exceptional and monumental defensive ring of 135 kilometres in length, located at an average of fifteen kilometres around the heart of Amsterdam, the capital of the Netherlands. The Defence Line



Defence Line of Amsterdam



Inundation sluice open near Fort Asperen 1940

consists of a defensive ring of 46 forts and batteries, a number of inundation basins, and a large number of water management structures such as dykes and sluices. This is a brief summary of the submitted dossier with which the Defence Line of Amsterdam became a World Heritage Site in 1996.

In combination, inundations and military fortifications were able to hermetically seal off the areas within the Defence Line from the outside world, as a last point of retreat in defence of the country. All provisions were available to be able to weather a months-long siege, including sufficient agricultural land for the supply of food. The cause for the construction of the Defence Line was the Fortifications act of 1874. This act was a response to the Franco-Prussian War of 1870-1871 and laid out a new defence system for the Netherlands. Part of this was a significant and systematic reinforcement of the defence of the capital, which was designated 'national redoubt'. Up to that moment, the defensive ring of Amsterdam consisted of some 50 earthen and stone forts: the 'posts of Krayenhoff' (the majority of which have been lost). Because of the development in military tactics, they were close to the city. The Defence Line of Amsterdam formed the country's most extensive defence structure. It was the most modern defensive ring in Europe, and the largest in terms of area.

The use of inundation as a defence strategy is distinctive in comparison to foreign defensive rings. Inundation is the actual force behind

the system. Water was managed by means of new and existing water management structures such as dykes and sluices, and an interconnected system of military fortifications, such as forts, gun emplacements, magazines, and buildings for various provisions. For this, use was made of knowledge and technology that had already been applied in the New Dutch Waterline. However, there were two important differences from the New Dutch Waterline. First, existing landscape features could not be relied upon to the same extent. Whereas advantage could be taken of the transition from relatively high to low-lying areas and intersecting rivers in the construction of the New Dutch Waterline, the distance to Amsterdam was the determining factor in the construction of the Defence Line of Amsterdam. Second, shortly after the start of construction, the high-explosive shell was introduced, which meant much greater fire power had to be repelled. The density of military fortifications is, therefore, higher and the construction technology used in the forts is more solid. The transition was made from brick to concrete. The forts are of great architectural value due to this early use of concrete. This transition – with its experiments in the use of concrete and emphasis on unreinforced concrete – represents an episode in the history of European architecture of which few material examples still exist.

The Defence Line was constructed between about 1880 and 1920, and its attributes have been preserved exceptionally intact. The effects of this structure on spatial planning in the area within and around the Defence Line of Amsterdam have remained clearly visible. For many years, the inundation fields along the outside of the Defence Line and the agricultural lands on the inside formed an obstacle to urban expansion. This buffer effect is still visible in large undeveloped and relatively sparsely developed terrains near the urban dynamic of Amsterdam, parts that are now included in the World Heritage Site. It is no coincidence that Schiphol International Airport lies within the area of the Defence Line of Amsterdam, at a relatively short distance from the city. This airport was set up in 1916 as a military air base within the national redoubt.

The area of the Defence Line of Amsterdam

The main defence line between the defended redoubt and the inundatable polders is approximately 135 km long and includes 46 forts, in addition to the smaller structures. For the inundations, the existing water management system and polder structure were used, with dykes that would stem the flow of the inundation water. For transport and communication reasons, it was important that the distance to Amsterdam should be neither too long nor too short. A radius of fifteen kilometres from the city centre was taken as the average. In places where existing dykes were not suitable or were too far away, military dykes were constructed, such as in the Zuidwijkermeer Polder or the Haarlemmermeer Polder. The soil of the area consists of peat, clay, and occasionally sand. The typical Dutch polder landscape around the main defence line consists of peatland reclamations and polders, and has remained undeveloped despite the high population density in the area. From the air and on the map, the forts and their interconnections are clearly recognisable in their rural environment.



Haarlemmermeer



Fort at the Middenweg

The structures in the Defence Line of Amsterdam

Various structures were needed for the defence system. The defence system was based on flooding or inundation of the polders on the outside of the main defence line. First, therefore, a closed, defensible line had to be created. From there, it had to be possible to manage and maintain the inundation. The strips of land that remained dry, e.g. the edges of polders, dykes, raised roads, railways or easily navigable waterways formed vulnerable sections ('accesses') in the Defence Line. These required defence by means of forts, batteries, and shelters. 46 forts were built in strategic locations.

A large part of the main defence line runs along dykes not specifically constructed for the Defence Line. The specific qualities of the landscape determined the nature of the structures that were constructed. In general, the area can be divided into six sections.

- 1 North section. Possibilities for inundation were excellent here, due to the large polders. In this strong front, fort construction was started last.
- 2 North-west section. This part has a somewhat erratic course via existing dykes that were in part adapted to convert them into military structures. In the south, a line rampart was necessary. At IJmuiden, the North Sea Canal required particularly strong defences, which included a fort island.
- 3 West section. Inundation capacity was limited because of the city of Haarlem outside of the Defence Line and the higher ground. Therefore, the number of forts and batteries in the west is relatively high, with the Position at Spaarndam, being the highest point.
- 4 South-west section: the Haarlemmermeerpolder (impoldered 1848-1852). Cutting across this large and orderly landscaped polder, a completely new line rampart was required, with strongly interconnected forts and batteries.
- 5 South and south-east section. Here, the defence line is also irregular, through a water-rich and relatively inaccessible peatland. The inundation capacity was complex but very good. In this area, the connection was made to the New Dutch Waterline. The existing forts in this waterline were given a position in the Defence Line of Amsterdam. Additional forts in this section date from the final years of construction of the Defence Line of Amsterdam.
- 6 East section: the Zuiderzee coast. Here, the Defence Line meets the open water. In 1932, this stretch of water was dammed (with the construction of the Afsluitdijk), but at the time of the construction of the Defence Line it was still an inland sea. Defence at sea was the job of the navy. Two batteries and a unique artificial fort island (Pampus) were constructed to close off the entrance to the harbour of Amsterdam.

Landscape

To the present day, the forts in the Defence Line of Amsterdam have been preserved exceptionally well. This also applies to the area in which they are situated. 'Prohibited Circles' around the forts set limitations to building activities on the front side (the outside of the Defence Line of Amsterdam). The Prohibited Circles were legally enshrined in the Prohibited Circles Act of 1853. Prohibited Circles had a radius of 300, 600, and 1,000 metres around the fortifications, zones in which building restrictions varied. It is exceptional that the rural environment of the forts remained relatively untouched in the densely populated area around the capital, Amsterdam. The first Prohibited Circle of 300 metres is in its original state in almost all locations. Surrounding the majority of the 46 forts, the landscape on the front side has even remained agricultural up to the outer area of 1,000 metres.

2.a.3 Extension of the World Heritage Site to include the New Dutch Waterline

The extension of the Defence Line of Amsterdam World Heritage Site to include the New Dutch Waterline adds a defence line of approximately 85 kilometres in length to the existing World

Heritage Site. The New Dutch Waterline protected the economic and administrative heartland of the Kingdom of the Netherlands: the westerly section, bordering the North Sea, which includes the cities of Amsterdam, Rotterdam, The Hague, and Utrecht. Because of its location and elongated form, it was possible to make use of landscape features – more so than with the Defence Line of Amsterdam – such as the difference in height (although slight) between the relatively elevated east and the relatively low-lying west, and the large rivers that intersected the New Dutch Waterline.

The New Dutch Waterline extends from the then Zuiderzee, now IJsselmeer, at Muiden to the Biesbosch estuary at Werkendam. As with the Defence Line of Amsterdam, a small number of components outside of the continuous area of the New Dutch Waterline are a functional part of the system.

The New Dutch Waterline includes three of these small remote components: Fort Werk IV as a remainder of the Naarden Offensive, the Tiel Inundation Canal, and Fort Pannerden at the bifurcation of the Rhine and the Pannerden Canal, near the German border.

The continuous landscape of the New Dutch Waterline (component 759-001)

On the basis of component 759-001, the large, continuous area that connects to the Defence Line of Amsterdam, the unique functioning of military defence by inundation is explained. The description goes on to show the vital part played by the three other components in the overall defence system. In accordance with the numbering of section 1.d, the components are numbered 759-009, 759-010 and 759-011.

The New Dutch Waterline runs through linearly the country's polder landscape. The features of the landscape were the determining factor in the construction of the New Dutch Waterline at this location. The landscape provided the perfect ingredients for a defence line based on inundation. The main defence line was strategically set in this landscape to protect the economic and administrative heartland in the west. The ingenious system of ditches, canals, pumping stations, and sluices through which water management was controlled, was used to inundate the land. Military fortifications were used to defend the vulnerable points in this system. The following core features are distinguished in the New Dutch Waterline:

- Strategic Deployed Landscape
- Water Management System
- Military Fortifications

These outstanding core features are explained in more detail below.

Strategically Deployed Landscape

Similar to the Defence Line of Amsterdam, the New Dutch Waterline has given the existing human-made landscape a military-strategic function. The difference is that the landscape in which the New Dutch Waterline was constructed (generally speaking the boundary between the section of the Netherlands that lies below sea level and the section that lies above sea level) offered more options for inundation than the landscape around Amsterdam. Rivers and their quays (such as the Vecht) and existing inner dykes (such as the Diefdijk) were used as main defence lines. The soil, relief, and polder dykes made the polders to the east of this main defence line suitable as inundation fields.



Sliding door construction in Diefdijk A2, flanked by cannon casemate

This military landscape was reinforced at vulnerable, non-inundatable or insufficiently inundatable accesses with forts, with building restrictions within the 'Prohibited Circles'. Initially, forts were built in places where inundation was not possible. The presence of a wide, elevated push moraine to the east of Utrecht explains the high density of defence structures in that area. A second group of accesses are the river passages. In order to hold back the enemy, large forts were built on the river dykes. Fort Honswijk and Fort Everdingen on either side of the Lek are good examples of this. A third group of accesses are the quays and roads that intersect the main defence line. Examples of these are the Tienhoven Quay with Fort Tienhoven and the A2 motorway/Diefdijk with the cannon casemate on the eastern side.

New accesses such as railway lines, canals, and motorways were also built during operation of the New Dutch Waterline. The Ministry for War had an important voice in the choice of route for the new infrastructure, such as the routes of the railway lines (the Amsterdam-Arnhem line in 1843 and the Hilversum-Amersfoort-Utrecht line in 1863), the canals (Lek Canal in 1938), and motorways (A2, A12), including their bridges across the rivers. Sufficient means of defence were to be provided during construction. Particular examples of these modern access works are the sliding door construction in Diefdijk/A2 flanked by a cannon casemate, and the Structure on the Railway Dyke near Diefdijk, including crane bridge(s).

The military function of the strategically deployed landscape also affected urbanisation choices on a large scale. For example, the long-postponed easterly extension of cities such as Utrecht, Nieuwegein, and Gorinchem, and the southerly extension of Woudrichem, on a small scale the building of wooden houses within the Prohibited Circles.

In part because the most important elements of the Strategically Deployed Landscape also had a civil engineering function (inundation basins were, generally speaking, agricultural lands, and many water management structures were also used for day-to-day water



Inlet sluice at inundation canal Fort Everdingen

management), the Strategically Deployed Landscape has been preserved and has remained recognisable following the termination of the military function. Not only have the Prohibited Circles around the forts remained undeveloped, most inundation basins have also remained partially or fully intact. Conservation of the Strategically Deployed Landscape following termination of military use was enhanced by the relatively eccentric location in relation to the economic and administrative heart of the Netherlands. In 1815, the New Dutch Waterline was constructed not far from the urban boundary of Utrecht but runs some tens of kilometres from Rotterdam and The Hague. Due to this positioning, the pressure of urban expansions in the majority of the New Dutch Waterline is not as great as in the Defence Line of Amsterdam. The northern section of the New Dutch Waterline overlaps with the Defence Line of Amsterdam.

Water Management System

The New Dutch Waterline lies at the transition point between the low-lying and the elevated parts of the Netherlands, and is intersected by a number of broad rivers. For centuries, measure have been taken here to control and to use water for agriculture and transport. Constructed in the Middle Ages, the polder system, adapted time and again between the 15th and 19th centuries to cope with the continuing subsistence of the soft peat soil, formed



Fort Honswijk

the basis for the functioning of the New Dutch Waterline. The countless water management structures still in use testify to this. The civil objectives of protection against flooding and drainage for agricultural use were adapted to be reversed in the controlled flooding of polder land for military purposes; a temporary, controlled water barrier. Existing civilian hydraulic engineering works were employed to this end, with just minor supplementary military inundation structures. Dykes and quays were needed to stem the flow of the water, canals were needed for the additional and rapid admitting of water, and sluices, dams, and pumping stations were needed for the intricate and accurate management of inundations. In order to carry out the inundations properly, a complete organisation was set up in decentralised units that had their own detailed instruction book.

Military Fortifications

The Military Fortifications were constructed in locations where the enemy could evade the inundations: relatively elevated sections of the landscape and intersecting infrastructure. The New Dutch Waterline has a long history of development that is divided into seven phases of construction (see section 2B). Between 1815 and 1940, various types of defences were built, the shape, size, and lay-out of which were always a response to innovations in military engineering and changing strategies. Existing defence structures

in strategic locations were used and adapted as part of the New Dutch Waterline. Therefore, the proposed World Heritage Site also includes examples of medieval castles, fortified towns from around the 16th century, and 17th-century forts that were used by the precursor of the New Dutch Waterline: the Old Dutch Waterline.

The seven phases of construction of the New Dutch Waterline are reflected in the attributes of the proposed World Heritage Site. Both large and small structures are intact and located throughout the landscape. The large forts from the first four phases of construction are eye-catchers:

- the moated earthworks from the first phase of construction (1815-1826), built around the city of Utrecht, to which (directly or afterwards) brick guardhouses, barracks, and storage bunkers, as well as gun emplacements, and wooden warehouses were added,
- the circular brick tower forts along river dykes from the second phase of construction (1841-1864), of which Fort Honswijk is the highest,
- four forward forts around Utrecht from the third phase of construction (1867-1870), including Fort Vechten and Fort Rijnauwen – large and solid forts that had to be able to withstand heavy artillery,
- extensive modifications to existing forts from the fourth phase of construction (1871-1886) and the construction of new forts on the remaining vulnerable locations, including accesses that were created by the construction of new infrastructure.

The transition to concrete construction took place in the fifth phase of construction (1880-1914). Military Fortifications from this period can be found in the other section of the Dutch Water Defence Lines, the Defence Line of Amsterdam, in particular.

In the sixth phase of construction (between 1915 and 1940) large numbers of more widely dispersed small concrete structures were built, consisting of various types of group shelters and casemates. Most of the structures were built during the mobilisations of the two world wars and were used to reinforce the existing accesses and to defend new accesses. With the widening of the main defence line to become the main line of resistance, these structures came to be spread over a wider area. In the seventh phase of construction (1940-1963) no fortifications were added, but existing objects were improved.

Position, size, and shape of the Military Fortifications were modified to suit the local situation: positioned forward, precisely in the middle of a quay, of which Fort Spion and Fort Vuren are fine example, or at a multiple access, such as Fort Everdingen, located both on the Lekdijk and on the axis of the Diefdijk. Every fort in the New Dutch Waterline is a location-specific version of a standard type, with symmetry as its fundamental feature. It is noticeable that in the vast majority of forts, this symmetry is adapted to the local situation. This was done to be able to cover the immediate surroundings optimally with artillery – especially the access routes/roads that were not to be flooded, and passages through the main defence line. This means that here we are dealing with a contextually strategic system,



Fort Spion



Fort Everdingen

which, with the Prohibited Circles Act [Kringenwet], was even legally regulated and embedded in the landscape.

Three small remote components

In addition to the large, continuous area, the New Dutch Waterline includes, as proposed extension of the World Heritage Site, a number of small, isolated components, as does the Defence Line of Amsterdam. These three isolated components are: Fort Werk IV in Bussum, the inundation canal at Tiel, and the Fort near Pannerden. For a full understanding of the functioning of the Waterline, it is important that these components are included in the World Heritage Site, in addition to the isolated components of the Defence Line of Amsterdam.

Fort Werk IV, as part of the Naarden Offensive (component 759-009)

At the north-eastern most point of the New Dutch Waterline lies the seventeenth century fortified town of Naarden. As part of the New Dutch Waterline, the fortified town played a role in sealing off the access to Amsterdam. Inundation was not possible in this elevated area. When firepower increased at around 1860 and the fortifications were unable to provide sufficient resistance, it was decided that the 'Naarden Offensive' would be constructed. This new ring of forts was located at some distance from the fortified town itself. Of the five structures that made up the Offensive, the 'Main structure' remains intact: Werk IV. This now lies within the built-up area of Bussum, isolated from the proposed continuous World Heritage Property. This small fort has a unique combination of a polygon fort site, a dry moat (due to the elevated position), and a brick, crenelated wall with embrasures and small crenelated bastions ('oreillons') at the five corners. The wall used to run all the way round. To the northwest, a section has disappeared.

Tiel Inundation Canal (Component 759-010)

The Inundation Canal at Tiel is three kilometres long and connects two rivers: the Waal and the Linge. It is approximately 20 kilometres from the New Dutch Waterline and, as such, illustrates the large scale of operation of the military system. Water could be transported from the Waal to the Linge through a perfectly straight canal. In turn, the Linge supplied the inundation of the polders in the Culemborgerwaard and the Tielerwaard. The direct reason for the construction was the outbreak of the Franco-Prussian War in 1870. Because the plans of the Prussian military leadership were unclear, the New Dutch Waterline was readied. An additional inundation canal was found to be necessary to speed up flooding. In 1886, the canal was brought into use following placement of a military sluice in the Waalbandijk. In 2008, the Inundation Canal was dredged and given environmentally-friendly banks. The sluice and bridges were restored on that occasion.



Dutch Water Defence Lines



Inundation canal Tiel

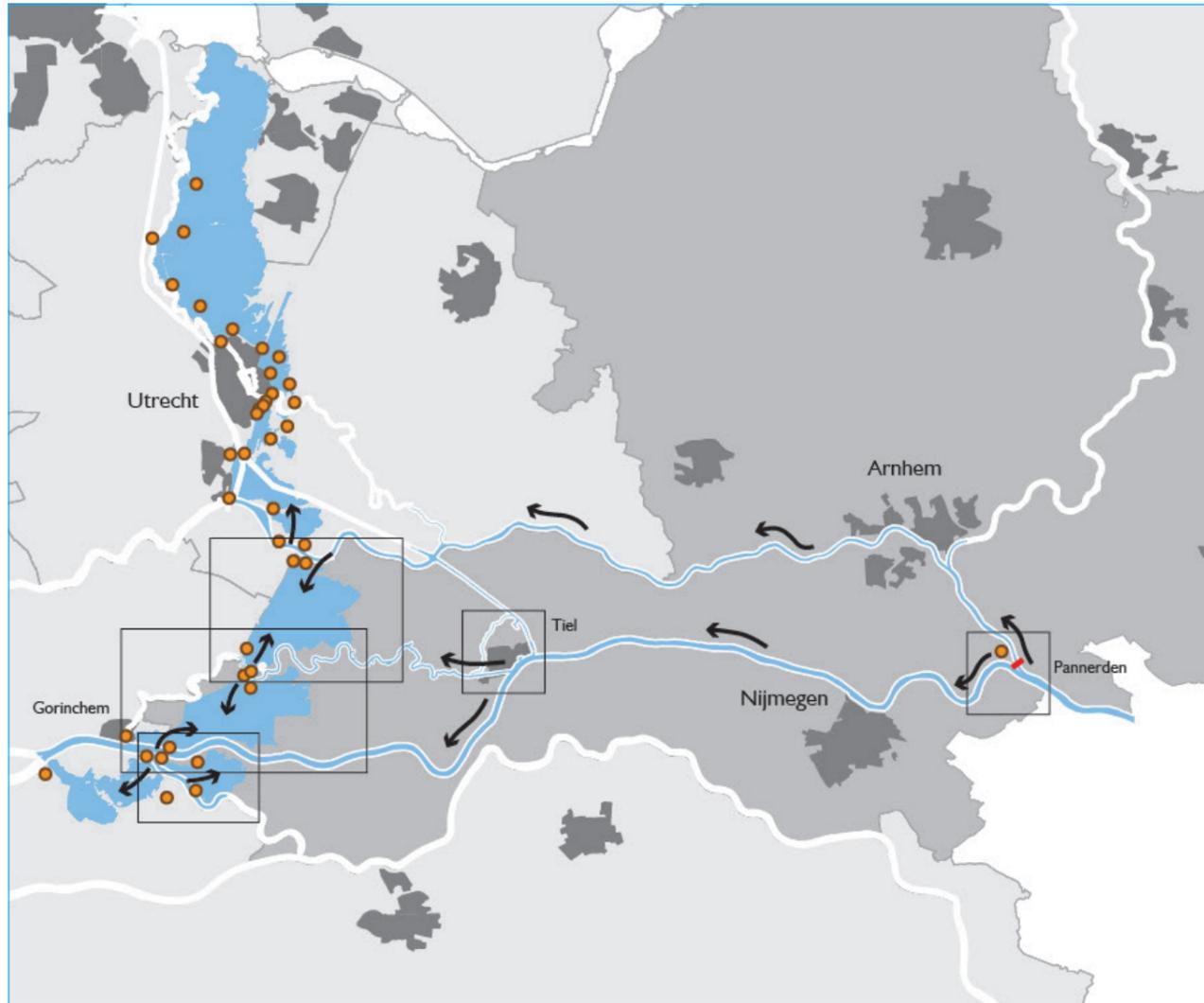


Fort Pannerden

Fort Pannerden (component 759-011)

Fort Pannerden is even farther away than the Tiel Inundation Canal: more than 60 kilometres from the main defence line. It is strategically located at the bifurcation of the Waal, and the Pannerden Canal, near the German border. The Pannerden Canal turns into the Nether Rhine and IJssel rivers. The Nether Rhine was of essential importance in ensuring the operation of the New Dutch Waterline. Many inundation basins were dependent on water that flowed to the Nether Rhine and the Lek via the Pannerden Canal. If the enemy was able to close off the beginning of the Pannerden Canal, the water supply to the New Dutch Waterline would stagnate. To prevent this, Fort Pannerden was built between 1869 and 1871, during the Franco-Prussian War. It was also possible to carry out checks on shipping from the fort. The fort was designated a National Monument (in 1969) and was renovated in 2011. It has been given a new function, as have most of the other forts of the Dutch Water

Description of Dutch Water Defence Lines



Fort Pannerden - strategically located

Defence Lines: in this case, a recreational-educational function, with a focus on experiencing history and nature.

2.a.4 Features of the landscape

In this part of section 2.a, first the features of the various landscapes that have formed the New Dutch Waterline will be further detailed. Then we will discuss for each sub-area how its landscape characteristic affected the organisation of the military system.

The New Dutch Waterline has been constructed strategically in the characteristic Dutch landscape. Along the chosen route, the natural situation and the existing landscape were ideal for inundation. In centuries past, this landscape had been extensively modified and optimised by its residents: protected against flooding, drained to make it less boggy, and subdivided for agricultural use. This landscape is the starting point for the functioning of the New Dutch Waterline; there is a high degree of coherence between the two. The same applies to the Defence Line of Amsterdam (the current

World Heritage Site), albeit to a lesser extent. Sections of the Defence Line of Amsterdam are connected to the landscape situation, but, as a whole, the ring-shaped structure has less of a basis in the landscape than the elongated structure of the New Dutch Waterline. What they have in common is that the Dutch Water Defence Lines were difficult to identify within the landscape as long as they had not been brought into position. Making use of landscape features has a double effect: they make inundation technically possible and they increase military effectiveness by providing camouflage.

Based on the soil and geomorphology, six landscape types can be identified within the Netherlands: marine clay landscapes, river landscapes, sand landscapes, peat landscapes, loess landscapes, and polders. With the exception of the loess landscape, all landscape types are included within the Dutch Water Defence Lines. They each have their own appearance. This provides changes in character and operation of the defence lines.

The Defence Line of Amsterdam mainly used the existing peat landscape and a number of polders. The most westerly section is jammed up against the (higher and drier) dune landscape, which meant that only a narrow inundation field was possible. Where the Defence Line of Amsterdam links up with the New Dutch Waterline, the soil consists of marine clay and peat.

Five types of landscape can be found within the New Dutch Waterline:

- the large northern section is characterised by the peat landscape with a few small polders,
- the southern section contains the landscape featuring the major rivers,
- in the central section lies the sand landscape of the push moraine, the Houten alluvial ridge, which cannot be or cannot easily be inundated, and
- the northern and southern extremities contain a small area of marine clay.
- In addition to these natural and agricultural landscapes, cities and infrastructure gave shape to the defence line. The 'urban landscape' could be described as a unique fifth landscape type.

The organisation of the defence system was influenced by the differences between these landscape types: the natural features (geomorphology, soil, contours, rivers) and the features of the agricultural human-made landscape (parcelling, drainage, dykes, polder systems). Furthermore, the organisation of the system was influenced by the cities and infrastructure lines (railways, canals, roads) that existed at the time. The New Dutch Waterline was constructed to bring the city of Utrecht within the area defended by the waterline and was, therefore, located at a short distance from the then boundaries of the city. A number of smaller towns (including the six fortified towns) were also located closely behind the main defence line.

The course of the inundation water can be tracked in each of these landscape types, except in the sand landscape, where inundation was not or was hardly possible. The water from the major rivers and the then Zuiderzee (now IJsselmeer) was let in via the main inlet and discharged over the area via smaller rivers, supply and inundation canals, discharge and seepage basins, and fort moats. Here and there, culverts were needed as auxiliary structures. The water entered the polder that was to be inundated via a sluice or coupure, and occasionally through such a polder along the quay or dyke to a subsequent inundation polder. Ultimately, each inundation basin was a smooth water surface with a controlled water level. Elevations, e.g. polder dykes, and depressions, e.g. watercourses, became hidden from view by the inundation water. As soon as inundation was no longer required, the water could be drained off via the regular drainage system used for agriculture.

The basic features of the inundation polders are the same everywhere. They are flat, unpaved, and have a controlled water level. They are below the water level from which the inundation water originates. In terms of size, land division, and drainage, there are major differences, however. Landscape difference also affect the composition of the main defence line, the details of the Water Management System, and the placement of the Military Fortifications.

Peat landscape Peat landscapes were not cultivated until relatively late. They were unattractive places to live, because they were wet and difficult to cultivate. The peat landscape within the New Dutch Waterline lies to the north of Utrecht, along the river Vecht, and is mostly characterised by division into narrow, elongated parcel strips. The area was cultivated from the cultivation axis. Side dykes were built to ensure the drainage of water from the high, unreclaimed peat. Due to the inheritance system, in which lots were divided lengthwise, very narrow plots were created. Over time, the plots became so narrow that living on one's own plot was impossible. Many farms were therefore

Peat landscape behind Fort Maarsseveen



Dutch Water Defence Lines

placed on a plot one behind another. Peat is boggy. Active management of the groundwater level is required to make the land productive in terms of agriculture. Management of the groundwater level requires many ditches that drain into a 'boezem' (ring) canal, a peat river or another watercourse via pumping stations. It is used as pastureland. Most of the buildings are situated in long ribbons alongside straight roads. The peat landscape is an open and vast landscape. Inherent to peat is that it oxidises, a process that is accelerated when the peat is drained. Peat not only oxidises, but it also settles (subsides) and shrinks (dries out). Settling, shrinking, and oxidation result in an average subsidence of 1 centimetre per year for a land reclamation of 60 centimetres. This means that peat soil that is not kept boggy will settle by definition.

The Loosdrechtse Plassen are part of this peat landscape. The high vegetation around the lakes ensure a more private character. The Loosdrechtse Plassen were created by large-scale commercial peat extraction (as were many other lakes in the Dutch peat landscape). Peat was a sought-after fuel that was in high demand in the cities of Holland. Peat extraction took place until well into the 20th century. When peat was dug off in the low-lying Netherlands, the water line was quickly reached.

The New Dutch Waterline has relatively large inundation polders in the peat landscape: deep polders (Bethune Polder, Hostermeer Polder; both drained at the end of the nineteenth century), peat polders with a high density of drainage ditches (Keverdijkse Polder, Westbroek Polder), and polders that are permanently submerged (Loosdrechtse Polder, Stichts Ankeveense Polder). Part of the inundation water came from the Zuiderzee (dammed in 1932 and renamed 'IJsselmeer') via the river Vecht. Another part was supplied by the river Lek and transported a great distance to the inundation basins via the Kromme Rijn. The quays along the Vecht formed the main defence line along the majority of the length of the northern peat landscape, and in the east the boundary is also determined by the landscape: the foot of the elevated sand landscape of the Utrecht Ridge. Part of the Military Fortifications lie some distance from the main defence line between inundation fields, in defence of a dyke access in the submerged area.

River landscape A large part of the New Dutch Waterline lies within the river landscape. This landscape is shaped by the major rivers, i.e. the Nether Rhine/Lek, Waal/Upper Merwede and the 'Afgedamde Maas' (a tributary of the Meuse), and the smaller rivers, i.e. the Vecht, Kromme Rijn, Linge, and the Alm. The natural landscape consists of sand levees along the rivers with clayey flood plains and basin areas in between. Since the Middle Ages, the rivers were embanked, but breaches in the dykes and flooding would regularly occur into the nineteenth century. The river courses were not yet fixed. The rivers have, therefore, also left traces in the landscape outside of their current banks. The typical pattern is that of clay soil through which alluvial ridges run: relatively elevated remnants of former river beds and their levees.



River landscape, south bank of the Waal, castle Loevestein

The Tielervaard is a good example of such a landscape. Heukelom, Acquoy, Rhenoy, and Rumpt are villages in the Tielervaard and are located on an alluvial ridge of the river Linge. They are so-called outstretched villages: elongated settlements with buildings along two or three parallel streets. On the fertile ridges and in particular on the natural levees many orchards can be found. The levees result in a small-scale and enclosed landscape, formed by the concentrations of buildings, vegetation, and land use that alternates between pastureland, farmland, fruit-growing and arboriculture. The parcelling is irregular. Traditionally, the roads followed the higher ridges and, therefore, are meandering in nature. To the north of the villages lie the basin areas that remained undeveloped until the period following the war. There were duck decoys and osieries here. They also served as collecting basins for excess water in the winter season. These basin areas are low-lying and of a wetter, open and large-scale nature. The land is arranged into both regular blocks and strips. The land-use mainly consists of pastureland. The roads are long and straight. The most notable elements are the duck decoys.

In the sixties of the twentieth century, the Tielervaard-West land consolidation had a lasting impact. Lowering of the water level and the construction of roads and new farms ensured far-reaching changes in structure, although the main structure of roads and watercourses remains visible.

Thanks to the alternation of peat bogs, clayey river basins, and sandy alluvial ridges, the bottoms of the inundation polders in the river landscape are relatively irregular. With two major rivers in this

area – the river Nederrijn, which becomes the Lek, and the Waal, which becomes the Merwede – the inundation water could be guided to the inundation basins relatively quickly and easily. However, the rivers also formed accesses, which is the reason why large forts were constructed along all riverbanks. The south bank of the Waal could be defended from medieval castle Loevestein. The main defence line crosses these rivers. However, the existing dykes could still be used. In the Middle Ages, a series of inner dykes had been constructed perpendicular to the major rivers, of which Diefdijk was the most important. These inner dykes were built to prevent flooding in the slightly elevated east from spreading across the whole of the polder landscape between Waal and Lek. Diefdijk still has this function.

Sand landscape

There are not many sand landscapes within the defence lines. They lie above the waterline of the rivers and can, therefore, not be inundated. In general, sand landscapes are less open than polder landscapes. Significantly fewer technical facilities are required for water management, due to the higher elevation. Farmland and pastures alternate with woods. This made sandy areas popular for the construction of estates and country houses.

Although sand landscapes are atypical for waterlines, the engineers had taken them into account. The proximity of the sand landscape of the push moraine to the east of the line (Utrecht Ridge, Gooi region) influenced the construction of the New Dutch Waterline, just as the area of dunes affected the Defence Line of Amsterdam. Because of its elevated position, the sand landscape there determined the route, shape, and width of the New Dutch Waterline; the natural contours of the land determined the boundaries of the inundation basins, which were narrow, if at all present.

Due to the elevation, the landscape articulation of the main defence line is relatively minor. In particular at Utrecht, urban development crossed the line multiple times. Only a few years after the creation of the line, the main defence line along the eastern city canal could no longer be maintained. It was then moved to the east. Even later, canals were dug that served as main defence line (in addition to their primary transport function).



Sand landscape near Franse Kamp

Marine clay landscape

In the most northern part of the New Dutch Waterline (and therefore the most easterly part of the Defence Line of Amsterdam) the soil consists of marine clay. However, the character of the landscape here does not differ from the surrounding peat landscape. It is also parcelled into strips and used as grassland.

The most southern part of the New Dutch Waterline, however, does differ in character from the other types of landscapes within the Dutch Water Defence Lines. Here, the river landscape becomes a marine clay landscape. The levees along the rivers are narrow and the creeks and channels from the Biesbosch nature reserve also define the appearance of the landscape. The area shows traces of a long history of habitation. The current landscape is shaped by floods that were the result of a rise in sea level in the 15th century. These floods made parts of the area uninhabitable for a long period of time. Streams and channels ran through it freely. After the Second World War, the elongated, narrow plots were redivided in a major land consolidation operation to form the 'Land of Heusden and Altena'. The landscape is now remarkably open and large-scale and is mainly characterised by arable farming. The land was divided in a large-scale block arrangement.

The height differences are relatively large due to the streams in the landscape. This affects the structuring of the New Dutch Waterline: the height differences result in the irregular shapes of the inundation basins in this relatively short section. The main defence line was a less obvious choice than in the peat and river landscapes. Quays and dykes were used that cannot or can hardly be distinguished visually from other quays and dykes in the marine clay landscape: the linearity is less clear. Therefore, it was relatively simple to move the main defence line while the New Dutch Waterline was in operation: during the First World War the river Alm formed the main defence line, which was later moved west.

The urban landscape

The Dutch Water Defence Lines used landscape features to protect the most important cities in the country. This is where the economic and administrative heart of the kingdom was located. A number of smaller cities were also a short distance from the New Dutch Waterline: the fortified towns that were included in it (Muiden, Naarden, Weesp, Nieuwersluis, Gorinchem, and Woudrichem), as well as towns such as Jutphaas (present-day Nieuwegein), Maarsse, and Leerdam.

At those locations where the New Dutch Waterline passes close to urban areas, the contrast between the openness of the inundation basins and the buildings on the safe side of the main defence line is often clearly visible. The best example of this can be found to the north-east of the city of Utrecht, near the neighbourhood of Overvecht, which was constructed up to the main defence line (Gageldijk) directly after the Second World War.

The urban area that was defended by the Dutch Water Defence Lines at that time is now part of a metropolitan area, the Delta Metropolis, or 'Randstad', which distinguishes itself from metropo-



Marine clay landscape near Fort Bakkerskil

Urban landscape near Fort de Gagel



lis regions abroad by its polycentric structure and the many green areas in between the city centres. Today, the New Dutch Waterline manifests itself as a green belt along the eastern boundary of this Delta Metropolis, similar to the way in which the Defence Line of Amsterdam forms a green ring around the capital. The landscape of the waterlines is easily accessible for recreational use, which contributes to an appealing residential environment in the Delta Metropolis. The history of its development involves the green belt running through spacious rural areas in some places, far from the hustle and bustle of the city. In other places, urban development is nearby, sometimes even directly behind the main defence line, and the dynamic of the city becomes evident. In a number of places, infrastructure lines cuts across the New Dutch Waterline. This was already the case during military use, but infrastructure has increased since then.

At Utrecht, urban development has expanded across the main defence line. The Utrecht Science Park was built on the inundatable side of the main defence line, albeit in a relatively elevated zone where the inundation field is extremely narrow, and the number of military fortifications is relatively large. The dividing line that was once the main defence line can be found in the current urban fabric. The city's continuous area of development gradually becomes the green, spacious layout of a campus on the other side of the main defence line. Long, straight roads offer a view of the surrounding landscape, including in the direction of the large Fort Rijnauwen. The line of fire of the Structure at Hoofdijk (which is in the centre of the Utrecht Science Park) was not spared from this urban development, but now the fort does form the heart of the University's botanical gardens.

In the northern part of the New Dutch Waterline, the proximity to Amsterdam is reflected in the intensive recreational use of the landscape, the emphasis on infrastructure, and the development of the towns and cities. There are no cities that have developed over the main defence line. Larger-scale housing projects are built on the 'safe side' of the main defence line: near Weesp and to the west of Muiden. Cultural heritage plays an important role in urban and infrastructural development. For example, the widening of the A1 motorway at Muiden has been used as an opportunity to build a tunnel under the river Vecht, restoring the linearity of the main defence line.

Characterisation of sub-areas

On the basis of the landscape, urban environment, and defence system, the New Dutch Waterline can be divided into a number of sub-areas. Each sub-area has its own character and is unique in some way and/or different from adjacent areas. The core features of the defence system as a whole (strategically deployed landscape, water management system and military fortifications) present themselves in different ways. Below, the landscape features and most important attributes are listed for each sub-area. The attributes are explained in detail in 2.a.5.

Triangle of fortified towns Muiden, Naarden and Weesp

This area is characterised by its many historical layers. The main defence lines of the New Dutch Waterline and the Defence Line of Amsterdam come together in a zone in which older military fortifications were also in use: the three fortified towns of Naarden, Weesp, and Muiden, and a number of forts of the Old Dutch Waterline, the precursor of the New Dutch Waterline. Because the two main defence lines meet, inundation was possible on both sides in part of the area. The appealing landscape near Amsterdam draws many holiday-makers and tourists. The fortified towns, in particular, are popular destinations. Naarden is known as the most beautiful and best-preserved fortified town in the Netherlands. At Muiden lies Muiderslot Castle, which receives over 100,000 visitors every year. Between elevated Muiderberg and Fort Uitermeer, lies a front line that is easily recognisable due to its many concrete fortifications.

As noted in the previous section, cultural heritage plays an important role in urban and infrastructural developments in this sub-area.



Muiderslot Castle and West Battery

Strategic Deployed Landscape

- Link between Defence Line of Amsterdam and New Dutch Waterline
- The main defence lines of the Defence Line and the Waterline merge at fort by Hinderdam The New Dutch Waterline can be inundated on two sides at this point
- The main defence line of the Defence Line joins the Vecht
- Prohibited Circles usually open, with clear relationship with the wooden houses

Water Management System

- Recognisable inundation fields, situated between the fortified towns of Naarden, Muiden and Weesp
- Main inlet complex for Zuiderzee water near Muiden
- Inundation sluices and canals

Military Fortifications

- Fortified towns as link between the Defence Line and the Waterline
- Fortified towns as an additional historical dimension with the Old Dutch Waterline
- Transition from Defence Line to Waterline recognisable in fort construction and use of materials (brick and concrete)
- Forts along Amstel and Vecht

Vecht lakes area

In this area, the river Vecht also forms a clearly recognisable main defence line. The peat landscape is characterised by lakes and polders with ditches and quays running east to west. This is also the orientation of the barrier quays that separate the inundation basins. The extensive lakes and marshes make inundation unnecessary; a large part of the area to the east of the main defence line was permanently inaccessible. There are forts located at the ends of the basin barrages, including Fort Kijkuit and Fort Spion, almost surrounded by water. It is a beautiful and unspoiled area in which the New Dutch Waterline system is easy to identify and experience. The combination of the cultural heritage, the beautiful landscape, and lakes that are exceptionally well suited for water recreation make the Vecht Lakes area a popular destination for recreation.



Fort Spion

Strategic Deployed Landscape

- Main defence line clearly recognisable, follows the Vecht
- Difference between safe and unsafe side recognisable in many places by wet outer surface
- Clear relationship between forts and accesses (mainly quays)
- Prohibited Circles open

Water Management System

- Almost no urbanisation outside the New Dutch Waterline, which makes inundation field clearly recognisable
- Outside consists of wet pasture, wetlands, and lakes

Military Fortifications

- Forts take up a clear position along the main defence line or at the end of basin barrages
- Mutual relationship between the forts is recognisable
- Large number of dispersed concrete fortifications such as casemates and group shelters mark out the main defence line

Utrecht-East

Utrecht-East takes up a special position in the New Dutch Waterline. The most important motive for replacing the Old Dutch Waterline with a new one around 1800 was to move the city of Utrecht within the defence line. The passage at Utrecht is one of the few places where the waterline passes an urban area at a short distance. Inundation was not or hardly possible near the elevated sand landscape of the Utrecht Heuvelrug and the Kromme Rijn river landscape. The inundation fields there were too narrow. What's more, the Utrecht-oriented infrastructure led to a great number of accesses. Both factors explain the high density of forts in this sub-area. The presence of the double ring of forts makes this area unique for the New Dutch Waterline. The inner ring of forts was built early on. A number of these forts now lies within the urban area of Utrecht. The outer ring was built in a later period, when enemy artillery was able to cover a greater distance. Part of it lies in the open but narrow landscape of the original inundation field and part of it on the higher flanks of the Utrecht Ridge. In the years following the war, part of the city expanded into the area, in particular due to the construction of the Utrecht Science Park campus. In other areas, the contrast between the built-up, defended side and the inundatable side of the main defence line can still clearly be seen in the landscape. In this sub-area, the city is perceptible everywhere.

Strategic deployed landscape

- Continuous main defence line very close to urban areas and surrounded by urban areas in places
- The original route of the main defence line still recognisable in the urban development structure
- The edges of some inundation fields have been built-up along the north and south edge of Utrecht

Water management system

- Remarkable inundation structures, including special solutions, such as the Plofsluis inundation sluice



Utrecht Science Park campus

Military Fortifications

- Unique double ring of forts on the eastern and southern side of the city of Utrecht
- First ring integrated into urban area, Prohibited Circles built up here
- Second ring consists of large and typical forts in a green setting, Prohibited Circles more open here
- Special types of fort, such as the Four Lunettes, and Rijnauwen, the largest fort in the New Dutch Waterline
- A large number of dispersed concrete fortifications such as casemates and group shelters in lines and clusters mark out the second ring of forts
- Remains of anti tank ditch between Griffenstein and Fort near 't Hemeltje in front of the second ring of forts

Landscape of the major rivers

As a counterpart to Utrecht-East, where the connection between the New Dutch Waterline and the city is clearly noticeable, the landscape basis can easily be recognised and experienced in the river region. Along the route between the northern and southern-most points (Nieuwegein and Gorinchem, respectively) the urban area that was being defended is relatively far away. Rivers define the landscape: in particular the intersecting Lek and Waal, a long distance of which forms the main defence line. River water is an important source for inundations. The large tower forts along the rivers are striking and recognisable ensembles. Fort Everdingen and Fort Honswijk, in particular, on either side of the Lek, form a striking cluster to close off the access, together with Lunette along the Snel, the Covered Community Way, the Structure along the Spoel, and the Structure along Groeneweg. The section of the main defence line along Diefdijk (an old inner dyke) is also clearly recognisable, in part because of the large number of smaller concrete fortifications, e.g. group shelters and casemates, that were built here in the interbellum. Diefdijk was recently reinforced in order to meet

modern water safety requirements; in the process, the cultural-historical expression of the dyke as part of the New Dutch Waterline was reinforced. The Gorinchem-Woudrichem-Loevenstein Castle triangle of fortified towns around the Waal forms an ensemble with an exceptional historical dimension. The fortified towns are defence structures from a much earlier date. Together with 19th-century Fort Vuren, they defended the Waal access.

Strategic Deployed Landscape

- Main defence line clearly recognisable, formed by river or inner dykes
- Wide inundation basins situated in mainly agricultural area
- Inundation fields are largely open areas and recognisable, with diffuse boundary to the east (gradual elevations in the landscape, formed by alluvial ridges, form the boundary)
- Built-up in some locations, e.g. at Nieuwegein and Gorinchem
- At Nieuwegein and Gorinchem the main defence line has moved eastwards during the development of the New Dutch Waterline
- At a number of locations at both ends, there is a compaction on the west side (the safe side) of the most recent main defence line
- Prohibited Circles are largely open

Water Management System

- Important main inlets for river water
- Typical inundation sluices
- Various inundation canals

Fortified town of Gorinchem





Loevestein castle

Military Fortifications

- Forts and fortified town from earlier periods at strategic positions along the river
- Recognisable ensembles
- Large number of small concrete fortifications such as casemates and group shelters mark out the main defence line
- The 'Kogelvanger', a wall closing a shooting range, as a unique German military (1940-1945) structure in the open landscape
- Fort Vuren and the Gorinchem-Woudrichem-Loevenstein Castle triangle of fortified towns

Southern marine clay area

This sub-area constitutes the transition from river region to marine clay area. Its character is more large-scale, and the land use is predominantly arable farming. This is the southernmost sub-area, which links the New Dutch Waterline to the Biesbosch estuary. From there farther south, open water formed the defence; an inundatable waterline was not needed there. In this transitional area, the landscape basis for the waterline is more diffuse. Behind Loevestein Castle in the Land of Maas and Waal, the main defence line jumps eastward in between two rivers, where forward fortifications guard the access by water (the Brakel and Poederoijen batteries). Elsewhere, elevated alluvial ridges run deep into the inundation basin. Throughout the operation of the New Dutch Waterline, the main defence line shifted a number of times. In part because of this, inundation fields are less pronounced in terms of the landscape than in, for example, the river landscape, but they have maintained their open and agricultural or natural character. On the safe side of the main defence line lie the fortified town of Woudrichem and the village of Werkendam. Thanks to their presence, the contrast between defended and inundatable land can be identified within the landscape. There are a number of forts along the main defence line; Fort Steurgat closes off the southern access via the river Merwede.

Strategic Deployed Landscape

- Main defence line of 1940 partly recognisable as dyke
- Other defence lines (from various periods) not as easily recognisable in all places
- Prohibited Circles largely open
- The inundation field's open farmland has remained intact
- Alluvial ridges penetrate deep into the inundation basin

Water Management System

- Some typical inlet sluices

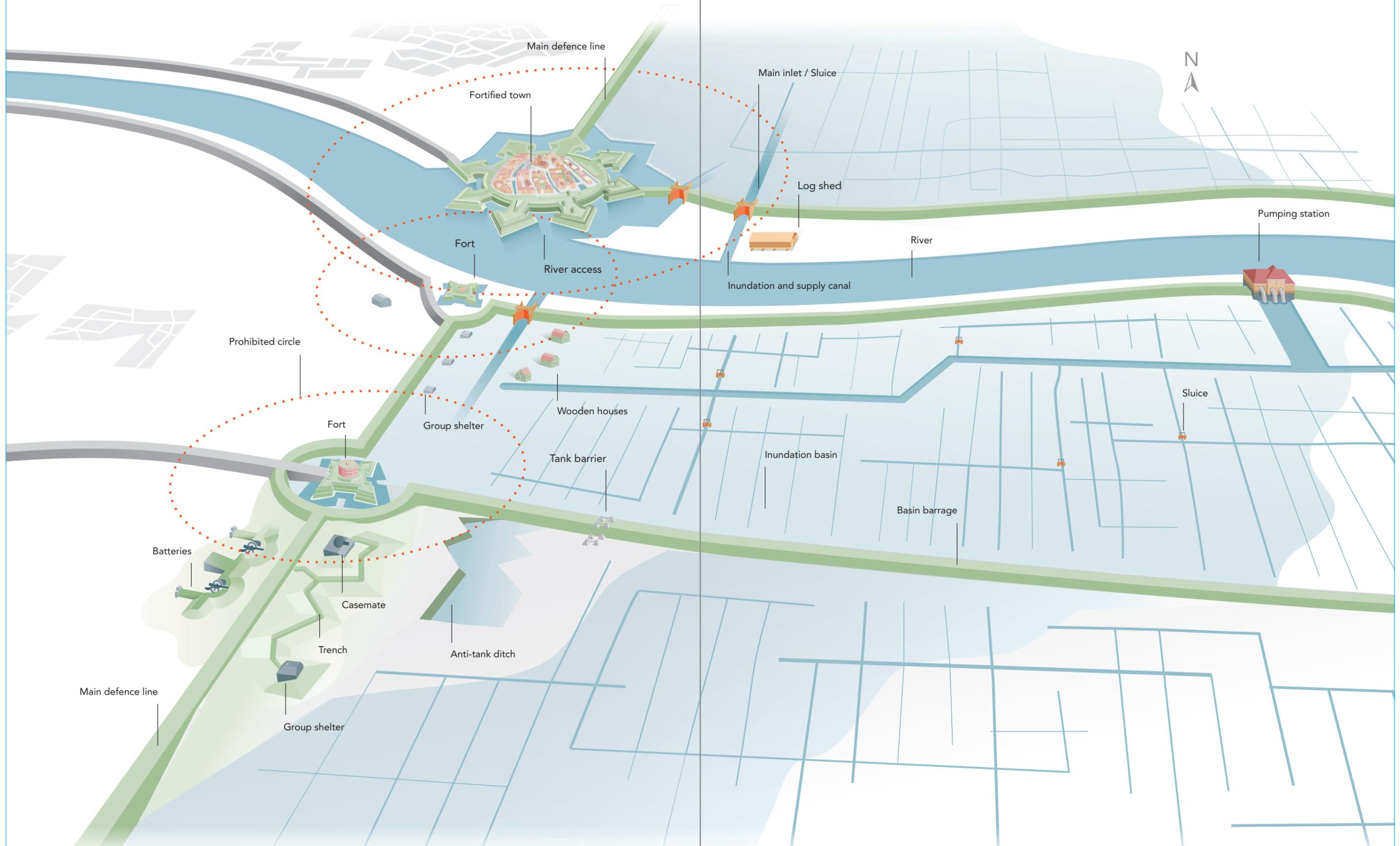
Military Fortifications

- Forts at strategic positions on the river and near the accesses (dykes, creeks, and channels)
- Number of forward fortifications in the Land of Maas and Waal

Papsluis (fan sluice) Bakkerskil



Core features and attributes



2.a.5 Attributes

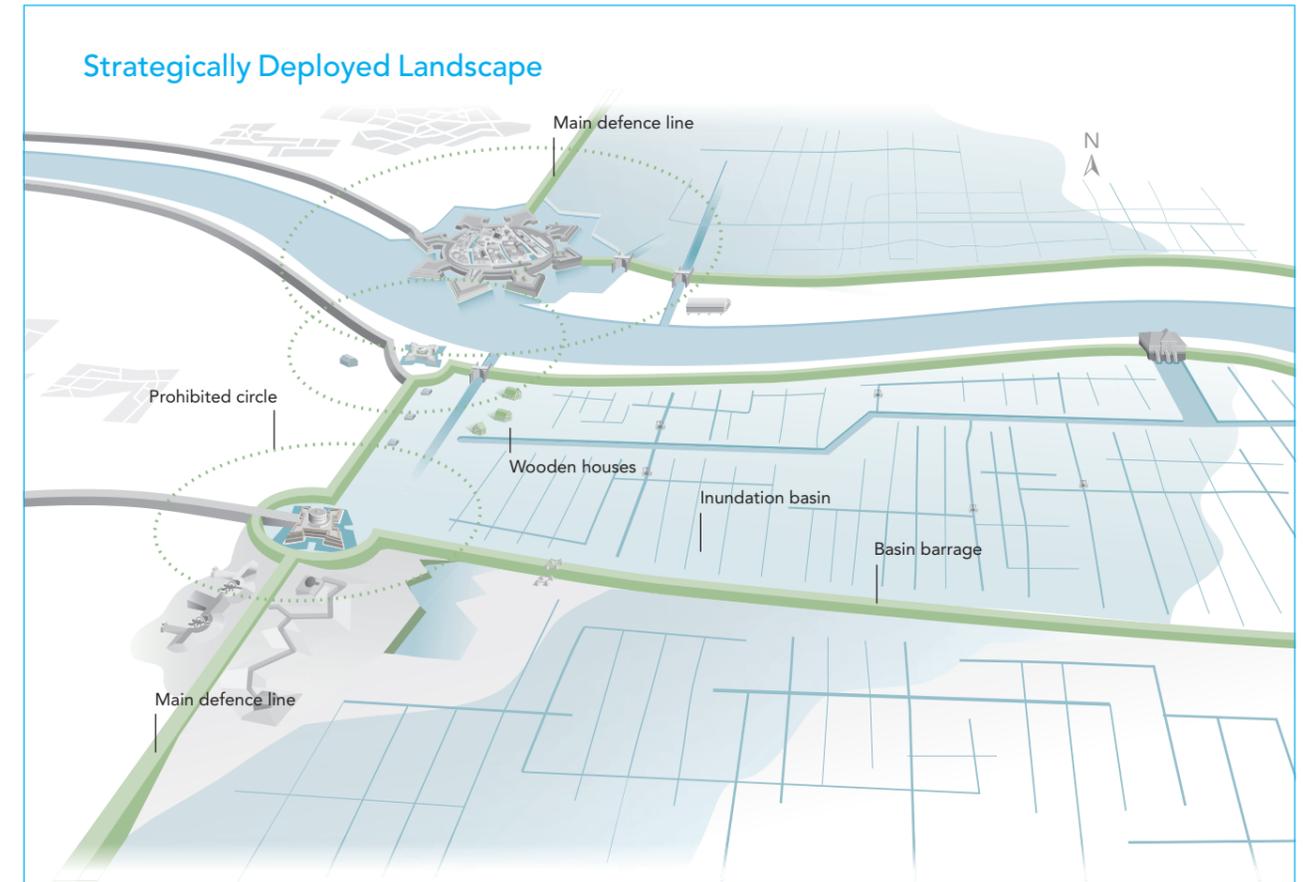
The attributes give expression to the Outstanding Universal Value of the site. This section offers an overview of the attributes with a brief explanation of their significance within the New Dutch Waterline. The attributes are ranked according to the three core features: Strategically Deployed Landscape, Water Management System, and Military Fortifications. In Appendix 2 'Description of attributes', the attributes are broken down into categories and subcategories. The table below shows the main category of attributes.

Strategically Deployed Landscape	Water Management System	Military Fortifications
Main defence line	Inundation quays	Fortified towns
Basin barrages	Rivers	Forts and batteries
Inundation basins	Inundation and supply canals	Positions and dispersed system
Accesses	Discharge and seepage basins	Group shelters
Prohibited Circles	Main inlets	Casemates
Wooden houses	Sluices	Other military buildings
	Culverts	
	Log sheds	
	Pumping stations	

Attributes belonging to the Strategically Deployed Landscape

Nowadays, the Strategically Deployed Landscape can still be recognised physically by the landscape along the main defence line, the inundation basins, the basin barrages, the accesses, and the Prohibited Circles with their wooden houses.

Main defence line The main defence line marks the boundary between the defended area in the west and the inundatable area in the east. This is the boundary where the final 'fierce resistance' was to take place. Almost everywhere, elevations present in the landscape, in the form of quays and dykes, were used. Over time, the first main defence line of the New Dutch Waterline (1815) was extended in a number of places, for example at the city of Utrecht during the construction of the second ring of forts (1870) and to the east of Nieuwegein as the result of the construction of the Lek Canal in 1938. During the mobilisation of 1914-1918, at Naarden and in the two southern basins (Bommelerwaard and the Land of Altena) the main defence line was shifted to the east and to the south, respectively. These modifications were largely reversed again at a later date.



Main defence line
Diefdijklinie

Inundation basins

Inundation basins are areas bounded by quays, which have their own water level when inundated. A covering of water 30-50 cm deep (knee-height) was sufficient to make it impossible either to sail or to wade across an area. The areas are flat, unpaved, and can be controlled. In daily use, they mostly had and have an agricultural function and sometimes that of a nature reserve. Each inundation basin consisted of a number of polders with only slight differences in height. Basin barrages separated the inundation basins from each other. By exploiting the specific features of the existing types of landscapes and intervening in the historical water management of the constituent polders, the inundation basins have acquired a unique characteristic. The inundation basins are characterised by a substantial degree of openness, an intricate pattern of roads and ditches and subtle water management with many sluices, culverts, mills, and pumping stations. In the northern section, the inundation basins extend eastwards as far as the elevated sandy areas of the Utrecht Ridge and, in the southern section, as far as the polder quays and river dykes.

Basin barrages

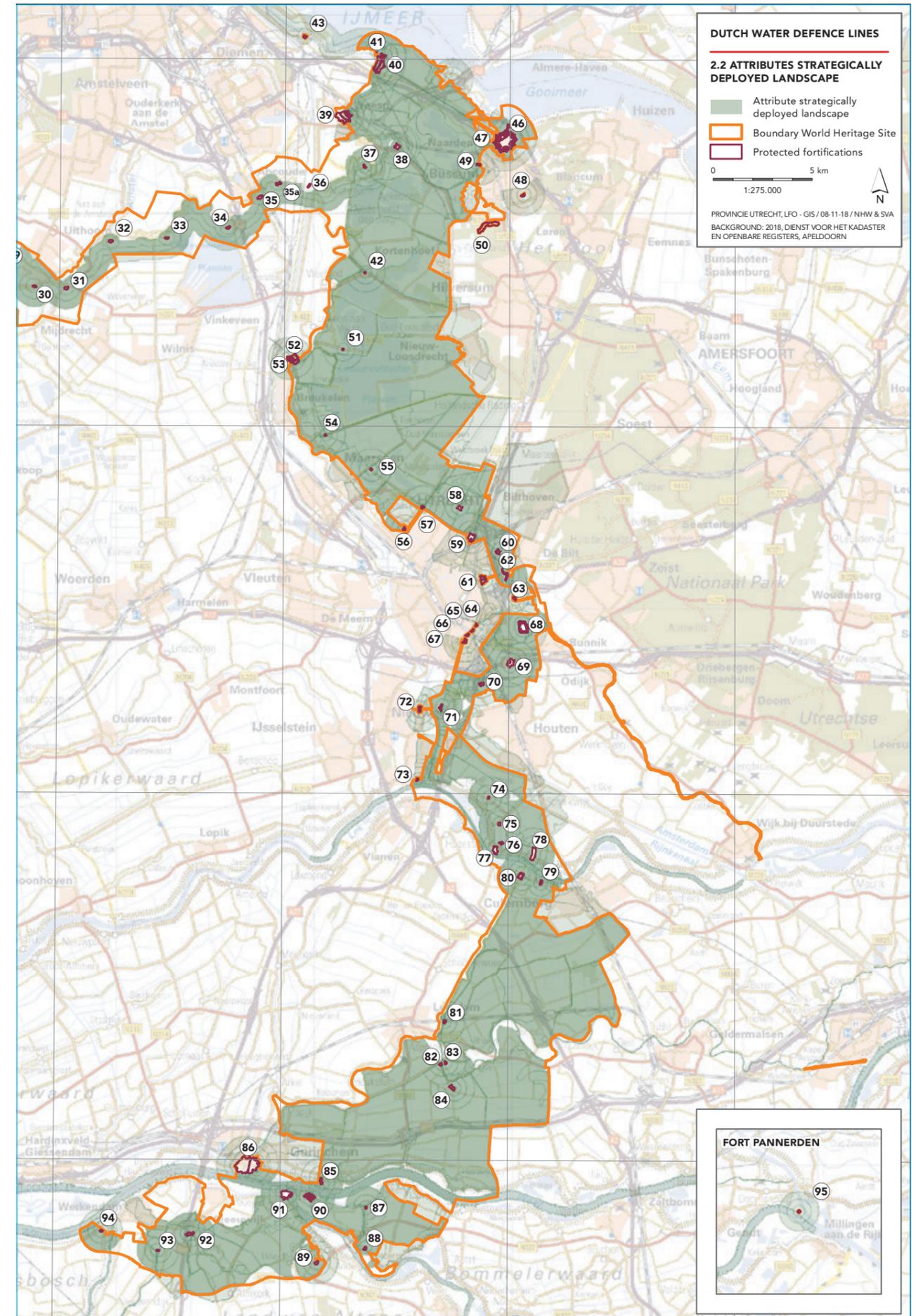
Basin barrages are dykes, quays or elevated sites that were intended to maintain the difference in water level between the inundation basins. Existing dykes and quays in an east-west orientation, such as the quay along the Tienhoven Canal or the dykes on the Lek and the Linge, were used as barrier quays to divide the inundation fields east of the main defence line into basins. These were strategically accentuated in the existing landscape by means of elevated areas and defence structures built on top of them. Basin barrages are usually positioned at right angles to the main defence line. This also includes barrier quays which are used to prevent inundation water from flowing out of the basins in a westerly direction.

Accesses

Accesses are entrances that remain dry and navigable waterways that passed in between in inundation areas. They were potential weak spots in the New Dutch Waterline. Accesses take the form of an elevated site, a dyke or quay, a river or canal, a railway line or motorway. Where accesses situated close together provide an opportunity for mutual support, this is referred to as a multiple access. Forts and other defences were a means of closing off these accesses. In the case of Utrecht, the large number of forts is an indication of the vulnerability of the wide area of the Houten levee (Houtense Vlakte) which could not be inundated. In order to provide the best possible protection for an access, the standard symmetrical shapes of the forts were adapted to take account of the local conditions on site and the topography. The Rijnauwen and Honswijk forts are good examples of this.

Prohibited Circles

Prohibited Circles are imaginary circles around a defence structure, within which a clear line of sight or line of fire is guaranteed by statutory provisions. These provisions are set out in detail in the Prohibited Circles Act [Kringenwet], which was legally valid between 1853 and 1963. In order to have a clear line of sight or line of fire in times of war, the area around the defence structures was divided into zones of 300, 600, and 1,000 metres from the farthest corners of the fort, sometimes around the fort and sometimes only on that side



of the fort where the enemy treat was expected. They were called 'Prohibited Circles' because all kinds of strict building and planting regulations applied in them. For example, only wooden buildings could be erected within the first two circles, so that these 'obstacles' could easily be demolished again if war was imminent. The military requirement for a clear line of sight or line of fire emphasised the contrast between the closed, defended side of the main defence line and the openness of the landscape on the inundatable side, including at the accesses.

Wooden houses The so-called 'kringenwetwoningen' (prohibited circles act dwellings), typical wooden houses, which can still be found here and there around the forts, bear particular witness to these military regulations. These houses are located in the first and second Prohibited Circle of 300 and 600 metres around a fort, where only wooden structures were permitted. In the first circle, a maximum of 40 square metres could be built on. Due to this limitation in the first circle, the larger buildings are located in the second circle, and are, therefore, still easily recognised in some places. Magnificent examples can be found near Weesp and Muiden. In Naarden and Bussum, some neighbourhoods are constructed entirely out of wood. Even untouched wooden farmhouses are encountered around Nieuwersluis and near Fort Rijnauwen in Utrecht.

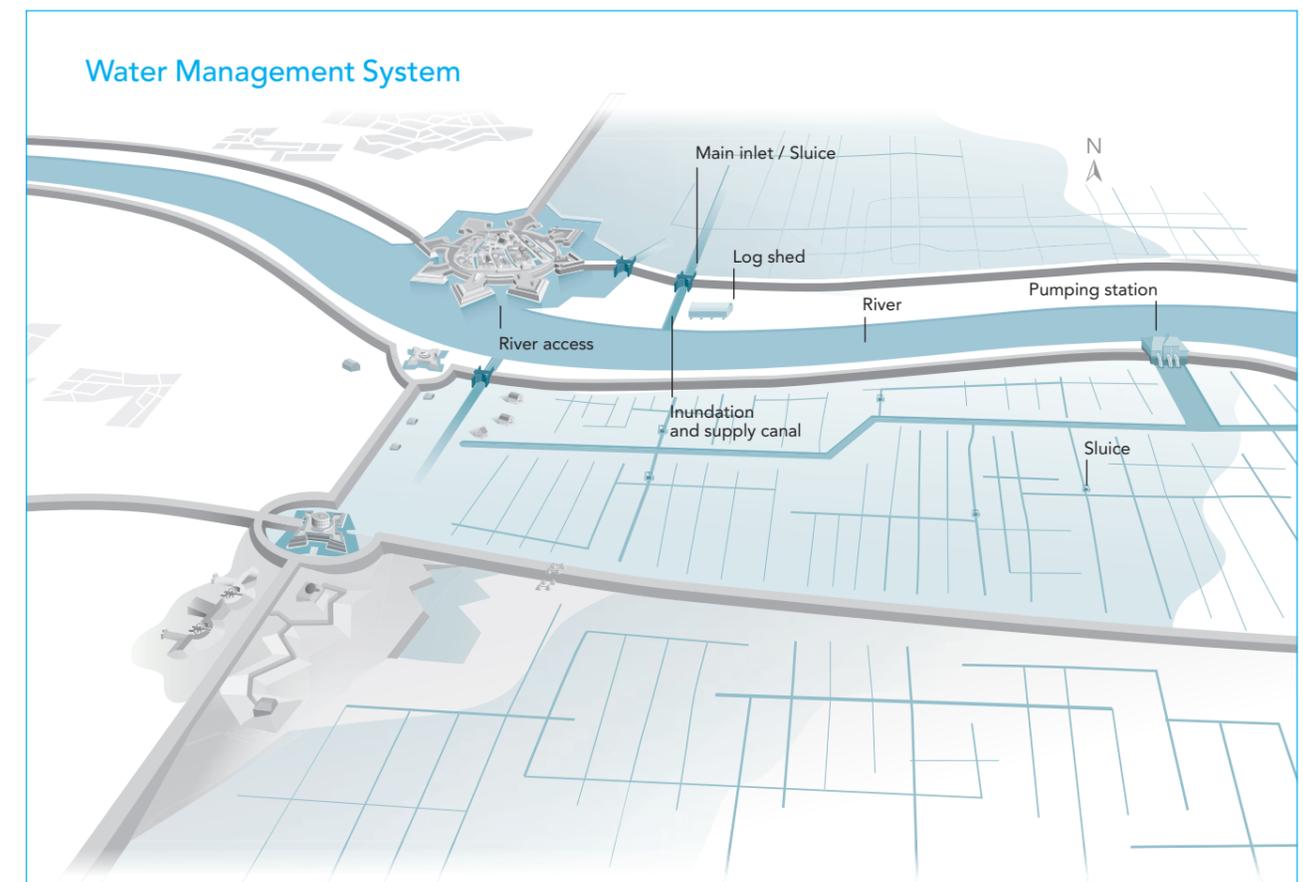
Attributes belonging to the Water Management System

The inundation system of the New Dutch Waterline was radically altered three times between 1815 and 1940 and was further perfected each time. The inundation of the polder country in Noord-Holland, Gelderland, and Brabant ranged from the large-scale main inlets at the Zuiderzee and the major rivers, via the inland waterways to the intricate network of ditches and channels. The land of 'lake and bog' was inundated to knee height in five phases, the final three phases being from Preparatory Level, via Provisional Level to Full Level. The nine inundation basins covered about 50,000 hectares. The primary water supply for the inundations progressed via the main inlet sluices along the major rivers, e.g. the Lek, the Waal, and the Meuse, to the Zuiderzee (now IJsselmeer). Drainage sluices and floodgates controlled the increase in and storage of this water in the secondary waterways (Vecht-Vaartsche Rijn Canal, Kromme Rijn, Linge, Bakkerskil, and later also the Amsterdam-Rhine Canal) and in the polder outlets, from where the water was distributed into the basins via smaller inlets and countless polder culverts.

The description of the water management structures focuses on the inundation structures, i.e. elements that were necessary to affect the inundations. Civil engineering structures, which acquired a joint military use, are also included. Inundation quays, rivers, inundation and supply canals, discharge and seepage basins, main inlets, sluices, culverts, stop log sheds, and pumping stations are described in turn.

Inundation quays The existing dykes and quays – raised earth banks intended to hold back external water – were used to advantage to regulate the inundations. Dykes are found alongside rivers, whereas quays are generally smaller and lower and are found alongside excavated waterways, such as canals and watercourses. Dykes ensure that rivers cannot overflow, and quays keep water from elsewhere out of the polders. In some places, the existing dykes and quays have been modified to accommodate the inundation basins, as in the case of the Tienhoven Quay along the canal of the same name, which was raised in 1876, and served as a barrier quay between the first and second inundation basins in the New Dutch Waterline. Special inundation quays, also known as barrier quays, were also constructed to ensure that the water was kept in the inundation basins. Examples of this can be found in Utrecht: along the Vaartsche Rijn and along the first ring of forts.

Rivers Being certain of the supply of sufficient water in times of inundation was essential. In addition to the Zuiderzee, the major rivers provided the primary water supply: the Nether Rhine-Lek, the Waal-Merwede, and the Meuse. This water was admitted directly or via the inland waterways from the rivers Vecht, Kromme Rijn, Linge, and Bakkerskil. The internal water reached the basins via distribution points.



Inundation and supply canals

Inundation canals are meant for the supply of inundation water. Generally speaking, existing water courses were used. They were widened and deepened, and dam sluices and locks were added, to make them suitable for this purpose. A fine example of this is the canalised Kromme Rijn, where a new link was built to the Nether Rhine at Wijk bij Duurstede, where an inlet sluice was provided. Both the Kromme Rijn and the Linge were partially canalised between 1866 and 1875 to improve the supply of water. In some places, new inundation canals were excavated specifically for this purpose, so that water could be quickly directed to an inundation field from the intake point. This mainly took place in the period around 1870. The length of the excavated inundation canals varies strongly. There is a short canal near Woudrichem, whereas the inundation canals at Fort Honswijk and Tiel are three kilometres long.

The supply canal is a special type of inundation canal. They are short canals that conduct water from the river to the fort moats for onward supply to the interior. A good example of this is at Fort Everdingen, where water enters from the river Lek. Small canals were also excavated, which controlled the supply of water to the polders with a dam sluice. Sometimes, the existing mill outlets were also used for this purpose. Most examples of this can be found along the inland rivers (the Vecht and the Linge).

Discharge and seepage basins

Discharge basins are water-filled depressions in the landscape, enclosed by a dam sluice. Some discharge basins have survived, such as those at Muiderberg, Nigtevecht, and Fort De Gagel. Seepage basins consist of a seepage quay and a dyke. Water seeping from the dyke and the land was collected in these basins. This created so much back pressure that the infiltration of seepage water could be halted. The seepage basin behind the fan sluice at Woudrichem is a fine example of this.

Main inlets

Inundation sluices were built at strategic locations near the Zuiderzee and along the major rivers to control the primary water supply for the inundations on the New Dutch Waterline. Because these main inlets were essential for effective inundation, they were almost always provided with defence structures. The fort at Pannerden positioned forward, tasked with protecting the river (Nether Rhine) itself, had a special function in this regard. By raising the water level in inland rivers, such as the Vecht, the Kromme Rijn, and the Linge by means of opened main inlet sluices, the inundation basins could be filled using all manner of sluices and other distribution points (ancillary sluices, culverts, and spillways).

The Waterline has fifteen main inlets. These main inlets were sometimes extensive complexes, consisting of multiple components such as dam sluices, culverts, batardeaus, seepage basins, inundation canals, and pumping stations. These are often combined with existing discharge sluices, such as those in the particularly extensive complex of sluices near Poederloijen. Combinations used for harbours and shipping also exist: for example, the discharge sluice at Muiden and the lock at Vreeswijk. Undamaged examples of purely military main inlets can be found at Fort Everdingen and,

less undamaged, at Fort Honswijk. These are discussed in detail in appendix 1.

Sluices

The most important inundation structures were the sluices: movable flood defences in a watercourse that held back water or let it pass through. There are four types of sluices, categorised according to function: inlet sluices, which are used to let in higher level external water; discharge sluices to discharge the surplus water to rivers or the sea; floodgates that separate an open link between two waterways; and locks that allow shipping between two waterways with different water levels.

Military use of existing sluices

'By the beginning of the eighty years' war, sluices were already playing an important part in the defence of the Netherlands. In 1572, for example, rochus meeuwsz., the town architect of Brielle, cut the doors of the polder sluice in two in order to inundate the Nieuwland polder, obliging the Spanish to withdraw. In 1629, Frederick Henry, the brother and successor of Maurice, prince of Orange, used the existing sluices to create the Utrecht waterline. The sluices at Vreeswijk and Wijk bij Duurstede in the south and the sluice in the river Vecht at Hinderdam in the north were used to inundate the strip of land in between.'

G.J. Arends, *Sluizen en stuwen*, Delft 1994, p. 24-25

These sluices vary considerably. They can be open or closed (culvert sluices) and provided with different barriers, including slide gates, various types of gate, and stop logs. The main feature of military inundation sluices is that they have to be opened or closed quickly.

The existing civilian facilities were not always best suited for rapid inundation. The water was not at the required level either. The Dutch army's engineers [Genie] therefore adapted the civilian facilities for military use. The purpose of all these water management structures was not only to exert and maintain control of a defensive water barrier, they also had to take account of the existing water management system for agriculture. Moreover, the obstruction of shipping traffic, much more important then than now, had to be kept to a minimum.

From 1815 onwards, the materials used in the construction of sluices in the New Dutch Waterline consisted of wood (mainly oak) for the sluice doors, brick and stone for the bridgeheads and the pillars in between, and iron for the winding gear, etc. From about 1850, riveted iron gate doors were also used (no longer troubled with shipworm, but with corrosion instead). Around 1900, reinforced concrete was introduced in sluice construction and steel replaced iron in closing gear.

Stop log sheds

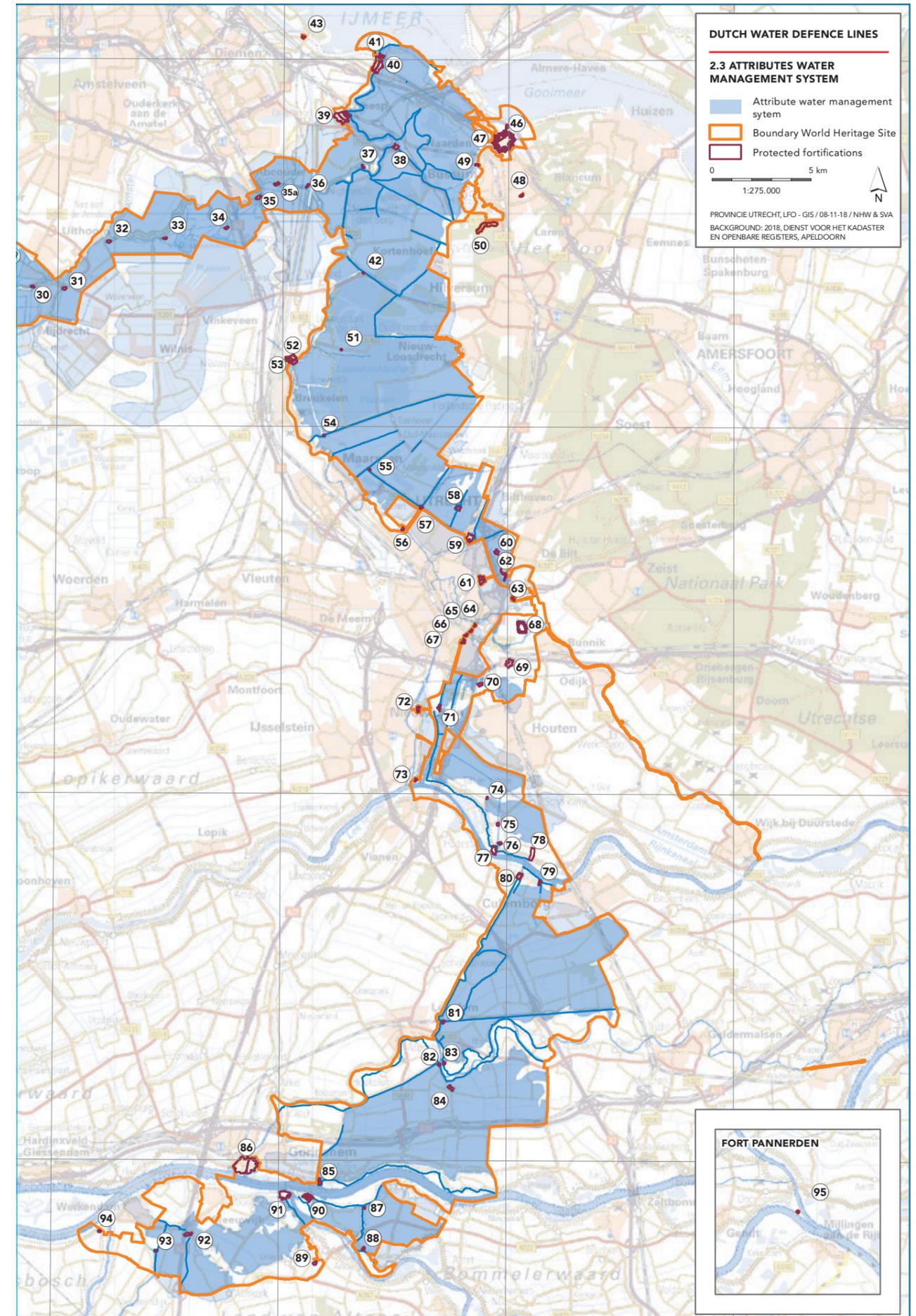
'Inundation sluices' is a collective name for sluices intended solely for military use. These sluices are normally not in use and are only opened (inlet sluices) or closed (floodgates) when there is a real hostile threat. The most common type of sluice that was to be operated occasionally was the dam sluice. This dam sluice could be closed off with double oak logs and the space in between was filled with clay and topped off with sand. These stop logs were stored as close as possible to the sluice in sheds, simple wooden single-storey buildings with a tiled saddle roof with overlapped planks or consisting of an open slatted construction. Depending on the type of sluice, (many) dozens of logs – ranging in length from four to eight metres – were kept in these sheds. Subsequently, Nissen huts were also used, as in the case of Fort Asperen and De Wapenplaats.

Culverts

Initially, the dykes and quays were simply breached in order to inundate the land. To make it easier to cut a channel through the dykes, they were cleverly prepared at the appropriate places. These 'cut-offs' were for a long time included in the instructions for the most detailed polder level and were indicated accurately on maps. But for the primary and secondary inlets, they were rather unreliable. They were, therefore, soon replaced by sluice structures that were much easier to control. Culverts, in the form of curved masonry passages or simple pipes through dykes and quays, were designed mainly to spread the inundation at polder level. The 'ploffduiker' (explosion culvert) is a special type of culvert. These are culverts which can close off the watercourse once and in an instant through the use of explosives. These culverts were built on at least three sites along the current Waterlinieweg near Utrecht in the early 1930s.

Pumping stations

From the fifteenth century, when more and more polders were being built in the Dutch landscape, groundwater was drained off to surrounding ring canals or rivers using windmills. The peat soil in the polders subsided due to oxidation. This subsidence was sometimes so great that a single polder-draining mill was no longer enough. Increasing numbers of mills were linked in series so that the water could be pumped step-by-step, a little higher each time, until it was eventually discharged into the river. An iconic example of this uniquely Dutch polder drainage system can be found in Kinderdijk, which is on the World Heritage List. During the nineteenth century, the windmills were increasingly replaced with much more powerful steam-driven pumping stations. Again, there is a Dutch example of this on the World Heritage List: the Woudagemaal, or Wouda Pumping Station, in the Frisian town of Lemmer. The steam-powered pumping stations were in turn replaced by diesel and electric pumping stations. The military engineers made clever use of the existing pumping stations in situations where inundation water could only be conveyed to a higher level by artificial means. Pumping stations were also very useful in speeding up the discharge of water when the inundation period was over. Three of the pumping stations in the New Dutch Waterline are known to have had the option of defensive use: the Noordpolder pumping station at Muiden, the Nieuwe Keverdijksche Polder steam-powered pumping station at Weesp, and De Oude Horn steam-powered pumping station along the Diefdijk with adjacent lock.

