

FIRM FOUNDATIONS

RECOMMENDATIONS FOR
A NATIONAL APPROACH
TO THE PROBLEM OF
UN SOUND FOUNDATIONS

FEBRUARY 2024



About the Council for the Environment and Infrastructure

The Council for the Environment and Infrastructure (*Raad voor de leefomgeving en infrastructuur, Rli*) advises the Dutch government and Parliament on strategic issues concerning the sustainable development of the living and working environment. The Council is independent, and offers solicited and unsolicited advice on long-term issues of strategic importance to the Netherlands. Through its integrated approach and strategic advice, the Council strives to provide greater depth and breadth to the political and social debate, and to improve the quality of decision-making processes.

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PREFACE

The foundations of buildings in many parts of the Netherlands have sustained damage, and many more will be similarly affected in the coming years. This is the result of our living in a low-lying country where the ground is in many places very soft. Until now, the problem was not readily apparent – it is literally hidden away underground. To prevent the situation eventually becoming unmanageable, this advisory report makes recommendations for a national approach to the problem of unsound foundations.

To understand the problem, we commissioned a number of studies and held numerous discussions with experts, residents, and administrators. These made clear that – even when one allows for all the uncertainties – the problem is extensive. Above all, we were struck by the personal accounts of people who have to deal with damage to the foundations of their property. Those accounts are about more than just structural damage; they also involve profound emotions arising from the possible loss of one's home and long periods of uncertainty.

We spoke, for example, to someone in the Bloemhof neighbourhood of Rotterdam who had only recently bought his home. The structural survey had revealed no defects, and the estate agent had been reassuring. It now turns out, however, that the foundations under the man's house are

unsound, resulting in a great deal of damage. He now needs to devote all his savings to repairing the damage, but a full restoration of the foundations is beyond his means.

We also visited a couple living in the peat meadows area of the province of Friesland. They bought their farmhouse – a listed building – twenty years ago and renovated it themselves. Their home represents their retirement capital. Investigations have now revealed that the farmhouse has subsided, and it is only a matter of time before it becomes too unsafe to continue living in. They cannot afford to have the foundations fully restored, and they do not qualify for a loan from the bank. The only option they can see is to sell their dream home at a sizeable loss and move to rented housing.

It has been known for more than twenty years that countless houses, offices, business premises, and schools in the Netherlands have problems with their foundations. However, systematic attention and action on the part of building owners, mortgage lenders, local government, and national politicians has so far failed to materialise. Virtually nobody has been able or willing to face up to the foundations problem. Nor have any of the parties involved had an interest in bringing the problem up for discussion to its full extent: building owners because they feared high costs, mortgage lenders because they feared the impact on the value of collateral, and public authorities because they feared having to cope with the financial and social consequences of the problem.



As a result, (a) the exact extent of the problem and the options for dealing with it are still unclear and (b) the consequent personal and social problems in many neighbourhoods and villages continue to accumulate.

This situation is a recipe for social disruption. A national approach to the problem is badly needed. We therefore welcome the fact that the ministers of the Interior and Kingdom Relations (BZK), Infrastructure and Water Management (IenW), and Agriculture, Nature and Food Quality (LNV) requested us (on 9 October 2023) to devise such a national approach to the problem of unsound foundations.

We also wish to express our appreciation to all the steadfast residents and private initiatives that have been working tirelessly – despite everything, and sometimes for many years – to place this issue on the agenda. We also express our appreciation to those administrators who did indeed call attention to this societal issue; they provided us with valuable insights on which to base our proposals.

In this advisory report, we advocate a national approach to the foundations problem that emphasises actual *effectiveness*. In our view, an effective approach is one that creates a situation as soon as possible in which it is feasible for anyone to take action, ultimately even without support from the authorities.

But although emphasising effectiveness seems obvious, it isn't. All too often, central government policy in fact considers – first and foremost – questions of legal responsibility (who can we hold liable?) and the efficiency

of chosen solutions (what is the minimum that we need to do?). As a result, all the bureaucratic hassle means that for those facing the problems, actual solutions take too long to materialise – or don't materialise at all.

The earthquake issues resulting from the extraction of natural gas in the province of Groningen have taught us that a lot of concerns and distress can be alleviated if policy in fact focusses on effectiveness, not by taking over the work of restoration from property owners but by providing those who wish or need to undertake such restoration with support and relieving them of their concerns. Ultimately, this is also much cheaper than just bungling on and letting things run their course. After all, putting off tackling the problem will inevitably lead to higher costs, with existing problems then being exacerbated and unnecessary further problems being added.

With an approach that prioritises effectiveness, we wish to prevent what we currently term the foundations *problem* from ultimately escalating into a foundations *crisis*, with all the expensive ad hoc measures needing to be put in place as a result.



A personal account of the foundations problem in Dordrecht

A married couple who had been living in a two-storey house in the town of Dordrecht for 35 years became aware of rumours that the timber piles underneath their home were unsound. Together with their neighbour, they decided to have the piles inspected. They were told that the timber was rotting and the horizontal foundation beam could not be found. They now understand how that could have happened. “There is fungal rot on the outside that eats its way in, while bacteria pass from the inside to the outside. The bacteria are in the groundwater. It also makes a difference whether you have pine or spruce piles; pine rots faster. But we didn’t know that yet. We were still pretty ignorant about it.”

The street got to work and a neighbourhood committee was formed. In the meantime, the municipality of Dordrecht began organising neighbourhood meetings, which were widely attended. The mood among some of those attending was grim, and they let it be known – emphatically – that they held the municipality responsible. The married couple were more down-to-earth about the problem, arguing that determining who was to blame was a separate matter to finding a solution. That contribution to the discussion resonated with the executive councillors and the pair were invited to help devise a solution. “I helped ensure that assistance was provided for the affected residents, through the Woonactief organisation. I also pushed for a cheap loan and for there to be the option of coercion: if certain people in a row of houses were obstructing restoration of the foundations, the municipality needed to be able to force them to participate.”

At a certain point, it became clear that things were badly wrong with the foundations along the street. A structural survey revealed that the foundations of all eleven houses needed to be restored. What should be done? The owners of the various properties turned out to disagree about it. “There weren’t enough of them who were ready to participate in tackling the problem jointly. Some of them didn’t think renovating the foundations was actually necessary, while others simply denied having pile rot at all. Some thought it was all getting to be too expensive, or weren’t enthusiastic about all the hassle and mess that would be involved in restoration.”

The lack of agreement brought everything to a standstill, and the neighbourhood committee also folded. But about ten years later, things finally started to happen. Seven of the street’s homeowners agreed to restoration of the foundations and a contractor was able to get to work.

Quotes from: Van Wijk & Van Engelen, 2013.



A personal account of the foundations problem in Lingewaard

The municipality of Lingewaard is located in an area known as the “rivers region”. To the east, it is bordered by the Pannerden Canal, and to the south by the Waal, the main distributary branch of the Rhine. The little river Linge runs through the area. Since the extremely dry summer of 2018, a number of owner-occupiers have been struggling with damage to their homes. Their properties are leaning and there are big cracks in the walls. A lot of the residents have no idea what to do. The solutions that have been proposed will quickly cost tens of thousands of euros. Early in 2022, at the invitation of the municipality, a platform was set up with the aim of sharing the knowledge and experience of those with unsound foundations.

One owner-occupier – who was knowledgeable and also had the necessary financial resources – decided on decisive action. Like most of the properties in the municipality, his house had “shallow” foundations without piling. He had the entire house excavated and had new concrete foundations installed. Since then it’s been stable. But this was a drastic intervention, and not everyone in Lingewaard has the know-how or money for such a solution.

Over 130 affected owner-occupiers have now united in the platform, within which fellow sufferers strive to inform and assist one another as much as possible. “It’s clear that owners are themselves responsible, but it’s disappointing if public authorities simply adopt a reluctant position and are even afraid to help devise solutions. The foundations problem

in this area is still relatively unfamiliar. Pilot projects are needed and know-how needs to be shared. Public authorities and also experts should talk to those affected and not just about them.”

Owner-occupiers in Lingewaard have many questions but few answers. It’s often not clear to them why a particular property has sustained damage but another has not. Is it due to different types of clay in the subsoil? Or differences in groundwater levels?