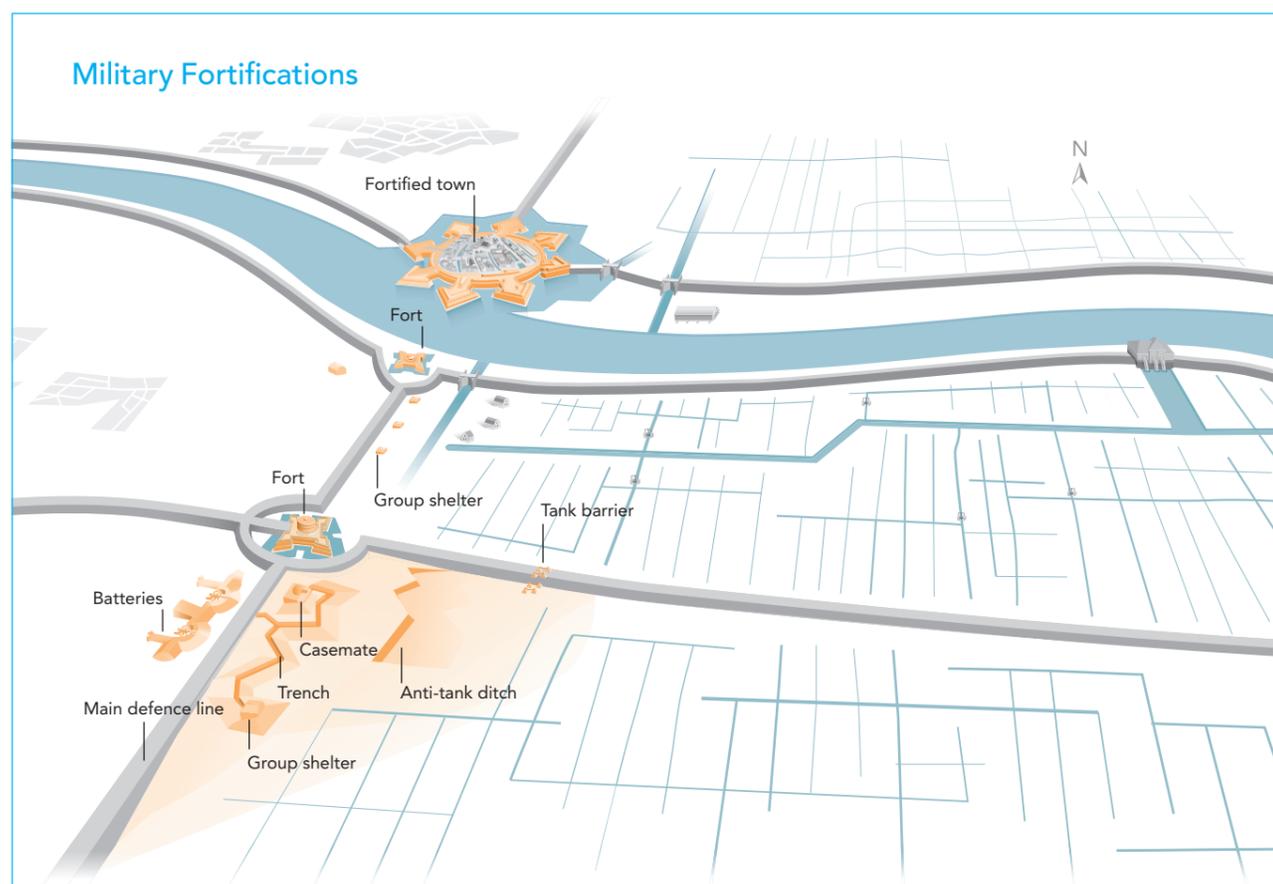


Attributes belonging to the Military Fortifications

The Military Fortifications are the most tangible and recognisable components of the New Dutch Waterline. They are defence structures which are intended both to seal off the vulnerable points in the New Dutch Waterline and to accommodate and protect men and equipment. The Military Fortifications in the New Dutch Waterline consist of 6 fortified towns (two of which are also part of the Defence Line of Amsterdam), 50 forts including a number of batteries, 14 defence lines, 16 clusters of dispersed structures, 3 covered community ways, 4 anti tank ditches, and many separate structures.

Fortified towns

Fortifications are fortified towns or military encampments with a permanent garrison. Most Dutch towns acquired a town wall from the thirteenth century onwards. In the sixteenth and seventeenth centuries, many strategically situated towns were provided with heavier and more elaborate defence structures with ramparts, bastions, ravelins, envelopes and moats. Because of the permanent military presence, these garrison towns acquired barracks with parade grounds, arsenals, munitions stores and sometimes training facilities as well. The precursor of the New Dutch Waterline, the Old Dutch Waterline, is mainly a defence line consisting of a series of fortified towns. Some of these towns were included as fortifications in the New Dutch Waterline and have therefore undergone modifications to a greater or lesser extent. Inside some fortified towns (Weesp and Nieuwersluis), completely new forts were built during the construction of the New Dutch Waterline. These are included in the descriptions of the fortified towns.



The six fortified towns below form part of the New Dutch Waterline:

- Fortified town of Naarden
- Fortified town of Muiden
- Fortified town of Weesp
- Fortified Town of Nieuwersluis
- Fortified Town of Gorinchem
- Fortified town of Woudrichem

Four fortified towns (Naarden, Nieuwersluis, Gorinchem, and Woudrichem) are included in the proposed extension of the World Heritage Site to include the New Dutch Waterline. The other two (Muiden and Weesp) are located in the area where the New Dutch Waterline overlaps with the Defence Line of Amsterdam. They are part of the existing World Heritage Site.

The main characteristics of the fortified towns are explained in detail in appendix 1.

Forts and batteries

All forts and batteries are given the collective name of defence structures, i.e. arrangements that provide cover for troops and weapons (see appendix 2, section 3). A fort is defined as a defensible structure enclosed on all sides by a moat, from which a defence can be mounted independently. The New Dutch Waterline has different types of forts, which are generally variations within the bastion system, except for later forts such as Rijnauwen (polygonal system) and Fort Vechten and Fort 't Hemeltje (hybrid system). [Eight forts are also referred to as 'structures'. These are generally smaller forts without bastions and organised as battery forts, such as the Structure near Maarsseveen and the Structure at Hoofddijk. Apart from the Four Lunettes in Utrecht, the New Dutch Waterline does not contain any brick-built forts. All fort bodies are earthworks, only the buildings usually added later being built of brick, supplemented here and there with concrete shelters and casemates after 1900. The function of the forts was to safeguard the nearby parts of the water system, such as inundation sluices, and to close off accesses. They were also designated encampments of manpower and equipment.

Batteries are emplacements for a number of artillery pieces, often combined into an organisation of earthworks and mutually supporting fires. In view of their function as providing support for the forts, they are also known as secondary batteries. The earthen structure is vulnerable in terms of maintenance, which led to the disappearance of many batteries over time. Nine have survived, but not all of them in peak condition. In three cases (Karnemelksesloot, Brakel, and Poederoijen), the defence structures are called 'Batteries'. As they are completely surrounded by a moat, we have listed them under forts.

Positions and dispersed system

Concrete group shelters and casemates are often clustered together in the landscape, on sites where an enemy could cross the inundation field or at accesses (for example, the Structure along Groeneweg). A distinction is made between positions and dispersed structures.

Positions generally date from the period of mobilisation during the First World War and are characterised by their compact formation: the structures are close together. A position is a more or less self-contained system of defensive emplacements, consisting of a coherent set of trenches, machine-gun nests and group shelters, usually situated between the older forts, or in a more forward position. A fine example of an intermediate position with several types of concrete structures can be found at Rijnauwen and Vechten. The Structures near Griffenstein and De Franse Kamp near Bussum are typical examples of forward infantry positions.

Most of the dispersed structures date from the period just before the Second World War. These concrete structures are spaced further apart. In some locations, there is a mixture of structures with those from the 1914-1918 period of mobilisation. We frequently see a combination with the older defence structures. Because the different landscape types in the New Dutch Waterline had to be taken into account, no cluster is identical. Unlike the older forts, the concrete structures were built in a limited number of standard types. However, their location in relation to the surrounding area and their position relative to each other in clusters characterise their strategic relationship with the landscape.

Group shelters

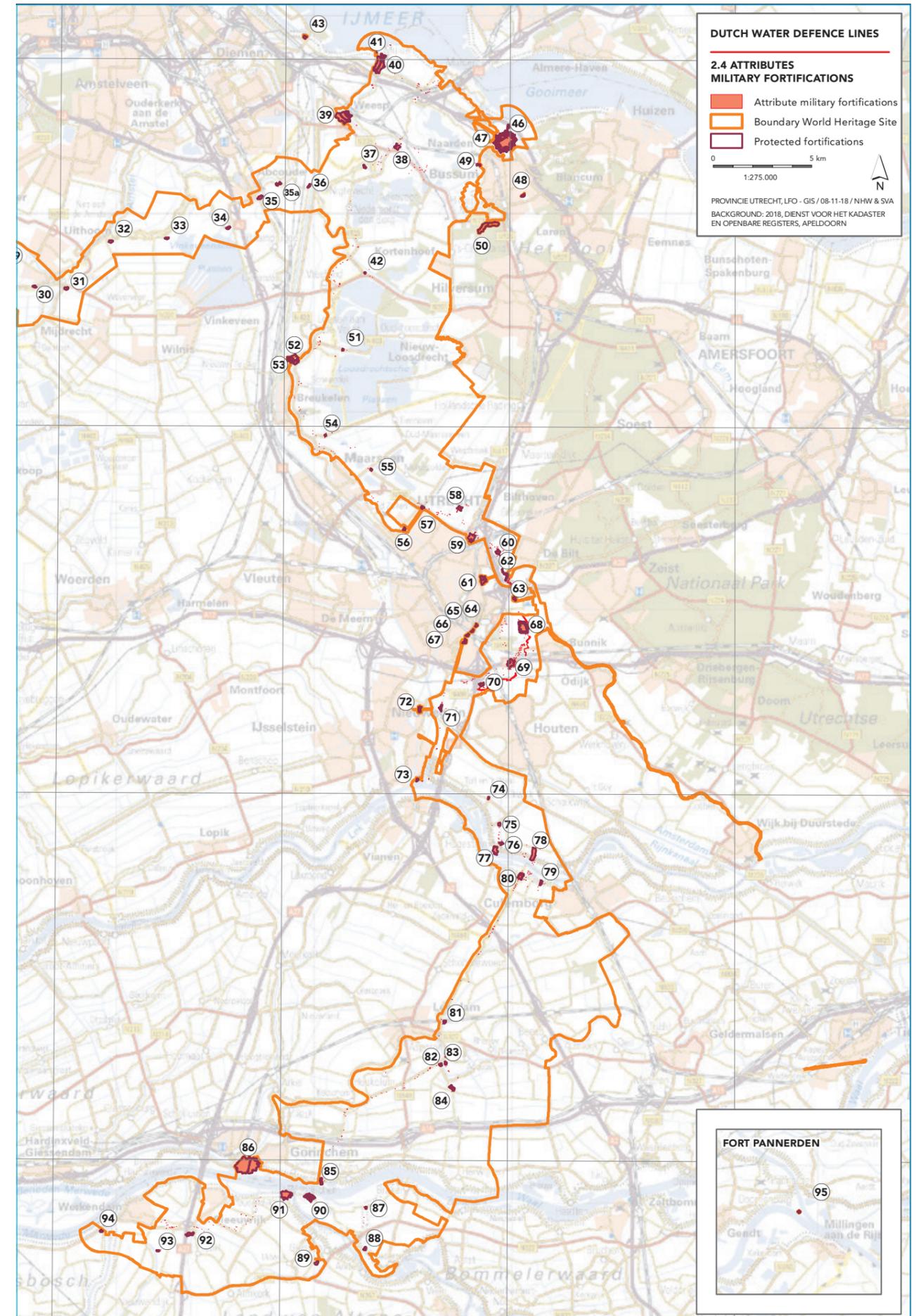
Group shelters are concrete structures designed to house groups of infantrymen when the trenches between the shelters do not provide sufficient cover. Unlike a casemate, a group shelter does not have an active combat function. There are no emplacements for weapons such as machine guns or cannons. Hundreds of group shelters and dozens of casemates from the 1914-1918 mobilisation period and the interbellum period (the period between the First and Second World Wars) and 1939-1940 can still be found – either dispersed or concentrated – in the area of the New Dutch Waterline. There are six different types of group shelters, from different construction periods. An extensive description of the group shelters can be found in Appendix 1.

Casemates

A casemate is a covered emplacement for artillery or machine-guns in a defence line, having one or more embrasures. They were added to the New Dutch Waterline in the twentieth century, and were generally made from concrete. Since the Second World War, concrete shelters are often described in everyday language as a 'bunker', the German word for casemate. There are four types of casemate, which are described in more detail in Appendix 1.

Other military objects

A number of other military objects were built for the New Dutch Waterline, such as covered community ways, machine-gun nests, trenches, and anti tank ditches (see explanation in box).



2.a.6 Proposed modifications of the Defence Line of Amsterdam World Heritage Site

Significant Boundary Modification

In this section, the argument for the modification of the boundary of the Defence Line of Amsterdam to include the New Dutch Waterline is described or substantiated. For this, the ICOMOS recommendation (23 December 2015), published following the ICOMOS mission at the end of 2015, was used. The advisory report offers three recommendations with regard to the boundaries:

- 1 The report emphasises the importance of a thorough landscape analysis, which also sets out the dynamics of the Defence Line of Amsterdam and the New Dutch Waterline. This provides reference points for determining the boundaries.
- 2 The report contains the recommendation to investigate the possibility of a buffer zone for the New Dutch Waterline and the Defence Line of Amsterdam and take it into account in deliberations when determining the boundaries. It states that the protective effect of existing planning regimes should be investigated and they should be used to protect the property.
- 3 The report states that the boundaries of the New Dutch Waterline must where possible be in keeping with the system and approach adopted in the Defence Line of Amsterdam.

These recommendations have been taken into account when preparing this proposal for the boundaries of the site and the way in which the buffer zone has been dealt with. See also Section 5.

In different contexts, ICOMOS has already recommended to the WH Committee some large extensions in terms of surface and/or in terms of attributes and significances. It completely conforms to the Operational Guideline section 'Significant modifications to the boundaries' (2015, #165-167).

However, an ICOMOS evaluation may pay strong attention to the coherence of extended properties in terms of geographical continuity or proximity, and in terms of complementarity of attributes and meanings. Each proposed extension must have a real, visible and clear contribution to the OUV of the already listed property.

The method outlined for delineating the property is – in part on the basis of the aforementioned third ICOMOS recommendation – to a considerable extent in keeping with the method used to establish the boundaries of the Defence Line of Amsterdam.

For the Defence Line, the authentic and sound attributes have been included within the boundary of the Defence Line of Amsterdam World Heritage Site. This includes the main defence line of the forts and other defence structures, and a wide area surrounding these structures. At the time of nomination of the Defence Line of

Amsterdam, it was decided not to make all the inundation fields part of this World Heritage Site. The argument was that space is under a lot of pressure in the surrounding area and it was not expected that permanent conservation of these areas could be guaranteed. In addition to the existing protection regime, the Defence Line of Amsterdam has not placed an additional buffer zone around the site.

Methodology for the boundaries of the Dutch Water Defence Lines

For the boundaries of the extension to include the New Dutch Waterline, the choice has also been made to include as many of the attributes that represent the Outstanding Universal Value as possible within the boundaries of the proposed World Heritage Site. In addition to the various military structures, the Prohibited Circles and the inundation fields also form part of the property. The inundation fields are important here, because the inundation areas form an important part of the functioning of the system. Additionally, in the extension, large sections of the inundation fields are exceptionally well preserved and are sufficiently protected. It underlines the choice to have the open inundation areas make up as complete a part of the property as possible. For the extension, the buffer effect of the existing protection regimes is used, similar to the Defence Line of Amsterdam. After 2021, this buffer effect of the Environmental & Planning Act will be reinforced by the Living Environment (Quality) Decree, in which the external effect on the OUV of developments outside of the World Heritage Site must also be considered.

On the basis of the studies detailed below, the following principles determine the boundaries of the Dutch Water Defence Lines as a whole:

- All the attributes that represent the Outstanding Universal Value form part of the property.
- In the extension, i.e. the New Dutch Waterline, the inundation fields form an integral part of the system because they are complete and intact inundation basins that can tell the whole story. This forms an important added value in relation to the current World Heritage Site.
- Any areas that the integrity and authenticity surveys and landscape analysis showed to represent sufficient value and that can be protected in a sustainable manner have been kept within the property.
- For the protection of the site from external influences, the existing – surrounding – protection regimes have been identified and shown as a buffer zone

To determine the boundaries of the New Dutch Waterline as an extension of the Defence Line of Amsterdam, the following steps were taken to further support the proposed boundaries of the New Dutch Waterline:

- 1 Reformulate the draft Statement of Outstanding Universal Value and specify the attributes that represent the future World Heritage Site (see sections 2.a, 3.3, and Appendix 1 Attribute details).
- 2 Investigate the authenticity and integrity of these attributes (see Sections 3.1.c, 3.1.d, and Appendix 2 Integrity and Authenticity).
- 3 Prepare a landscape analysis of both waterlines, including features and dynamics (see Appendix 3: Landscape analysis).

- 4 Investigate existing protection regimes that are consistent with the objectives of the World Heritage Site (see Appendix 4: Landscape analysis).

The most important conclusions for each study are:

1 Draft Statement of Outstanding Universal Value and attributes

Work was done on reformulating the draft Statement of Outstanding Universal Value (Section 3) and specifying the attributes (Section 2.a) that represent the future World Heritage Site. It was decided which attributes represent the Outstanding Universal Value and must therefore form part of the site. For the extension to include the New Dutch Waterline, the choice has been made to include all attributes corresponding to the three core features (Strategically Deployed Landscape, Water Management System, and Military Fortifications) in their entirety in the nominated property. The recognisable coherence between these three outstanding core features and the intact and undamaged inundation fields give the existing Defence Line of Amsterdam World Heritage Site added value.

2 Integrity and authenticity

A study has been carried out into which attributes are no longer authentic and sound, and, therefore, insufficiently represent the (coherence of) Outstanding Universal Value. The investigation of integrity and authenticity (Appendix 3) show that the New Dutch Waterline has a high degree of integrity and authenticity. Almost all the attributes specified are in very good condition, and they make a valuable contribution to the representation of the Outstanding Universal Value and the proposed World Heritage Site. Thanks to enforcement of the Prohibited Circles Act, many areas around the Military Fortifications have remained open, even if they are near urban areas. After this military legislation was lifted, a number of areas were developed. For this reason, these areas were kept outside of the boundaries.

3 and 4 Future transformations and developments and corresponding protection regimes

The mission was of the view that consideration should be given to defining the setting (beyond the military landscape) for the existing property and for the proposed extension. This would involve an accurate and individual landscape analysis for the way it supports the property. This analysis would need to consider possible future high constructions (e.g.: city or economic zone not directly visible at that time from the DLA & NDW line, agro-industrial plant, wind farm project, and etc.).

- On the basis of the landscape analysis (Appendix 4), a list is offered for each sub-area of what is characteristic and which corresponding protection it deserves. This gives us the following overview:
- Triangle of fortified towns – Muiden, Naarden, and Weesp: Focus on maximum preservation and strengthening of the (physical, functional, cultural heritage, topological) relationship between the three fortified towns of Muiden, Weesp, and Naarden, the relationship between the fortified towns and the surrounding ('undefended') landscape/water, the remaining degree of openness, and the link between the Defence Line of Amsterdam and the New Dutch Waterline.
 - Vecht lakes area: Focus on maximum preservation and recognisability of the system and the original open inundation field as a complete and intact expression of the New Dutch Waterline as a military defence system in the landscape, principally also as a counterpart to the urban area in the north (Triangle of fortified towns of Muiden, Weesp, and Naarden) and in the south (Utrecht-East).
 - Utrecht-East: Preservation and strengthening of the recognisability and coherence of the double ring of forts of the New Dutch Waterline as a military defence system.
 - Landscape of the major rivers: Focus on maximum preservation and recognisability of the ensembles of forts, the castle and other fortifications, Diefdijk and Nieuwe Zuiderlingedijk as a clearly recognisable main defence line together with the open inundation field, as a complete and intact expression of the New Dutch Waterline as a military defence system in the landscape.
 - Southern marine clay area: Focus on maximum preservation and strengthening of the coherence and recognisability of the military system of the main defence lines (WWI and WWII), the ensembles of forts, the triangle of fortified towns, and the open inundation field.

Landscape analysis shows that, for the New Dutch Waterline section, the structure of the landscape is the determining factor for specific location of the Waterline and its attributes. It largely explains the coherence between the various elements and the functioning of the system. It is unique that this coherence is still present in large parts of the New Dutch Waterline. This is in line with the basic principle that all attributes would be included within the property and, therefore, within the boundary, thereby ensuring the coherence of the system.

The locations where many transformations may be expected have also been analysed, because large-scale developments have already been embedded in urban planning. These are areas where few attributes are left as a result of developments in the past or where it is unlikely that they can be permanently protected. These areas were kept outside the boundaries. They are: Residential areas around the fortified town of Naarden, within the urbanisation boundary of the city of Utrecht, 't Klooster industrial estate in Nieuwegein, reservations in Gorinchem (Dalem), and Regional Industrial Estate Werkendam.

Proposed Boundary Modification for the Defence Line of Amsterdam

This dossier is a significant modification of the boundaries of the World Heritage property Defence Line of Amsterdam. The focus is mostly on the proposed extension of the Defence Line of Amsterdam to include the New Dutch Waterline.

Part of the significant boundary modification is also a modest modification of the Defence Line of Amsterdam itself. For this, the State Party submitted a proposal for a minor boundary modification in 2017. It was discussed during the 41th meeting of the World Heritage Committee and was not approved (decision 41COM 8B.46). The most important reasons for this are that the World Heritage Committee, as advised by ICOMOS, is of the opinion that the proposed changes are not a 'minor modification' and must be assessed in relation to the extension to include the New Dutch Waterline.

In a meeting between the UNESCO World Heritage Centre, ICOMOS International, and the State Party, it has been decided that the proposals for a number of modest reductions and extensions of the Defence Line of Amsterdam would be included in this significant boundary modification. This section will include a description of those proposals and their justification. The text follows the general structure of the proposal for a minor boundary modification that was submitted on 27 January 2017 under ref 2017B-005. The text at that time has been supplemented in those areas where the decision of the World Heritage Committee and ICOMOS's recommendation so required. The additional recommendations in decision 41COM 8B.46 that relate to the protection and management of the property (sections 3.1 – 3.6 and 3.8) are discussed elsewhere in this proposal for a significant boundary modification.

This section no longer includes a proposal for the reconfirmation of Fort Kijkuit. In the Defence Line of Amsterdam boundary clarification, which was approved during the 42nd meeting of the World Heritage Committee in Manama in 2018 (decision 42COM.8D), it is clearly stated that Fort Kijkuit is part of the property already placed on the World Heritage List. Extensions 'A4' and 'A5' from the 2017 boundary modification proposal are also no longer discussed separately. These extensions are now part of the proposed major extension to include the New Dutch Waterline.

During development of the boundary clarification and relating communication between UNESCO and the State Party (2009-2014), boundary problems had come to light at a few places in the Defence Line of Amsterdam. Some of these are problems that date from the time of the nomination of the Defence Line of Amsterdam (1996). During the nomination, some spatial developments were being implemented or had already been completed within the property's boundary. An example of these is the construction of the Broekpolder residential development near Heemskerk. At a few other locations, a planning decision had already been made in 1996 for the creation of a housing estate or a business estate. At the

Spatial developments since placement on the World Heritage List

time, no mention was made in the nomination file of these developments, which were either planned or had already been started. With current knowledge, it must be noted that these sites should not have been included within the Defence Line of Amsterdam boundary. These locations will be discussed in more detail further on in this proposal.

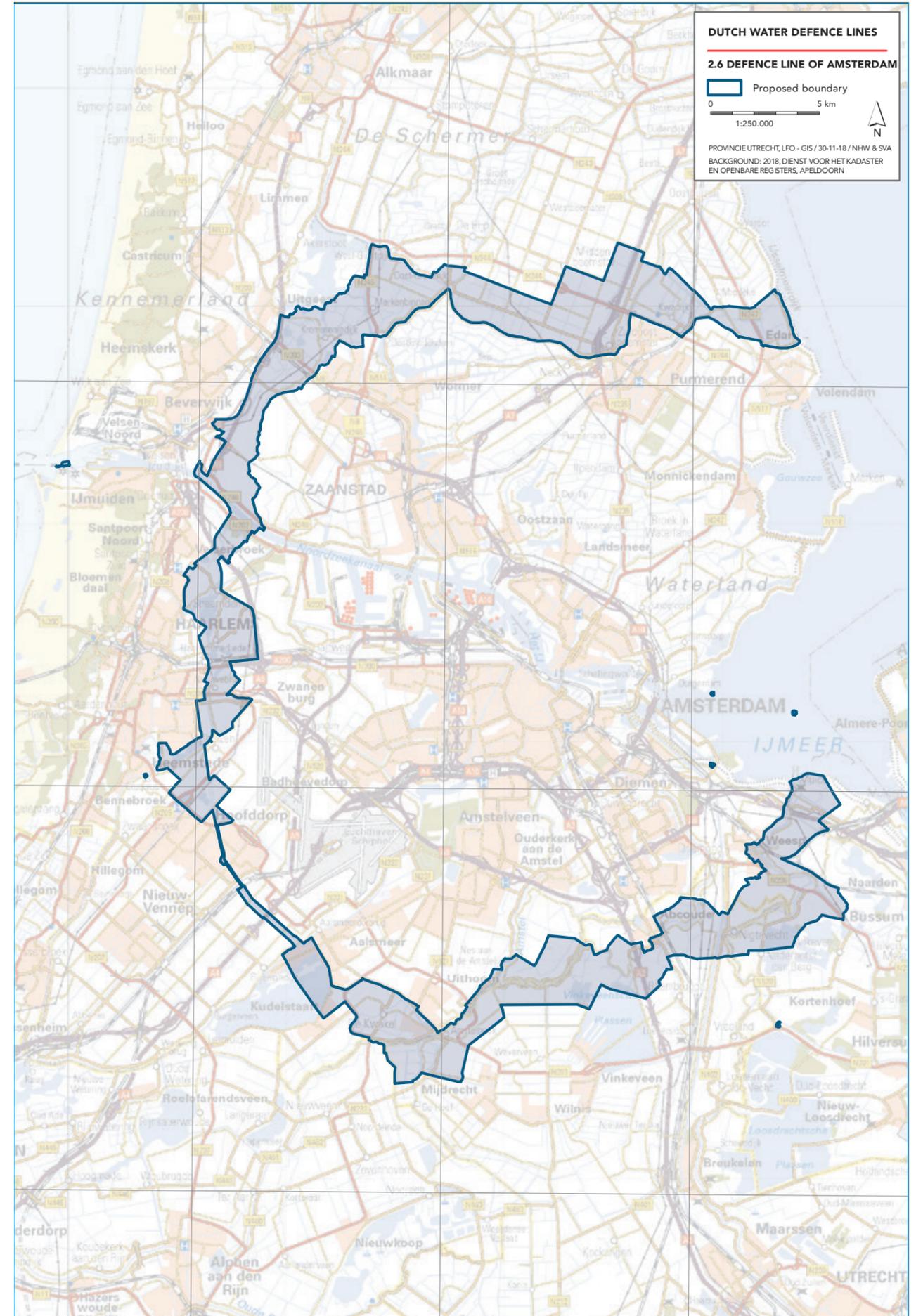
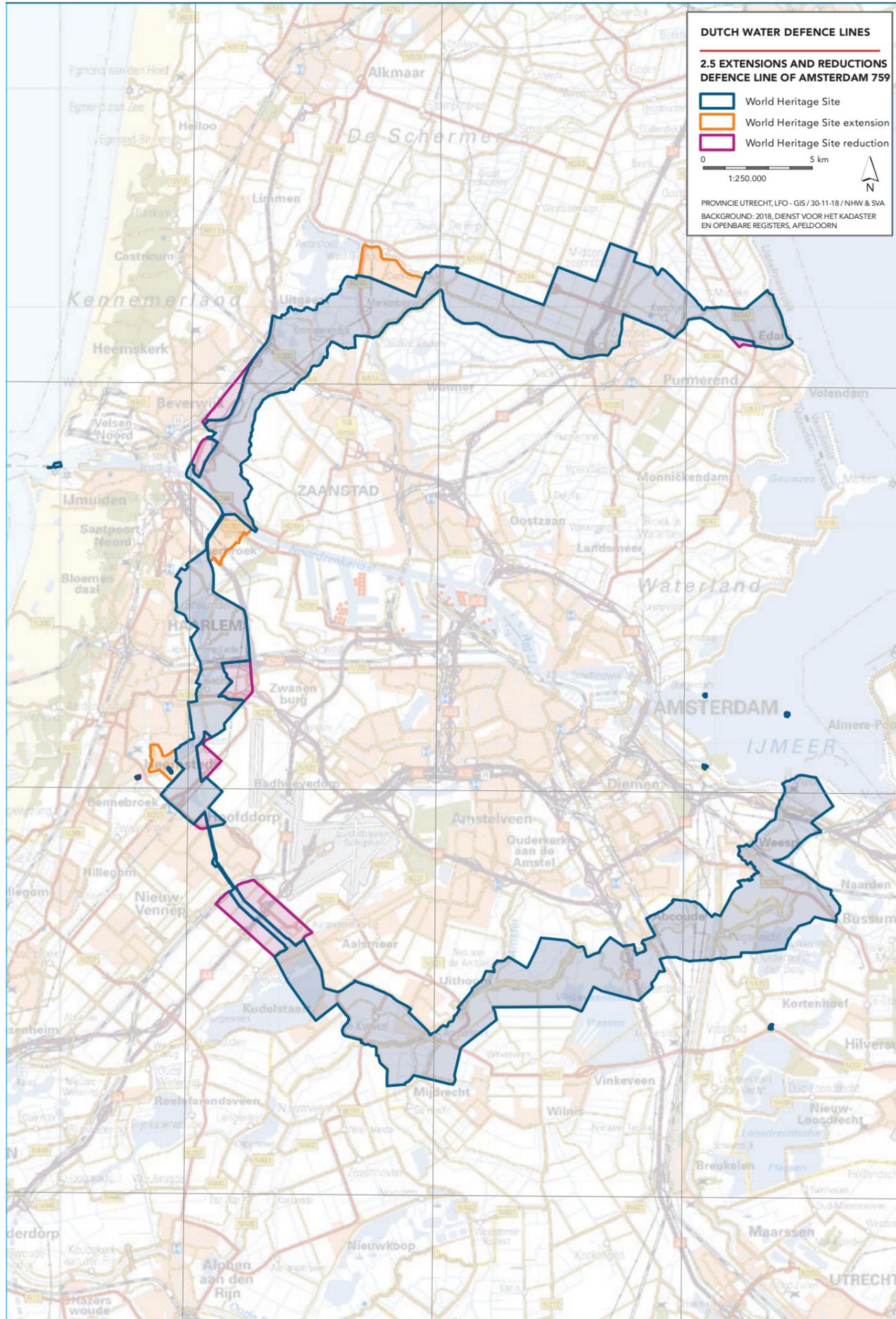
There are two further locations where construction decisions were made after 1996. These decisions are now irreversible. One is a location near Edam and the other is an area near Hoofddorp, close to Schiphol Airport. The latter location in particular is illustrative of the economic and spatial planning-related pressure that we have to deal with in maintaining the OUV of the Defence Line of Amsterdam. This permanent pressure on space was one of the reasons why we indicated at the beginning of 2014 that we wished to consult the Centre and ICOMOS on this subject, which resulted in the formal Advisory Mission of ICOMOS in 2015.

ICOMOS Advisory Mission

After the terms of reference for an upstream assistance mission had been agreed, the ICOMOS Advisory Mission took place from 21 to 23 September 2015. Central to this was the advice on the way in which, and the conditions under which, the nomination of the New Dutch Waterline as an extension of the Defence Line of Amsterdam can take place. One of the objectives of the mission was to examine the potential inclusion of some minor boundary modifications of the Defence Line of Amsterdam. During the mission, a visit was made to the area, taking in the most important locations where plans exist for modifying the boundary.

In the report that ICOMOS produced on 23 December 2015 following the Advisory Mission (see the enclosure to the letter Ref: CLT/HER/WHC/8523/NL/MA/) it is noted that the proposal 'which (...) includes additions and diminutions, might not change drastically the existing limits of the Defence Line of Amsterdam but appropriate ICOMOS evaluation of a complete dossier for "minor modifications" will determine whether it is overall a "minor modification" or not'. The report continues with the observation that a minor modification must not modify the basic parameters of the initial definition of the property relying on the attributes expressing the OUV, with this involving tangible attributes such as dykes, canals, forts, hydraulic equipment, logistic paths, etc., as well as the inundation zone all along the defence line itself (...) that express continuity of the defensive flood arrangements.

In response to this, the Netherlands indicated in a letter of 13 June 2016 (Ref 2016B-11) that it was gratified by the positive and constructive approach adopted in the ICOMOS report. It acknowledged the appreciation expressed for the policy pursued in the Netherlands to maintain and manage the OUV of the Defence Line of Amsterdam World Heritage property, and also for the understanding expressed for the difficult context of economic forces within which preservation is implemented. In the response it is also noted that the nomination dossier that is to be submitted "will include a proposal for a minor modification to the boundary of the Defence Line of Amsterdam. Clear reasons will be given for each proposed minor boundary modification".



Another letter was received on 19 August 2016 (Ref.: CLT/HER/WHC/EUR/16/9115) relating to two ICOMOS Technical Reviews. One of these related to State of Conservation reports that had been sent; the other one concerned the Advisory Mission. This stated: Regarding minor boundary modifications in conformity with paragraph 164 of The Operational Guidelines for the Implementation of the World Heritage Convention, if a State Party 'wishes to request a minor modification to the boundaries of a property already on the World Heritage List, it must be prepared in compliance with the format of Annex 11 and must be received by 1 February by the Committee through the Secretariat, which will seek the evaluation of the relevant Advisory Bodies on whether this can be considered a minor modification or not'.

Although it was not said explicitly, this passage appeared to be inspired by the announcement by the Netherlands that the nomination dossier that is to be submitted 'will include a proposal for a minor modification to the boundary of the Defence Line of Amsterdam'. ICOMOS refers to the fact that a minor boundary modification must take place in conformity with paragraph 164!

On the basis of this paragraph, the State Party decided, in close consultation with the site holder responsible, the province of Noord-Holland, to submit a request for some modest boundary modifications in 2017. After this proposal was rejected during the 41st committee meeting, it was agreed that the proposals would be submitted within the framework of this significant boundary modification.

Description of the proposed modification of the boundary

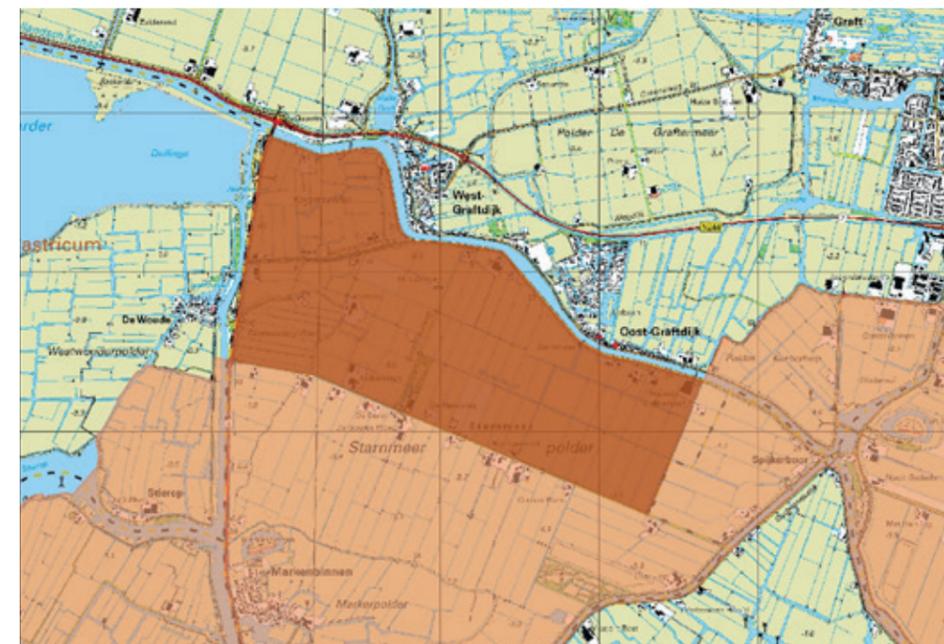
The proposal for a minor boundary modification concerns the exclusion of seven areas that have now been built on and the inclusion of two inundation field sections and Spaarnwoude where there has been no construction, within the boundary of the Defence Line of Amsterdam World Heritage Site. We will explain below for each area why the Netherlands proposes to add that area to the Defence Line of Amsterdam World Heritage Site or remove it from the Defence Line of Amsterdam. The relevant number (e.g. A1) refers to the location on the map.

A. Areas to be included

In category A, we present three areas that we wish to include in the Defence Line of Amsterdam World Heritage Site. When the Defence Line of Amsterdam was placed on the World Heritage List in 1996, these areas were erroneously 'forgotten' or were not considered for inclusion in the World Heritage Site. However, the Dutch government considers it desirable for these areas to be included within the boundary of the World Heritage Site, because the areas have attributes that make them part of the Defence Line of Amsterdam or because in their visual quality (open landscape) they make a contribution to and strengthen the OUV of the Defence Line of Amsterdam. This concerns the following areas.

A1: Starnmeerpolder (+ 323 ha)

This area, used as grassland for dairy farming, is a former Defence Line of Amsterdam inundation polder. The area is still completely open and very recognisable as an inundation field. For this reason, and because the inclusion of this area in the World Heritage Site



Starnmeerpolder

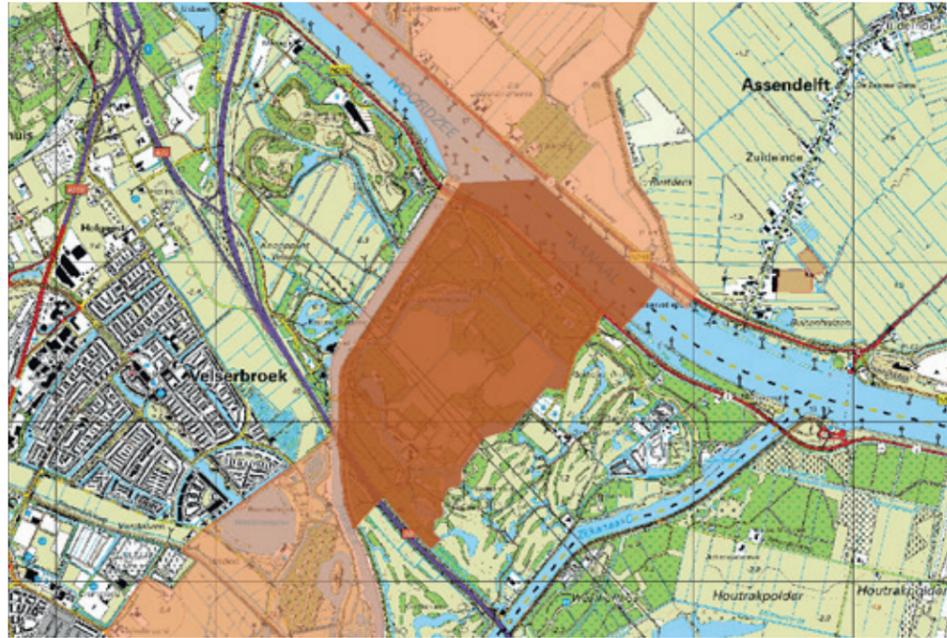
would increase the amenity value of the open inundation landscape, it is proposed that this area should be added to the Defence Line of Amsterdam and brought within its boundary. The area covers 323 ha and due to its previous function, its openness and the way in which it relates to the Defence Line of Amsterdam, it enhances the Outstanding Universal Value of the Defence Line of Amsterdam. The area's location is given on the map images below. The current boundary of the Defence Line of Amsterdam World Heritage Site is the area coloured light brown. The area that we propose to include is in dark brown.

A2: Spaarnwoude (+ 240.9 ha) [B 2. 31]

This refers to an undeveloped and mainly wooded recreational area east of the current – at this point very narrow – boundary of the World Heritage Site. The area is part of the Spaarnwoude leisure authority and will remain vacant and green due to its recreational function for the nearby cities of Amsterdam and Haarlem. Although this area is situated in the inner part of the World Heritage Site, where no inundation fields or other attributes are located, the added value of this extension lies in the fact that it would reinforce the ring of the Defence Line and would thus strengthen its continuity. This inclusion is therefore important from the point of view of experiencing the landscape and increasing its coherence. The addition of these 240.9 ha would make it easier to preserve the integrity of the Defence Line. The current boundary of the Defence Line of Amsterdam World Heritage Site is the area coloured light brown. The area that we propose to include is in dark brown.

A3: Inundation field in the vicinity of the Advanced fort near Vijfhuizen (+ 141.8 ha)

This area lies west of the current World Heritage Site boundary. Most of it is an open inundation field (Molenplas and Zuid-Schalkwijk near Haarlem) belonging to the Defence Line of Amsterdam.



Spaarnwoude



Inundation field in the vicinity of the Advanced fort near Vijfhuizen

The area also contains a number of small batteries that form part of the Advanced fort Vijfhuizen fortifications. The Advanced fort belongs to the defence works dating from an earlier stage in the defence of Amsterdam and therefore has a special relationship with the Defence Line of Amsterdam, specifically with the Fort near Vijfhuizen. Both the fort and the Advanced fort fortifications are already part of the World Heritage Site. The area is on the outside of the main defence line between Vijfhuizen and Hoofddorp, south of Haarlem, and is still to a great extent open land. Adding this area to the World Heritage Site will bring an original inundation field of the Defence Line of Amsterdam inside the boundary of the World

B. The areas to be brought outside the boundary of the Defence Line of Amsterdam World Heritage Site

Heritage property. The inclusion of this area of 141.8 ha will further increase the OUV and the amenity value of the Defence Line of Amsterdam in this part of the World Heritage Site. The current boundary of the Defence Line of Amsterdam World Heritage Site is the area coloured light brown. The area that we propose to include is in dark brown.

This category, containing seven proposed exclusions that will be described below, can be divided into two parts. In part B1 we describe a few small areas that were built on shortly after 1996. In these areas, development was based on provincial regional plans and/or municipal zoning plans dating from before 1996, the year of the nomination. Implementation of these plans had in some cases already been started at the time of the areas being placed on the World Heritage List, and in other cases the plans were implemented a short time afterwards. The Netherlands regrets that these areas were nominated as part of the property, even though it should already have been known that there were different plans for them. The reason for this was that at the time coordination between the heritage and the spatial planning departments at national and provincial level was not yet optimal. In consequence, the heritage department was not sufficiently informed about the latest planning decisions. Upon reflection, these areas should not have been included in the nomination.

Part B2 describes two areas for which development decisions were made - at least partial - after 1996, and where the decision has either been implemented in the meantime or has become irreversible. These developments are directly related to the great economic pressure on the Defence Line of Amsterdam. The Defence Line of Amsterdam is situated around the Dutch capital, in a region that can be seen as the economic driver for the country and is very close to Schiphol Airport, which is of international importance. The developments mentioned could not be prevented because of their economic and social importance. At the time, the Netherlands failed to report these developments proactively to the World Heritage Centre. The developments near Hoofddorp (Geniedijk and surroundings) were mentioned in the retrospective Statement of Outstanding Universal Value (SoOUV) and discussed at length during the ICOMOS advisory mission in 2015. The Advisory Report refers sympathetically to the major spatial planning pressure in parts of the Defence Line of Amsterdam, especially near Schiphol Airport, and to the fact that boundary modifications are necessary.

The areas in B1 and B2 consist only for a small part of former inundation land and land in the field of fire of the Defence Line of Amsterdam, and for a large part of land that is situated behind the main defence line (on the inside of the Defence Line of Amsterdam), without any relevant attributes. Both categories have no other attributes that are significant for the OUV of the Defence Line of Amsterdam. Therefore, only a small part of the open inundation field with a free field of fire is lost, while all attributes relevant to the defence system, such as dykes, quays, forts, locks and weirs, remain within the boundaries of the World Heritage property. The proposed adjustments also do not threaten the spatial cohesion and the continuity of the Defence Line as a coherent defence system.

The Dutch government is of the opinion that excluding the parts referred to in B1 and B2 from the area within the boundary of the World Heritage Site will have no significant effect on the OUV of the Defence Line of Amsterdam.

Below, we will set out in greater detail for each area the reason why the Dutch government is proposing to exclude it from the Defence Line of Amsterdam World Heritage Site, and we will also explain why we believe that this will have no negative impact on the OUV of the Defence Line of Amsterdam as a whole.

B1. Areas that were intended as residential areas or business estates in zoning plans in 1996

This category contains five areas that we propose should be excluded and thus brought outside the boundary of the Defence Line of Amsterdam World Heritage Site. These areas have now been built on and are no longer of any real significance for the Defence Line of Amsterdam, because they are no longer open and recognisable as inundation fields.

B1.1: Broekpolder, municipality of Heemskerk (- 156 ha)

This area, located on the western side of the Defence Line of Amsterdam, by Heemskerk, belonged to the inundation fields of the Defence Line of Amsterdam. In 1993 the state authorities designated it as a residential area ('Vinex location'). This planned housing estate, called Broekpolder, was included in the Vierde Nota over de Ruimtelijke Ordening-Extra (*Fourth Memorandum on Spatial Planning Extra*). From 1993 the usual planning procedures were set in train, and this location was developed, starting in 1996. The whole area lies to the west of the A9 motorway, which was diverted in the early 1990s due to the need for a new tunnel under the North Sea Canal. The diversion of the A9 had already been completed in 1996. The motorway forms an unmistakable barrier between the built-up area to the west of this road and the remaining open inundation fields to the east of the motorway. Due to the development of Broekpolder, the open nature of the area west of the A9 has been lost and it no longer has any special significance for the Defence Line of Amsterdam.

Broekpolder



Wijkemeerpolder west of A9

In view of the fact that no characteristic attributes of the Defence Line of Amsterdam are present in this area, it is proposed to exclude Broekpolder from the World Heritage Site and to draw the boundary on the eastern side of the A9. The exclusion concerns an area of 156 ha.

The area's location is given on the map images below. The current area of the UNESCO World Heritage Site, the Defence Line of Amsterdam, is coloured light brown. The hatched area is the part that we propose should be placed outside the boundary of the World Heritage Site.

B1.2: Wijkemeerpolder west of the A9, municipality of Beverwijk (- 97.5 ha)

After the A9 motorway had been diverted in the early 1990s (see also B1.1) and to this end a new tunnel had been built under the North Sea Canal (the Wijkertunnel), a business estate was built on the area west of the A9 near Beverwijk. This area (the western part of the Wijkemeerpolder) was strongly industrial in character from the start due to the proximity of the North Sea Canal, the connection between Amsterdam and the North Sea, and the ports located there. Development of the Wijkemeerpolder west of the A9 took place from 1996, but was based on the 'De Pijp Industrial Plan' that had been approved as early as 1964. Plans for the business estate had therefore already been approved long before 1996.

As there are – beside the inundation field - no other characteristic attributes of the Defence Line of Amsterdam within this area (the Fort near Velsen – see photograph – remains within the boundary of the World Heritage Site), we are of the opinion that excluding this area (97.5 ha) has no negative effect on the OUV of the Defence Line of Amsterdam.

The area's location is given on the map images below. The current area of the UNESCO World Heritage Site, the Defence Line of Amsterdam, is coloured light brown. The hatched area is the part



Floriade site Vijfhuizen

that we propose should be placed outside the boundary of the World Heritage Site.

B1.3: Eastern side of Haarlem, municipality of Haarlemmerliede/ Spaarnwoude and Haarlemmermeer (- 202.7 ha)

This area is located east of the municipality of Haarlem, between the N200 and N205 arterial roads. This area contains two industrial estates: De Liede and Polanenpark. The De Liede industrial estate was built as early as 1981 and therefore long before the Defence Line of Amsterdam became a World Heritage Site. Polanenpark (at that time still called Afvalzorg Noord-Holland) has existed since 1997, having been built on the basis of a zoning plan that applied to this area before 1996. The De Liede industrial estate is home to companies from the highest environmental category. The industrial estates are not located in a significant part of the property. Because

the area is located 'behind' the main defence line of the Defence Line of Amsterdam, it is not a former inundation field. Therefore, no inundation field or other attribute was lost as a result of the development of the area. As there are no characteristic attributes of the Defence Line of Amsterdam within this area, we are of the opinion that excluding this area (202.7 ha) from the Defence Line of Amsterdam has no negative effect on the OUV of the Defence Line of Amsterdam.

The area's location is given on the map images below. The current area of the UNESCO World Heritage Site, the Defence Line of Amsterdam, is coloured light brown. The hatched area is the part that we propose should be placed outside the boundary of the World Heritage Site.

B1.4: Floriade site Vijfhuizen, municipality of Haarlemmermeer (- 113.9 ha)

This area is located east of the village of Vijfhuizen in the municipality of Haarlemmermeer. The area is located inside the main defence line of the Defence Line of Amsterdam, and is therefore not a former inundation field.

The area was designated as a future residential area ('Vinex location') as early as 1993, and thus before the Defence Line of Amsterdam was proposed as a World Heritage Site in 1996. Since 2002, the area was completely built up, in line with the zoning plan from 1993. As no characteristic attributes of the Defence Line of Amsterdam can be found within this area, we are also in this case of the opinion that the area (113.9 ha) can to be excluded from the Defence Line of Amsterdam. In our opinion this has no negative effect on the OUV of the Defence Line of Amsterdam. The area's location is given on the map images below. The current area of the UNESCO World Heritage Site, the Defence Line of Amsterdam, is coloured light brown. The hatched area is the part that we propose should be placed outside the boundary of the World Heritage Site.

B1.5: Vrijshot Noord, Hoofddorp, municipality of Haarlemmermeer (- 27.4 ha)

This small area, located to the north of Hoofddorp, was developed from 1994. It concerns a housing estate, Vrijshot-Noord, which is located between the Haarlemmermeer Woods, the Geniedijk and the national road N201. The Vrijshot-Noord zoning plan, which allowed building here, was approved in 1993. The area is located within the inundation field on the outside of the Defence Line of Amsterdam. As a result, it has no attributes of the Defence Line of Amsterdam and is of no particular significance. In view of the fact that there are no characteristic attributes of the Defence Line of Amsterdam in this area, it is also proposed to exclude the area from the Defence Line of Amsterdam World Heritage property. Removing this small area (27.4 ha) has no negative effect on the OUV of the Defence Line of Amsterdam.

The area's location is given on the map images below. The current area of the UNESCO World Heritage Site, the Defence Line of Amsterdam, is coloured light brown. The hatched area is the part that we propose should be placed outside the boundary of the World Heritage Site.



Vrijschot Noord,
Hoofddorp

B2. Areas developed after 1996

This category contains two areas that were built on or where building was planned after 1996, and that we propose should be excluded and thus brought outside the boundary of the Defence Line of Amsterdam World Heritage Site. The first case concerns the sad tale of how well-intended dual protection led to an area falling victim to development. The second case illustrates how the great economic pressure around the capital city and particularly around Schiphol Airport can cause problems even for the protection of a UNESCO World Heritage Site.

B2.1: Edam business estate (- 22.8 ha)

North-west of the town of Edam, an extension of a business estate was built over recent years inside the boundary of the Defence Line of Amsterdam, adjacent to an estate that existed before 1996 and that was already partially located inside the UNESCO boundary. Construction of the business estate (22.8 ha in total) began in 2012. The fact that construction could take place here after 1996 (the year that the Defence Line of Amsterdam was listed) is connected to the fact that over past years the Defence Line of Amsterdam has been under dual protection. Since 2007, in addition to heritage protection as a UNESCO World Heritage Site, the Defence Line of Amsterdam has also enjoyed planning protection as a National Landscape. However, the boundary of the National Landscape Defence Line of Amsterdam deviated on a number of points from the UNESCO boundary of the Defence Line of Amsterdam. One of the locations where the boundary deviated was this location near Edam. Because the location of the business estate near Edam did not fall within the boundary of the National Landscape Defence Line of Amsterdam, planning permission was given for the construction of this business estate. However, this should not have happened based on the UNESCO boundary and prevailing world heritage policy. This undesirable development also escaped the attention of the Dutch State and was therefore not reported to the World Heritage Centre.

This example of dual protection with two slightly different boundaries shows clearly that it is essential to arrive at one clear and unambiguous boundary for the UNESCO World Heritage Site, about which there will be no further discussion in future. This is another reason for this proposal for a minor boundary modification, in which we propose a number of boundary corrections that do justice to the current manifestation of the Defence Line of Amsterdam. The proposal is therefore to exclude this now completed business estate from the area within the UNESCO boundary.

The Edam business estate is located 'behind' the main defence line, on the inside of the Defence Line of Amsterdam. The location has never had the function of an inundation field and neither does it have any attributes that belong to the Defence Line of Amsterdam. In our view, excluding this location from the Defence Line of Amsterdam therefore has no effect on the OUV of the Defence Line of Amsterdam.

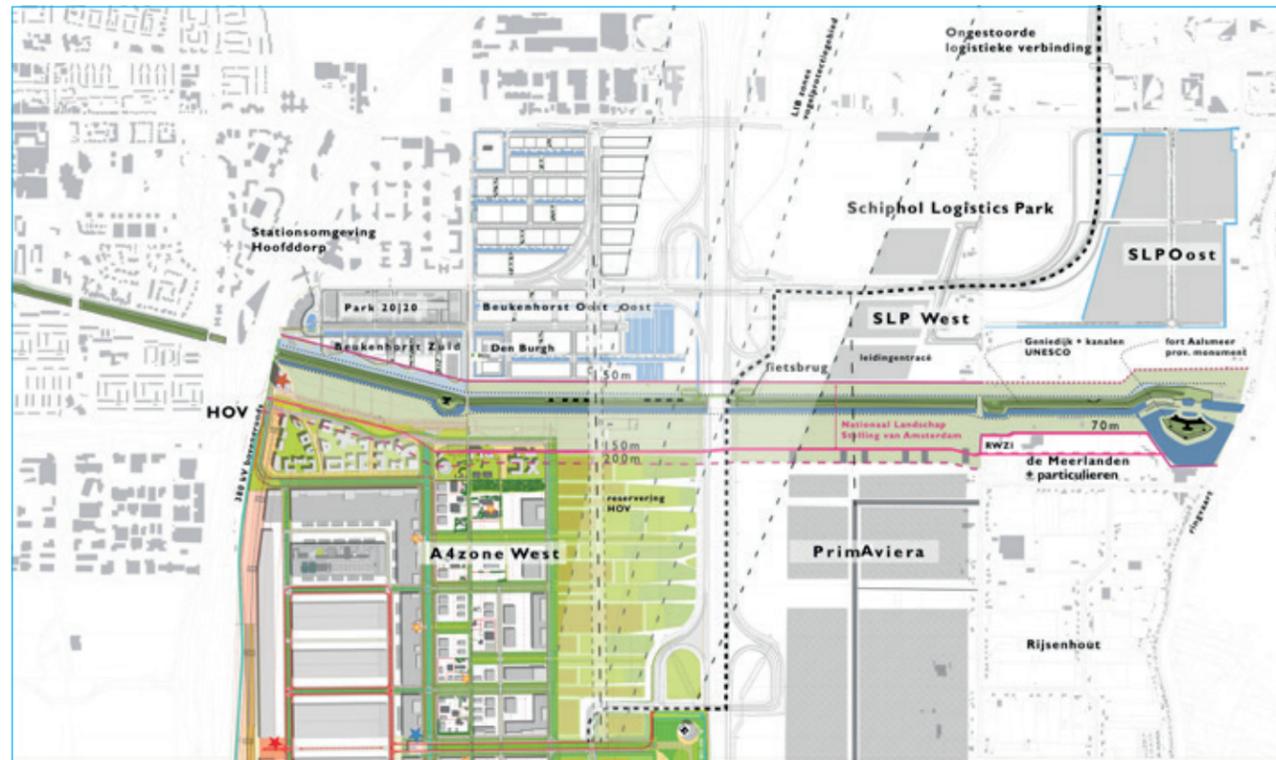
The area's location is given on the map images below. The current area of the UNESCO World Heritage Site, the Defence Line of Amsterdam, is coloured light brown. The hatched area is the part that we propose should be placed outside the boundary of the World Heritage Site.

B2.2: Geniedijk and surrounding area, municipality of Haarlemmermeer (- 622 ha)

This area is located on the south-western side of the Defence Line of Amsterdam, immediately to the south of Schiphol Airport. The area lies between Hoofddorp station to the west and the Fort near Aalsmeer to the east, and it contains a number of attributes characteristic of the Defence Line of Amsterdam, such as the Geniedijk dike with a canal on either side, the Fort near Aalsmeer, a battery (battery on the Rijnlanderweg) and a number of group shelters in the dike. According to the property's boundary of 1996, the area is 1670 metres wide in total – 1000 metres north and 670 metres south of the Geniedijk. The total length of this strip of the Defence Line of Amsterdam is 3800 metres.

Some developments in this area had already been planned in the provincial regional plan for Haarlemmermeer-Schiphol from 1995, and thus before listing as a World Heritage Site. These plans have only been realized recently, or realization is planned for the near future. The plan for a logistics industrial estate (A4 zone West/ACT; see below) dates from after the Defence Line of Amsterdam was designated a UNESCO World Heritage Site.

As a result of the huge economic pressure to facilitate spatial developments close to Schiphol Airport, it has not been possible to keep this area completely open since 1996. The pressure to exploit this area for logistical and other business estates for the benefit of the airport and transport, as well as greenhouse horticulture moved to make room for them, was too great. In the area north of the Geniedijk, and therefore 'behind' the main defence line, the Beukenhorst Zuid business park has been developed in recent years (north-west of the Geniedijk). North-east of the dyke, the Schiphol Logistics Park (SLP) is currently under construction. The noise contours of a possible future 6th runway at Schiphol are also envisaged to be in this area, which implies that no high-rise or residential



Planned and completed spatial developments around Geniedijk south of Schiphol

building will be allowed there. Only low-rise building that does not have to meet noise standards, such as greenhouses and storage sites, are permitted here.

For the area south of the Geniedijk, a greenhouse development (PrimaViera), was planned in 1995 and was already included in the previous Haarlemmermeer-Schiphol regional plan (1992). An additional logistics industrial estate (A4 zone West/ACT), also located on the southern side of the Geniedijk, originates from the Noord-Holland- South regional plan of 2003, and therefore dates from after the Defence Line of Amsterdam was designated a UNESCO World Heritage Site.

Based on the above, we must conclude that in 1996 there were already plans for building on part of this area (Beukenhorst-Zuid, SLP and the greenhouse horticulture development PrimaViera). Furthermore, the economic pressure on this area was so great, above all due to the proximity of Schiphol Airport, that it was not possible to guarantee that the openness of the remaining area would continue to be protected after 1996. Decision-making on the spatial development of the area south-west of the Geniedijk (A4 zone West/ACT) in fact took place from 2003. Although administrative approval has been given for these developments along the Geniedijk, so that part of the inundation area and the south-western field of fire of the Fort near Aalsmeer are being developed, stakeholders have made every effort to preserve the most essential attributes of the Defence Line of Amsterdam there and to incorporate them appropriately into their surroundings.

The Advisory Mission that ICOMOS carried out in September 2015 at the Defence Line of Amsterdam and the New Dutch Waterline (see introduction) also visited this location near Schiphol and reported on it extensively in its advisory report. In its report (p. 15/16), ICOMOS said the following about this location:

Despite the pressure of diverse spatial developments around the Geniedijk, the municipality of Haarlemmermeer and the province of Noord-Holland, in cooperation with the project organisations A4-Zone West and PrimaViera, have succeeded in keeping a zone open on either side of the Geniedijk and making a coherent whole of the attributes contained in it, turning them into a park called the Geniepark. This Geniepark was designed by H+N+S Landschapsarchitecten, a renowned firm of landscape architects in the Netherlands. The basic principle in designing the park was to stress the continuity of the Defence Line of Amsterdam, to enhance the linear structure of the Geniedijk, to give all the characteristic attributes belonging to the Defence Line of Amsterdam a prominent place in the park and to improve the conservation and experience of the attributes. These attributes include the Geniedijk itself, the canals on either side of the Geniedijk (Front and Back Canals), the Fort near Aalsmeer, the Battery on the Sloteweg (now called Rijnlanderweg), and several munition bunkers. The park is intended to form a green buffer between the industrial estates to be constructed and the linear structure of the Defence Line of Amsterdam. The park needs to have a recreational function, including for the people who come to work at the industrial estates.

Case study of the Defence Line of Amsterdam in Schiphol vicinity (Geniedijk)

The mission noted that the main tangible attributes at Geniedijk were still present as individual attributes, in good state of conservation: fort, canal and dyke with an associated line of trees; but that the immediate surroundings are very strongly affected by diverse constructions inside the actual property boundary. (...)

The Steering group proposal suggests diminishing drastically the property's boundary to a residual land strip including the dyke, the canal, the line of trees and immediate back sides: a green land [strip] of 150 m or 70 m south and of 50 m on the northern side including a service path. These two lateral strips remained clear of any change because there are State properties issued from the ancient military zone for maintaining the defence line in use.

This example clearly demonstrates that it has proved impossible to maintain the visual quality of the entire property (15 000 ha / 135 km) since inscription,

in context of private ownership of the soil and a very favourable context for continuous urban growing and economic development. Planning rules have failed to maintain intact the large and open landscapes everywhere. In this extreme case of Schiphol airport (in the top 5 of European airports), the powerful economic and political role of this large airport can be understood and its strategic importance, but so too can its impact upon the OUV, particularly in the context of landscape. On the other hand, the excellent conservation of the main attributes in the Schiphol zone is acknowledged, showing the continuity of the Defence Line of Amsterdam. In summary, while the landscape part of the property was locally strongly impacted (7-8 km), one of the major clusters of the NL economic development fully respected and respects the main Defence Line of Amsterdam attributes as World Heritage.

The Geniepark is currently being developed and contains a green recreational axis (running west-east) that is some 3.8 km long and 70-150 m wide to the south of the Geniedijk (measured from the Front Canal), and 50 m to the north of the dyke (measured from the Back Canal).

By making this a green recreational zone, the continuity of the Defence Line of Amsterdam as a whole is maintained and its recognisability enhanced. On the west side, the Geniepark connects directly to the Geniedijk, which runs directly through the city of Hoofddorp. Because the Geniedijk in Hoofddorp runs right through residential areas from the early 1970s, the Defence Line of Amsterdam is not wider there than the Geniedijk including the nearby ditches, but it is nevertheless an especially recognisable 'green' element in the urban environment.

In view of the great pressure on space in this area and the developments that have already been completed and approved, the Dutch government proposes to move the boundary of the World Heritage property to the outer boundary of the Geniepark. This means that here the boundary of the World Heritage Site will enclose an area between 50 metres north of the Geniedijk (from the far bank of the Back Canal) and 150 metres south of the Geniedijk (from the far bank of the Front Canal). As all the attributes present in this area relating to the Defence Line of Amsterdam are being preserved and restored, it is our opinion that the reduction in the size of the World Heritage Site has no significant negative effect on the OUV of the Defence Line of Amsterdam. The proposed reduction in the World Heritage Site means that 366 ha would be excluded on the north side of the Geniedijk, while on the south side of the Geniedijk 256 ha would be excluded.

Design for Geniepark, preserving and strengthening the attributes of the Defence Line of Amsterdam



Design for Geniepark, preserving and strengthening the attributes of the Defence Line of Amsterdam

The Geniedijk

The Geniedijk, with a total length of 10.5 km, runs as a long line straight across the Haarlemmermeer polder, from the Fort near Vijfhuizen in the west to the Fort near Aalsmeer in the east. The line dike is specially constructed to hold back the water in the event of military inundations.

The Defence Line of Amsterdam, and the Geniedijk in particular, was intentionally built around Schiphol International Airport, because, at the time, Schiphol was a military airfield and, therefore, of essential importance to the defence of the country. The Geniedijk is therefore a dike constructed specifically in connection with the function of the Defence Line of Amsterdam, in contrast to most of the other line dikes of the Defence Line of Amsterdam, which had mostly been present in the landscape before they began to be used as part of the Defence Line of Amsterdam.

The Geniedijk is still completely intact and easily recognisable in the landscape due to its linear structure and planting (see Figure 6). The section near the future Geniepark (between Hoofddorp station and the Fort near Aalsmeer) is also intact over a length of 3.8 km and will remain so. On the west side of Hoofddorp station, the Geniedijk runs through a residential area from the 1970s. Here, the World Heritage Site has been kept within narrow

boundaries since the site was designated in 1996, due to the presence of housing areas on both sides of the dyke. Nevertheless, the Geniedijk is very visible here and can easily be experienced, and it has continued to be well-conserved as an attribute. The continuity of the Defence Line of Amsterdam has, therefore, also been preserved within the built-up area of Hoofddorp.

The municipality of Haarlemmermeer drew up a policy vision for the Geniedijk in 2010. This 'Vision on the Geniedijk' sets out how the municipality wants to preserve and further strengthen this characteristic dyke. For the municipality it is an iconic structure that is important in determining the landscape within its borders and that is easily visible from all sides, and also from the air.

The Geniedijk is open to the public. A cycle path runs from west to east along the entire 10.5 km of the Geniedijk. The cycle path has recently been improved and has been provided with an attractive new bridge crossing the A4 motorway. The bridge, built in a style that suits the military character of the Defence Line of Amsterdam, reinforces the linear structure of the dike and ensures that the western and eastern halves of the Geniedijk are now accessible and connected.

The area's location is given on the map images below. The current area of the UNESCO World Heritage Site, the Defence Line of Amsterdam, is coloured light brown. The hatched area is the part that we propose should be placed outside the boundary of the World Heritage Site.

Justification for the proposed modifications

A. Proposed extensions of the property

The Netherlands proposes to add three areas to the Defence Line of Amsterdam World Heritage Site, because these areas, as former inundation fields or fields of fire, enhance the OUV of the Defence Line of Amsterdam. These areas are explained in more detail in category A.

The Dutch government considers it desirable for these areas to be included within the boundary of the World Heritage Site, because they have attributes that are functionally part of the Defence Line or because in their visual quality (open landscape, inundation field) they make a very significant contribution to, and enhance, the OUV of the Defence Line of Amsterdam. The New Dutch Waterline, which is the extension of the Defence Line of Amsterdam proposed in this nomination dossier, also has substantial inundation areas. Due to the sizeable addition of inundation areas, in particular relating to the New Dutch Waterline, and despite a number of inundation fields in the existing World Heritage Site being dropped, the Outstanding Universal Value of this attribute remains fully intact.

B. Proposed reductions in the property

The proposal to modify the boundary of the Defence Line of Amsterdam World Heritage Site has as its basic principle that the current boundary of the UNESCO World Heritage Site (dating from 1996) should be modified as little as possible. However, there are some areas of the World Heritage property that were built on after 1996 and for this reason we propose that these are excluded. This concerns:

- Five areas that were already intended as residential areas or business estates in zoning plans and/or regional plans in 1996. These areas are explained in more detail in section 2, B1.

These areas should not have been nominated in 1996 as part of the World Heritage Site, because it was already known at the time that they were included in zoning plans and/or regional plans and that development of these areas was therefore unavoidable and irreversible. Most of these areas had no actual function in the Defence Line of Amsterdam, because they were not inundation fields, but rather areas that are located behind the main defence line of the Defence Line of Amsterdam. The five areas referred to in B1 have now been built on and they are no longer of any significance to the Defence Line of Amsterdam. The Dutch government proposes to exclude these five areas, because they no longer contribute to the OUV of the Defence Line of Amsterdam, nor can they be recognised or experienced as an inundation area. In our opinion, excluding these five areas from the World Heritage Site has no negative effect on the OUV of the Defence Line of Amsterdam.

- Two areas where a decision to proceed with development was made after 1996, due to insufficient coordination between planning bodies and heritage policy or due to the great economic pressure in the area around Schiphol. This development has either already been implemented or the decision is irreversible. These areas are explained in more detail in section 2, B2.

The two areas for which plans were decided after 1996 are an industrial estate near Edam and an area south of Schiphol Airport (Geniedijk and surrounding area). In the case of Edam, a mistake was made in the past in drawing the boundary of the National Landscape, as a result of which building was permitted within the World Heritage Site. This location, which originally had no function as an inundation field within the Defence Line of Amsterdam, has since been built on and for this reason we propose to exclude this area from the World Heritage Site. Around the Geniedijk, construction could not be prevented due to the great economic pressure on this area. For this location we propose to modify the boundary and reduce the area inside the boundary to a zone within which all relevant attributes are actually represented, met the exception of the inundation field. The future building of the inundation field located here is an evident degradation of the surrounding OUV, but because all other attributes are preserved and the continuity of the Defence Line of Amsterdam as a whole is even reinforced, we believe the effect on the OUV of the Defence Line as a whole is limited. The creation of the Geniepark and the restoration of the existing attributes will improve the visibility and experiential value of the line.

The Dutch government is of the opinion that excluding the area near Edam from the World Heritage Site and retaining a reduced section of the area south of Schiphol within the boundary of the World Heritage Site will have no negative effect on the OUV of the Defence Line of Amsterdam as a whole. The Dutch government and the site holder admit that things have gone wrong over recent decades and they regret what has happened in relation to planning and the implementation of plans within the boundaries of this part of the World Heritage Site. National policy and regulations have now been changed in order to prevent such situations from arising in future (see sections 4 and 5). The importance of preserving the OUV of the World Heritage Site is recognised at all levels of government, and it has been incorporated into spatial planning policy and included in new legislation.

The report based on the ICOMOS Advisory Mission concludes that the proposed changes do not significantly alter the extent of the Defence Line of Amsterdam. On this basis, the Dutch government and the province of Noord-Holland are of the opinion that this constitutes modest modifications of the boundary. We also think that the proposed modification of the boundary of the Defence Line of Amsterdam World Heritage Site, which comprises inclusions and exclusions of a number of areas of a relatively limited size, also has not weakened the overall OUV of the Defence Line of Amsterdam. The integrity of the property remains intact as the continuity of the Defence Line is preserved and remains recognisable, and the authenticity of its attributes does not change at all.

Due to their landscape-related, functional and historical relationship with the Defence Line of Amsterdam, the three areas that we propose adding to the Defence Line of Amsterdam World Heritage Site enhance the OUV of the Defence Line of Amsterdam. The total of seven areas (five in category B1 and two in category B2) that we propose excluding from the Defence Line of Amsterdam in fact no longer make any contribution to the OUV of the Defence Line of Amsterdam. The exclusion of these areas would make the formal boundary of the Defence Line of Amsterdam more easily recognisable and as a result it would be easier to explain to residents and users. This is also beneficial for maintaining the Defence Line of Amsterdam, because it is then easier for the site holder to explain what is part of the World Heritage Site property and what obligations (among others an obligation to conserve and manage, laid down in a Provincial Regulation) apply to the area.

A clear, unambiguous and credible boundary for the World Heritage Site will be certain to benefit the effective implementation of the policies and the regulations, and the maintenance of the Outstanding Universal Value. The responsible authorities in the Netherlands are looking forward with confidence to an assessment of the proposed boundary modification by ICOMOS during the technical evaluation of this significant boundary modification.

The newly proposed boundary is shown on map 2.6.

2.b History and development

2.b.1 The concept of the Waterline

The concept The main defences of the Netherlands were based on a continuous water barrier created by inundating the land, with military fortifications at the accesses. This typical Dutch defence system with inundations was an improved extension of the Old Dutch Waterline, the first plans for which date from as far back as 1589.

Old Dutch Waterline This feared Dutch Waterline proved highly effective in 1672 when extensive inundations managed to hold back advancing French troops just in time and for the long term. Although this defence line was initially built much farther to the west, for the exclusive protection of the political and economic heartland of the Republic of the United Netherlands, the Old Dutch Waterline moved eastwards during the eighteenth century. From 1815 onward, this shifted defence line was further developed as the new defence system, now including the city of Utrecht. In addition to this New Dutch Waterline, the government decided in 1874 to construct an additional defensive ring around the capital, Amsterdam. With a circumference of 135 kilometres and 46 forts, this Defence Line of Amsterdam was built between 1880 and 1914. Work was being done to improve and refine the inundation and defence system of both the New Dutch Waterline and the Defence Line of Amsterdam until the outbreak of the Second World War in May 1940.

Three major rivers, the Meuse, the Waal and the Rhine, formed a natural barrier against an enemy coming from the south, but also formed natural invasion routes, leaving the land open to a (turning) movement from the east. In order to protect this vulnerable eastern side, two routes qualified for the construction of a waterline: through the lower-lying Gelderland Valley and along the Vecht-Vaartsche Rijn between Muiden and Vreeswijk. The Grebbe Line was developed along the first route, commencing in 1745. The construction of a waterline along the second route, the Utrecht Line, was much more difficult due to opposition from the city of Utrecht. Following the Disaster Year of 1672, priority was given to the Old Dutch Waterline.

Commencing in 1815, the new national government of the Kingdom of the Netherlands built the main defence line along the proposed Muiden-Vreeswijk route, now including Utrecht. The New Dutch Waterline ran via Honswijk-Everdingen-Gorinchem to become the main defence line of the country and was extended as far as Werkendam near the Biesbosch estuary, crossing the rivers Lek, Rhine, Waal and Meuse. The maximum possible use was made of existing rivers (Vecht, Vaartse Rijn, Linge) and dyke (Diefdijk, Lingedijk, Nieuwedijk) in the construction of the main defence line. Extensive inundations on the eastern side were meant to make it impossible for enemy armies to pass. Defence structures were built where

The Disaster Year: 1672



School poster of disaster year 1672

On 23 March 1672, a fully laden Dutch trading fleet was stopped in the English Channel by a small squadron of English warships. When they respectfully lowered their flag, they received a broadside from the English. This skirmish was the start of the conflict referred to in France as the 'Franco-Dutch War' and in the UK as the 'Third Anglo-Dutch War'. In the Netherlands, it was commonly known as the 'Disaster Year' [Rampjaar]. The greatest danger was not posed by the English, but by the French, led by Louis XIV. The event that gave rise to this took place four years before the Disaster Year. By marrying a daughter of the Spanish king Philip IV, Louis XIV believed he had a right to the Spanish Netherlands. The Sun King seized his opportunity. He and his army invaded the Southern Netherlands in 1667. As the Grand Pensionary of Holland, the most powerful man in the Dutch Republic, Johan de Witt managed to prevent the further advance of the French king by entering into a treaty with Sweden and England, known as the Triple Alliance. Louis was given a choice: either he handed back half of the conquered territories or he would

be attacked by the allies. Louis, therefore, gave way to the inevitable in the Peace of Aachen (1668).

In 1672, he was given a new opportunity. Louis' ministers had bribed Sweden – and the prince-bishoprics of Münster and Cologne – using diplomacy and massive subsidies to rip up the Triple Alliance. England, which Johan de Witt thought supported the Dutch Republic, had agreed with France to support Louis' invasion from the sea. Under the secret Treaty of Dover (1670), the wealthy Republic would be shared out among England, France and Münster and Cologne, which would be granted parts in the east and south. With the Dutch coastal towns and Walcheren (Zeeland) in its possession, England would have complete control of overseas trade and France would now also occupy the Generality Lands as well as the Spanish Netherlands. In this way, France would achieve its goal of making the river Rhine its natural border. As sovereign prince, William III, Prince of Orange, would be allowed to reign over a rump state.

A couple of days after the encounter in the English Channel, on 27 March 1672, the English king, Charles II, declared war on the Dutch Republic. On 6 April, France followed. In order to avoid war with Spain, the 120,000-strong French army turned eastwards to enter the Republic via the Rhine. A quarter of the Republic's army of less than 40,000 men intended to stop the Sun King in the fortified town of Maastricht. But the French bypassed Maastricht and a belt of Rhine forts was swept away within ten days. In May, the soldiers of the prince-bishoprics of Cologne and Münster joined the rapidly advancing French forces. On 12 June, the army was outside Lobith, ready to cross the Rhine. Panic reigned in the Republic. The small, hastily assembled army that had to defend the 100 km IJssel Line, then the most important line of defence on Dutch soil, was taken by surprise. In one week's time, ten cities and five fortified towns fell. It then took a few more weeks to conquer three-quarters of the Republic. That provided Johan de Witt with sufficient respite to put the Dutch Waterline into operation. In the first week of July, one month after the breaching of the first dykes, the waterline was operational. The French had to abandon the prospect of a complete conquest. On 4 July, William III was named Stadtholder of Holland. The part of the population that supported the

prince, having had enough of the wealthy regency that they believed had conspired with the enemy, demanded more and lynched Johan de Witt and his brother Cornelis on 20 August. Liberated from a government-supporting faction, the prince learned his trade as a commander by trial and error. Because complete conquest could not be realised in the short term, Louis XIV left for France with 20,000 men. Marshall Luxembourg stayed behind with 40,000 men. Following a failed attempt to break through the waterline to The Hague at the end of December, this Marshall massacred the populations of Zwammerdam and Bodegraven. Having had enough of submerged polders, he handed over the reins to the Prince of Condé on 1 May 1673.

The turning point came on 13 September 1673, when William III captured the strategic fortified town of Naarden. The Republic used diplomacy to obtain assistance from the Elector of Brandenburg and the German emperor. With their help, William occupied Bonn, from where he threatened the French army's supply lines. France lost more and more allies, such as England, which made peace with the Republic in the spring of 1674. Over the next thirty years, William III would also become king of England between 1689 and 1702, and lead the European war against the French hegemonic claims.

the main defence line was vulnerable as a result of intersections with waterways, roads and dykes or where the land was too elevated to be inundated. This sixteenth-century concept could only be fully developed along the desired long route during the nineteenth century thanks to emerging government intervention (formation of a unitary state with appropriate legislation, financing and implementation organisations (Ministry of Defence and Ministry of Public Works [Waterstaat]) at national level).

Three times the New Dutch Waterline was brought to a state of defensive readiness: during the Franco-Prussian War in 1870 and during the mobilisations of 1914-1918 and 1939-1940. During the mobilisation of 1914, the Waterline was permanently occupied by approximately 12,000 men. They were supplemented by 6,000 men at times of international tension. The New Dutch Waterline was brought up to organic strength when war threatened. This meant that 33,000-36,000 men were stationed there, at best supplemented by units withdrawn from the army in the field. From 1916 onwards a total of 20,000 men were mobilised within the New Dutch Waterline.



Poster, mobilisation 1939



Poster mobilisation 1870



Poster mobilisation N 105.6

The Waterline was actually partially flooded three times: in July 1870, in May 1940, and in April 1945 by the German armed forces as the *Hintere Wasserstellung* [Rear water position]. In the latter case, both to the east and to the west. During the mobilisation for the First World War (1914-1918), the New Dutch Waterline was only brought up to Preparation Level a few times. As late as 8 May 1917, a note for the cabinet stated that our army, protected by the inundations of Fortress Holland, could hold out against any enemy for a considerable period. The limited number of hand grenades was not seen as a problem: 'It is impossible to throw them over an inundated terrain or a large river.' However, the waterline's highly refined inundation system was never actually put to the test as a whole.

Waterline decommissioned

'...keep out of Low Country Fighting. (...) You can fight in Mountains and deserts, but no one can fight in mud and when the water is let out against you, at best, you are restricted to the narrow fronts on the higher ground, which are very unfavourable with modern weapons.'

Military attaché Charles à Court in 1917 to Field Marshall W. Robertson, British Chief of General Staff

After the Second World War, the New Dutch Waterline ceased to be a significant part of the country's main defences. In 1951 most forts in the New Dutch Waterline were declassified and the repeal of the Prohibited Circles Act in 1963 signalled the end of the New Dutch Waterline as a main defence line for all time. This was partly due to the rapid development of the air force. However, geopolitical considerations were more important. With the advent of the Cold War, the Netherlands became a member of NATO (1949). The country abandoned its long-held principle of neutrality and joined a new European security policy. From that moment on, the Netherlands abandoned the concept of national defence and switched to *forward-based defence*: working with NATO allies to defend the North German Plain, where a large-scale assault by the armies of the Warsaw Pact (set up in 1955) was deemed possible. Still in the context of NATO, the IJssel Line became the last line of defence with water barriers on Dutch territory, as a fall-back option. There were no longer to be any large forts but a series of smaller buildings and special facilities for making inundation possible.

Description of the system

Exploitation of what exists: the Strategic Deployed Landscape

The construction and organisation of the New Dutch Waterline is based on Dutch efficiency with people and resources, military pragmatism and ingenious engineering. The low-lying stretch of land between the Zuiderzee (now IJsselmeer) and the Biesbosch estuary was extremely suitable for effecting inundations, i.e. flooding large areas of land. In terms of geomorphology, the swampy peat subsoil at the edge of the former sphere of influence of the sea was a logical choice for inundation. The Waterline also made intelligent use of the very detailed polder system for water management which had been developed by a number of since the late Middle Ages. This water management system had to be scaled up for the 85 km Waterline and adapted for the new goal, continuous inundation. In order to obtain a linear defence line, it was relatively easy to use the existing north-south oriented river Vecht and dykes such as Diefdijk as a main defence line. This essential line of resistance is strategically situated in the transition zone from elevated to low-lying areas of the Netherlands and acted as a dividing line between east and west. This line corresponded with the eastern edge of the wealthy Holland of the Dutch Republic, today's Randstad region of the Netherlands, that was to be defended.

Controlling the inundation: Water Management System

The main obstacle provided by the New Dutch Waterline is the water barrier. Three aspects were essential in ensuring a successful defence using water. First, the availability of water: there had to be sufficient water to flood the basins. Second, inundation speed to ensure that a sufficient defensive depth was reached before the enemy troops attacked. The ability to transport water to the right locations forms the third aspect. To create a waterline, a series of contiguous strips of polder land was deliberately flooded (inundated) in a controlled manner. The water barrier was three to five kilometres wide and only 30-50 centimetres deep (knee height). The inundated areas were so wide that the enemy was unable to fire across them. The lakes created were so shallow that they were impossible to sail across but deep enough to make it impossible to wade across carrying military equipment. After all, ditches, trenches, all kinds of obstacles and also sometimes deliberately churned-up soil became invisible in muddy water, making it treacherous and dangerous to cross.

Stumbling landscape

'The difficulty of attacking the inundations must be increased by making low, invisible barbed-wire entanglements, setting trip wires, digging man traps and removing the soil from them, or by deturfing or ploughing up a strip of the area to be inundated immediately in front of the defence line to make it even less passable after inundation and ensure it remains impassable for a considerable period if the inundation is drained.'

From: a textbook of the Dutch Royal Military Academy, 1934

The inundation was the most typical part of the New Dutch Waterline. Initially, the dykes and dams were simply breached (cut-offs) so that the water ran into the lower-lying polders. From 1815 onwards, the management of inundations was increasingly improved by means of an ingenious system of inlets and outlets. The aim was to achieve the ideal half-metre-deep inundation everywhere. This only succeeded when the height difference of two metres between the lower-lying polders in the north and the higher ones in the south of the New Dutch Waterline could be controlled to ensure that all the water would not run into the lowest-lying polders. To bridge this height difference, a total of nine inundation basins were established, each with its own water level, sea level. Each inundation basin consisted of a combination of polders that had almost the same water level.

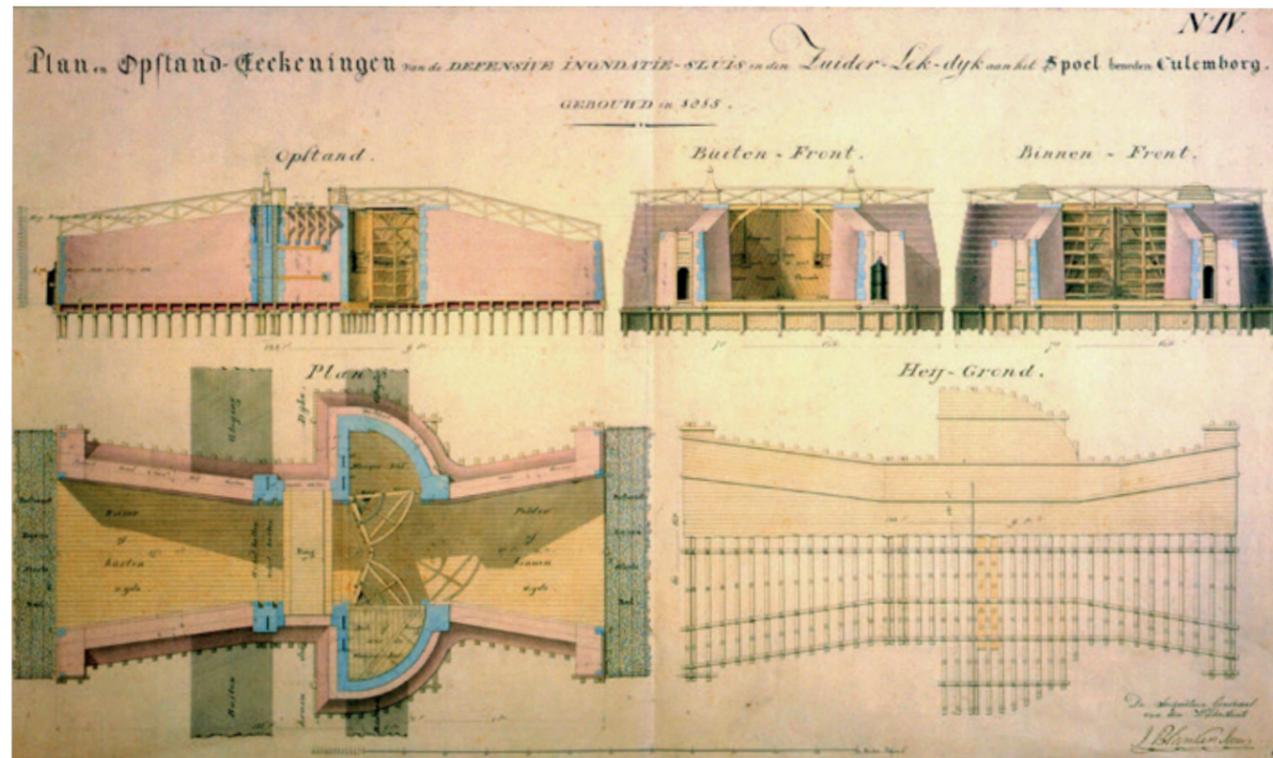
Polders are the smallest units in the water management system that have their own water level and are bounded by their own water defence structure. From the fourteenth century onward, every polder had its own administrative body that was responsible for water management: the Water Board or Polder Board. Polders are the result of the large-scale medieval developments that divided swampy peat and clay soil into regular plots in the form of strips. The military benefited greatly from this characteristic Dutch polder landscape with its strict water management pattern of plot enclosures, watercourses, mill brooks, quays and numerous sluices and spillways. With a few adaptations, the same tools that kept the

polders dry could be used to expertly inundate the reclaimed land. To allow the inundation of the whole basin, the polder defences had to be breached by sluices, culverts or coupures or by simply flooding the lower-lying polder quays.

The construction of new inundation structures in the 1870s made it possible to reduce the inundation time to 12-13 days for the lowest known river level or to 4-5 days for an average river level. This still took at least 26 days in 1859, which was enough to respond to a French threat at the time, but not enough for a response to faster-moving German troops. The advent of the railways made it possible to mobilise much faster, which made it more important to reduce the inundation time. The German Reich had designed its railway network for fast mobilisation. In 1940, the New Dutch Waterline was divided into 19 inundation stations for effecting inundations. Six stations were exclusively responsible for letting water in and through: Muiden, Nieuwersluis, Utrecht, Vreeswijk, Wijk bij Duurstede, and Tiel. The other twelve stations were responsible for the eventual inundation of the basins.

The inundation process took place in five systematic phases. During the first three phases, preparations were made for effecting the inundations in such way that the process of admitting and dispersing the inundation water could be started at any moment. These three initial phases were based on whether the operations had normal legal status (whether or not a permit had been issued by the authorities or individuals concerned) (Phase 1), whether a ministerial authorisation had been issued for matters such as expropriation (Phase 2), and a phase where action was actually taken, such as making the sluice gates accessible, requisitioning land and water-related structures and raising the water level in canals and ditches (Phase 3). The actual inundation followed in Phases 4 and 5. In Phase 4, all the supplying watercourses were filled to the brim. That was the Preparation Level. To this end, the water levels in the inland waterways were raised substantially via the main intake points on the major rivers and at the Vecht estuary. In the river Vecht, for example, the river was closed off with a dam sluice near Nieuwersluis. The next step consisted of raising the inundation to Provisional Level. The inundation basins were filled with the accumulated water via all kinds of distribution points such as ancillary sluices and culverts. During this phase, civilians and retreating soldiers could escape on the paths that were still just dry. The Increased Provisional Level also applied in areas with a few inundation stations. The fifth and final phase, was the Full Level: the ideal height of 30-50 centimetres had been reached. In exceptional cases, the army command could still decide to inundate additional polders 'by special order'.

Water management structures such as sluices, culverts, dams, and pumping stations were needed to distribute the water and keep the basins at the right level. Where possible, the initial coupures (breaches in the dykes) were replaced by ingenious inundation sluices which were easier to regulate. These permanent structures used fan sluices, slide gates or gates to temporarily close the watercourses or actually allow the water in. Dating from the early nine-



Werk aan het Spoel, inundation sluice

teenth century, the fan sluice [waaiersluis] was an ingenious invention. It could be opened against floodwater and could close off both inflowing and outflowing water. Of more recent date is the Plofsluis, a special dam sluice which was built across the Amsterdam-Rhine Canal shortly before the Second World War. This sluice could close off the canal, which had recently been constructed, in an instant to prevent two dangers: the risk that the enemy could increase the water level and sweep the defender away, and the risk that all the inundation water would drain away via the canal.

The Waterline constituted a threat to the inhabitants of the inundation fields as well as the enemy. The water suffocated crops. And the remaining salts and minerals would make the soil useless for a long period of time. In the days of the Old Dutch Waterline, farmers therefore breached dykes to discharge water from areas that were under water. The Inundation Act entered into force in 1896 with the aim of safeguarding inundations and regulating compensation payments. The compensation payments were so generous that some farmers were happy when, for example, the army carried out manoeuvres or a mobilisation. The Inundation Act, with some amendments in 1989 and 1996, is still in force today.

Defence of the accesses: the Military Fortifications

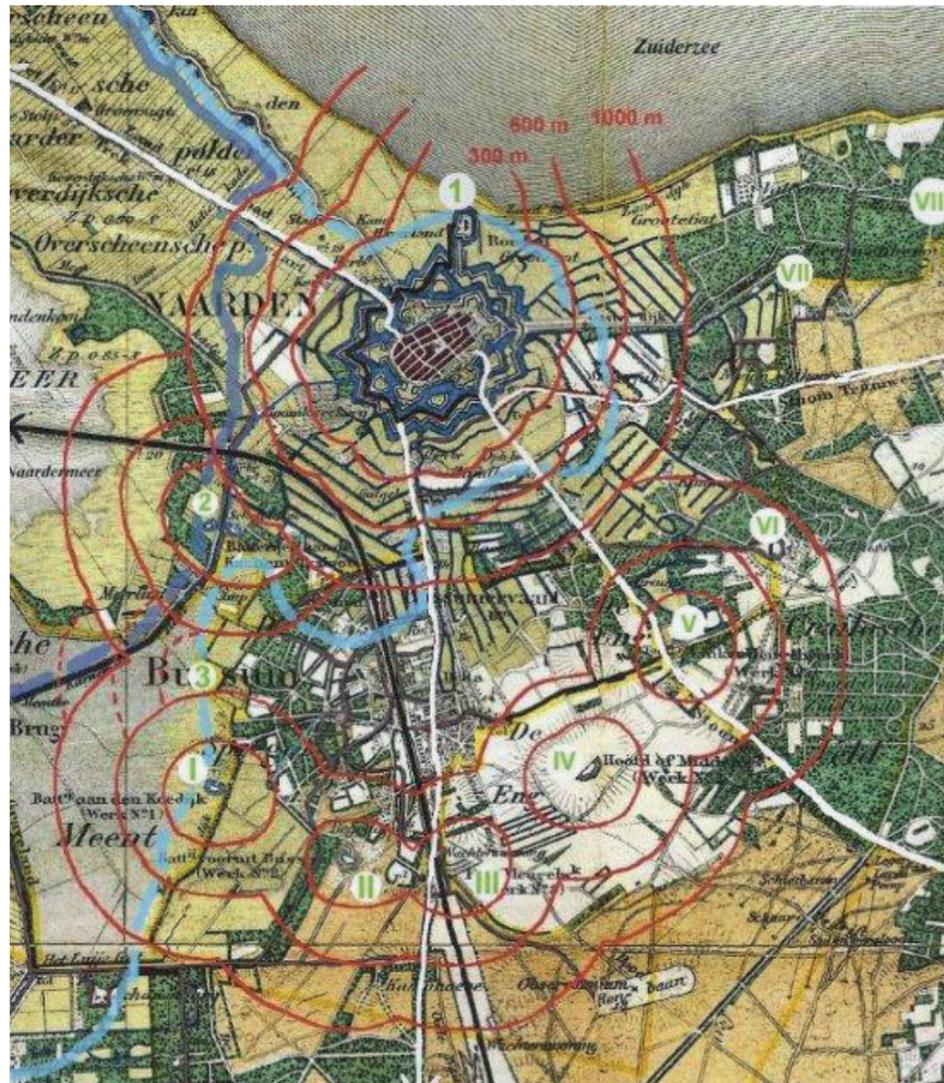
The Waterline remained vulnerable in some places when fully inundated. The enemy could break through the defence line via rivers and dykes and later also via new canals, railways and roads. It was also found that various areas of higher ground could not be inundated. Forts were built to protect these accesses. The defenders would seal off the access with artillery from the forts. In a number of cases, a defence structure was also built to protect the inundation

sluices and inundation canals that were so essential for inundation. The recurring theme through all the phases of construction of the New Dutch Waterline is that the defence system should be more mobile. We see a shift from a static protection of the main defence line at the accesses to a more offensive form of defence across a deeper line of resistance, where the forts would be used as support facilities and guardhouses for the army in the field.

The construction of the New Dutch Waterline began between 1815 and 1825 with the building of five forts in a semi-circle to the north and east of Utrecht at a distance of 1.5-4 kilometres from the city boundary. They were simple, moated, enclosed earthworks, sometimes with bastions, still completely in the traditional form of eighteenth-century military design. Around 1840 people saw the weakness of the earthworks, with their lack of storage or encampment facilities and protection. The restricted view from the low banks, three or four metres high, was another problem. During the second phase of the Waterline's construction all the existing forts were therefore provided with heavy-duty brick-built bombproof guardhouses and towers where the artillery was set up. They were used as a redoubt, the last place in a fort from which the defence could continue. Building upwards provided defenders with a much better view of the approaching enemy, thereby reducing the risk of a surprise attack. It was that view that was essential for closing the river accesses.

The New Dutch Waterline was to be the nation's main defence structure [wapenplaats], to which an offensive army could fall back to launch a counter-attack from this covered operations base. Based on this concept and because of the increased range of the latest artillery, a second, forward ring of four large forts was built round Utrecht between 1867 and 1872. This was further extended northwards and southwards after 1874 (Fortification Act). Because of the increased range of artillery, towns such as Naarden, Utrecht, and Gorinchem, which had ended up on the front line and were regarded as the most important and most vulnerable accesses, were defended at longer range. That is why, for example, the Naarden Offensive was built.

Then, in the third phase of construction, forts were added to the new inundation structures. At the very large forts, e.g. 32-ha Fort Rijnauwen, the focus shifted to eight to ten-metre-high heavy walls that were to withstand the heaviest grenades, to the distribution and spread of the artillery, and to a large capacity for the long-term housing of troops. We also see the appearance of many new buildings, each with its own function: housing in bomb-proof barracks, artillery in storage bunkers, munition in munition stores, army engineering corps' tools in wooden warehouses. After 1885, the invention of the high-explosive shells, combined with the increased accuracy of artillery, figuratively knocked out all the forts with one blow. Although improvements were still made, the era of brick forts was definitely over. The answer from the Defence Line of Amsterdam was the construction of low, earth-covered concrete forts. The final additions to the Waterline in terms of Military Fortifications are



Military map with the Naarden offensive

the many hundreds of concrete group shelters in the 1915-1916, 1918, and 1939-1940 mobilisation periods. After 1930, concrete casemates for machine guns and cannons were constructed at the new railway and motorway accesses.

Taken together, the Defence Line of Amsterdam and the New Dutch Waterline had seven successive construction phases (see box). The extension to include the New Dutch Waterline ensures that the first four construction phases will form part of the World Heritage Site. The Waterline shows in particular how water management has been refined and improved over the years.

What is exceptional about the New Dutch Waterline is how the defence structures have been incorporated into the landscape. The completion of the new and improved forts in the 1870s was followed in 1885 by a planting campaign for almost all the forts to provide camouflage for the defence structures. The forts were provided with 'General Planting Facilities' from 1896. Rows of trees that grow tall (horse chestnut, elm, Canadian poplar, oak, lime) planted along the outside of the moat were intended to disguise the contours of

Construction phases of New Dutch Waterline and Defence Line of Amsterdam

Taken together, the Lines have seven successive construction phases:

Construction phase 1

1815-1826. The fortifications of the New Dutch Waterline were built around Utrecht and the inundation basins created during Phase 1, including the construction of a series of military inundation fan sluices to replace the primitive coupures.

Construction phase 2

1841-1864. Following Belgium's secession in 1839, the New Dutch Waterline became what was undoubtedly the most important line of defence in the Netherlands. Except for the forts around Utrecht, it took until 1841 before the actual construction and extension of the new Waterline could begin. In this second construction phase, which lasted until 1864, the designers reverted to the Napoleonic plan of 1811 and other sources to place about 50 tower forts along the Waterline. Ten large tower forts were built on the river accesses and bombproof guardhouses or redoubts were added to a number of other forts.

Construction phase 3

1867-1870. Improvements were made all along the line during the third construction phase as a result of the invention of longer-range and more accurate artillery. It was during this period of German threat that the inundation time was substantially reduced with all kinds of water management interventions.

Construction phase 4

1871-1886. The last forts on the New Dutch Waterline were built during Construction Phase 4 and the existing neglected structures upgraded. The forts were provided with additional heavy earth cover and barracks were built in the forts for the expanded field army.

Construction phase 5

1880-1914. The fifth construction phase was dominated by the construction of the Defence Line of Amsterdam with concrete buildings between 1880 and 1914, as already announced in the Fortifications Act of 1874. In the New Dutch Waterline, we see the first concrete field fortifications appear in response to the destructive effect of high-explosive shells, which made the forts redundant as defence structures.

Construction phase 6

1914-1940. Military tactics underwent a drastic change in the early twentieth century. The emphasis shifted to field fortifications such as trenches and machine-gun nests and various reinforced concrete structures such as group shelters and machine-gun casemates. This sixth period is characterised by the construction of defence lines between the forts during the mobilisations at the beginning of the First and Second World Wars, i.e. the period 1914-1940.

Construction phase 7

1940-1963. After having been used by the occupying forces in the Second World War, all forts were downgraded in the 1950s, but it was not until 1963 that the Prohibited Circles Act was repealed, clearing the way for large-scale post-war urban development. This is the seventh and final period, the period of the Cold War, in which the individual forts of the New Dutch Waterline still had a semi-military function as storage, for detention, and for training. The New Dutch Waterline ceased to be used as a line of defence.



Fortifications, general planting system

the fort embankments in the form of 'tree camouflage' and absorb them in the surrounding countryside. A large quantity of plots of coppiced trees or willow were created outside the moats to further disguise the forts. So as not to betray their position, even the trees on the forts were not permitted to be too high: pollard willows were planted on the inside bank of the fort moats. Trees were planted behind gun emplacements, preferably dark-leaved species such as elm, thereby concealing the contours of the guns. The preferred options were trees with light crowns and thin, flexible branches, so that projectiles fired from inside the fort would not get stuck in the branches and explode prematurely. Coppice trees on the bank of the moat act like 'natural picket posts' when they are cut down at a height of 30 centimetres when an attack is imminent. Hedges of hawthorn, blackthorn and acacia planted round the moat had a similar repelling function and, according to the 1908 guidelines, could not exceed a height of 1.2 metres. The invention of barbed wire in 1873 signalled the beginning of the end for the hedges. Whereas the fields of fire in front had to remain open, the New Dutch Waterline itself would have to disappear into the countryside. Camouflage techniques were standardised and in 1908 published in the 'General system of planting for the permanent defence structures in the New Dutch Waterline'. To meet the requirement for planting vegetation, the army had its own nurseries, such as the one at Fort Vossegat near Utrecht. The camouflage effect of vegetation

declined sharply with the introduction of the aeroplane during the 1914-1918 mobilisation. Much of the vegetation was then cleared to provide a more open field of fire and view from the fort. The high maintenance costs provided another argument for clearing it. Water lilies and other aquatic plants were used as part of another well-intentioned attempt to obscure the reflecting fort moats, but money was no longer being spent on vegetation. During the 1939-1940 mobilisation, new bushes and other vegetation were planted to camouflage casemates and group shelters but this was superseded by the use of camouflage nets and camouflage paint.

2.b.2 Creation of the Dutch defence system

Between 1815 and 1940 the New Dutch Waterline was the Netherlands' main line of defence. The Waterline extended 85 kilometres from the then Zuiderzee (now IJsselmeer) near Muiden as far as the Biebosch estuary at Werkendam. The defence system was based on creating a water barrier, with military fortifications at intersections with roads and watercourses. This typically Dutch defence system of inundation was an improved continuation of what was at that time the successful Old Dutch Waterline from 1672-1673. In order to identify the Dutch tradition of using water as an efficient and effective means of defence, we will be going back in time a bit further and offering an overview of small-scale inundations of Dutch cities as isolated water fortresses.

'(...) We are firmly convinced that our new dutch waterline is now one of the best defence lines in the world and that it depends entirely on us whether we take advantage of it.'

W. Rooseboom, from: de gids, 20th year of publication (1882), part three, p. 27

Long tradition of water-based defence

Water is the element that is most closely bound up with the identity of the Netherlands. Surviving with water is what characterises the country and its inhabitants. The struggle for survival 'against, but also with' water has over the centuries resulted in large-scale development of marshland through drainage and land reclamation with an ingenious system of water management in the polders between the dykes. According to a French saying, God created the world, except for the Netherlands, as the Dutch created that country themselves. They made water their ally at an early date to protect house and home. The eleventh century, when the major developments got under way, saw the first castles and fortified homesteads appear with single and double moats, provided with removable bridges. The emerging towns and cities followed suit and, in the thirteenth and fourteenth centuries we see a real boom in town moats which provided effective defence with earth embankments and later brick walls. Water-filled moats in particular were an obstacle that was difficult to overcome and they retained their value until well into the Eighty Years' War (the struggle for Dutch independence from Spanish rule, 1568-1648).

First inundations Long before the Dutch military engineer Menno van Coehoorn (1641-1704) wrote his internationally renowned 'New fortress construction' [Nieuwe Vestingbouw op een natte of lage horisont] (1685), the Dutch had been trying to improve the defence of towns and cities in their water-rich country by digging wide moats and inundating polders. During the revolt against the Spanish monarchy in the 1572-1577 period, inundation was successfully used as a tool: 'Around all places, yes even the most miserable hole, is a water-filled channel, over which first a bridge must be built before it can be crossed,' wrote the Duke of Alva despairingly to King Philip II. As yet, this concerned the defence of individual cities like Brielle (1572), Alkmaar (1573), and Leiden (1574). In the border region between the provinces of Holland and Utrecht, it involved towns such as Woerden that managed to hold out for a year (1575) after inundating a wide area. And a failed inundation had dire consequences for the small town of Oudewater (1575), as it resulted in conquest by the Spanish.

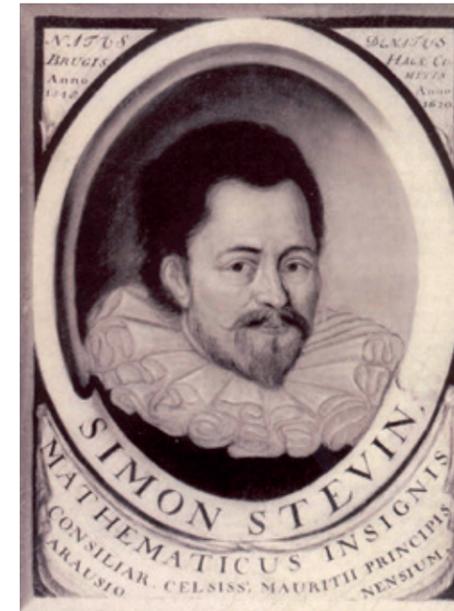
Years of war and water The inundations were very damaging for farmers but they did not receive a penny in compensation because it was 'in the public interest'. The situation in Zeeuws-Vlaanderen must have been really awful when the rebels fighting the advancing Spanish in the years 1584-1586 breached the dykes on a large scale and whole regions ended up under salty seawater for years. In the west, people preferred to concentrate on the defence of the towns and cities, which was of greater importance to the rapidly emerging middle classes and urban elites.

From: Cordon van Holland, p. 13

The military had also inundated the countryside between the rivers Hollandsche IJssel, Lek, and Merwede, sometimes for long periods. It is estimated that two-thirds of the southern part of Holland must have been awash in the years 1572-1577.

In the south of the country, between Bergen op Zoom, Tholen and Steenberg, there was already a real waterline in 1583: the Eendracht Line. The exceptional feature of this inundation was that it was inundated with both fresh water and salt water. This waterline would subsequently be included in the Southern Frontier or Southern Waterline, which was an important line of defence for the country until 1830. Shortly after 1580, a waterline was also constructed in the north of our country: the Tjonger-Linde Waterline in Friesland.

Build-up of the army and construction of defence structures On 23 January 1579, a number of Dutch provinces signed the Union of Utrecht in St. Martin's Cathedral in Utrecht. They agreed to work together in their struggle against the Spanish sovereign. They all retained autonomy, but they would form a united front to the outside world and assist each other 'met lijff, goet ende bloet' [with bodies, property, and blood]. In 1581, independence was then declared for the northern provinces in the Act of Abjuration in the Hague. When, in 1588, it was decided not to cede sovereignty to a monarch but to the States, the Republic of the Seven United Netherlands was born.



Simon Stevin

Utrecht Waterline

It was vital to create a common army. Cities were obliged to provide accommodation for garrisons. In 1579, Adriaan Anthonisz (1541-1620) was appointed military engineer. Under his direction, new fortifications were built according to the Old Dutch System in thirty towns and cities, most of which still had their medieval ramparts and walls. This 16th-century method of defence, which originated in Italy, was based on the bastion system. Some of the towns and cities fortified in this way, i.e. Muiden (1577), Naarden (1579), Utrecht (1577-1584), Gorinchem (1579-1590 and 1596) and Woudrichem (1583-1588) and Loevestein Castle (1575) would later be incorporated into the New Dutch Waterline. Because of its effectiveness, the Old Dutch System became the leading system of fortification construction in Europe. Remnants of fortifications built according to this system can be found as far away as Sweden and Poland.

Prince Maurice (1567-1625), son of William of Orange and stadtholder of Holland and Zeeland, became commander-in-chief of the States Army, the Republic's regular army, in 1587. His principal mentor was the Flemish military engineer Simon Stevin (1548-1620), who provided Maurice's reforms in the areas of strategy, tactics, encampments and fortification with theoretical underpinning.

After Prince Maurice's insurgent army had been annihilated by the Spanish royal army at Amerongen in 1585, the sluice at Vreeswijk was opened to inundate the surrounding land. Four years later, Prince Maurice was ordered, together with the States of Utrecht and Holland, to prepare a defence line for the Republic with inundations and military fortifications. At that moment, the concept of a continuous waterline was born.

The major rivers formed a natural barrier against an enemy coming from the south, but the land was open to a bypassing movement, along the natural invasion routes via the rivers, from the east. In order to protect this vulnerable eastern side, the Muiden-Utrecht-Vreeswijk route was chosen as the most technically feasible and the shortest line between the Zuiderzee and the rivers. The river Vecht, Utrecht's canals and the Vaartsche Rijn formed a main defence line that would be easy to protect. Extensive inundations on the eastern side were meant to make it impossible for enemy armies to pass.

Simon Stevin and his method of fortification

Prince Maurice must have known about Stevin's 'new method of fortification using pivoted sluice locks' (1617), a treatise on the art of inundation. In it, Stevin discussed three types of sluice: the drainage sluice 'to drain low-lying land', the lock 'to allow ships with upright masts to sail through', and the discharge

sluice 'to sluice harbours'. With his 'pivoted gates' consisting of a double mitre gate with slide gates in each part of the gate, he was able to solve the problem of letting water through and the problem of letting ships through in a simple way.



Map Prince Maurice
1589, Utrechtse Linie and
Grebbelinie

The approaching army had to be kept at bay to gain time to prepare and effect the inundations. To this end, Prince Maurice proposed a forward line in the Gelderland Valley in 1589, consisting of five sconces between Amersfoort and Rhenen. Utrecht and Holland did not agree. The plans would not be followed up until the middle of the eighteenth century with the construction of the Grebbe Line.

Maurice's successor, Prince Frederick Henry (1584-1647) managed to find an ingenious way to take full control of the water management around Den Bosch during his siege of the city in 1629. The knowledge of the gifted hydraulic engineer Jan Leeghwater (1575-1650) was found to be indispensable on this occasion. By the same year, 1629, Spanish troops had captured Amersfoort and threatened to penetrate further into Holland. Frederick Henry ordered hurried preparations to be made for a continuous waterline, the Utrecht Line. Water from the river Lek flowed into low-lying polder country. In the north, water from the Zuiderzee was admitted via the sluice near Hinderdam. Naardermeer Lake, which had just been drained, filled with water again. Fortified positions were built at Nieuwersluis,

Utrecht (The Klop), Jutphaas, and Vreeswijk. They were the first structures responsible for closing and defending the rivers, roads, dykes and permanently dry pieces of land that intersected the waterline. This meant that a small army was sufficient.

According to Dutch poet P.C. Hooft (1581-1547), it would be possible to defend the waterline along the Vecht and the Vaart 'with ten thousand men against the whole world. The construction of a line rampart with a moat to the east of Utrecht was bogged down in the early stages. Further work was halted due to a lack of money and the unwillingness of the States of Utrecht and the city of Utrecht, who did not want to give up their sovereignty in case of war and saw greater value in an eastern waterline in the Gelderland Valley. Existing structures were even partly demolished. The Utrecht Waterline between Hinderdam and Vreeswijk had not (yet) been built. Holland would choose a line on its own territory.

Holland's defence policy

Pieter de la Court (1618-1685), a well-known author in republican circles, proposed in his 'Interest of Holland' (1662) making Holland and Utrecht an easily defended island by digging a wide ditch between the Zuiderzee and the river Lek and separating from the other provinces. This ditch would make Holland an impregnable fortress. It would then be able to concentrate more on the sea and controlling world trade. A trading republic should behave like a cat: not getting involved with others (no expansion of power), always being after food (accumulating wealth), avoiding dealing with others (not entering into alliances) and only being willing to hit out when its life is threatened. Holland was by far the most important province in the Republic, in both financial and cultural terms. Of the eighteen city republics, Amsterdam had a dominant position in the province. Its importance is revealed in striking fashion when, during the Disaster Year of 1672, Grand Pensionary Johan de Witt (1625-1672) recommends giving up part of Holland if necessary and concentrating on the defence of the Amsterdam bulwark, an idea that would lead to the construction of the Defence Line of Amsterdam two centuries later.

Old Dutch Waterline

In Holland, according to a well-known saying, 'the government was desperate, the people senseless and the country beyond hope' when troops from Münster and Cologne advanced via Gelderland and Overijssel towards Groningen and the Frisian Waterline, combined English and French units tried to land on the coast and on 12 June 1672 the French Sun King Louis XIV (1638-1715) crossed the Rhine near Lobith with 120,000 men. Two weeks later, the city of Utrecht and the fortified towns of Oudewater and Naarden had been taken. At the very last moment, the States of Holland and the newly appointed stadtholder Prince William III decided to set the inundations of the waterline in motion. Because Utrecht was unwilling to cooperate, the waterline ended up in the border area between Holland and Utrecht. The entire area around Amsterdam was under water as far as Naarden. Even the inundations in the Lopikerwaard polder were twenty kilometres wide. Large parts of the Alblasserwaard, the Vijfheerenlanden (as far as Diefdijk) and the Land of Altena were awash. When Louis' forces

Hollandism

The Republic has been described as a merchant's office defended by fleets and fortresses. That office was Holland and the other provinces served as a buffer zone. This 'Hollandism' dominated defence policy until 1940 and formed the basis for our pursuit of neutrality and our defence system: Fortress Holland with the New Dutch Waterline as the Eastern Front, the front and border lines as buffer

zones, and with the Defence Line of Amsterdam as national redoubt. Holland's defences extended even further, beyond its own borders, as in the case of the Barrier towns in the Southern Netherlands (Southern Frontier) and the strategically situated city of Namur in Belgium. The aim was to delay the enemy, thereby gaining time to take defensive measures on its own territory, such as inundating the waterlines.

were ready to continue their advance after a few weeks' delay in late July 1672, the French found their way barred by an extensive sparkling lake.

Impregnable line

'The french marched rapidly onwards, it was a victory parade, but they had to stop before the dutch waterline. Could they proceed in boats? Not possible. The water lay shallow on the fields... Could they wade across? Not possible. They would drown in the innumerable ditches and channels they couldn't see... Could they carry on along the higher dykes and roads? Not possible. Every road, every dyke was provided with strong sconces from which the canons stared them in the face...'

From: W.G. van de Hulst and R. Huizinga, toen en nu, leesboek over de geschiedenis van het vaderland voor de hristelijke geschiedenis, Groningen 1923.

The way the inundations were organised was chaotic and the successes of the States and French army units were variable. The weather at that time was a factor that should not be underestimated. The (short-lived) hard frost in December 1672 made it a simple matter for the French troops consisting of 8,000 infantry and 1,400 cavalry to cross the inundations to the north of Woerden. In the summer of 1673, French engineers tried to drain the land east of the river Vecht again, upgraded the fortifications near Naarden and Woerden and built a sponce near Jutphaas. But, by the end of 1673, the French had departed. The unique Dutch recipe for inundations turned out to be a success, despite the belated and extempore actions. The States of Holland therefore decided to adjust the waterline and design it as a permanent defence line 'to make the province invincible such that it be like a city or island so that the enemy need no longer be feared in it'.

Canaux – canards – canailles, canals, ducks and rabble (...) The Dutch breached the dykes and saw their flocks drown. But these extremities seemed less grievous than slavery.

Voltaire in Le siècle de Louis xiv, 1751



Voltaire

Inundation map 1672-1673





Baron Menno van Coehoorn

Menno van Coehoorn: new defence system

Appointed Inspector General of Fortifications in 1695, military engineer and strategist Menno van Coehoorn (1641-1704) became the key figure in a large-scale building programme: a system of connected defence lines along the borders of the Republic, with inundations as its tried and tested defence mechanism. The idea was to keep France at a distance using the Southern Netherlands as a barrier. Part of his programme was the construction of three waterlines that were to protect the economic heart of the Republic: the Grebbe Line, the Utrecht Line, and the Dutch Line. Around 1688, Van Coehoorn modernised the various lines, fortified towns and military positions along the border of the Republic, and connected them to form continuous lines: the Southern Frontier, the Southern Water Line between Bergen op Zoom and Grave, near Nijmegen, the IJssel Line, and the North-East Frontier for the defence of Drente, Groningen, and Friesland.

Waterline progresses eastwards

During the first phase of construction of the Dutch Line between 1672 and 1702, the New Dutch Waterline was soon pushed forward to Nieuwersluis and then conducted alongside Oudewater. It was only much later, in around 1740, that work started again as a

Kraijenhoff: first plans for a new waterline

result of the French threat. Woerden was now part of the waterline and two new forts were added to it in 1748 (Oranje and Kruijin) on either side of the Oude Rijn River. Additional fortifications were added to the south-side of Oudewater and Nieuwersluis expanded to form a true fortified town. Following the French siege in 1672 Weesp was fortified with four bastions, only two of which were completed. Both Weesp and Nieuwersluis, small fortified towns on the river Vecht became part of the New Dutch Waterline after 1815, Weesp subsequently being incorporated into the Defence Line of Amsterdam.

The rapid Prussian raid with 25,000 men in 1787 exposed the vulnerable points in the Dutch Line, in particular the vulnerable access of the river Lek. Shortly afterwards, the section between the Lek and Merwede was moved eastwards from the Ameide-Gorinchem Line to Diefdijk. Diefdijk and the river Linge became the new boundaries for the inundations on their eastern side. The winter of 1794-1795 was so severe that even the major rivers froze solid. With a superior French Revolutionary force 70,000 strong, including many Dutch patriots, General Pichegru crossed the frozen rivers and took the Republic by surprise.

The foundations for an improved Dutch Waterline were laid during the French period. In 1796, Patriot and self-made military engineer Cornelis Kraijenhoff (1758-1840) became director of the 'Dutch Fortifications, Defence and Artificial Inundations'. Under King Louis Napoleon, he even made it to Minister of War in 1809. In his Memorandum concerning the 'first or capital Waterline' of 16 January 1797, Kraijenhoff described in detail the state of the (old) Dutch Waterline and how it should be improved. In addition, he argued for an extension of the waterline to the east to include the city of Utrecht and the important inlet sluice at Vreeswijk, protected by a chain of outposts. Not only because Utrecht was an important garrison city, but mainly to prevent the enemy from easily tapping the water barrier via the city. These outposts were intended to protect the inundation sluices.

However, the then still sovereign province of Utrecht stopped Kraijenhoff's plan because it regarded this proposal as a power grab by the province of Holland. Out of necessity, Kraijenhoff focused on improving water distribution and reinforcement of some vulnerable points. In particular, the situation where the line south of the Lek (Diefdijk) no longer connected to the northern part which reached the Lek at Schoonhoven was a critical point. The recommendations he made created the concept for what would later become the New Dutch Waterline. The coupures in the dykes were another objection. Once these had been made, the incoming water could no longer be controlled. In 1809, under the direction of Jan Blanken (1755-1838), hydraulic engineer and from 1808 inspector-general of the Waterstaat, various water management improvements were made between the Lek, Linge and Merwede, such as a dam with fan sluice in the Linge near Asperen and a new dyke, Zuiderlingedijk. Since then, this section has been known as the Diefdijk Line.

Napoleon: the real defence line of the Empire

After the Kingdom of Holland was absorbed into the French Empire in 1810, Napoleon unveiled his defence plans. In his 'Note sur la défense de la Hollande' dated 23 October 1811, he describes his plan for a new waterline as follows: 'The line from Naarden to Gorinchem may be considered to be 'the true defence line of the Empire'. The line must be properly reconnoitred and properly constructed, the inundations must be prepared and the emphasis must be on the tower models, which can house fifty men and can be sited alongside the dykes. Fifty of these towers, which will serve as guardhouses and redoubts for the batteries, will keep the line completely safe. (...) The remaining inundations will be useful when the occupants want to defend themselves. This will hold up the enemy for fifteen days, which will give time to summon help quickly. The map of inundations must be available on a large scale, and the most important elements on it must be identified clearly and in detail.' Napoleon saw that the extension of the Rhine Line in the direction of Delfzijl, via Coevorden and Groningen, was too expansive. He also considered the IJssel Line too vulnerable as a second line. No, continuing the line via the existing Naarden-Gorinchem line, that was the real defence line of his Empire!

Napoleon's plan for the New Dutch Waterline was based on a mobile field army (6,000 men) that was to operate mainly outside the forts using rapid deployment, just as he himself had done successfully. The forts were to be mainly used as safe rest quarters and guardhouses, whereas artillery fire could be unleashed from his Tours-Modèles. Assessment of Napoleon's plan soon followed and, in 1812, the *Comité Central des Fortifications* came up with an economical alternative (7 instead of 11 million francs): it would primarily be an inundation line with four permanently defended strong points (Naarden, Utrecht, Vreeswijk, and Gorinchem). The dykes were to be defended with simple earth redoubts, dug by the troops stationed there. The original 15 defensive towers were scrapped, as were the many bombproof buildings intended to house troops and equipment.

After the French departed in November 1813, the borders of the newly created Kingdom of the Netherlands were re-established. During the Treaties of Paris in 1814 and 1815, the Northern Netherlands were expanded to include the Southern Netherlands (Belgium) as a buffer against France, as well as a few pieces of French territory on either side of the river Meuse. France was reduced to its boundaries of 1790. King William I (1772-1843) acquired Luxembourg (until 1890) as a personal possession (Grand Duchy) to compensate for the loss of his German possessions (Principality of Orange-Nassau). As the first king of the Netherlands, he maintained and strengthened the reforms from the period of French occupation and set to work on both the civilian and the military infrastructure.

In March 1816, Kraijenhoff set out an ambitious, coherent plan for the new national defence system. The greatest attention was to be focused on strengthening the twenty fortifications in the Southern Frontier, also known as the Wellington Barrier, after its British advocate.

The 'Utrecht Line' or the 'Dutch Waterline', as the New Dutch Waterline was known at the time, was to be built according to the most recent French plans but extended across the Waal/Merwede river. The Old Dutch Waterline could be decommissioned, as well as the Grebbe Line, which was difficult to defend because of the uncertain water supply from the Nether Rhine. The line along the river IJssel in Gelderland was also unsuitable due to lack of water. It was not until 1871 that the name 'New Dutch Waterline' came into use, to distinguish it from its precursor, the 'Old Dutch Waterline'.

2.b.3 The New Dutch Waterline and the Defence Line of Amsterdam in seven phases of construction

In the spring of 1815 King William I decided to build a new Waterline. The military and water management structures for the New Dutch Waterline would become the largest and most expensive infrastructure project ever to be completed in the Netherlands. The Dutch defence system underwent a dramatic improvement with the construction of the New Dutch Waterline between 1815 and 1885. In the course of the eighteenth century, the Old Dutch Waterline had already shifted further and further to the east. Now the route of the new waterline would again run along the rivers Vecht and Vaartse Rijn according to the old sixteenth-century plan for a Utrecht Line. The city of Utrecht was brought inside the defence system for the first time. Following the construction of the railways and the Merwede Canal in the second half of the nineteenth century, the garrison town of Utrecht became such an important logistical centre for the country that it had to be well defended.

Between Zuiderzee and Biesbosch

The New Dutch Waterline extended from the former Zuiderzee (now IJsselmeer) at Muiden in the north to the Biebosch estuary at Werkendam in the south. The route of the Old Dutch Waterline along the Vecht was maintained as far as Nieuwersluis. From Nieuwersluis the new line followed the Vecht to a few kilometres north of Utrecht. There, the New Dutch Waterline had to go around the city to the east, to then continue along the Vaartse Rijn as far as the sluices at Vreeswijk on the Lek. At this river, the line moved eastwards to connect with the southern route, which had been diverted to Diefdijk and the Linge in 1787. This southern Diefdijk Line formed part of the route of the Old Dutch Waterline which had been moved eastwards.

Inundations

Just like the Old Dutch Waterline, the new Waterline relied on extensive, but now more manageable, inundations, while forts and batteries protected the intake points (sluices) and closed-off areas that were not to be inundated and accesses. Together with hydraulic engineer and Inspector General of Public Works Jan Blanken (1755-1838), Krayenhoff, as Inspector General of Fortifications, developed the 'wet' plans for the New Dutch Waterline, and engineer and Major Willem Offerhaus (1773-1830) was given the assignment to build a ring of forts around Utrecht.

Franco-Prussian War 1870

On 19 July 1870, France declared war on Prussia. The reason was a telegram, deliberately brusquely shortened by Chancellor Bismarck, from the Prussian king, Wilhelm I, to the effect that he refused to yield to the authority of Napoleon III. France was afraid that if the German prince, Leopold von Hohenzollern, ascended the Spanish throne, the country would be surrounded by Prussia on both sides. France demanded a guarantee from Wilhelm I that the prince would never ascend the Spanish throne, either now or in future. And Wilhelm refused. This declaration of war suited Bismarck. Now he could call on the armies of other German states to mobilise under Prussian leadership. In the event of victory, the ad hoc military union could be turned into a permanent union between states. The war was disastrous for France and after the surrender on 10 May 1871, the German Reich – as already

proclaimed in Versailles on 18 January – came into being. German-speaking Alsace-Lorraine was annexed. The city of Belfort remained French but Metz, with its military fortifications, became German. The war contribution of five billion gold francs, over double the annual national budget, was to be repaid by the French government within three years. The war set the tone for almost a century of tension between France and Germany, the terrible consequence being the First and Second World Wars. The Netherlands had not been directly involved in the war but did mobilise its forces and partly inundated the New Dutch Waterline. This was done in such a chaotic manner that the Minister of War, General Van Mulken, had to resign. From that point on, it was not France but Germany who was the potential enemy.

A total of nine inundation basins were to be provided, with permanent defence structures on the accesses and near the intake points. The organisation of an optimum inundation system and the construction of the indispensable permanent defence structures on the accesses took from 1815 to 1886, with interruptions. That the realisation of the new waterline took so much time had everything to do with international political and military engineering developments and far-reaching infrastructural and water-management changes during the nineteenth century.

It was very important to have a short inundation time, because the time it took to mobilise armies became shorter and troops could be moved faster due to the expansion of the rail network. Troops who had been mobilised in Berlin could be at the border twelve hours later. The German railways were an integral part of German military strategy. There was an arms race between the speed of troop movements and the speed of inundation. Developments during the Franco-Prussian War in 1870-1871, the invention of new weapons and munitions such as the high-explosive shell and the construction of railway lines and canals across the New Dutch Waterline all had an influence on the organisation and infrastructure of the Dutch main defence line.

Military Fortifications

A strip of land could be inundated to the east of the Vecht-Utrecht-Vaartse Rijn-Diefdijk-Linge line, where the accesses were protected by a total of 6 fortified towns and 46 forts. Not counting the city of Utrecht, the older fortified towns of Muiden, Naarden, Weesp and Nieuwersluis in the north and Gorinchem and Woudrichem in the south were incorporated into the new waterline. Even Loevestein Castle would become part of the New Dutch Waterline and formed a triangle of fortifications with Woudrichem and Gorinchem. By May 1940, the New Dutch Waterline had undergone many alterations, e.g. with a series of concrete casemates, group shelters and trench systems between the forts. The New Dutch Waterline and the Defence Line of Amsterdam overlap in the area between the fortified town of Muiden and Fort Hinderdam.

Seven phases of construction

The New Dutch Waterline was constantly adapted to take account of new developments in the military sphere, changes in defence policy and, last but not least, interventions in the infrastructure, especially as regards the new waterways and the advent of the railways. Although the process of inundation generally remained the same during the lifetime of the Waterline, work was constantly being done to refine the system. It was done because of new attacking tactics and weapons and to keep the time taken to complete an inundation to a minimum. The table on the previous page shows for each phase the focus of the development in relation to the outstanding core features (see 2.a) of the New Dutch Waterline.

Phase	Strategic Deployed Landscape	Water Management System	Military Fortifications
Phase 0: prior to 1815			Fortified towns
First construction phase: 1815-1826	Prohibited Circles Act 1814	Construction of inundation system	First ring of forts round Utrecht
Second construction phase: 1841-1864	Prohibited Circles Act 1853		Tower forts, guardhouses and redoubts
Third construction phase: 1867-1870			Second ring of forts round Utrecht, Naarden Offensive and fort Pannerden
Fourth construction phase: 1871-1886	Zoning of the New Dutch Waterline	Speeding up of the inundations	Modernisation and addition of barracks and sheds
Fifth construction phase: 1880-1914	Inundation Act 1896		Construction of concrete forts in Defence Line of Amsterdam
Sixth construction phase: 1914-1940	Enhancement of the defence system	Last adaptations through new infrastructure	Dispersed concrete structures between and in front of forts
Seventh construction phase: 1940-1963	Suspension of Prohibited Circles Act		New (mainly military) use of forts

Phased 0: prior to 1815

Older, existing defence structures were used in the construction of the New Dutch Waterline. This mainly involved upgrading six fortified towns with their seventeenth and eighteenth-century fortifications. Other sections of the Old Dutch Waterline were also converted and incorporated into the new waterline.

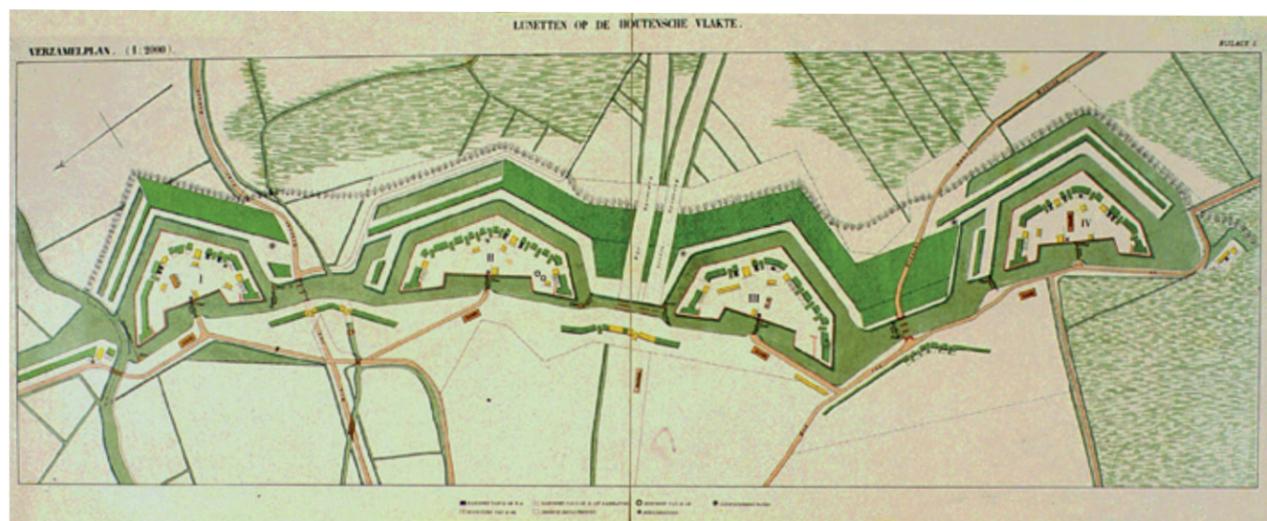
First construction phase: 1815-1826

During the first phase of construction of the Waterline, the focus was on defending the city of Utrecht and building the inundation system. After the necessary surveys in 1815, the construction of new fortifications began to the east of the city of Utrecht in 1816. During this phase of construction, five forts were built at the vulnerable accesses around Utrecht between 1816 and 1821: Fort along the Klop, Fort De Gagel, Fort Blauwkapel, Fort on Biltstraat, and Fort Vossegat. Together with the four Lunettes, they were situated to the north-east of the city at a distance of 1,250-2,000 metres from the city walls, which at the time was out of artillery range. To the south of Utrecht, a number of existing defence structures were improved:

Fort Vossegat



Plan of Defence of four Lunettes



Fort near Jutphaas and Fort Vreeswijk. The first series of forts on the Waterline were simple structures, consisting of earth ramparts, located at the centre of the road or quay to be protected. The forts were surrounded by a moat and the gun emplacement was on the main rampart. The shape and size of the forts were dictated by the width of the access and the location of the constructions that enable inundation. Apart from the Lunettes, the forts did not yet have stone buildings.

Strategically Deployed Landscape: Prohibited Circles Act 1814

A defence structure must be able to see the enemy approach and bombard them with artillery and small arms fire. In both cases, a clear field of fire is essential. This had been set out in a decree by the States of Holland in 1792. It stated that nothing should be built within a distance of about 230 metres, as measured from the slope of the outside moat. In 1810, a French law, also applicable to the Netherlands, was passed stating that any building within a radius of 500 metres from the fortification would be subject to strict rules.

Article 9, prohibited circles act 1814

All estates, stables, dwellings, farmhouses, barns or structures of any kind whatsoever; all gardens, orchards and other plantations that are situated at a distance of 300 rods from towns or villages which have served as strongholds over the last fifty years or have been surrounded by fortifications and are now considered to be among the fortresses, strongholds and lines of the first and second class, will, as soon as we deem it unavoidable for the defence of the country, be demolished, burned or destroyed on our instructions without any payment of damages being made to the owners, nor as if these objects had been destroyed by the enemy.

However, insofar as, during the construction of these fortresses, strongholds and lines of defence, such objects were already situated within the specified circle of 300 rods and they still actually exist, the payment of a reasonable amount in damages to the owners will be permitted by the government in the event that the former's destruction is necessary.

On 16 November 1814, the first Dutch law entered into force which stated that all buildings and vegetation up to 300 rods (= 1128 metres) from the fortification were subject to rules. Between 100 and 300 rods, structures could be built of wood with straw or reed roofs. In the case of houses, only fences could be made that were suitable for 'immediate burning, and consequently no thorn bushes or other hedges; whereas tree species may only consist of fruit trees.' In the first ring up to 100 rods and between the fortifications themselves, any building or planting were forbidden. However, this regulation left many doubts as to which fortifications it applied to and also it was not properly enforced. The Prohibited Circles Act of 1853 was intended to improve this situation.

The construction of the New Dutch Waterline represented a major step forward in the inundation technique. The inundation was prepared in detail so that the process could be started quickly in time of war. In 1815, having been commissioned by King William I, Cornelis Kraijenhoff began work on a new waterline that would be situated further to the east, on higher ground. The greatest difference in height occurred between the Zuiderzee and the river Lek (two metres). In 1797, as a solution to bridging this height difference, Kraijenhoff had proposed creating inundation basins, clusters of polders within which the same water level could be maintained. Existing quays had to be used wherever possible to separate the basins according to their different levels. The rivers Lek, Linge and Waal were the natural means of separating the basins in the river region.

In the early nineteenth century, an inundation system of over 80 kilometres in length was completed in initially eight inundation basins (nine in 1870). Initially, between the Zuiderzee and the Lek, four inundation basins (five in 1870) were created, with Tienhovensche Kade, Klopdiijk, Achttienhovensche Kade, and the Utrecht-Hilversum road serving as basin barrages. North of Utrecht, salt water could be admitted to the Vecht near Muiden. South of Utrecht, Vreeswijk was the main intake point for water from the Lek into the Vaartse Rijn at that time. The area between the Lek and the Waal had been divided into two basins. At this point, the Linge separated the Neder-Betuwe basin from the Tielerwaard basin. North of the Linge, water from the Lek could be admitted via Het Spoel near Culemborg. To the south, it was the Waal that provided the inundation water via the sluice near Dalem. Both basins were also filled with water from the Linge via the fan sluices near Asperen. In the most southerly part of the Waterline, the Bommelerwaard basin was located between the Waal and the Meuse and the Land of Altena basin was located between the Meuse and the Bakkerskil, a creek in the Biesbosch estuary. Bommelerwaard was supplied with water from the Meuse via the inundation sluice in the Nieuwendijk. The Land of Altena obtained water from the Merwede via the sluice near Woudrichem and water from the Schenkel via the Papsluis, a sluice near Werkendam.

Water was prevented from running off to the lower-lying western side through the use of existing dykes and quays, usually situated along the rivers and canals. This was easily done without interventions along the east bank of the Vecht. Between Maarsse and Utrecht, the first medieval reclamation was used as the westerly boundary: the Zogwetering-Groeneweg-Hoofddijk-Ezelsdijk. However, along Vaartse Rijn between Utrecht and Vreeswijk a separate inundation quay had to be constructed. This because a great deal of industry had settled directly along the canal. The route of Juliana-weg in south Utrecht is a reminder of the inundation quay behind the industrial site. In order to prevent inundation water flowing into the Vaartse Rijn via the Overeindse Wetering, a dam sluice was built in this watercourse west of Jutphaas. A similar dam sluice was also built in the Schalkwijkse Wetering. On the eastern side, the water flowed out until it reached higher ground, which made for a rug-

ged boundary. The enemy was unable to tap off water on this side, which, therefore, did not need to be protected.

An effective inundation meant 30-50 centimetres of water on the land, too deep to walk across and too shallow to sail across, being 3-5 kilometres wide. This distance could not be covered by the artillery of the day. Kraijenhoff estimated that it would take 14 days to effect the inundations. In many cases, existing sluices could be used to inundate the land. But in order to inundate quickly, additional inundation sluices had to be constructed. Already in 1809, Jan Blanken had overseen the construction of the ingenious fan sluice, which could be opened against floodwater without much effort, together with a dam in the Linge near Asperen. Nieuwe Zuiderlingedijk was also built in that year, creating – together with Diefdijk – a continuous rear boundary for the inundations between the Lek and the Merwede-Waal, known as the Diefdijk Line.

In 1815, the Ministry of Public Works, led by Jan Blanken, built seven fan sluices between Culemborg and Werkendam: the Pap Sluice at Bakkerskil under Werkendam, a sluice at Woudrichem, one in Gorinchem, two sluices in Zuider and Noorder Lingedijk above Asperen, one in the river Linge at Asperen, and one at the Structure along the Spoel in Lekdijk between Everdingen and Culemborg. In 1794, a cut-off 23 metres long had been made in the dyke near Het Spoel to produce extensive inundations east of Diefdijk intended to hold back advancing French troops. Jan Blanken had already considered that a forced breach of the dyke there could save the low-lying areas of the Netherlands, which would flood very quickly if Noorder Lekdijk was breached. Building a series of fan sluices meant that the water from the Lek could be diverted towards the Biesbosch estuary. This gave these 'Diversion and Inundation sluices' a double protective function for Holland: to delay the enemy through inundation and to prevent flooding in the economic heart through indirect diversion of water.

The many planned coupures in the dykes were not very popular but were of vital importance. The main intake points lay along the major rivers and at the Zuiderzee near the Vecht estuary. The eighth fan sluice, the Rijkshulpschutsluis, was built near Vreeswijk in 1817, the main intake point for water from the Lek for the northern basins. The old, existing sluice was in such poor condition at the time that it had to be closed off immediately. The use of additional ancillary sluices, dam sluices, culverts and spillways raised the water level in inland rivers including the Vecht, Linge and Kromme Rijn to fill the inundation basins. In this way, Basin 2 south of the Lek, the polders between the Waal and the Linge, could be filled with water from the Waal via the large inundation and ancillary sluice near Dalem to the east of Gorinchem, which had been rebuilt in 1814-1815.

Military Fortifications: the first ring around Utrecht

- During the first phase of the Waterline, the emphasis was on building forts in the city of Utrecht.
- Fort along the Klop, a closed earthen redoubt from 1821, is in the same location as a precursor from 1626. The defence structure on the east bank of the Vecht protected both the dyke with its towpath along the river, as well as Klopdijk along the Klopvaart canal, which discharged into the Vecht.
 - Dating from 1821, Fort De Gagel was built as an earth battery fort and was used to close off Gageldijk and Kerkeindsche Dijk and provide a flanking defence for Klopdijk. The fort also had to protect the inundation sluices in front of it.
 - Built in 1818, Fort Blauwkapel is an earthwork enclosure with four bastions and an earth redoubt. Its precursor was the 'Groote Redout te Blauw Capel' dating from 1787, a simple bunker with four artillery pieces, built by the Patriots to protect the city. The structure had to defend the barrier quay between the fourth and fifth inundation basin (Tolakkerweg) and Gageldijk, which was perpendicular to it. Next to this crossing point, a fortified house, Huis ter Veen, with a chapel, had stood since the late Middle Ages. Blauwkapel (blue chapel) may take its name from this chapel, which was painted blue. The Ministry of Defence was too thrifty to buy out the existing hamlet. For this reason, we can still see the remarkable settlement that lies within the fort.
 - Fort on Biltstraat, now known as Fort De Bilt, was the first fort to be built in the New Dutch Waterline. Since the late thirteenth century, this had been Steenstraat, the road to De Bilt and the main eastern access route to the city. In 1787, the Patriots had built a makeshift sconce there to protect this access. The construction involving the excavation of the fort moat began in 1816. By 1819, a bastioned double crownwork lay precisely on the axis of the road, with an earth redoubt gorge, with its own moat and drawbridge. The road was diverted along the south side of the fort moat (Offerhausweg). The old route was not restored until 1930, right across the fort's redoubt.
 - Fort Vossegat, the second structure in the Waterline, followed in 1817 and was used to close off the multiple access consisting of Kromme Rijn, the Utrecht-Bunnik road that ran alongside it and Vossegatsedijk. There too, the Patriots had built a battery in 1787. By 1819, the single crownwork with two ravelins and a gorge with earth redoubt had been completed. After 1862, it also had to protect the inundation sluice in front of it. Following the construction of the Kromhout barracks in 1910, only a few fragments of the fort were left, including the 25-metre-long inundation sluice, nicknamed the 'Bridge with Twelve Holes' [Brug met de Twaalf Gatē].
 - Built between 1818 and 1828, the Four Lunettes [Vier Lunetten] on the Houten Plain [Houtense Vlakte] provided the defence for higher ground, which was not to be inundated, on the south-east side of the city and had been built to protect the two city accesses: Houtensepad and Koningsweg. These special structures had been inspired by the Beverwijk Line, a series of lunettes which Kraijenhoff had built in 1800. In view of their location on a non-inundatable piece of land, the Lunettes had to conform to high standards in terms of 'attack resilience'. The V-shaped fortifications, which are

unusual in the Waterline, were therefore provided with heavy brick apron walls and had crenelated half-size apron walls encircling the gorge. The crenelated walls were demolished in the late nineteenth/early twentieth century.

- Fort Jutphaas was built to the south of the city on the axis of Overeindseweg.
- Various thirteenth-century castles, including Wijnestein Castle, the site of which can still be seen next to the fort, stood on the medieval route between Houten and Jutphaas. The road lay on a major non-inundatable corridor that was originally an old river course of the Rhine. Fort Jutphaas must have originally consisted of two half star-shaped sconces on either side of the road. Dating from 1629, these defence structures were converted to an elongated closed earthwork in the form of a bastioned sconce in 1819-1820. The final remains of thirteenth-century Plettenburg Castle were cleared away for the construction of the 'earth fort on and over the road from Jutphaas to Heemstede'.
- Vreeswijk became the main intake point for water from the Lek and, in 1818, a special lock, the 'Rijkshulpschutsluis' with fan-type gates, was built there. In 1820, the defence structure built in 1786 was converted to an enclosed earthwork right next to Lekdijk and outside the village of Vreeswijk, hence its name, Structure near Vreeswijk. As long ago as the fourteenth century, there were fortifications near the Vreeswijk lock, which dates from 1373. A 'sconce on the Canal' was mentioned in 1567. In 1629, 'the old defence structures were rebuilt' as part of the Utrecht Line. In 1672, the French built a sconce there, which was fortified by the Patriots in 1786.

Second construction phase: 1841-1864

Work on the Waterline ceased between 1825 and 1840. All the attention was being focused on the construction of extensive fortifications in the Southern Frontier, a gigantic project that started in 1816 and centred on at least twenty fortified towns in what is now Belgium. Following the final secession of the Southern Netherlands in 1839, the old Southern Waterline was revived as the primary line of defence in the south. Later, after the national defence system had been moved westwards as part of Fortress Holland, the Southern Waterline was used as a refuge for the retreating field army.

The next phase of construction occurred after 1839, when the Netherlands recognised Belgium as an independent state. The defence system required reorganisation and renewal. King Willem II decided on a concentrated defence system, with the New Dutch Waterline as the main line of defence. It was intended to protect the most vital part of the country, the west. The area was to be made into a complete island, surrounded by water from the North Sea and the Zuiderzee, the inundations from the new Waterline in the east and the delta of the major rivers in the south. 'After all', explained Major J.G.W. Merkes van Gendt of the Army Corps of Engineers (1831-1884), the originator of the waterline plan and faithful adjutant of Willem II, 'Holland alone can be made impregnable by

means of nature and artifice', which was technically impossible for any other province in the Netherlands. The fortified towns and lines near the borders of the Netherlands served to delay any enemy advance, so that the inundations of the Waterline could be effected. The second period of construction in the Waterline followed from 1841 to 1864, despite drastic cuts to the defence budget. The first priority was to protect the rivers, which were dangerous accesses within the Waterline.

Strategically Deployed Landscape: Prohibited Circles Act 1853

Initially, a law dating from the French occupation was in force, under which all obstacles within a radius of 500 metres around a fort could be burnt down without compensation if war was imminent. The law was vague about which defence structures it covered. The passing of the Prohibited Circles Act in 1853 resulted in new, detailed rules on how to manage the open spaces around the forts. Around the outer perimeter of each defence structure, three Prohibited Circles were planned, in which strict building regulations applied: a Small Circle up to 300 metres, within which woody crops could be planted only with the permission of the Minister of War and only wooden buildings were allowed up to a maximum surface area of 40 m², a Medium Circle up to 600 metres, where buildings partly of stone (only the substructure, hearth, chimney and roof) were allowed without a permit and a Large Circle up to 1,000 metres, where all buildings, trees and other obstacles could be cleared without due process in a time of war and where a permit was required to dig ditches or build roads, dykes, sluices, etc.

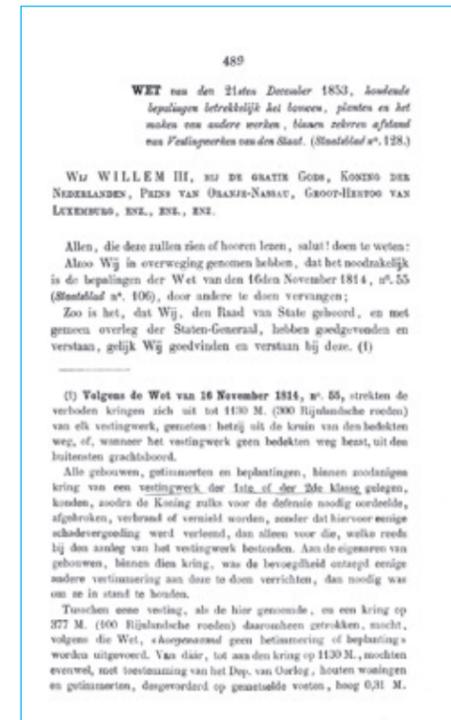
Wooden farmhouse Spoel



Dutch Water Defence Lines

Article 29, Prohibited Circles Act 1853

All buildings or structures, all fences, all woody crops and all piles and stacks that have been or will be erected, planted or laid within the medium circles of defence structures of any of the classes, may, as soon as the defence structure has been declared to be in a state of war or siege, be cleared away without due process on the instructions of the military commander. Compensation will be paid for buildings, structures, fences or woody crops destroyed which had been erected or planted when such was not prohibited. No compensation will be paid where the buildings, structures, fences or woody crops destroyed were erected or planted when this was only permitted on condition that they could be cleared without compensation or the building or planting had taken place subject to different conditions that precluded the payment of compensation.



Prohibited Circles Act 1853

The imaginary Circles were drawn around the forts with extreme precision. There was no single point that served as a compass point, but several, which were determined at the furthest protruding parts of the fort's contour. In the case of closely spaced forts, such as those round Utrecht, the rings were closely interwoven into a single prohibited area.

The Prohibited Circles were primarily intended to produce a clear field of vision over the approaching enemy. They were also 'off-limits' zones, providing an unobstructed field of fire over the accesses to be defended. The very wide-ranging Prohibited Circles Act divided the forts into three classes according to their strategic importance. Any building, even in wood, between a first-class fort and the Small Circle required the permission of the Minister of War. What was new was the right to compensation, set out in specific terms, on account of the establishment of the circles.

The result of the Prohibited Circles Act was that Utrecht's urban expansion to the east was prevented for a long time. In their second urban expansion plan of 1924, architects Holsboer and Berlage made a virtue of necessity by regarding the ring of forts as a wholesome green belt. New plans were made following the suspension of the Prohibited Circles Act in 1951, but it was only after the act was finally repealed on 28 November 1963 that a start could be made on a large-scale expansion, e.g. the De Uithof university campus (now: Utrecht Science Park) and the Overvecht high-rise estate.

Military Fortifications: tower forts, guardhouses, and redoubts

Nine brick tower forts were built on the dykes along the Vecht, the Lek, the Linge and the Waal under the direction of Merkes van Gendt. Unlike the planned square Napoleonic towers, these round defensive towers were not standardised. The round tower forts were 30-40 metres in diameter and two or three levels high. They were intended to house men and equipment and to have a gun emplacement in and on the top levels. At the time, defence focussed on short distances: protected behind the tower wall and breastworks, defenders could shoot over their own town wall. The tower also served as an observation post. With three levels and artillery on the roof, Honswijk was the tallest tower fort, rising 22 metres above the flat polder land by the river Lek. Its resemblance to a medieval keep was increased by the fact that its silhouette was



Fort Honswijk

enhanced by an ornamental edge of battlements and the surrounding moat and drawbridge. These tower forts were not modelled on the French 'Tours-modèles' but on the series of towers built around the military camp in Linz, Austria, between 1831 and 1837. Named after Austrian Archduke Maximilian d'Este, these Maximilian towers were promoted to the crown prince, King William II from 1840, by his personal adjutant, Captain J.G.W. Merkes of the Army Corps of Engineers, because of their bombproof construction. Kraijenhoff also recommended 'a type of Maximilian Tower' for the upgrading of the fortified town of Naarden in 1837.

The Waterline contains the following tower forts:

- The West Battery at Muiden, built in 1852 on the left bank of the Vecht estuary at Muiden, on the location of a 1799 earthen battery. The oval tower with its moat and drawbridge across from Muider slot Castle was meant to provide flanking over of the harbour and the Zeedijk.
- Dating from 1861, Fort along the Ossenmarkt in Weesp was the last tower fort to be built in the Waterline. The defensive tower with moat and drawbridge was built inside the fortified town of Weesp and was designed to keep the quays of the river Vecht under fire.
- Fort Uitermeer originally dates from 1589 and had been built as an earth scone on the Vecht for the defence of Weesp. Following the excavation of the 's-Gravenlandsevaart canal in 1634, the earthwork was extended to become a fort to defend the new lock, which was also intended to inundate the land between the Vecht and the fortified town of Naarden. The fort was incorporated into the Old Dutch Waterline in 1673. In 1845, a defensive tower approximately 30 metres in diameter was built in Uitermeer, as well as a moat and a drawbridge.

- Fort Nieuwersluis is situated on the west bank of the Vecht inside the fortified town of Nieuwersluis, which had formed part of the Old Dutch Waterline since 1673. Dating from 1851, the new fort had a round tower with moat and drawbridge. The fort provided protection for the dam sluice in the Vecht and cover for the Vecht quays and the Amsterdam-Utrecht railway dating from 1843.
- Dating from the first phase of construction, Fort along the Klop was fortified in 1850 with a bombproof guardhouse in the form of a round brick-built tower on two levels inside a moat with drawbridge.
- Fort Honswijk and Fort Everdingen, were the first two in a series of tower forts, and date from the 1841-1849 period. Their purpose was to close off the Lek access and maintain control over the river dykes. Honswijk had been planned as far back as 1811. Just how important this river passage was is shown by the fact that there were already fortifications on both banks at the beginning of the fifteenth century: the Bishop of Utrecht's Vreedborch blockhouse on the north bank, and Everstein Castle on the opposite side. Honswijk was built as a bastioned earthwork and was the biggest tower fort in the Waterline. Apart from the Lek access, Honswick also defended the main inundation sluice in front of it. The tower of the similarly bastioned Fort near Everdingen was located exactly on the T-junction of Lekdijk and Diefdijk.
- Fort Asperen is a tower fort dating from 1847 and is located on the north Lingedijk to the east of Asperen, on the same location as the Castor dyke post dating from 1794. The purpose of the moated tower of the half circular fort was to close off the Linge access and to protect the inundation sluice dating from 1815, which lay behind it, and the fan sluice in the Linge, which lay behind that.
- Fort Vuren dates from 1844 and is situated on the northern Waaldijk east of Gorinchem. In 1849, a large bomb-proof tower with a moat and drawbridge was added to the earthen redoubt. Its purpose was to protect the Waal access, including the fort located behind

Fort Vuren



the sluices. This tower fort also had to provide the fortified town of Gorinchem with cover against a direct attack.

- Renamed 'Fort along Uppelsedijk' after 1878, Fort Altena was built as a circular earth redoubt with a free-standing bombproof tower 28 metres in diameter. It was used to close off the Napoleonic Breda-Gorinchem road, Uppelsedijk and the small Gantel river.

In this phase of construction, it was not only the above-mentioned tower forts that were built, 'bombproof' buildings, i.e. buildings that could withstand the impact of gunpowder-packed projectiles, were also built in many smaller structures. They were usually rectangular guardhouses with heavy, three-brick-thick vaults, often with earth cover. These buildings were also provided with embrasures on all sides and had a watch post, powder magazine, underground provisions store, kitchen, washing facilities and toilet, as well as a barracks. Rainwater was collected in a brick fresh water cistern. Fort Hinderdam (1848), Fort De Gagel (1852), Fort Blauwkapel (1850), Fort on Biltstraat (1850), Fort Vossegat (1849), Fort Jutphaas (1848) were fortified with bombproof guardhouses, the largest being at Fort Blauwkapel, 20 by 30 metres in size. The two-level-high bombproof redoubt in Fort Jutphaas is shaped like a segment of a circle and provided space for 137 soldiers. The Structure at Vreeswijk was upgraded in 1853 but because it was situated far behind Fort Honswijk, hardly any changes were made to it subsequently.

Some fortifications on the dyke accesses in the Vecht lakes area, which still dated from the French occupation (1803), were replaced with simple forts or redoubts with a bombproof guardhouse between 1844 and 1850:

- Fort Kijkuit (1844-1847) to close off the Kortenhoefse Zuwe and the adjacent canal.
- Fort Spion (1844-1847) to close off the road access (Bloklaan) around the fort and almost identical to Fort Kijkuit.
- Fort Tienhoven (1848-1850) to close off the Tienhoven Canal and the adjacent inundation quay as a dividing line between two basins.

Fort at Tienhoven



Fort Ronduit

Third construction phase: 1867-1870

The theme that dominates all the phases of construction is that defence was becoming more mobile. The strategy of the first two phases, between 1815 and 1865 can be summarised under the headings of observation, concentrated fire power and short-range defence. The strategy of the third phase, between 1867 and 1870, was dictated by the fact that the range of artillery had doubled. Its accuracy increased considerably as well, with the introduction of rifled cannons with elongated grenades in 1861. Because of the increased range of the projectiles, the inhabitants of fortified towns, such as Naarden, Utrecht, Gorinchem and Woudrichem, had to be protected at longer range by a ring of forwardly positioned, detached forts.

The Naarden Offensive was built to the south of the town in the period 1868-1877 to give the field army more time to withdraw to the fortified town of Naarden and if necessary undertake offensive actions themselves. Five battery forts had the task of closing off the main access routes. The fortifications shielded the elevated area of sandy ground on the south site; they were therefore in front of the inundations of the Waterline. The structures were built in a semi-circle around Bussum. Werk IV, the main structure of the Offensive, is the only surviving fort. The moat and the structure of Werk I were reconstructed, the rest disappeared as a result of later urbanisation. There are many wooden villas located in the former prohibited circles. Connected by a covered community way, Fort Ronduit was built on the north side of the fortified town of Naarden in 1873.

With its central location, Utrecht had long been a crossroads but, since the 1860s it had also been the Netherlands' main hub for a new form of infrastructure: the railways. The ring of six older forts that protected Utrecht was too close to the city in relation to the possible positions of enemy artillery. A second, projecting ring of mutually supporting forts was built even further eastwards from the city. This was mainly based on the example of Antwerp, where a similar ring of forts had been built shortly after 1860. Between 1867 and 1872, four detached (self-contained and forwardly positioned) large forts were built three to five kilometres away from Utrecht: Ruigenhoek, Voordorp, Rijnauwen, and Vechten. All four forts were provided with an attack-resilient embankment eight to ten metres high that would have to withstand the heaviest shells. With three bridges across the moat and a large courtyard (terreplein), two of these forts (Rijnauwen and Vechten) would have to be able to take in rapidly retreating units to be able to make a rapid sortie with the garrison. If that was no longer possible, the men could, in an extreme emergency, withdraw into a heavy brick-built and moated redoubt that had been designed for a long, isolated stay.

Three forts had initially been planned for the Rijnauwen-Vechten zone. This led to great conflict within the Ministry for War in 1866. It was decided to build only two forts despite the fact that they would not be able to provide each other with as much cover. Rijnauwen was the first fort to be built according to the modern polygonal

system, which was invented by French military engineer Montalembert, and was further developed in Germany in response to increasingly heavy artillery: the vulnerable protruding bastions made way for somewhat broken front walls, which were flanked by sunken casemates (in caponiers), accessible via underground tunnels.

**Military Fortifications:
second ring around
Utrecht, the Naarden
Offensive, and Fort
Pannerden**

To sum up, the following new forts were built in the Waterline in the third building campaign:

- Dating from 1870, Werk IV of the Naarden Offensive is the only surviving section of the five defence structures south of the fortified town of Naarden. Werk IV is now an enclave in the built environment of Bussum. This most important fort in the Offensive, known as the Main Structure, has a polygonal contour and, unique to the Waterline, a free-standing (crenelated) wall in a dry moat, provided with embrasures with outbuildings at the vertices to provide cover.
- Fort Ronduit north of Naarden was used to protect the land outside the dykes and was built in 1873 on an older structure near the harbour entrance on the Zuiderzee.
- Fort Rijnauwen was built according to the polygonal or caponier system between 1868 and 1871 and, at 32 hectares, is the largest fort in the Waterline. As a detached fort, it had a fortified redoubt with its own moat and drawbridge as the last refuge for the fort's garrison.
- Fort Vechten dates from 1867-1870 and, like Rijnauwen, was used to seal off the Houten Plain. The fort also had to cover the Utrecht-Arnhem railway, which was built in 1843. The 17-hectare

Fort Werk IV



Fort Pannerden



Fort Pannerden

fort was built according to the hybrid system and took the form of a pentagon with slightly curved sides. It is a cross between the polygon and bastion system. At the central vertex, there is a caponier, projecting from the embankment, from which the fort moat could be kept under fire. At the rear of the building is a large redoubt. This is an independent defence structure surrounded by a moat, constructed within a fort. Defensive forces could retreat into this structure, if the rest of the fort could no longer be defended.

- Fort on the Ruigenhoeksedijk was built in 1869-1870 to the east of the village of Groenekan on the Ruigenhoeksedijk access and was used to defend a barrier quay between two inundation basins. The fort consists of a regular, bastioned quadrangle with bombproof barracks, storage bunkers and shelters.
- Fort on the Voordorpsedijk was built in 1869-1870 as an irregular bastioned quadrangle along the axis of the dyke. Its task was to defend inundation sluices and could provide covering fire over the Utrecht-Amersfoort railway line.
- The Batteries along Overeindseweg were erected between 1871 and 1873 as two earthworks open at the gorge on each side of this major access. The northern structure was built behind a previously

excavated inundation canal. The separate earthworks were later connected by an embankment and had bombproof buildings built on them. These batteries were popularly known as 'the second fort' to distinguish them from Fort Jutphaas which lay behind.