The owner-occupiers in Lingewaard are upset that their houses suddenly feel much less like “real homes” than before. They face not just financial but also emotional problems. And some are angry: they feel they aren’t being taken seriously. They say that the public authorities and banks hardly acknowledge the problem. Know-how about repair and restoration still seems to be very limited. Moreover, there appear to be major differences in the damage to individual properties, sometimes even within one and the same neighbourhood. People in Lingewaard also find that the occurrence of damage is very unpredictable. Large cracks can quite suddenly appear after an extremely dry and then wet period. It is all hard to understand, and that increases the insecurity that many people feel.

These owner-occupiers find themselves facing an uncertain future. Climate change will greatly affect the nature and extent of the foundations problem in this and similar areas.

Source: Interviews by the project team.



A personal account of the foundations problem in Weststellingwerf

At the beginning of the present century, a married couple with two children bought a 160-year-old “head-neck-body farmhouse” in the peat meadow area of the province of Friesland. At first, there were no problems with groundwater levels, but that changed when land consolidation took place and a number of drainage ditches were filled in. Cracks began to appear in around 2015, and in 2018 it became clear that there were also problems with the foundations.

A foundation survey was carried out in 2019. It concluded that the situation was “code red”: without immediate action, it would only be possible to continue living in the property for another one to five years. The wife had this to say: “We discussed the matter personally with the municipality, the water authority, and the province. We conducted drawn-out, frustrating compensation proceedings with the Friesland water authority.” Restoration of the foundations is not an option in this case, and the advice given to the couple is for demolition followed by new construction. “The house, which we put so much money into, has no value anymore... We can’t see any future for ourselves here, and our children also wonder how long their room will be safe.”

Quotes from: Tweede Kamer, 2023.



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The Dutch version of the advisory report contains an additional analytical section.





SUMMARY

The Netherlands faces an extensive foundations problem, in both urban and rural areas. The problem currently affects some 425,000 buildings. These already have subsidence damage or will be affected by it between now and 2035. Without preventive measures, the number of buildings with foundation damage will increase sharply. The total cost of the damage could amount to €54 billion.

The foundations problem also has serious emotional and social consequences for people. Having a safe and affordable home is one of the most important basic needs. Poor foundations and subsidence damage jeopardise that basic need, and life suddenly becomes unsettled, both literally and metaphorically.

How should the problem be tackled? That is the question addressed by this advisory report.

The foundations problem is a complex issue with multiple causes

Unsound foundations can be due, for example, to reduced groundwater levels, bacterial attack, drought, work in the vicinity of a building, ageing, or construction errors. In practice, there is hardly ever a single clear cause of foundation damage.

Tackling it is also complicated. Owners are often not (yet) aware of any problems with the foundations underneath their property. And if they are aware of them, they often do not know how to find a solution. The

administrative hassle and the high costs, which can exceed €120,000, almost always lead to worry and stress. Foundation problems also mean a period of uncertainty and stress for tenants, because it is uncertain whether they will need to (temporarily) leave their home and neighbourhood, or because their investment in a new kitchen or bathroom will prove to have been wasted.

Many owners attempt to recover the cost of the damage through complex proceedings, but because there is hardly ever a single cause from the legal perspective, this often fails to lead to a solution but to a great deal of frustration. Repairing the damage is often therefore necessarily put on hold. In several places, this is clearly leading to an accumulation of problems, with serious consequences for people's quality of life and the quality of the existing housing stock.

The foundations problem: known for a considerable time but still unresolved

Although the foundations problem has been an issue in the Netherlands for over twenty years, an effective approach has so far failed to materialise. Very few owners have actually had their foundations restored. And with the passing of time, the problem is simply getting worse, partly due to climate change. The existing damage is increasing and more and more buildings are affected. Social problems also continue to accumulate in neighbourhoods, districts, and villages.

The infographic on the next page illustrates four difficulties that contribute to the foundations problem still not having been addressed. There appears

to be an impasse, with owners, market parties, and public authorities being unable or unwilling to face up to the problem until recently.

Information about foundations is necessary and demands prospects for a solution

A key prerequisite for formulating an approach to the problem is the availability of information – as soon as possible – about the foundations of every building in the country. Without that information, the exact problems will remain unknown, and ultimately buyers in the property market will end up footing the bill for this long-standing issue. They are not properly protected. Risks and costs are passed on by the seller of the property to the next owner who – often unwittingly – fails to build up sufficient reserves to carry out the necessary repairs.

At the same time, revealing information about buildings' foundations and the resulting transparency within the property market will have a major impact on current owners of affected buildings. They face depreciation in the value of their property and all the complexities and concerns that foundation damage currently involves. We are therefore convinced that creating transparency must at all times go hand-in-hand with the realistic prospect of a solution. If information about foundations is simply revealed, resulting in a decline in value of buildings, without there being any prospect of a solution, we foresee considerable social disquiet.

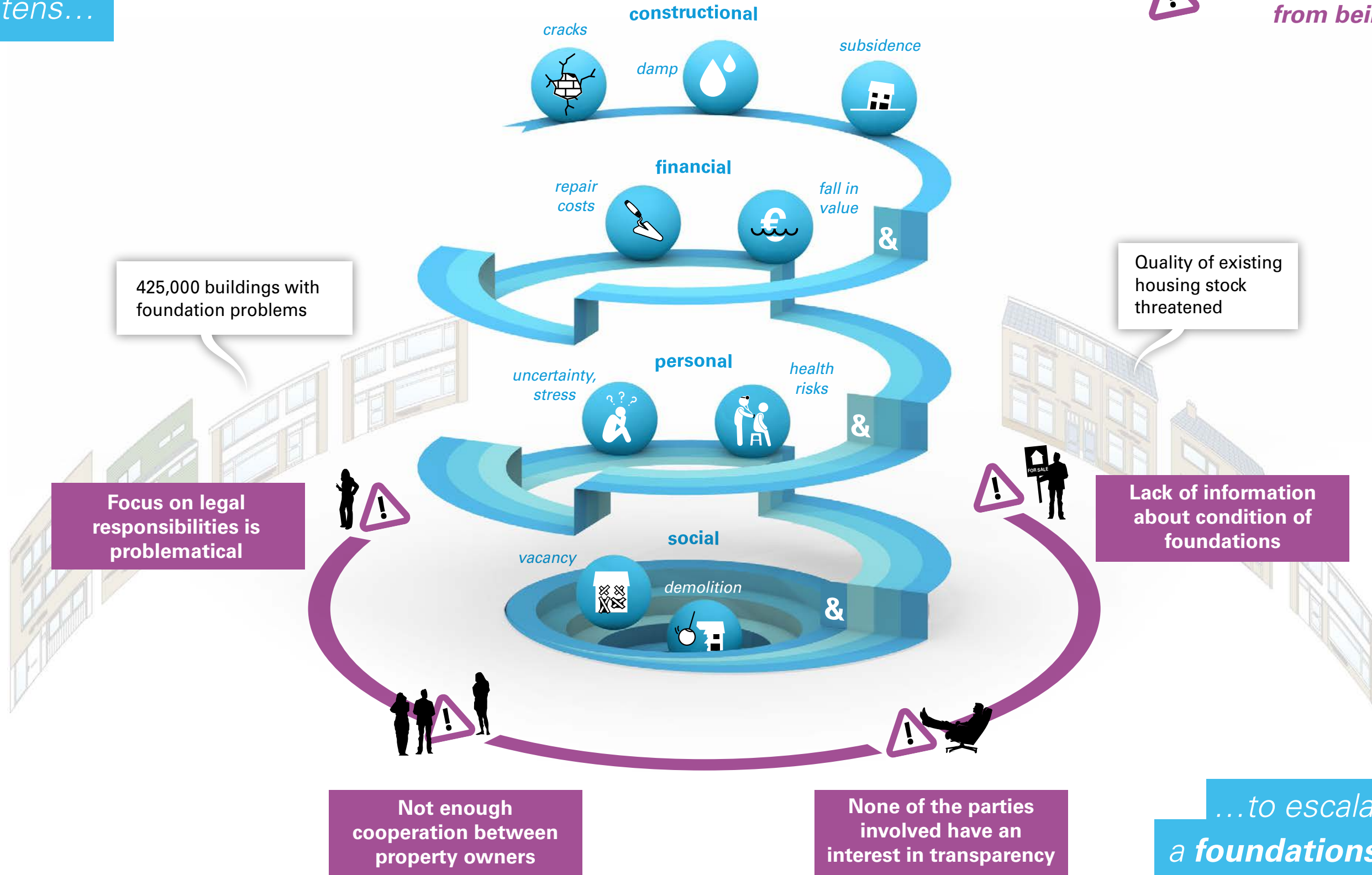


Foundations problem threatens...