- Fort Pannerden is situated well outside the Waterline zone at the fork of the Waal and the Pannerden Canal towards Lower Rhine. However, it was a vital defence structure for ensuring the inundation of the Waterline. The fort had already been planned in response to the Prussian threat in 1862 on the site where a star-shaped scone had been built in 1742. Fort Pannerden was built between 1869 and 1871 to prevent Bismarck's army from advancing from the east via the Waal or the Nether Rhine and, more importantly, closing the Pannerden Canal to make it impossible to inundate the Waterline via the Lower Rhine.

Fourth construction phase: 1871-1886

The Dutch army of 50,000 men was mobilised on the outbreak of the Franco-Prussian War in 1870. For the first time, the forts of the Waterline had their garrisons raised to full strength. The nine-week-long mobilisation brought a lot of defects to light. Communication between the forts was patchy (by carrier pigeon), there was no clear command structure, the army was too small and its weaponry was hopelessly out of date. The defence structures were in poor condition and there were far too few bombproof shelters for the troops or magazines and storage bunkers for ammunition and artillery. There was also found to be a need for dwellings for the fort guards and wooden engineering and artillery sheds for storing equipment in a dry place in peacetime. These shortcomings were a wake-up call. The Netherlands would have to undertake detailed preparations in peacetime for a possible war. *Kriegsbereitschaft* [Preparedness for war] became the new magic word.

Sinking waist-deep in the mud

'Although the waterline had many defects, inundation remained a supreme defensive weapon and was supposed to be able to withstand a prussian attack. The Dutch people were reassured with the following words: 'we do not have to have great power: infantry in close ranks with breech-loading weapons under cover behind the dyke, here and there effectively relieved by a battery of field artillery or a few machine-guns will make him [the enemy] pay dearly for his mad venture for he cannot dislodge these troops before he has crossed the river, and he will be unable to manoeuvre his artillery properly on this ground which will be, if not awash, then at least very saturated. Moreover, with every passing minute he will run the risk of getting his feet wet or whole batallions sinking waist-deep – through a paper ceiling as our young people would say – in the peat soil. I do not consider it unlikely that many attackers will stretch out their arms to us begging to be pulled out of the mud.'

From: W. Hoogendoorn, een woord aan neerlands volk aangaande de verdedigbaarheid van nederland, 1872

Strategically Deployed Landscape: zoning of the Waterline

Another four years passed before the Fortification Act 'to regulate and complete the defence system' entered into force. From then on, the Dutch defence system was to consist of nine defence lines, including the Defence Line of Amsterdam, which had yet to be built. The IJssel Line was terminated, and many urban defence structures were decommissioned and had to be dismantled as quickly as possible. Utrecht had already demolished its walls and gates by 1830 and transformed them into a public park. The New Dutch Waterline was designated as the Netherlands' main defence line and became the most important part of Holland's concentrated defence system around its capital, Amsterdam. The name 'Fortress Holland', conceived by Captain A.L.W. Seyffardt, a name that was supposed to radiate strength and confidence, first appeared in 1880. The Waterline had to be modernised within eight years and be resilient again. Over ten million guilders was invested between 1874 and 1885. Lieutenant-General J.H. Kromhout (1835-1897), Inspector of the Army Corps of Engineers, was given the task of restructuring and improving the way the Waterline was organised. For the first time, 'fort manoeuvres' were organised against 'an enemy from the east attacking the Netherlands with a superior force' between 1880 and 1884. The central command was based in Utrecht from 1885 onwards and the command structure was divided into groups. Utrecht grew to become a major garrison town.

The forts were no longer suitable as emplacements for artillery. To reduce the likelihood of being hit, troops and artillery would have to be dispersed throughout the line environment. However, the forts did still have a role to play as an attack-resilient infantry strong point. Since then, 'disguise', i.e. camouflage, achieved by planting vegetation, has played a part on and near the forts.

For the older forts, planting thorny shrubs and coppiced trees (picket posts) was a tried and tested method of halting an enemy's advance. In late-nineteenth-century defence structures the emphasis was on having the forts 'disappear into the surrounding countryside' by planting rows of tall trees. This 'tree camouflage' was used on a large scale around Vechten and Rijnauwen. The sharp contours of the forts were obscured with poplar and willow. Transport roads were given a character of concealment by planting shrubs in between the trees. This allowed soldiers to move around unseen. A 'General system of planting for the permanent defence structures in the New Dutch Waterline' was published in 1908 to prevent uncontrolled plant growth in fields of vision and fields of fire.

Forts disappearing off the map

In the mid-nineteenth century, printed topographical maps were published on which the forts had also been drawn in. These maps were on general sale. The military authorities subsequently concluded that they should disappear from the maps so as not to make things too easy for the enemy. The forts had indeed disappeared from later editions of the maps but could still be easily identified from the imaginary pattern of ditches that replaced them.

A 1913 military map of the Naarden and Nieuwersluis Groups shows 'clearing zones' in between the forts, where all objects obscuring the line of sight had to be cleared in times of war. This zoning arrangement, which probably dates from around 1880, is in fact an extension of the Prohibited Circles around the forts to cover the whole Waterline. In addition, the map shows a number of polder-draining mills and church towers located far out in the inundation area: 'terrain objects to be cleared using explosives', because they could be used as observation posts by the enemy. Also shown were the 'disguises', avenues of trees to camouflage the accesses near the forts.

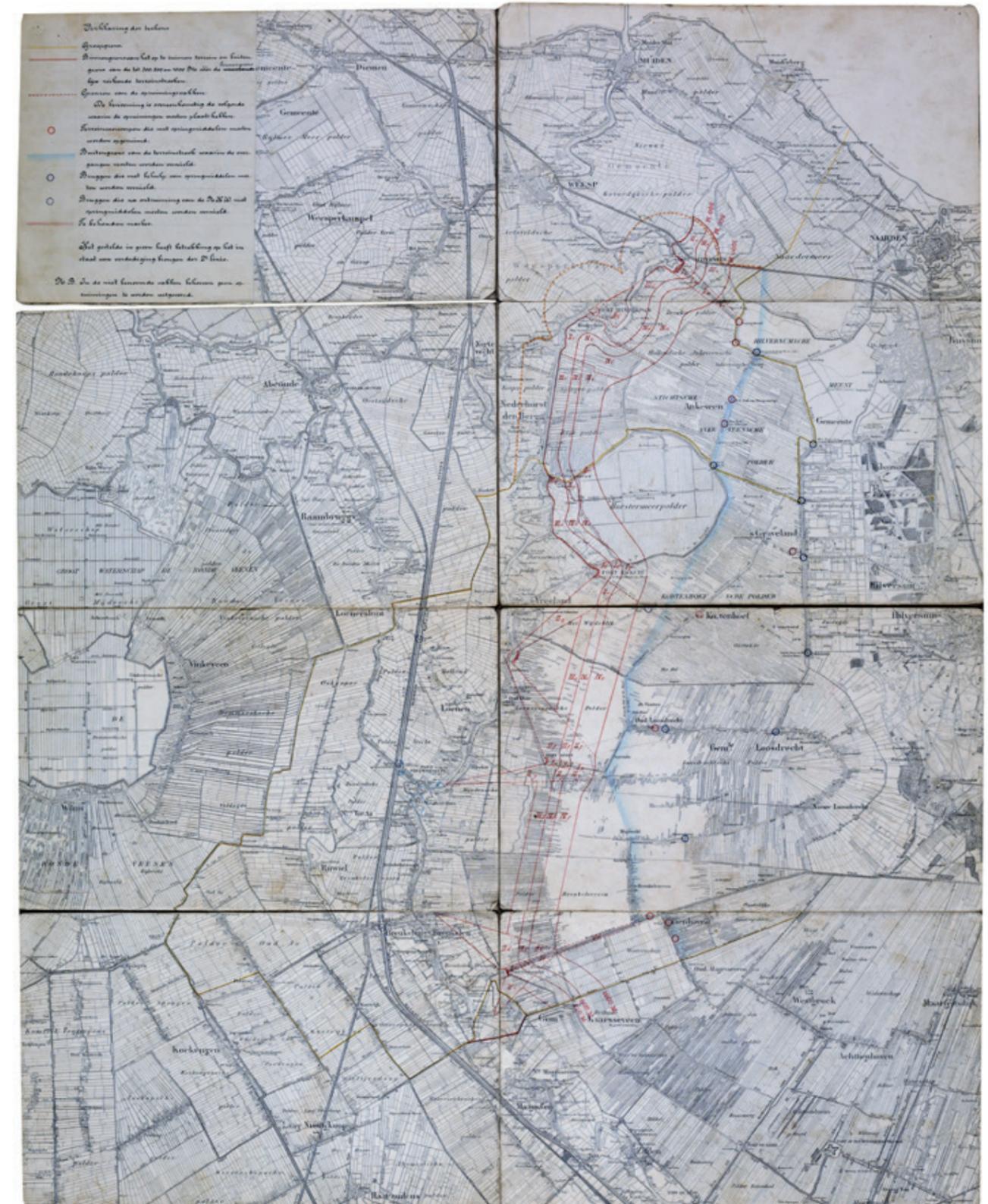
Water Management System: acceleration of the inundations

Around 1860, the New Dutch Waterline appeared to have been more or less completed. This turned out to be a miscalculation when the Franco-Prussian War broke out in 1870. It was no longer the French, but the new German Reich that would be the threat. According to a calculation from 1859, an inundation period of 26 days was acceptable against the French. However, Germany bordered on the Netherlands and could make it to the Waterline before the water itself. To counter a German attack, the inundation would have to happen much faster, i.e. in four up to a maximum of twelve days.

A second reason for taking action was the rapid development of the infrastructure as a result of emerging industrialisation and urbanisation. A network of different railways was being built at a rapid pace around Utrecht in particular. The choice of location for new railways, but also for many new waterways, was dictated by the location of the Waterline: either safely behind the main defence line or as far away from the lines of fire as possible.

Apart from countless subtle adaptations to the inundation system in the form of sluices, culverts and cut-offs and the speeding up of the water supply through the use of steam-powered pumping stations from the end of the 1870s, the main actions taken in the second half of the nineteenth century were as follows:

- In order to improve the water supply from the Vecht to the inundation fields, the Klopvaart canal was deepened in 1875, Klopdiijk raised and a special canal built just south of Fort along the Klop, with the sluice as the outlet point for the water from the Vecht.
- Following the construction of Fort on Ruigenhoeksedijk in 1870, the third inundation basin above Utrecht was split into two basins. The dividing line was Sint Anthoniedijk along the axis of the fort. The Waterline now consisted of nine basins.



Military map of Naarden and Nieuwersluis



Inundation canal Tiel, approximately 1985

- The river Kromme Rijn came on stream as an additional water supply in 1862. In that year, a new inundation sluice near Vossegat, the 'Bridge with Twelve Holes' started providing an additional water supply. The river was canalised between Wijk bij Duurstede and Odijk, with, on average, double the cross-section (the starting point was a width of eight metres at the bottom). The meander was cut off near Hardenbroek in 1866, as was the bend directly below Odijk. The Kromme Rijn was reconnected to the Nether Rhine near Wijk bij Duurstede, where an inundation sluice and seepage basin were built. A dam sluice was also built near Lunette I on the Utrecht side. Other locks and sluices were built near Cothen, Werkhoven and Beverweerd to provide the by now necessary regulation of the water level. About 350 ashlar boundary posts bearing the letter 'O' (ministerie van Oorlog [Ministry of War]) marked the boundary of government property a few metres from the river bank.
- An additional inundation canal at Houtensche Wetering-Lunettes was excavated from Houtensche Wetering northwards as far as Ravensche Wetering. Using a staggered junction, the water could be conveyed via Hoog Ravensche Wetering – part of the main defence line – to the east side of the city of Utrecht, near the Lunettes.
- Between 1874 and 1879, the essential inlet for the Lek water near Honswijk was upgraded with the over three-kilometre-long Honswijk-Schalkwijkse Wetering inundation canal as a water supply for Schalkwijkse Wetering. A covered community way alongside the canal connected Honswijk to the new Structure along Korte Uitweg. The Structure near Waalsewetering provided for the defence of the watercourse of that name as the main water supply.
- The inundation in the southern part of the Waterline was improved and regulated more accurately. After 1870, the Everdingen-Prijsseweg inundation canal was built near Fort Everdingen to ensure the rapid transport of Lek water along the Diefdijk Line.
- Water from the Lek was admitted further into the Culemborg polder with the construction of the Spoel-Rietveldseweg inundation canal between Lekdijk and Rietveldseweg near Het Spoel.
- In order to be able to supply the Linge with sufficient inundation water if the water level of the Lek was too low, a three-kilometre-long inundation canal was excavated between 1878 and 1886 from the Waal near Tiel (Ophemerstedijk) to Wadenoijen. The water could then flow down from the Linge to the basins at Culembergerwaard and Tielerwaard. This gave the Linge an more important function as a waterline valve, which allowed inundation to take place more quickly. However, the extreme eastern location of the Tiel-Wadenoijen inundation canal made it vulnerable to enemy capture.
- Following the damming of the Meuse at the end of the nineteenth century, a new access was created with the construction of the Afsluitdijk near Giessen (renamed Wilhelminasluis in 1896).
- The inundation system shifted eastwards with a focus on Bommelerwaard below Meidijk, where Nieuwendijk had to stop the inundation. New forts were built near Brakel (1884) and Poederoyen (1886) to defend the accesses of the Waal and the Meuse.

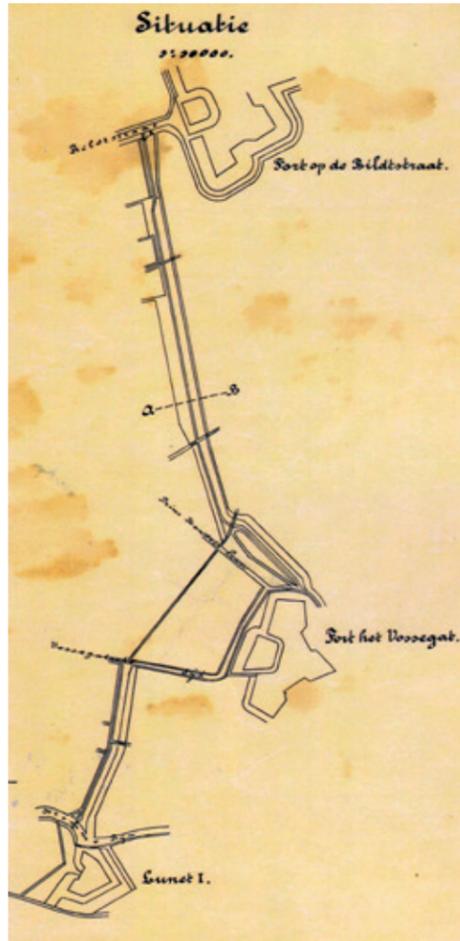
The inundation system became increasingly refined and better regulated. Military maps from around 1880-1890 clearly show two inundation levels: Provisional Level and Full Level. At Provisional Level, most major roads were still dry, allowing the field army to easily withdraw behind the Waterline. The 1896 Inundation Act had been intended to counter public opposition and provided compensation payments. These were so generous that some farmers were happy when, for example, the army carried out manoeuvres or a mobilisation. A special 'Inundation Department' was established, which was later rechristened the 'Central Inundation and Technical Bureau of the Army Corps of Engineers'. To organise the inundations, the Waterline had been divided into inundation stations, each of which was responsible for the flooding of a specific area and for a specific phase of the inundation process. They were small divisions of army engineers, assisted by the Waterstaat and Water Board personnel. Six of the nineteen inundation stations had the task of admitting water and passing it to the other stations. The structure of these six stations was based on the origin of the water: Zuiderzee, Vreeswijk, Kromme Rijn, Honswijk, Lek, Waal, and south of the Waal. Each station had its own detailed scenario ('Special Instruction') with maps for effecting and maintaining the inundations. The remaining stations' area of operation differed from basin to basin. For example, the large first basin was divided into five stations, whereas the second basin corresponded to 'Station No. 9 Maarseveen'. The Inundation Act is still in force today and was last amended in 1989 for the revision of the New Dutch Civil Code and in 1996 on account of the Act implementing the Coordination (Exceptional Emergencies) Act [Coördinatiewet Uitzonderingstoestanden].

Military Fortifications: modernisation and supplementation

Almost all existing forts were provided with bombproof barracks, storage bunkers for artillery and munitions stores with earth cover five to ten metres thick. We see this in Muiden (barracks, storage bunkers, 1879), Naarden (various buildings, 1880), Hinderdam (emplacement, 1880), Biltstraat (barracks, storage bunkers, 1875), Rijnauwen (barracks, storage bunkers, 1877), Vechten (barracks, storage bunkers, 1881), Jutphaas (storage bunkers, 1873), Vreeswijk



Muiden, barracks and storage bunkers, 1879



The first ring of forts around Utrecht

(munitions store and gun carriage shed, 1885), Loevestein (storage bunkers, 1883) and Woudrichem (gunpowder magazine, 1863) and Gorinchem (various buildings). The tower forts of Nieuwersluis (1882), Vuren (1879) and Altena (1880) underwent a far-reaching transformation and were also provided with barracks and storage bunkers. At Weesp (1876) and Asperen (1880) the moats were filled in and the actual towers banked up with earth. The Uitermeer tower was banked up in 1878 and provided with various buildings in 1885.

In 1879-1888, Honswijk underwent a far-reaching transformation with the demolition of one level of the tower, the construction of a counterscarp gallery and the erection of a gatehouse (1880), a magazine, a casemate and four storage bunkers. Everdingen was also provided with a counterscarp, a semi-circular earth structure consisting of a thick layer of clay with a brick gallery. This separate construction took the form of a wide semi-circle around the towers as additional protection on the side from which the enemy would be advancing. Many other older bombproof guardhouses were also provided with solid earth cover.

The first ring of forts at Utrecht acted as a refuge and supply line. In 1876, a continuous covered community way was built between the four Lunettes, Vossegat, De Bilt and Blauwkapel to enable troops and artillery to be transported safely without being seen.

During this period, the Ministry of War further fortified Utrecht's second ring of forts and further expanded it both northwards and southwards to include new forts. Some new defence structures were also built in the river region. The majority of these 'additional' structures were built to protect the improved inundations.

The following new forts were built in the Waterline during the fourth phase of construction:

- Structure on Hoofddijk is a small fort with barracks and three storage bunkers dating from 1879 and was designed to close off the Hoofddijk access. It was used to fill the wide gap between Forts Voordorp and Rijnauwen.
- Fort bij 't Hemeltje (1877-1881) is situated on the old Utrecht-Houten road (Houtense Pad) and defended a strip of land next to Wulvenbroeksewetering. Constructed in 1868, the Utrecht-Den Bosch railway was a major new access to be defended. The fort has regular contours and is provided with a bastion and caponier in the moat with casemates to provide cover for the moat.
- Dating from 1881, the Structure at Maarsseveen is a small battery fort which was used to protect Maarsseveen Dyke and the adjacent canal. In addition, its artillery covered the dykes for the Maarsseveen and Tienhoven polders.
- Structure along Waalse Wetering is a small, closed earthwork with bombproof buildings dating from 1878. It protected the non-inundatable strip of land of Schakwijk Wetering, which was important for the supply of inundation water to Utrecht.
- Structure along Korte Uitweg is a closed structure with barracks and storage bunker dating from 1879. It is located at the end of the covered community way along the Honswijk inundation canal and

- kept Lekdijk's inner bank, which could not be seen from Honswijk, under fire.
- Fort near Nieuwe Steeg, also known as Fort Herwijnen, is a largely bastioned fort with an exceptional U-shaped bombproof barracks dating from 1878. It lies to the east of Asperen and was used to close off the Linge, Lingedijk, and an elevate alluvial ridge.
- Dating from 1884, Battery below Brakel, south-west of the village of Brakel, closed off the Waal, the floodplains and Zuider Waaldijk. Together with Battery below Poederoijen, it covered the inundation of Bommelerwaard.
- Dating from 1886, Battery below Poederoijen is situated near Noorder Maasdijk and was used to close off the Meuse access and protect the inundation sluice in Nieuwedijk as the main inlet for Bommelerwaard.
- Built in 1881, Fort near Giessen was used to prevent a direct attack on Woudrichem and also kept southern Maasdijk under fire. The lunette-shaped structure has a bombproof barracks and storage bunkers.
- Dating from 1879, Structure along Bakkerskil is situated on Schenkeldijk south-east of Werkendam and was used to close off this dyke and protect Papsluis, a fan sluice built in 1815. The fort has a bombproof barracks that is connected to storage bunkers.
- Built in 1882, Fort near Steurgat south-west of Werkendam was used to close off the Merwede and the dyke. The simple shape contains barracks and a storage bunker with two underground gunpowder magazines connected to the barracks by means of a passageway (postern).

On completion of the second ring of forts round Utrecht, the construction of a number of additional forts and the upgrading of most existing forts, the fortification of the New Dutch Waterline had reached its apex by 1885. The advent of projectiles with a high-explosive charge (12-16 times the impact of a conventional black powder shell) rendered the thick brickwork and heavy earth cover redundant at a stroke. The construction of forts therefore ceased after 1885. Reports of parliamentary proceedings dating from 1893 described most forts as 'useless'. The strength of the New Dutch Waterline still lay in its water. A secret German study dating from 1908 speaks of it highly: 'Well prepared and organised inundations can make the Dutch fortifications almost invincible'.

Fifth construction phase: 1880-1914

When, in 1787, the Prussian armies had advanced far into Holland, Amsterdam would act as the last stronghold of the Patriots. Inundations were effected and provisional fortifications erected on the accesses. When war between France and Prussia seemed imminent in 1805, Kraijenhoff was ordered to draw up plans for a systematic defence of Amsterdam on all sides. It was not until 1809 that work started under Louis Napoleon. The new defences joined the Old Dutch Waterline near Muiden. The old batteries in the accesses were upgraded and provided with earthworks for use as gun

Strategically Deployed
Landscape: The Defence
Line of Amsterdam as a
National Redoubt

emplacements. One of the three surviving 'Kraijenhoff Posts' can be found on the river Gein, east of Abcoude.

Tensions were running high in Europe around 1870. Under pressure due to this situation, the Netherlands was obliged to undertake a far-reaching review of its national defences. This was sanctioned in the 1874 Fortification Act. As the country's main line of defence, the New Dutch Waterline was given top priority and a new defensive ring was to be built around Amsterdam as the National Redoubt: the Defence Line of Amsterdam. In the event of an enemy breakthrough, the army and the government could withdraw inside the redoubt and await assistance from a friendly power. The defenders would have to be able to hold out in the redoubt for nine months, assisted by the grazing of livestock and the cultivation of food inside the Defence Line.

The construction of the Defence Line of Amsterdam prompted the question as to which waterline should now be the Netherlands' main defence line. In its report of 1911, a committee established by the Minister of War concluded that 'its starting point should be that the New Dutch Waterline and the Defence Line of Amsterdam are of equal value.' The committee offered the following explanation: 'First of all, it is of the opinion that the provinces of Noord-Holland and Zuid-Holland are in all respects such an important part of our country that they must not be surrendered to the enemy without mounting a stubborn defence. Moreover, it feels that it is impossible to discern in peacetime which defence line will require the most powerful defence in wartime because this will depend entirely on the direction and force of the attack that has to be resisted. In the event of a landing in Noord-Holland, regarding the Defence Line of Amsterdam as the redoubt and the New Dutch Waterline as the main line of defence when no threat comes from our eastern borders, would in its opinion be just as wrong as depending on the New Dutch Waterline as the secondary line and the Defence Line of Amsterdam as the main line of defence when the threat comes solely from the east. Only the commander-in-chief will be able to discern, on the basis of time and circumstances, where the greatest emphasis must be placed.'

The committee also noted a decision taken by the Minister in 1908 that the dispute which had been conducted since 1886 about the course of the Defence Line of Amsterdam between Fort Nigtevecht and the Zuiderzee 'will not be discussed until the defensive ring has been completed.' The shortening of the Defence Line of Amsterdam by removing the Woudrichem Group was also a point of discussion.



Fort near Vijfhuizen

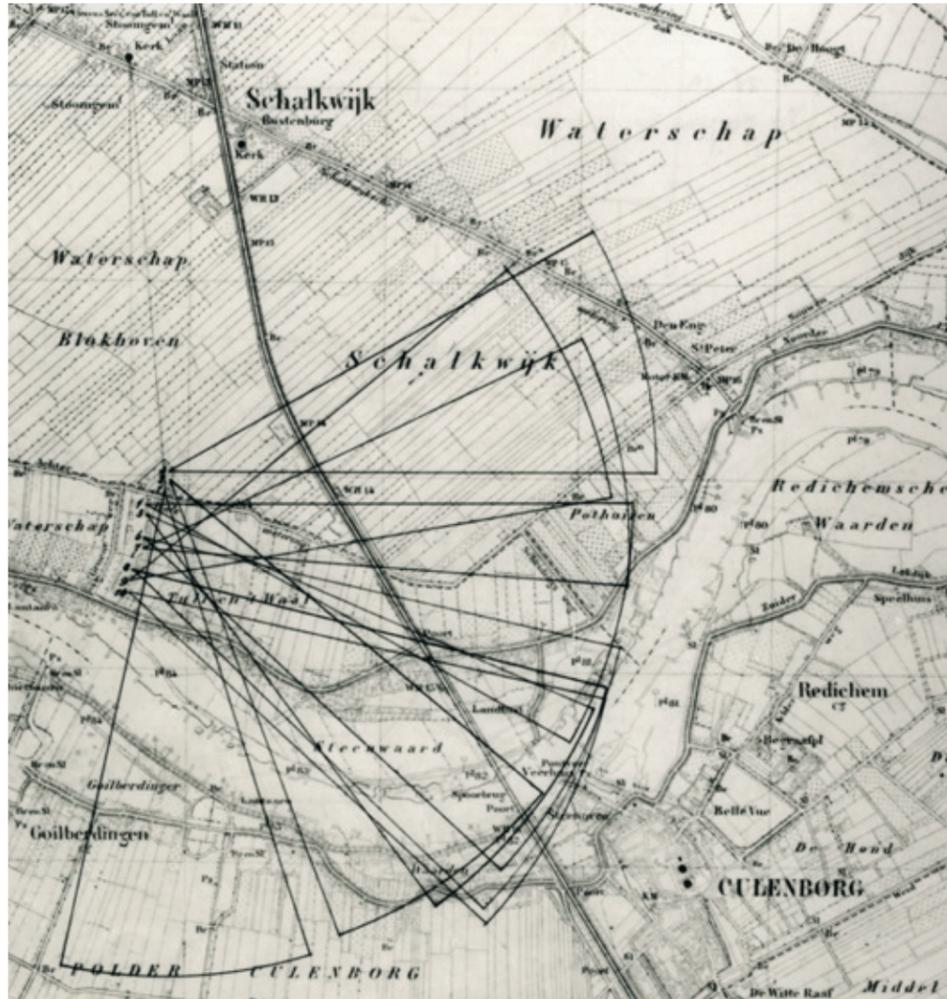
Military Fortifications:
new type of fort in
the Defence Line of
Amsterdam, batteries in
the New Dutch Waterline

The defensive ring was 135 kilometres in circumference and was situated a distance of 10-18 kilometres from Amsterdam. A total of 46 defence structures were built between 1880 and 1914. Built between 1883 and 1885, Fort Abcoude is regarded as the first fort to be constructed for the Defence Line of Amsterdam. It was still of a traditional design with a simplified bastioned floor plan, open earth batteries and brick-built bombproof buildings. However, no account had been taken of developments in military technology. The introduction of the tungsten-tipped high-explosive shell around 1885 made the brick buildings, which had been regarded as bombproof until that date, obsolete at a stroke. Originally, more forts of the same design had been scheduled, but army high command decided to pause the work and use the time to develop a new, more modern fort design.

From 1897, when the standard design for the forts had been finalised, a start was made on building concrete bombproof buildings. The Fort near Vijfhuizen was the first fort that was built according to the new standard design: a long, low fort of unreinforced concrete (a mixture of cement, sand, and brick rubble), with retractable, armoured gun turrets for rapid-fire cannons and gorge casemates at the rear to provide flanking fire. Owing to the range of this type of artillery, the forts could not be spaced more than three kilometres apart. In 1907 the standard design was upgraded with the addition of items such as additional casemates in the front wall. In 1910, all forts, secondary batteries and defence line walls of the Defence Line of Amsterdam were classified as first class. The 1853 Prohibited Circles Act also applied in this case.

The eastern front of the Defence Line was originally part of the New Dutch Waterline. From 1892, parts of this front, including the fortified towns of Muiden and Weesp, were placed under the command of the Commander of the Defence Line of Amsterdam. Fort Hinderdam and Fort Uitermeer were the last sections to come under the command of the Defence Line Commander in 1913.

All work on the construction of forts in the Defence Line was halted in 1914. The latest flat-trajectory artillery could easily fire across the fifteen-kilometre zone between the ring and the city. The forts at Kwadijk, Botshol, Winkel and Coehoorn would never be completed. However, vulnerable points in the Defence Line were reinforced



Field of fire Schalkwijk
1937

with concrete shelters and casemates, including at Spaarndam and Vijfhuizen.

During the period, a start was also made on modernising armaments according to the latest strategic developments. This was particularly true of the Waterline with its 'large, old-fashioned, usually bastioned forts'. A map, included as an appendix to the above-mentioned report by the 1911 committee, shows the boundaries and the main defence line of the Waterline and provides a complete overview of the fields of fire of the long-range artillery with a range of between 6.2 and 8.5 kilometres. What is noticeable is the concentration of guns near Naarden and Utrecht, the most vulnerable places in the Waterline. This is in contrast with a single firing field from the Vecht, which meant that effective protection was provided by the large inundation fields. Yet another aspect is worthy of note: the cannons were not only placed in the forts but between them, on various dykes (Lekdijk and Diefdijk) or just behind the main defence line, e.g. behind Utrecht's second ring of forts. A number of batteries were built there after 1900 as additional defence structures. The committee believed that a set of permanent batteries were needed in the Waterline based on the expectation that the Waterline 'may experience an attack very quickly if the enemy marched across our

eastern border'. Not springing into action until mobilisation might apply to the Defence Line, but definitely not to the Waterline: 'Do not flatter yourself that time will work in your favour', the committee warned. The batteries, of which there are only a few still in existence, were meant for long-range ballistics. The time was not yet ripe for modern concrete structures: 'By their nature, armour-plating and concrete casemates are excluded for this waterline, as long as a costly modernisation is not undertaken'.

Under the term 'security armament' [veiligheidsbewapening], artillery for two additional types of targets required modernisation: for flanking fire between the forts with light artillery, and for close-range defence of the canals and accesses, mainly with machine guns. Extra arms and munitions, known as 'supplementary armaments' were stored in three arms dumps behind the Waterline, a day's march apart. This system of supply logistics would be further extended in the run-up to the First World War to include a system of 'backward connections' such as narrow-gauge track and strong points.

In 1911, there was still little fear of enemy 'flying machines' with their flimsy construction which could easily be shot out of the sky with small arms. People were more afraid of 'airships', as they could 'carry explosives, which, by moving over the target, and then dropping them, they could directly cause the destruction of such a target.'

Sixth construction phase: 1914-1940

Fort-building came to a standstill at the end of the nineteenth century. The usefulness and strength of the costly and rapidly ageing forts of the New Dutch Waterline was questioned. The focus was shifted from so-called 'dead defensive facilities' to living armed forces. A mobile field army was to operate across field fortifications in order to withstand an assault with the latest weapons. Mobilisation was announced just before the outbreak of the First World War. The Netherlands remained neutral. Were the Germans afraid of Holland's strong waterlines? The idea that the Netherlands would be of greater benefit to Germany as a neutral country than as one more enemy was also floated. The port of Rotterdam maintained an important role throughout the war in supplying products to Germany.

The New Dutch Waterline was brought to a state of defensive readiness and inundations were effected to Preparation Level. Unlike the inadequate mobilisation of 1870, everything went well this time. The forts along the Waterline were fully manned and the field troops were stationed in infantry positions in trenches between the forts and in front of the inundations.

An alert sentry at fort de klopp

'Fort de Klop is concealed behind a couple of small houses, but the presence of a sentry highlights their dangerous proximity. It also overlooks klopdijk and the kloppvaart, which lead into the peat and i could not resist drawing in this view: a few high oak trees in the foreground to the left, to the right tall poplars, in the distance a row of alders, the road, and the canal tranquilly in between. The sentry came to see what was going on and said that it was strictly prohibited to make drawings of fortifications. We'll think about it.'

From: Jac. P. Thijsse, de vecht, 1915

Strategically Deployed Landscape: deepening of the defence

It was in the wide accesses south of Naarden, east of Utrecht and in the southern part of the Waterline that the Army Corps of Engineers dug kilometres of trenches. An extensive exercise area was created for all kinds of trenches and sconces on Leusderhei heathland near Soesterberg. The main defence line, which contained the forts, trenches, and barricades, was now made deeper with a Second Defence Line [Voortgezette Verdedigingsstelling] behind it, where artillery was to seal off any breakthrough.

After the First World War, this system of defence in depth was further developed with a Main Line of Resistance [Hoofdweerstandstrook] of a few kilometres wide with a line of outposts in front of it. The Main Line of Resistance itself consisted of a front line, a stop line, and a ridge line. This system was used for the Grebbe Line in 1939-1940 but was only practicable for the New Dutch Waterline on the Houten Plain and near Fort Uitermeer. Apart from the trenches, a whole series of machine-gun nests with different casemates and group shelters were located in the front line. The machine-guns in the casemates had been set up so that they were defending a specific target with their field of fire (sector of fire) and combined to form a continuous firing front.

Water Management System: final adaptations through new infrastructure

A few changes were made to the inundation system during the 1914-1918 mobilisation. For example, the inundation field near the Giessen-Almkerk-Steurgat trench line in the Land of Altena was adapted in connection with the addition of the station at Woudrichem. The construction of the Amsterdam-Rhine Canal and, branching off it, the Lek Canal (1934-1952) to Vreeswijk also had four consequences for the Waterline.

First, a radical change was made to the inundation of the area north of the Lek, where the opportunities for inundation were improved by making adjustments. These included, among other things, making the western canal dyke higher (0.4 m) than the eastern dyke. Widening operations were also carried out so that artillery batteries could be placed there in time of war.

Second, the likelihood of flooding, especially controlled flooding by the enemy, became substantially greater due to the possible destruction of the Prinses Irene sluice near Wijk bij Duurstede. However, the Directorate General for Public Works and Water Management rejected the four to six casemates planned for the sluice. But, according to C.W. van Dooder, head of the Central Inundation Bureau, 'Every effort must therefore be made to retain control of



Plofsluis, an explosion sluice near Nieuwegein

the sluice near Wijk bij Duurstede until the inundation has been effected and the sluice rendered as unserviceable as possible as an inlet.' Uncontrolled inundation would also make column roads impassable for any retreating field army. One option for draining away the water in the event of flooding was to discharge it into the North Sea via the North Sea Canal. A bombproof sluice was built at IJmuiden for this purpose. An admittedly very drastic measure, the most striking structure in the New Dutch Waterline was built in 1938: the Plofsluis (explosion sluice). This floodgate consisted of five concrete silos, 60 metres long and 10 metres high, filled with sand and rubble. Blowing up the floor of these silos would result in the rubble falling down and blocking the canal at a stroke. The Plofsluis had pumping stations on either side of the sluice to control the water level in the closed-off reaches of the canal. The Plofsluis had not yet been completed in 1940. Because of the high cost of demolition, the extension of the Amsterdam-Rhine Canal was diverted round the Plofsluis in 1981, but at the expense of the southern battery along Overeindse Weg.

Third, the elevated approach roads to the level crossing on the Utrecht-Culemborg railway line were detrimental to the defences near Honswijk. Apart from the proposed construction of two casemates on the Waalse Wetering-Honswijk section of the line, the improvement of the inundation was also regarded as compensation.

And, fourth, the existing main defence line along the Vaartsche Rijn had to be moved one kilometre to the east owing to the construction of the Lek Canal, which made the forts at Vreeswijk and Jutphaas redundant. This would also improve the inundation of the area in this case. A new defensive quay with a few casemates was erected on the east bank of the Lek Canal. During the recent widening of the Lek Canal, the casemates were moved in connection with the potential nomination for inclusion on the World Heritage List.

Another exceptional structure from this period was the sliding gate system in Diefdijk above Motorway 26 (now the A2). Built in 1935, this motorway resulted in an intersection in Diefdijk near Zijderveld. To ensure that, when an inundation was effected, the water would not run off through the cut-off for the motorway, a slide gate was placed in the dyke section that could close the road completely. A culvert underneath the motorway was intended to drain off the water to the south side of the dyke. The new access was defended with two V.I.S. casemates in Diefdijk. The slide gates were removed when the A2 was widened. The casemates at this location were restored and made accessible, and an inundation field was set up for water storage.

The New Dutch Waterline was inundated for the last time shortly before the liberation in 1945, this time by the German armed forces. It was not the east side, but the polder land west of the Vecht that had to act as *Hintere Wasserstellung* [rear water defence line]. A 75-kilometre inundation quay had to be built in haste in April 1944. The New Dutch Waterline was then reversed, as it were, as a rear defence for the Atlantic Wall and the *Vordere Wasserstellung* [forward water defence line] just behind the coast. During the war years, Utrecht was the headquarters of the Wehrmacht and Kriegsmarine (German army and navy) and sixty casemates and a few large command bunkers were built there, eight of which survive today. The main reason that the Allies initially bypassed Holland and Utrecht was the power of the inundations of Fortress Holland.

**Military Fortifications:
scattered concrete
structures**

To provide infantry in the trenches with better protection against artillery bombardment, hundreds of concrete group shelters were built along the entire length of the Waterline. The concrete type-1916 shelters, vulnerable to direct hits, were meant as accommodation for four to eight men in a none-too-comfortable squatting position. A total of 225 type-1918 concrete shelters were built in two variations with heavier concrete reinforcement. These shelters provided space for eight or sixteen men. 165 of these have survived.

Concrete shelters were concentrated as described below:

- An infantry position was built to provide additional protection for the Naarden Offensive, near De Fransche Kamp to the south of Bussum. It consisted of two rows of type 1918 shelters, of which about 60 survive.
- An almost continuous system of trenches was created between Fort on Biltstraat and Fort near 't Hemeltje east of Utrecht. The largest concentration of concrete shelters is situated between Fort Rijnauwen and Fort Vechten.
- In addition, two forward infantry positions have been constructed with concrete shelters, casemates, and observation posts: a number of trench systems at Griftenstein on either side of Utrechtseweg and double trench systems on either side of the Lek in front of the Fort Honswijk and Fort Everdingen.
- A line of trenches was dug in the most southerly part of the Waterline between 1914 and 1917 across the Land of Heusden and Altena and the Biesbosch estuary. In 1916 a large number of group shelters was built on this line which ran between Fort Vuren via

Brakel, Poederoijen and Giessen, many of them also along the Alm to Altena and Bakkerskil as far as Fort Steurgat.

- Two types of shelters were placed between Fort Giessen and Fort Steurgat: segmented shelters consisting of prefab concrete segments and the well-known type-1916 I and II shelters. Unlike the prefabricated segmented shelters, type 1916 shelters were poured on site into wooden moulds to produce one-piece reinforced concrete shelters in the shape of a hexagonal shaft. All of these shelters were covered in earth to a thickness of one or two metres.

**Modernisation during
mobilisation**

In 1915 an officer at fort Honswijk mused as follows: *'The war teaches so many new things from which advantage can be taken, that everything in our waterline that is ineffective for an ultra-modern war will disappear and be replaced by something effective. Our own dear fort has also had a lot of experience in this regard. There is always much work to do. We work, we work, and we keep on working. In this respect we are also, as it were, in constant competition with the roar of the cannon on the western front. It does not stop. We do not stop. It just continues. We also just continue. Sometimes, however, the roaring can be so utterly abominable that we mount the observation posts to see whether something may already be happening on the other side of the lek!'*

From: fort Honswijk, staat van oorlog 1914-1915, deel ii

Following the disastrous destruction of a number of forts in the defensive ring around Antwerp in 1914, the Dutch lost all confidence in the as yet unfinished Defence Line of Amsterdam as the National Redoubt. The autonomous status of the Defence Line was removed in 1922 and it became the Northern Front of Fortress Holland. The New Dutch Waterline was known as the Eastern Front from then on. The Southern Front followed the Biesbosch-Hellevoetsluis line (formerly the Defence Line of the Meuse and Haringvliet Estuaries and the Defence Line of the Hollandsch Diep and Volkerak) and the Western Front lay along the North Sea coast.

In February 1935, the Chief of the General Staff reported to the Minister that the threat of war from Germany should be taken very seriously and that, unlike in 1914, the Netherlands could be occupied. Additional millions were set aside for national defence. That was certainly needed after years of cuts and the creation of new accesses as a result of the initial construction of a new motorway network (National Road Plan of 1927). The new accesses built or upgraded between 1930 and 1936 were all compensated by the construction of heavy V.I.S. machine-gun and/or concrete casemates, at the expense of the interested parties or the party responsible for the access.

By the end of 1936 work had begun on the reinforcement of the New Dutch Waterline with a large number of casemates and other structures:

- Two heavy V.I.S. casemates were built at the mouth of the new Lek Canal and river casemates were incorporated into the pillars of the road bridge over the Lek near Vianen. In the Utrecht Group alone, 13 V.I.S. casemates were provided, including those at Fort on Biltstraat, Vossegat and the Lunettes.
- Eighty (of 100 planned) heavy casemates with cast-steel machine-gun turrets (type G) were built on and between the forts in the Waterline between 1936 and 1940. Eventually, 25 of the 34 planned turrets were built in the Utrecht Group. Most of the turrets were removed by the Germans in 1941 and melted down for their war industry.
- The Dutch army mobilised in late August 1939. Trench systems, barbed-wire entanglements, military vehicle barriers in the form of upward-pointing steel I-beams in the road (asparagus), and zig-zagging anti tank ditches dominated the view of the military landscape.
- Between November 1939 and May 1940, 570 (of 900 planned) concrete type P group shelters – each housing twelve men – were built, dispersed along the Waterline. The Utrecht Intermediate Position would be provided with 300 of them. These shelters were designed to protect the crews of nearby machine-gun nests against attacks from the air. With this in mind, these shelters were given a roof of reinforced concrete as much as two metres thick. To deflect shells and bombs, the shelters were sloping on three sides, a shape that quickly earned them the nickname of ‘pyramids’. The rows of hooks on the sloping surfaces were used for attaching camouflage nets or securing earth cover. The shelters had been equipped with ventilation, telephone line and periscope facility. In the course of 1940, the earth embankments of the machine-gun nests were equalised, so that only these type Ps are left as reminders of the previous period of construction in the Waterline. Concentrations of type P group shelters can be found not only around Utrecht, but also in the south, along the line between Woudrichem and Werkendam. This line was much further north than the trench line from the First World War due to the sifting of the inundation basin.
- Between September 1939 and April 1940, about 1,000 machine-gun nests were built on the Eastern Front of Fortress Holland. The machine-gun nest is a gun emplacement for eleven men and consists of a trench about 12 metres long split into sections.
- A nine-kilometre-long anti tank ditch in a zigzag shape was dug between the Structures near Griffenstein and Fort near ‘t Hemeltje in 1940.
- The seven hundred-metre-wide Lek access along the dyke was fortified with casemates in the Structure along Groeneweg, which also had an eight-metre-wide anti tank ditch dug in front of it.
- A double trench with seventeen type P shelters was dug immediately to the east of Fort Everdingen, in addition to the seventeen outdated type 1918s.

On page 21, General Reynders says: ‘In Fortress Holland, the construction of terrain fortifications was also undertaken with vigour’. In contrast, I would note that during a visit on 3 October 1939 (i.e. approximately five weeks after the announcement of mobilisation) I found that not a single sod had yet been turned at Fort Muiderberg or Fort Blauwkapel. At the latter fort, the trenches and shelters dating from the previous world war had completely collapsed. On enquiry, I was told that the arrival of civilian contractors was awaited. The answer to my question to the commander in charge, concerning where the troops were to take up position if war were to break out tomorrow, was: ‘at ground level; I have strict orders that digging is not permitted here’.

From: Response by former Minister A.Q.H. Dijkhoorn to ‘De wisseling in het Opperbevel van Land- en Zeemacht in Februari 1940’ by general bd I.H. Reynders, 1946. p.30

In February 1940, General H. Winkelman (1876-1952) assumed command from General I.H. Reynders, who had by then been dismissed, having come into conflict with Minister A.Q.H Dijkhoorn, as regards the waterline to be used as the main defence line. Reynders considered ‘a decisive occupation of the Grebbe front necessary (...) to gain time for the evacuation of the civilian population and livestock from the forward area of the Eastern Front of Fortress Holland and to effect the inundations before this front...’, but stated that the ‘final fierce resistance’ on the Eastern Front, the New Dutch Waterline, should take place by means of a withdrawal of troops. However, the government’s fear was that retreating army corps would not be capable of any form of defence ‘being at the mercy of the German Air Force in the open polder landscape’. In March 1940, less than two months before the German invasion on 10 May, the decision was taken to use the Grebbe Line as the main defence line. Building work on the fortifications in the New Dutch Waterline was halted. By 13 May, a breakthrough could no longer be avoided and part of the army withdrew to the New Dutch Waterline, but no confrontation took place there. As late as 12 May 1940, the order was given to inundate the New Dutch Waterline. The Provisional Level was reached on schedule on 14 May, sufficient to allow the retreating troops to pass through the inundations. After the German breakthrough near Grebbeberg and the bombing of Rotterdam in support of the breakthrough to the centre of government in The Hague, followed by a threat to bomb Utrecht as well, the Netherlands capitulated on 14 May 1940. The inundations were terminated immediately.

Inundation near fort Altena

On Saturday 11 May 1940, one day after the outbreak of war, fourteen families living near Uppesdijk received a devastating message. Their homes were inside the first circle around the fort. According to the 1853 prohibited circles act, however, there had to be a clear field of fire. The fourteen houses would have to disappear so as not to obstruct the clear field of fire. On Sunday morning, 12 May, the soldiers came to carry out their orders. The fourteen houses were sprinkled with petrol and set alight. A few days later, the Netherlands capitulated and German soldiers marched into the area. By then, all the Dutch soldiers had left. Ultimately, despite all the preparations, the role of the forts on the battlefield was minimal.

From: Job Koekkoek, gaandeweg Almkerk (Waardhuizen & Uitwijk, 2004), p. 102

Seventh construction phase: 1940-1963

After the Second World War, the New Dutch Waterline and the Defence Line of Amsterdam no longer had a role as defence lines. After 1949, national defence became part of a wider NATO strategy. As part of this strategy, it was decided that the defence would be positioned as far east as possible. Initially, Western Europe's main international defence line ran along the Rhine in Switzerland to Lobith in the Netherlands. Because this left the west of the Netherlands unprotected, it was decided to extend the Rhine Line to include the old IJssel Line. This was followed, between 1951 and 1954, with the modernisation of this waterline, 3-15 kilometres wide, between Ooijpolder east of Nijmegen and IJsselmuiden north of Zwolle. It was the last Dutch waterline, which existed briefly until the repeal of the relevant law in 1964. Once West Germany joined NATO in 1955, the defence line was moved further east, to the Elbe. This defence doctrine was also abandoned after the fall of the Berlin Wall.

The Defence Line of Amsterdam and the New Dutch Waterline were never really able to prove their worth as operational defence lines. The Defence Line was only partially inundated once, in May of 1940. Part of the New Dutch Waterline was brought to a state of defensive readiness three times. The first time was in 1870 when the Franco-Prussian War threatened to escalate into a European war. The second time was during the First World War and the last time in 1939 on the outbreak of the Second World War. It was the German armed forces that flooded the Waterline on a large scale against the advancing Allied armies in 1944-1945 and therefore recognised the value of water as a means of defence in the form of a delaying tactic. The Prohibited Circles Act was suspended in 1951. Until that time, this law had prevented the expansion of towns and villages in the Waterline. The growth of the city of Utrecht towards the east, for example, was restricted for a long time. During this phase of construction, many forts were downgraded from 'first-class defence structure' to second or third class, followed in the years 1950-1953 by a further downgrade to 'unclassified defence structure'. It would only be a matter of time until the law was formally repealed by Royal Decree. The curtain officially fell on the forts in the Utrecht area in 1958 and 1959. On 28 November 1963, the Prohibited Circles Act was finally repealed.

Dead defence line *'I could not even take my grandson's hand and shown him the structure; he would ask what it was for and i would have to say: nothing. It had become a 'dead defence line'. It had quickly become neglected. The grass on my redoubt looked like hay; the moats had silted up to become reed beds. The batardeau had sunk into the clay. Profiles were hard to discern, they were so overgrown. Hundreds of men had worked there for sixty years.'*

From: F.B. Hotz, dood weermiddel en andere verhalen, 1976

Initially, most of the forts on the New Dutch Waterline were designated a different military use after the Second World War, usually as stores for equipment and munitions or as training areas. In the 1960s, some forts were adapted as mobilisation complexes, such as the forts at Nieuwersluis, Altena and Bakkerskil. Gradually, various non-functioning fort complexes with relatively high operating costs were disposed of by the Ministry of Defence in the 1960s, in part because preservation of cultural heritage is not with the responsibilities of the Ministry of Defence. More forts followed after the end of the Cold War. At first, many forts led a dreary existence under the Domain Directorate (Ministry of Finance). For years there was hardly any interest in the forts, which meant that some, including Voordorp and Steurgat, could be sold to private property developers for little money. A number of forts were disposed of to the State Forest Service [Staatsbosbeheer] out of necessity and the municipalities of Weesp and Utrecht also acquired structures from the former Waterline.

At the same time, the realisation was dawning that, because of their isolated and very tranquil locations, they had also acquired special natural values. This was followed by a call for active preservation on the basis of the primary goal of nature preservation and development. The State Forest Service, in particular, has distinguished itself in this area. Gradually, various private initiatives were launched to utilise the extraordinary structures and their surroundings. For almost forty years, little attention has been paid to the Waterline, partly as a result of ignorance and indifference. Since the Ministry of Defence ceased to be the central manager, the overall structure has deteriorated badly and individual parts have been neglected. Sections have also disappeared due to the abrupt cessation of maintenance work, vandalism, large- and small-scale building projects, road construction, compulsory purchase and dyke reinforcement. Although some of the forts have been preserved, they have become 'alien' in a changed environment.

At a time when many historical landscapes are gradually disappearing in the Netherlands, interest in the cultural and historical values of the landscape and its conservation is growing apace. Over the past few decades, the human-made landscape of the Netherlands has increasingly been under the spotlight. The Defence Line of Amsterdam's World Heritage status is a good example of this. Moreover, the value of the historical infrastructure and cultural heritage (of the landscape in particular) has in recent years been added to the agenda of many, especially those in the world of politics.

Phase 0 prior to 1815	First construction phase 1815 - 1826	Second construction phase 1841 - 1864	Third construction phase 1867 - 1870	Fourth construction phase 1871 - 1886	Fifth construction phase 1880 - 1914	Sixth construction phase 1914 - 1940	Seventh construction phase 1940 - 1963
Strategically Deployed Landscape							
	Prohibited Circles Act 1814	Prohibited Circles Act 1853	Prohibited Circles Act 1853	Zoning of the New Dutch Waterline	Inundation Act 1896	Enhancement of the defence system	Suspension of Prohibited Circles Act
Water Management System							
	Construction of inundation system	Construction of inundation system		Speeding up of the inundations		Last adaptations through new infrastructure	
Military Fortifications							
Fortified towns	First ring of forts round Utrecht	First ring of forts round Utrecht	Tower forts, guardhouses and redoubts	Modernisation and addition of barracks and sheds	Construction of concrete forts in Defence Line of Amsterdam	Dispersed concrete structures between and in front of forts	New (mainly military) use of forts
1 Fort near Edam 2 Fort near Kwadijk 3 Fort north of Purmerend 4 Fort along Nekkerweg 5 Fort along Middenweg 6 Fort along Jisperweg 7 Fort near Spijkerboor 8 Fort Marken Binnen 9 Fort near Krommeniedijk 10 Fort along Den Ham 11 Fort near Veldhuis 12 Fort along St. Aagtendijk 13 Fort Zuidwijkermeer 14 Fort near Velsen 15 Fort near IJmuiden 16 Fort north of Spaarndam	17 Fort south of Spaarndam 18 Fort near Penningsveer 19 Fort near the Liebrug 20 Fort along the Liede 21 Fort near Heemstede 22 Advanced fort near Vijfhuizen 23 Fort near Vijfhuizen 24 Battery on the IJweg 25 Fort near Hoofddorp 26 Battery on the Sloterweg 27 Fort near Aalsmeer 28 Fort near Kudelstaart 29 Fort near De Kwakel 30 Fort along the Drecht 31 Fort near Uithoorn	32 Fort Waver-Amstel 33 Fort in the Waver 34 Fort along the Winkel 35 Fort Abcoude 35A Battery along the river Gein 36 Fort near Nigtevecht 37 Fort near Hinderdam 38 Fort Uitermeer 39 Fortified town of Weesp including Fort Ossenmarkt 40 Fortified town of Muiden (including Muiderslot Castle & Muizenfort) 41 West Battery	42 Fort Kijkuit 43 Coastal battery near Diemerdam 44 Fort along the Pampus 45 Coastal battery near Durgerdam 46 Fort Ronduit 47 Fortified town of Naarden 48 Werk IV 49 Batteries along Karnemelksloot 50 Fransche Kamp 51 Fort Spion 52 Fortified town of Nieuwersluis	53 Fort Nieuwersluis 54 Fort Tienhoven 55 Structure near Maarsseveen / C-Fordt 56 Fort along the Klop 57 Fort De Gagel 58 Fort Ruigenhoek 59 Fort Blauwkapel 60 Fort Voordorp 61 Fort near De Bilt 62 Structures near Griftestein 63 Fort on the Hoofddijk 64-65-66-67 Lunettes (1, 2, 3, 4) 68 Fort near Rijnauwen	69 Fort near Vechten / Waterline Museum 70 Fort 't Hemeltje 71 Battery along Overeindseweg 72 Fort near Jutphaas / Wijnfort Jutphaas 73 Fort Vreeswijk 74 Structure along Waalse Wetering 75 Structure along Korte Uitweg / WKU 76 Lunette along 't Snel 77 Fort bij Honswijk 78 Structure along Groeneweg	79 Structure along the Spoel 80 Fort Everdingen 81 Work on the railway at the Diefdijk 82 Fort near Asperen 83 The weapon site at Asperen 84 Fort near Nieuwe Steeg / GeoFort 85 Fort Vuren 86 Fortified town of Gorinchem 87 Brakel Battery 88 Poederoijen Battery 89 Fort Giessen	90 Loevestein Fortress and Castle 91 Fortified town of Woudrichem 92 Fort Altena 93 Fort Bakkerskil 94 Fort Steurgat 95 Fort Pannerden

2.b.4 Renewed zeal for the New Dutch Waterline

National New Dutch Waterline Project

Since the New Dutch Waterline was designated a National Project in 1999, structural attention has been given to preservation, and the focus is on making the Waterline recognisable and giving it amenity value. In recent years – thanks to the efforts of many – a major investment has been made in the New Dutch Waterline as a cultural and historical heritage asset of international stature. The following table gives an overview of the most important milestones since the launch of the New Dutch Waterline National Project.

The *Belvédère Memorandum*, the 1995 policy document in which the New Dutch Waterline was designated a National Project, added a new dimension to the future plans for the New Dutch Waterline. The increasing urbanisation of the Netherlands gave rise to concerns about the reduction of the diversity and quality of rural areas. In order to calm these concerns, this Memorandum attached great significance to the relevance of cultural heritage in relation to spatial planning. The main task of the *Belvedere Memorandum* was to strike a reasonable balance between dilemmas such as economic capacity on the one hand and preserving the quality of our living environment on the other.

A new motto, ‘conservation through development’, was put into practice with the *Belvedere Memorandum*, which means that, in order to maintain cultural heritage and at the same time allow spatial planning to satisfy the economic requirements of today’s society, three principles must be followed when developing the landscape. First, the maintenance of the existing characteristic, heritage and historic structures. Second, the same development principles must be continued and, finally, it is essential to build on the historical processes. Cultural history as a source of inspiration for further development.

A project on this scale is unique in the Netherlands, and in order to ensure that collaboration runs smoothly and cultural unity of the areas is preserved, the Waterline was designated one of the ten Major Projects in the third *Designing the Netherlands Architecture Policy Document*. The Waterline was also included in the Fifth National Memorandum on Spatial Planning in that year. To manage the implementation of the project, the social and administrative trajectory of the Waterline was drawn up in the Panorama Krayenhoff Line Perspective in 2004. This contains a widely-supported vision for the New Dutch Waterline, which will form the basis of the protection and development of the area. The watchword of the Belvedere Memorandum ‘conservation through development’ is clearly reflected in this policy vision. The idea is that the New Dutch Waterline can only be brought back to life with the help of new functions in the old structures. Although the defence line is no longer of military significance, the New Dutch Waterline can still be of particular significance in today’s society. In order to bring this about, three spatial regimes have been selected, the main defence line as the backbone, with ‘open fields’ in the inundation fields to the east, in contrast to ‘densification fields’ to the west. The entire

area of the New Dutch Waterline was divided into seven sub-areas for the organisation of the development challenge, with an independent spatial quality advisory team for recommendations relating to the quality of the project proposals within the coherence of the Waterline.

Panorama Krayenhoff

In 2003, forty years after its military use had formally ended, the government accepted a new perspective on the future of the New Dutch Waterline. The National Project produced a planning document that is the foundation of the current conservation and development strategy; ‘Panorama Krayenhoff’. This document was produced by a broad cooperation and was ratified in 2004 by the New Dutch Waterline’s steering committee at that time, consisting of government and provincial authorities.

The conservation and development concept of Panorama Krayenhoff was derived directly from the original military concept. Its core is the clearly distinguishable main defence line: the border of the defended area and the inundation fields, along which most of the forts and fortifications are situated. One of the means to increase the recognisability of this line in the landscape, is the contrast between the use of the land on either side. Inundation areas should be kept open according to Panorama Krayenhoff, so it can be imagined that these areas would be flooded. For the defended areas, the proposed landscape strategy is aimed at increasing the density, aided by buildings and vegetation. Forts and fortifications, according to this document, should be monuments and/or protected town or cityscapes.

An investment agenda was part of the Panorama Krayenhoff. This did not solely consist of the task of restoration and landscape renovation, it was also clear that the conservation of the typical waterline structure (a continuous main defence line with open inundation areas to one side and fortifications at the accesses) would only be successful if a strong contemporary use is connected to it.

The vision document therefore connected to actual current spatial needs. Next to the historically prevalent agricultural function, possibilities of water management, nature development and recreational functions were examined. There were suggestions to build dispersedly in several areas in the defended area. For the forts, there was a division into four main functions: nature, recreation, museum or (in a single case) dwelling.

To organise this development task, the area was divided into seven parts. Regional authorities directed the developments per area. An independent Spatial Quality Advisory Team advised as to the consistency and quality of the project proposals. A total of about 200 million Euros was invested in the New Dutch Waterline. The conservation and development agendas are still organised regionally and the overall Spatial Quality Advisory Team for the defence line is still active.

In 2005, the Waterline was designated a National Landscape. The Dutch Water Defence Line Committee concluded an administrative agreement, which documented the agreements made and how they were to be carried out. In order to realise the ambitions concerning implementation, concrete plans were required consisting of implementation-oriented projects with due regard for the time, financing, and instruments required. Drawn up in 2006, the implementation programme ‘*One Line, together making good progress*’ [Eén Linie, samen sterk in uitvoering], provided a more detailed specification of the implementation ambitions. Examples include the restoration,

maintenance and repurposing of forts, as well as the addition of recreational and information facilities.

In 2008, the *Pact of Rijnauwen* was set up to accelerate the implementation of the projects and create the required conditions, drawing on the 2006 implementation programme. It is an agreement between the national government and the five provinces involved concerning the specific projects to be implemented, the corresponding financing, and the organisation of said financing. The Pact of Rijnauwen expired in 2011, which prompted the development of the '*Line in Operation*' [Linie in Bedrijf] implementation programme, drawn up in 2012.

In 2009, the national government started the process of designating the New Dutch Waterline as a national monument. This process has now been completed. The result is the legal protection the New Dutch Waterline enjoys with national monument status. By consulting the public Register of Heritage Assets, everyone can check which parts of the New Dutch Waterline have been designated national monument. This concerns so many parts that in policy documents and the media, the New Dutch Waterline is referred to as the 'largest national monument of the Netherlands'.

Pact of Altena In 2014, the national government transferred ultimate responsibility for the New Dutch Waterline National Project to the four provinces of Noord-Holland, Utrecht, Gelderland, and Noord-Brabant. These provinces, working together in the Dutch Water Defence Line Committee, then set out the ambition with which they meet their responsibility in the New Dutch Waterline Administrative Agreement 2014-2020, known as the 'Pact of Altena'. In the new period from 2014 to 2020, the emphasis is on using the New Dutch Waterline for new functions and submitting the nomination for inclusion in the World Heritage List.

As a result of the enormous efforts made during previous periods, the New Dutch Waterline has more public value and its quality, accessibility, and recognisability have increased. Much has been fixed up, but work is not yet complete. A gradual changeover is taking place to sustainable management, public use, and guarantees for the future. This is an approach that must be monitored, and action must be taken if necessary. The World Heritage status will help protect the existing site and invest in the future. Specific attention is given to keeping the New Dutch Waterline recognisable and giving it amenity value.

This phase of sustainable management and public use means that various previously discussed policy visions have been implemented. The vision in the Belvédère Memorandum, 'conservation through development', is still key to the project, even today. This is apparent from today's public use, which manifests itself, for example, in different repurposing projects and restorations and contributes, to a major extent, to tourism, recreation facilities, heritage elements and experience of nature. The new functions within society arouse greater interest from the market, making sustainable manage-

ment possible. Supervision is important in this regard, because the authenticity and integrity of the New Dutch Waterline as cultural heritage must not be adversely affected by this new function within society.

Statement of support The New Dutch Waterline covers a large area, where a multitude of stakeholders and other parties are involved. The schedule below gives an overview of parties that play a role in protecting, developing and communicating the site.

The most relevant stakeholders, as well as many other parties, have expressed their support for the UNESCO nomination of the New Dutch Waterline as an extension of the existing Defence Line of Amsterdam World Heritage Site. This broad support contributes to the sustainable maintenance of the World Heritage Site. By signing this statement of support, parties have indicated that they wish to play their role in protecting, developing and communicating the future World Heritage Site. This involves protection of the New Dutch Waterline and communicating its Outstanding Universal Value, so that it becomes known to, and valued by, a broad public. This is achieved by, among other things making the New Dutch Waterline visible and accessible and giving it amenity value.

Examples of the new public function

Since 2000, extensive work has been done in terms of redevelopment, restoration, and repurposing of the New Dutch Waterline. This has given the Waterline a new, valuable public function. The pages that follow contain a number of examples:

Strategic Deployed Landscape

Diefdijk Line

Diefdijk forms part of the route of the New Dutch Waterline. This special dyke of almost 30 kilometres runs from the Lek near Everdigen to the Merwede near Gorinchem. The recent 'dyke reinforcement to Diefdijk Line' project was completed by Rivierenland Water Board as part of the National Flood Protection Programme in collaboration with the New Dutch Waterline National Project. The dyke improvement was seized upon to restore eighteen as yet unrestored structures in or near the dyke to their former glory. These included



Diefdijk Line



Group shelter sliced in two

secondary batteries, a machine-gun nest, sluices, barrier quays, shelters, and casemates. The project contributed to the reinforcement of the dyke and the restoration of elements from various periods of the New Dutch Waterline. The 'Integrated Approach to Dyke Reinforcement of the Diefdijk Line' was voted winner of the 2016 Water Innovation Award in the 'Water Safety' category.

Molenkade

The Molenkade project near the A2 in the municipality of Culemborg was completed in 2010. The aim of this project was to plan for the re-use of the former inundation fields, with a focus on military and cultural heritage values and natural areas. A secondary aim was to raise awareness of cultural heritage values by enabling people to experience them. The area was to regain its open character wherever possible. One of the group shelters was sliced in two and turned into a visitor experience. This was an accomplishment in itself, as the walls of group shelters were built of heavy reinforced concrete over two metres thick. The Molenkade project ensured that, with the emphasis on the area's cultural heritage values, the military landscape could be better experienced by visitors to the Waterline. The cross-sectioned bunker offers a unique view of a group shelter in the inundation area; the claustrophobic space offers a physical experience of how it must have been for soldiers to take shelter here. The view from the shelter with a modern jetty in the water provides an insight into what an inundation feels like and

also shows the new water-rich nature reserve behind the defence structure. A permanent lake has been created on both sides of the motorway to mimick the original inundation fields. The area around the group shelters can be used four or five times a year as retention basins in the event of flooding, with the result that the area provides an even stronger image of the inundation fields. Information boards provide details of the area's history, the natural environment and the history of the New Dutch Waterline. Thanks to its location along the A2 motorway, a wide audience is introduced to the Dutch Water Defence Lines, knowingly or unknowingly.

New Heemstede Bicycle Bridge – Waterline routes

The Heemstede Bicycle Bridge links the spacious, open area near Schalkwijk and the various forts along the southern edge of Utrecht. The bridge enables bicycles to avoid the urban area of Nieuwegein. All in all, the bicycle bridge improves the experience of cyclists and walkers. The design of the bridge is based on its connection with its technical environment relating to water management, for which the first section of the bridge across the canal served as a good reference image.

Water Management System

Sluices near Fort Everdingen

The sluices near Fort Everdingen were fully restored in 2014-2015. Proof that the restorations of the three different types of sluice were carried out with care is provided by the fact that the project was awarded first prize as the best restored sluice of the year by the Netherlands Foundation for Historic Sluices and Dams [Stichting Historische Sluizen en Stuwen Nederland] (HSSN). The opinion of the jury was that the restorations had been carried out with care and the historical character of the sluices had been preserved and even enhanced. Although the sluices no longer have their original military function, the restoration has made sure that the locks remain recognisable and continue to have amenity value. Following the restoration work, public access to the sluices was provided in the form of walking trails. Dispersed along the route are information boards on the sluices, the fort and the surrounding area, so that visitors learn

Sluice near Fort Everdingen





Munnikenland from Battery onder Brakel

more both about the Military Fortifications and about different parts of the Water System.

Munnikenland

In 2011, a project was started in Munnikenland that no longer had the objective of keeping the water out but actually providing more space for the water when water levels are high. Part of the Room for the River programme, this project made changes in Munnikenland, so that the water level drops by 11 cm when there is a danger of flooding due to high water levels in the river Waal. As well as increasing water storage, the project also reinforced the cultural and historical values and enhanced the natural values of the area, with the experience of Loevenstein Castle and the New Dutch Waterline being chosen as the starting point. The castle moat and the external structures were respectfully restored and made more accessible by means of new roads and paths. Nature development helps to improve this area as a former inundation field for the Waterline.

Covered community way, inundation canal and inundation field near Fort Honswijk

After the Second World War, the covered community way between Structure along Korte Uitweg and Lunette along the Snel fell into disrepair. The straight defensive embankment slowly collapsed and became overgrown with vegetation. The defensive dyke was restored to its original condition in 2008, for which 16,000 m³ of earth was added. A modern coupure was made so that visitors could experience the height and width of the embankment. Access to the top of the embankment, from where the significance of the embankment and the functioning of the Strategically Deployed Landscape could be experienced, was provided with modern steps. Standing on the embankment, it is easy to imagine the land being inundated and there is also a panoramic view of the clear fields of fire and the inundation canal, which helps visitors to recognise and understand the water system. In 2017, the Blokhoven combined water-storage and inundation area was opened, constructed on the instructions of the Stichtse Rijnlanden Water Board. Part of this area (2.2 hectares) serves as a demonstration inundation field that is used

Polder Blokhoven



for water storage during downpours. In summer, the inundation process can be experienced: every other weekend the area is inundated. At this location, visitors are told the history of the New Dutch Waterline and the story of this extraordinary place.

Military Fortifications

Fortified town of Naarden

The centuries-old history of the fortified town of Naarden can be discovered in the Dutch Fortress Museum on the Turfpoort bastion. The exhibition spaces are located in the passageways and casemates of the embankments and bastions. The considerable attention focused on the Dutch Waterline and the attraction of Naarden as a well-preserved fortress town, the best in the Netherlands, ensure that the Dutch Fortress Museum plays an important part in increasing the name recognition of the Defence Line of Amsterdam and the New Dutch Waterline. It is possible to walk along the embankments and sail on the moat, so that the fortress can be experienced from the perspective of both a defender and an attacker. The Waterline Path runs around the fortress, so that visitors can experience the enormous size of the fortress with its double moats.

Fort near Vechten, Waterline Museum

Fort near Vechten is considered a successful example of re-use and functional change. Fort near Vechten is centrally located southwest of Utrecht and is one of the largest forts. Management and use of the fort were transferred to an operating company by its owner, the State Forest Service, under a ground lease arrangement. The fort is freely accessible and is used for events, catering, education, and outdoor activities. Following a construction phase

Dutch Fortress Museum Naarden





Exposition in the Waterline Museum

lasting a few years, the architect-designed Waterline Museum was opened in 2015 as a major addition to the fort. The museum shows the operation and history of waterlines in the Netherlands and of the New Dutch Waterline in particular. The Waterline Museum attracts around 40,000 visitors a year. The Waterline Museum, the sensational redevelopment of the fort site and the stylishly laid out sustainable car park won a number of architectural prizes and were nominated for various awards.

Fort Kijkuit

Small but remarkable, Fort Kijkuit is the property of the Nature Preservation Society [Vereniging Natuurmonumenten]. The fort underwent substantial restoration in 2014/2015, from abandoned fortification to inviting information centre and viewpoint. The former powder magazine, in which weapons used to be stored, was turned into an unstaffed information centre with a viewpoint on top. The main building was fitted out as an office for the foresters employed by the Nature Preservation Society. The casemate was restored on the outside. This is where bats spend the winter and is therefore the only building that is not accessible to visitors. In the information centre in the former powder magazine, visitors are given information on the history of the fort, the special natural features of the surrounding area and cycle, walking and sailing routes. From the viewpoint, visitors have a panoramic view over the polders that could have been inundated. The Nature Preservation Society won



GeoFort

the prestigious Europa Nostra Award for Fort Kijkuit in the category 'conservation and maintenance of cultural heritage'.

Fort near Nieuwe Steeg, GeoFort

The initiators saw an opportunity in the historic buildings of Fort near Nieuwe Steeg and the landscape of relief to establish an education centre around cartography, navigation and the natural environment. The GeoFort Foundation opened its doors to the public in 2012. GeoFort gives children the opportunity to learn more about geo-information and shows how important this information is to our society today. The repurposing to the new GeoFort function involved making a lot of changes to the fort island site. The old function was kept recognisable and accessible by focusing attention on the original design and architectural forms. The combination of the unique location and the repurposing of GeoFort was a great success, as the visitor numbers testify. The fort won the international 'Best Children's Museum in the World' award in 2016. The prize is awarded by the European Museum Academy and the Hands On! International Association of Children in Museums organisation.

Fort Rijnauwen

In 1975, management of the largest fort in the Waterline, Fort Rijnauwen, was transferred to the State Forest Service; it was designated a natural feature because of its natural values. The fort site and the buildings had fallen into disrepair as a result of uncontrolled plant growth which had overgrown the buildings, causing cracks and leaks. The State Forest Service therefore decided to renovate the large buildings, which were in relatively good condition, and abandon to nature the smaller buildings, such as the storage bunkers on the embankments. The decision taken by the State Forest Service to only carry out a partial renovation has meant that the fort site has

Entrance of Reduit fort Rijnauwen

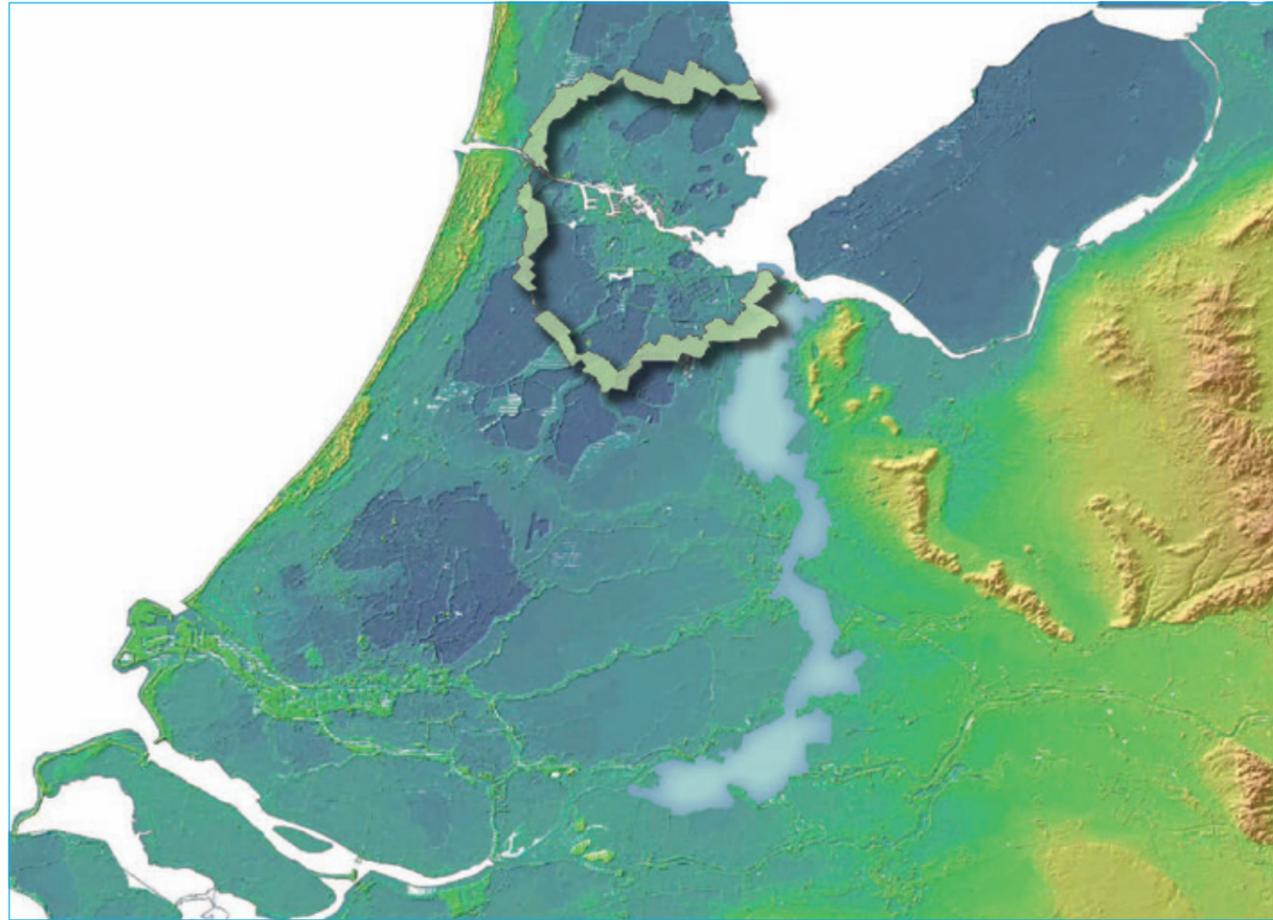


natural values as well as cultural and historical values. The aim of managing the site is therefore both to preserve and enhance its natural values and to preserve its cultural heritage. For this reason, the fort is not accessible to the public. The fort is only open to visitors during small-scale activities, such as guided tours under supervision, exhibitions or occasional public events, such as the event on 4 May to commemorate the resistance fighters of the Second World War.

An aerial photograph of a small, circular island in the middle of a large body of water. The island features a prominent circular structure with a flat roof, possibly a fortification or a large building. There are other smaller buildings, a parking area, and a harbor with several boats docked. The water is a deep blue-green color, and the sky is a pale blue with some light clouds. A vertical line runs down the center of the image, separating the left and right halves.

3

Justification for
inscription



The New Dutch Waterline is derived from the landscape and the Defence Line of Amsterdam is projected onto the landscape

The largest component of the proposed *significant boundary modification* is the extension of the Defence Line of Amsterdam World Heritage Site to include the New Dutch Waterline. The north-south oriented New Dutch Waterline (constructed from 1815 onward) protected the west of the Netherlands, where the most important administrative centres and economic concentration areas were located. The Defence Line of Amsterdam (constructed from 1880 onward) was added to it as a second defence line; a defensive ring around the capital, Amsterdam, as a national redoubt. Both used the same defence system: the inundating of flat, low-lying grass and arable land, making the terrain impassable for enemy troops.

From the construction of the Defence Line of Amsterdam onward, the two defence lines were part of the same defence system. In 1922, this coherence was reinforced, when the Defence Line of Amsterdam and the New Dutch Waterline were combined to form the northern front and the eastern front of Fortress Holland, respectively. Geographically speaking, the two systems are interconnected: the northern segment of the New Dutch Waterline is also the south-eastern and eastern segment of the Defence Line of Amsterdam.

The New Dutch Waterline supplements all criteria of the Outstanding Universal Value of the Defence Line of Amsterdam, in particular criterion (iv): 'be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history'. This supplement has a landscape dimension and a historical dimension.

- 1 The structure of the New Dutch Waterline addition is derived from landscape characteristics and cuts across various landscape types. The Defence Line of Amsterdam has less variation in terms of landscape and has the character of a military structure projected onto the landscape. In the New Dutch Waterline, differences in natural characteristics and landscape elements (geomorphology, soil, differences in level, rivers) and in cultural-historical characteristics and elements (land division, drainage, dykes) affect the form of the military system more strongly, as do the cities of the time and the infrastructure lines (railways, canals, roads) of the time. The military system is still identifiable within the landscape. Reversely, the way in which the landscape differences affected the structure of the military system can be seen clearly. This applies, in particular, to the passage through the sand landscape to the east of the city of Utrecht, because inundation was not possible there due to its elevation. The passage at Utrecht is also one of the few places where the waterline passes an urban area at a short distance. The majority of the 85-kilometre-long New Dutch Waterline was located at a great distance from the defended cities, because the inundation options were optimal there.
- 2 The New Dutch Waterline includes multiple generations of water management structures and military fortifications. On the basis of physical attributes, the development can be followed from the start of construction in 1815 to 1940. Forts were built of brick and, throughout the course of history, they had to withstand heavier and

heavier artillery. Inundations had to be carried out with increasing speed and precision. Unique technological artworks testify to the ingenuity with which military engineers went to work throughout the years. The Defence Line of Amsterdam was erected in a relatively short period of time, starting in 1880. Concrete was introduced as a building material for forts, compelled by the introduction of the high-explosive shell in 1885. From an architectural-historical perspective, the significance of the Defence Line of Amsterdam concentrates on experimentation and early adoption of mainly unreinforced concrete between 1880 and 1920.

With the addition of the New Dutch Waterline to the existing Defence Line of Amsterdam World Heritage Site, the Outstanding Universal Value is upheld, nuanced, and increased. Together, they make the development and perfecting of national defence by means of inundation visible in its most complete form.

3.1.a Brief synthesis

The Statement of Outstanding Universal Value for the Dutch Water Defence Lines builds on the Retrospective Statement of Outstanding Universal Value that was specified for the Defence Line of Amsterdam in 2016. This section offers the brief synthesis of the Defence Line of Amsterdam from 2016, as well as the additions on which the proposal for the significant boundary modification is based.

(RSoOUV Stelling van Amsterdam, 2016)

The Stelling van Amsterdam (Defence Line of Amsterdam) is a complete ring of fortifications extending more than 135 km around the city of Amsterdam. Built between 1883 and 1920, the ring consists of an ingenious network of 45 forts, acting in concert with an intricate system of dykes, sluices, canals and inundation polders, and is a major example of a fortification based on the principle of temporary flooding of the land.

Since the 16th century, the people in the Netherlands have used their special knowledge of hydraulic engineering for defence purposes. The area around the fortifications is divided into polders, each at a different level and surrounded by dykes. Each polder has its own flooding facilities. The depth of flooding was a critical factor in the Defence Line of Amsterdam's success; the water had to be too deep to wade and too shallow for boats to sail over. Water levels were maintained by means of inlet sluices and barrage sluices. Forts were built at strategic locations where roads or railways cut through the defence line (accesses). They were carefully situated at intervals of no more than 3500 m, the spacing being determined by the range of the artillery in the forts. The earlier ones were built of brick, the later of massed concrete.

The land forts have an important place in the development of military engineering worldwide. They mark the shift from the conspicuous brick/stone casemated forts of the Montalembert tradition, in favour of the steel and concrete structures that were to be brought to their highest level of sophistication in the Maginot and

Atlantic Wall fortifications. The combination of fixed positions with the deployment of mobile artillery to the intervals between the forts was also advanced in its application.

(SoOUV Dutch Water Defence Lines proposal, 2018; additions and changes underlined.)

The Dutch Water Defence Lines form a complete defence system extending more than 200 km along the administrative and economic heartland of Holland, consisting of the extensive New Dutch Waterline and the circular Defence Line of Amsterdam. Built between 1815 and 1940, the system consists of an ingenious network of 96 fortifications, acting in concert with an intricate system of dykes, sluices, pumping stations, canals and inundation polders, and is a major example of a fortification based on the principle of temporary flooding of the land. Since the 16th century, the people in the Netherlands have used their special knowledge of hydraulic engineering for defence purposes. The polders along the line of forts each have their own flooding facilities. The depth of flooding was a critical factor in the Dutch Water Defence Line's success; the water had to be too deep to wade and too shallow for boats to sail over.

Because Dutch Water Defence Lines have continuously been adapted to the development of defence techniques and knowledge of hydraulics, they offer a complete and unique insight in a 125-year period of military water management in combination with fortifications. The extraordinary consistency of the strategically used landscape, the water management works and military fortifications is still clearly visible. The New Dutch Waterline contains well conserved and very special hydraulic engineering works like the fan sluice, a type of sluice that was adopted worldwide after its invention. The Defence Line of Amsterdam contains forts that have an important place in the development of military engineering worldwide. They mark the shift from the conspicuous brick/stone casemated forts of the Montalembert tradition, in favour of the steel and concrete structures that were to be brought to their highest level of sophistication in the Maginot and Atlantic Wall fortifications. The combination of fixed positions with the deployment of mobile artillery to the intervals between the forts was also advanced in its application.

Explanatory note

The New Dutch Waterline and the Defence Line of Amsterdam together make up a system of military defences, more than two hundred kilometres long, based on the principle of the temporary inundation of low-lying territory. Both waterlines, brought together in the Dutch Water Defence Lines, make it clear that the Dutch not only learned to manage water in order to cultivate the land, but were also able to turn it into an ally in their struggle to maintain independence. The New Dutch Waterline was constructed in the early years of the Dutch monarchy, at the beginning of the nineteenth century, in defence of the administrative and economic heart of the kingdom. From 1880 onward, the Defence Line of Amsterdam was added to this as a national redoubt within which the country's capital could hold out as the last defensive position. The Dutch applied the insights and experience of the European tradition of military defence to the particular conditions in a delta of major

rivers; experience of water management and knowledge of marine engineering were deployed for defence based on inundation.

The defence system has three main characteristics: Strategically Deployed Landscape (a main defence line with inundation fields on one side and the defended land on the other side), a Water Management System, and Military Fortifications. The topography of the existing landscape formed the basis for the system; as many characteristics and elements of the existing landscape as possible were used for the main defence line. For this, the landscape of the New Dutch Waterline offered more reference points than the landscape in which the Defence Line of Amsterdam was constructed. The route of the New Dutch Waterline follows the landscape structure, whereas the Defence Line of Amsterdam had to be projected onto the landscape like a defensive ring around the capital.

Visually, the defence line landscape could hardly be distinguished from its context, the surrounding landscape without military function; the system had to remain as invisible as possible in the eyes of the enemy. The extremely complex and ingenious water system made inundation of individual polders possible. Feeder canals, quays, and sluices were constructed specifically for that purpose. The depth of inundation was a critical success factor; the knee-deep water barrier was difficult to wade through and too shallow for boats to cross.

Forts were built in strategic locations. Their purpose was to protect the inundation system and guard the accesses. Accesses are vulnerable points in the line, where it is crossed by rivers, roads or railways, or the landscape was too high to be inundated. The Defence Line of Amsterdam had an additional dimension: the firepower of the high-explosive shell, which could be fired from a great distance. This development, in combination with the advent of motorised military transport, made it irresponsible to rely on inundation alone. Forts had to be able to defend each other. They were built in each other's line of sight, at a distance that could be covered by canon fire from the flanks of the fort. The distance between forts could not be more than three kilometres. This showed that changes in military tactics were gaining the upper hand in the structure of the Defence Line of Amsterdam, whereas it was mainly the landscape that could be taken advantage of during construction of the New Dutch Waterline.

Together, the Dutch Water Defence Lines offer a complete picture of 125 years of military water management in relation to fortifications: from 1815 to 1940. Again and again, the defence systems were adapted to new water management technology and in anticipation of increasingly heavy enemy weaponry. The fortifications that were built vary from earthworks and bastioned brick forts from the early nineteenth century (mainly in the New Dutch Waterline) to concrete forts and group shelters from the twentieth century (mainly in the Defence Line of Amsterdam). Furthermore, during the construction of the New Dutch Waterline, fortified towns from preceding periods were used: two medieval castles, a number



Main defence line
Diefdijk

Strategically Deployed Landscape

of sixteenth and seventeenth-century fortified towns, and many seventeenth-century forts from the Old Dutch Waterline. The World Heritage Site, therefore, also includes examples of Military Fortifications from earlier periods.

The typical landscape structure of the Dutch Water Defence Lines has two components: inundation fields that could be flooded and a main defence line behind which the defended land was located. Vulnerable spots in the main defence line (accesses between inundation fields that could not be inundated) were guarded by forts or other military structures.

Specific to the ingenious defence system is that as many characteristics and elements of the existing landscape as possible are used. In many cases, inundation fields are polders that were drained and developed for agricultural use. Characteristics such as flat, open, and surrounded by a dyke to keep the water level manageable made these polders suitable for flooding (inundation) to obstruct the passage of enemy troops.

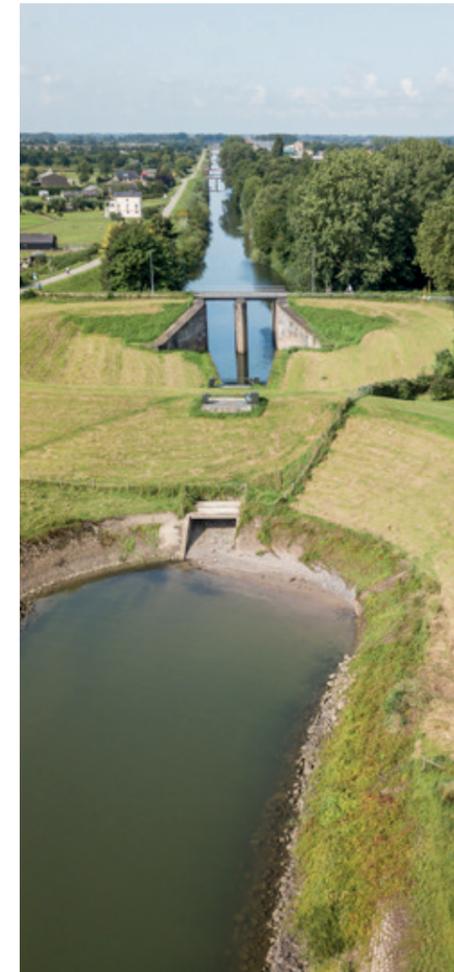
A coherent system of nine inundation basins was built for the New Dutch Waterline over a distance of 85 kilometres. Each inundation basin consists of a number of polders linked together. Differences in elevation in the landscape formed the basis of the inundation. Low-lying polders were to be inundated from the relatively elevated east as quickly as possible but in a controlled manner. Because the level of each inundation basin differed somewhat, they were not connected. Barrier quays were prevented water flowing from one basin into another. In this way, a similar depth of water was achieved everywhere. Where possible, the main defence line also consisted of previously constructed elevations in the landscape, such as quays along rivers and polder dykes. The starting point for the design of the New Dutch Waterline was to include the city of Utrecht in the defended area – the preceding Old Dutch Waterline had left Utrecht undefended. In this way, topography, for the most part, determined the route of the north-south oriented main defence line.

The route of the main defence line of the Defence Line of Amsterdam was definitively decided upon in 1894, after construction of the first fort had started in 1880. The route was dictated less by topography than was the case with the New Dutch Waterline. Because the Defence Line of Amsterdam is a defensive ring, it was not possible to systematically harness the height differences in the landscape. Furthermore, it was important for the distance from the main defensive line to Amsterdam not to be too short (in connection with shelling) or too long (for reasons of transport and communication). A radius of fifteen kilometres from the city centre was taken as the average. This also meant that, in the event of siege, there was enough land for food production within the defensive ring's safe zone. Nevertheless, for the main defence line of the Defence Line of Amsterdam, existing polders, dykes, and waterways could also be used in many places. Where the landscape did not provide any suitable reference points, special defence line walls were built across polders. Initially, they served as barrier quays, but could also be used for the construction of covered roads, along which troop movements and military transports could take place unnoticed by the enemy.

Landscape elements constructed specifically for military use did not always stand out visually from existing landscape elements. For example, Diefdijk, part of the main defence line in the southern section of the New Dutch Waterline, was an existing inner dyke for the protection against floodwater. The similar Geniedijk, part of the Defence Line of Amsterdam, solely had a military function. Visually, there are no hints of this difference anywhere.

The defence system of the Dutch Water Defence Lines was first and foremost based on the controlled flooding of agricultural polders to halt the enemy. An area about three to five kilometres wide was inundated by means of a complex hydrological system. Inundating an area by approximately 30 to 50 centimetres of water made it too shallow to cross by boat and too deep to wade across.

Water Management System



Inundation canal Tiel

The water was supplied by means of existing waterways (rivers, canals, waterways, and ditches) and hydraulic engineering structures (pumping stations, sluices, and dykes). In some locations, specially dug inundation canals were required to transport the water more quickly from the intake point to an inundation basin. An example of this is the inundation canal at Tiel, a short artificial waterway between the river Waal and the Linge. A ingenious system of sluices (which were opened or closed), dams, culverts, and coupures made the inundation possible. Together, these objects ensured that the inundation water reached the required level and remained there.

The system was refined even further to keep the time needed to effect an inundation as short as possible. In the early nineteenth century, when France was regarded as the greatest threat, a period of three to four weeks was available until the inundation fields had to be put into action. In the twentieth century, when Germany was developing into a threatening power, the inundation time in the New Dutch Waterline was reduced to approximately a week.

For inundations in the Defence Line of Amsterdam, the existing water system, consisting of polders with ditches, sluices, and other water management structures, could be used. In large sections of the Defence Line, inundation could easily be realised: in three days, enough water could be transported to the land to complete the inundation.

The extension to include the New Dutch Waterline adds a number of historically significant water management structures to the World Heritage Property. The New Dutch Waterline includes elements that are considered highlights of the Dutch mastery of innovative hydraulic engineering. The fan sluice is such an invention. This type of sluice could be opened by just one person, against the pressure of high water. A number of them were included in the New Dutch Waterline and, since then, this system has found its way into other applications. The Explosion Sluice [Plofsluis] is a unique example of military-water management ingenuity.

The Plofsluis, an explosion sluice: the only one of its kind

A good example of a water management structure that was developed specifically for the New Dutch Waterline is the explosion sluice in the Amsterdam-Rhine Canal – the only one of its kind in existence. Work on the canal began in 1933, at the end of the period in which the New Dutch Waterline was operational. The explosion sluice made it possible to drop 40 million kilos of rock or debris into the canal with one simple action, thus blocking off the canal. This was necessary because, otherwise, inundation water in the surrounding polders would drain away via the newly constructed canal.



Military Fortifications

The easily navigable watercourses, rivers, and elevated roads and railways were vulnerable spots in the defence mechanism of the Dutch Water Defence Lines. Via this infrastructure, an enemy army could approach the defended area, in between the inundated areas. The relatively high strips of land where inundation was technically impossible also formed vulnerable links in the chain. The broadest is the Houtense Vlakte to the east of the city of Utrecht, but elsewhere there are also relatively elevated levees, alluvial ridges, edges of polders, dykes and quays. The infrastructure and elevated terrains formed the 'accesses' where enemy troops could avoid the inundations during their advance. These accesses required active defence, and forts, batteries and shelters were therefore constructed in these places. Spread out over a total length of over 200 kilometres, the Dutch Water Defence Lines contain no less than 96 fortifications and a multitude of other military structures.



On the one hand, the defenders benefited from a good view from the forts and a broad field of fire. The circles within which construction was forbidden or only that construction was permitted which could easily be removed – e.g. wood – were laid down by law. On the other hand, it was important that the defence lines were invisible in the landscape to the approaching enemy. Camouflage of forts was, therefore, important. This was done by means of the planting of trees and other vegetation. Most of the forts have a green side facing the possible enemy threat, and more brick masonry on the 'safe' side.

The positioning of the forts is one of the aspects that shows that the New Dutch Waterline was better attuned to the surrounding landscape than the later Defence Line of Amsterdam. The accesses determined where a fort or other military fortification was required. In the Defence Line of Amsterdam, the regularity of the forts is greater. This was due to the high-explosive shell, which was introduced in 1885 and could be fired from a greater distance. In order to maintain control over the entire area, the distance between the forts in the Defence Line of Amsterdam could not be greater than the artillery that such a fort could accommodate, and the forts had to be within the line of sight of the two adjacent forts.

The increased firepower of the artillery at the beginning of the twentieth century was also the reason for constructing the forts in the Defence Line of Amsterdam using concrete. The forts are of great architectural value due to this early use of concrete. They marked the transition from brick to concrete, with its experimental use of concrete and an emphasis on reinforced concrete. The Defence Line of Amsterdam is one of the few places in which this episode in the history of European architecture can be found. The nineteenth century forts are typical of the New Dutch Waterline. In the area, multiple generations of earthen and brick forts, which resisted ever greater firepower, are visible, in addition to smaller concrete field fortifications from the twentieth century. With the proposed extension, the Dutch Water Defence Lines World Heritage Site offers a complete overview of 125 years of military architecture. Because a number of existing castles, fortified towns, and forts were

given a new function within the New Dutch Waterline, the proposed extension of the World Heritage Site also includes examples of military architecture from earlier periods.

There is a high concentration of defence structures in the area to the east of Amsterdam. Here, the New Dutch Waterline and Defence Line of Amsterdam overlap. The lack of a double defence line made increasingly high demands on the resistance on this route. A large concentration of defence structures was also built around Utrecht. Only limited use could be made of inundation there because of the relief of this area on the elevated alluvial ridge of the Kromme Rijn.

Conclusion

Together, both waterlines form a complete picture of military defence by means of inundation. The New Dutch Waterline reinforces and provides the context for the Outstanding Universal Value as expressed in the Defence Line of Amsterdam. In historical terms, the New Dutch Waterline is the precursor of the Defence Line of Amsterdam, and together they formed the main defence for the administrative and economic heart of the Kingdom of the Netherlands for many decades. The proposed extension of the site makes 125 years of developments in inundation as a means of defence recognisable within the World Heritage Site, and the interconnection between this military technology and the landscape characteristics of the Dutch polder and river landscape becomes visible.

3.1.b Criteria under which inscription is proposed

The proposed Dutch Water Defence Lines World Heritage Site is an extension of the Defence Line of Amsterdam World Heritage Site to include the New Dutch Waterline. The Defence Line of Amsterdam is registered as a 'Cultural Site' based on criteria (ii), (iv), and (v). For this, the Retrospective Statement of Outstanding Universal Value was specified in 2016.

The extended site is nominated on the basis of the same criteria as the Defence Line of Amsterdam: criteria (ii), (iv), and (v). The extension adds to the justification of these criteria, in particular criterion (iv). Thanks to the longer history of development of the New Dutch Waterline in relation to the Defence Line of Amsterdam and the difference in geographical circumstance, the extension introduces new values to the World Heritage Site. This section explains and justifies this addition.

Criterion (ii)

(RSoOUV Stelling van Amsterdam, 2016)

The Defence Line of Amsterdam is an exceptional example of an extensive integrated European defence system of the modern period which has survived intact and well conserved since its creation in the late 19th century. It is part of a continuum of defensive measures that both anticipated its construction and were later

to influence some portions of it immediately before and after World War II.

(SoOUV Dutch Water Defence Lines proposal, 2018; additions and changes in underlined.)

The Dutch Water Defence Lines are an exceptional example of an extensive integrated European defence system of the modern period which has survived intact and well conserved since it was created from the beginning of the 19th century. It is part of a continuum of defensive measures that both anticipated its construction and were later to influence some portions of it immediately before and after World War II.

Justification

The extension to include the New Dutch Waterline increases the value of the World Heritage Site as ‘*part of a continuum of defensive measures*’. Military defence on the basis of inundation has been utilised since the Middle Ages, in particular in low-lying parts of Northwest Europe, but also in other parts of the world. However, these were seldom completely controlled inundations, as they were in the Netherlands. The Dutch developed the technology into a system on an unprecedented scale and with a high degree of technical ingenuity. The Dutch Water Defence Lines demonstrate this system in its most advanced and extensive form.

The construction of the New Dutch Waterline reflects the rise of the national consciousness at the beginning of the nineteenth century. The Dutch monarchy had just been established, following the reorganisation of Europe on the basis of the Congress of Vienna and the fall of Napoleon Bonaparte short thereafter. A nation could only develop if it could safeguard its independence and unity. In the case of the Kingdom of the Netherlands, the New Dutch Waterline played a determining role in this.

The Dutch Water Defence Lines were the most advanced, but not the last waterlines. The principle of defence by means of inundation was also used elsewhere in the run-up to the Second World War, for example in the French Maginot Line and the German Pomeranian Line in what is now Poland. A new waterline was constructed in the Netherlands following the Second World War: the New IJssel Line in the east of the Netherlands, as a response to the Cold War. The knowledge of water-management and military-strategy that forms the basis of the Dutch Water Defence Lines has been reapplied here and developed further, but the IJssel Line was not on the same scale as the Dutch Water Defence Lines.

Criterion (iv)

(RSoOUV Stelling van Amsterdam, 2016)

The forts of the Defence Line of Amsterdam are outstanding examples of an extensive integrated defence system of the modern period which has survived intact and well conserved since its creation in the later 19th century. It illustrates the transition from brick construction in the 19th century to the use of reinforced concrete in the 20th century. This transition, with its experiments in the use of concrete and emphasis on the use of unreinforced concrete, is an episode in the history of European architecture of which material remains are only rarely preserved.

(SoOUV Dutch Water Defence Lines proposal, 2018; additions and changes in underlined.)

The Dutch Water Defence Lines are an outstanding example of an extensive and ingenious system of military defence by inundation that uses features and elements of the country’s landscape. The well-preserved collection of fortifications in the context of the surrounding landscape is unique in the European history of (military) architecture. The forts illustrate the development of military architecture between 1815 and 1940, in particular the transition from brick construction to the use of reinforced concrete in the Defence Line of Amsterdam. This transition, with its experiments in the use of concrete and emphasis on the use of non-reinforced concrete, is an episode in the history of European architecture of which material remains are only rarely preserved.

Justification

The application of criterion (iv) to the existing Defence Line of Amsterdam World Heritage Site focusses on the architectural value of the forts. The transition from brick construction, via unreinforced concrete, to reinforced concrete marks a period in European architecture of which few examples still exist. The extension to include the New Dutch Waterline broadens the perspective of this transition, but not only that: it also gives cause to emphasise values such as *military landscape* and *technological ensemble* within this criterion. The essence of the extension lies in two passages from the proposed justification of criterion (iv):

- ‘an extensive and ingenious system of military defence by inundation that uses features and elements of the country’s landscape’,
- the ‘well-preserved collection’ of fortifications that represents ‘the development of military architecture between 1815 and 1940’.

- 1 *An extensive and ingenious system of military defence by inundation that uses features and elements of the country’s landscape*

The functioning of the New Dutch Waterline system and the Defence Line of Amsterdam system is the same, but the landscape basis is different. Generally speaking, the New Dutch Waterline follows the orientation of the contours in the mainly flat, Dutch

landscape: most of the easterly area (the inundation sides) lie just above sea level and most of the safe areas to the west of the line lie just below sea level. This difference in height, however minor, offered more options for inundation in terms of landscape than the landscape surrounding the Defence Line of Amsterdam, a defensive ring around the capital. Furthermore, the New Dutch Waterline is intersected by a number of broad rivers. These rivers left their mark on the system as a source of inundation water, but also as access (carrying the risk of enemy passage).

Both river characteristics required special water management structures. The New Dutch Waterline contains a number of highlights of Dutch mastery in this area. The ingenious and unique solutions that were thought of and implemented are exceptional. Examples include fan sluices and the explosion sluice. The New Dutch Waterline adds a lot in this respect, thereby enhancing the value, as represented in the Defence Line of Amsterdam.

The New Dutch Waterline also runs past a zone that was difficult or even impossible to inundate: the relatively elevated zone to the east of Utrecht. There, a high concentration of military fortifications was relied upon.

Because of the difference in landscape setting between the Defence Line of Amsterdam and the New Dutch Waterline, the functioning of the system within the landscape is more visible than in the New Dutch Waterline. That is the case even today. Extension of the World Heritage Site gives cause to broaden criterion (iv) to include the military-landscape and technological ensemble that the Dutch Water Defence Lines have formed since the beginning of the nineteenth century.

2 The 'well-preserved collection' of fortifications that represents 'the development of military architecture between 1815 and 1940'

The existing Defence Line of Amsterdam World Heritage Site represents the relatively short period in which the transition from brick to concrete military fortifications took place. Extension to include the New Dutch Waterline reinforces the value as 'part of a continuum of defensive measures', because construction began earlier and, over the years, the system was continually adapted to advances in water management knowledge and military tactics. Because of this, the New Dutch Waterline and the Defence Line of Amsterdam together demonstrate the architectural development that is inextricably linked to the system of military defence by means of inundation that was used over the last 125 years.

In addition, the Dutch Water Defence Lines include examples of even older defence structures. Seventeenth-century forts from a waterline from an earlier period (the Old Dutch Waterline) were included in the New Dutch Waterline and, in part, later also in the Defence Line of Amsterdam. This also applies to a number of fortified towns and castles from even earlier periods, up to the late Middle Ages. Extension to include the New Dutch Waterline adds a

number of well-preserved castles, fortified towns, and 17th-century forts to the World Heritage Property.

Together, the Strategically Deployed Landscape, Water Management system, and Military Fortifications of the Dutch Water Defence Lines form a highpoint of the defensive use of inundations in the nineteenth and twentieth centuries.

Criterion (v)

(RSoOUV Stelling van Amsterdam, 2016)

It is also notable for the unique way in which the Dutch genius for hydraulic engineering has been incorporated into the defences of the nation's capital city.

(SoOUV Dutch Water Defence Lines proposal, 2018; additions and changes in underlined.)

The Dutch Water Defence Lines form an extraordinary example of the Dutch expertise in landscape design and hydraulic engineering. They are notable for the unique way in which hydraulic engineering has been incorporated into the defences of the administrative and economic heartland of the country, including the nation's capital city.

Justification

The defence lines illustrate the special way in which the Dutch have used the existing topography in the defence of their country. The technology that made inundation of polders under enemy threat possible is a direct extension of the Dutch people's centuries-long experience with the construction, development, and drainage of polders for agricultural use. They learned to control the level of ground water and surface water with the help of technological interventions, such as pumping stations, watercourses, sluices, ring canals, and dykes. This same technology made it possible to reclaim inland seas. The Dutch developed this knowledge to perfection. The close relationship between the Dutch Water Defence Lines and this form of land use is reflected in the way in which the military system utilised the characteristics and elements of this polder landscape: inundation of flat, low-lying polders up against a linear main defence line, consisting of quays, dykes or other elevations in the landscape. Some of the water management structures in the military system were already part of the civil use of the landscape

The extension to include the New Dutch Waterline increases the value of the World Heritage Site as a model of a perfected military system that uses landscape characteristics and water management structures for controlled inundation. The New Dutch Waterline adds an expansive landscape ensemble where, to this day, the functioning of this system can be easily identified and understood.

3.1.c Statement of integrity

Assessment of integrity

The integrity of a World Heritage Site indicates whether all of the essential attributes in which the Outstanding Universal Value is expressed are still present and have not been impaired or are under threat. Integrity refers to 'the extent to which the property:

- includes all elements [attributes] necessary to express its Outstanding Universal Value;
- is of adequate size to ensure the complete representation of the features and processes which convey the property's significance;
- suffers from adverse effects of development and/or neglect.'

The three criteria have been assessed separately:

- Wholeness: are all attributes located within the property
- Intactness: are all attributes present without significant damage or degradation?
- Absence of threats: are attributes threatened by development, deterioration or neglect?

(RSoOUV Stelling van Amsterdam, 2016)

The Defence Line of Amsterdam and its individual attributes are a complete, integrated defence system. The defence works have not been used for military purposes for the past four decades. As the surrounding area was a restricted military zone for many decades, its setting has been preserved through planning development control, although it could in the future be vulnerable to development pressures. The ring of forts make up a group of connected buildings and other structures whose homogeneity and position in the landscape have remained unchanged and distinguishable in all its parts. They form the main defence line together with the dykes, line ramparts, hydraulic properties, forts, batteries and other military buildings, and the structure of the landscape.

(SoOUV Dutch Water Defence Lines proposal, 2018; additions and changes in underlined.)

The Dutch Water Defence Lines and their individual attributes are a complete, integrated defence system. The defence system has not been used for military purposes since World War II and is formally out of operation since 1963. The main defence line and inundation fields remain clearly recognisable in the landscape, because many of these attributes also had a civil function. The characteristic openness of the inundation fields is preserved integrally in the parts of the Dutch Water Defence Lines where the pressure of spatial development was low after its military use has ended. Especially in more urbanised areas, policy has been developed to safeguard the visual integrity of the inundation fields and the main defence line. Inundation fields that have lost their visual integrity have not been incorporated in the property. The range of hydraulic works and the military fortifications that supported the inundation system is a complete and intact entity, in mutual connection and in relation to the landscape. The series of forts, batteries and ramparts make up a group of connected buildings in which the consecutive phases of military architecture are clearly recognisable. As the surrounding

Research method for integrity and authenticity

For the assessment of integrity (3.1.c) and authenticity (3.1 d) of the proposed extension of the World Heritage Site, research was conducted on the New Dutch Waterline. The integrity and authenticity of the system and of the individual attributes was assessed on the basis of the three main characteristics (Strategically Deployed Landscape, Water Management System, and Military Fortifications). To arrive at a proper assessment, the evaluation started at the lowest possible level of scale. The next step was to justify the Statement of Integrity and Authenticity as a whole. The research was conducted during the period from May 2015 until June 2016.

1940 Reference point

A reference point was needed to assess the current condition of integrity and authenticity. The research is based on a comparison between the current condition and the 1940 reference point. This year was chosen because no new elements were added that form part of the Dutch Water Defence Lines military system following the outbreak of the Second World War. In 1940, it had reached its most evolved form.

The system and its component parts

The attributes have been grouped into categories, some of them further subdivided. For the majority of the attributes, all objects were assessed

individually, even if the attribute is represented by many different examples. Each object, including the large ones such as forts and inundation basins, were given one assessment. The sizeable objects, such as the inundation basins, were studied to see if all components were still present. The main defence line is an exception. It was not assessed as a single object, because the line consists of various 'generations' of defence lines. Each generation was assessed individually.

For a small number of attributes, no individual assessment of each object was carried out, because the objects were too small or too numerous. This includes auxiliary water management structures, such as concrete structures, dam sluices, and navigation locks). The countless concrete water management structures derive their added value for the Outstanding Universal Value from the cluster in which they operate. The integrity and authenticity of these concrete structures has, therefore, been assessed on the scale of the cluster of which they form a part.

The justification is based on an analysis of the integrity and authenticity. This analysis is included in the nomination dossier as Appendix 2.

area of each fort was a restricted military zone for many decades, its setting has been preserved through planning development control, although it could in the future be vulnerable to development pressures.

Justification

Wholeness The property of the Dutch Water Defence Lines includes all elements necessary to express its Outstanding Universal Value

The New Dutch Waterline forms a coherent and complete whole with the existing Defence Line of Amsterdam World Heritage Site. Both lines still exist in their entirety without interruptions.

Both lines had their own function in the defence of the administrative and economic heart of the Kingdom of the Netherlands, as part of a coherent system. Initially, the Defence Line of Amsterdam was the second defence line: if the New Dutch Waterline were to fall,

Physical attributes

Belonging to the Strategically Deployed Landscape:

- Main defence line
- Inundation basins
- Basin barrages
- Accesses
- Prohibited circles
- Wooden houses

Belonging to Water Management System:

- Inundation quays
- Rivers, including waters e.g. part of the Randmeer
- Inundation and supply canals
- Discharge and seepage basins
- Main inlets
- Locks
- Culverts
- Log sheds
- Pumping stations, e.g. mills

Belonging to the Military Fortifications:

- Fortified towns
- Forts and batteries
- Positions and dispersed structures
- Group shelters
- Casemates
- Other military objects, e.g. the bullet trap.

the administrators and the military could fall back on the capital as a national redoubt.

The extension adds two essential characteristics to the Outstanding Universal Value of the World Heritage Site, both appropriate under criterion iv:

- the landscape coherence: *'an extensive and ingenious system of military defence by inundation that uses features and elements of the country's landscape'*,
- the historical coherence: *'the collection of military architecture between 1815 and 1940'*.

Both additions are fully represented in the proposed extension of the World Heritage Site. The boundary includes all elements and characteristics present in the landscape that were once part of the New Dutch Waterline, including the full and continuous main defence line of 85 kilometres. All physical attributes are represented in the property. This required including three components outside of the continuous area in the World Heritage Site (in addition to the five separate components that are already part of the World Heritage Site): two components to secure the safe supply of sufficient inundation water (Fort Pannerden and Tiel Inundation Canal) and one forward defensive post (Werk IV in Bussum).

Essential for the addition to the Outstanding Universal Value is the landscape and historical coherence between all these individual physical attributes. This has also been included in its entirety and is recognisable within the property. The following characteristics at system level, recognisable within the landscape, convey the addition to the Outstanding Universal Value of the existing World Heritage Site:

- the linearity of the main defence line (a continuous, line-shaped elevation in the landscape that does not, however, take the same form everywhere);
- the landscape openness of the inundation fields (unpaved, flat, surrounded by dykes or quays);
- the water management structures that played a role in the inundation and, in their coherence, make it possible to follow the route of the inundation water (from main inlet to inundation field and, following the inundation, back to the main system);
- Military Fortifications with their Prohibited Circles (lines of fire) in relation to the accesses that they guarded;
- Military Fortifications in their successive architectural-historical phases.

By including the entire 85 kilometres of the system within the property, all four landscape types (peat landscape, sand landscape, river landscape, and marine clay landscape) are present in the proposed World Heritage Site, and the interaction with the urban landscape within the boundaries is clearly visible. The existing physical attributes make it possible to recognise and understand the functioning of the system in all these landscapes. The landscape types are described in detail in section 2A.

The six generations of fortifications that can be identified in the history of the New Dutch Waterline are all included in the proposed extension of the World Heritage Site, including the Prohibited Circles around them that guaranteed a free line of fire. They form a valuable addition to the military architecture that, in part, determines the Outstanding Universal Value of the existing Defence Line of Amsterdam World Heritage Site: early concrete construction from the beginning of the twentieth century. The architectural-historical phases are described in detail in section 2B of this nomination dossier.

Intactness All of the necessary attributes of the Dutch Water Defence Lines are present and sufficiently intact to convey the Outstanding Universal Value

The attributes of the New Dutch Waterline that the proposed addition conveys to the Outstanding Universal Value are present and intact.

There are amply sufficient numbers of all physical attributes to recognise and understand their position in the defence system and their relationship to the landscape context. They are in good condition. This applies to both the attributes that correspond to the Strategically Deployed Landscape and the attributes that correspond to the Water Management System and the Military Fortifications. In as far as the attributes vary per landscape type, they are present and in good condition in every landscape type.

All forts are located within the property; not one has been destroyed. Examples of each generation of fort can be found within the proposed extension of the World Heritage Site, and the corresponding military and architectural-historical characteristics stand out well. They are almost all in good to excellent condition. This is in connection with recent restorations that result from new forms of use with preservation of authenticity. Good examples of this include

Successive generations of Military Fortifications 1815-1940

1815-1826

Forts of earthen ramparts at Utrecht

1841-1864

Brick tower forts, including at river accesses; bombproof areas in the courtyards

1867-1870

Forward defence structures with thick, stormproof ramparts at Utrecht and fortified towns

1871-1886

Renovation and fortification of many forts to include bombproof barracks and heavily sheltered weapons and munitions depots

1880-1914

Construction of the Defence Line of Amsterdam, with concrete forts, among other things

1880-1940

Construction of scattered concrete field fortifications in the New Dutch Waterline, grouped in defence lines between the forts from 1914

Fort Everdingen, Fort Asperen, Fort Kijkuit, and Fort Nieuwe Steeg (now in use as 'Geofort').

Strategically Deployed Landscape

The extension of the World Heritage Site to include the New Dutch Waterline adds expansive landscape zones, where the attributes belonging to the Strategically Deployed Landscape are present in their coherence and are in good condition. These zones are the peat landscape to the north of Utrecht and the river and marine clay landscapes to the south of the river Lek, together accounting for approximately 70 of the 85 kilometres of the New Dutch Waterline. Many attributes have been preserved because they also have a civil function. The inundation fields within the property have been maintained as agricultural areas or nature reserves, which they also were at the time. They are still flat and unpaved, with controlled water management. The edges of the inundation fields that have been developed have been kept out of the property. This includes small-scale locations that do not affect the recognisability of the military system and the role that the inundation fields play in it. The main defence line consists, to a large extent, of flood defences that can also keep the land dry in times of peace. They are still in operation as flood defences. Examples are the quays along the Vecht and Diefdijk as an inner dyke. Thanks to this continuity of civil use, the military system is still easily identifiable in the landscape and can also be recognised by the less trained eye.

Between the two expansive landscape zones lies the plateau, Houtense Vlakte, the relatively elevated alluvial ridge of the river Kromme Rijn. The relatively high elevation, which essentially makes this zone the widest access within the New Dutch Waterline, and its proximity to Utrecht as one of the cities to be defended presented the military engineers with special challenges. The high concentration of military fortifications and the main defence line are recognisable in the landscape and in the urban structure of Utrecht, but the very narrow inundation basins (in as far as they are present in the original situation) have been lost in this part of the waterline.

Diefdijk



Dutch Water Defence Lines



Blokhoven polder

Water Management System

Just like the main defence line and the inundation fields, many water management structures also had a civil function. They were needed to protect the land from high water or to drain agricultural polders. In particular for the drainage of inundated land, few additional water management structures were required. Inundation, sluices, canals, and coupures were built into dykes for purely military purpose.

In part due to this civil use, the attributes belonging to the Water Management System are present and in good condition. In general, they are operated by water authorities, the democratic government bodies that are responsible for water management in the Netherlands. These water boards are very much aware of the cultural-historical value of many structures and they, therefore, invest in restoration. Recent examples of this are Diefdijk near Everdingen and the sluice in the Tiendhoven Canal. If the object qualifies, restoration is coupled with repurposing. For example, the entire system of water management structures that made inundation of the Blokhoven polder possible was restored. This polder to the south of Utrecht now functions as a water storage area and as a demonstration inundation field in the New Dutch Waterline. The Tiel Inundation Canal and the corresponding main inlet, which are located relatively far from the inundation fields, have been restored and contribute more to the quality of the surrounding residential environment than before.

Group shelters and trench near Fort Ruigenhoek



Military Fortifications

The Military Fortifications in the New Dutch Waterline are, generally speaking, in good condition and are visibly present within the landscape. A large number of typical examples of the smaller concrete fortifications spread out over the landscape (casemates, group shelters) survive, in such a way that their coherence is still visible. Without exception, the larger fortifications (forts, fortified towns) are still present. Almost all batteries are still present and in good condition. A number of them have been restored. Where beneficial to the educational experience of the cultural heritage, reconstruction took place in a number of cases. All the larger military fortifications in the New Dutch Waterline are protected as national monuments. This guarantees sustainable preservation of all generations of forts and, with it, a complete overview of military architecture between the construction and decommissioning of the New Dutch Waterline.

Since approximately 2000, most forts have been repurposed. These repurposing projects enabled restoration of forts and their surroundings. In part because of this, most forts are in excellent condition. All repurposing projects and restorations since 2000 have been carried out in such a way that prioritises and respects the cultural heritage value of the monument. Well-preserved and restored examples can be found from every construction period. Some forts are better visible than at the time of their original military function, when they were camouflaged by the landscape. This approach was taken to increase the experience and social awareness of the cultural heritage – the forts are eye-catchers of military heritage.

The location of the Military Fortifications in the landscapes is linked to the accesses: roads, railways, rivers, canals, and elevated territories where enemy armies could escape the inundated areas. These accesses are also present in the landscape today. The function of a number of fortifications was also to guard sluices and other water management structures, with Fort Pannerden – located far from

the main defence line – as the clearest example. From there, it was ensured that enemy troops would not block the water supply through the river Nether Rhine. Thanks to the intactness of the Strategically Deployed Landscape, this landscape context is still visible today.

The unobstructed line of fire was typical of the forts; in the Netherlands, this was implemented by means of rings around each fort, which were laid down by law. The Prohibited Circles Act [Kringenwet] placed building restrictions on these rings, which were, therefore, called 'prohibited circles'. For rings within a distance of 1000, 600, and 300 metres, increasing restrictions were in place for structures, infrastructure, and vegetation, with the most salient feature being that construction was only permitted using easily removable materials. In practice, this was wood. Around the forts of the New Dutch Waterline, the prohibited circles in the landscape remain largely intact, even after the Prohibited Circles Act was repealed in 1963. There are still some 200 wooden houses in existence, fifteen of which are intended national monuments. The only exception are the prohibited circles around a number of forts near Utrecht, where urban expansion has crossed the main defence line and has, therefore, reached the line of fire of the forts. Prohibited circles around fortified towns from the seventeenth century and earlier were developed shortly after the repeal of the Prohibited Circles Act, as a result of the need for residential space within these fortified towns.

On the whole, attributes within the 'Military Fortifications' group from each construction period are present and in good condition.

Absence of threats **None of the attributes are threatened by development, deterioration or neglect**

Section 4B of this nomination dossier includes an analysis of the factors that could potentially influence the integrity of the proposed extension of the World Heritage Site. There are no realistic threats from natural phenomena. Flooding is the greatest natural threat in the delta of a number of major rivers. For centuries, the Netherlands has pursued an active policy with respect to keeping this risk manageable, also in the light of the increasing water supply via the rivers. This is always done in connection with the quality of the landscape and its cultural-historical values. Major rivers are given more space, polders are made suitable for additional water storage in the case of extreme high river levels, and flood defences are reinforced.

Threats due to human activity (in particular, urbanisation, infrastructure, and energy transition) are realistic, but under control. The Dutch government has an extensive set of tools with which to manage urbanisation and shape spatial developments that affect cultural heritage in such a way that damage is minimal or that the developments offer a positive contribution to the preservation or restoration of the cultural heritage property. For example, in the case of intersecting infrastructure, the accesses in the defence system, capacity increase may be an issue as a result of the increase in traffic volume. As a part of these projects, the impact on the World

Heritage Site is analysed in Heritage Impact Assessments. If possible, investments are made in the spatial expression of the World Heritage Site in connection with these projects. For example, the A1 motorway to the east of Amsterdam was recently widened. On this occasion, the road was given a generously sized aqueduct at the location of the intersection with the river Vecht, which forms the main defence line of the New Dutch Waterline there. This increased the continuity of the main defence line and improved the landscape setting near Muiden.

Spatial planning and planning rules at all administrative levels prevent new urbanisation from taking place in undesirable locations, e.g. in the inundation basins of the New Dutch Waterline that are now being added to the Defence Line of Amsterdam World Heritage Site.

Urbanisation outside of the property does not affect the intactness of the World Heritage Site in and of itself, but it can overshadow it visually. This disrupts the visual integrity of the New Dutch Waterline. Because the former military system is so recognisably present in the landscape of the New Dutch Waterline (one of the reasons for the proposed extension of the World Heritage Site), this defence line is relatively sensitive to damage to visual integrity. The urban dynamic is greatest in the far northern part, to the east of Amsterdam, where both parts of the Dutch Water Defence Lines come together, and in the central part, to the east of Utrecht, where the Utrecht Science Park was built on the undefended side of the main defence line. Area analyses are being drawn up for these zones, and for the dynamic zones between Schiphol and Heemskerk, along the existing Defence Line of Amsterdam World Heritage Site. This will show under which conditions urbanisation can take place with respect for the visual integrity of the World Heritage Site. The conclusions will then be incorporated in the existing tool set for the protection of the World Heritage Site.

In future, the Dutch landscape will be affected as a result of other challenges, such as making the Netherlands more sustainable. Energy transition is an example of this. One point of attention is the prevention of this leading to an irreversible effect on the integrity of the OUV. Although initiatives in this area are, as yet, incidental, the provinces anticipate a more systematic pressure of transformation on the landscape as a result of energy transition. They are preparing frameworks that contrast this sustainable production of energy with the proposed extended Dutch Water Defence Lines World Heritage Site. In 2018 and 2019, research is being carried out on the possibilities and impossibilities of connecting various sources of sustainable energy with the proposed Outstanding Universal Value.

The risk of degradation or neglect of individual objects is minimal. Many water management structures and military fortifications are still being used or are again being used, but no longer for defence purposes. Water management structures play a role in the country's current water management. Most of the forts now have an educational, economic or recreational uses. Active use is the best way to

ensure systematic maintenance. Owners of national monuments can rely upon the national government's Conservation of Historic Buildings and Monuments subsidy scheme to carry out maintenance and renovation activities.

3.1.d Statement of authenticity

Assessment of authenticity

The concept of authenticity refers to the truthful and credible expression of the Outstanding Universal Value. The Operational Guidelines show that this expression can be conveyed through the following qualities:

- Form and design
- Material and substance
- Use and function
- Traditions, techniques, and management systems
- Location and setting
- Language, and other forms of intangible heritage
- Spirit and feeling
- Other internal and external factors

Mainly relevant for the New Dutch Waterline as the proposed extension of the Defence Line of Amsterdam World Heritage Site are: form and design, material, use and function, location and setting in the landscape, and spirit and feeling.

The individual physical attributes of the New Dutch Waterline and the system as a whole have been assessed on the basis of the 'qualities of authenticity'. This results in a well-founded image of the authenticity of the New Dutch Waterline as an extension of the Defence Line of Amsterdam World Heritage Site. The information used for this has been included in appendix 2.

(RSoOUV Stelling van Amsterdam, 2016)

The fortifications have been preserved as they were designed and specified. The materials and building constructions used have also remained unchanged. Repair in arrears applies in some cases. No parts of the Stelling have been reconstructed. The Outstanding Universal Value is expressed in the authenticity of the design (the typology of forts, sluices, batteries, line ramparts), of the specific use of building materials (brick, unreinforced concrete, reinforced concrete), of the workmanship (meticulous construction apparent in its constructional condition and flawlessness), and of the structure in its setting (as an interconnected military functional system in the man-made landscape of the polders and the urbanised landscape). The Stelling van Amsterdam is a coherent man-made landscape, one in which natural elements such as water and soil have been incorporated by man into a built system of engineering works, creating a clearly defined landscape.

(SoOUV Dutch Water Defence Lines proposal, 2018; additions and changes in underlined.)

The Dutch Water Defence Lines still are a coherent man-made landscape, one in which natural elements such as water and soil have been incorporated by man into a built system of engineering works, creating a clearly defined military landscape. The military use has been terminated, but the landscape and built attributes are still present. The large majority of fortifications has been preserved as they were designed and specified. The Outstanding Universal Value is expressed in the authenticity of the design (the typology of forts, sluices, batteries, line ramparts), of the specific use of building materials (brick, non-reinforced concrete, reinforced concrete), of the workmanship (meticulous construction apparent in its constructional condition and flawlessness), and of the structure in its setting (as an interconnected military functional system in the manmade landscape of the polders and the urbanised landscape). Since the 1990s the defence line and its individual attributes are being maintained, restored, made accessible, put to use and exploited sustainably. There have been no major reconstructions, for educational purposes, some attributes have been refurbished and are recognisable as such. A great number of forts now has an educational, economical or recreational function. The military history remains tangible, because the story of the Dutch Water Defence Lines continues to be told in the area and through various media.

Justification

The proposed addition of the New Dutch Waterline to the Defence Line of Amsterdam World Heritage Site is truthful and credible. Due to the presence of the many physical attributes, the functioning of the system within its landscape context is easy to understand. The form and design, material, and landscape setting are authentic and convey the Outstanding Universal Value. These qualities of authenticity are supported by forms of civil use that many water management structures and the most important elements of the Strategically Deployed Landscape had and still have. These historic narratives connected to the cultural heritage property are kept alive by means of references in the landscape and through the media outside of it. Although military use has disappeared never to return, the spirit and feeling of the heritage property are being kept alive.

Form and design

The form and the design of the 'extensive and ingenious' military system of the New Dutch Waterline can be found easily in the current landscape. The main defence line is still present everywhere, inundation fields are still flat and can be flooded in a controlled manner, and the relationship between the placement of the forts and the location of the accesses is clearly visible. The 'prohibited circles' as open spaces surrounding the forts are also clearly visible.

Because the form and design of nearly all forts and other fortifications has remained unchanged since approximately 1940, the proposed extension of the World Heritage Site offers the 'complete collection of military architecture between 1815 and 1940'. New

forms of use have made it possible to maintain the large number of forts in a good condition and increase the social awareness of the cultural heritage. Additions or modifications that make re-use possible are clearly identifiable from the original fort, in terms of use of materials, and are visually subordinate. Generally speaking, the modifications are also easy to remove.

The continuing attention for water safety in the Netherlands facilitates preservation and continued civil use of many attributes that belong to the Water Management System. Within each category of water management structure there are examples of preservation of form and design. For a number of water management structures, continued civil use means that form and design had to be modified.

Over the years, intersecting infrastructure has developed along with the increased intensity of traffic. This has consequences for the form and design of the infrastructure and, with it, for the historic access that cut across the military system. The forts that guard the access are still in their place and are connected to the access in terms of landscape. Intersecting infrastructure that was constructed following the termination of military use is recognisable from the lack of such military defences.

Materials

Authenticity in terms of use of materials is particularly important for military architecture. For repaired and restored sections, original materials, e.g. brick, wood, iron, steel, glass, and concrete have been used; no plastics were used. The original construction techniques have also been applied again. The same applies to the smaller military fortifications that, by their nature, do not have any new forms of use, such as group shelters and casemates. This practice arose in the nineties, after the first repurposing projects had been carried out, and has further developed since then. The repair activities are, therefore, in line with the construction methods used in the period in which the fort was built. The differences between the generations of forts remain visible. Repairs and restorations are fully documented.

Exceptional in terms of use of materials are the wooden houses in the 'prohibited circles', which were located in the line of fire of the forts. They were built out of wood, so as to be easy to demolish or burn down when under enemy threat.

The physical attributes of the Water Management System also still consist of the materials out of which they were originally built. The same applies to the physical attributes of the Strategically Deployed Landscape, in as far as applicable.

Use and function

Military use was always a barely visible secondary function of the agricultural and natural landscape, however crucial that military function was to the independence of the kingdom. After the military function was officially terminated in 1963, the agricultural function of the inundation basins remained. The main defence line was no longer the line where 'fierce resistance' was to take place, but almost everywhere it was a line in the landscape that guarded

the land behind it from flooding. In some places, the relationship between agriculture and nature has changes and the increase in recreational use of the landscape has led to more bicycle and walking paths and other recreational facilities. That does not detract from the assessment that the continuity of agricultural and nature use contributes to the authenticity of the landscape system.

The water management operates in essentially the same way as at the beginning of the nineteenth century. Sluices, pumping stations, and canals, among other things, are still used to control the water level for the benefit of agriculture or nature. Part of the Water Management System only had an inundation function and has, therefore, fallen out of use. This function was restored to the inundation demonstration field in the Blokhoven polder.

In almost all forts in the New Dutch Waterline, military use has now been replaced by other forms of educational, economic or recreational use. For a number of forts, repurposing projects have been developed. In many cases, forts that are not actively used contain extraordinary and protected natural values, including bats.

The setting in the landscape

The original setting of the main defence line and the inundation basins is recognisable in today's landscape, compared to the 1940 reference point. In places where the main defence line ran close to urban areas, the contrast is visible between the openness of the landscape on the inundation side and the more built-up character of the landscape on the safe side of the main defence line. In general, the relationship between water management technology (sluices, dams, canals, etc.) and the surrounding landscape (rivers, waterways, ditches, polders) is clearly visible. The landscape context of the forts has remained recognisable in their relationship with the accesses that they defend and in the openness of the prohibited circles, with or without wooden structures. An exception to this is Utrecht-East. Here, the line is located between the city of Utrecht and the elevated Utrecht Ridge ('Utrechtse Heuvelrug'). The high concentration of military fortifications and the main defence line are recognisable, but the very narrow inundation basins – in as far as they were originally present – have been lost in this part of the waterline.

Many forts are more visible than in the past, a measure taken to increase the public's attention for the cultural heritage. In one case (near the widened Lek Canal), it was not possible to maintain the casemates in their original position. In order to avoid deviating from history, but also to maintain the casemates, a one-off playful solution was devised. The casemates have been moved and put back a bit further down at an angle, as if they rolled there to make way for the widening of the canal. This non-authentic form and location are explained on the spot using information panels. In the urbanised sections to the east of Utrecht and Amsterdam, spatial developments have taken place that make the context of the forts less recognisable.



Centre for peace education at Fort de Bilt

Spirit and feeling

The authentic restorations and repurposing projects of the forts keep the military past alive, also when the new function of a fort is not directly connected to it. The spirit and feeling of the military past (sturdy, strong, austere, but also tough and sometimes frightening) is kept alive in and around the forts, in particular. In some forts, spaces for museum purposes have been brought to the state in which they were during military use (for example, in Fort Ruigenhoek and Fort Pampus), or the past is made understandable in other ways. Two forts have been set up with the explicit and primary purpose of remembering the spirit of the cultural heritage: Fort Vechten, where the National Waterline Museum has been set up, and Fort De Bilt, which has been converted into a 'peace fort', a centre for peace education. Lunette along the Snel, a 'water fort', revolves around dealing with water and its relevance for nature, agriculture, the economy, liveability, sustainability, and safety. In a small number of places, small-scale reconstruction was required to bridge the gap to experiencing the military past, for example along Diefdijk, where a number of trenches have been restored. Reconstructions are recognisable as such, and detailed and explained in the landscape with the help of an information panel.

3.1.e Protection and management requirements

The significant boundary modification provides an opportunity to update the 'Protection and Management Requirements' section from the Retrospective Statement of Outstanding Universal Value of the Defence Line of Amsterdam World Heritage Site, in the light of new developments and new legislation. The text in this section has been completely rewritten in comparison to the 2016 Retrospective Statement of Outstanding Universal Value for the Defence Line of Amsterdam. The updates in this Statement have no effect on the

ambition level of the protection of the Defence Line of Amsterdam, which remains high.

(SoOUV Proposal Dutch Water Defence Lines, 2018)

The national government obliges provinces and municipalities to include the preservation of Outstanding Universal Value in regional and local plans and legislation. The basis for this obligation lies in the Spatial Planning (General Rules) Decree (Besluit algemene regels ruimtelijke ordening, or Barro) and, from 2021, the Environment and Planning Act already adopted. In addition, all structures of the New Dutch Waterline are protected as nationally listed buildings, and the connection with the landscape is also protected through clustering of these structures. A number of built attributes of the Defence Line of Amsterdam are also protected as nationally listed buildings; the remaining built attributes in the Defence Line of Amsterdam are protected as provincially listed buildings. In all these cases, there is a licensing requirement for architectural and spatial planning developments, which is linked to the preservation of the monumental character.

Together, the provinces of Noord-Holland, Utrecht, Gelderland, and Noord-Brabant act as site-holder of the Dutch Water Defence Lines. The administrative portfolio holders of these provinces work together in the Dutch Water Defence Line Committee. Actual implementation is currently in the hands of two project offices, namely the project office for the Defence Line of Amsterdam and the programme office for the New Dutch Waterline. The two management organisations will merge to form one joint executive organisation (starting 1/7/2020), which will be executing the comprehensive management plan.

The Dutch Water Defence Lines protected the economic and administrative heartland of the Netherlands. The pressure of urban development is great in some parts, in particular where the defence system has been constructed a short distance from urban areas. Developments are only permitted if they fall within the planning framework and they have been designed in such a way that they preserve or reinforce the OUV. This requires of the site-holder and other governments involved a meticulous consideration and precise assessment against the integrity and authenticity of the World Heritage Site. For this, checks and balances have been integrated. Large-scale initiatives with a potentially large impact are subjected to a Heritage Impact Assessment (HIA). A strategic HIA of the proportion to the World Heritage Site is carried out in the case of potentially far-reaching developments (such as energy transition). Recommendations from independent experts are structurally enshrined in the process, both on the level of the World Heritage Site as a whole (Spatial Quality Advisory Team), the provincial level (provincial spatial quality advisor), and the local level (building aesthetics committee and listed buildings committee).

Justification

Dutch system for protecting the World Heritage Site

The system of World Heritage Site protection for the Dutch Water Defence Lines consists of three interconnected policy tracks:

- the spatial planning track for planning-related protection;
- the heritage conservation track that ensures legal protection of monuments;
- the supplementary spatial quality track.

The planning protection focusses on maintaining the Outstanding Universal Value of the World Heritage Site as a former defence system in its interconnection of Strategically Deployed Landscape, Water Management System, and Military Fortifications. The heritage policy focusses on the preservation of town and cityscapes and individually constructed monuments within the World Heritage Property. The purpose of the additional spatial quality track is to set up spatial developments within the framework of spatial planning and heritage conservation in such a way that they respect the Outstanding Universal Value and reinforce it where possible.

The planning-related protection track

The national government obliges provinces to specifically identify core qualities of a World Heritage Site (the Outstanding Universal Value), to detail them, and to give them a protected status in the provincial by-laws. This is an 'instruction' in the Spatial Planning (General Rules) Decree (*Besluit algemene regels ruimtelijke ordening*, or Barro). By means of the by-laws, provinces instruct municipalities to translate these qualities to their zoning plans. The latter plan constitutes the assessment framework for applications by initiators of spatial developments, for example involving building construction or functional changes in land use. In the zoning plan, the planning protection is given binding legal force. The protected status affects the spatial 'policy strategy' on all levels of government, which are to be drafted on the grounds of the Spatial Planning Act.

A drastic change is awaiting the planning system in the Netherlands. In 2016, a new Environmental & Planning Act was passed and published in the Bulletin of Acts and Decrees. The law will enter into force in 2021 and will replace a large number of laws relating to the living environment. This law includes a direct reference to the Outstanding Universal Value of World Heritage Sites, with the obligation to maintain it. This provision can be regarded as incorporating the World Heritage Convention into Dutch law. This gives the protection of the Outstanding Universal Value an even more solid legal status. The current instruction rule in the Barro will be copied without alteration in the new Living Environment (Quality) Decree, which is part of the Environmental & Planning Act. This instruction rule secures the effect of protection in the municipal environmental plan that will succeed the current zoning plan and will also form the assessment framework for planning applications and other spatial initiatives under the new law.

Furthermore, the Environmental & Planning Act regulates that the national government, the provinces, and the municipalities each have to draft an Environmental Strategy. This Environmental

Strategy has a broader scope than the current policy strategy. Cultural heritage is an integral part of it, as are environment, water, nature, and other aspects of the living environment.

Heritage conservation track

The rules for dealing with the physical living environment are integrated in the Environmental & Planning Act, including those for monument conservation. The broad thrust of the competences and protection levels will be maintained. The provisions and permits in the Monuments and Historic Buildings Act of 1988 that pass into the Environmental & Planning Act will remain in force until the date on which the Environmental & Planning Act takes effect. Until that moment, these articles are in force as transitional provisions on the grounds of the Heritage Act. Pending the entry into force of the Environmental & Planning Act, the Environmental Permitting (General Provisions) Act remains the legal framework for dealing with monuments. This law stipulates that it is prohibited to 'demolish, disturb, move or change in any way' a national monument without a permit or to 'repair, use or allow others to use a national monument in such a way that it is defaced or endangered'.

The transitional provisions of the Heritage Act include a duty to maintain for national monuments. This means that the owner of a national monument must maintain it in such a way that its preservation is ensured. The implementation rules pursuant to the new Environment and Spatial Planning Act will include a similar provision concerning conservation. When this act becomes effective, that provision will assume the role of the article included in the transitional provisions of the Heritage Act. The owner does not meet the duty to maintain if the specific maintenance period of a part of the monument has demonstrably lapsed, such as the roof, the foundation or the paintwork, and the owner fails to carry out the required maintenance during a prolonged period of time. This situation leads to degradation, which means the preservation of the monument is no longer guaranteed. Whether the neglect is intentional or not is irrelevant. For municipalities as competent authorities, the duty to maintain is an explicit cause to enter into discussions with the owners.

The designation and registration of national monuments is regulated by the Heritage Act, which also covers other forms of heritage (e.g. archaeology and movable heritage). All forts in the New Dutch Waterline have the status of national monument. The Heritage Act includes the basis for subsidy for the preservation of cultural heritage. This is the basis for, among other things, subsidies and loans for national monuments. With these subsidies, the national government wishes to encourage high-quality care for and preservation of cultural heritage. The Cultural Heritage Agency is responsible for the implementation of government subsidy schemes. This responsibility applies to approximately 25,000 national monuments that are not residences. On behalf of the Minister of Education, Culture, and Science, the Cultural Heritage Agency provides two types of subsidies: the subsidy scheme for the preservation of monuments and the subsidy scheme for the encouragement of the repurposing of monuments. With various subsidy schemes, the national govern-

ment has reduced the monument restoration backlog from 40% to 10% in the period 1995-2010. Now, the preservation subsidy is focussed on keeping monuments in a good state of repair. Thanks to the subsidy, planned maintenance is possible, and expensive and drastic restoration will be prevented in future. With the repurposing subsidy scheme, the Cultural Heritage Agency promotes new use of, for example, valuable churches, factories, and schools, but also forts. The subsidy offers owners, municipalities, and provinces financial support when searching for new functions for national monuments and wind and waterproofing vacant buildings. In addition to the national monuments, provinces and municipalities have their own monument lists. Fortified towns have the status of protected town or village conservation areas. This means that municipalities can introduce a licence requirement for activities that affect the cultural-historical quality. In future, the heritage conservation track will also transfer to the Environmental & Planning Act.

Spatial quality track

Planning protection and heritage conservation lay down clear restrictions for the spatial development options within the site. Within these restrictions, development is possible, in as far as it is required to maintain the vitality of the monuments, the landscape, and the urban network in the area. The design of such a development must respect the OUV or, if possible, enhance it. There are a number of instruments that secure that quality of design, the use of which depends on the scale of the development:

- The Spatial Quality Advisory Team of the New Dutch Waterline, a team of external experts who offer their advice, both solicited and unsolicited, regarding the trends, developments, and challenges that affect the World Heritage Site on a larger scale.
- The Heritage Impact Assessment (HIA). For developments within the main infrastructure of the World Heritage Site, the HIA is an instrument that is used with increasing frequency to assess the effect of various alternatives on the World Heritage Site. The number of other applications is increasing.
- The local Building Aesthetics Committee. The Netherlands has a long-standing tradition of advisory assessment of visual quality on the municipal level by a committee of external experts (the Building Aesthetics Committee). In addition, every municipality has a Monuments Committee that offers recommendations concerning the approach to cultural heritage. Occasionally, both committees are combined to form a Spatial Quality Committee. These committees are guided by one or more municipal policy documents, which include rules for visual quality and cultural heritage.
- Landscape quality policy laid down and implemented by the provinces, which offers municipalities and initiators a starting point for the design of spatial initiatives. In addition, provinces have independent provincial 'spatial quality advisers', who offer their advice, both solicited and unsolicited, regarding the approach to concrete spatial developments.
- Recently (2018), the province of Noord-Holland developed a new Landscape and Cultural History Guideline, with specific attention paid to the Defence Line of Amsterdam and the New Dutch Waterline in that province. This province also has a Spatial Development Advisory Committee (*Adviescommissie Ruimtelijke*

Ontwikkeling, or ARO). This committee advises the public administration on initiatives for urban development outside of the existing city and town boundaries, within and outside of the *World Heritage Site*.

3.2 Comparative Analysis

Introduction

A comparative analysis has been carried out to justify the addition of the New Dutch Waterline to the World Heritage List as an extension of the Defence Line of Amsterdam. A comparative study was carried out on the Defence Line of Amsterdam at the time of its successful nomination. In that study, a comparison was made mainly between the Defence Line of Amsterdam and the New Dutch Waterline. In addition to the New Dutch Waterline, two other defence lines were listed: the defence structures around Paris and the Defence Line of Antwerp. The comparative study for the Defence Line of Amsterdam mainly focused on lines built to defend strategically important cities. With regard to the proposed extension, it is necessary to consider not only the fortified lines around national redoubts but also other fortified lines at national level that used water as a means of defence.

Given the long history of the New Dutch Waterline and the Defence Line of Amsterdam, this analysis contains several types of waterlines and defence systems that used the defensive value of water within a Dutch, European, and global context. The emphasis is mainly, but not exclusively, on nineteenth and twentieth-century defence structures. These were the heydays of the Dutch Water Defence Lines. Static defence lines of this type had become obsolete by halfway through the twentieth century. It was specifically because the water-based defence system was so typically Dutch that the Defence Line and Waterline were also compared to other historical Dutch waterlines.

Methodology and selection

Preliminary exploration

First of all, a preliminary exploration was conducted. This preliminary study involved the use of desk research and advice from experts to prepare a list of areas that have features similar to the Dutch Water Defence Lines. This has resulted in several cultural heritage sites that, to a greater or lesser extent, have the same main characteristics: Strategically Deployed Landscape, Water Management System, and Military Fortifications. Particular consideration was given to the unique features of the Dutch Water Defence Lines within their geographical and cultural context. After all, the management of water is intertwined with the history of the creation and existence of the 'Nether' lands, otherwise known – with good reason – as 'the Low Countries'. The delta of the rivers Rijn,



Fort Uitermeer

Detailed comparative analysis

Maas and Schelde is mostly below sea level. This natural state gave the Netherlands a unique opportunity to use water as a means of defence. In the preliminary exploration, the heritage sites with the most relevant features were selected for a detailed comparison. The results of the preliminary exploration are included in the section below.

The sites selected in the preliminary study were studied in detail. The Outstanding Universal Value of the Dutch Water Defence Lines, as described in section 3.3, forms the basis of this comparative study. The outstanding characteristics and associated attributes were used for a comparison to other heritage sites. In addition to the Outstanding Universal Value, a number of unique features were included in the comparative analysis. These are:

- Size: The New Dutch Waterline and the Defence Line of Amsterdam together make up a national line of defence over 220 kilometres in length. The Lines constituted the main defences of the Kingdom of the Netherlands.
- Time period: over a century. The attributes of the New Dutch Waterline and the Defence Line of Amsterdam illustrate the evolution of the Dutch inundation-based defence system over a period of 125 years.
- Integrity and authenticity: The heritage of the Defence Line of Amsterdam and the New Dutch Waterline is authentic, complete and in good condition, thanks to past military legislation and current safeguards in the areas of spatial planning and heritage conservation.

Results of the preliminary exploration

In the preliminary exploration, the following (World) Heritage Sites were compared to the Defence Line of Amsterdam and the New Dutch Waterline. Attention focussed on the Dutch, European, and worldwide context. Both existing World Heritage Sites and sites on the tentative list were considered. A brief description was provided for each heritage site and World Heritage Site – in chronological order – and reasons were given as to why the asset was or was not included in the follow-up study for the comparative analysis.

Brief description	Yes/No
<p>The Tjonger-Linde Waterline (late sixteenth century to 1672) The Frisian Waterline was one of the first waterlines in the Netherlands and was developed in the province of Friesland in the late sixteenth century. The line consisted of small earth fortifications, known as sconces, which guarded fordable places, and a water management system. The system was basic and the inundation of plots of land was uncontrolled. In times of war, the dykes were breached to make the land impassable. The line fell into disuse after the French invasion in 1672. The marshes that formed part of it were drained and the sconces disappeared into the landscape. The line ceased to be included in the Republic's defence plan after 1672. Nowadays, these fortifications are barely distinguishable in the landscape, as they mainly consisted of earth embankments, dykes and canals. A few sconces were recently restored. The strategically deployed landscape is almost completely unrecognisable, the water management was basic and the military fortifications were confined to earth embankments, of which few traces remain.</p>	No
<p>Old Dutch Waterline (1672-1815) The Old Dutch Waterline was used to defend Holland in the seventeenth and eighteenth centuries. The line runs from Muiden on the Zuiderzee, via Nieuwersluis, Woerdense Verlaat, Zwammerdam, Bodegraven and Schoonhoven to Gorinchem. The Old Dutch Waterline was hurriedly created in 1672 with the effecting of inundations, the manning of the defence structures and the construction of new structures. The Waterline was again brought to a state of readiness in 1786 as a result of the domestic conflicts between the Patriots and supporters of the House of Orange. When the hostilities were over, part of the route of the Old Dutch Waterline was moved further east, thereby abandoning a number of vulnerable points. In 1816, almost all the structures in the Old Dutch Waterline were decommissioned and demolished, unless they formed part of the New Dutch Waterline. Only Fort Wierickeschans was not demolished and went on to become the 'The Government's Main Gunpowder Depot'.</p>	Yes
<p>Grebbe Line (1745-1926) The Grebbe Line was used as a forward position of the New Dutch Waterline. The Grebbe Line ran from the Nether Rhine near Grebbeberg (close to Rhenen) via the Vallei Canal and the Eem as far as what is now IJsselmeer Lake. In 1745, building work started on the Grebbe Line, which was then first used in 1794 against invasion by the First French Republic. The Grebbe Line was maintained until the late nineteenth century. A large part of the fortifications was decommissioned in 1926. By the eve of the Second World War, the Grebbe Line was completely modernised. This line was the Netherlands' main defence at the time of the German invasion.</p>	Yes

Brief description	Yes/No
<p>The Peel-Raam Line (1939-1940) This defence line was built in 1939-1940 in the east of the Province of Noord-Brabant and in north Limburg. Part of the line benefited from the natural protection provided by the marshy peat bogs of the Peel region and a number of existing waterways, such as the Graafse Raam river and the Helenavaart and Noordervaart canals. An artificial barrier was installed along the northern section in the form of a water-filled anti-tank ditch. The defences included casemates and barbed wire obstacles. In places where it was easy for the Army Corps of Engineers to effect inundations, this was done. This was only done on a limited scale along the line as a whole. The line did not have an ingenious, permanent inundation system similar to the New Dutch Waterline and the Defence Line of Amsterdam. In May 1940 the line formed part of the national defence system as a forward position and only operated briefly (1939-1940). Because this line did not have one of the most important components of a real waterline, i.e. the controlled inundation of large areas of polder, the Peel-Raam Line is not included in the comparison with the Defence Line of Amsterdam and the New Dutch Waterline.</p>	No
<p>Southern Waterline or Brabant Waterline (sixteenth century to 1952) The Southern Waterline is a military defence line dating from the sixteenth and seventeenth centuries which was intended to protect the Northern Netherlands from Spanish and, later, French, attacks. The Southern Waterline ran from the Zeeland coast to past Grave east of Den Bosch. The Brabant Waterline, later known as the Southern Waterline, had an almost continuous system of inundation fields. Some parts were in use until 1952. The Fortification Act of 1874 placed the emphasis on national defence being provided by the New Dutch Waterline. The Southern Waterline was used as a refuge for retreating troops. The last structures were finally decommissioned as a military defence line in 1952.</p>	Yes
<p>Old IJssel Lines (from 1700 until after WWII) The IJssel Line has a history that goes back to 1700. In this period, the line was formed by the fortified towns along the IJssel: Zwolle, Deventer, Zutphen, Doesburg, and Arnhem. Just like the Grebbe Line, this line was a buffer line for the main defence system of the Old Dutch Waterline. The line relied on inundating the wide floodplains of the IJssel by means of dams. The line along the IJssel was modernised in the 1930s, in the run-up to the Second World War. These adaptations consisted of countless concrete casemates built on the banks of the IJssel, usually near river crossings, and the construction of floating concrete weirs. The line would serve to delay the first wave of an enemy attack from the east, so that the main line of resistance could be brought to a state of readiness. It was mainly the river that formed the barrier in these lines. These IJssel Lines are not therefore considered further in this comparison.</p>	No
<p>New IJssel Line (1951 and 1954) During the Cold War period, a decision was taken to build the New IJssel Line [Nieuwe IJssellinie]. Following the Second World War, the Netherlands feared a Russian land attack. When the rivers Waal and Nether Rhine were completely dammed up, the Rhine water would flow into the IJssel, which would then flood the land outside the primary dykes. In this way, the area from Ooijpolder up to and including IJsselmuiden would be inundated across a width of three to 15 kilometres.</p>	Yes

Brief description	Yes/No
<p>Frontiers of the Roman Empire (World Heritage Site) The boundaries of the Roman Empire extended from Great Britain in the west, via the Rhine and Danube, to the Black Sea in the east. At that time, these rivers were lined with dozens of forts and fortifications. In this way, the Romans tried to prevent their enemies from the north from penetrating the mighty empire. Parts of the Roman Limes are on the World Heritage List under the heading 'Frontiers of the Roman Empire'. This includes: Hadrian's Wall (England), Antonine Wall (Scotland), and the Upper Germanic and Rhaetian Limes (Germany). Sometime in the future, the Netherlands hopes to nominate the Lower Germanic Limes, in collaboration with Germany, as part of this World Heritage Site. The Roman Empire had a river as its natural northern border almost everywhere. This also applies to the Dutch part of the Limes. The river was also used as a major transport route. The defence of the Limes was never based on water, which was however the case with the Defence Line of Amsterdam and the New Dutch Waterline.</p>	No
<p>Defence structures of Paris The defence structures of Paris, which were also listed in the comparative analysis for the nomination of the Defence Line of Amsterdam, were built between 1841 and 1845. The similarity lies in the function of national redoubt; the two are hardly comparable in terms of inundation. This was confined to a small area around Saint-Denis. With the expansion of Paris after the Second World War, the existing fortified landscape was almost completely swallowed up by suburbia. In Saint-Denis, for example, two of the four forts have disappeared and the sites have been developed. The use of the remaining fortifications for military purposes was maintained. Because they were built within such a short space of time, these fortifications do not represent the diversity of building styles that together characterise the Defence Line of Amsterdam and the New Dutch Waterline. Moreover, inundation was not at the heart of the defensive concept.</p>	No
<p>Venetian Fortifications (part of the World Heritage Site of Venice and its Lagoon) The defence structures around the Venice lagoon have a number of features in common with the waterlines in the Netherlands. The city is surrounded by marshes, and water has always played an important role there. However, the fortifications are modelled more on the maritime coastal forts of Kronstadt and Suomenlinna: built not with the goal of controlling ground troops, but rather to control shipping traffic. Inundation was hardly involved, which is why Venice has been omitted from the comparative study.</p>	No
<p>Defence structures of Wroclaw (Breslau) In the run-up to and during the First World War, there was a fortification system, consisting of a number of military flood defences, around the former German city of Breslau, the current Polish city of Wroclaw. With it, the river valleys around the city could be inundated in times of crisis. The concept of Fort Breslau, as evident from historical planning documents, was never implemented and the weirs were never used. Currently, few traces of it are to be found and the landscape of which it formed part is also hard to distinguish in the present situation.</p>	No

Brief description	Yes/No
<p>Inundations along the IJzer during the First World War This inundation at the beginning of the First World War is mostly remarkable because it may have been the only time that the underlying technology of a waterline was actually used on a twentieth-century battlefield. Inundation took place on an ad-hoc basis rather than a controlled manner along a specially designed line, and the fortified positions did not survive the war. The only concrete position that relates to the inundation is the Ganzenpoot complex of sluices in Nieuwpoort, which still has the pivotal role in draining the polder in this part of West Flanders.</p>	No
<p>Gibraltar Gibraltar sits on a small, rocky peninsula, which means that water has always played an important part in its defence. Indeed, the Rock appears to be protected by a shortened waterline that forms a natural elevation. The defence line was limited to dry ditches which were only flooded, in a controlled manner, in exceptional circumstances.</p>	No
<p>Siegfried Line/Westwall There is no evidence that inundation was ever used in the fortifications of the Siegfried Line, although this was mentioned in the ICOMOS evaluation of the nomination of the Defence Line of Amsterdam. Besides this difference in principle between the two lines, the ICOMOS evaluation did acknowledge that both the Siegfried Line and the Maginot Line had been 'drastically dismantled' since the end of the Second World War. Moreover, the line was short-lived and therefore hardly had a chance to become embedded in the landscape.</p>	No
<p>Atlantic Wall The Atlantic Wall – which extended for thousands of kilometres along the Atlantic Ocean – was built to repel an amphibious invasion by Allied troops during the Second World War. The defensive measures included the use of water. For example, in part of the Atlantic Wall in France, areas behind the wall were deliberately flooded with the intention of drowning any paratroopers who were dropped in the area. This approach has little in common with the systematic and controlled inundation fields of the Dutch waterlines. Moreover, this wall was short-lived.</p>	No
<p>Kronstadt (World Heritage Site) Kronstadt is a fortified Russian port city on the island of Kotlin in the eastern part of the Gulf of Finland. From 1700, the fortress had a key military role in the defence of Saint Petersburg and was an important naval base. Various fortifications can be found in and around the city. Kronstadt was built by Peter the Great, as was St. Petersburg itself. Peter the Great acquired his knowledge about the building of fortified towns in the Netherlands.</p>	Yes
<p>Suomenlinna (World Heritage Site) The fortress of Finland (Suomenlinna) is an interesting example of European military architecture of the time. In 1747, when Finland was part of the Kingdom of Sweden, it was decided to build a fort as a major base for the country's armed forces in Finland. A group of islands belonging to the district of Helsinki was chosen for this fortress, which was named Sveaborg ('Fortress of Sweden'). Construction began in 1748 with the aim of connecting and fortifying the islands so that access to the port could be controlled. It is a sea fortress, which was built gradually on a group of islands near Helsinki.</p>	Yes

Brief description	Yes/No
<p>Defence Line of Antwerp The Defence Line of Antwerp was a military defensive belt around Antwerp and consisted of two rings of forts. The innermost ring of forts, which had the task of protecting the city from shelling and safeguarding it from occupation, was built between 1859 and 1914. Part of this ring also included inundation basins. The innermost ring of forts around Antwerp contains elements of the inundation technique used in the late nineteenth century.</p>	Yes
<p>Fortifications of Vauban (World Heritage Site) The fortifications of Vauban consist of twelve groups of fortified buildings and sites along the western, northern, and eastern borders of France. They represent the finest examples of the work of Sébastien Le Prestre de Vauban (1633-1707), a military engineer of King Louis XIV. The property includes towns built from scratch by Vauban, citadels, urban bastion walls and bastion towers. Vauban played a major role in the history of fortification in Europe and on other continents until the mid-nineteenth century. The fortifications are not based on inundation as a means of defence.</p>	No
<p>Valletta (World Heritage Site) The capital of Malta is inextricably linked to the history of the military and charitable Order of St John of Jerusalem. It was ruled successively by the Phoenicians, Greeks, Carthaginians, Romans, Byzantines, Arabs, and the Order of the Knights of St John. Valletta has 320 monuments within an area of 55 hectares. These monuments make Valletta one of the most concentrated historical areas in the world. After the Siege of Malta in 1565, the new city was built according to a uniform grid plan. In the nineteenth and twentieth centuries, the influence of British architecture was combined with that of the older buildings. The defence of Valletta was not based on the inundation of land. Moreover, this concerns the defence of a city.</p>	No
<p>Fortifications of Copenhagen During the first Danish-Prussian War (1848-1851), the Danes protected their capital city by flooding the area west of Copenhagen. By 1885, this had become a more permanent solution, with extensive inundation basins north of the city and a water management system consisting of weirs and sluices.</p>	Yes
<p>Fortified sector of the Saarland (part of the Maginot Line) The Maginot Line is the defence line built by France in the period 1930-1940 in the run-up to the Second World War to protect its north-eastern border from invasion by Germany. The Maginot Line ran for 700 kilometres along France's north-eastern border. A small part of this line, known as the Saarland sector (40 kilometres in length), is situated in a marshy landscape, so inundations were planned there as a way of stopping the enemy from passing, instead of building forts.</p>	Yes
<p>German fortifications in Poland This category contains two separate defence lines built by Nazi Germany in what is now Poland. The construction of both the Pomeranian Line and the Oder-Warthe Line began in the 1930s and formed part of the German defence line against possible invasions from the east. The lines used existing lakes and river valleys to flood areas of land.</p>	Yes

Global context

Brief description	Yes/No
<p>Benin Lya Although they are outside the geographical and cultural context of the Defence Line of Amsterdam and the New Dutch Waterline, the fortifications around the ancient African city-state of Benin are part of a site that is still the subject of intense study. In most studies, it is described as a series of (frequently destroyed) moats around a central city location. There is no evidence of controlled inundation being part of the defence system.</p>	No
<p>Great Wall of China (1368-1644) – World Heritage Site At over six thousand kilometres in length, the Great Wall of China is one of the most iconic World Heritage Sites in the form of a fortified border. But the Great Wall has not been included in the comparative study, as inundation was not the main component of the defensive concept behind the Great Wall of China.</p>	No
<p>Khmer civilisations (Angkor World Heritage Site) The Angkor World Heritage Site – in Cambodia's northern province of Siem Reap – extends over approximately 400 square kilometres and consists of scores of temples, hydraulic structures (basins, dykes, reservoirs, canals) and communication routes. The Angkor archaeological park contains the remains of the various capitals of the Khmer Kingdom, from the ninth to the fifteenth century. The remains include the famous temple of Angkor Wat and the Bayon temple in Angkor Thom. The Khmer made full use of water in their buildings in the Mekong Delta, but here too there is no evidence that this involved the use of controlled inundation for defence purposes.</p>	No
<p>Pre-Columbian American civilisations There are few examples of lines of fortifications on the American continent where the indigenous peoples led a nomadic lifestyle. From a geographical and cultural point of view, the Maya would have been most likely to use controlled inundation but no evidence of this has been found. The poor availability of data complicates the further analysis of the fall of the Mayan culture.</p>	No
<p>Defence structures in India India has many defence structures, including a number of well-known structures that are also on the World Heritage List: Hill forts of Rajasthan, Red Fort Complex, and Agra Fort. No evidence has been found that controlled flooding was used as a means of defence to protect India's cities or parts of India.</p>	No
<p>Rideau Canal (1826 and 1832) – World Heritage Site The Rideau Canal is a monumental early-19th-century structure in Canada. The 202-kilometre-long waterway between south Ottawa and Kingston Harbour utilises parts of the rivers Rideau and Cataraqui. It comes out of Lake Ontario and was built primarily for strategic military purposes at a time when Great Britain and the United States vied for control of the region. The Rideau Canal was one of the first canals to be designed specifically for steam-powered vessels. Fortifications can also be found alongside the canal.</p>	Yes
<p>Yellow River flood (1938) The inundation of the Yellow River valley in 1938 was part of the Second Sino-Japanese War and delayed the advance of Japanese forces through the north of China. It was not a planned defence line but an ad hoc manoeuvre, and it certainly did not involve a controlled inundation.</p>	No
<p>Iran-Iraq War (1980-1988) During the Iran-Iraq War, the Iranians used inundations to delay the Iraqi invasion. However, these floods were not systematic and there was no fortified periphery or border. Neither did it form part of a line or an essential part of the Iranian defence concept.</p>	No

Details of comparative analysis

The preliminary study highlighted ten fortifications which are comparable to the New Dutch Waterline in a number of respects. These sites were compared in detail to the Defence Line of Amsterdam and the New Dutch Waterline in a follow-up study. The results of this study are presented below.