Spiral of problems



Difficulties preventing foundations problem from being tackled



Joint efforts by the authorities are indispensable

The nature and scale of the foundations problem requires the comprehensive involvement of numerous parties: private owners, housing associations, tenants, estate agents, property valuers, mortgage lenders, surveyors, and contractors. All of them must contribute to a national approach to tackling the problem. In the present advisory report, we offer a number of proposals for how they can do so.

Moreover, the urgent need to tackle the problem effectively and the far-reaching social consequences that loom on the horizon make robust joint efforts on the part of the public authorities indispensable. It is only the authorities that can ensure transparency about foundation problems while at the same time offering the prospect of a solution. They also have the necessary mechanisms for preventing foundation problems in certain places.

A special responsibility lies with central government. It is only central government that can ensure that this national problem is addressed effectively, and without the government's financial leverage it will not be possible to offer the prospect of a solution for those who have been hit hard by the problem. Local and regional authorities often do not have sufficient financial capacity to provide support for residents with foundation problems. We do however call for major efforts on the part of municipalities, water authorities, and the provinces to prevent foundation damage.

Looking further than legal responsibilities

Legally seen, it is the owner of a building who is responsible for its condition, including its foundations. The approach we advocate in the present report does not alter that personal responsibility. In our view, government cannot shoulder all the risks that arise within society. Our analysis shows, however, that in practice owners are unable to shoulder their own responsibility due to the lack of information regarding the foundations problem. As soon as that information becomes available and the property market can function transparently as regards this issue, then owners will be able to shoulder that responsibility – and must in fact do so. In the transition to a transparent property market, we advocate an approach that looks further than the legal responsibilities alone. We advocate an approach in which government stands alongside owners and tenants and works with them towards an effective approach to repairing damaged foundations and thus maintaining the quality of the existing housing stock.

It is only if the foundations problem is addressed nationally that it will be possible to work towards solutions expeditiously, at sufficient pace, and in sufficient numbers. That is essential, because the Netherlands cannot afford to deal with the problem in a half-hearted manner and to pass on the bill to future generations. The adverse effects on the built environment are too far-reaching for that, and the uncertainty that such an approach will create in the lives of those affected – with all the implications it has for their socioeconomic security – is more than merely undesirable.



Recommendations to government along five tracks

In the present advisory report, we make recommendations for the national approach in which we focus on the principles of effectiveness, feasibility, fairness, and efficiency. In working out our recommendations, we prioritise effectiveness. After lying unheeded in the background for so many years, the problem must now be tackled quickly and effectively.

Our recommendations are along five tracks:

- improve the availability of risk information regarding foundation damage;
- prevent foundation damage;
- prevent social problems by providing support and relief from the associated concerns;
- create grant and loan options for damage and foundation repair;
- ensure vigorous shared implementation.

These five tracks cannot be viewed in isolation. They will need to be followed simultaneously if the approach is to be effective, and to ensure that transparency goes hand-in-hand with prospects for a solution, so that social disruption does not occur. The infographic on the next page lists our recommendations for each track. We have also indicated the timeframe within which measures are necessary.

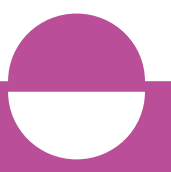
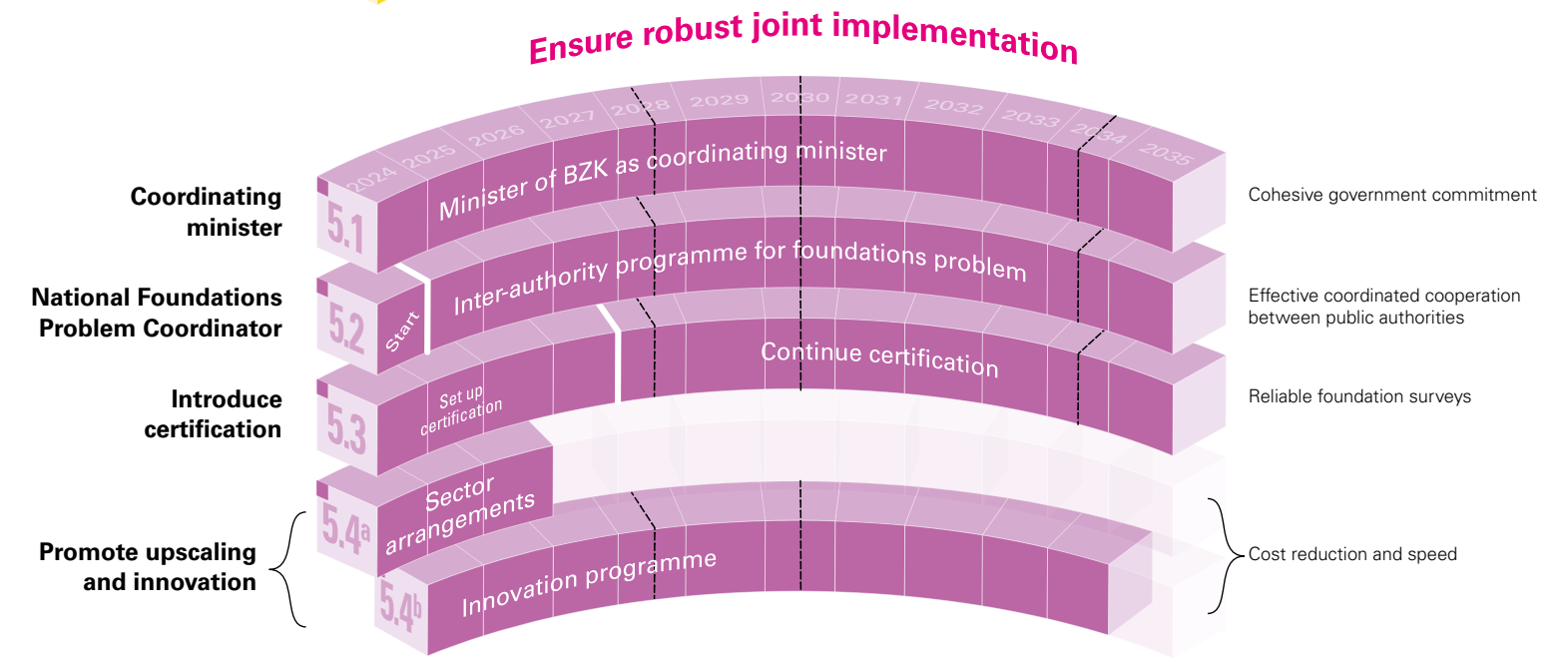
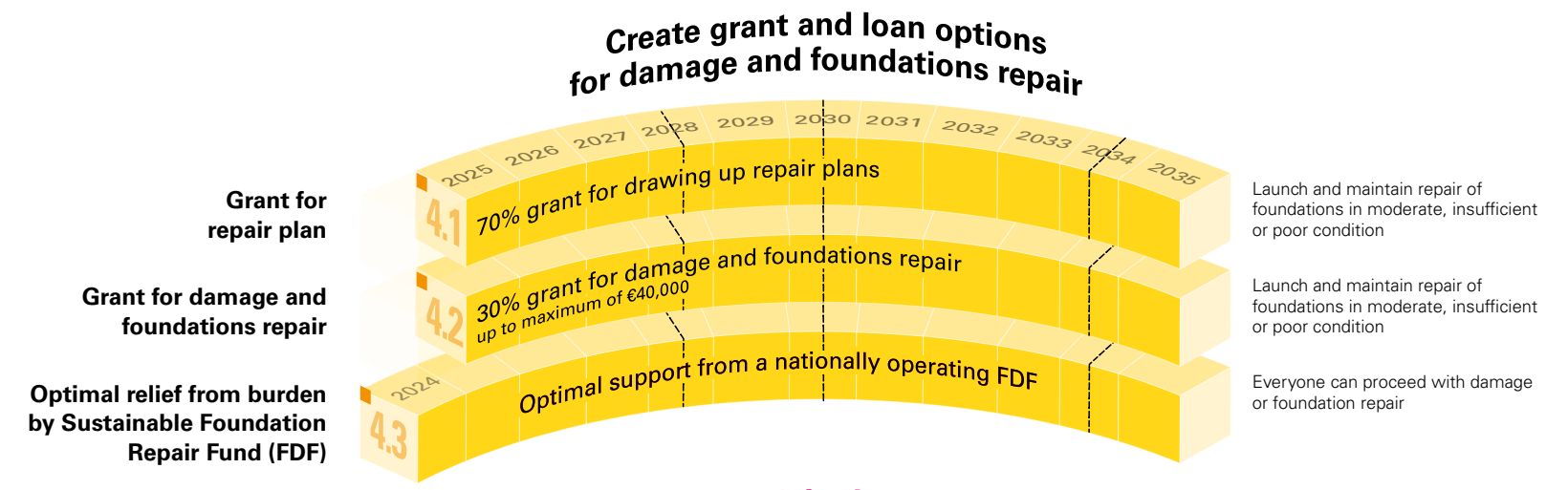
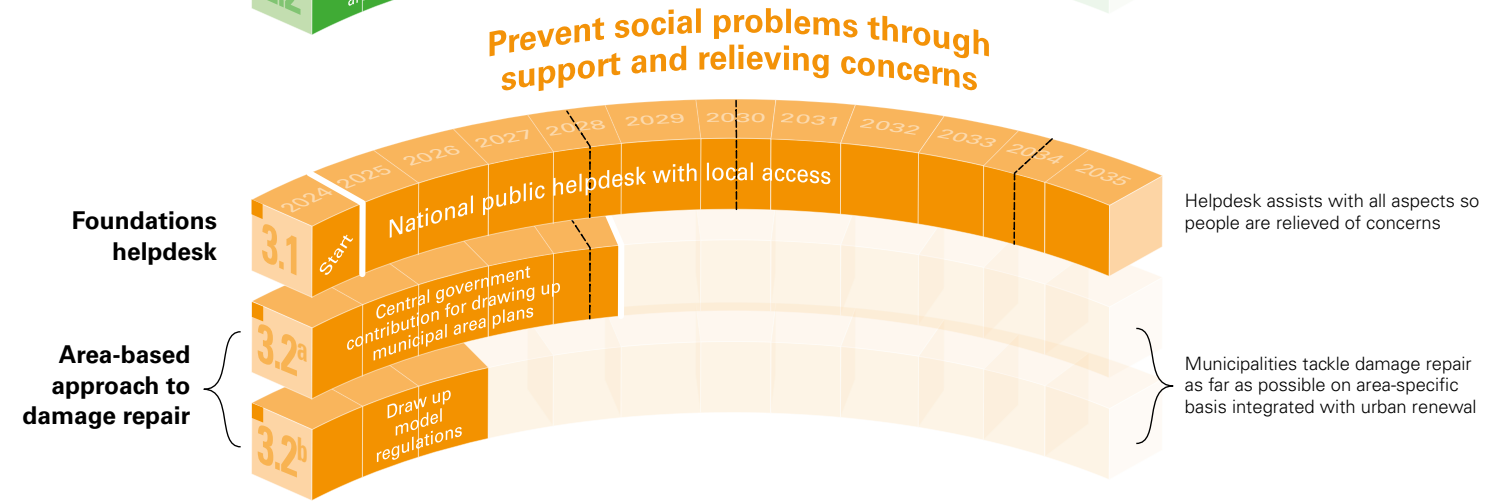
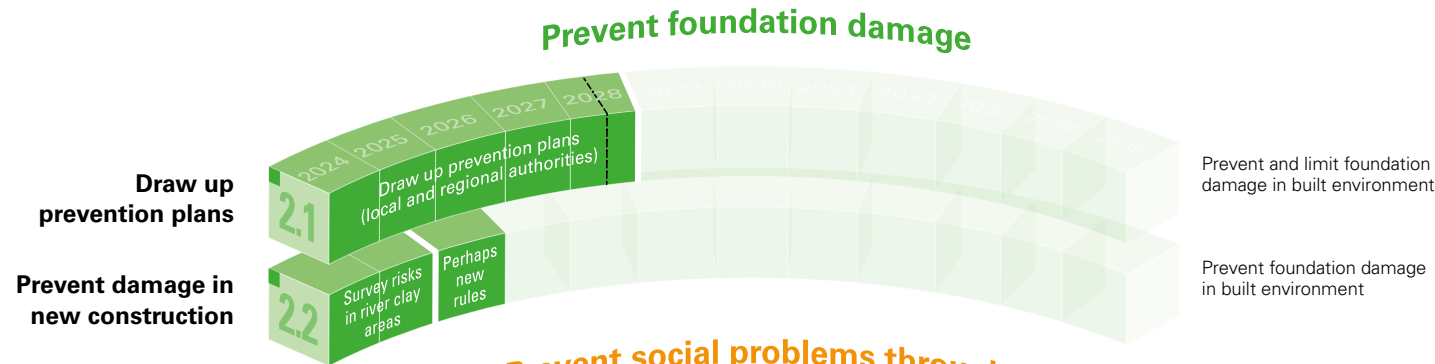
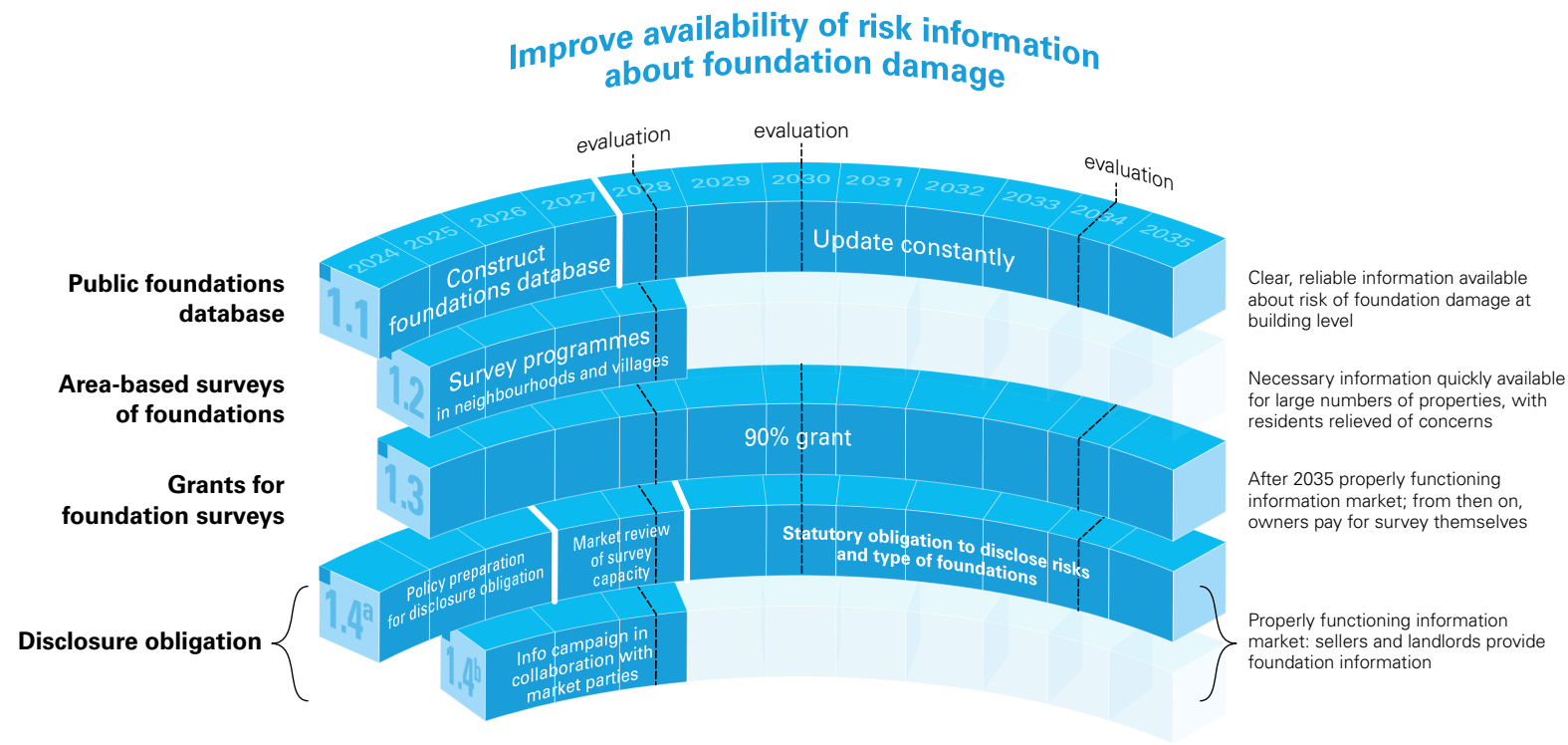
We are aware that the schedule we are proposing is a tight one. This is based on the premise that there will quite soon be a new government that will decide whether and how to adopt our advice. If it takes a long time to form a government, that will have consequences for the proposed

schedule. We also realise that our proposals demand a great deal from the implementing parties, for example construction companies, survey firms, and government organisations. They will therefore need to be closely involved in working out the national approach that we are recommending. A National Foundations Problem Coordinator (to be appointed) should agree with implementing parties on rapid scaling-up of capacity, standardisation of work, quality assurance, and innovation. In support of this, we recommend that 3% of the total cost of the national approach be devoted to innovation in order to contribute to making the national approach truly feasible.