Dutch context

Precisely because the New Dutch Waterline, as an extension to the Defence Line of Amsterdam, is being positioned as a military defence system based on flooding (inundation), a comparison is also made with other Dutch defence systems based on a water barrier, i.e. the Old Dutch Waterline, the Grebbe Line, the Southern Waterline and the IJssel Line.

Old Dutch Waterline

The struggle for freedom and the foundation of the Netherlands as a nation led to the creation of the Old Dutch Waterline and marked a great leap in the technology of inundation-based defence. This technology was further developed in the New Dutch Waterline and used in a controlled way. This main defence line of the Republic of the Seven United Netherlands is the inextricable forerunner of the New Dutch Waterline. It had originally been an improvised waterline but a more planned approach was adopted after the Disaster Year of 1672, where the speed of implementation depended on the level of threat. In the eighteenth century, there were various extensions of the Old Dutch Waterline and a geographical shift to the east. In 1815, the Old Dutch Waterline was decommissioned and the part of the line that did not become part of the New Dutch Waterline lost its military function.

Holland's defence system shifted eastwards so that the important garrison town of Utrecht would be inside the area to be defended. The area covered by the New Dutch Waterline is partly (in the north and in the south) a continuation of the Old Dutch Waterline. Many older component parts of the New Dutch Waterline, including the fortified towns of Naarden, Muiden, Nieuwersluis, Gorinchem, and Woudrichem, also date back to the older line. However, the innovative development of an advanced inundation technology did not come about until after 1815, in the New Dutch Waterline.

The assessment of the Old Dutch Waterline below only relates to the old route that did not form part of the New Dutch Waterline.

Strategically deployed Landscape

The strategically deployed landscape along this part of the Old Dutch Waterline has disappeared, in particular around the fortified towns.

Water management system

The inundation system was rather rudimentary. It was a fairly improvised inundation. However, after 1673, developments were set in motion to take more control of the inundations.

Military fortifications

The development of further fort-building ceased as the military fortifications were no longer part of the main defence system. Many fortified towns in the Old Dutch Waterline were later to become part of the New Dutch Waterline.

Conclusion

The Old Dutch Waterline (known as the Dutch Waterline until 1815) can be regarded as the beginning of the planned use of water as a means of defence. The inundation system was fairly rudimentary. Initially, large areas were inundated by breaching dykes. However, developments were set in motion to take more control of the inundations, but the development into the ingenious water management system that ultimately characterises the New Dutch Waterline and the Defence Line of Amsterdam dates from a later period. The strategically deployed landscape of the Old Dutch Waterline has mostly disappeared.

Grebbe Line

The Grebbe Line is a waterline that was built in the mid-eighteenth century. In 1874, the Grebbe Line was designated a buffer or forward position of the New Dutch Waterline (Fortification Act). The Grebbe Line briefly became the main defence line of the Netherlands in 1940. Shortly before the German invasion of the Netherlands (May 1940), the line was upgraded to include over a hundred concrete casemates, numerous field fortifications and trenches. Some of the water management structures had not yet been completed. After it was decommissioned as a defence line in 1951, parts of the Grebbe Line were excavated and the earthworks became overgrown.

The Grebbe Line shares important features with the New Dutch Waterline. The heart of their defence systems was based on inundating areas of polder land. The Grebbe Line also had a well-thought-out water management system, was operational during the same period as the New Dutch Waterline and also boasts many similarities in terms of its main feature, strategically deployed landscape. The main differences are the scale and the size of military and water management structures. The Grebbe Line is less extensive than the New Dutch Waterline. The line only has one stone fort and a simple inundation system. It was more like an outpost or buffer line.

Strategically deployed landscape

The military landscape of the Grebbe Line is similar in a number of respects to that of the New Dutch Waterline. The Grebbe Line is situated outside the administrative and economic centre in a less densely populated region. It is partly for this reason that the regulations for military spatial planning that had such an important effect on the New Dutch Waterline were not nearly as visible in the spatial

structure of the area. The strategically deployed landscape around the cities of Amersfoort and Veenendaal in particular deteriorated after 1951.

Water management system

The Grebbe Line's water management system is generally similar to that of the New Dutch Waterline, including an inundation canal and military sluices. Given its modest size, the water technology is less varied than in the New Dutch Waterline and of a more limited scale.

Military fortifications

The Grebbe Line's military fortifications, which date from before its short-lived fame during the Second World War, are confined to one real fort, a number of batteries and a lot of machine-gun casemates. Unlike the New Dutch Waterline, the Grebbe Line consisted mainly of earth fortifications. The Grebbe Line also has many smaller concrete buildings (casemates and group shelters) from the period just before the Second World War. They are similar to those of the New Dutch Waterline and reflect the great importance of the Grebbe Line in this conflict. However, the buildings usually lack the diversity that characterises the New Dutch Waterline.

Conclusion

The Grebbe Line is an important line in the history of the development of waterlines. What is special about it is that this waterline still retains most of its eighteenth-century fortifications and inundation infrastructure. The Grebbe Line was a waterline but effecting inundations was problematic because – for a large part of the year – the water level in the Nether Rhine was too low. The Grebbe Line represents an important phase in the further development of the waterline to become a complex defence system with an ingenious water management system, the full extent of which can be admired in the New Dutch Waterline and the Defence Line of Amsterdam.

The Southern Waterline

When the northern provinces renounced the Spanish king in 1581, the northern border of Brabant became even more important. The river Eendracht, a tributary of the river Scheldt, ran between Brabant and Zeeland. In order to protect Zeeland and Tholen from an attack from Brabant, a number of polders along the Eendracht were inundated in 1583. Only the higher areas of the polders remained passable, making defence easy to oversee. Troops from Zeeland constructed fortifications on these higher areas, creating the first, albeit rather makeshift, waterline in Brabant: the Eendracht Line.

The term 'Southern Waterline' [Zuiderwaterlinie] was a collective term for a series of lines, forts, fortified towns, and other fortifications after the Eighty Years' War (1568-1648). The existing waters along the northern border of Brabant, e.g. the river Eendracht, the river Hollands Diep, the Biesbosch wetlands, and the river Meuse, were used to inundate the area between the fortified towns. During its entire existence, the Southern Waterline was inundated off and on for over 50 years, longer than any other waterline in the Netherlands. Once inundated, these areas formed an effective defence line.

This wide range of waterlines in the south of the Netherlands dates from different periods and reflects various standards in the construction of fortified towns, e.g. the Italian, Old Dutch, and New Dutch system of fortified towns, the Napoleonic Tour-Modèle, and additions from the First and Second World Wars. A number of them used water as a means of defence. The greater part of this line dates back to the seventeenth century and before, but was not upgraded after the second half of the 19th century to become a modern continuous waterline like the New Dutch Waterline. Initially, the Southern Waterline was not a centrally organised line either. Around 1800, parts of it were merged into a more cohesive system, which protected the Netherlands' southern border. During the Franco-Prussian War (1870-1871), it briefly functioned as an extension of the New Dutch Waterline.

Napoleon's defeat at Waterloo marked the end of French hegemony. With the rise of Prussia and later the German Reich, the threat from the east took on more serious forms during the nineteenth and twentieth centuries; the enemy was changing. The Fortification Act of 1874 saw the revision of the Dutch defences: the Defence Line of Amsterdam was constructed and the New Dutch Waterline was improved. This required a major investment. The Southern Waterline was no longer a priority. This line was, therefore, never fully developed to form the ingenious water management system that was optimised in the New Dutch Waterline and the Defence Line of Amsterdam.

Strategically deployed landscape

The strategically deployed landscape is still present along parts of the Southern Waterline, but large parts of it have also completely disappeared.

Water management system

The water management system boasts fine examples of eighteenth-century inundation technology. Further development of the water management system ceased in the early nineteenth century. After 1815, the innovative developments and the further refinement and expansion of inundation technology took place in the New Dutch Waterline, the national defence line.

Military fortifications

The various forts and fortifications represent a series of phases of development in military architecture. Many of the older forts consisted of earth embankments and fortifications. They have, to a considerable extent, disappeared from the landscape.

Conclusion

The Southern Waterline represents an important episode in the history of waterlines. The line developed from a series of fortified towns into a collection of lines, many parts of which can be regarded as waterlines. Inundation in the form of controlled flooding was refined in parts of the Southern Waterline in the eighteenth century. This was an important phase in the development of waterlines into unique and complex defence systems. Further

development in the Southern Waterline ceased with the construction of the New Dutch Waterline and the Defence Line of Amsterdam.

New IJssel Line (1950-1968)

The most recently constructed IJssel Line served as a delaying line that made it possible to transport troops overseas to Europe in the case of aggression from the east. After the Second World War, the Netherlands joined the North Atlantic Treaty Organisation (NATO) in 1949. At this point, Dutch defence strategy became part of a larger whole. In particular, the fear of Russian tanks resulted, once again, in the Netherlands using water as a weapon; a modern waterline equipped with floating concrete weirs was built. From 1951, the New IJssel Line stood ready as a defence line during the Cold War, which makes the IJssel Line the most modern waterline on this list.

Strategically deployed landscape

The New IJssel Line is interesting as a military landscape, as it is built in a relatively sparsely populated part of the Netherlands. The planning restrictions that applied during the active period of the Cold War affected urban development in this area. This is still visible today, but these restrictions were too short-lived to have a comparable impact on the landscape as in the case of the New Dutch Waterline.

Water management system

In view of its relatively recent history and its location along a river valley, the New IJssel Line has a water management system that is both similar to the New Dutch Waterline and considerably different from it. The scale is similar and its complexity is a good example of the Dutch expertise in the area of hydraulic engineering around 1960. Modern warfare imposed new demands on the inundation weapon: it had to be possible to effect a full inundation very quickly, which meant that the flood protection structures had to be more solid and also centrally located, based on the rapid flooding of the IJssel Valley instead of a slower, more controlled inundation of the polders. This is why the floating weirs were developed. The success of this waterline mainly depended on three weirs in the rivers IJssel, Rhine, and Waal. Their task was to ensure that there was sufficient water to quickly inundate the line. These innovative weirs could dam up the rivers Rhine, Waal and IJssel in times of war, quickly flooding the IJssel Valley.

Military fortifications

As a result of the prominent role played by the New IJssel Line during the Cold War period, the military fortifications do not include stone or concrete forts. Instead of large structures, smaller positions were chosen as they are more suitable for the more flexible form of warfare practised in the twentieth century.

Conclusion

The New IJssel Line can be regarded as the last development in the history of waterlines. Two innovations in the area of inundation technology are the floating weirs and the use of armoured steel. The line represents the last revival of an outdated concept. The advent of air

forces and airborne troops limited the resilience and therefore the importance of waterlines. The time of static defence lines was over. The New IJssel Line had a short service life and has left a limited number of remains in the landscape.

European context

In addition to the Dutch examples of waterlines described above, details of the most similar European examples are provided in the same way below.

Kronstadt (World Heritage Site)

In the Gulf of Finland lie two World Heritage Sites that demonstrate an affinity with characteristics of the New Dutch Waterline: Kronstadt in Russia and Suomenlinna in Finland. Kronstadt is a fortified Russian harbour town on the island of Kotlin in the eastern part of the Gulf of Finland and is part of the 'Historical Centre of Saint Petersburg and Related Groups of Monuments' site. From 1700, Kronstadt had a key military role in the defence of Saint Petersburg and was an important naval base. Various fortifications can be found in and around the city. In the past, there were forty-two forts situated on the north and south bank of the Gulf of Finland, some were in the city and one was on the west coast of the island of Kronslot. Some of the forts (including on the island) have been preserved. Others have disappeared as a result of the construction of a dam (Saint Petersburg Flood Prevention Facility Complex). There is a defence line on the west side of the city in the form of an old moat.

Strategically deployed landscape

The island with the fortified town was in a strategic location in the Gulf of Finland for the defence of Saint Petersburg.

Water management system

The fortified coastal town of Kronstadt did not have an inundation-based defence system similar to the New Dutch Waterline and the Defence Line of Amsterdam.

Military fortifications

Various forts and batteries on the island and in the southern and northern shipping route were built to deny enemy naval vessels access to the city of Saint Petersburg.

Conclusion

Kronstadt's defence was not based on controlled inundation as in the Defence Line of Amsterdam and the New Dutch Waterline.

Suomenlinna (World Heritage Site)

Suomenlinna (Fortress of Finland) was built in the second half of the eighteenth century as Sveaborg (Fortress of Sweden). Sweden began construction of the fortress in 1748 when Finland was still part of the Kingdom of Sweden. It is a coastal fortress, which was built gradually on a group of islands near Helsinki. The coastal fortress was needed after Peter the Great had occupied a strong maritime position with Kronstadt in the Baltic Sea. Suomenlinna was designated a World Heritage Site because the fortress is an

interesting example of military architecture of the time. It is a unique example of a fortress from the seventeenth and eighteenth centuries, in particular thanks to the bastion system.

Strategically deployed landscape

The site consists of a group of islands covering an area of about 210 hectares.

Water management system

Suomenlinna does not use inundation as a means of defence.

Military fortifications

Consisting of 200 buildings and 6 km of defensive walls, the fortress stretches over six separate islands. In the nineteenth century, the defence system was adapted to accommodate the military equipment used at the time.

Conclusion

Suomenlinna is not based on controlled inundation as is the case with the Dutch Water Defence Lines.

The Defence Line of Antwerp

The Defence Line of Antwerp was a military defensive belt around Antwerp and consisted of two rings of forts. The innermost belt of forts, which had the task of protecting the city from shelling and safeguarding it from occupation, was built between 1859 and 1914. Part of this ring also included inundation basins. The innermost ring of forts around Antwerp contains elements of the inundation technique used in the late nineteenth century. A great deal of the area around the city, approximately 60%, was protected by six inundation basins. In the run-up to the First World War, national military thinking in Belgium turned to a 'réduit national' approach, focused on Antwerp. Inundations gave way to a ring of enormous forts. This defence structure served as a national redoubt, the last refuge.

Strategically deployed landscape

The Defence Line of Antwerp has created a military landscape around the city, with the number of forts in the landscape being similar to the number in the Defence Line of Amsterdam and the New Dutch Waterline. However, the Belgian military landscape differs from the Dutch situation. In the Netherlands, inundations were at the heart of the defence system. The use of water around Antwerp was on a smaller scale and played a less vital part in the defence of Antwerp. The section of the defence line near the city where inundations were actually involved, around the mouth of the river Scheldt, is currently part of the international port of Antwerp. The landscape has changed drastically with the development of Europe's second-largest port for freight traffic.

Water management system

The geography around Antwerp matches the Dutch geography, with the city's water management system being incorporated into an existing polder landscape. This meant a more complex system could be created. By the beginning of the twentieth century, the Belgians had decided to build a second ring of ever bigger forts

and abandoned inundation as a weapon. Inundation, therefore, ceased to be part of their strategy. The result was that the water management structures that made it possible to flood the polders largely disappeared from the area around Antwerp. This process was accelerated by the rapid expansion of the port of Antwerp in the area that was once intended for inundation.

Military fortifications

The military fortifications built in this area are varied and are similar to structures in the New Dutch Waterline in terms of size. The development of the two defence lines in the nineteenth century was very similar. For example, the construction of the first, innermost ring of forts around Antwerp took place at the same time as the second and third phase of construction of the New Dutch Waterline. Examples can also be found in Antwerp of styles of fortification that had been important before 1839, such as the first ring of forts around Utrecht or the fortified towns of the Old Dutch Waterline, such as Naarden and Gorinchem, which were incorporated into the New Dutch Waterline. Antwerp was a fortress that had been developing since the Middle Ages and, during the Napoleonic period, adaptations were made and structures built outside the fortress itself.

In the later period, also known as the fourth and fifth phase of construction of the New Dutch Waterline and the entire construction period of the Defence Line of Amsterdam, the two lines also varied to some extent in terms of the construction of fortifications. Whereas, in the case of the Defence Line of Amsterdam and the New Dutch Waterline, the Dutch used the flooded landscape as their main means of defence and adapted the construction of fortifications to meet the various challenges that the land and landscape posed for them, the Belgians decided to build a series of ever bigger forts, abandoning inundation as a strategic element and shifting the emphasis to heavy fort-building operations.

Conclusion

The Defence Line of Antwerp has many features in common with the New Dutch Waterline and is probably the most similar site outside the Netherlands. This applies to the first ring of forts, in particular. The importance of inundation disappeared with the construction of the second belt of forts. For this reason, the site clearly differs both in terms of its primary defence strategy and in terms of the surrounding landscape from its Dutch counterpart, which can be regarded as a perfected waterline. Based on its function as national redoubt, the Defence Line of Antwerp is more readily comparable to the Defence Line of Amsterdam, although it remains true that inundations had a much more limited role.

Defence Structures of Copenhagen

During the first Danish-Prussian War (1848-1851), the Danes protected their capital city by flooding the area west of Copenhagen. By 1885, this had become a more permanent solution, with extensive inundation basins north of the city and a water management system consisting of weirs and sluices. Denmark remained neutral during the First World War and the inundation basins were never

used. The system ceased to be part of Danish military strategy from 1920 onwards.

Strategically deployed landscape

The strategically deployed landscape around the fortifications of Copenhagen has now been almost completely swallowed up by the city, especially the area to the north and north-west of the capital where inundation formed part of the defence strategy. The area that once contained the southern inundation basin is now a large business park and residential district. In the northern area, some inundation basins have become permanent lakes, otherwise they are largely fully built-up. This was possible because the fortifications ceased to form part of the Danish defence system from 1920 onwards. For almost a century, it has not been necessary to take account of a military use in planning legislation.

Water management system

The water management system of the Danish fortifications is similar to that of the New Dutch Waterline, but on a more limited scale. It originated from attempts made by the people of Copenhagen in the thirteenth and fourteenth centuries to direct water to their canals as the city did not have a major source of fresh water. The rudimentary inundations of 1848 made use of a simple earth dam. The more advanced inundation infrastructure built in 1886-1888 could fill a northern and a southern basin with water from Lake Furesø north-west of the city within eight days. In the case of a quickly advancing army, the northern part could be inundated within two days. To do so, a complex system of dams and sluices was used, some of which are still visible in the current landscape. This type of advanced inundation system has similarities with the system used in the New Dutch Waterline. One important difference is that inundations were not at the heart of the defence of the Danish capital, but were part of it. Another major difference is that the purpose of the water management system in the New Dutch Waterline was to achieve the same water level at knee height along the whole line, whereas the Danish system aimed to fill inundation basins quickly. The Danish system therefore differs from the New Dutch Waterline in two vital respects.

Military fortifications

The ring fortification around Copenhagen was built around the same time as the Defence Line of Amsterdam, between 1885 and 1894. Furthermore, the comparable geographies of Copenhagen and Amsterdam confirm the similarities between the Danish fortifications and the Defence Line of Amsterdam, with Trekroner fort island as the counterpart of the island of Pampus in the former Zuiderzee. The defence structures were built of concrete and date from one brief period. The Danish forts therefore represent structures of a single period, whereas the Defence Line of Amsterdam and the New Dutch Waterline together contain a wide diversity of structures.

Fortified sector of the Saarland, part of the Maginot Line

Conclusion

The Copenhagen's ring defence line is an example of a waterline but is more limited than that of the New Dutch Waterline. There are similarities in terms of the existence of a – partially still existent – inundation system, in particular. However, the scale of the system is more limited than in the New Dutch Waterline, as the project was designed to flood two small areas. The relatively short time that the fortifications were part of Danish military strategy also means that no real 'waterline landscape' was created. Moreover, the expansion of the city led to the disappearance of many of the remaining defence structures.

The Maginot Line is the defence line built by France in the period 1930-1940 in the run-up to the Second World War to protect its north-eastern border from invasion by Germany. The Maginot Line ran for 700 kilometres along France's north-eastern border. A small part of this line, known as the Saarland sector (40 kilometres in length), is situated in a marshy landscape, so inundations were planned there as a way of stopping the enemy from passing, instead of building fortifications. The defence structures deemed necessary were built in such haste that the inundations attempted in 1940 were only partly successful. The water management system was simple and lacked the scope of the New Dutch Waterline.

Strategically deployed landscape

While it is true that the military landscape of the Maginot Line as a whole was on a large scale, much of it has been dismantled since the end of the Second World War, as was noted in the ICOMOS assessment of the nomination of the Defence Line of Amsterdam for the World Heritage List in 1995. Because of its relatively short existence (construction of the line did not begin until 1930), no visible military landscape was created in the area.

Water management system

The use of water in the Maginot Line was limited to the Saarland Sector, where a number of sluices and dykes were built when Germany re-occupied Saarland. These structures did not operate efficiently and made accurate inundations impossible.

Military fortifications

All military fortifications in the fortified Saarland sector date from a period of not more than ten years, during which the line was built to defend France. They are, therefore, fairly uniform and do not reflect a long-term technological development in the field of military architecture, as does the New Dutch Waterline. The construction of the defence structures in the area was limited. Sporadic efforts were made along a number of possible invasion routes and, in view of the innovations in the area of fortifications, smaller structures were the preferred option.

Conclusion

The fortified Saarland sector as part of the Maginot Line was a short-lived attempt to use waterline technology. This line was not at the heart of France's defensive concept and was therefore limited

Ostwall; German fortifications in Poland

in scope. The Maginot Line has also left few traces behind in the landscape.

This category contains two separate defence lines built by Nazi Germany in what is now Poland. The construction of both the Pomeranian Line and the Oder-Warthe Line began in the 1930s and formed part of the German defence line against possible invasions from the east. The lines used existing lakes and river valleys to flood areas of land.

Strategically deployed landscape

In view of the short period for which it existed, the Ostwall did not have time to permanently shape the landscape. Moreover, the inundation areas were of limited size, which reduced their impact on the spatial development of these areas.

Water management system

In both parts of the Ostwall, the use of water as a means of defence differed greatly from the systematic and controlled system of the New Dutch waterline. The lines were built in a brief period of time and in areas without a history of water management. This is the reason why the water management system hardly developed in comparison to the high standard of management that was achieved in the Netherlands. In Pomerania, the low-lying landscape with its countless lakes encouraged the use of inundation to join lakes together, in the same way as in Copenhagen, though never as complex or advanced as in the Dutch system. In the case of the Oder-Warthe Line, an emergency plan was prepared to flood the river valleys by means of a number of weirs and reservoirs but, just as in Pomerania, it was intended as an emergency measure to reinforce the line and not as the heart of the defence system.

Military fortifications

The military fortifications on the Pomeranian Line and the Oder-Warthe Line were built almost completely of reinforced concrete. There is not a great variety of building styles or materials, such as in the case of the New Dutch Waterline. Large parts of the Ostwall were dismantled or destroyed after the Second World War.

Conclusion

The Pomeranian Line and the Oder-Warthe Line are exponents of a phase in the history of defence lines, but they are not real waterlines. With a total active period of only fifteen years in the region, they do not have the multiple construction layers that go to make up the complex landscapes of the New Dutch Waterline. They are hard to distinguish in the landscape.

Global context

When comparing existing World Heritage Sites to a defensive function, attention quickly shifts to two large-scale defence lines: the Great Wall of China and the Borders of the Roman Empire. They are both defence lines of outstanding universal value. This also applies

Rideau Canal

to fortifications in India (e.g. the Hill Forts of Rajasthan, Red Fort Complex, and Agra Fort). However, none of the defence lines are comparable to the New Dutch Waterline. After all, the above World Heritage Sites did not use water as a means of defence in such an ingenious way and on such a large scale. One World Heritage Site outside Europe is an exception: the Rideau Canal.

A World Heritage Site that did use water is the Rideau Canal in Canada. This canal was completed in 1832 and has been a World Heritage Site since 2007. It was built for reasons of military strategy during a period in which Great Britain and the United States were in a struggle to win hegemony over the region. This site contains a number of defence structures at the point where the canal flows into Lake Ontario. The canal's water management system is relatively complex. It has weirs and sluices, including some of the best-preserved sluice complexes on the American continent dating from the European period. That is where the resemblance ends. The canal was intended as a transport system. The site is on the World Heritage List because of its value as a canal. The canal itself was not a defence line and did not have the capability of effecting inundations. The Rideau Canal cannot therefore be classified as a military waterline.

Conclusion of the comparative study

Dutch context

The Netherlands had ten waterlines. The struggle for independence, combined with the location and availability of water – large parts of the Netherlands are below sea level – meant that the Dutch relied upon water as an ally. The use of water as a means of defence has been further refined over the centuries, as is evident from the development of the waterlines over the centuries, from simply breaching dykes to innovative fan sluices. The priority was always to control the water level.

All the waterlines studied can therefore be regarded as 'forerunners' or reflections of the New Dutch Waterline and Defence Line of Amsterdam. They have played a part in developing inundation technology and military architecture. Developments in the area of hydraulic engineering and military architecture reached their apex in the nineteenth and twentieth centuries, as is evident from the New Dutch Waterline and Defence Line of Amsterdam. Together they provide a complete picture of a waterline at its apex.

The modern New IJssel Line occupies a place of its own. Over the centuries, the Netherlands had identified so strongly with waterlines as a defence concept that it took some time for it to depart from this concept. For this reason, the New IJssel Line was another short-lived attempt to base the defence system on a waterline in the 1950s.

European context

Even after making comparisons with other defence lines within the European context, it is evident that there are no other waterlines that can compete or are comparable to the Dutch Water Defence Lines. The Defence Line of Antwerp has many features in common

with the New Dutch Waterline and is probably the most similar site outside the Netherlands. But this line clearly differs in terms of hydraulic engineering as well as the surrounding landscape from its Dutch counterpart.

The fortifications of Copenhagen can also be compared to the Defence Lines of Amsterdam and the New Dutch Waterline, but are more limited in scope. They have similarities, especially as regards the inundation system, part of which survived. However, its scale was more limited than in the New Dutch Waterline, as the inundation system was designed to flood two small areas. The relatively short time that these fortifications were part of Danish military strategy also means that no 'waterline landscape' was created. Moreover, the expansion of the city led to the disappearance of many of the remaining defence structures. Neither did the fortified Saarland sector and parts of the Ostwall have a complex water management structure, the inundation of polder areas was not at the heart of their defensive doctrine and the system could not be clearly distinguished in the landscape.

After studying other defence systems in Europe that used water as a means of defence to some extent, it has become clear that there are no other waterlines that can bear comparison with the Defence Line of Amsterdam and the New Dutch Waterline on the basis of criteria (ii), (iv) and (v).

Global context Only one World Heritage Site outside Europe has any similar features, the Rideau Canal. It boasts a number of ingenious sluice complexes, but they were not used for defence. It is not a military defence line based on inundation.

In the comparative analysis, three World Heritage Sites were studied on the grounds of a preliminary exploration in which another seven World Heritage Sites involved. This shows that there are no World Heritage Sites that have features comparable to the Defence Line of Amsterdam and the New Dutch Waterline combined.

In the diagram below, a cross means that the line in question does not have that characteristic, the check mark means that it does have the same characteristics as the Dutch Water Defence Lines, and both cross and check mark mean that this comparative characteristic is only partially present. This is described in detail in the text of the Comparative Analyses.

Name of World Heritage property or other heritage asset	Strategically deployed landscape	Water management structures	Military fortifications	Impressiveness	Period	Integrity and authenticity
Dutch context						
Old Dutch Waterline	x	x	x	✓	✓	x
Grebbe Line	✓	✓	x	x	x	✓
Southern Waterline	✓	✓	x	✓	x	x
IJssel Line	x	✓	x	x	x	x
European context						
Kronstadt (World Heritage Site)	x	x	✓	x	x	x
Suomenlinna (World Heritage Site)	x	x	✓	✓	x	✓
Defence Line of Antwerp	✓/x	✓/x	✓	x	✓	x
Fortifications of Copenhagen	✓/x	✓/x	✓	x	✓	x
Maginot Line (Saarland sector)	x	x	x	x	x	x
German fortifications in Poland	x	x	x	x	x	x
Global context						
Rideau Canal – World Heritage Site	x	✓	x	x	x	✓

3.3 Proposed statement of outstanding universal value

a) Brief synthesis

The Dutch Water Defence Lines form a complete defence system extending more than 200 km along the administrative and economic heartland of Holland, consisting of the elongated New Dutch Waterline and the Defence Line of Amsterdam defensive ring. Built between 1815 and 1940, the system consists of an ingenious network of 96 fortifications, acting in concert with an intricate system of dykes, sluices, pumping stations, canals and inundation polders, and is a major example of a fortification based on the principle of temporary flooding of the land. Since the 16th century, the people in the Netherlands have used their special knowledge of hydraulic engineering for defence purposes. The polders along the line of fortifications have their own flooding facilities. The depth of flooding was a critical factor in the Dutch Water Defence Line's success; the water had to be too deep to wade and too shallow for boats to sail over.

Because the Dutch Water Defence Lines were continually being updated due to advances made in military tactics and knowledge of water management, they offer a unique and comprehensive overview of 125 years of military water management in combination with fortifications. The exceptional coherence of the Strategically Deployed Landscape, Water Management System, and Military Fortifications can be seen to this day.

The New Dutch Waterline contains well-maintained, exceptional water management structures, including the first fan sluice, a type of sluice that was later to be used worldwide. The Defence Line of Amsterdam includes forts that have an important place in the development of military engineering worldwide. They mark the shift from the conspicuous brick/stone casemated forts of the Montalembert tradition, in favour of the steel and concrete structures that were to be brought to their highest level of sophistication in the Maginot and Atlantic Wall fortifications. The combination of fixed positions with the deployment of mobile artillery to the intervals between the forts was also advanced in its application.

b) Justification for the criteria

Criterion (ii) The Dutch Water Defence Lines are an exceptional example of an extensive integrated European defence system of the modern period which has survived intact and well conserved since it was created from the beginning of the 19th century. It is part of a continuum of defensive measures that both anticipated its construction and were later to influence some portions of it immediately before and after World War II.

Criterion (iv) The Dutch Water Defence Lines are an outstanding example of an extensive and ingenious system of military defence by means of inundation, using characteristics and elements of the surrounding landscape. The well-maintained comprehensive overview of fortifications in their landscape context is unique within the history of European architecture. The forts illustrate the development of military architecture between 1815 and 1940, in particular the transition from brick construction to the use of reinforced concrete in the Defence Line of Amsterdam. This transition, with its experiments in the use of concrete and emphasis on the use of unreinforced concrete, is an episode in the history of European architecture of which material remains are only rarely preserved.

Criterion (ii) **Criterion (v)**
The Dutch Water Defence Lines are an exceptional examples of Dutch mastery of land and water management. They are notable for the unique way in which the Dutch genius for hydraulic engineering has been incorporated into the defences of the administrative and economic heartland of the country, including the nation's capital city.

c) Statement of integrity

The Dutch Water Defence Lines and their individual attributes are a complete, integrated defence system. The defence system has not been used for military purposes since World War II and was formally decommissioned in 1963.

The main defence line and the inundation fields have remained clearly recognisable in the landscape, in part because many of these landscape elements also had a civil function. The characteristic openness of the inundation fields was retained in those sections of the Dutch Water Defence Lines where the pressure of development was low following their military use. Especially in urban areas this pressure of development was and is present and policy measures were taken to prevent further damage to the visual integrity of the inundation fields and the main defence line.

The range of hydraulic works and military fortifications that supported the inundation defence system form a single unit and are intact, including in their interconnection and their relationship with the landscape. The forts, batteries, and field fortifications form a group of interconnected buildings of which the successive construction phases are clearly identifiable. As the surrounding area of each fort was a restricted military zone for many decades, its setting has been preserved through planning development control, although it could in the future be vulnerable to development pressures.

d) Statement of authenticity

The Dutch Water Defence Lines still are a coherent man-made landscape, one in which natural elements such as water and soil have been incorporated by man into a built system of engineering works, creating a clearly defined military landscape. The military use has been terminated, but the landscape and built attributes are still present. The large majority of fortifications has been preserved as they were designed and specified. The Outstanding Universal Value is expressed in the authenticity of the design (the typology of forts, sluices, batteries, line ramparts), of the specific use of building materials (brick, unreinforced concrete, reinforced concrete), of the workmanship (meticulous construction apparent in its constructional condition and flawlessness), and of the structure in its setting (as an interconnected military functional system in the manmade landscape of the polders and the urbanised landscape).

Since the nineties, with the utmost care, efforts are being made in restoration, maintenance, accessibility, repurposing, and exploitation of the defence line and individual attributes. There have been no large-scale reconstructions; a number of small-scale examples of reconstruction have educational purposes and are recognisable as such. A large number of forts now has an educational, recreational or economic function. The military history remains tangible, in part because historical narratives continue to be told in the area itself and through various media.

e) Protection and management

The national government obliges provinces and municipalities to include the preservation of Outstanding Universal Value in regional and local plans and legislation. The basis for this obligation lies in the Spatial Planning (General Rules) Decree (*Besluit algemene regels ruimtelijke ordening*, or Barro) and, from 2021, the Environment and Planning Act already adopted. In addition, all structures of the New Dutch Waterline are protected as nationally listed buildings, and the connection with the landscape is also protected through clustering of these structures. A number of built attributes of the Defence Line of Amsterdam are also protected as nationally listed buildings; the remaining built attributes in the Defence Line of Amsterdam are protected as provincially listed buildings. In all these cases, there is a licensing requirement for architectural and spatial planning developments, which is linked to the preservation of the monumental character.

Together, the provinces of Noord-Holland, Utrecht, Gelderland, and Noord-Brabant act as site-holder of the Dutch Water Defence Lines. The administrative portfolio holders of these provinces work together in the Dutch Water Defence Line Committee. Actual implementation is currently in the hands of two project offices, namely the project office for the Defence Line of Amsterdam and the programme office for the New Dutch Waterline. The two management organisations will merge to form one joint executive organisation starting 1 July 2020. This organisation will execute a comprehensive management plan.

The Dutch Water Defence Lines protected the economic and administrative heartland of the Netherlands. The pressure of urban development is great in some parts, in particular where the defence system has been constructed a short distance from urban areas. Developments are only permitted if they fall within the planning framework and they have been designed in such a way that they preserve or reinforce the OUV. This requires of the site-holder and other governments involved a meticulous consideration and precise assessment against the integrity and authenticity of the World Heritage Site. For this, checks and balances have been integrated. Large-scale initiatives with a potentially large impact are subjected to a Heritage Impact Assessment (HIA). A strategic HIA of the proportion to the World Heritage Site is carried out in the case of potentially far-reaching developments (such as energy transition). Recommendations from independent experts are structurally enshrined in the process, both on the level of the World Heritage Site as a whole (spatial quality advisory team), the provincial level (provincial spatial quality advisor), and the local level (building aesthetics committee and listed buildings committee).

A large group of people is seated at long wooden tables in an outdoor courtyard. The background features a tall, weathered brick wall with several arched openings. Large trees with green leaves are visible in the foreground and to the right, partially obscuring the wall. The scene is brightly lit, suggesting a sunny day. The people are engaged in conversation and eating. The ground is paved with cobblestones.

4

State of
conservation and
factors affecting
the property

4.a Present state of conservation

This section addresses the present state of conservation. The Significant Boundary Modification focusses mainly on the extension of the Defence Line of Amsterdam, designated a World Heritage Site in 1996, to include the New Dutch Waterline. This combination will be given the designation Dutch Water Defence Lines. This section is limited to the state of conservation of the New Dutch Waterline, with the existing World Heritage Site being addressed only indirectly. For the Defence Line of Amsterdam World Heritage Site, a reporting requirement is linked to its world heritage status.

The New Dutch Waterline

The New Dutch Waterline covers a large part of the central Netherlands. Large sections have maintained their clearly open and agricultural character, whereas other sections are mainly dominated by suburban development. The context of the New Dutch Waterline has a considerable impact on the method of conservation and character of the Waterline. Since the beginning of the nineteenth century, the initiative phase of the Line, the landscape (the setting) of the waterlines has further developed. The military defence function has continually anticipated this to compensate for the digging of the Amsterdam-Rhine Canal. The construction of the Explosion Sluice is the most expressive example of this. The waterline developed militarily in the construction phases described in section 2.b.3. The current interest and the basis of support for the waterlines have ensured that the waterlines are well maintained. In general, the New Dutch Waterline is in a very good state of conservation. The present state is partly due to the restrictive military legislation that made it impossible to develop the inundation fields and Prohibited Circles of the Waterline until 1963. Only after the building restrictions arising from this legislation were lifted, were some parts of the Waterline developed. The New Dutch Waterline has remained well preserved after it was placed on the Provisional List (1995, revised in 2011) and designated a National Project (1999) and National Landscape (2005). Since that time, national, provincial, and municipal governments have worked on making the Line recognisable and enabling people to experience it. Many of its characteristic structures have also been consolidated and restored. Many forts have been repurposed, which has kept the physical condition of the structures intact.

The present state of conservation can best be assessed on the basis of a division into three parts of the attributes that convey the OUV: Strategically Deployed Landscape, Water Management System, and Military Fortifications. The nature of the attributes varies strongly in terms of size, typology, and function.

Given the size of the heritage property, also known simply as the property, it is not very surprising that the number of owners is so large. The ownership of the physical attributes varies greatly. The majority of the main defence line still has a water management function. The responsibility and ownership is in hands of the three water authorities. The land of the inundation basins is mainly owned by private owners (farmers) and nature conservation organisations.

Strategically Deployed Landscape

The present state of conservation of each outstanding characteristic is described below. For more information on the description of the attributes, we would refer you to appendix 1. The information presented in this section is used further in this dossier, when the subject is monitoring the state of conservation of the nominated property in the future.

The essential attributes in the Strategically Deployed Landscape are the main defence line, the inundation basins, and the accesses. The present state of the Strategically Deployed Landscape is determined by the way the landscape is used. Together, the inundation basins form the most extensive attribute within the property. Large parts of the inundation basins are used for agriculture, or are nature reserves or recreational areas. The large majority of agricultural plots still has an open character today and reflects the former military landscape. Originally, the inundation areas had a dual function. The lands had been cultivated long before the line was built and were used for agriculture. This agricultural use is mainly pasture land for dairy farms and stockbreeding. A powerful and effective tool is available to safeguard the openness of these inundation areas: the rural zoning plan. This zoning plan limits the construction possibilities in the rural areas and limits the functions and use of the land. Existing building plots have been identified and may not be enlarged. In principle, new building locations in the rural areas are not permitted and their agricultural use cannot be modified. There is European legislation for farmers in support of this: the Common Agriculture Policy (CAP). The CAP sets conditions for dairy and livestock farmers who wish to qualify for subsidies. These conditions relate to the use of the pasture lands. For example, limitations are set for the cultivation of crops that affects the openness of the inundation fields. In addition, volunteer conservationists help farmers

Agricultural area along the Diefdijk



with the management of their open grassland-bird areas. The public care of grassland birds contributes to the conservation of the open inundation areas of the waterlines. The agricultural areas are not threatened by natural processes. They are not subject to erosion. Owner of the plots are legally required to maintain the ditches around the pastures and fields. This maintenance is checked annually by the water board.

Another section of the inundation fields has been designated a nature reserve of international and/or national importance. In addition, the nature reserves often have an important secondary function as a water-storage location. International and national legislation (the Birds Directive, the Habitat Directive, and the 2017 Nature Conservation Act) limits the use of these nature reserves. Provinces and municipalities have implemented this legislation in their provincial by-laws, nature policy plans, and municipal zoning plans. Far-reaching limitations are set for use and development possibilities. In this way, the existing openness and its use are safeguarded. The ownership and management of these nature reserves in in the hands of professional conservation organisations, e.g. the National Forest Service [Staatsbosbeheer], the Society for the Preservation of Nature [Vereniging Natuurmonumenten], Brabants Landschap, and 't Gooi Nature Reserve. The management plans are updated periodically, which includes verification and updating of cultural-historical information. There is no maintenance backlog in the management of the nature reserves.

Today, the main defence line has various functions. In addition to its former defence function, this continuous line has other functions. In essence, there is still a dyke body in the landscape. The continuity of this line is essential. Sections of the dyke still have a water management function. Management and maintenance of this flood defence dyke are the responsibility of the water board. The quality standards for maintenance are laid down by law. For more information, also see the following section.

A road often runs along the top of the dyke. In many cases, this is provincial road, meaning that the management and maintenance of the main defence line is a responsibility shared between various authorities. An example of this is the collaboration between the province of Gelderland and the Rivierenland Water Board, working on the improvement of the 'Diefdijk'. 'Diefdijk' as a dyke had and still has an important function in the water safety within the Rivierenland dyke rings. Therefore, when constructing the motorway, two gates were installed in order to be able to close off Diefdijk in the case of flooding. This also preserves the inundation function of the Waterline. When the A2 motorway was widened in 2004, the layout as a compartment dyke was maintained and, in the design of this new infrastructural artwork, it was connected to the design of the line landscape.'

In the low-dynamic areas, the main defence line is in a good state of repair. Technically, the dyke body is in stable condition and there are no physical threats.



Diefdijk

In the more dynamic, suburban areas, the continuity and the recognisability of the main defence line is sometimes at risk due to space being claimed by residential construction and industrial estates, and by infrastructure challenges. In the case of such spatial developments, regional authorities are well able to incorporate the interest of cultural heritage into the plans at an early stage. In doing so, preservation of the continuity of the main defence line is leading.

The state of conservation at the accesses is difficult to describe clearly. An access is an intersection of the waterline, which leads to a vulnerable spot in the defensive system. This makes accesses not so much a physical attribute, but rather the result of the spatial characteristics of the terrain: the intersection of the main defence line by a river, canal, road, or railway. Many of the accesses give rise to the construction of additional fortifications such as forts or batteries. The essence of an access lies in the perceptible functional and spatial coherence between the main defence line, its intersection, and military fortifications constructed for the defence of this vulnerable spot. For the majority of the accesses, the perceptible functional and spatial coherence is easy to classify. The nature of the attribute is such that the physical state of conservation cannot be assessed.

Additional spatial protection of the Strategically Deployed Landscape follows from the existing designated urban and village conservation areas. The fortified towns of Naarden, Muiden, Weesp, Nieuwersluis, Gorinchem, and Woudrichem have been designated by the state as urban conservation areas. This results in a mandatory conservation zoning plan, focussing on the protection of values and qualities of the urban and village conservation areas. This guarantees the characteristics of the fortified towns. There is no restoration backlog for the Waterline attributes within the conservation areas.

The characteristic prohibited circles around the defence structures have maintained their distinctive openness for the most part, with the exception of the suburban areas. Prohibited circles are a tool with which the Ministry for War could keep open the direct surroundings of defence structures. The Prohibited Circles Act set severe restrictions and building conditions for initiators who wanted to build near a fort. The prohibited circles form imaginary circles with building restrictions, resulting in visual openness around the defence structures. The value of these attributes lies in their visual openness, which is safeguarded by municipal zoning plans. Within the prohibited circles, construction was only permitted subject to conditions. The most important condition that the Ministry for War set was the building materials to be used. By using wood for construction, the army could be sure that removal of structures would be easy under the threat of war. The wooden structures could be set on fire or demolished. The existing wooden houses, built under the Prohibited Circles Act, have been surveyed and, following a selection process, the majority has been or will be designated a national monument. The houses are all in private ownership and mainly have a residential or agricultural function. The physical condition of the residences is fair to good. Wood is a vulnerable building material that requires a high degree of maintenance. Not every private owner is able to provide this. The Subsidy Scheme for the Preservation of Monuments (*Subsidieregeling Instandhouding Monumenten* or SIM) has been set up for monuments. On the basis of a six-year management plan, owners can apply for a subsidy of a maximum of 50% of the conservation costs from the Cultural Heritage Agency.

Water Management System

The Water Management System has continued to function until the present day to control and manage the water level in the polders. Most of the attributes are managed and maintained by the water authorities. A number of attributes are owned and managed by municipalities. The responsibility for the management and maintenance of the ditches between de plots lies with the owners of the adjacent plots. The state of maintenance is safeguarded by the so-called 'Keur' or water authority by-law; a periodically updated, legally recognised government document. The Keur lays down and prescribes maintenance obligations. The legal basis for the Keur is the Water Act and the Water Authorities Act (section 78).

The most important attributes within water management are the water management structures and the rivers and canals. Concrete examples are: main inlets, fan sluices, pumping stations, and inundation canals. In the Dutch Water Defence Lines, the Water Management System is owned by five water boards and by a number of municipalities and provinces. They carry out the appropriate functional maintenance; they are required by law to do so. The maintenance instructions for water management structures and all waterways are also laid down in the Keur. The Keur differentiates between the importance of different waterways. Management and cleaning of primary waterways is the responsibility of the water authorities. Management of secondary waterways is also the responsibility of the water authorities, but cleaning is the responsibility of the owners of the adjacent plots. The cleaning and man-



Main inlet sluice Fort Everdingen

agement of tertiary waterways is entirely the responsibility of the owners of the adjacent plots. Historically speaking, the Water Management System has a dual function: civil water management and regulating the water level for the defence of Holland. In peace time, the water management structures were, of course, used for the civil function: protecting the land from flooding and carrying off excess water. The low level of the polders makes water management necessary for farmers. This permanent use of the Water Management System is the most important reason that the state of maintenance of this category of objects is very good. Some of them have been updated to meet today's safety requirements. This includes, for example, the river dykes that have a primary function as flood defences. Various water management structures are protected by the highest monument status, the status of national monument [*Rijksmonument*]. This protection ensures that any required changes and the functional maintenance do not have an adverse effect on the integrity and authenticity of the attributes. The inundation and supply channels are also protected by the state with monument status. This status guarantees the conservation of these attributes. A Subsidy Scheme for the Preservation of Monuments has been set up for monuments. On the basis of a six-year management plan, owners can apply for a subsidy of a maximum of 50% of the conservation costs from the Cultural Heritage Agency. There is no restoration or conservation backlog for the water management structures.

Permanent attention is paid to the safety of the inhabitants of the Netherlands. Regulation of the water level in the major rivers and the state of maintenance of the Dutch river dykes are matters of national importance. This ensures an excellent state of maintenance of rivers, flood plains, and dykes. The dykes are regularly modified to meet changes in climate requirements. Parts of the current river dykes no longer meet the safety requirements set for future water management. Technically speaking, the dykes are in excellent condition, but they will not be able to handle the expected higher river levels within the safety requirements. This results in a planning process for dyke reinforcement. The responsible water authorities pay structural and extensive attention to all relevant interests, such as the cultural-historical values of the dykes and other attributes, and also to the interests of nature and the local residents. The existing cultural-historical values are taken into account during framework development, planning, and realisation of the dyke reinforcement. The most important tool used for the conservation of these objects are the Heritage Act (duty of care for the existing monuments) and the Water Act (management and monitoring). The legislation in the Water Act will be incorporated in the Environmental & Planning Act as per 2021.

Military Fortifications

Forts and batteries form essential fortifications in places where the land cannot be sufficiently inundated. During the construction of the New Dutch Waterline, mainly new defence structures were built, but a number of existing fortified towns and castles were also used. All forts, castles, batteries, and scattered structures located in the New Dutch Waterline have been designated national monuments; the fortified towns are urban conservation areas. The structures within the Defence Line of Amsterdam in part have the status of national monument and in part that of provincial monument. Most of the forts have been given a new function in the past decades. Thanks to the monument status, the necessary adaptations to the forts and other military structures to suit their current functions have been carried out with care. Furthermore, the robustness of the Military Fortifications ensures that they are not or are hardly subject to damage or physical degradation.



Fort Nieuwersluis

Defence Line of Amsterdam				
Number	Name	Owner	User	Use
1	Fort near Edam	State Forest Service	St. Fort near Edam	Nature conservation, regular guided tours
2	Fort near Kwadijk	Private	Apollo Dumpstore	Storage
3	Fort north of Purmerend	Private	J. Bart B.V.	Wine wholesale
4	Fort along Nekkerweg	Landschap Waterland	Fort Resort Beemster	Hotel and wellness
5	Fort along Middenweg	Nature Preservation Society	Same	Nature conservation
6	Fort along Jisperweg	Nature Preservation Society	Same	Nature conservation
7	Fort near Spijkerboor	Nature Preservation Society	Voluntary group	Brewery. Large part of fort still vacant, but regular guided tours
8	Fort Marken Binnen	State Forest Service	St. RBOC and FORTtreffelijk	Firefighter training centre and events venue
9	Fort near Krommeniedijk	Landschap Noord-Holland	Same and Heeren van Zorg	Visitors' centre for Defence Line of Amsterdam and residential/training centre for people with autism
10	Fort along Den Ham	Central Government Real Estate Agency	St. Fort along Den Ham	Small museum
11	Fort near Veldhuis	Landschap Noord-Holland	St. ARG40-'45	War museum
12	Fort along St. Aagtendijk	Landschap Noord-Holland	Same and Stichting Fort Pop	Rehearsal space for musicians and Landschap Noord-Holland stewardship unit
13	Fort Zuidwijkermeer	Landschap Noord-Holland	Savoir vivre lifestyle	Cheese storage
14	Fort near Velsen	Private	Kruk (private firm)	Storage
15	Fort near IJmuiden	Municipality of Velsen	PBN and voluntary organisations	Events and museum
16	Fort north of Spaarndam	Spaarwoude Leisure Authority	None	None
17	Fort south of Spaarndam	Spaarwoude Leisure Authority	Miscellaneous	Hospitality and child care
18	Fort near Penningsveer	Central Government Real Estate Agency	St. Fort near Penningsveer	Group accommodation, wine importer and cooking workshops
19	Fort near the Liebrug	Spaarwoude Leisure Authority	Miscellaneous	Wine importer and saddlery
20	Fort along the Liede	Central Government Real Estate Agency	None	None
21	Fort near Heemstede	Municipality of Haarlemmermeer	None	Park
22	Advanced fort near Vijfhuizen	Province Noord -Holland	St. Kunstfort Vijfhuizen	gallery, catering, business space
23	Fort near Vijfhuizen	Province Noord - Holland	St. Kunstfort Vijfhuizen	art gallery and catering

Defence Line of Amsterdam				
Number	Name	Owner	User	Use
24	Battery on the IJweg	Township Haarlemmermeer	St. fort of Hoofddorp	will be catering and a park with open-air theater
25	Fort near Hoofddorp	Municipality of Haarlemmermeer	St. Fort near Hoofddorp	To be converted to hospitality and park with outdoor theatre
26	Battery on the Sloteweg	Township Haarlemmermeer	-	-
27	Fort near Aalsmeer	Municipality of Haarlemmermeer	St. Crash and Boer Bos	Museum and training centre
28	Fort near Kudelstaart	Municipality of Aalsmeer	None as yet	Will be tendered soon
29	Fort near De Kwakel	Private	Bart 't Fort	Hospitality and club house
30	Fort along the Drecht	St. BHEIJ and Landschap Noord- Holland	Miscellaneous	Hospitality, exhibition space and club house
31	Fort near Uithoorn	State Forest Service	Fort Amstelhoek	None as yet
32	Fort Waver-Amstel	Nature Preservation Society	Krimpenfort wines	Wine storage
33	Fort in the Waver	Natuurmonumenten	Krimpenfort wines	Nature
34	Fort along the Winkel	Central Government Real Estate Agency	None	None
35	Fort Abcoude	Nature Preservation Society	St. Fort Abcoude	None
35A	Battery along the river Gein	Natuurmonumenten	Krimpenfort Wijnen	Wine storage
36	Fort near Nigtevecht	Nature Preservation Society	De Gedenkplaats	Memorial, exhibition space and workshops
37	Fort near Hinderdam	Nature Preservation Society	None / not open to public	Nature conservation (no access)
38	Fort Uitermeer	Province of Noord-Holland	St. Uiteraard Uitermeer and Prov N-H	Hospitality sector / Nature conservation / Storage for road management
39	Fortified town of Weesp including Fort Ossenmarkt	Municipality of Weesp Municipality of Weesp	Miscellaneous Miscellaneous	Clubs and small businesses Lease / Office
40	Fortified town of Muiden (including Muiderslot Castle & Muizenfort)	Municipality of Gooise Meren and private State (Min. of Education, Culture and Science)	Miscellaneous Muiderslot Castle National Museum Miscellaneous	Hospitality, marina, clubs and small businesses Museum / Lease / Art / Events N/A (no access)
41	West Battery	Municipality of Muiden	Scouting	Scouting / Lease
42	Fort Kijkuit	Nature Preservation Society	Same	Business premises of Nature Preservation Society
43	Coastal battery near Diemerdam	Stadsherstel Amsterdam	Paviljoen Puur	Licensed premises
44	Fort along the Pampus	Pampus Foundation	Same	Defence Line of Amsterdam Visitor Centre and hospitality

Defence Line of Amsterdam				
Number	Name	Owner	User	Use
45	Coastal battery near Durgerdam	State Forest Service	Lighthouse island	Licensed premises

New Dutch Waterline				
Number	Name	Owner	User	Use
46	Fort Ronduit	Stichting Monumenten Bezit	Miscellaneous	N/A (no access)
47	Fortified town of Naarden	Stichting Monumenten Bezit and private	Miscellaneous	Includes Naarden Fortress Museum, home furnishings retail, commercial and club facilities
48	Werk IV	Municipality of Gooise Meren	St. Beheer van Werk IV	Creative and cultural activities and events leasing
49	Batteries along Karnemelksloot	(SBB?)	Miscellaneous	Recreation / Scouting
50	Fransche Kamp	Goois Natuur Reservaat	Public	Nature conservation
51	Fort Spion	Waternet	Walking and cycling club / walking foundation	Small campsite
52	Fortified town of Nieuwersluis	Miscellaneous	Miscellaneous	Housing
53	Fort Nieuwersluis	Nature Preservation Society	Miscellaneous, including SLO	Nature conservation / Hospitality / Offices / Lease
54	Fort Tienhoven	State Forest Service	None	Nature conservation (no access)
55	Structure near Maarsseveen / C-Fordt	C-Fordt Foundation	C-Fordt Foundation	Lease / Art
56	Fort along the Klop	Municipality of Utrecht	Brasserie het Wachthuis	Hospitality / Lease / Campsite/ Overnight stays / Events
57	Fort De Gagel	Municipality of Utrecht	Under development / Miscellaneous	N/A (no access)
58	Fort Ruigenhoek	State Forest Service	State Forest Services / Miscellaneous	Nature conservation / Events
59	Fort Blauwkapel	Municipality of Utrecht	Miscellaneous	Residential / Scouting / Lease
60	Fort Voordorp	Private	Fort Voordorp B.V.	Lease / Events
61	Fort near De Bilt	Municipality of Utrecht	Vredeseducatie Foundation	Museum / Netherlands Royal Military Constabulary
62	Structures near Griftestein	Municipality of De Bilt	Partly open to public	Recreational / Nature conservation
63	Fort on the Hoofddijk	Utrecht University	UU Botanical Gardens	Museum / Nature conservation

New Dutch Waterline				
Number	Name	Owner	User	Use
64-67	Lunettes (1, 2, 3, 4)	Municipality of Utrecht	Miscellaneous	Hospitality / Scouting / Lease / Daytime activities / Museum
68	Fort near Rijnauwen	State Forest Service	Limited access	Nature conservation / Events
69	Fort near Vechten / Waterline Museum	State Forest Service	Nieuwland BV / Stichting Waterliniemuseum	Museum / Hospitality / Lease / Events
70	Fort 't Hemeltje	State Forest Service	INSID Foundation and others	Offices / Nature conservation
71	Battery along Overeindseweg	Private	Communication agency ID310	Offices / Nature conservation
72	Fort near Jutphaas / Wijnfort Jutphaas	Municipality of Nieuwegein	ondernemer BV	Shop / Hospitality / Lease
73	Fort Vreeswijk	Municipality of Nieuwegein	Miscellaneous	Lease / Community centre
74	Structure along Waalse Wetering	State Forest Service	Public	Nature conservation
75	Structure along Korte Uitweg / WKU	State Forest Service	Fort WKU - Reinaerde	Lease / Hospitality / Campsite / Day-care centre
76	Lunette along the Snel	Municipality of Houten	Lunet aan de Snel Foundation	Museum (future)
77	Fort near Honswijk	Municipality of Houten	Entrepreneurs and visitors	business accommodation and rental for film location, outdoor activities, parties, dinners, theater performances, network meetings
78	Structure along Groeneweg	State Forest Service	Public	Nature conservation
79	Structure along the Spoel	Municipality of Culemborg	Werk aan het Spoel Foundation	Hospitality / Art / Lease / Events
80	Fort Everdingen	Private	Duits & Lauret	Hospitality / brewery / lease / day-care centre
81	Work on the railway at the Diefdijk	State Forest Service	Private use	Live
82	Fort near Asperen	State Forest Service	Kunstfort Asperen Foundation	Art / Lease / Hospitality
83	The weapon site at Asperen	Township Lingewaal	Stichting GeoFort	Museum, catering, rental
84	Fort near Nieuwe Steeg / GeoFort	State Forest Service	GeoFort Foundation	Museum / Hospitality / Lease
85	Fort Vuren	State Forest Service	Wandel en Fiets Forten Foundation	Hospitality / Overnight stays / Lease / Events
86	Fortified town of Gorinchem	Miscellaneous	Miscellaneous	Housing
87	Brakel Battery	State Forest Service	None / Nature conservation	Nature conservation

New Dutch Waterline				
Number	Name	Owner	User	Use
88	Poederloijen Battery	State Forest Service	Bommelerwaard Foundation for the Preservation of the New Dutch Waterline	Nature conservation
89	Fort Giessen	Brabants-Landschap	Nature conservation society Altenatuur and Archaeological Society	Museum / Nature conservation
90	Loevestein Fortress and Castle	Formerly state-owned, now independent	Museum Slot Loevestein Foundation	Museum / Lease / Events / Hospitality
91	Fortified town of Woudrichem	Miscellaneous	Miscellaneous	Housing
92	Fort Altena	Brabants-Landschap	De Kwartiermeesters meeting and events spaces	Hospitality / Lease / Museum / Shop / Events
93	Fort Bakkerskil	Brabants-Landschap	Koos and Marjolein Lucas	Overnight stays / Hospitality
94	Fort Steurgat	Private	Owners' association	Housing
95	Fort Pannerden	State Forest Service	Foundation for the management and maintenance of Fort Pannerden	Hospitality / Museum

The forts and batteries have a wide array of owners. Most of the forts are owned by professional land management organisations, e.g. the Society for the Preservation of Nature [*Natuurmonumenten*], the National Forest Service [*Staatsbosbeheer*], and provincial landscape authorities, or by the government, and are under sustainable management, by their nature. These owners conclude long-term management and maintenance agreements with the operators or tenants of the forts, in which this sustainable management is imposed. Almost all forts have a partial public function, which means strict safety requirements are set for the use of the buildings and grounds. In years past, the site-holders have enabled owners and managers to learn from examples abroad and to acquire knowledge. The project organisation has taken part in INTERREG IV programme SHARE, 2012-2015. Among other things, this programme has led to acquiring experience in training and certifying volunteer managers and in the establishment of various management groups.

A number of non-accessible forts with a nature reserve function are experiencing a dilemma in terms of maintenance and management. The natural values gain from cautious maintenance, while the interest of heritage and the conservation scheme make large-scale maintenance of structures desirable and possible. This dilemma was brought up by the land management and nature organisations, discussions about a compromise are taking place with the Cultural Heritage Agency.

The Subsidy Scheme for the Preservation of Monuments has been set up for monuments. On the basis of a six-year management plan, owners can apply for a subsidy of a maximum of 50% of the conservation costs from the Cultural Heritage Agency. There is no maintenance backlog for the forts.

The budgets for large-scale restorations are managed in the Netherlands by the provinces. In the past 10 years, the provinces involved have offered the possibility for careful restoration of various defence structures through different implementation programmes. The secondary objective of these implementation programmes is to increase the recognisability in the area. Repair and new functions help in this process. The Military Fortifications in the New Dutch Waterline are in a very good state of conservation thanks to the many investments made over the past ten years. The management of scattered military structures on private land, such as the many concrete group shelters and casemates, requires special attention. There is sufficient public interest for management of these structures, in particular because the group shelters also have an ecological value for bats. This has led to various volunteer groups that manage the group shelters and casemates. Because the structures are made of solid concrete, they are not threatened with demolition or removal.

4.b Factors affecting the property

(i) Development pressures

The Defence Line of Amsterdam and the New Dutch Waterline together constitute the last military structure based on inundation on such an enormous scale that is still recognisable today. The waterlines are the final result of a period in which the Netherlands had one single defence strategy at the national level. As structures, they are still completely recognisable within the landscape.

The Defence Line of Amsterdam and the New Dutch Waterline cross one of the most dynamic, complex, and densely populated parts of the Netherlands. In this area, there is a wide variety of social, economic, spatial, physical, and ecological developments taking place. In future, new developments with diverse characteristics and societal interests will also present themselves. This mainly includes large-scale and complex developments relating to residential construction, infrastructure, activity, energy supply, and water management that require an integrated approach within the area. In principle developments could form a potential threat to the Defence Line and the Waterline or parts thereof, but they also offer opportunities to improve the Dutch Water Defence lines and enable even more people to experience them. It is within this context that the Netherlands has embraced UNESCO's Historic Urban Landscape Recommendation (2011) and is searching for ways in which cultural heritage can benefit from spatial developments and, conversely, ways in which

The Historic Urban Landscape approach (HUL)

In 2011, the general conference of UNESCO embraced the recommendation for the approach to the historic urban landscape. This approach to historic urban landscape focusses on maintaining the quality of the human environment, improving the productive and sustainable use of urban areas, with acknowledgement and recognition of their dynamic character, and advancement of social and functional diversity. The historic urban landscape is defined as the result of historical layers of cultural and natural values and attributes that goes beyond the concept of a 'historical centre' by including the broader urban context and the geographical surroundings. This approach recognises the natural and cultural, tangible and intangible, international and local values that every city has. These values must be used as the starting point for the general management of cultural heritage. The World Heritage Site can be used as an incentive and a source for the development of sustainable and resilient cities. This turns the management of cultural heritage in urban areas into the management of developments, instead of the prevention of developments. The successful management of a World Heritage Site in a complex environment requires a robust and continually developing range of instruments. These instruments can be divided into four categories:

1 Knowledge and planning

This focusses on monitoring and maintaining attributes with regard to integrity and authenticity. Examples include GIS, planning, and impact assessments;

2 Support and involvement

The stakeholders, owners, users, and local residents involved must be supported in the recognition of the core values of their neighbourhood or urban district, the drawing up of objectives, and the setting up of activities for the protection of sustainable development of the cultural heritage;

3 Policy and legislation

Policy and legislation take into account the local conditions. Protection is focussed on tangible and intangible values of the urban cultural heritage, including the social, cultural, and environmental values;

4 Financial resources

Subsidies, funds, public-private collaboration.

The Dutch vision of 'conservation through development' is in line with the vision as described above. For the Dutch Water Defence Lines, this approach becomes specific through the implementation of Strategic and Heritage Impact Assessments, the use of subsidies, the encouragement and support of marketing and exploitation, and collaboration in the Pact of Loevestein (2003) and the Pact of Ruigenhoek (2017).

cultural heritage can serve as a source of inspiration for an increase in the quality of the new developments.

In part on the basis of the ICOMOS recommendation of 2015 relating to the extension of the Defence Line of Amsterdam to include the New Dutch Waterline, a landscape analysis was drawn up with a link between the landscape characterisation and setting and the Outstanding Universal Values of the Defence Line of Amsterdam and the New Dutch Waterline. The main trends and developments facing the Dutch Water Defence Lines are set out in the landscape analysis (appendix 3). The overview below briefly sums up the current and planned transformation of the New Dutch Waterline.

Transformation of each sub-area

Triangle of fortified towns – Muiden, Naarden, and Weesp

- High-dynamic urban area
- Urban developments mainly on the safe side of the Defence Line of Amsterdam
- Urban pressure from Naarden (residential construction and recreation)
- Autonomous developments such as increasing urbanisation and business activities and increasing recreational pressure from the city

Vecht lakes area

- Low-dynamic
- Recreational pressure from the city, water sports recreation in particular
- Nature development with locally dense landscape as a result of becoming overgrown
- Connection to Noorderpark by means of bridges

Utrecht-East

- High-dynamic urban area
- The city is prominent and people can experience it
- Widening and upgrading of infrastructure (motorways, public transport, and slow transport connections)
- Great need for residential construction in Utrecht and surroundings; locations not yet known
- Autonomous developments such as increasing urbanisation and business activities and increasing recreational pressure from the city

Landscape of the major rivers

- Mainly low-dynamic
- Limited urban expansion around Gorinchem
- Upgrading of infrastructure (motorways and shipping)
- Flood risk management challenges along the rivers
- Local water storage, possibly combined with biomass cultivation
- Autonomous developments such as an increase in scale of agriculture, agricultural buildings being vacated, and increasing recreational pressure.
- Various projects to upgrade, strengthen, repair or open up the New Dutch Waterline or its structures.

Southern marine clay area

- Low-dynamic with urban centres
- Various expansions of business activity
- Widening of A27 motorway
- Flood risk management challenges along the rivers
- Increasing recreational development on triangle of fortifications comprising Gorinchem, Woudrichem, Loevestein Castle, and Fort Vuren
- Autonomous developments such as an increase in scale of agriculture, agricultural buildings being vacated, urban expansions, and increasing recreational pressure

Method for dealing with development pressures

The recognisability of the individual physical attributes in their inter-connection is essential for the preservation of the OUV. This interconnection is described in 3.1.c as:

- the linearity of the main defence line (a continuous, line-shaped elevation in the landscape that does not, however, take the same form everywhere);
- the landscape openness of the inundation fields (unpaved, flat, surrounded by dykes or quays);
- the water management structures that played a role in the inundation and, in their coherence, make it possible to follow the route of the inundation water (from main inlet to inundation field and, following the inundation, back to the main system);
- military fortifications with their Prohibited Circles (lines of fire) in relation to the accesses that they guarded;
- military fortifications in their successive architectural-historical phases.

Spatial development pressure that is at odds with these characteristics at system level is, in principle, diverted to areas outside of the site, in such a way that the integrity of the World Heritage Site also continues to exist visually. However, spatial development pressure can also be utilised to enhance the characteristics at system level. In the past, deterioration has occurred that can be repaired with new and integrated area development plans, in particular in zones in which the pressure of urbanisation is high. An example from the past can be found in Muiden, where an aqueduct was built for the widened A1 motorway. Another example is the plan presented in 2.a.5, for the area around Geniedijk in the Defence Line of Amsterdam. Urbanisation also involves an increasing need for leisure facilities. This combines perfectly with a reinforcement of the ability of people to experience and recognise the World Heritage Site. Recently created recreational routes and restorations of forts and other structures are living proof of this.

Of course, there are developments along the 220 kilometres of the proposed Dutch Water Defence Lines World Heritage Site that are not easily combined with reinforcement of the OUV, but for which there is no alternative location. This applies to infrastructure, in particular. Roads, canals, and railways running east-west must cross the line somewhere, and the location of logistical hubs such as Schiphol Airport and the Port of Amsterdam near the Defence Line of Amsterdam are historically explicable facts. Developments such as these require careful consideration on the part of the site-holder and other relevant authorities, in the course of which they always do sufficient justice to conserving the Outstanding Universal Values.

Area developments that combine preservation or reinforcement of the OUV with the inclusion of autonomous developments (unrelated to the World Heritage Site) always require customisation. For this, extensive tools are available that both protect the physical attributes and safeguard the quality of new developments. The HIA (Heritage Impact Assessment) is a part of this. Section 5 discusses this in greater detail. Below, we will be focussing on the developments that take place in and around the proposed World Heritage Site.

Rural areas

In low-dynamic areas, approximately 80% of the area of the Dutch Water Defence Lines, few major spatial developments are to be expected. The appearance of the line landscape there is constant. These are areas where agriculture and nature conservation dominate, with extensive shared recreational use. Large parts of the landscape are protected by policy, due to their ecological value or value as catchment zones for the city, in addition to protection due to their cultural-historical value. Preservation of a vital and profitable agriculture function is essential to keeping the inundation areas open. Autonomous developments such as the scaling up of agricultural operations can affect visitors' perception of the peaceful, mainly agricultural, character of landscape of the Defence Line of Amsterdam and the New Dutch Waterline. The location and scale of these changes will determine whether the effect is potentially negative or negligible. The construction of large-scale animal sheds in inundation fields or other locations that affect the visual integrity

is prevented by the current zoning plans for the outlying areas. In addition to the economic function, the recreational function of the areas is also of particularly great importance to the recognisability and the support for the preservation of the cultural heritage property.

High-dynamic areas

Together, the high-dynamic areas make up approximately 20% of the total area of the Dutch Water Defence Lines. These areas have various major social challenges. The most important of these follow from growth of the population and the economy, which also affects infrastructure, and from the transition to a sustainable energy supply.

The focus is on the following three zones:

- the Heemskerk-Schiphol zone in the Defence Line of Amsterdam, where there are many infrastructure challenges related to the presence of international logistics hubs (Schiphol Airport, the Port of Amsterdam), and where the inundation fields of the waterline were relatively narrow;
- the Vechtstreek-North region, where the pressure of recreation from nearby Amsterdam is high and which lies on the route between Amsterdam and Almere (the most important expansion city in the region); the three fortified towns of Muiden, Naarden, and Weesp are popular places to live;
- the 'Utrecht area', where the main defence line of the New Dutch Waterline traditionally ran close to the city's boundary, where the continually growing Utrecht Science Park was developed on the 'unsafe' (but locally not or hardly inundatable) side, and where urban developments relatively easily affect the (visual) integrity of the World Heritage Site.

For these three areas, 'area analyses' are being carried out that connect the World Heritage Site's OUV to other possible demands on space in the area. These analyses will examine to what extent and in which manner the pressure of development can be used to increase the OUV, and where such synergy has less chance of success and additional effort is required to preserve the OUV. Where necessary, these analyses have an additional effect of creating a framework for concrete area development plans, following conclusions by the Provincial Executive [*Gedeputeerde Staten*].

Living and working

The Amsterdam and Utrecht regions have a relatively fast-growing population and economy. This is reflected in the great necessity for new homes and commercial spaces. This involves 250,000 homes in the Amsterdam Metropolis region, and a maximum of 160,000 homes in the urban region of Utrecht. As far as possible, space for this is sought within the existing city boundaries, by transforming, grouping, and condensing (draft Environmental Strategy Noord-Holland 2050 and Utrecht Provincial Policy Strategy for Spatial Planning 2013-2018). However, it is clear that construction will also take place outside of the existing city boundaries.

The most important locations that are eligible for this are near the World Heritage Site. In the Amsterdam Metropolis region, this includes, for example, locations in Almere, in the Haarlemmermeer adjacent to the Hoofddorp and Nieuw Vennep residential centres,

The most relevant developments for each high-dynamic area

Heemskerk-Schiphol

- Train depot in Uitgeest
- Transformer station 'Wind op Zee'
- Parallel runway (Kaagbaan) for Schiphol Airport
- Widening of A9 motorway between Velsen-Rotterdamplein
- Corridor study A7 motorway
- A8/A9 Connecting road

Vechtstreek-North region

- Area development 'Naarden buiten de Vesting'
- Widening of A27 motorway
- IJmeer Public Transport connection Amsterdam - Almere
- Public Transport SAAL Weesp
- Outer Port Muiden

Utrecht area

- U NED, the programme, which, in the coming 10 years, will ensure a balanced and coherent development of living, working, and accessibility in the Utrecht Metropolis region.
- Residential construction challenges in the search areas in the A12-zone (Laagraven), Public Transport hub Lunnetten and Bunnik, Rijnsweerd, Utrecht Science Park, and Kromme Rijn area
- Widening of Northern Utrecht Ring Road
- Widening of A27 and A12 motorways
- Construction of fast-cycle route between Public Transport Bunnik and Utrecht Science Park

and in Amsterdam on the water of the IJmeer (IJburg) and probably in the new residential area of Haven-Stad. New centres of employment are not envisaged. Economic growth will, in part, be absorbed by further boosting existing concentrations of employment. At Schiphol Airport, this strategy will affect one of the high-dynamic zones of the World Heritage Site (Heemskerk-Schiphol). Other economic centres in the Amsterdam region are the city centre, the Zuidas, Sloterdijk, and the Arena area in Amsterdam-Zuidoost. As the most competitive region in the European Union, the Utrecht Metropolis region is a very attractive place to live, work, and spend time. This resulted in substantial growth in the demand for housing, the number of workplaces, and a strong increase in mobility in, from, and through the region. Because of this pressure of urbanisation, the surroundings of the Lunettes, Fort de Bilt, and Fort along the Klop are not included in the site, or are included to a limited extent. Fortunately, the fortifications themselves and the associated inundation canals are part of the site. The Utrecht Metropolis area also has an important function as a hub. The use of the central station is expected to increase to approximately 100 million passengers in 2030, and the roads in and around Utrecht are also busy. Additional condensing of living and working is not possible without improvement to accessibility and vice versa. Many of the traffic junctions (including public transport) are near the World Heritage Site and the need for construction lies in the vicinity of the public transport stations. The high-dynamic zones to the east and south-east of the city of Utrecht necessitate the conducting of an area analysis for dealing with the OUVs.

A8-A9 Connecting road

The Dutch government has been in contact with UNESCO and ICOMOS regarding the A8-A9 possible connecting road in the northern part of the Defence Line of Amsterdam since 2010. An HIA has been conducted, various SoC reports have been drawn up, and two advisory missions have taken place. In October 2017, an ICOMOS Advisory Mission took place, and ICOMOS issued a report on the basis of this with recommendations concerning the continued approach. In September 2018, the Dutch government informed UNESCO and ICOMOS regarding the current situation relating to the planning process and the way in which ICOMOS recommendations will be included in this. This letter (reference 2018B-24) states that, following discussions with the Ministry of Culture, the Province of Noord-Holland has decided to regard the possible construction of the A8-A9 connecting road in conjunction with the possibilities of preserving and restoring the Outstanding Universal Value of the Defence Line of Amsterdam within the planning area. The Province of Noord-Holland will do this by drawing up a Landscape Plan for the entire planning area in which the A8-A9 connecting road crosses the Defence Line of Amsterdam. The preferred design (the 'Golf course variant'; Provincial Executive decision 17 January 2017) and the ICOMOS recommendation of November 2017 will be used as a guideline for the drawing up of the Landscape Plan. The Landscape Plan chooses maintenance and reinforcement of the OUV as its basic principle, and the connecting road will be incorporated in the best possible way. On the one hand, the Landscape Plan will lead to concrete recovery measures for the landscape of the Defence Line of Amsterdam, and, on the other hand, it will lead to basic principles for the design of the connecting road. Above all, the Landscape Plan must restore visual coherence between the individual defensive structures and combat the fragmentation of the landscape in order to preserve the integrity of the property and the liveability of the defensive landscape. Virtual images and visual studies of the effects of the various measures (both the current disruptions and the planned measures) may assist in this process, as indicated by ICOMOS.

The Provincial Executive of Noord-Holland has indicated a preference for the Golf course variant as an alternative for the connection between the A8 and the A9 to be further detailed. In doing so, the provincial government has expressed a preference

for a route, a line on the map. This does not (yet) apply to the design of the connecting road and its placement in the landscape. These aspects will have to be further detailed in the Landscape Plan. This does also not mean that the construction of the connecting road has been decided upon. The choice of the Golf course variant as the 'preferred alternative' is by no means an irreversible decision, but it is an important intermediate step in the process of achieving an appropriate and accepted connection between the A8 and A9 motorways. At the end of 2018, a start was made with the drafting of the Landscape Plan. The definitive Landscape Plan will ultimately be tested in relation to the question whether the three objectives – improving liveability, improving accessibility, and preservation and restoration of the OUV of the Defence Line of Amsterdam – are achieved by means of the incorporated connecting road and the additional measures for landscape restoration. Of course, cost considerations also play a role in this. The Landscape Plan will be drawn up by a reputable landscape architect's office.

In the third quarter of 2019, the Provincial Executive of North-Holland and the Ministry of Education, Culture, and Science will be expected to come to separate conclusions regarding whether the Landscape Plan offers sufficient options to achieve a feasible and acceptable design for the A8-A9 connecting road. This is a go/no-go moment in the planning process, meaning that planning for the construction of the connecting road could or could not be continued. At that moment, the State Party will again consult with UNESCO and ICOMOS regarding the results and the intended decision. If possible, the assessment of the plans will coincide with the technical evaluation mission of ICOMOS for the significant boundary modification of the DLA, so that the plans and the intended measures can be assessed in the field.

In its report of November 2017, ICOMOS also included recommendations regarding the protection of the OUV by setting up a buffer zone and regarding a strategic approach to the method in which spatial developments, infrastructure developments in particular, are dealt with in the light of protecting the integrity and authenticity of the landscape. These components of the ICOMOS report will be discussed in chapter 5.b.2 of this significant boundary modification proposal.

No large-scale urbanisation will take place within the proposed Dutch Water Defence Lines World Heritage Site. However, the effect will be undeniably present; in the form of infrastructure that crosses the World Heritage Site (see the following section) and possibly also small-scale housing and employment projects. The area analyses will show which opportunities there are for synergy with the World Heritage Site and where additional efforts are required to maintain the OUV. The four instruments of the Historic Urban Landscape Approach will be used as a guideline for this.

Mobility

In part, the purpose of the policy of prioritisation of transformation, grouping, and condensing within the city is to make the best possible use of existing infrastructure and to limit the need for new infrastructure as much as possible. As much as possible, new spatial-economic developments will be grouped in locations near hubs of public transport, motorways, energy and/or data, depending on the type of activity. This limits traffic movements and offers more options for collective measures to boost climate robustness. The intention is to guide traffic more by means of reliable travel information and to encourage switching from car traffic to public transport and bicycles with Park&Ride facilities along the edges of living and working areas.

Nevertheless, traffic around the Amsterdam and Utrecht metropolises is expected to increase and a capacity expansion of public transport and the road and bicycle networks will be necessary. The capacity expansion of the road network, in particular, may affect the World Heritage Site. The A9 motorway around Amsterdam will be widened. Other important elements are the completion of the new Westfrisia road, the plans for a connection between the A8 and A9 motorways, and possible modifications of the A7 motorway. Regarding the A8-A9 connecting road, an HIA has been conducted and now a landscape plan is being drawn up in order to incorporate it into the proposed World Heritage Site as successfully as possible.

Around Utrecht, efforts are being directed towards the improvement of accessibility by means of the widening of the existing ring road, the A27, the A12 ring road, the A27 Houten-Hoopolder, A28/A1 Hoevelaken interchange, and the Noordelijke Randweg Utrecht. The new Uithof Line will increase the public transport capacity of the connection between Utrecht Central Station and Utrecht Science Park. However, on the basis of new growth expectations, capacity expansions are required for all modes of transport – by foot, bicycle, public transport, and car – with efforts being directed toward the use of multimodal transfer hubs.

In general, the HIA is a suitable instrument with which to assess, minimise, and weigh the effects of alternative routes on heritage values. Through the landscape-architectural design, opportunities are sought to reinforce the OUV. The area analyses may have an additional effect of creating a framework, because they offer a clear picture of the coherence between the urbanisation programme, the infrastructure, and the OUV of the World Heritage Site.