In our proposal, we have included interim evaluation points in 2028, 2030 and 2034, so as to determine whether actual progress is in line with the aims. Depending on progress and the implementation capacity then available, more time may prove to be necessary.



Infographic setting out recommendations over time



Costs

Our proposed national approach to the foundations problem will require investment on the part of central government that we estimate at over €12 billion over the period from 2024 to 2035. The table below gives an indication of the distribution of costs per year (in millions of euros).

2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
23	336	815	855	1,339	1,318	1,318	1,318	1,318	1,318	1,318	1,181

For the approach to be effective, we advocate a simple set of regulations that (a) mitigates the consequences of transparency for building owners, (b) encourages owners to get started on the necessary restoration work, and (c) avoids further juridification as much as possible.

This also means that we consider financial solidarity with affected homeowners to be necessary. That will have what are technically referred to as “distribution effects”. Some people will consider it unfair that the entire Dutch population will need to help pay for repairing homeowners’ foundations, especially because those owners are in some cases well-to-do, although certainly not all of them. Each decision made to provide financial support for certain groups and not for others has its own effects and groups that are impacted financially.

In the past, attempts were often made to overcome distribution effects within the policy approach. Practice shows that this results in complex arrangements, high implementation costs, and also decreased effectiveness. Because the problem is then not solved, or not solved quickly enough, the social costs incurred and dissatisfaction with the approach not infrequently boomerang back to government.

We therefore advocate that the distribution effects of our proposed measures be properly identified, but then weighed up within the entire taxation package. Any corrections to redistribution effects should be made in the annual tax plan and not within the national approach to the foundations problem itself.

In conclusion

We realise that the publication of our advisory report may already have an impact on the property market, on people’s concerns about the foundations of their homes, and also on the expectations that people will have of government. That applies not only to the many members of the Dutch population who already know they are facing foundation problems and must decide what to do, but also to the many people who will wonder whether they too will find themselves facing such problems. We therefore wish to express our hope that the new Dutch government will quickly make clear how the national approach to the foundations problem will be worked out in detail. We hope and expect that municipalities, provinces, water authorities, estate agents, and mortgage lenders will also interpret our advisory report as a call to action!



In the course of our many discussions, we saw and heard what an invasion foundation damage can be in people's lives, and the enormous worries that it brings with it. For all these people and for those whom the problem will yet affect, an effective approach – with public authorities and relevant market parties standing shoulder-to-shoulder with them and supporting them – is both indispensable and necessary.



ADVISORY REPORT





1 INTRODUCTION

1.1 Subject of this advisory report

The Netherlands is a low-lying country where the ground is in many places very soft. To make the land habitable, and keep it so, interventions in the water and soil system have been necessary for centuries. Those interventions have enabled millions of Dutch people to build, live, and do business within the delta. But that is not without risks. Most of the Dutch population are well aware of the danger posed by flooding.

Another risk inherent in the country's water and soil system manifests itself more insidiously, namely the danger that the foundations that support buildings will eventually fail. This "foundations problem" is less well-known among the general public, but it is an increasingly urgent issue. It is that issue that the present report addresses.

The country's foundations problem is extensive. Currently, some 425,000 buildings have already sustained damage due to their foundations being in poor condition, or will sustain such damage in the foreseeable future. Without preventive measures, that figure can increase sharply in the coming years. And that is not to mention the intangible costs of the problem, namely the impact that it has on the lives of the people affected by it.

1.2 Main question addressed

On 9 October 2023, the Minister of the Interior and Kingdom Relations (BZK) asked us to draw up an advisory report on a national approach to the foundations problem. His request was also on behalf of the ministers of Agriculture, Nature and Food Quality (LNV) and Infrastructure and Water Management (IenW). The Minister of the Interior and Kingdom Relations asked us to indicate how central government – together with all the parties involved (municipalities, provinces, water authorities, civil-society parties, market parties, and members of the public) – can arrive at a national approach that is both feasible and fair.¹

Normally, the advice we provide focuses on the broad strategic outlines of policy. This time, however, the minister asked us to provide pointers for a specific policy proposal. That means that the way the present report has been drawn up is somewhat different to most of the Council's other advisory reports.

1.3 Scope

In the present report, we highlight the foundations problem as it affects residential buildings, commercial buildings, offices, and buildings that are of social, cultural, or historical value. We disregard other types of buildings. We do not, for example, make recommendations regarding the foundations

¹ Annex 1 contains the full request for our advice.

of infrastructure works within public space or problems relating to cables or piping (such as sewers).

A second limit on the scope of our report concerns the cause of subsidence damage to buildings. We consider only situations in which the problems arise from damage to foundations. This means that we do not make recommendations regarding repair of damage resulting from the extraction of natural gas in the province of Groningen or other existing schemes for dealing with mining damage. In formulating our recommendations, we have however made use of the experience of residents in the earthquake area and the lessons from the parliamentary inquiry into how damage has been dealt with in Groningen.

1.4 Working method

We drew up this report within only a brief period of time. Be doing so, we were able to comply with the government's request that we make the report available to the parties that are working towards forming a new government.

To understand the foundations problem, we commissioned a number of studies:

- Two knowledge institutions, Deltares and TNO, produced an overview of the nature and extent of the foundations problem for us.
- The law firm AKD described for us the applicable legislation and regulations regarding damage to foundations.



- The consulting firm KPMG worked with us to review the existing (financial) schemes for supporting building owners affected by damage to their foundations.
- The Knowledge Centre for Addressing the Foundations Problem (KCAF) analysed the extent of the foundations problem.

We also conducted a study of the relevant literature and interviewed numerous direct stakeholders: experts, implementers, administrators, and, last but not least, residents of areas affected by foundation problems. In the latter context, we made working visits to the Rotterdam district of Bloemhof and the Groote Veenpolder in the province of Friesland.

1.5 Structure of this report

The rest of this advisory report is structured as follows.

- In Section 2, we describe the features of different types of foundations, the structural and social impact of damage to foundations, its extent and possible causes, and the available technical solutions.
- In Section 3, we highlight a number of difficulties that have so far impeded an expeditious and effective approach to the foundations problem.
- In Section 4, we discuss four principles that we believe should guide the national approach that we envisage for tackling the foundations problem.
- In Section 5, we make a number of recommendations, directed to central government and to local and regional authorities. Taken together, these

recommendations comprise the national approach to the foundations problem that we propose in the present report.

- Finally, in Section 6, we work out that approach in greater detail, estimating the annual costs for each aspect, and proposing a phased timetable for implementation.





2 NATURE AND EXTENT OF THE FOUNDATIONS PROBLEM

2.1 Types of foundations

Every building in the Netherlands (homes, shops, offices, churches, schools, and so forth) has foundations; no building remains solidly standing without them.

The type of foundations may differ: some buildings have *shallow* foundations, while others have *deep* foundations. Buildings with shallow foundations have a substructure that rests directly on the ground. Buildings with deep foundations have a substructure that rests on piling (i.e. a system of piles). The material of the piles has changed over time. In older buildings, they consist of timber and in more modern buildings of concrete.

What type of foundations are needed is determined by the composition of the soil and the weight of the building. If the subsoil consists of soil layers that are not compressible, or hardly so, and with considerable load-bearing capacity (such as sand or stiff clay) and the building is not too heavy, then shallow foundations can be utilised. In other cases, for example if the subsoil consists of peat or soft clay, then deep foundations on piles are needed. However, in the reconstruction years after the Second World War,

when a large number of houses needed to be built in just a short time, such deep foundations were not always installed in situations where – with the knowledge of today – they were in fact needed.

2.2 Impact of the foundations problem

In everyday parlance, foundation problems are mostly associated with buildings that have subsided because the timber piles on which they stand have been affected by fungal rot or bacteria. However, problems also arise in the case of buildings without timber piling. For instance, large numbers of properties in peatland areas with only shallow foundations are known to have sustained damage due to subsidence.

When the foundations problem is mentioned, many people initially think of structural problems; but the foundations problem encompasses more than that. When we refer to the foundations problem in the present report, we mean the structural, financial, and social consequences of damage to foundations.

Definition of the foundations problem

Foundation damage technically involves deterioration of a building's foundations. As a result, the building may start to move, causing it to sustain damage. This is referred to as consequential damage. When we refer to "the foundations problem", we mean the damage to the foundations, the consequential damage, and the resulting financial and social impact.

Structural problems resulting from damaged foundations occur in the form of cracks in walls, floors and ceilings, tilting of the building, moisture problems, or jamming doors. There may also be problems in the connection to the sewer system or the street. As a result, the quality of these buildings can be severely affected.

If no action is taken, the damage will become worse, leading in some cases to safety risks (see Section 4 of Part 2 of this report). But that is not all that is at stake. For building owners, problems with their foundations can also culminate in major financial difficulties. Repairing the foundations of a single building can already cost about €120,000, which people cannot always afford. A number of municipalities have launched initiatives to support building owners who are affected by damaged foundations, for instance with a helpdesk or limited funding for surveying and/or repairing the damage. In many cases, such support offers only limited prospects for owners.

As we have already noted, for many of those affected, the social impact of foundation damage is at least as profound as the financial impact. Having a safe and affordable home is one of the most important basic needs. When that basic need is threatened by poor foundations and subsidence damage, one's life suddenly becomes unsettled, both literally and metaphorically.

Moreover, taking the necessary measures is also a complex matter, and that complexity can also put owners under great pressure. Many people do not know how to start addressing the damage that has occurred. Both



the hassle and the costs can cause worries and stress.² This is even more significant for apartment owners who are members of an Association of Owners (VvE) and owners of homes that are part of a structural unit (for example a block of houses). In such situations, all the owners affected must decide jointly whether to proceed with repairing the foundations. That can be a source of disagreement and conflict, and sometimes the task of addressing the problem simply fails to get off the ground at all.³

Failure to repair foundations can lead to an accumulation of problems in neighbourhoods and villages. People cease to invest in their property while waiting for the underlying foundations problem to be solved. As a result, properties may slowly but surely become dilapidated and technical problems may arise. Subsidence may sometimes cause problems, for example, with the connection of buildings to the sewerage system and public space.

In some neighbourhoods and villages, vulnerable foundations underneath houses are accompanied by other problems. There may also be overdue maintenance, for example, or as a result high energy bills. Sometimes the property may simply have come to the end of its useful life. Residents, owners, and public authorities are then faced by a difficult decision: does repairing the foundations still make sense, or would it not be better to

² This is also reflected in all the stories of owners who did in fact manage to successfully complete repairs in recent years; they say it was a process that they would not wish on anybody else.

³ In neighbourhoods with a lot of properties owned by housing associations, the latter also regularly come up against this problem. Tackling problems with the foundations then fails to get going because some structural units comprise not only tenants but also private homeowners who are unable or unwilling to participate.

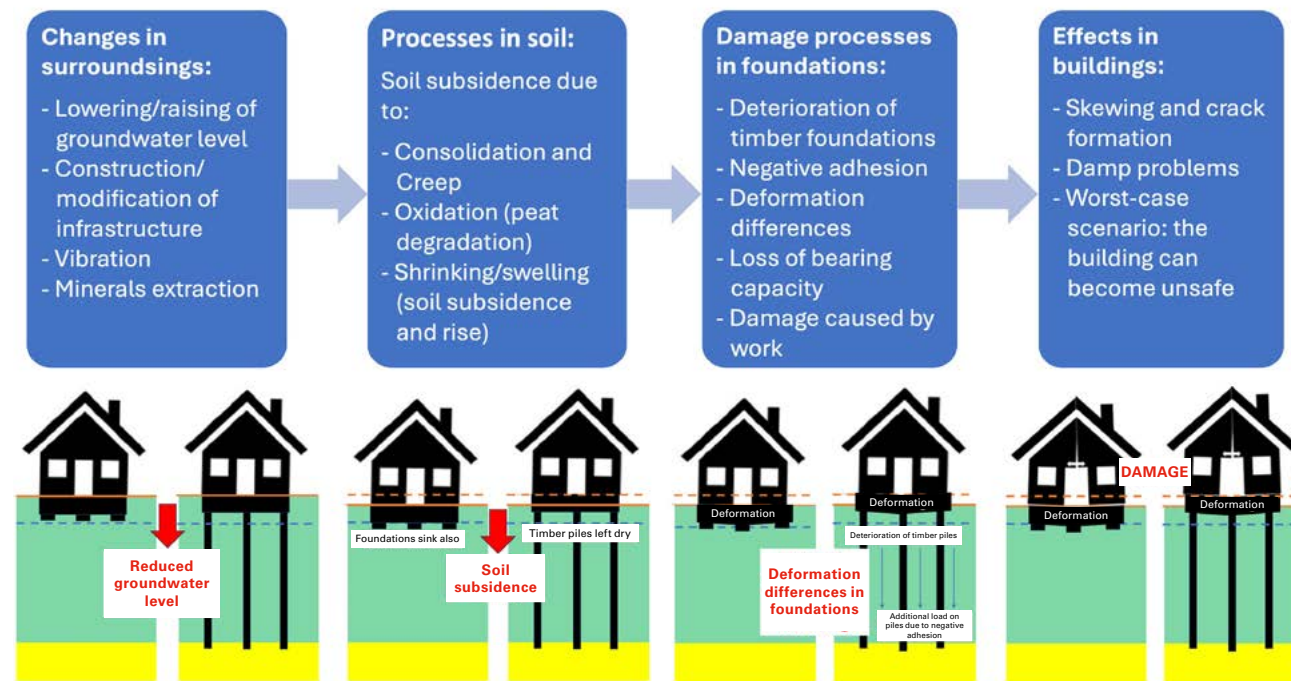
demolish the building and build a new one? From a financial and technical point of view, that question is often easy to answer, but from a social, cultural, or emotional point of view, it is far more difficult. That is because the identity of an area and the sense of community in the neighbourhood also play a role in whether demolition followed by new construction is desirable. This is illustrated by a question raised during one of our working visits: “What is left of a small village’s identity if it’s only the historic church that remains, surrounded on all sides by the outcome of demolition and new construction?” This is precisely why, for example, housing associations sometimes deliberately opt for repairing the foundations of a building, even if that is more expensive from the financial and technical perspective. It is worth it in terms of preserving the sense of community and identity.

2.3 Possible causes

Reduction of the groundwater level is often cited as a cause of damage due to subsidence. That is correct, but there are almost always multiple causes at play. Figure 1 shows the multitude of processes that can cause damage to a building’s foundations, and the impact those processes can have on the condition of the building (see Section 3 of Part 2 for an explanation of the processes shown in Figure 1).



Figure 1: Processes leading to damage and their impact on buildings



In the 1990s, problems with building foundations became apparent in a number of Dutch municipalities, mainly in buildings resting on timber piling. The timber turned out to be affected by fungal rot and/or bacteria. The affected buildings were mainly pre-1970; that is understandable, given that since 1970, timber piling foundations have hardly been used any more.⁴

⁴ Sinds 1970 worden er, als gevolg van technische ontwikkelingen en een aanpassing in de bouwregelgeving, bijna alleen nog betonnen palen gebruikt. Bij betonnen palen zijn de risico's op funderingsschade heel beperkt.

In recent years, it has become increasingly clear that buildings with shallow foundations – i.e. for which no piles have been used and the substructure of the foundations rests directly on the ground – can also face foundation problems.

Examples of the foundations problem in different areas



There are many historic free-standing farms in *peatland areas*, many of which now have a residential function. These buildings are located in areas of permanent natural subsidence of the ground. Since the 1960s, however, subsidence there has been faster than the natural rate, partly because the water level has been lowered for the benefit of agricultural activity. This can eventually lead to subsidence damage, in the case of both buildings on timber piling and those with shallow foundations.



Many *pre-war and post-war Dutch housing estates* were built rapidly because of the housing shortage. This mainly involved constructing semi-detached houses with cheap materials. They were sometimes

built in sites with soft soil, further limiting the durability of the homes. Nevertheless, many of those houses are still there today, and the fact that they have foundation problems is unsurprising, particularly if one considers that in many places the surface water level has been lowered. This has prevented homes from being flooded, but it has also contributed to further subsidence.



Historic town centres contain numerous buildings (many of them listed) of varying constructional quality. Work within public space, such as installing new sewers, often involves excavation right next to these buildings. This movement within the soil can easily cause damage to the foundations. Permanent natural subsidence also often occurs in these areas.