Energy transition

The implementation of the Dutch Climate Agreement will be one of the greatest challenges for spatial planning in the coming decades. A sustainable energy system takes up a lot of space and is visible. The appearance of cities and landscapes will be changed by transition. Space is not a given in the Netherlands, where every square metre may have one or multiple intended uses. A good spatial approach to transition, including making (occasionally far-reaching) spatial choices is, therefore, a necessary condition for reaching climate objectives. At the moment, the impact of the Energy Transition on the New Dutch Waterline cannot yet be made sufficiently concrete in a claim on land-use. It is clear, however, that this transition will also affect the New Dutch Waterline. In order to ensure that this incorporation runs as smoothly as possible, a Strategic Heritage Impact Assessment (HIA) Energy Transition has been started. This looks at whether and how solar fields and windmills can be incorporated.

Noord-Holland is aiming to be a climate-neutral province in 2050. This means the province wants to make space for energy transition. Taking into account the specific natural conditions (geological, geomorphological, and climatological), optimal use is made of the qualities for the generation of renewable energy (electricity and low temperature heat) without unacceptable infringement on landscape and area qualities. The starting point for this is the use of those forms of sustainable energy that ensure the highest energy yield at the lowest possible societal costs. In addition, the objective is to link the supply and demand of renewable energy in such a way that the utilisation of existing and new energy infrastructure is efficient. Within the Province of Utrecht, the ambition in terms of energy transition as a spatial challenge in the Environmental Strategy is formulated as the following challenge:

- Generating sustainable energy in relation to the protection of the values of landscape, nature, and cultural heritage.
- Climate-proof and water-robust design in relation to the space requirement for urbanisation.

Within this framework, an assessment is made of what forms of sustainable energy, where, and under what conditions on the basis of the OUV this may be possible in relation to the waterlines. In 2018, a Strategic HIA Energy Transition was started at the initiative of the site-holder. The outcome of this is expected at the beginning of 2019.

A considerable contribution to a sustainable energy supply will come from large-scale energy generation at sea. This energy must then be brought on land. The North Sea Canal area is a logical location for this, with its presence of steel manufacturer Tata Steel in IJmuiden as a large-volume user of energy.



Inundation polder
Blokhoven

(ii) Environmental pressures

At present, the achievement of the Sustainable Development Goals and the transition to a sustainable society are key elements in the field of spatial development. Protecting and preserving heritage sites is an essential challenge in this. In the spirit of the Historic Urban Landscape approach, the Netherlands is working to bring about this sustainable future.

Climate adaptation and water safety

Measures focussing on limiting or combating the effects of climate change will bring about changes in the living environment. The most far-reaching of these are the changes that are to be expected in the amounts of precipitation, the distribution of precipitation throughout the season, and their effect on water management in the Netherlands. These changes lead to additional attention being paid to water safety. For the (major) rivers, this means that dyke reinforcements are necessary in a number of places. Behind the dykes, solutions will be sought that include water storage locations for the temporary storage of excess water. With the right design insights, this spatial challenge can contribute to the readability and recognisability of the lines by converting former inundation areas into retention areas. An example of this is water storage location – and former inundation polder – Blokhoven, where the operation of the line's water system can be experienced every two weeks. A 23-km dyke reinforcement is currently being prepared between Gorinchem and Waardenburg. The project includes an HIA, involving the OUV in the design phase of the dyke reinforcement, e.g. around fort ensembles Honswijk-Everdingen.

Quality frameworks directive for these challenges safeguard the importance of cultural history in general and the Lines in particular.

Subsidence In the peat landscapes, in particular, subsidence can be as much as 1 centimetre per year. Subsidence is the result of systematically keeping the ground water level low for agricultural use. When peat is drained, it comes in contact with oxygen and oxidises. Oxidation of the peat leads to subsidence. A substantial part of both the Defence Line of Amsterdam and the New Dutch Waterline are located in peatland. This gives rise to the danger that the foundations of forts and other component parts could be damaged by subsidence. Subsidence can be combated or delayed by raising the water level and rewetting the area of by means of submerged drainage. This measure can be used to positive effect in making the original inundation basins recognisable again. Such measures are often paired with nature development and the creation of water collection facilities. A drawback of this could be that the openness could be adversely affected by tall vegetation.

Energy Transition & Renewable Energy In most provinces in the Netherlands, the policy regarding the building of wind turbines on land has, until now, been cautious. The result of this is that there are currently only a small number of wind turbines in the area of the lines. They are located in only a few places, individually or in small groups. Wind turbines are planned in some places. This has a limited effect on visitors' perception of the Defence Line of Amsterdam and the New Dutch Waterline. Within the framework of the Climate Agreement and the necessary energy transition, an intensification of the conversion from oil and gas to renewable energy is required and laid down in policy. Although the majority of sustainable energy is generated at sea (wind turbine parks in the North Sea), some will have to be realised on land. Where and in what form has not yet been determined.

Other forms of energy transition are, for example, installing solar panels, extraction and storage of terrestrial heat, and cultivating biomass. The possible effects of energy transition and storage in the case of such developments are also considered. The implementation of these types of land use may also signal a change in visitors' perception. Large fields of solar panels will have a more urban character than pastureland. Although the cultivation of biomass preserves the green character of an area, it is very important to consider carefully the type of biomass (plant species) to be used and where to ensure openness and visibility and allow an understanding of the inundation system. There are, of course, opportunities for boosting the area, e.g. by combining wetlands with biomass to create reed beds in the inundation fields.

No other environmental pressures likely to impact on the OUV have been identified. There is, however, contamination of (water) bottoms of the canals around a number of forts, as a result of munitions storage and use within the forts. Contamination with heavy metals, explosives, and other materials is manageable and does not directly affect the OUV, but could, at any moment, lead to the necessity to excavate the contaminations and/or explosives. In recent years, awareness of this matter has increased substantially among owners and operators. In addition, it prevents any changes in functions for the forts.

(iii) Natural disasters and risk preparedness

The area where the Defence Line of Amsterdam and the New Dutch Waterline are located is not an earthquake risk area. However, gales, thunderstorms, and hail can cause damage to planted areas and buildings. Due to the robustness of the military fortifications, the water systems, and also the inundation basins, the impact of this can be considered negligible.

Climate change increases the chance of extreme flooding or drought. The resilience of the Defence Line of Amsterdam, the New Dutch Waterline, and their surroundings with which they are able to anticipate this, has increased due to the ingenious water system. Water-related tasks are properly managed by the water authorities and damage due to climate, the environment or disasters will be repaired where necessary and possible. Water authorities are actively exploring the possibilities of using the Lines to anticipate climate adaptation.

A section of the Dutch Water Defence Lines is located near Schiphol International Airport. This theoretically increases the chances of crashing aircraft. However, the chance of this is negligible and no control measures have been taken for this, other than the usual preparedness of the emergency services of policy, fire services, and ambulance. No other specific measures will be taken to prevent this.

(iv) Responsible visitation at World Heritage sites

The familiarity of the national and international public with the Defence Line of Amsterdam and the New Dutch Waterline is still limited. Research among the population of the Netherlands in 2017 (Motivaction) has shown that 14% of the Dutch public have intentionally visited the Defence Line of Amsterdam once or more, and 21% of the Dutch public have intentionally visited the New Dutch Waterline once or more. This same research shows that half of the Dutch population intends to visit the heritage property. No figures are available for the international public.

At a regional and local level, the Dutch Water Defence Lines are popular recreation areas for walkers and cyclists from neighbouring cities. This means they have a potential audience of approximately four million city residents. The area is large and offers a great variety of cultural heritage sites connected by various cycling and walking routes, spread out over a long distance. In various locations, these routes are interconnected by means of bridges or ferries across the water. Due to its expanse and the spreading out of visitors over the area, recreational use hardly has any negative effects on the OUV. It is expected that – once the Dutch Water Defence Lines would be awarded the World Heritage Status – the number of visitors will increase somewhat, but not spectacularly. It will still be possible to provide facilities for these increased numbers within the site and the direct surroundings.

A number of tourism and recreational clusters can be distinguished in the Dutch Water Defence Lines, where thematic recreation is possible that is directly connected with the Waterline. In the

Room for Rivers

This programme was set up in response to the extremely high water levels of 1993 and 1995. With Room for Rivers, the Dutch government has chosen to achieve the required safety, in as far as possible, through measures that prevent high-water levels from increasing further. Emphasis was shifted from dyke reinforcement to river widening, with measures being taken on both sides of the dykes. In addition to a high-water safety objective, the Room for Rivers programme also aimed to improve spatial quality. This involved a partial reorganisation of the river region. Where possible, the heritage of both waterlines was used to achieve these objectives. In

particular, the specified water and nature challenges were seen as an opportunity to make the rich history of the New Dutch Waterline easy to comprehend. A good example of this can be seen at Fort Pannerden, on the south side between Culemborg and Vianen, and near Gorinchem. Room for Rivers was implemented in close collaboration between the national and regional governments. Its follow-up programme is the Delta Programme, which anticipates climate change and the increased peak loads that are expected to accompany it. Within this framework, the north side of the Lekdijk near Fort Honswijk is being tackled.

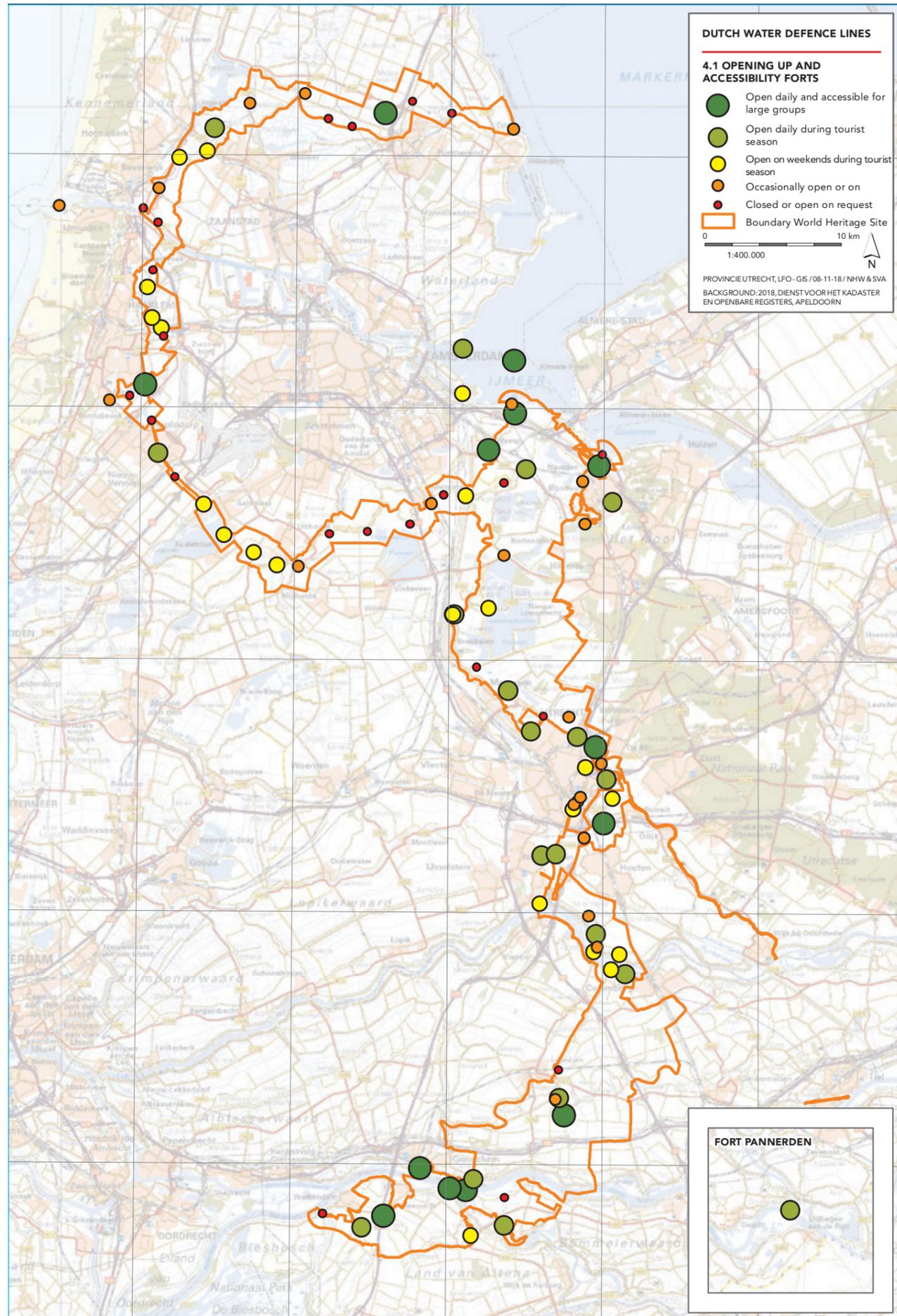


Room for the river, Munnikenland with Loevestein Castle

Defence Line of Amsterdam, this can be experienced at Fort K'IJK, the recently opened experience centre at Fort Krommenierijk (opened in 2018), and at the visitor centre on the fort island of Pampus (45,000 visitors per year). In the north, the Defence Line of Amsterdam and the Beemster World Heritage Site overlap, and there is a visitors centre in Middenbeemster. At the intersection of the two Lines lies the recreational cluster around the fortified towns of Muiden, with its Muiderslot Castle (144,000 visitors per year), Weesp, and Naarden, and in the south of the New Dutch Waterline lies the triangle of fortifications comprising Woudrichem, Slot Loevestein (125,000 visitors per year), Fort Vuren, and Gorinchem. Two new recreational clusters have been realised in the vicinity of Utrecht: The Linielanding, as a gateway to the Line landscape at Fort Honswijk and Lunette along the Snel. The other cluster lies to the east of Utrecht around the Waterline Museum (30,000 visitors per year) at the Fort near Vechten and Fort Rijnauwen. Along the Linge near Asperen lies the Geo-Fort (100,000 visitors per year). In 2016, this fort was voted the best children's museum in the world and it won the Europa Nostra award in 2018. At the southern tip of the New Dutch Waterline lie Forts Altena and Giessen. Both forts have a small visitors centre. In the rest of the New Dutch Waterline landscape, tourism and recreation are much more quiet and nature-oriented. Map 4.1 shows the opening up and accessibility of all forts.

(v) Number of inhabitants within the property and the buffer zone

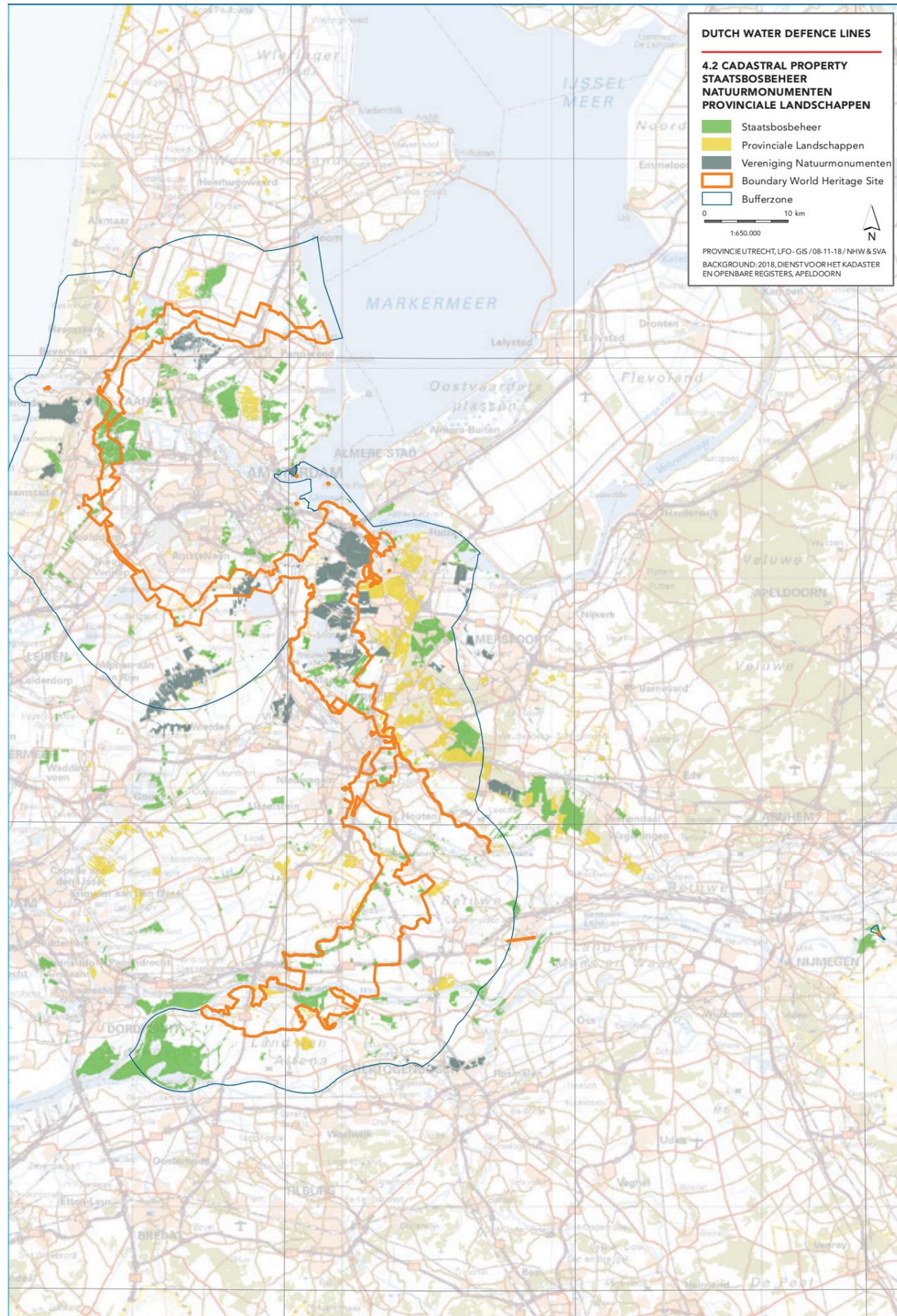
In the properties and the bufferzone of the Dutch Water Defence Lines, the following numbers of inhabitants are known. Within the property there are approx 130.00 inhabitants. In the bufferzone there are approx 1.3 million inhabitants. In total there are approx 1.43 million inhabitants in the property and bufferzone.





5

Protection and
management of
the property



5.a Ownership

The Dutch Water Defence Lines has many owners and site managers who jointly ensure that the heritage site is sustainably maintained. The general division of property for the Dutch Water Defence Lines was assessed on the basis of the three main characteristics (Strategically Deployed Landscape, Water Management System, and Military Fortifications). The attached map shows the most important main owners of areas within both lines.

Strategically Deployed Landscape

The large, rural areas that fall under the heading Strategically deployed landscape (inundation areas, Prohibited Circles, and flat accesses) are mainly the property of farmers and professional land management organisations (the Society for the Preservation of Nature, the National Forest Service, 't Gooi Nature Reserve, Brabants Landschap, and others). Linear accesses such as roads, railways, waterways, and rivers are principally owned and managed by the responsible government body (Directorate General for Public Works and Water Management, ProRail, Water Management Boards, and provinces). The wooden houses are largely privately owned.

Water Management System

Dykes, quays, and other water management structures are mainly owned and managed by the Directorate General for Public Works and Water Management or one of the five water authorities in the area: 'Amstel, Gooi, and Vecht', Hollands Noorderkwartier, Rijnland, Stichtse Rijnlanden, and Rivierenland. In some cases, they are owned and managed by provinces and municipalities. The more intricate parts of the system, such as ditches, dams and culverts, are owned by private parties (often farmers and land management organisations). As part of their statutory responsibility, the water authorities are responsible for the functional management of these elements. For a further explanation of the management, see section 4A, 'Present State of Conservation'.

Military Fortifications

The forts of the New Dutch Waterline are owned by the state, the province of Noord-Holland, municipalities, professional land management organisations, and private parties. The group shelters and casemates are spread throughout the entire area of the Dutch Water Defence Lines. The ownership situation is determined by the ownership of the land on which the elements are situated. For example, many casemates are owned by farmers and land management organisations. Some elements are on public land and are in public ownership (Directorate General for Public Works and Water Management, water authorities and municipalities).

Many of the military structures within the fortified towns are in private ownership. A number of characteristic components, such as canals, embankments (earthworks), earth-covered buildings, and barracks are owned by municipalities.

5.b Protective designation

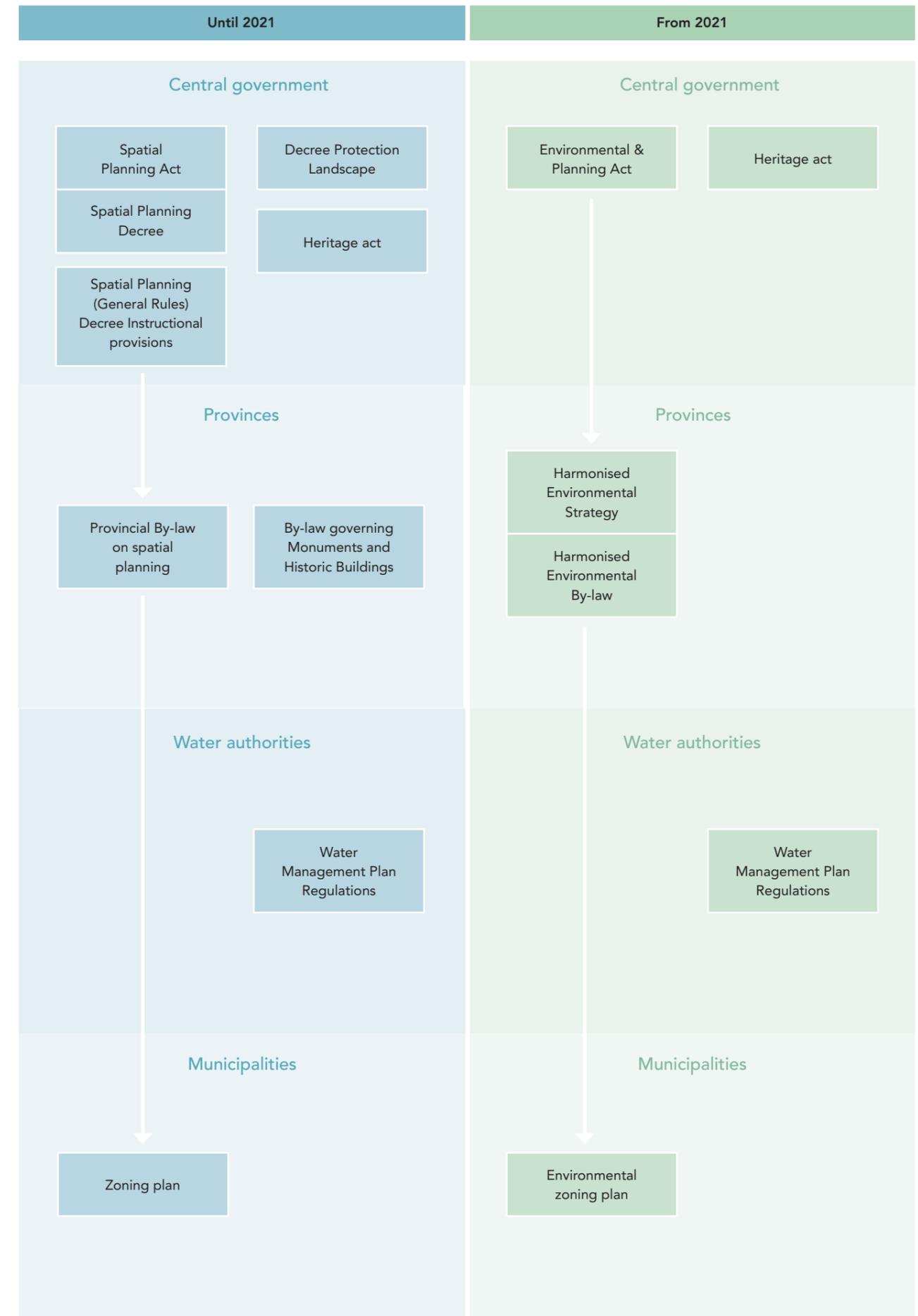
This section describes the status and protection regimes of the existing and proposed World Heritage Site and its immediate surroundings.

5.b.1 Protection of the property

Spatial policy and cultural heritage

Central government adopted the National Policy Strategy for Infrastructure and Spatial Planning [*Structuurvisie Infrastructuur en Ruimte*] in 2012. In this National Policy Strategy, the government outlines its ambitions for the Netherlands in 2040. Based on the responsibilities of the government, the ambitions have been laid down in government objectives, indicating which national interests are at stake. Room for conservation and strengthening unique national and international cultural, historical and natural qualities are listed there as national interests. In the explanation of the National Policy Strategy, the World Heritage Site, and the proposed extension to include the New Dutch Waterline have been identified as a national interest.

The National Policy Strategy is elaborated further in the Vision for Heritage and Spatial Planning ('Choosing Character'). This Vision for Heritage and Spatial Planning establishes the relationship between heritage policy and spatial planning. One of the five priorities is World Heritage: safeguarding its coherence and increasing its character.



The Vision for Heritage and Spatial Planning was translated by the provinces into provincial by-laws.

Prov.	Vision	By-law
Noord-Holland	Cherishing and utilising features for new developments. New plans must adopt the history of development, structuring principles, and characteristic construction of the landscape and integration into the wider surroundings as basic principles. Any adverse impact must be compensated.	Designating the Defence Line of Amsterdam and New Dutch Waterline a heritage site of outstanding universal value (article 20). To this end, rules must be included in the zoning plan (article 21) for the preservation or reinforcement of the core values of the heritage sites of outstanding universal value. Zoning plans may only provide for new functions/expansion of functions if the value of heritage sites is preserved or reinforced.
Utrecht	Preserving the qualities of the cultural and historical structure and seeking an improved ability to experience this. Preserving and developing the core qualities where this contributes to the preservation of the heritage site.	A visual quality section must be created for small-scale developments in the rural landscape (change of function, demolishing stables, rebuilding houses, etc.). This must include, at the least, an analysis of existing qualities and justification of the way in which the proposed development contributes to these qualities or does not lead to disproportionate degradation or limitation due to the way in which it is embedded in the rules of the spatial plan.
Gelderland	Preservation through development, focussing on preservation of cultural heritage, development of economic potential, and embedding in society.	The provincial executive may grant the municipality exemption for the realisation of municipal spatial policy due to special circumstances if it is disproportionately hindered in relation to the provincial interests to be served by these rules. A municipal zoning plan may not affect land that is part of the New Dutch Waterline. This also applies to 'valuable open areas'.
Noord-Brabant	Further developing cultural and historical values in their coherence, protecting them, and making them accessible for tourism and recreation.	This applies to the location of the 'New Dutch Waterline' designation, where a zoning plan focusses on the preservation, restoration or sustainable development of the core values and sets rules for the protection of the core values.
Zuid-Holland	Protection and development. The emphasis is on protection in those locations where these qualities are very high and vulnerable (heritage icons). There is room for development outside of these areas.	'Cultural and historical crown jewel' Diefdijk is so special, valuable, and vulnerable, that the preservation and possible further development of the values that it represents take precedence over all other developments. Aims: To preserve and reinforce the qualities of the New Dutch Waterline, focussing on the coherence of all components of this ensemble, to preserve the open view of the polders bordering Diefdijk, and to maintain the recognisability of the profile of Diefdijk as a historic dyke.

UNESCO World Heritage site

In 2012, the government of the Netherlands decided to connect legal area protection to the areas that have UNESCO World Heritage status or that have been nominated as such. This area protection is in addition to the protection of individual constructed objects and conservation areas. This is an interpretation of the obligations following from the ratification of the UNESCO World Heritage Convention (1972). Legal area protection at national level applies to the Defence Line of Amsterdam and Beemster Polder World Heritage Sites, and to the New Dutch Waterline and the Lower Germanic Limes, which are on the Tentative List.

This national protection of both lines follows from the Spatial Planning (General Rules) Decree (*Besluit Aanvullende Regels Ruimtelijke Ordening* or Barro, 2011). This government decision follows from the Spatial Planning Act and the Spatial Planning Decree (2006). For the four areas listed, the Barro describes 'core qualities'; for World Heritage Sites that have already been nominated, they are derived from the Outstanding Universal Value. All levels of government set rules with which to maintain or enhance these core qualities during spatial developments. The practical way in which this legislation is carried over into provincial by-laws and municipal zoning plans is described in section 5.c.1.

In 2021, the new Environment and Planning Act (2016) will come into effect in the Netherlands. This law replaces the Spatial Planning Act and a large number of other laws and rules with a spatial effect. The Barro is also incorporated in full in the new Environmental & Planning Act. The Environmental & Planning Act stipulates that rules must be created on all levels of government 'for the preservation of Outstanding Universal Value of World Heritage Sites, for the implementation of the World Heritage Convention'.

UNESCO World Heritage site National and provincial monuments

All military and many water management structures in the New Dutch Waterline have been designated national monuments on the grounds of the Heritage Act (2016). Not all elements of the Defence Line of Amsterdam in Noord-Holland in fact have this status. In Noord-Holland, these elements without status have the status of provincial monuments on the basis of the Monument Protection Ordinance of the Province of Noord-Holland. Practically speaking, this protection of provincial monuments in Noord-Holland is the same as that of a national monument.

UNESCO World Heritage site Designated urban and village conservation area

The fortified towns within the New Dutch Waterline are protected on the basis of their designation as "designated urban conservation area". No developments are permitted which impair their cultural and historical character. This concerns the following sites (with the year they were designated an urban or village conservation area), including six fortified towns:

- Naarden (1986)
- Muiden (1986)
- Weesp (1982)
- Nieuwersluis (2007)
- Nigtevecht (1987)
- Blauwkapel (Utrecht; 1966)
- Vreeswijk (1983)
- Gorinchem (1988)
- Woudrichem (1972).

The protection aims to safeguard the historical structure of an area for the future.

New buildings can be added and the use of a building may change, provided this is compatible with the historical character of the area. It gives an idea of the possibilities for development, within limits. The protected areas come under the responsibility of the municipality. The municipality is obliged to take this into account with respect to spatial planning and must ensure that the attributes are conserved. Section 36 of the Monuments and Historic Buildings Act 1988, in conjunction with Section 9.1(1)(a) of the Heritage Act, stipulates that municipalities are obliged to draw up a protective zoning plan for the conservation area. From 2021, this will be safeguarded in the Environment and Planning Act.

The protection of “conservation areas” and the protection of structures as state or provincial monuments complement each other, but do not replace each other. The protection of conservation areas protects the urban development structure, while the protection of structures protects the building as well as the authenticity of the building material and the construction.

The table below gives an overview of the policy and instruments of each level of government.

	National Government	Province /Water authorities	Municipalities
Policy	<ul style="list-style-type: none"> – National Policy Strategy for Infrastructure and Spatial Planning – Multi-year Programme for Infrastructure, Spatial Development and Transport (MIRT) – Vision for Heritage and Spatial Planning – Living Environmental Vision 	<ul style="list-style-type: none"> – (Spatial) Strategic Structure Agenda – Main Cultural Historical Structure (CHS) – Provincial cultural and heritage memorandum – Implementation plans – Guidelines, Visual Quality Plan, quality guides, handbooks – Theme-based or area-specific policy memoranda – Living Environmental Vision 	<ul style="list-style-type: none"> – Strategic Structure Agenda – Cultural and heritage memoranda – Cultural and Historical Value Map – Theme-based or area-specific policy memoranda – Living Environmental Vision
Instruments	<ul style="list-style-type: none"> – Spatial Planning Act and the further elaboration of the Spatial Planning Decree – Spatial Planning (General Rules) Decree – Heritage Act 2016 – Environmental Permitting (General Provisions) Act (WABO) – National Incorporation Plans – Environment and Planning Act (2019) – Heritage Impact Assessment 	<ul style="list-style-type: none"> – Provincial By-law on Spatial Planning – By-Law governing Monuments and Historic Buildings – Environmental Impact Assessment (EIA) – Provincial Incorporation Plans – Heritage Impact Assessment – Rule-making authority 	<ul style="list-style-type: none"> – Zoning plan – Municipal regulation including By-Law governing Monuments and Historic Buildings – Environmental permit – Heritage Impact Assessment

Policy letter ‘Heritage Counts’

On June 22nd of 2018, the Dutch National government published its policy letter ‘Heritage Counts’. The main outline of our cultural heritage policy was already described by the government in its letter ‘Culture in an open society’. In the letter ‘Heritage Counts’ the administration details the specific aspects of the policy and the meaning of heritage to our society. The government will invest €325 million in heritage conservation over the coming years. The policy is based on three ‘pillars’ for heritage care in future years:

- 1 Conservation of heritage for the current and future generations.
- 2 Positioning our heritage in the everyday living environment.
- 3 Attention to the connecting power – social and societal value – of the heritage.

The national government deems it important to invest in monumental buildings and areas, to make sure these places remain attractive to their inhabitants and visitors.

Next to a permanent focus on preservation and restoration, a broader vision for our heritage is called for. The government stresses the value of heritage and design for the living environment in its letter ‘Culture in an open society’. It wants, in addition to the protection and development, to use parts of our heritage for current spatial challenges such as the energy transition, climate adaptation, the development of new housing projects in cities and the areas that suffer from rural depopulation. The government facilitates connections between the heritage and the creative industry, i.e. city planners and spatial designers. For this, the Netherlands can build on a strong tradition in creativity and design. The government will also strengthen the relation between heritage, spatial design and living environment, which is a responsibility of the national government itself, in development of the Environment and Planning Act, the national vision document for the environment, the Delta (flood protection) program and the Energy- and Climate agreement which describes the energy transition. Additionally, the government aims to strengthen the contribution of heritage to changes in our living environment, by making a ‘Heritage Deal’ with the decentralised administrations (municipalities, provinces and water management boards) and social partners. It will offer a budget of € 20 million for the matching of initiatives by the aforementioned

administrations. The incorporation of spatial challenges of accessibility and energy transition is a complex matter in relation to the World Heritage sites in the busy and economically highly dynamic heartland of the Netherlands. The government will do its utmost to reach understanding of this particular situation and method in their talks with UNESCO. An important challenge is to include all inhabitants in the talks about and development of the heritage. This can only succeed when the stories that these heritage sites tell, are heard and understood by as many people as possible. People that live in today’s Netherlands. In times when it seems people oppose each other more and more, the connecting power of heritage is a value that should not be underestimated. This is why it is so important that as many people as possible – from childhood – can experience the heritage and are committed to it. The government invests in making places that tell the stories within our history accessible and visible.

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5.b.2 Protection of the property against the adverse impact of developments outside of the property

Following the Advisory Mission of September 2015, ICOMOS advised that an investigation should be carried out to ascertain whether it would be feasible to create a buffer zone for the Defence Line of Amsterdam to supplement existing legal protection for the Outstanding Universal Value of the property. ICOMOS urged that all existing legislation for the protection of the direct vicinity of the site be reviewed and/or the creation of a zone be considered. At the time of the Defence Line of Amsterdam being listed on the World Heritage List (1996), the buffer zone instrument did not yet exist. Nowadays, it has become more common to establish a protective zone around a newly nominated World Heritage Site, with the aim of preventing a negative impact on the Outstanding Universal Value of the property as a result of developments in the surrounding area. This has already been assessed for the existing site and the extension.

On the grounds of the recommendations from the Advisory Mission, the ICOMOS recommendations relating to the possible construction of an A8/A9 connecting road and World Heritage Committee decision 41 COM 8B.46, research has recently been carried out into protection of the site from external influences and the desirability and possibility of setting up a buffer zone for the Dutch Water Defence Lines. For this, all the existing protection regimes around the site and the proposed extension have been analysed.

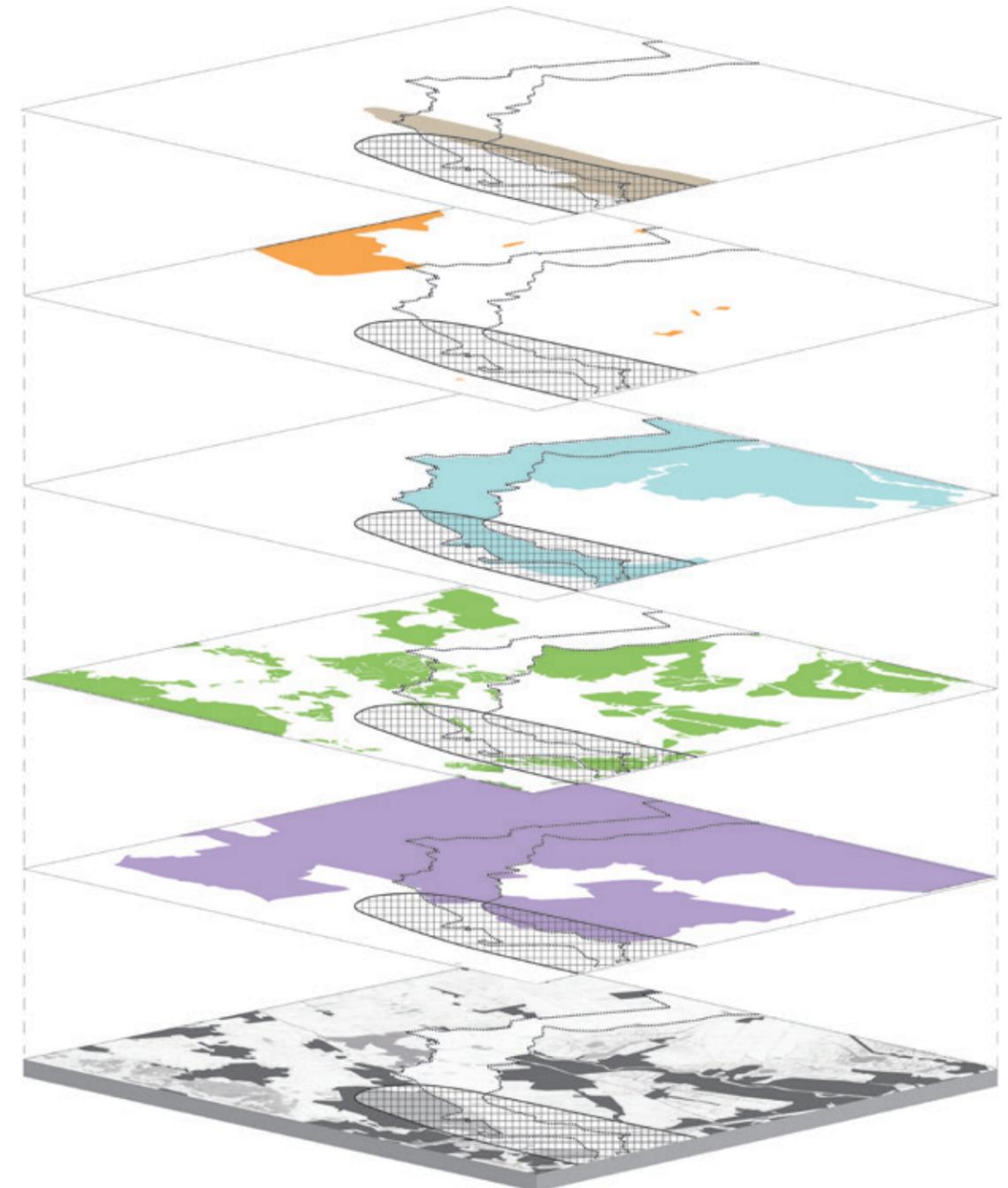
The zones around the property have various designative protections, generally prompted by other interests but effective as protective regimes for World Heritage (5.b.2b). For areas where the urban dynamic is relatively high, area analyses will also be made, creating a framework for the protection of the OUV (5.b.2c). Furthermore, from 2021 onward, overarching protection will be installed due to the introduction of the Dutch Environmental & Planning Act, with the direct provision that the Outstanding Universal Value of the World Heritage Sites must be preserved (see 5.b.1). This provision also affects areas outside of the boundaries of the property.

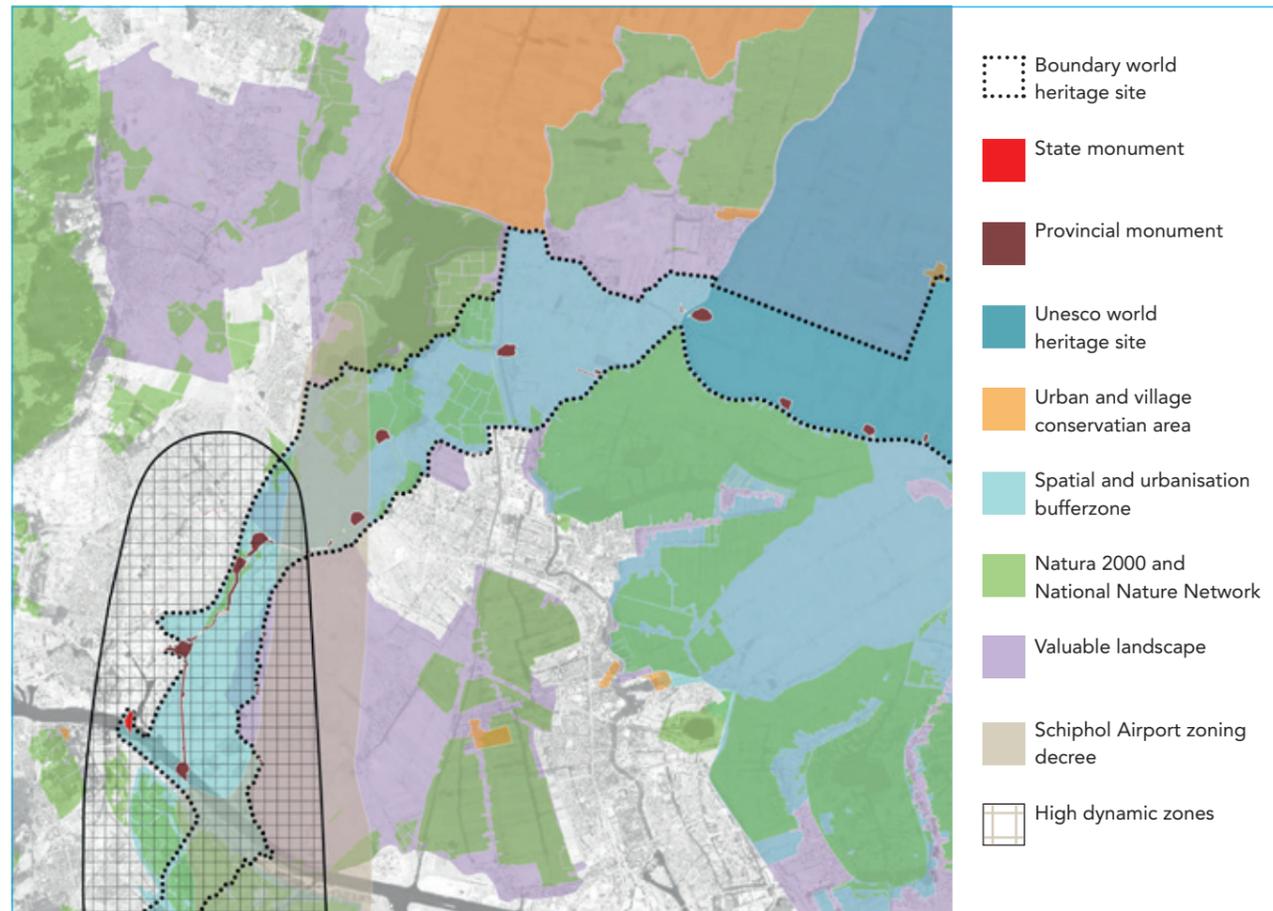
Expanded impact of the UNESCO World Heritage Status

The aforementioned Environmental & Planning Act – which takes effect in 2021 – determines that spatial developments may not threaten or endanger the Outstanding Universal Value of a World Heritage Site. This applies to all spatial developments, even if they take place outside of the World Heritage Site or the buffer zone. This deters developments that may affect the (visual) integrity of the OUV.

In a 2018 recommendation entitled 'On Visual Integrity', the Spatial Quality Advisory Team of the New Dutch Waterline (a team of external experts) describes the form that this protection of the OUV against development from outside the property could take. The recommendation identifies disruption of scale on the 'safe' (defended) side of the main defence line as the most important risk to visual integrity outside of the property. This disruption of scale arises when a new development near the main defence line does not physically damage the World Heritage Site, but does visually dominate it, for example due to its mass, height or architectural or landscape expression. This risk presents itself in those areas where

Accumulation of layers of protective regimes for the site





the main defence line is located near urban areas and the pressure of development is high.

To the east of the property, beyond the inundation fields that extend to a maximum of 10 kilometres from the main defence line, urban use of space may be visible, according to the Spatial Quality Advisory Team. This is a part of the strategic position of the New Dutch Waterline: it protected not the entire country, but only the administrative and economic centre. Cities, such as Hilversum, Zeist, and Culemborg, are located just to the east of the New Dutch Waterline and were not protected by it. The same applies to the Defence Line of Amsterdam to a greater extent. For example, just beyond the inundation fields lies Haarlem, which has been an important city for centuries, but is not part of the national redoubt defended by the Defence Line of Amsterdam.

The Spatial Quality Advisory Team describes the protection of the OUV against developments outside of the property as a design challenge. General, quantitative development restrictions are not sufficient, because there are many design aspects at stake (including, for example, colour and urban development structure), because a nuanced interpretation of local qualities is required each time, and because the variety of possible spatial developments is great, meaning the standards set in advance may not be adequate.

All instruments listed in 5.c and the local building aesthetics committee can also be utilised outside of the property. Effective use does require action and attention, according to the Spatial Quality Advisory Team. In particular in areas under urban or infrastructural pressure, a buffer zone can (as designative protection), therefore, have added value.

'On Visual Integrity' has been attached as appendix 5. The site-holder complies with this by setting up a buffer zone (5.b.2b) and conducting area analyses that set an additional framework for the high-dynamic zone along the World Heritage Site (5.b.2c).

Supporting protective regimes for the site

In the areas around the property, there are various policy regimes in force that have been set up for other reasons, but that have a protective effect on the OUV and visual integrity of the World Heritage Site. These regimes continue up to the boundary of the property, where they support the regime that prompted by the status of the UNESCO World Heritage Site itself. Together, they offer protection to nature values, cultural-historical values and/or landscape values in almost the entire direct vicinity of the Dutch Water Defence Lines. These are listed below.

Natura 2000

Natura 2000 areas are a coherent network of protected nature conservation areas in the European Union which have been designated on the basis of the Birds Directive (1979) and the Habitats Directive (1992). The objective of Natura 2000 is to reverse the decline in biodiversity. The protected areas are designated habitats for vulnerable species. The regime supports the preservation of the Outstanding Universal Value by means of far-reaching limitations on construction and repurposing that may lead to an increase in visitors or traffic movements, such as recreational areas. The framework for this limiting regime is a management plan, drawn up in consultation with owners, local residents, and governments. Natura 2000 areas have a 'de facto' protective effect on the site.

National Nature Network

The National Nature Network [Natuurnetwerk Nederland] is the Dutch network of existing and planned nature conservation areas. The National Nature Network has wider boundaries than Natura 2000 and its legal basis consists of the Spatial Planning Act [Wet ruimtelijke ordening] (2006) and the Nature Conservation Act [Wet natuurbescherming] (2017). It supports the conservation of the Outstanding Universal Value by limiting large-scale compaction (i.e. construction and new functions that result in an increase in the number of visitors or traffic movements – for example recreation grounds).

Provincial urbanisation buffer zones in Noord-Holland

For many years, the province of Noord-Holland has applied 'buffer zones' between centres of urbanisation in its spatial planning. These buffer zones are not to be confused with the concept of buffer zones as applied by UNESCO. These specific buffer zones have been created to prevent the open, rural area between cities from being developed. They are among the strictest protection regimes

in the provincial spatial by-laws of Noord-Holland. In the designated buffer zones, a municipal zoning plan may not allow new development and may only allow new functions on a very limited scale.

Schiphol Airport Zoning Decree

The Schiphol Airport Zoning Decree (Luchthaven Indelingsbesluit Schiphol, or LIB) issued by the national government limits objects, development, and functions in the area surrounding Schiphol International Airport. This decree identifies five areas of limitation in which the degree of protection decreases. In LIB 1, no new development is permitted. In LIB 2, no housing construction is permitted. In LIB 3, business functions are permitted for businesses with fewer than 22 employees, subject to conditions. In LIB 4, new housing and noise-sensitive buildings are not permitted, and, in LIB 5, small-scale housing construction is permitted. The limitations of limitation areas 1 through 4 are sufficiently great that they may be considered as supporting the protection of the OUV. Limitation area 5 is not included as a supporting regime.

Valuable landscape

Around the Defence Line of Amsterdam and its intended extension with the New Dutch Waterline, large parts of the landscape have been designated as 'valuable landscape'. In the Spatial Planning memorandum [Nota Ruimte] in 2006, the national government designated 20 national landscapes. These landscapes have object that are rare internationally or unique and characteristic in the national context, and in connection with this, they have special natural and recreational qualities. In 2012, responsibility for national landscapes was transferred to the provinces, which continue to implement the protection policy. Around the Dutch Water Defence Lines, these are the former national landscapes Laag Holland, Groene Hart, Rivierenland and Gelderse Poort (near Fort Pannerden). The New Dutch Waterline itself was also designated as a National Landscape in 2006.

The spatial development options are limited in these areas. Large-scale transformations in these areas are not possible. In addition, quality requirements are set for spatial developments. New developments must take into account the core qualities of the landscape. The duty to preserve these core landscape qualities supports the visual integrity of the World Heritage Site. These landscapes are described in the Provincial by-laws at provincial level and have been incorporated into municipal zoning plans. They are 'de facto' buffer zones for the property.

Together, the aforementioned five policy categories are serving as a buffer zone for the site, up to an average distance of 10 kilometres outside of the boundary of the property. They form a protective zone, as recommended by ICOMOS and as the State Party was advised by the Committee in decision 41 COM 8B.46.

Of course, this only applies to the 'unsafe' outside of both Waterlines. On this side of the defence line, it was important to have a free and open line of fire. In Panorama Krayenhoff, this principle was translated into the contemporary concept of spatial development, see 2.b.4.

In accordance with the principles of Panorama Krayenhoff, urban densification by means of construction or vegetation was possible on the 'safe' inside of the main defence line. After all, behind the main defence line lies the heart of the country, the large cities with the majority of the population, and the most important economic activity, which are to be defended. This is in contrast to the openness of the inundation fields on the 'unsafe' side of the main defence line.

The Defence Line of Amsterdam already has a buffer zone, which does not allow construction within 50 metres of the boundary of the World Heritage Site, to prevent an adverse impact on the OUV of the Defence Line of Amsterdam. This same 50-metre zone will also be set up for the New Dutch Waterline.

Area analyses of high-dynamic zones

In addition to the setting up of a buffer zone – in part, prompted by the 2015 ICOMOS recommendation and decision 41 COM 8B.46 of the World Heritage Committee – specific attention is paid to the vulnerability of the site in the high-dynamic areas, where the urban area directly connects to the Dutch Water Defence Lines (for further explanation, see 5.c and 5.d). Three areas have been identified as high-dynamic: the Heemskerk-Schiphol zone, Vechtstreek-Noord, and the area around Utrecht.

In order to anticipate possible developments at an early stage and to take into account the surroundings and the OUV of the World Heritage Site, so-called area analyses are drawn up for the three high-dynamic areas. In these area analyses, the OUV and its attributes are further detailed for the assessment of future developments in and near the site, and a framework is set up for this. The area analyses are also the basis for the Heritage Impact Assessments. The emphasis in the area analyses is on the protection of the (visual) integrity of the site, including against outside influence. Drawing up the three area visions is done following the recommendation of the Committee and ICOMOS in 2017: 'to improve the protection of the property and its visual integrity, particularly for sections near industrial and residential development areas' and 'ensuring the use of 'Heritage Impact Assessment' processes for all zoning and development proposals inside and adjacent to the Defence Line of Amsterdam (particularly in relation to proposals for expansions to the Schiphol Airport and its associated facilities and surrounds)'.

Map 1.3 shows the three areas for which this detailing is drawn up. In 2018, the area analysis of the area around Utrecht was begun, and in 2019, the area analysis for the Heemskerk-Schiphol and Vechtstreek-Noord areas will be drawn up.

In addition to the protection of the property's OUV, the new Environmental & Planning Act includes another legal obligation. This is the obligation on site-holders and other administrative bodies involved to provide the national government with information if there is a plan for large-scale restoration or new spatial developments likely to affect the Outstanding Universal

Value of a World Heritage Site. This better enables the State Party to comply with the ICOMOS recommendation (2017) to ensure 'that all major projects that could impact on the Outstanding Universal Value of the property are communicated to the World Heritage Centre in line with paragraph 172 of the Operational Guidelines' for the Implementation of the World Heritage Convention, WHC.17/01, 12 July 2017. The Netherlands complies with this by drawing up State of Conservation reports.

The aforementioned statutory duty to provide information also applies to monitoring and the six-yearly 'periodic report' to UNESCO. This applies to developments both inside and outside the property.

5.c Means of implementing protective measures

This section describes how the aforementioned forms of protection apply to practice. Until 2021, the basis for implementation lies in the Spatial Planning Act and the Heritage Act. In 2021, the Spatial Planning Act will be replaced by the Environmental & Planning Act. Managementplan Dutch Water defence Lines, part III, chapter 7.5 includes a full overview of the legislation that applies to the entire site.

In addition to legal rules focussing on the prevention of undesired developments (5.c.1), the provinces involved pursue a targeted policy to safeguard the quality of developments that are permitted (5.c.2). Safeguarding quality means that these developments do not affect the Outstanding Universal Value or even increase it.

The responsibility of implementing protective measures lies mostly with provinces or municipalities, and occasionally with water authorities. There are differences in the way in which protection is implemented. The goal is to harmonise this decentralised policy in the coming years. Section 5.c.3 further details this objective of policy harmonisation.

In addition to these joint measures, authorities have the autonomy to implement supplementary policy independently. Examples are a municipality that supports start-ups operating forts, a province that sets up new recreational routes or a ministry that releases budget funds for the nomination of a World Heritage Site.

5.c.1 Legal instruments

Until 2021: Spatial Planning Act

In the Spatial Planning Act (2006), the municipal zoning plan is the central instrument. It is the only spatial plan that has general, legal binding force. Protective measures must, therefore, eventually be implemented in these municipal plans. Both the national and provincial government can prescribe the conditions that such a

municipality plan must meet, by means of General Administrative Orders [*Algemene Maatregel van Bestuur*] and provincial by-laws, respectively. In order to comply with the obligation to preserve the Outstanding Universal Value, the state and the four provinces take advantage of this option.

Two of the government's General Administrative Order are relevant to the World Heritage Site. The first is the Spatial Planning Decree (*Besluit ruimtelijke ordening*, or Bro). In general, the Spatial Planning Decree stipulates that municipalities have to take account of cultural history when drawing up zoning plans. Municipalities have to do research to discover the cultural and historical values within zoning plan area. This involves an integrated analysis of cultural history: a combination of structural heritage, archaeology, and human-made landscape.

The second is the Spatial Planning (General Rules) Decree (*Besluit algemene regels ruimtelijke ordening*, or Barro). This outlines the core qualities of the existing Defence Line of Amsterdam World Heritage Site and the proposed extension to include the New Dutch Waterline. These core qualities follow from the Outstanding Universal Value. Through the Spatial Planning (General Rules) Decree (Section 2.13.4), the provinces responsible are given the task of describing the core qualities of existing or proposed World Heritage Sites and making them objectifiable. They are also charged with the task of translating the core qualities into rules that preserve or increase the Outstanding Universal Value. These rules are then copied into the provincial by-laws, which are, in turn, carried over into municipal zoning plans.

Provinces that formulate policy that affects the Dutch Water Defence Lines must carefully observe the regulations in the Spatial Planning (General Rules) Decree. If not, they run the risk of a 'reactive instruction' from the Minister. In that case, the national government prescribes the rule(s) that the province must include in its by-laws. The municipal zoning plans must comply with the rules of the provincial planning by-laws. If they fail to comply, the Provincial Executive (the provincial government) can give a 'reactive instruction'.

This decentralised planning system has, in broad outlines, been in force since the first Spatial Planning Act of 1965. Inherent to the system was that the period between the formulation of national policy and it being carried over into municipal zoning plans may sometimes be a long one. For this reason, a number of auxiliary schemes were included in the revised act of 2006, which increase the speed of the carrying over. For example, the national and provincial governments can now also draw up 'government-imposed zoning plan amendments', as long as there is a national or provincial interest at stake (such as the preservation of the Outstanding Universal Value). These government-imposed zoning plan amendments have the same legal status as the municipal zoning plans.

The rural zoning plan

As indicated in the introduction to this section, the zoning plan is the only spatial plan that general, legal binding force. Protective measures must, therefore, be implemented in the zoning plan. The majority of the Dutch Water Defence Lines is located in the rural landscape, an area in which, in principle, no urban developments may take place, unless there are justifiable reasons to do so. For the protection of the OUV, the rural zoning plan is, therefore, crucial. The provinces, that jointly fulfil the role of site-holder, play an important part in the protection, the preservation, and the increasing of the qualities of the rural area. The provincial spatial by-laws require that, in rural zoning plans, residential construction, industrial estates, and other urban developments are not permitted outside of the building locations identified by the province. In practice, existing building capacities may only very rarely be increased. This protective effect is further increased by the so-called ladder of sustainable urbanisation. The ladder is part of the Spatial Planning Decree (*Besluit ruimtelijke ordening*, or Bro). The ladder requires that, in principle, urban development must be realised in existing urban areas. Deviation from this must be motivated and the necessity must be demonstrated. This means that an additional deterrent is added for developments in the rural landscape, in which the majority of the site is located. This means that the rural zoning plans have an important protective effect for the proposed World Heritage Site.

Heritage Act

The protection of constructed objects, such as national monuments, provincial monuments or urban or village conservation areas, is based on the Monuments and Historic Buildings Act (until 2016) or the Heritage Act (since 2016). Together with the Spatial Planning Act (and, from 2021 onward, the new Environmental & Planning Act), the Heritage Act enables integrated protection of cultural heritage. The Heritage Act lays down how our cultural heritage is dealt with, who has which responsibilities, and how oversight is carried out. The Cultural Heritage Agency is responsible for the implementation of two government subsidy schemes for cultural heritage: the subsidy scheme for the preservation of monuments and the subsidy scheme for the encouragement of the repurposing of monuments. Since 2012, the provinces have been responsible for restoring national monuments. To this end, they receive an annual budget from the national government and also provide co-funding themselves. Between 2005 and 2017, the Province of Noord-Holland invested a sum of 20 million euros in the restoration and repurposing of monuments in the Defence Line of Amsterdam. Because the Province of Noord-Holland only makes funds available if other parties co-finance, an amount of approximately 40 million was available for the Defence Line of Amsterdam in this period. In the period from 2000 to 2017, a total of 200 million euros was spent on restoration of state and provincial monuments within the Dutch Water Defence Lines.

In the Province of Noord-Holland, the Defence Line of Amsterdam / New Dutch Waterline 2017-2020 implementation programme is currently being carried out. This programme is a result of the Noord-Holland Document Policy on Culture 2017-2020. A sum of 8.1 million euros is available for the implementation of the

Environmental and Planning Act (from 2021)

programme. Within the Pact of Ruigenhoek and the Pact of Loevenstein, a joint amount of approximately 25 million is available for the New Dutch Waterline for this period.

In the Netherlands, legislation relating to spatial planning and heritage is being simplified and made more comprehensive. The new Environmental & Planning Act, which provides for, among other things, the spatial protection of heritage values, was adopted by parliament in 2016 and takes effect in 2021. The Environmental & Planning Act offers wider possibilities to protect valuable areas and assess developments comprehensively. The act also has specific articles for World Heritage. This provision states that no developments may take place that threaten or put at risk the Outstanding Universal Value of that World Heritage Site. This also applies if such developments take place outside the boundaries of the World Heritage Site. Urban and village conservation areas and provincial and municipal monuments will in future be protected under the Environmental and Planning Act. The protection regime for national monuments remains in effect in its current form.

5.c.2 Quality assurance

Planning protection and heritage conservation lay down clear restrictions for the spatial development options. Within these restrictions, development is possible, in as far as it is required to maintain the vitality of the monuments, the landscape, and the urban network in the area. The design of such a development must respect the OUV or, if possible, enhance it. There are a number of instruments available that secure the quality of design of permitted developments, the use of which depends on the scale of the development: These will be explained in this section.

Section 4.b and Managementplan Part III, chapter 7.5 describe a number of dossiers of spatial developments that affect or have affected the Dutch Water Defence Lines and in which a number of these instruments have been used. For each dossier, the appendix states how the OUV was dealt with. This includes the following development projects: Geniedijk industrial estate, Muiden and aqueduct A1 motorway, regional industrial estate Werkendam, widening of Beatrix Sluice, and Sustainable Energy.

The most important lesson in these dossiers is that large-scale interventions offer an opportunity for repair of adversely affected cultural heritage and/or an improved experience of the OUV. What is important in this is that, during the design phase of the planning, initiators were aware of the OUV and the way in which adverse effects could be prevented and/or compensated by repair. 'The sooner we are at the table, the better!'

Spatial Quality Advisory Team

The Quality Team of the New Dutch Waterline is a team of independent external experts that has been in existence since 2005 and provides solicited and unsolicited advice on the trends, developments and challenges that affect the military heritage on the larger scale. Since 2016, the team has had a new composition and a new

Provincial quality handbooks

- **Noord-Holland:** Guidelines for Landscape and Cultural History (2018). In this guide, the Defence Line of Amsterdam and the New Dutch Waterline are designated as supporting provincial structures. This means that attention is paid to this structure in the regional complexes.
- **Utrecht:** in 2011, the Quality Guide for Utrecht Landscapes [*kwaliteitsgids Utrechtse landschappen*] was published. The quality guide comprises one overarching section and six area sections, one of which is the Waterlines (New Dutch Waterline and Defence Line of Amsterdam) section. The quality guide specifically defines the OUV into core features of the Dutch Water Defence Lines in the Utrecht landscapes, so that everyone understands which elements are involved. It also offers inspiration and support for safeguarding the OUV for the future in the case of developments, and even making them better able to be experienced.
- **Gelderland:** handbook “Core qualities of the New Dutch Waterline, handbook on protecting and developing (2015)” [*Handboek “Kernkwaliteiten Nieuwe Hollandse Waterlinie, beschermen en ontwikkelen” (2015)*], produced by the managers of the regional cooperative partnership, the Pact of Loevestein, to the south of the River Lek. The handbook recounts the history of the New Dutch Waterline, explains the protection philosophy and describes the features in detail for each subarea (the various attributes such as forts, dikes and sluices). It also offers a perspective on development and design guidelines.
- **Noord-Brabant:** this part of the New Dutch Waterline is also described and defined in the above-mentioned handbook. In addition, there is the Cultural and Historical Value Map [*Cultuurhistorische waardenkaart*], which describes the landscape of the New Dutch Waterline as a cultural and historical landscape of importance to the province. Supporting structures in the region are the levees and alluvial ridges along the big rivers, the dikes and the defensive structures. Furthermore, there is a Development Strategy in which the cultural and historical values are linked to protection, development and tourism and recreational development.

brief: to issue opinions with the aim of maintaining the balance between spatial development in and of the area of the New Dutch Waterline, and the monument values of the New Dutch Waterline as an extensive heritage site. The advice ranges from architectural suggestions and comments on spatial planning matters to points of concern in the case of dilemmas relating to management and operation. Once the New Dutch Waterline is part of the planned Dutch Water Defence Lines World Heritage Site, the Quality Team will extend its field of operation to the Defence Line of Amsterdam. Among other things, the Quality Team has advised on the Exploratory Strategic Line Perspective, energy transition, quality assurance, and the terms of reference for the Heritage Impact Assessment on energy transition. It has also drawn up a memorandum on Visual Integrity, which is included as an annex to the dossier.

Quality handbooks

In the Spatial Planning (General Rules) Decree (see 5C1), the Outstanding Universal Value of the World Heritage Site was converted into “qualities” of the proposed site. Provinces are asked to elaborate and objectify the OUV. The OUV is legally safeguarded in by-laws and zoning plans. They additionally have an influence on the

architecture or the spatial design of developments that are permitted. For this purpose, quality handbooks have been produced in all four of the provinces. The quality handbooks describe the desired incorporation of the heritage site into the landscape or for each area type. In addition, the provinces have their own independent “advisers on spatial quality”, which give the provincial administration solicited and unsolicited advice on how to approach specific challenges inside and outside the World Heritage Site. In the coming years, the provinces will align the layout of the quality handbooks (see below for further details). In 2019-2020, a single joint quality handbook will be produced for the Dutch Water Defence Lines, covering how to deal with the incorporation of development wishes into the landscape or for each area type. In addition, one uniform model strategy will be devised for Supervision and Enforcement Policy for the whole site and its surrounding area.

Heritage Impact Assessment

Since 2013, the Netherlands has been employing the Heritage Impact Assessment as an instrument to assess the impact on the Outstanding Universal Value of potential developments in or near a World Heritage Site.

Overview of Heritage Impact Assessments

Below is an overview of the Heritage Impact Assessments carried out since 2013 for both the Defence Line of Amsterdam and the New Dutch Waterline.

- New Dutch Waterline / third lock chamber for Beatrix lock and business park het Klooster.
- Plan adjustment / more funds made available to integrate the move of the New Dutch Waterline elements and for an additional open zone between the Lek Canal and het Klooster (adjustment to urban development plan).
- New Dutch Waterline / Regional business park Werkendam (phase 2)
- Following the Heritage Impact Assessment, it was decided to abandon the development of phase 2.
- New Dutch Waterline / Wildlife corridor
- Original plan for wildlife corridor was changed.
- New Dutch Waterline / Northern Ring Road Utrecht
- Partly on the basis of the Heritage Impact Assessment, planners sought possibilities for making more crossings underground or at a sunken level.
- New Dutch Waterline / Northern Ring Road Utrecht – extra bicycle bridge
- Based on the Heritage Impact Assessment, alternative solutions were sought for the construction of an extra bicycle bridge.
- New Dutch Waterline / Solar fields
- Heritage Impact Assessment on the effects of constructing a solar field. Solar panels at this location have a limited effect. Planning for the project is continuing.
- Defence Line of Amsterdam / Train depot
- Limited impact, further development of plans based on recommendations resulting from Heritage Impact Assessment and recommendations from ICOMOS.
- Defence Line of Amsterdam / plan for A8-A9 motorway connection
- Results of Heritage Impact Assessment form the basis for further research into alternatives. There will now be further deliberations and research.
- Defence Line of Amsterdam & New Dutch Waterline / Energy transition
- In progress; strategic study on the effects of new forms of energy generation on the attributes of the Defence Line of Amsterdam and the New Dutch Waterline.

Source Land-ID, Loes van der Vegt (9 July 2018)

In 2015, two Heritage Impact Assessments were carried out for the Defence Line of Amsterdam: a HIA for a train depot and a HIA for a possible road connecting the A8 and the A9 motorways, which will cross the Defence Line of Amsterdam. Both Heritage Impact Assessments were submitted to the World Heritage Centre and ICOMOS for assessment. ICOMOS advised on this matter and since then, the two parties have been in consultation. In future, too, the Heritage Impact Assessment will continue to be used as an assessment instrument for developments with a potential impact on the site.

The Heritage Impact Assessment has also been used in relation to a number of projects in an around the site of the New Dutch Waterline, in anticipation of its planned status as part of the Dutch Water Defence Lines World Heritage Site. In addition, on the site-holder's initiative, a Strategic Heritage Impact Assessment on Energy Transition was started in 2018. The outcome of the Heritage Impact Assessment on Energy Transition is expected in early 2019.

In order to make things clearer for initiators, the programme offices, on the advice of the independent Dutch Water Defence Lines Quality Team (as a complement to the ICOMOS guidelines), have drawn up recommendations regarding situations in which a Heritage Impact Assessment is desirable, and on formulating the terms of reference of future Heritage Impact Assessments and how to implement them.

5.c.3 Harmonisation of decentralised legislation

Corresponding with the wish that, from the summer of 2020, the Defence Line of Amsterdam and the New Dutch Waterline together form one World Heritage Site, is one clear and unambiguous form of policy and legislation for preservation of the OUV. For the World Heritage Site and its extension, the four provinces involved – Noord-Holland, Utrecht, Gelderland, and Noord-Brabant – have decided on a harmonised impact of the spatial government policy in terms of legislation, implementation, supervision, and enforcement. This means that harmonised texts on the protection of the World Heritage Site will be included in the most important provincial instruments that follow from the Barro and the Environmental & Planning Act: the provincial Environmental Strategy and the provincial by-laws. Linked to this is a uniform, qualitative assessment framework for the way in which the OUV of the high-dynamic areas must be taken into account. Differentiation of implementation only prompted by differences in the local situation. In 2019-2020, a single joint Dutch Water Defence Lines quality manual will be drawn up, to formulate the approach to integrating development requirements in the landscape or for each area type. A uniform model strategy for Supervision and Enforcement Policy will also be created for the entire site and its surroundings.

In addition to harmonising the protection in provincial environmental strategies and by-laws, local governments will also be asked to harmonise the municipal zoning plans. Experience with this was acquired during the creation of the Pact of Loevestein 'umbrella

zoning plan' (for the southern part of the New Dutch Waterline). An umbrella zoning plan contains rules with the same solid legal status as the zoning plans that it relates to.

Harmonisation of zoning plans in the southern part of the New Dutch Waterline

On 13 February 2014, the municipalities in the southern part of the New Dutch Waterline and the Province of Gelderland, united in the 'Pact of Loevestein', signed the 'New Dutch Waterline' administrative agreement. The objective of this administrative agreement is to adopt uniform zoning plan rules that safeguard the preservation and the development of the core qualities of the waterline. For the municipalities of Lingewaal, Culemborg, Gorinchem, Vianen, Zaltbommel, and Leerdam, an umbrella zoning plan was drawn up, in which the protection rules for the New Dutch Waterline are placed over the applicable zoning plan like an umbrella. The 'developed areas' were left out of the limits of the umbrella zoning plan, because no additional rules for the protection of the waterline were set. All zoning plans were laid down prior to 1 January 2017. The umbrella zoning plan was drawn up as a so-called coordinated zoning plan. This means that the plan was drawn up in coordination between the municipalities involved and the Province of Gelderland.

5.d Existing plans related to municipality and region in which the proposed property is located

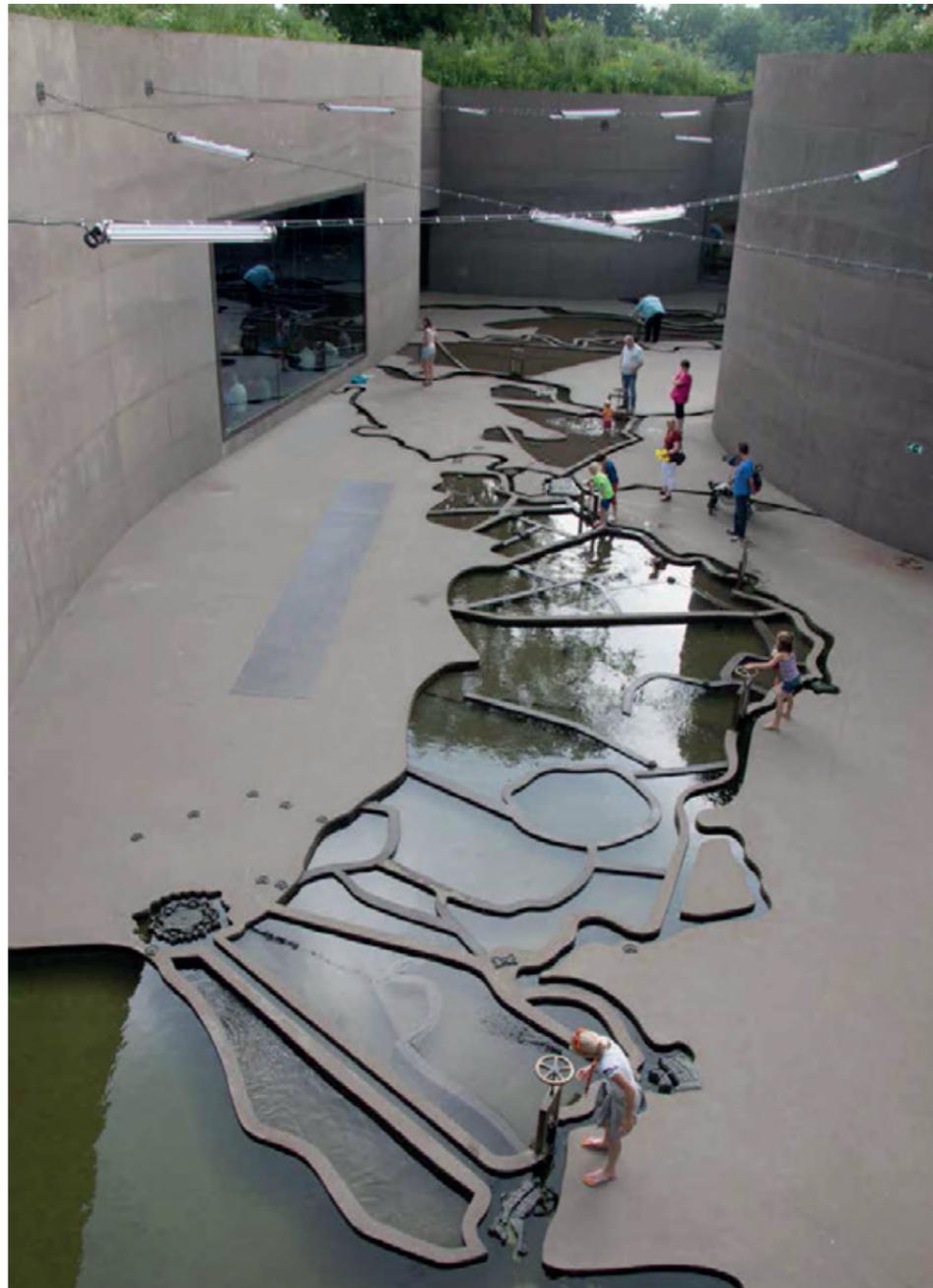
The Dutch Water Defence Lines are located in a dynamic part of the Netherlands. Societal challenges, such as mobility, housing, climate change, and the transition to sustainable forms of energy take up the limited space in this dynamic section of the Netherlands. Spatial developments continue to take place here, because parts of the cultural heritage are in a high-dynamic environment. Locations where urban expansion has been set out for the coming period have been placed or kept outside of the site. Further expansion in the Dutch Water Defence Lines is neither likely nor permitted under current policy. However, transformations of existing urban areas are possible. The Dutch integrated assessment framework of all interests (including the cultural-historical values) applies to all large-scale transformations. The new Environmental & Planning Act virtually eliminates damage to the Outstanding Universal Value by urban developments.

On the instructions of the provinces involved, an analysis was drawn up, in the *Landscape Analysis* (appendix 3), of the types of developments that could (adversely) affect the OUV of the current and future World Heritage Site. This shows that in theory these can involve large-scale developments resulting from urbanisation, industry and business activity, wind turbines and high-voltage power

lines, infrastructure, recreation, nature conservation and agricultural upscaling. In addition, researchers examined the extent to which these developments are or can be regulated within current policy. The conclusion is that the existing policy regimes offer adequate protection of the Outstanding Universal Value. Appendix 11, map 11.21 and 11.22 contain Existing protection regimes in the vicinity of the property.

Section 4B (i) contains a more specific description of the urban dynamics and development pressures that may affect the current World Heritage Site and the extension. Examples of the way in which the site-holder combines developments in and around the heritage site with reinforcement and accessibility of the OUV can be found in appendix 7B Defence Line of Amsterdam and New Dutch Waterline: Stronger Together.

Maquette Waterliniemuseum



Dutch Water Defence Lines

5.e Property Management Plan

The motto of the management plan is 'Stronger together'. It is not a new motto, in fact; rather, it is the same motto that the cooperating Provinces of Gelderland, Noord-Holland, Utrecht and Noord-Brabant chose at the start of the nomination process (in 2011). 'Stronger together' not only means that, in the past, the Defence Line of Amsterdam and the New Dutch Waterline together were stronger as one defence line than individually. It also means that conferring World Heritage status on both defence lines will offer both more effective protection, and that joint supervision can lead to more robust, more uniform management of both Dutch Water Defence Lines.

In 1996, the Defence Line of Amsterdam was placed on the World Heritage List by UNESCO, with the provinces of Noord-Holland and Utrecht as site-holders and its own programme office for implementation. In the years thereafter, businesses, civil society organisations, and public authorities continued to invest in refurbishing and repurposing various parts of the Defence Line.

In 1999, the national government designated the New Dutch Waterline a National Project with the intention to propose it as part of the World Heritage Site in the long term. Under the direction of a Dutch Water Defence Line Committee with administrative representatives from the State and four provinces, a programme office expressed this ambition in the Panorama Krayenhoff strategic vision. In recent years (2000-2016), approximately 200 million euros has been invested, thanks to joint investments of private and public parties. Under the coordination of representatives of provinces, municipalities, water authorities, and the larger fort owners, many forts have been fixed up, sluices have been restored, dykes have been repaired, and recreational connecting routes have been created, linking the National Project to regional and local partners.

Besides the physical refurbishment and repair of the Defence Line of Amsterdam and New Dutch Waterline, the National Project generated growing interest in knowledge-sharing, public education, communication and marketing. A number of notable examples are the Fort Season as an annual tourist-recreational campaign, the books 'Tastbare Tijd' [*Tangible Time*] and 'The Dutch Water Defence Lines', the opening of the Waterline Museum and the Geofort, and the Dutch Water Defence Lines knowledge centre.

In 2011, the Netherlands decided to nominate the heritage site for inscription on the World Heritage List. Given the great coherence with the Defence Line of Amsterdam, the decision was made not to nominate the New Dutch Waterline separately, but to propose it as an extension of the Defence Line of Amsterdam World Heritage Site. This means that the Defence Line and Waterline not only have a shared past but also a shared future as a World Heritage Site. In anticipation of this, the management of both lines is interlinked more and more. Cooperation has been taking shape under the 'Stronger Together' motto since the end of 2016. Together, projects are assigned, research is done, and, ultimately, a joint organisation

will take on the site-holdership of the entire World Heritage Site. The ICOMOS recommendation regarding the extension of the Defence Line of Amsterdam to include the New Dutch Waterline and regarding the boundary modifications of the existing World Heritage Site (WHC, Decision: 41 COM 8B.46) has been discussed and incorporated in the joint nomination dossier and the management plan.

In this way, the recommendations of the World Heritage Committee and ICOMOS for the Defence Line of Amsterdam are already being carried over into the management of the New Dutch Waterline. This can be found in the accompanying management plan. The Management Plan describes how protection of the Defence Line and Waterline is currently organised and indicates which steps are being taken to ensure comprehensive protection of the proposed 'Dutch Water Defence Lines' World Heritage Site. The management plan related to the period prior to World Heritage status. If the proposal for extension is honoured, the full, integrated management plan will take effect as quickly as possible. The 'Resource Manual: Managing Cultural World Heritage (November 2013)' forms the guideline for the chosen structure of the management plan. This management plan is structured as follows:

- Part I: The Dutch Water Defence Lines are stronger together: is the overarching theme that links Parts II and III and concerns the integration of the Defence Line and Waterline. This section describes what the Defence Line of Amsterdam and the New Dutch Waterline do together and how one integrated management plan will ultimately be drawn up in 2020 and take effect on 1 January 2021.
- Part II: Defence Line of Amsterdam: the current management plan for 2015-2020. This management plan, with an English-language summary, was sent to the World Heritage Committee (UNESCO) at the end of 2015.
- Part III: New Dutch Waterline: describing the management of the New Dutch Waterline for the coming three years (2018-2020). In terms of content and structure, it follows Part III of the Defence Line of Amsterdam management plan as closely as possible.