2.4 Extent of the problem

Hard figures on the extent of the foundations problem in the Netherlands are unfortunately unavailable. The extent of both current damage and the damage that can be expected in the future is uncertain (see Section 4 of Part 2). This is partly because in many cases we do not know what kind of foundations the buildings actually have, let alone what the exact condition of those foundations is. Nevertheless, it is possible to arrive at an estimate, as we will discuss in this subsection.

It should be noted that we do not believe that uncertainty as to the exact figures should be any reason for delay in tackling the foundations problem. After all, it is certain that the scale of the problem as well as the costs involved will increase if no action is undertaken.

Numbers of buildings

How many buildings in the Netherlands will need to contend with damage due to damaged foundations in the foreseeable future? In the course of public discussion, reference is frequently made in this context to “a million buildings”. But is that correct? We requested Deltares/TNO and the Knowledge Centre for Addressing the Foundations Problem (KCAF) to investigate this for us. Based on their risk analyses – which they conducted independently from one another (see Section 4 of Part 2 and KCAF, 2024) – we conclude that it is more realistic to assume an indicative figure of 425,000 buildings, i.e. some 6% of all the buildings in the country. These buildings will experience moderate to severe damage due to deterioration of their foundations between now and 2035. Given the various uncertainties, however, the number of buildings with foundation damage and consequential damage may also turn out to be significantly higher – especially if no preventive measures are taken.

Costs

In addition, current data does not allow us to arrive at an accurate estimate of the total cost of the foundations problem either. There are still too many uncertainties involved in estimating the risks and the damage. What is clear, however, is that the cost of repairing structural damage across the



entire country could reach €54 billion (Deltares, 2021).⁵ This indicative figure concerns the total financial extent of the damage between now and 2050 if no preventive or repair measures are taken.

Cost of repairing the foundations for a building owner

How high the repair costs are for an individual building owner depends on the work required to fix the problem. In some cases, complete restoration of the foundations is unavoidable, and that involves work on a very large scale. For an average building resting on timber piling, it will cost some €120,000. In other situations, technical measures, such as installing a prestressed concrete slab, will be sufficient. For an average building, that means about €60,000. In yet other cases, the problem can be tackled by means of soil injection. Materials are then injected into the ground to improve the bearing capacity and/or stability of the soil (see Section 2.5 below). For an average building, the cost of such an intervention is about €30,000.

Location of damage claims

Large areas of the Netherlands are at risk of foundations damage. There are only a limited number of areas where the risk is absent (or virtually absent) (see Section 4 of Part 2).

⁵ This calculation is based on the worst-case climate risk scenario drawn up by the Royal Netherlands Meteorological Institute (KNMI) in 2014.

2.5 Available technical solutions

In recent years, constructional methods have been developed for preventing or repairing foundation damage.

Measures to prevent damage

It is hardly possible for individual building owners to implement preventive measures. They usually only encounter foundation problems when there is no more time or opportunity to think about prevention.

In the context of a national approach to the foundations problem, however, focusing on prevention is extremely important. We will briefly mention the main technical measures for preventing foundation damage, both at area and building level.

Water management plays a crucial role in preventing foundation damage.

Ensuring a stable groundwater level that is suitable for the foundations present in each area is therefore a prerequisite. In addition, preventive hydrology measures are possible at both area and building level.

At area level, this involves, for example, compartmentalising areas by *installing sheet piling* (which can stabilise the groundwater level) or *constructing water storage facilities* (which also contribute to stabilising the groundwater level).

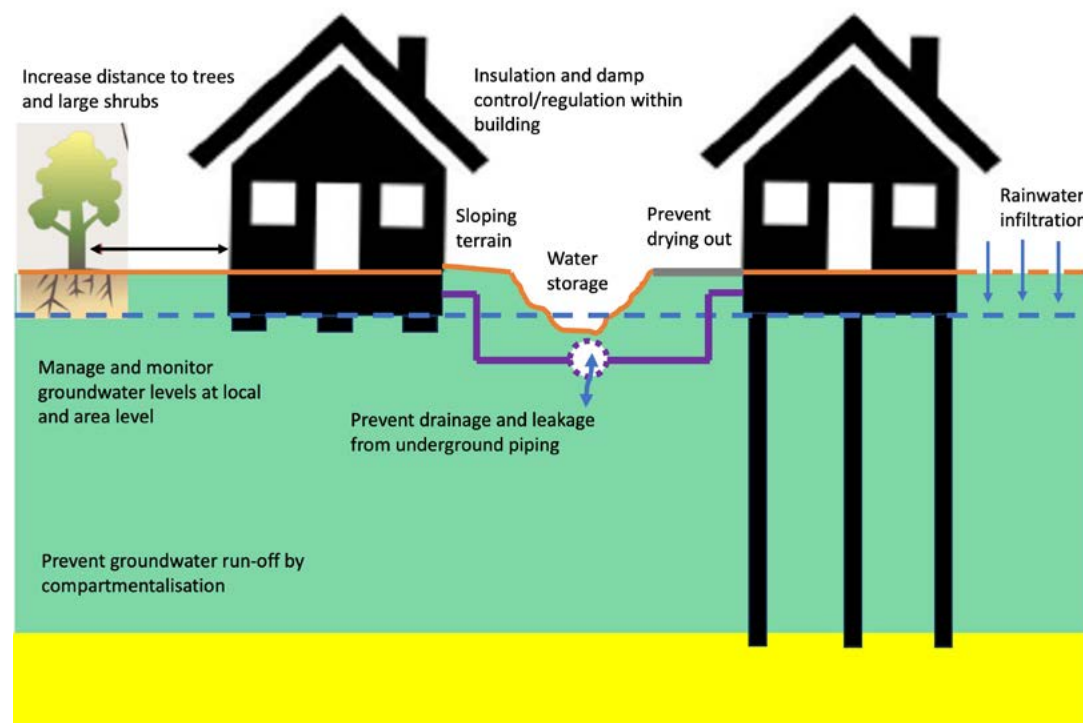
At building level, this can include *installing an infiltration drain* (which pumps water into the soil) or *applying return drainage* (which returns groundwater pumped up elsewhere back into the soil).



In addition to hydrological control, damage can sometimes also be prevented by working on the building's existing foundations, for example preventively reinforcing them by widening and reinforcing the foundation strips of the substructure and/or by driving some additional piles.

Figure 2 depicts various preventive measures. We explain the related methods in greater detail in Section 5 of Part 2.

Figur 2: Measures to prevent foundation damage



Building-level measures to repair damage

If damage to a building's foundations has occurred, it needs to be repaired. This may mean replacing the foundations completely or, in the case of a

building with shallow foundations, installing foundations supported on concrete piles.

If there are problems with shallow foundations, other less invasive methods can often be utilised, such as installing a new prestressed concrete slab or carrying out soil injection. The latter involves injecting materials into the ground to improve the strength, bearing capacity, or stability of the soil. This method is mainly used for buildings on sandy soil. In specific cases, facades and structures can be strengthened and made more rigid so as to ensure that they can withstand the subsidence and rotation. In the worst case, demolition followed by new construction may even be necessary.

Figure 3 depicts the various restoration measures. We explain the related methods in greater detail in Section 5 of Part 2.