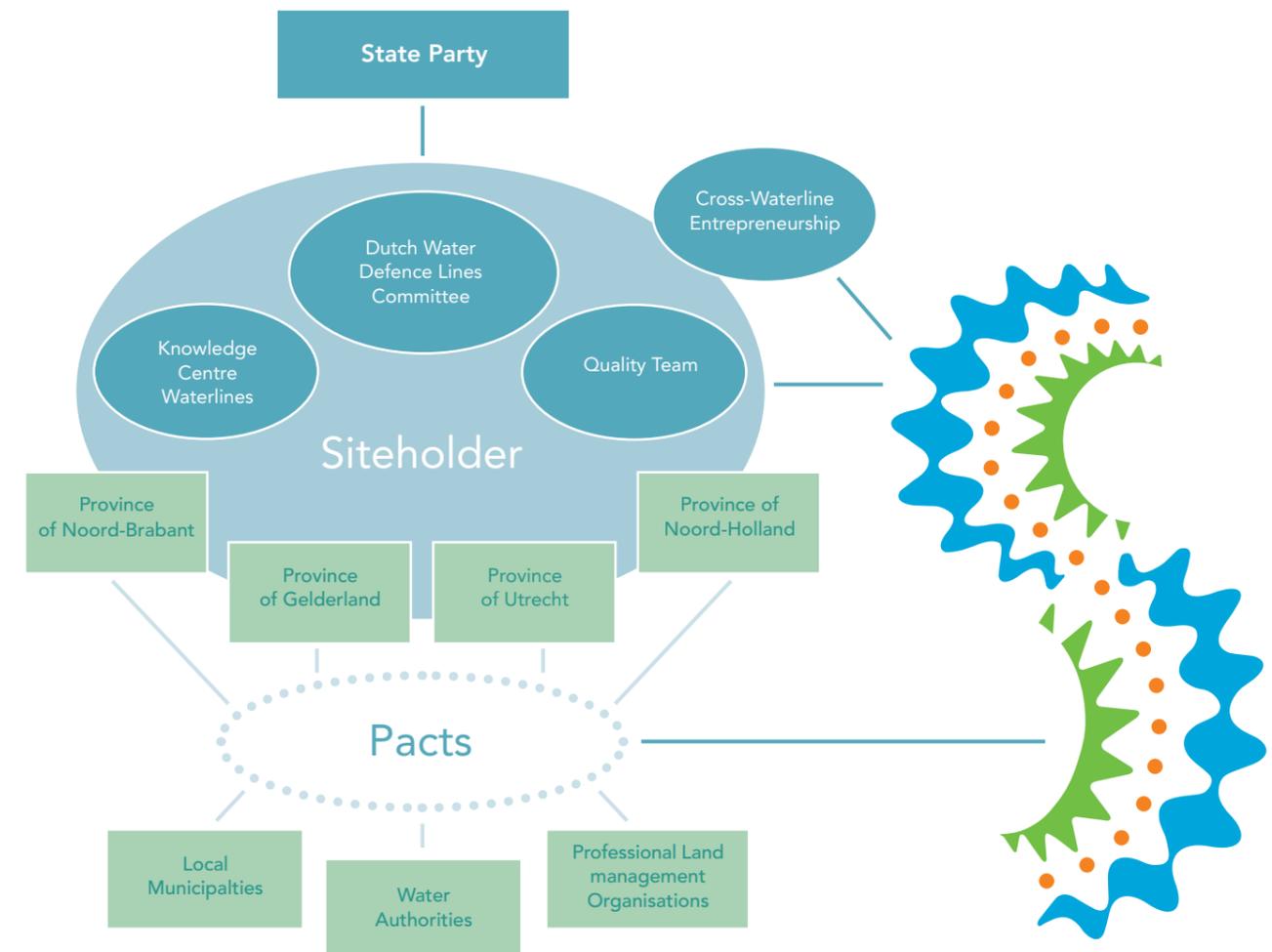
Management Plan Dutch Water Defence Lines	
Part I: Defence Line and Waterline – stronger together (overarching memorandum) Effective 2018 - 2020, going forward to 2021 and beyond	
Part II: Defence Line of Amsterdam Effective 2015 - 2020	Part III: New Dutch Waterline Effective 2018 - 2020

The strengthened collaboration can be seen in the Management Plan in the detailing of six jointly formulated objectives:

- 1 Organising joint site-holdership
- 2 Preparing a joint management plan from 1 July 2021 onwards
- 3 Conveying the joint narrative
- 4 Detailing and harmonising planning protection
- 5 Setting up an effective monitoring system
- 6 Launching Agenda 2030

1) Organise joint site-holdership

The aim is for the New Dutch Waterline and the Defence Line of Amsterdam to become a single World Heritage Site in mid-2020. From then on, one site-holder is responsible for the sustainable preservation of the entire World Heritage Site, which we refer to as 'Dutch Water Defence Lines'. By signing the administrative agreement in October 2014, the Provinces of Noord-Holland, Gelderland, Noord-Brabant and Utrecht embarked on a period in which they will continue working together to obtain UNESCO status for the New Dutch Waterline. As per 1 July 2020, the four provinces work together in a joint body. This is an administrative partnership on the basis of the Joint Arrangements Act [*Wet gemeenschappelijke regelingen*]. Together, the provinces of Noord-Holland, Utrecht, Gelderland, and Noord-Brabant are the site-holder of the Dutch Water Defence Lines. A small part of the New Dutch Waterline is situated in the Province of Zuid-Holland. The five provinces have agreed that, in their capacity as site-holder, the Provinces of Noord-Holland, Utrecht, Gelderland and Noord-Brabant will also look after the section of the New Dutch Waterline situated in Zuid-Holland. Nevertheless, the Province of Zuid-Holland endorses the UNESCO nomination and performs its own core spatial-planning protection tasks.



The merging of the project organisations of the Defence Line of Amsterdam and the New Dutch Waterline was started in 2016 and will be completed on 1 July 2020.

This is being managed by representatives of the four provinces, under the direction of an independent chair and with a representative of the Cultural Heritage Agency as advisor. The site-holder will carry out or have carried out at least the following tasks:

- harmonising and coordinating the protection of the World Heritage Site as a whole, with a view to long-term adequate protection of the Outstanding Universal Value (OUV);
- drafting, carrying out, and updating the management plan;
- meeting the UNESCO reporting obligation, e.g. the ‘state of conservation reports’ and the periodical reports;
- seeing to the necessary communication, harmonisation, coordination, and cooperation between the sub-areas within the World Heritage Site;
- seeing to the timely involvement of relevant public authorities and stakeholders within the World Heritage Site as a whole;
- organising sufficient resources for the implementation of the management measures, with all parties involved;
- promoting the conceptualisation of a joint approach to joint operations;
- encouraging mutual knowledge exchange and the presence of OUV expertise relating to spatial quality. The Spatial Quality Advisory Team and the Knowledge Centre will be used for this, among others;
- timely identifying and responding to threats and developments that will have a long-term or lasting impact on the World Heritage Site’s Outstanding Universal Value;
- generating support and enthusiasm for the World Heritage Site among stakeholders and the public;
- acting as the first point of contact for and involving national authorities for expertise and advice in implementing the management plan.

Strategic site-holdership

The future Dutch Water Defence Lines World Heritage Site is one of the largest cultural heritage properties in the Netherlands in terms of length and with an area of approximately 55.000 hectares. These dimensions and the many different owners, users, and governments are a particular challenge for the site-holdership.

As the collective site-holder, the collaborating provinces see themselves as a ‘plus’ to local and provincial policy. Within the scope of the entire World Heritage Site, the site-holder takes up tasks that are useful for the entire World Heritage Site or parts thereof. Initially, it focuses on the preservation of the World Heritage Site in the long term and on the requirements that are necessary for this. It actively seeks discussion and coordination with the relevant partners in the vicinity. The strategic objectives of the site-holder are:

- To protect and preserve of the Outstanding Universal Value as determined by the World Heritage Committee for the Dutch Water Defence Lines World Heritage Site;
- To broadly convey and communicate the Outstanding Universal Value at national and international levels.

Water as an ally in the defence of the Netherlands

For over a century, the Dutch Water Defence Lines protected the economic and administrative heartland of the Netherlands against enemy invasion. In 1815, the construction of these defence lines, which were to protect the Netherlands in times of war by inundating the land to knee height,

was begun. The ingenious system of forts, sluices, canals, and dykes in the landscape is almost invisible. Together, they tell the story of the defence of the country, with water as an ally. A story has been well preserved and that can be discovered and experienced again and again in different ways.

- These two strategic objectives are, in terms of content, the same as the strategic objectives in the 2014 Management Plan of the Defence Line of Amsterdam. The details of the strategic goals for the Waterline have been included in part II and those for the Defence Line in part III.

2) Prepare comprehensive Management Plan

In July of 2020, the site-holder will begin drawing up an integrated Management Plan for the Dutch Water Defence Lines, under the responsibility of the administrators in the Dutch Water Defence Line Committee. The management plan describes the new joint management organisation and the tasks and responsibilities of the site-holder and relevant parties. More intensively than is now the case, it will be drafted in cooperation with partners in the field. Tasks and authorities will be organised as locally as possible, in keeping with Dutch governance culture. A broad approach will be taken to heritage protection, because heritage is important for local identity and thus for local communities. This broad or inclusive approach to heritage can also be found in the Operational Guidelines (2017, Article 111).

3) Communicate joint narrative

In the past three years, the Defence Line of Amsterdam and the New Dutch Waterline have been working together, to an increasing degree, to communicate the Outstanding Universal Value of both defence lines and their interconnection.

Conveying the narrative

Since 2016, the joint narrative of the Lines is conveyed in the brand strategy and in all forms of communication. In 2016, the joint narrative was formulated and, in 2018, the overarching name, ‘Dutch Water Defence Lines’, was decided on for the entire proposed World Heritage Site. The core of the joint narrative is:

Marketing and communication

It is the site-holder’s goal to make the outstanding value of the heritage site more recognisable and better known – both nationally and internationally. Another goal is to encourage people to visit the Dutch Water Defence Lines and the surrounding area.

Communication and marketing make the Outstanding Universal Value of the heritage site better known and more recognisable. The basis for this is conveying the joint narrative of the Dutch Water Defence Lines: 'Water as an ally', in many different places and in different forms. In cooperation with the collaborating partners in the field, various different communication channels and marketing methods are employed to achieve this.

4) Detailing and harmonising planning protection

One of the most important tasks of the site-holder is to safeguard the structure and coherence of the Dutch Water Defence Lines. There is a collective, joint responsibility to preserve in a sustainable way and to advise the authorities responsible (provinces, municipalities, water authorities, and the State) on decisions to be taken. The site-holder guards and enhances the effective planning protection in the coming years by:

- Harmonising the protection for the entire Dutch Water Defence Lines site, through the effects of the Environmental & Planning Act and the protection of the World Heritage Site.
- Working on a single quality manual for the entire site.
- Drawing up area analyses for high-dynamic areas within and around the site. The area analyses offer detailing of the OUV on the spot, which serve as input for the assessment of spatial developments. These analyses also serve as a basis for HIAs. In 2018, the 'Utrecht area' analysis was started. In 2019, the Heemstede-Schiphol and the Vechtstreek-North region area analyses will start.
- Drafting guidelines for a Heritage Impact Assessment (HIA). Several HIAs have been conducted in the Lines in recent years. The site-holder wishes to disseminate information about the HIA to the relevant parties to ensure early consideration of the Outstanding Universal Value in all spatial planning developments (starting in 2018).
- Giving the independent Spatial Quality Advisory Team with external experts an advisory role in large-scale spatial developments for the entire Dutch Water Defence Lines site. The Spatial Quality Advisory Team does this in close collaboration with the provincial spatial advisers, such as the Spatial Development Advisory Committee (*Adviescommissie Ruimtelijke Ontwikkeling*, or ARO) and the Spatial Quality Advisory Committee (*Adviescommissie Ruimtelijke Kwaliteit*, or ARK). The area falling under the New Dutch Waterline has already had good experiences with an independent Spatial Quality Advisory Team of external experts.
- Intensifying cooperation between Defence Line and Waterline spatial planning officials at national, provincial, and municipal level so that the site-holder learns about new initiative by other 'developers' good time. 'In good time' means early enough for the Defence Line and Waterline organisations to participate in planning supervision and advice early in the design process.

5) Effective monitoring system

The international Operational Guidelines (2017) show that monitoring is an important instrument in the protection of World Heritage. When monitoring, the site-holder and member state must have a clear picture of the Outstanding Universal Value and the state of conservation of the World Heritage Site. Furthermore, the monitor generates information of importance to the Periodical Report required by UNESCO once every 6 years (section 29 of the World Heritage Convention). The next Periodical Report for Europe and North America will take place in 2022-2023. In 2024, the reports will be assessed by the World Heritage Committee. The Periodical Report of the Dutch Water Defence Lines World Heritage Site will be drawn up by the collaborating provinces as the site-holder, in collaboration with the Cultural Heritage Agency.

The most important indicators in the monitor for the Dutch Water Defence Lines World Heritage Site are:

- The timely identification of developments with a possible effect on the Outstanding Universal Value, on the basis of 14 of the most important threat factors identified by UNESCO.
- The ongoing appraisal of the state of conservation of representative elements (attributes) of the World Heritage Site. Many structural attributes of the Dutch Water Defence Lines have a monument status on the basis of the Heritage Act. This obligates owners of monuments to maintain them. The Cultural Heritage Agency registers the state of conservation and any incidents involving archaeological and structural national monuments in the Heritage Monitor.
- The monitoring of the site-management progress, with a focus on preserving and conveying the OUV. As of 2020, there will be one overarching site-holder office for the Dutch Water Defence Lines. This office will monitor the progress of the implementation of the management plan. Every year will be concluded with an account of the results and the financial position. The collaboration between the provinces and the account is not non-committal, but will be laid down in a formal administrative collaboration (on the basis of the Joint Arrangements Act [*Wet gemeenschappelijke regelingen*]).

In 2017, the collaborating provinces began the Dutch Water Defence Lines Project Monitoring to implement this. An extensive description of the monitoring of the entire site can be found in section 6, Monitoring.

6) Setting up Agenda 2030: sustainability & partnership

With reference to the recommendation of the Committee in relation to the minor boundary modification (2017):

- Continuing to support communication and capacity building initiatives for local and provincial governments and stakeholders, and the ICOMOS Advisory Mission Report (UAM Additional Recommendations)

- The analysis of stakeholder groups in force led to an understanding of the social and economic powers in context, and to recommending the development of appropriate instances for information, debates and choices, namely to respect the property and the expression of the OUV. It is really important to try to get well-accepted decisions by all stakeholders and inhabitants, as best as possible. In addition, specific actions for economic stakeholders are also recommended, to better communicate the OUV concept and to encourage managers to make links between past and present, to use value of the place in business communication; that could be important for future preservation of the Dutch Water Defence Lines property.

The harmonisation and knowledge-sharing between partners, users, and local residents will be increased in the coming years.

In line with the Operational Guidelines (section 111), the protection of the World Heritage Site will take place in partnership with local parties, with sustainable use as a central challenge. The function given to an attribute must be in line with the integrity and authenticity of the Dutch Water Defence Lines. This requires customisation per attribute and per location. The site-holder will actively call the authorities involved to account for their legal authority to prohibit certain activities, if there is a danger of an undesired change of function.

Line perspective

Early 2017 saw the drafting of the document 'Exploratory Strategic Line Perspective Study 2030', commissioned by the Provinces of Noord-Holland, Utrecht, Gelderland, and Noord-Brabant. The basis for this document consisted of the Krayenhoff Panorama (2004) for the New Dutch Waterline and the Visual Quality Plan (2008) and Management Plan (2015) for the Defence Line of Amsterdam. The central question in this is how the lines can be further developed up to 2030 – in particular, in terms of space – and how to approach trends, developments, and other challenges. The Exploratory Study describes the leitmotiv for the spatial course: a 'line of ribbon in the delta', a zone of calm, quietness, and reflection. This ribbon is enormously valuable for the quality of life in this region of the Netherlands. The Dutch Water Defence Lines constitute a green outdoor space of major cultural and historical significance. The document identifies three priorities for the spatial course traced out for the ribbon:

- to recount a unique cultural and historical narrative,
- to shape the outdoor space of millions of people, and
- to capitalise on opportunities to combine functions.

On the basis of these concepts, the site-holder engages in discussion with the extensive network of owners, civil society organisations, site managers, volunteers, and other public authorities. The Exploratory Strategic Line Perspective Study 2030 is provided in an appendix to the nomination dossier. In 2019, it will be used to develop an Agenda 2030 for the three sub-areas: Loevestein Pact (South), Ruigenhoek Pact (Central), and Defence Line of Amsterdam (North).

The Agenda 2030 will be included in the Management Plan 2020-2028.

Energy lines

In 2017, the 'Energy line: cultural heritage in transition' report was drawn up by three design agencies and was commissioned by the Province of Noord-Holland and the Cultural Heritage Agency. The report describes the possibilities for respectful integration of renewable energy in the Defence Line of Amsterdam World Heritage Site and the proposed extension the New Dutch Waterline. The report concludes that, while the relationship between heritage and green energy is less than obvious, they can in fact co-exist or even enhance one another in surprising ways at times.

The site-holder will help draw attention to this report and spark the debate about the relationship between heritage and the energy transition. The basic idea is to promote the use of green energy, as long as this does not affect the Outstanding Universal Value of the Defence Lines. To this end, a thematic Heritage Impact Assessment of Energy Transition in the Dutch Water Defence Lines was also launched in 2018. This will produce a vision in early 2019, based on the Outstanding Universal Value, indicating which forms of renewable energy are possible at which locations along the Dutch Water Defence Lines and under what conditions. In addition, municipalities and environmental services will be issued with a guide to planning supervision and assessment of initiatives at specific locations.

Local support

The site-holder's main responsibility lies with World Heritage-wide matters. It therefore operates somewhat at arms' length from all the work carried out by local volunteers, heritage organisations, site managers and other local parties. Of course, there are regular meetings with the sub-areas through officials who work together though the project organisations of the Defence Line of Amsterdam and the New Dutch Waterline. The site-holder is also the initiator of the Cross-Waterline Entrepreneurship Foundation (*Stichting Liniebreed Ondernemen*, or SLO), which provides communication with the public and has formed a community for local entrepreneurs on the instructions of both project organisations. Furthermore, SLO organises training courses for volunteers. Examples of this are a storytelling course and the development of a manual for the guides and volunteers in the Dutch Water Defence Lines. This teaches them how to convey the traditional Dutch narrative of 'Water as an ally' even better to the public.

In the run-up to the joint site-holdership, we will be surveying local support organised by the separate project organisations and the supporting role the site-holder plays in that regard.

The first joint management plan in July of 2020 contains a separate chapter on local support, including projects and resources. This will include the role of the Expertise Centre.

In conclusion, there will be one single Management Plan for the entire site when the decision is made in the summer of 2020 whether the Dutch Water Defence Lines will be granted World Heritage status.

5.f Sources and levels of finance

Between 2000 and 2016, the redevelopment of both the Defence Line of Amsterdam and the New Dutch Waterline were well under way thanks to the joint investments of private and public parties. Approximately two hundred million euros was invested in this period, with many forts being refurbished, sluices restored, dykes repaired, and recreational connecting routes created. Necessary investments are possible for the period up to 2020; there is a budget of 25 million euros for this.

An amount of approximately 1 million euros per year will be needed for the implementation of the site-holder's tasks, as stated in Section 4 of the Management Plan. The four provinces that are responsible for the site-holder's tasks will contribute this amount together. The Province of Noord-Holland is currently contributing approximately 0.5 million euros to the Defence Line of Amsterdam. For the extension to include the New Dutch Waterline, the provinces of Noord-Holland, Utrecht, and Gelderland will each contribute 30% of the costs and the province of Noord-Brabant will contribute 10%.

5.g Expertise and training in conservation and management techniques

During the term of the Management Plan, the human resources capacity of the site-holder will include:

- 1 The Spatial Quality Advisory Team of the New Dutch Waterline and the secretary of this team. The team consists of experts and offers independent recommendations to the Dutch Water Defence Line Committee, in order to balance the spatial development in the area of the New Dutch Waterline with the Outstanding Universal Value of the heritage property. The chair of the Spatial Quality Advisory Team is Eric Luiten. As of 1 July 2020, the recommendations of the Spatial Quality Advisory Team will be extended to cover the entire area of the Dutch Water Defence Lines.
- 2 Human resources for the coordination and supervision of the New Dutch Waterline Knowledge Centre and Centre volunteers. This is a centre for research, study, and information regarding the cultural heritage of the waterlines in the Netherlands. The Knowledge Centre provides access, safeguards, and preserves (digital) knowledge of the waterlines in the Netherlands and the Defence Line of Amsterdam and the New Dutch Waterline, in particular.

The owners and operators are responsible for conserving, maintaining, and, where necessary, renovating the various structures of the New Dutch Waterline. The management and maintenance of the forts and other military elements are often assigned – sometimes long-term – to foundations specially set up for that purpose and which are in many cases staffed by volunteers, or to companies.

Conservation at Fort Rijnauwen



Restoration Waalse Wetering



Storytelling workshop at Fort Nieuwersluis

Volunteers not only contribute greatly to the maintenance of the forts, but also convey the narrative of the Line at the forts.

A majority of the fort owners has a contract with the Netherlands Monuments Watch Foundation [*Monumentenwacht*], and they receive periodical reports on the state of conservation, which they can use to budget and plan the appropriate maintenance for the long term. Knowledge has also been collected internationally, and partnerships have been started for the management and maintenance of the attributes within the Dutch Water Defence Lines. One example of this is participation in the SHARE (Safeguarding Heritage and Rural Economies) INTERREG IVB programme, which allows fort managers to exchange knowledge with the National Trust and Kempens Landschap, among other things. For the support of owners, managers, and operators, the following will be deployed:

- 3 Cross-Waterline Entrepreneurship Foundation (*Stichting Liniebreed Ondernemen*, or SLO). SLO supports entrepreneurs in and around the forts of the New Dutch Waterline and other waterlines. Examples are support with cross-waterline marketing and promotion, events, joint purchasing, knowledge-sharing, fundraising, and networking.
- 4 The Line Expert Team (LET) is deployed by the provinces of Utrecht and Noord-Holland, to offer owners, managers, and operators expertise and support. The LET is a multidisciplinary and innovative think-tank that discusses practical cases within the New Dutch Waterline and the Defence Line of Amsterdam. Experts offer advice relating to the problems of entrepreneurs, owners, municipalities, and water authorities. This includes for development, recreational routes, and broader area development. The Line Expert Team consists of sixteen experts, in eight different disciplines. These experts consider complex cases relating to themes such as sustainability, construction, cultural history, nature, finance, and hospitality.

Over the last few decades, the New Dutch Waterline has been a popular subject for research and publications, and for this reason, there is a lot of knowledge to be found at universities and universities of applied sciences. A number of valuable publications have also appeared about the New Dutch Waterline (e.g. *De Atlas van de Nieuwe Hollandse Waterlinie* [The Atlas of the New Dutch Waterline]); DVDs and television programmes have been produced (e.g. *waterlinie in perspectief* [waterline in perspective]); and eyewitness reports (oral history) have been written.



Education program

5.h Visitor facilities and infrastructure

The historic value and meaning of the Dutch Water Defence Lines is presented to the larger public by means of visitors centres, publications, events, exhibits, and educational programmes.

Familiarising children, young people, and adults with the historical narrative of the Dutch Water Defence Lines is leading at the visitors centres on the fort island of Pampus and at the Waterline Museum at Fort near Vechten. On the fort island of Pampus, the narrative focusses on the Defence Line of Amsterdam and life at the forts. At the Waterline Museum, the focus is on the New Dutch Waterline. In both places, history comes to life through an interactive exhibits for young and old.

At Fort Krommeniedijk, experience centre Fort K'ijk was opened in 2018; here, the nature and landscape of the Defence Line of Amsterdam come to life. As a fortification with accompanying fortified structures, Muiderslot Castle formed part of, as well as the culmination of, four water defence lines: the Utrecht Waterline, the Old and New Dutch Waterline, and the Defence Line of Amsterdam (UNESCO World Heritage Site). To tell this part of the history

Fort K'ijk



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of the castle, the Waterschild [*Water shield*] pavilion was built. At the Dutch Fortress Museum in Naarden, visitors are introduced to the history of forts and fortified towns in the Netherlands. And Loevestein Castle features the interactive exhibit '1001 bombs and grenades', where the audience is taken on a journey through the story of life in a castle fortress.

At the other 30 or more forts, in the fortified towns, and at sluices and other Waterline attributes, the public is informed by means of information boards and small exhibits about the history of the location and the operation of the system. In the New Dutch Waterline, these information boards will be replaced in 2019-2020 and improved to better inform the public.

At almost 20 forts, tours are provided by guides. These guides, many of whom are volunteers, are important ambassadors for communicating the story. In cooperation with the Cross-Waterline Entrepreneurship Foundation, training courses are organised to



Land of Beautiful Lines

Since 2017, the Cross-Waterline Entrepreneurship Foundation has organised an annual festival – Beautiful Land of Lines – in the first weekend of June, in collaboration with nature conservation organisations, such as the National Forest Service [*Staatsbosbeheer*] and the Society

for the Preservation of Nature [*Vereniging Natuurmonumenten*]. This cross-waterline festival invites the public to experience the landscape between the forts. Accompanied by a guide, walks or cycling trips can be taken and there are also special water trips.

train these guides in communicating the Outstanding Universal Value of the heritage site.

Both for the New Dutch Waterline and for the Defence Line of Amsterdam, a digital educational kit is available for children between 10 and 14 years old. A number of forts have developed their own educational programmes and special tours are organised for children and young people. For example, the Geofort won the Europa Nostra award for a youth education project. Using the Minecraft software programme, children and young people reconstructed the New Dutch Waterline. In 2019-2020, a new educational kit will be released, focussing on the story of the World Heritage Site and the OUV.

In the many route descriptions, both online and in print, the story of the Dutch Water Defence Lines is told on the basis of objects along the route. The new cycling routes in the Utrecht area, focussing on the themes of 'wooden houses' and 'water management structures', are a beautiful example of this. The Fort Land Route connects the Defence Line of Amsterdam and the New Dutch Waterline in the Muiden-Naarden-Weesp area. The Beemster Fort Cycling Route runs through two World Heritage Sites (both the Defence Line of Amsterdam and the Beemster Polder World Heritage Site). In 2019, the Dutch Water Defence Lines long-distance walking route will be launched. This 225-km-long walking route runs from Edam in the north, along all forts of the Dutch Water Defence Lines, to the Biesbosch nature reserve in the south.

5.i Policies and programmes related to the presentation and promotion of the property

It is the site-holder's goal to make the outstanding values of the heritage site more recognisable and better known – both nationally and internationally. Another goal is to encourage people to visit the Dutch Water Defence Lines and the surrounding area. Communication and marketing make the Outstanding Universal Value of the heritage site better known and more recognisable. The basis for this is conveying the joint narrative of the Dutch Water Defence Lines: 'Water as an ally', in many different places and in different forms. In cooperation with the partners in the field, various different communication channels and marketing methods are employed to achieve this.

An important partner for communication with the public is the Cross-Waterline Entrepreneurship Foundation [*Stichting Liniebreed Ondernemen*]. The Cross-Waterline Entrepreneurship Foundation has built up a close community of fort owners, operators, and entrepreneurs in the Dutch Water Defence Lines. All fort activities are placed together on the website www.forten.nl

and are also listed on the www.nieuwehollandsewaterlinie.nl and www.stellingvanamsterdam.nl public websites. In collaboration with the community, a number of times per year, the foundation organises cross-waterline events that are promoted nationally. In addition, the foundation develops clear communication resources, e.g. brochures in 4 languages, magazines, and media campaigns.

Utrecht Marketing is also an important partner of the New Dutch Waterline. On the instructions of the Pact of Loevestein and the Pact of Ruigenhoek, Utrecht Marketing works with various regional tourist organisations to provide packages and products for the regional market. With the National Bureau for Tourism and Congresses (NBTC), Utrecht Marketing is developing products with which to lure the international market to the Waterlines. Initially, the focus is on the Flemish and German public. In addition, research is being done, in collaboration with the NBTC, to see if a 'storyline of the Dutch Water Defence Lines' can be realised. This will then feature in the international promotional programme Holland City, created by NBTC, in addition to other tourist storylines, such as Dutch Design and the Van Gogh storyline. There is also a Democracy Fort at Lunette 1, and a ProDemos Peace Fort at Fort de Bilt with exhibitions and visitor centres. Topics of discussion are democracy and citizenship, respectively, as well as remembering the fight for freedom.

The Defence Line of Amsterdam is a member of the World Heritage Netherlands Foundation [*Stichting Werelderfgoed Nederland*]. Together with this national foundation and the other World Heritage Sites in the Netherlands, programmes are developed for the promotion of Dutch World Heritage in the Netherlands and abroad. The owners, operators, entrepreneurs, and volunteers at the forts are extremely important ambassadors and promoters of the Dutch Water Defence Lines. Each fort has its own character, its own network, and its own communication and media channels. In collaboration with the Cross-Waterline Entrepreneurship Foundation, a Toolkit was developed that provides the fort with information that can be used to tell the overarching story and the story of the OUV in their own communication.

5.j Staffing levels and expertise

The human resources capacity of around 5 FTE that will be available for carrying out the site-holder's tasks will be funded from the available budget. In 2018, the programme office for the New Dutch Waterline includes:

- the programme manager of the New Dutch Waterline
- four representatives from the four provinces
- the communications project leader and a webmaster
- the UNESCO project leader
- the programme secretary and the programme staff member

- In addition, the Defence Line of Amsterdam has a programme team. The team consists of:
- the Defence Line of Amsterdam programme manager
 - the Monuments and New Dutch Waterline cooperation staff member
 - the communication project leader
 - the spatial planning staff member
 - the UNESCO project leader
 - the support staff member

If the proposal for the extension of the existing World Heritage Property to form the 'Dutch Water Defence Lines' World Heritage Site is honoured, these teams will be merge.

- Furthermore, during the term of the Management Plan, the human resources capacity of the site-holder will include:
- The deployment of the Spatial Quality Advisory Team of the New Dutch Waterline and the secretary of this team;
 - The deployment of human resources for coordinating and supervising the New Dutch Waterline Knowledge Centre and Centre volunteers.

The owners and operators have first responsibility for conserving, maintaining and, where necessary, renovating the various structures of the New Dutch Waterline. The management and maintenance of the forts and other military elements is often assigned – sometimes long-term – to foundations specially set up for that purpose and which are in many cases staffed by volunteers, or to companies. In recent years, this has been professionalised, in part through the international exchange of knowledge and experience. This has, among other things, led to the forming of various qualified volunteer groups for the maintenance of the fort structures, structural collaboration with an educational institution for people who are removed from the labour market, and a training centre for volunteers.



6

Monitoring

6.a Key indicators for measuring state of conservation

Goals and indicators

In view of the massive scale of the world heritage site, monitoring is a complex task. For this reason, the cooperating provinces have already started to develop a monitoring system in anticipation of the submission in 2019. The Dutch Water Defence Lines Monitoring Project was started in 2017. This project will continue until 2020. The aim is to set up a monitor that systematically collects relevant information for the management of the World Heritage Site. In this way, the site-holder and the member state, the Netherlands, will have up-to-date information to follow developments, make interventions and support opportunities. In addition to qualitative data, quantitative data is collected and processed as far as possible in a new online database: waterlinie.monument-online.nl. In the summer of 2018, the basic version went online. As the site-holder, the collaborating provinces are the first point of contact for monitoring the world heritage site. The site-holder does this in coordination and consultation with the Cultural Heritage Agency.

The most important indicators in the Monitor for the Dutch Water Defence Lines World Heritage Site are:

- 1 Timely identification of developments with a possible impact on the Outstanding Universal Value;
- 2 Ongoing appraisal of the state of management, maintenance and re-purposing of the representative elements (attributes) of the World Heritage Site;
- 3 Monitoring the progress of site management aimed at maintaining and promoting the Outstanding Universal Values;
- 4 Organising and issuing the periodic UNESCO report for the World Heritage Site.

6.a.1 Timely identification of developments

By promoting early awareness of developments that could impact the Outstanding Universal Value, monitoring is largely meant to identify developments with a potential Impact and offer safeguards. The main point is to identify any developments that could harm the Outstanding Universal Value, either as a whole or within a specific sub-area. The World Heritage Centre has drawn up a list of the 14 most important factors that may be a threat (<https://whc.unesco.org/en/factors/>).

Below is an indication for each factor as to whether we expect there to be an impact on the New Dutch Waterline and Defence Line of Amsterdam. We will make a similar analysis in the joint management plan for the Dutch Water Defence Lines, which will commence in 2021.

Not all the factors on the list are relevant in the case of the Dutch Water Defence Lines. The table below gives an overview of all the standard factors that the World Heritage Centre has mentioned.

The second column indicates whether the factor is important for the World Heritage Site and is therefore included in the monitoring.

Factor (WHC)	Relevant for monitoring
Buildings and development	Yes, mainly in high-dynamic areas. But spatial development for housing, infrastructure or industrial estates is a factor in the entire World Heritage Site. The impact of tourism and recreation is also a development that is given a place in the monitor.
Transportation Infrastructure	Yes, relevant theme for the entire World Heritage Site. There is a specific focus on infrastructure around the major cities and the special position of Schiphol Airport (which is a unique case within the World Heritage Site).
Utilities or Service Infrastructure	Yes, hydrological infrastructure is part of the OUV. Renewable energy is a new theme and will be included.
Pollution	No. Not a relevant factor as regards the World Heritage Monitor. Possible pollution is addressed through environmental policy and not through world heritage policy.
Biological resource use / modification	No. Use of natural resources is not a threatening factor that must be monitored.
Physical resource extraction	No, extraction, e.g. by means of gas drilling, does not play a relevant role.
Local conditions affecting physical fabric	No. Not a task for the site-holder, but for owners and local authorities. Any local conditions that threaten physical condition are monitored locally. Damp is a well-known threat to defence structures. If necessary, the site-holder can assist by having research conducted. Not a standard indicator in the monitor.
Social/cultural uses of heritage	Yes. The use and repurposing is monitored. The impact of tourism and recreation is also a development that will be given a place in the monitor.
Other human activities	No, relates to illegal activities. Not relevant
Climate change and severe weather events	Yes, particularly the threat of flooding. In the Netherlands, authorities are paying a great deal of attention to this.
Sudden ecological or geological events	No, ecological or geological events with a great impact are not expected.
Invasive/alien species or hyper-abundant species	No, not a relevant factor.
Management and institutional factors	Yes. A great deal of attention is paid to the effects of legislation, policy, and the management of the World Heritage Site. Evaluation is a mandatory part of policy and legislation.
Other factor(s)	No. Not relevant.

As part of the nomination process, various studies have been carried out on behalf of the site-holder in order to gain a clear picture of relevant developments. These include in particular the 'Landschappelijke Analyse Stelling van Amsterdam en Nieuwe Hollandse Waterlinie' [Landscape Analysis of the Defence Line of Amsterdam and New Dutch Waterline] (Land-ID, Aug. 2016). In 2019, after the area analyses have been conducted for a few highly dynamic areas, the landscape analysis will be updated. This will produce an updated overview in autumn 2019.

In addition to fixed indicators, the site-holder has also built in the possibility of monitoring or commissioning research on temporary themes, so that a specific theme or development receives temporary additional attention. In 2018 and 2019, special attention will be focused on the theme of 'energy transition'. Among other things, by commissioning a Heritage Impact Assessment.

6.a.2 Appraisal of management, maintenance and re-purposing

The current Heritage Act [*Erfgoedwet*] imposes a conservation obligation on owners of national monuments: an owner must ensure that his or her monument is maintained in such a way that its preservation is guaranteed. The implementation rules pursuant to the new Environment and Spatial Planning Act will include a similar provision concerning conservation. When this act becomes effective (in 2021), that provision will assume the role of the section included in the transitional provisions of the Heritage Act. Where necessary, municipal authorities can use administrative and/or criminal law to enforce the necessary maintenance.

The Database of Cultural Heritage Incidents (DICE) exists to register any incidents involving monuments. The National Cultural Heritage Agency manages this database, which can provide a national overview of all registered heritage incidents. The Cultural Heritage Agency itself registers incidents involving archaeological and built national monuments. In addition, the national Heritage Monitor [*Erfgoedmonitor*] provides information on the state of maintenance of national monuments. The Heritage Monitor is a comprehensive and systematic monitor of heritage in the Netherlands. It will be developed and fleshed out in a cooperative venture between the national government and the 12 provinces. The information is available digitally from <https://www.erfgoedmonitor.nl/>. As of 2018, 171 indicators will be measured, including type of heritage site, geographical distribution, use, subsidy schemes, level of support, profile and educational projects. As the site-holder, we use the information gathered by the civil service and hold annual discussions to ascertain whether any incidents have occurred that require follow-up action. In addition, the online database will be further supplemented from 2018 to 2020. The aim is to have an overview of the state of maintenance, the existence of a current management plan and the current re-purposing efforts, at least for the national monuments within the World Heritage Site.

6.a.3 Site management progress

In recent years, the management of the Defence Line of Amsterdam World Heritage Site and the New Dutch Waterline heritage property were distinct. Both defence lines had their own programme office and their own policy and implementation plans. In the run-up to the extension of the Defence Line of Amsterdam and the New Dutch Waterline to form the Dutch Water Defence Lines World Heritage Site, collaboration has become increasingly close. From June of 2020 onward, the two programme offices will be merged into one overarching site-holder office.

There is an internal project administration for the implementation of the management plan. In administrative meetings, the progress and results will be discussed. Every year will be concluded with an account of the results and the financial position. The collaboration between the provinces and the account is not non-committal, but

will be laid down in a formal administrative collaboration (on the basis of the Joint Arrangements Act [*Wet gemeenschappelijke regelingen*]).

6.a.4 UNESCO periodic reporting

Monitoring is important for generating information for the Periodic Report that UNESCO requests once every six years (Article 29 of the World Heritage Convention). The next Periodic Report for Europe & North America will be issued in 2022-2023. The reports will be assessed by the World Heritage Committee in 2024. The Periodic Report for the Dutch Water Defence Lines world heritage site will be drawn up by the cooperating provinces as the site-holder in collaboration with the Cultural Heritage Agency (RCE).

No particular action will therefore be required in the period 2018-2020. However, we will be discussing the World Heritage in Europe Today report (2016) with the Cultural Heritage Agency's focal point (first international point of contact) in 2019. This report sets out the conclusions of the previous Periodic Report. This discussion may highlight areas of concern that can be included in the joint management plan that will apply from 2021.

The following summary table offers an overview of monitoring of the World Heritage Site.

Indicator	Method	Frequency	Source-holder / Responsible party
Identifying developments	Project administration for New Dutch Waterline, Heritage Monitor	Continuous	Site-holder, Spatial Quality Advisory Team
State of maintenance	Individual management plans, DICE, Heritage Monitor	Annually, occasionally	Owners, commercial operators, subareas, site-holder
Progress of management plan	Project administration for New Dutch Waterline	Annually	Site-holder
Periodic reporting	Midterm review (including site inspection), Heritage Monitor	3 & 6 years	Site-holder, Cultural Heritage Agency (RCE), subareas
Thematic	Variable	2-3 years	Site-holder, subareas

6.b Administrative arrangements for monitoring property

The following bodies manage monitoring data:

Site management

National New Dutch Waterline Project
P.O Box 406
NL-3500 AK Utrecht
E: nieuwehollandsewaterlinie@provincie-utrecht.nl

Provincial programmes

Province of Noord-Holland
Defence Line of Amsterdam Programme Office
Email: info@stellingvanamsterdam.nl
P.O Box 3007
NL-2001 DA Haarlem
Telephone: +31(0)23 514 31 43

Province of Utrecht
New Dutch Waterline Programme
P.O Box 406
NL-3500 AK Utrecht
Telephone +31 (0)30 258 36 03

Province of Gelderland
New Dutch Waterline Programme
P.O Box 9090
NL-6800 GX Arnhem
Telephone +31 (0)26 359 91 11

Province of Noord-Brabant
P.O Box 90151
NL-5200 MC 's-Hertogenbosch
Telephone +31 (0)73 681 28 12

Register of Heritage Assets

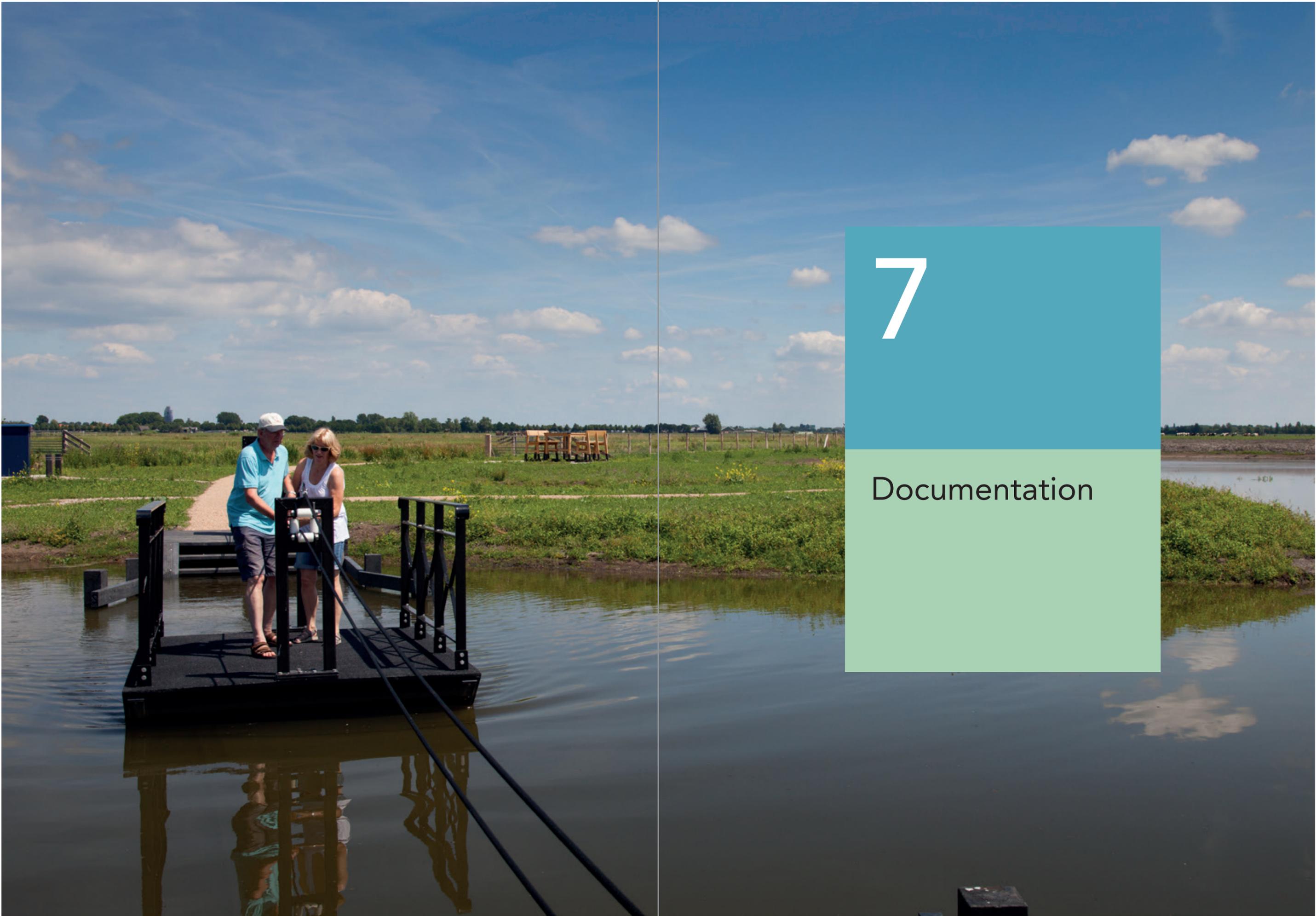
Cultural Heritage Agency
P.O Box 1600
NL-3800 BP Amersfoort
The Netherlands

6.c Results of previous reporting exercises

In 2013, a periodic report for the Defence Line of Amsterdam was sent to UNESCO. The conclusions formulated in this report were that:

- The authenticity of the World Heritage property has been preserved;
- The integrity of the World Heritage property is intact;
- The World Heritage property's Outstanding Universal Value has been maintained.

Listed as the most important threats were residential construction, development of industrial estates, and motorway infrastructure.



7

Documentation

7.a Photographs and audiovisual image inventory and authorization form

All images are available on our website:
www.programanieuwhollandsewaterlinie.nl/imagesunesco

ID No	Format	Caption	Date of photo	Photographer	Copyright owner	Contact details of copyright owner	Non exclusive cession of rights
1.	jpg	Fort south of Spaarndam	08/2016	Hanno Lans	Defence Line of Amsterdam	P.O Box 3007 NL-2001 DA Haarlem; info@stellingvanamsterdam.nl	yes
2.	jpg	Fort Krommeniedijk	08/2016	Hanno Lans	idem	idem	yes
3.	jpg	Fort Pampus	06/2018	Wiebe de Jager	New Dutch Waterline	P.O. Box 406 NL-3500 AK Utrecht; nieuwhollandsewaterlinie@ provincie-utrecht.nl	yes
4.	jpg	Fortified town of Muiden (including Muiderslot Castle & Muizenfort)	03/2015	Stichting Acquarius	idem	idem	yes
5.	jpg	Fort Uitermeer	06/2018	Wiebe de Jager	idem	idem	yes
6.	jpg	Fort Spion	03/2015	Stichting Acquarius	idem	idem	yes
7.	jpg	Plofsluis (Explosionsluice)	06/2018	Wiebe de Jager	idem	idem	yes
8.	jpg	Fort Vechten	08/2015	Ossip van Duivenbode	idem	idem	yes
9.	jpg	Structure along Korte Uitweg	03/2015	Stichting Acquarius	idem	idem	yes
10.	jpg	Fort Everdingen	idem	Stichting Acquarius	idem	idem	yes
11.	jpg	Fort Asperen	idem	Stichting Acquarius	idem	idem	yes
12.	jpg	Fortified town of Gorinchem	idem	Stichting Acquarius	idem	idem	yes
13.	jpg	Loevestein Fortress and Castle	06/2018	Wiebe de Jager	idem	idem	yes
14.	jpg	Fort Vuren	03/2015	Stichting Acquarius	idem	idem	yes
15.	jpg	Fort Bakkerskil	06/2018	Wiebe de Jager	idem	idem	yes

ID No	Format	Caption	Date of photo	Photographer	Copyright owner	Contact details of copyright owner	Non exclusive cession of rights
16.	jpg	Canoeing near structure along Korte Uitweg	08/2017	Desiree Meulemans	idem	idem	yes
17.	jpg	Group shelter at Fort Ruigenhoek	08/2017	Desiree Meulemans	idem	idem	yes
18.	jpg	Cyclists on the Diefdijk	08/2017	Desiree Meulemans	idem	idem	yes
19.	jpg	Polder Blokhoven	06/2017	Desiree Meulemans	idem	idem	yes
20.	jpg	Education at Fort Maarsseveen	05/2017	Desiree Meulemans	idem	idem	yes
21.	jpg	Main-inlet Tiel	08/2017	Luuk Kramer	idem	idem	yes
22.	jpg	Old sluice Vreeswijk	08/2017	Luuk Kramer	idem	idem	yes
23.	jpg	Fort Everdingen and Beersluice	08/2017	Luuk Kramer	idem	idem	yes
24.	jpg	Main-inlet Dalem	08/2017	Luuk Kramer	idem	idem	yes

7.b Texts relating to protective designation, copies of property management plans or documented management systems and extracts of other plans relevant to the property

Organisation	Document	Date	Website
European Commission	Natura 2000	2000	www.ec.europa.eu
European Union, EEC	Directive 79/409/EC of the Council of 2 April 1979 on the conservation of the wild birds	1979, April	www.ec.europa.eu
European Union, EEC	Directive 92/43/EEC of the Council of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora	1992, 21 May	www.ec.europa.eu
European Union, EEC Council of Europe	European Landscape Convention	2005	www.coe.int
European Union, EEC Council of Europe	European Convention on the Protection of the Archaeological Heritage	1992, 16 January	www.coe.int
Kingdom of the Netherlands	Nature Conservation Act 1998 (until 1-1-2017)	1998, 25 May	www.wetten.nl
Kingdom of the Netherlands	Environment & Planning Act	2019, 1 January	www.wetten.nl
Kingdom of the Netherlands	Heritage Act	2016, 1 July	www.wetten.nl
Kingdom of the Netherlands	Nature Conservation Act	2017, 1 January	www.wetten.nl
Kingdom of the Netherlands	Spatial Planning Act (until 1-1-2019)	2006, 20 October	www.wetten.nl
Kingdom of the Netherlands	Environmental Licensing (General Provisions) Act (Wabo)	2008, 6 November	www.wetten.nl
Kingdom of the Netherlands	Spatial Planning (General Rules) Decree (Barro)	2011, 22 August	www.wetten.nl
Ministry of Infrastructure and the Environment	Environmental Management Act (part environmental impact assessment)	1994, 4 February	www.rijksoverheid.nl

7.c Form and date of most recent records or inventory of property

- Visual integrity (2018)
- Defence Line of Amsterdam and New Dutch Waterlines Stronger Together (2018)
- Verkenning Strategisch Linieperspectief Stelling van Amsterdam en Nieuwe Hollandse Waterlinie (2017)
- Landschappelijke analyse Stelling van Amsterdam en Nieuwe Hollandse Waterlinie (2016)
- Kernkwaliteiten Nieuwe Hollandse Waterlinie, Pact van Loevestein (2015)
- Investeren in beheren, Nieuwe Hollandse Waterlinie (2014)
- Kwaliteitsgids Utrechtse Landschappen Gebieds Katern Waterlinies (2012)

7.d Address where inventory, records and archives are held

National Archive
Ministry of Education, Culture and Science
Prins Willem Alexanderhof 20, NL-2595 BE The Hague
<http://www.nationaalarchief.nl/>

St. Menno van Coehoorn Foundation
Mariaplaats 51, NL-3511 LM Utrecht
<http://www.coehoorn.nl/documentatiecentrum>

Knowledge Centre for the Waterlines (in preparation)
Fort near Vechten Marsdijk 2, NL-3981 HE Bunnik
<http://hollandsewaterlinie.erfgoed-suite.nl/>
[Mahttp://hollandsewaterlinie.erfgoed-suite.nl/rsdijk_ijk_2_Bunnik](http://hollandsewaterlinie.erfgoed-suite.nl/rsdijk_ijk_2_Bunnik)

Netherlands Institute for Military History
Frederikkazerne, gebouw 35 H-toren
Van Alkemadelaan 786, NL-2597 BC The Hague
<https://www.defensie.nl/organisatie/cdc/inhoud/eenheden/nimh>

National Military Museum, Knowledge Centre
Verlengde Paltzerweg 1, NL-3768 MX Soest
<https://www.nmm.nl/>

Military Engineering Archive, Military Engineering Museum
Lunettenlaan 201, NL-5263 NT Vught
<https://www.geniemuseum.nl/>

Royal Military Academy
Kraanstraat 4 (Kraanpoort entrance)
Gebouw J, Huis van Brecht, NL-4811 MA Breda
<https://www.defensie.nl/onderwerpen/defensieacademie/inhoud/bibliotheek-nlda>

The Utrecht Archives
Alexander Numankade 199 – 201, NL-3572 KW Utrecht
www.hetutrechtsarchief.nl/

Brabant Historical Information Centre (BHIC)
Zuid-Willemsvaart 2, NL-5211 NW Den Bosch
www.bhic.nl

Archives of Naarden, Bussum, Muiden area
Cattenhagestraat 8, NL-1411 CT Naarden-Vesting
<https://gooisemeren.nl/overig/over-gooise-meren/archief-van-de-gemeente/>

Vecht and Venen Regional History Centre
Nieuwstraat 70A, NL-1381 BD Weesp
and Schepersweg 6e, NL-3621 JK Breukelen
www.rhcvechtenvenen.nl/

Tiel Regional Archives
J.S. de Jongplein 3, NL-4001 WG Tiel
<http://regionaalarchiefrivierenland.nl>

Gorinchem Regional Archives
Stadhuisplein 1, NL-4205 AZ Gorinchem
<http://www.regionaalarchiefgorinchem.nl/>

Langstraat Heusden Altena Regional Archives
Pelsestraat 17, NL-5256 AT Heusden
www.salha.nl

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Allcorn, William, *The Maginot Line 1928-45*, Oxford 2003

Allcorn, William, *The Vauban Fortifications of France*, Oxford 2006

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Beek & Kooiman Cultuurhistorie, *Het Post-Militaire Landschap*, Den Haag 2004

Bekius, D., 'De Nieuwe Hollandse Waterlinie in het Kromme Rijngebied', in: *Het Kromme Rijn-gebied*, 34 (2000) 3, p. 37-47

Beemt, F.H. van den e.a. (red.), *300 jaar bouwen voor de landsverdediging, z.p., Dienst Gebouwen, Werken en Terreinen*, 1988

Beukers, E. (red), *Hollanders en het water. Twintig eeuwen strijd en profijt 1 en 2*, Hilversum 2007

Bevaart, W., *Nederlandse defensie 1839-1874*, 's-Gravenhage 1993

Bolhuis, P. van en P. Vrijlandt, *Waterlijn, ideeën voor de toekomst voor de Stelling van Amsterdam en de Nieuwe Hollandse Waterlinie*, Wageningen 1993

Bolhuis, P. van e.a., *Schakeling van jade en smaragd. Gebiedsverkenning voor het Utrechtse deel van de Nieuwe Hollandse Waterlinie*, Houten, Grontmij, november 1999

Boosten, Martijn, Patrick Jansen en Ido Borkent, *Beplantingen op verdedigingswerken*, Utrecht 2012

Bosboom, N., *Eenige beschouwingen over de Nieuwe Hollandsche Waterlinie en hare artilleristische verdediging*, Utrecht 1886

Brand, H. en J. Brand (red.), *De Hollandse Waterlinie*, Utrecht/Antwerpen 1986

Bruyn, S. de, *De Stelling van Amsterdam: zo sterk als de zwakste schakel, monitoring een Werelderfgoedmonument*, Groningen, Rijksuniversiteit, 1997

Bunkers en betonnen groepsschuilplaatsen in de gemeente Utrecht, Utrecht 1989 (Dienst Volkshuisvesting, Onderafdeling Monumenten Utrecht)

Buuren, Augustijn van, 'The Dutch Waterline and the Line of Fortifications around Amsterdam', in: *HYDROPOLIS: the role of water in urban planning*, Wageningen 1993

Bijl, Aart, *Het Gelderse Water. Waterstaatkundige en sociaal-economische ontwikkelingen in de polders van de westelijke Tielerswaard (1809-1940)*, Vuren 1997

Christensen, Peter Thorning (red.), *The Fortifications of Copenhagen*, Copenhagen 1998 (National agencies of Environment and Energy and Forest and Nature)

Denkschrift über die niederländische Landesbefestigung, Oberkommando des Heeres etc, Berlin 1941; reprint Helsing 2001

Die Belgischen und Holländischen Befestigungen und die Grundsätze ihrer Verteidigung. Geheim!, no. 410, Größer Generalstab, 4. Abteilung, Berlin 1908

Duffy, Christopher, *Fire and Stone, The Science of Fortress Warfare 1660-1860*, Newton Abbott 1975

Faucherre, Nicolas, *Les sites du genie Vauban en France et en Europe: Inventaire pour une candidature en réseau à une inscription au patrimoine mondial*, unpublished 2004

Gaasbeek, Fred, *De Lunetten op de Houtense Vlakte*, Hollandse Waterlinie Erfgoedreeks, Amsterdam z.j.

Gaag, A. van der, *Fort bij Rijnauwen*, Bunnik 1990

Geuze, A en Feddes, F., *Polders! Gedicht Nederland*, Rotterdam 2005

Gils, Robert, *De Wet van 30 Maart 1906 en de Pantserforten in Antwerpen*, Antwerpen 2006 (Simon Stevin Vlaams Vestingbouwkundig Centrum)

Gitz, H., *Fort bij Honswijk*, Hollandse Waterlinie Erfgoedreeks, Amsterdam 2018

Groot, Dirk de, *Fort bij Rijnauwen*, Hollandse Waterlinie Erfgoedreeks, Amsterdam z.j.

Groot, Dirk de en Chris Will, *Fort bij Vechten*, Hollandse Waterlinie Erfgoedreeks, Amsterdam z.j.

Hemmen, Ferdinand van (e.a.), *Het 'geheime wapen' ontrafeld... De wonderlijke dualiteit van de Nieuwe Hollandse Waterlinie; de relictten, het verhaal, de kansen*, Nijmegen 22 december 2014

Heijden, P. van der en E. Ruissen, *Fort Pannerden*, Utrecht 2012

Historic Scotland, Frontiers of the Roman Empire World Heritage Site Proposed Extension: The Antonine Wall: Nomination for Extension of the World Heritage Site (<http://whc.unesco.org/en/list/430/documents>)

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7.f Glossary

- A** Abatis – Obstacle made of felled trees and shrubs, possibly in barbed wire entanglements
- Access – A means of access that leads through the flooding in the form of a raised part of the land, dyke, road, railway or waterway; where accesses situated close together provide an opportunity for mutual support, this is referred to as a multiple access.
- Anti-tank barrier (asparagus) – Obstacle intended to obstruct armoured vehicles, consisting of forward-inclined pointed steel beams or rails, set into a heavy reinforced concrete base.
- Apron wall – wall erected against a bank to improve attack resilience
- Arsenal - a store for military equipment, usually with attached workshop; also known as an armoury
- Artillery – A collective name for guns
- Attack-resilient – Safeguarded from a direct assault by means of weaponry and obstacles
- B** Bank – Dyke-shaped earth mound around a defence structure, with a breastwork on top
- Bank – Mound, behind which artillery is sited; see also 'emplacement'
- Banquette – Continuous elevated area behind the breastwork of a fort wall, used as a position for infantry to fire over the breastwork
- Barrier quay – quay that halts water
- Barro - Spatial Planning (General Rules) Decree [*Besluit algemene regels ruimtelijke ordening*] The Barro provides legal safeguarding of national spatial policy and includes rules that limit the policy latitude of other governments in relation to spatial plans, where national interests so require.
- Basin – Landscape element: low-lying area next to a river where clay has been deposited
- Bastion – Pentagon built of earth or stone projecting from a defence structure (originally of Italian design), mainly to provide cover for the adjacent curtain walls.
- Bastioned fort – Fort built in accordance with the bastion system
- Bastion system – Fort-building system characterised by the use of bastions

Batardeau (hollow batardeau) – 1. (batardeau) Brick dam or flood defence in a moat; on the top side in the form of a dos d'âne (knife edge), with or without a dame (or monk), designed to obstruct passage. Function: Separation of internal and external water, or control of the water level in a canal, if necessary by means of a sluice (sluice batardeau), respectively. 2. (hollow batardeau) brick-built dam in a moat, used to allow personnel through, with embrasures, for flanking of the moat

Battery – 1. A number of artillery pieces of the same type, combined into a single organisation and mutually supporting fires. 2. Position for a number of artillery pieces, sometimes designed as a separate small defence structure: see also secondary battery and intermediate battery

Blockship – Vessel filled with ballast and deliberately sunk as an obstacle, dam or weir

Bombproof – defence structure resistant to contemporary artillery; resistant to projectiles during the period in which the term was used. The term originates from the Napoleonic period: 'à l' épreuve de bombe' is a defence structure rendered resistant to destruction by bombs by means of brickwork, concrete or earth cover

Booby-trap – Shell used as a landmine; placed vertically in the ground, with a plank on top which causes the shell to explode when stood on

Breastwork – Earth cover to protect marksman or artillery stationed behind it

Bridgehead – Transition point from a body of land to a sluice, bridge or viaduct

Bulwark – Alternative name for a bastion

Bunker artillery – Artillery that remained under cover in a bunker during an exchange of fire and was only brought into position when an enemy was a short distance away

Bunker casemate – Bunker provided with an embrasure

Bunker – General name, borrowed from German, for firing positions, shelters, etc., usually made of reinforced concrete

C Calibre – Internal diameter of the barrel of a firearm

Canal – Artificial excavated waterway

Cannon – Artillery piece with a long barrel about 15 times the calibre and a high initial velocity, for firing projectiles in an almost straight trajectory over a relatively long distance

CAP – Common Agriculture Policy

Caponier – A passage built in a moat to a forward defence structure, often set up to provide flanking fire for the moat

Carapace – Concrete shield subsequently added to an existing building

Casemate – 1. (In a fortification) a room shielded from enemy fire and provided with an embrasure in which to place a firearm. 2. (Free-standing) an artillery or machine-gun emplacement, usually made of concrete and belonging to a defence line

Cast-steel casemate – A permanent cast-steel turret for machine guns, contained within a substructure of heavy reinforced concrete

Centrifugal pump – water pumping tool

Cheval de frise – Portable barrier, consisting of a construction of timber or steel beams and provided with spikes or barbed wire

Clearing – Keeping the forecourt clear to ensure an unrestricted line of sight and fire

Coffer – Type of casemate usually part of the counterscarp, to provide flanking cover for a dry moat

Community way – see: covered community way

Concrete - 1. Trass concrete = concrete consisting of a mixture of mortar, lime, and trass (ground tufa). 2. Cement concrete

Conscript – A soldier on compulsory military service

Counterscarp – Bank, sometimes lined, situated opposite the scarp on the field side; the covered way outside and the glacis are sometimes also considered part of the counterscarp

Counterscarp gallery – 1. Gallery in a counterscarp, provided with embrasures and/or windows. 2. Structure with heavy earth cover, built round part of a tower fort with the aim of shielding it from artillery fire

Coupure - intersection of or passage in a dyke, embankment or wall

Culvert – Pipe under a quay or road, dyke or dam to allow water to pass through

Curtain wall – Part of a rampart or fortification wall situated between two roundels or bastions
Covered (community) way – A connecting pathway protected by an earthen bank (glacis) or breastwork

D Dam – Barrier placed across a body of water

Delta – Land enclosed by the branches into which a river divides before flowing into the sea

Detached fort – Fort situated so far forward from the fortress, line or position to which it belongs that the latter is safe from enemy artillery.

Detached structure – Defence structure, belonging to a fortress, built on a forward position. The distance from the fort is usually further than in the case of an outwork, a somewhat older term

Discharge basin - water-filled depression in the landscape, enclosed by a dam sluice

Discharge sluice – Outlet or sluice for removing surplus water

Ditch – Relatively narrow, excavated watercourse

Dyke – Artificially created, usually trapezoidal piece of land used as a flood defence

Dyke post – Small, simple defence structure on a dyke

E Earthwork – Civil or military engineering structure built of earth and sand

Emplacement – Prepared position for artillery; also known as a platform

Enclosed structure – Walled defensive structure defensible all round

Engineering structure – Civil or military engineering structure in which materials other than earth and sand have been used

External water – 1. In terms of water management, the sea and the rivers that freely communicate with it 2. Water that surrounds polders

F Face – Outward-facing sloping side of a bastion, ravelin, flèche, redan or lunette

Fan sluice – Sluice with fan-type gates which can be opened and closed irrespective of the internal and external water level

Fan-type gate – Sluice gate consisting of two fans/doors of unequal surface area/size, joined together at an angle of 90 degrees.

Overpressure on the fan ensures that the fan sluice can be opened or closed irrespective of the internal and external water level

Field structure – General name for a non-permanent defence structure built on the land; from the beginning of the First World War, usually using prepared components of wood, concrete, etc.

Flank – (Of a bastion) side of a bastion that forms an angle with the adjacent main rampart or curtain wall

Flanking artillery – Artillery intended to direct fire along one side of a fortification

Flanking battery – Battery that provides flanking fire for part of a fortification or intermediate area of land; also, battery placed on the flank of a fortification

Flanking fire – Fire that can be directed sideways from defence structures

Flood barrier – Hydraulic engineering construction that is closed in the event of storm surges and very high external water levels

Flood lock – Moveable engineering structure forming part of a flood defence which allows water to be drained into the external water

Fort – Self-contained, enclosed defence structure defensible on all sides, usually surrounded by a moat or ditch

Fortification - 1. Collective name for (permanent) defence structures; 2. The construction of (permanent) defence structures

Fortress – Fortified town or encampment with a permanent garrison

G Gabion – Cylindrical wickerwork cage which can be anchored in the ground with poles and filled with earth

Gallery - covered walkway in a defence structure, occasionally with openings, e.g. embrasures, on one or two sides; also see postern

Garrison troops – Nineteenth-century term for troops intended to defend permanent defence structures

Glacis - flauw aflopend talud, gelegen buiten de contrescarp van een vestingwerk, dat vanaf de wal of de gedekte weg met vuur kan worden bestreken

Gorge – The side of a defence structure facing away from the enemy

Group shelter – Concrete shelter for a group of infantrymen approximately ten men

Guard troops – Nineteenth-century term for troops intended to protect or guard the land in front of and between the defence structures

Gun carriage – A frame and mount that supports an artillery piece

H High-explosive shell – Shell packed with highly explosive ordnance

Hornwork – Advanced fortification structure, consisting of a bastioned face and two long flanks, usually parallel, adjacent to the moat

Howitzer – Type of artillery piece with relatively short barrel of five to fifteen times the calibre; due to the low initial velocity, the trajectory of the fired projectile is curved and the angle of descent relatively steep

I Intendance – Supply units

Inundation quay – Quay that prevents inundation water from spreading further than required

Interbellum - the period between two wars; common designation for the period between the First and Second World Wars

Intermediate battery – Battery situated in a wide area between the defence structures and organisationally under the command of a group or section commander

Internal water – All water on the land side of a dyke

Gabions and timber revetments – Earth-covered wooden construction, usually used on defence structures in addition to storage bunkers

Inundation basin - a secluded part of an inundation area, laid out to cover height differences and which is surrounded by weirs, dikes and/or embankments, with sluices, culverts and such to ingress or let out the water. See also: basin barrages

Inundation – Defensive flooding of land for military purposes

Inundation field – flooded polder or polder section; sub-area of an inundation basin

Inundation sluice – Sluice specially designed to effect and maintain inundations

L Limit pole - a border marking pole along the New Dutch Waterline

Line – Linear system of continuous, linked or otherwise coherent defence structures, in many cases provided with obstacles such as inundations, moats, barbed wire entanglements, minefields and anti-tank obstacles; see also position

Line rampart – rampart in the Line

Lock chamber – Chamber or space between sluice gates or flood defences

Lock – Type of sluice, consisting of a chamber closed at both ends by gates, through which vessels pass, i.e. are transferred from one waterway to another, with a different water level

Lunette – Small defence structure with two faces and usually short flanks; the gorge was generally open

M Machine-gun nest – Field fortification/gun emplacement for a group of eleven infantrymen, consisting of a trench about 12 metres long split into sections

Main Line of Defence (MLD) – The rearmost boundary of a continuous field position in which the final fierce resistance was to take place; in a line of forts, usually built between the gorges of the forts. Used from about 1880 to 1914 in the Netherlands

Main Line of Resistance (MLR) – Area of land some kilometres deep containing a combination of defensive positions, minefields and other obstacles; any older permanent defence structures situated in the MLR acted as an attack-resilient infantry strong point. Used from about 1920 to 1940 in the Netherlands

Military road – a road built in a fortified area for the movement of troops and transport of equipment

Mill – Machine, installation that uses a flow of air or water as a source of power

Mine - 1. Explosive charge laid underground to destroy surface or underground enemy structures. 2. Short name for a land mine

Mortar – Type of cannon with very short barrel, positioned almost vertically; the low initial velocity gives the projectile fired a very curved trajectory and a very steep angle of descent

N NAP – Average water level in Amsterdam on the basis of which the water level in the Netherlands is established

National monument - building or object that has been awarded a protected status thanks to its cultural value in the register of National monuments .

National redoubt – Defensive ring, intended as the last refuge for the national government and armed forces, of such a size that they could hold out for a prolonged period

O Open fortification – Fortification which does not have a bank or wall at the gorge

Open traverse – Traverse that contains a room for use as a shelter, store or casemate

Outstanding Universal Value – the exceptional value of UNESCO World Heritage

Outwork – Defence structure situated in front of the glacis of a fortress, but within the range of its supporting fire

P Palisade – Obstacle or barrier consisting of a row of sharpened stakes

Personnel bunker – Cover for personnel, situated close to a machine-gun nest or other fighting position; built of concrete, soil and/or other material; see also 'pyramid'

Pier – Intermediate pillar

Plank bridge – Bridge with loose walkway that can be quickly removed

Platform – Stable base for artillery, usually made of wood; intended, inter alia, to facilitate repeated change of aim; also referred to as an artillery platform.

Polder – An area surrounded by dykes, where the water level is artificially controlled

Polygon system – Fort-building system, the ground plan of which is characterised by the relatively simple polygon shape with straight sides which are protected by flanking fire from caponiers and/or counterscarp coffer; developed in the eighteenth century in line with the ideas of French military engineer Montalembert, as a replacement of the bastioned system

Position – More or less self-contained system of defensive emplacements, possibly based on permanent defence structures

Position fort – Detached fort, characterised by powerful armaments and a considerable degree of attack resilience; in the present case, usually situated in non-inundatable territory

Post – A small defence structure, constructed with the aim of preventing an attacker from penetrating along the access

Post – Small defence structure or fortified location for keeping a connecting road or tactically important area of land under observation or under fire

Postern – underground passageway connecting different parts of a defence structure

Prohibited Areas - imaginary circles around a defence structure, within which a clear line of sight/line of fire is guaranteed by statutory provisions

Providing flanking fire – Bringing part of one's own fortification, an area of land or an enemy target under fire from the side

Q Quay – 1. Small dyke, dyke or road along a canal. 2. Loading or unloading wharf alongside water

R Ravelin – Defensive island in the main moat, centrally situated opposite the front of a fortification; triangular or redan-shaped outwork to provide cover for the curtain wall and entrance gate, as well as the shoulder angle of nearby bastions, against enemy fire

Redan – Defence structure with open gorge, sometimes built as a field structure, consisting of two continuous straight banks (faces); a number of them were often linked to form a line by means of curtain walls

Redoubt – 1. Self-contained defensible structure inside a fort, designed to continue the defence after the fall of the main rampart; 2. Simple, (usually) closed defence structure; small sconce in the field

Retrenchment – Small fortification without a fixed shape

Rifled guns - firearms with spiral grooves cut in the inner surface of the gun barrel

Rijkswaterstaat – Dutch government department (Directorate General for Public Works and Water Management) responsible for overseeing bodies of water and operating any civil engineering structures they contain

S Scarp – bank of a ditch, sometimes faced with brick, situated on the side of the fortification

Sentry post – Guardhouse

Sconce – A simple, self-contained earth defence structure

Secondary battery - battery located in the immediate surroundings of a defence structure and part of it organisationally; see also intermediate battery

Seepage – Water (usually groundwater) leeching out at ground level as a result of natural or artificial differences in groundwater levels

Shell – Elongated and pointed, formerly spherical, iron or steel artillery projectile, filled with explosive or other material and ignited by a fuse

Slope – Sloping surface of an earth bank or glacis; divided into interior and exterior slope

Sluice – Movable flood defence in a watercourse or between two watercourses that holds back water or lets it through

Spanish Netherlands – the northern and southern Lowlands (a.k.a. the Seventeen Provinces), property of the Habsburg Empire from 1556, of Charles V and Philip II. In 1581, the northern provinces separated themselves from the others

Splinterproof – Capable, to a certain extent, of withstanding shrapnel, etc.; see also bombproof

State of defense - brought into defense

Statement of Defence [Memorie van Verdediging] – A comprehensive scenario for the mobilisation and combat-readiness of the fort and its surroundings, drawn up around 1880 (based on Kromhout exercises)

Storage basin – 1. Water storage for lower-lying polders. 2. System of waterways that serves as a temporary storage area for collecting surplus rain water outside a polder, situated between a polder and the external water into which it is discharged

Storage bunker – a bombproof storage area for artillery or other equipment

Summer dyke or summer quay – Low dyke in the river region that keeps out relatively low water levels of the river in summer

Superior slope – Top surface of a breastwork, usually slightly downward-sloping to the front to reduce the blind spot; sometimes (late nineteenth century), however, slightly upward-sloping to obtain a higher line of fire and therefore better cover from enemy observation and fire

Supply canal - short supply canal between river and system of sluices or fortress canal

T Tambour – Circle immediately outside a town wall for the direct defence of an entrance

Terreplein – Open internal space of a fortification

Tetrahedron – Pyramid-shaped concrete blocks (consisting of four planes) which are chained together to create an anti-tank barrier

Tower fort – Fort with bombproof tower as the main artillery emplacement; the tower also has the function of redoubt, barracks and magazine

Tracé – The route, or ground plan or floor plan of a defence structure or system

Traverse – Rampart perpendicular to the main rampart to provide cover from lateral fire or fragmentation

Tree camouflage – See: disguise

Trench – Deep, excavated ditch with raised breastwork, serving as cover against enemy fire or as a means of approaching the enemy safely or keeping the enemy under fire

U UNESCO – United Nations Educational, Scientific, and Cultural Organization

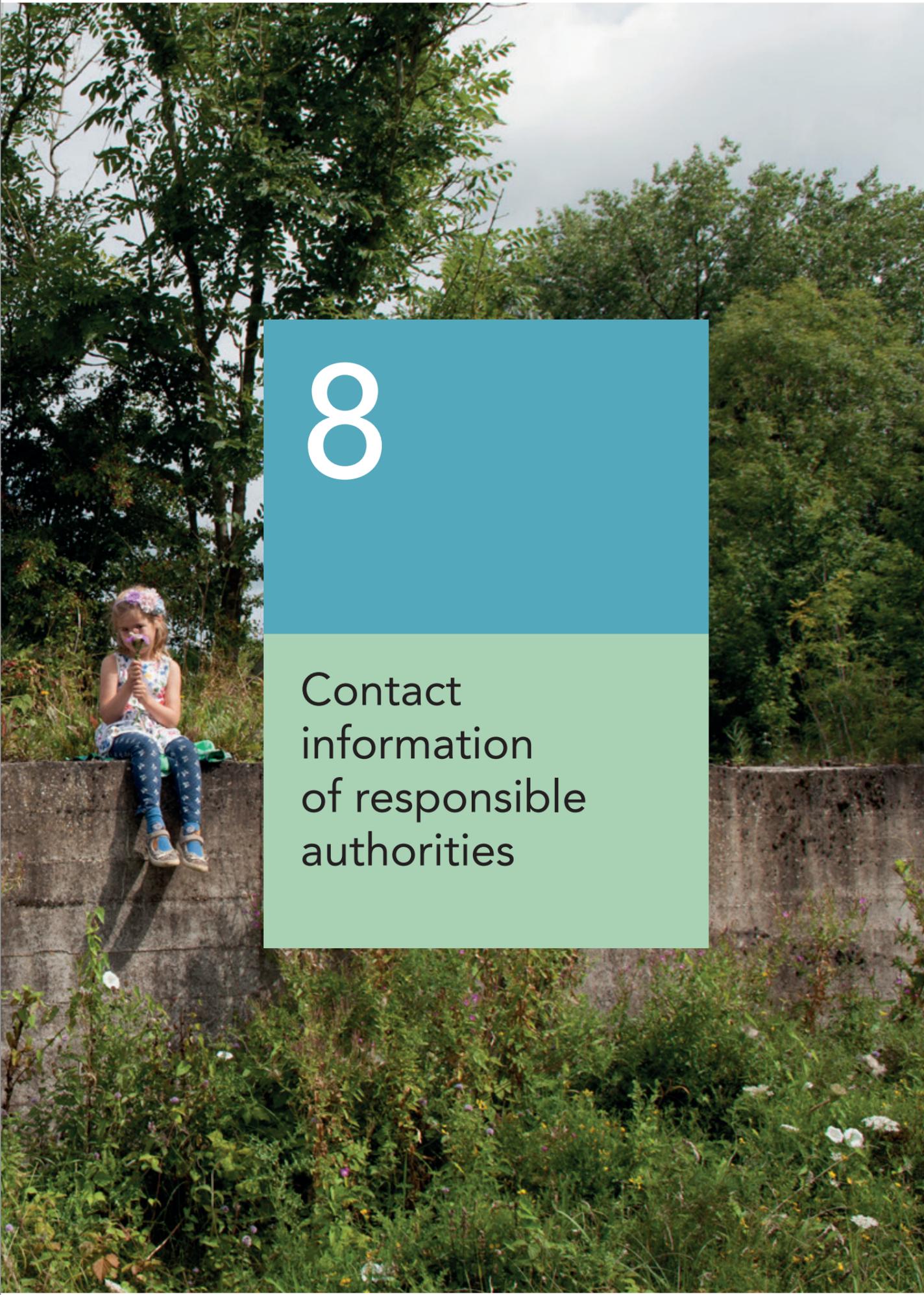
W Wallwark – Path or roadway sheltered behind the breastwork of the main rampart

Waterline – Continuous series of inundations, combined with defence structures

Water Board – Organisation with public authority which operates under the supervision of the Provincial Government with responsibility for the interests of water management, water quality, water discharge and flood defence

Wetering – Wide drainage ditch, usually excavated, in a basin

Winding gear – Hurdy-gurdy to operate a sluice



8

Contact
information
of responsible
authorities

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8.c Other local institutions

Gooi and Vechtstreek

Province of Noord-Holland
Gooi and Vechtstreek region
Municipality of Hilversum
Municipality of Gooisemeren
Municipality of Weesp
Municipality of Wijdemeren

Pact of Ruigenhoek (cooperative partnership)

Province of Utrecht
Municipality of Bunnik
Municipality of De Bilt
Municipality of Utrecht
Municipality of Houten
Municipality of Nieuwegein
Municipality of Wijk bij Duurstede
Municipality of Vijfheerenland (also party to Pact of Loevestein)
State Forest Service
Nature Preservation Society
Amstel, Gooi and Vecht Water Board
De Stichtse Rijnlanden Dyke Board
Rivierenland Water Board (also party to Pact of Loevestein)

Pact of Loevestein (cooperative partnership)

Provinces of Gelderland and Noord-Brabant
Municipality of Culemborg
Municipality of Geldermalsen
Municipality of Lingewaal
Municipality of Zaltbommel
Municipality of Tiel
Municipality of Lingewaard
Municipality of Rijnwaarden
Municipality of Berg en Dal
Municipality of Gorinchem
Municipality of Werkendam
Municipality of Woudrichem
State Forest Service (eastern region)
Rivierenland Water Board

Other bodies involved

Province of Zuid-Holland
Goois Natuurreservaat
Brabants Landschap

Visitor centres / Museums

Fort near Vechten Waterline Museum

Naarden Fortress Museum

Loevestein Castle

Muiderslot Castle

Fort near De Bilt Peace Education Centre

Lunette I Fort of Democracy

Geofort

KunstFort Asperen

Water fort Lunette along the Snel

8.d Official web address

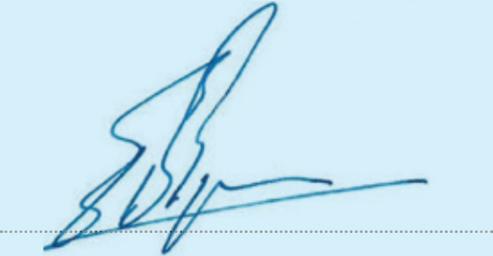
Web address: www.programmanieuwehollandsewaterlinie.nl



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Signature on
behalf of the
State Party

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