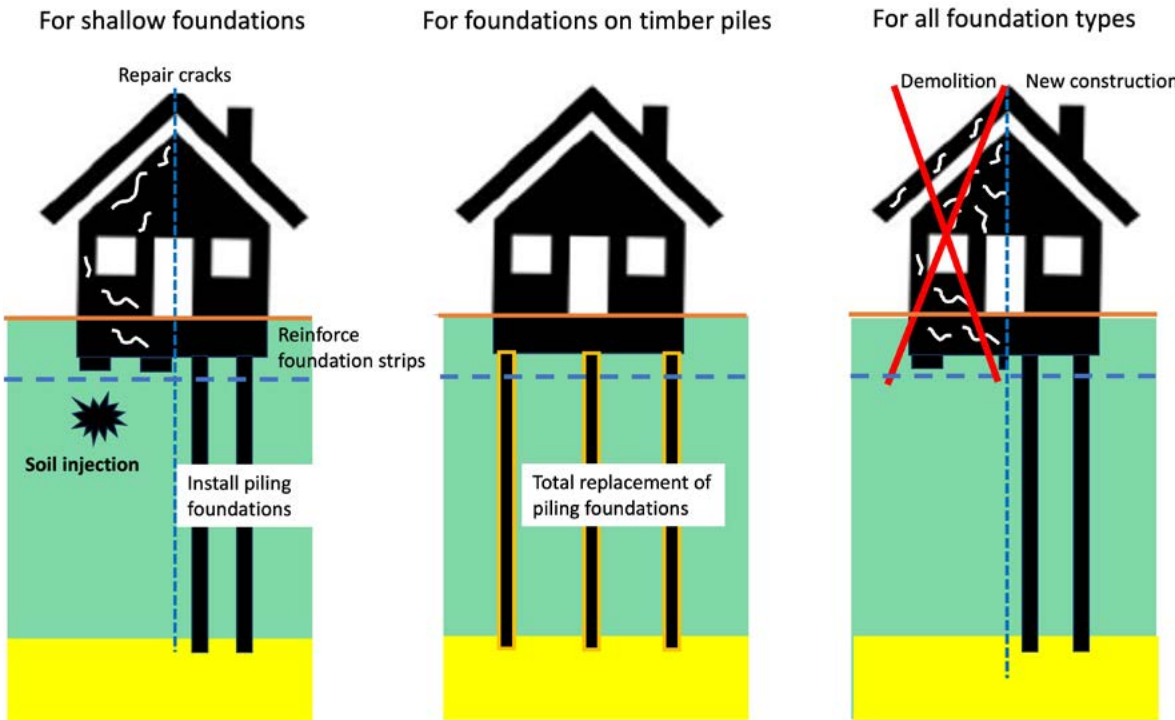
Application in practice

Generally speaking, the methods described above for preventing or repairing foundation damage are still utilised on only a small scale. It became clear from the discussions we had with implementing parties that some 1,000 buildings a year have had their foundations replaced entirely.⁶ This means that many of the existing problems are not yet being addressed, let alone that costs are being reduced by means of economies of scale.

⁶ Hard figures are currently lacking, given that implementation of foundation repair is not recorded nationwide.



Figur 3: Structural measures at building level to repair damage





3 DIFFICULTIES IN THE CURRENT APPROACH

For over twenty years, interest groups and individual building owners have fairly regularly drawn attention to the foundations problem. Despite this, a targeted approach on the part of the public authorities has so far failed – with a few local exceptions – to materialise. Meanwhile, the scale and severity of the problem has only increased. In this section, we identify four difficulties that hinder an effective approach. A national approach to the foundations problem will need to focus on removing these difficulties.

3.1 Lack of information about the condition of foundations

As we noted in Section 2.4, little or nothing is known about the exact condition of the foundations of most buildings. In many cases, it is not even clear what kind of foundations buildings actually have. No relevant information is currently recorded in the master records held by either the municipalities or the Land Registry.⁷

⁷ Housing associations, for example, also often lack information on the condition of the foundations of their housing stock. This became clear from discussions we had with representatives of the associations in the context of the present advisory report.

This is a problem, because it is exactly this information that is indispensable if we are to gain control of the foundations problem and to make clear to all parties involved what action is needed.

This lack of information about the condition of foundations means that the likelihood of foundation damage currently plays little role in pricing within the property market (AFM, 2023). A study by the Home Owners Association (VEH) found that 85% of people who own a house with a realistic risk of foundation damage were unaware of this when they bought it. Moreover, a survey by the Netherlands Authority for the Financial Markets (AFM) showed that 80% of homeowners have no idea what costs may await them if their foundations are found to have sustained damage (AFM, 2023).

Ideally, the condition of a building's foundations and the likelihood of future foundation damage should play a part in determining its sale price. Buyers would then know where they stand. The current property market lacks this transparency, however. In only 2% of house sales is anything said about the state of the foundations (Hommes et al., 2023).

As far as the risk of foundation damage is concerned, the pricing system in the property market is failing to function effectively. The necessary information needed for this on a building-by-building basis is lacking.

Because the condition of foundations at the moment is effectively a “black box”, consumers in the property market are not properly protected and foundation problems only come to light when it is too late. Risks and costs

are passed on by the seller of the property to the next owner who – often unwittingly – fails to build up sufficient reserves to carry out the necessary repairs.

3.2 None of the parties have an interest in transparency

The situation we have just outlined is perpetuated because in the current set-up stakeholders – individual owners, housing associations, rental investors, estate agents, mortgage lenders, and public authorities – have no interest in transparency about the state of building foundations. Promoting transparency within the property market as regards this point is not an appealing option for any of these parties:

- not for owners, because they fear high costs and/or loss of value of their property;
- not for financial institutions, because they fear the impact on the collateral value of their mortgage portfolio; and
- not for public authorities, because they fear having to cough up for the financial and social consequences of the foundations problem.

There is therefore an impasse, with owners, market parties, and public authorities unable or unwilling to face the problem. This partly explains why, after more than twenty years, there is still no national approach to the foundations problem.



3.3 Insufficient cooperation between building owners

Building owners with foundation damage are often dependent on their neighbours as regards reaching a solution. Indeed, in many situations, repair work can only be carried out if the owners of all the buildings within a given structural unit are prepared to participate. Moreover, in the case of a building owned by an Association of Owners, all the owners must decide jointly on remedial measures (and contribute to paying for them), even if only a few of them have sustained damage to their property (at least visibly). In practice, it often proves difficult to get everyone on board.

If there are safety risks and the owners concerned fail to act, the municipality can intervene. Environmental and planning legislation gives public authorities the power to do this. There are various ways in which such intervention can be effectuated, for example by the municipality issuing a notice requiring building owners to have certain repair work carried on their foundations. The municipality may also carry out the work itself at the owners' expense (see Section 7 of Part 2). In practice, however, public authorities are reluctant to deploy such coercive measures.

Compared to individual building owners, housing associations can basically operate more easily when tackling foundation repair. After all, they often own large numbers of homes in a neighbourhood or village. We in fact saw examples of such a large-scale approach by some housing associations when preparing this report. Other associations noted, however, that a large-scale approach was hampered by their not being the only building owner in the neighbourhood or village.

Moreover, we found that in recent decades housing associations, just like most other parties, have failed to place the foundations problem on the agenda. Most of them have only just started work on identifying the problem and drawing up a possible approach. In addition, the foundations problem does not currently form part of the national performance agreements made by central government with the umbrella organisation of housing associations (BZK, 2022). Our discussions with housing associations and municipalities revealed that the same also applies to most local performance agreements.

3.4 The focus on legal responsibilities is problematical

So far, the foundations problem has mainly been approached as an individual problem to be tackled on a building-by-building basis, with the legal division of responsibility between parties being the starting point.

Legally, building owners are responsible for the groundwater at their own property, for the drainage of rainwater, and for the structural condition and maintenance of the property (see Section 7, Part 2). This also means that they – whether owner-occupiers, housing associations, or landlords/investors – are basically themselves responsible for having timely work (including repair work) carried out on the property's foundations as soon as that is needed, and for bearing the cost of it themselves.⁸

⁸ This is unless the damage has been demonstrably caused by someone else (which, as we have noted, is often difficult to prove in actual practice).



One result of this legal responsibility is that many building owners who are confronted by damage to their foundations proceed to have the cause investigated in their private capacity, after which they seek damages by legal means. Given the increasing extent of the foundations problem, it is therefore unsurprising that the number of foundation damage lawsuits has risen sharply in recent years.⁹

In actual practice, these lawsuits generally have little chance of succeeding. Because damage to foundations can involve a variety of causes, it is virtually impossible to make a legally plausible case that one specific party is liable – for example, a local or regional authority that has carried out certain actions within the water and soil system. This is referred to as multi-causality. And even if it can be proved that the damage to the foundations was partly caused by action on the part of a municipality, province or water authority, that action has usually taken place after democratically balancing up the interests involved as part of carrying out a statutory duty.

We therefore conclude that an approach based on the legal division of responsibility between parties is ineffective. It leads to costly and frustrating legal proceedings instead of preventing or repairing damage to foundations. In our view, this means that the national approach to the foundations problem must be designed in such a way that owners will wish to make use of it and are spared a lengthy and frustrating legal battle.¹⁰

⁹ See <https://www.nu.nl/economie/6298132/vaker-rechtsbijstand-ingeropen-bij-juridische-conflicten-over-verbouwing.html>

¹⁰ By this, we do not of course intend to restrict access to justice; the possibility of taking the matter to court will always need to remain open.

It means, in other words, that the national approach must be sufficiently effective and accessible for owners and that they perceive it as fair. Under such an approach, owners who wish to do so should be able to take charge of matters themselves, but at the same time should as far as possible be relieved of their concerns if they so request.¹¹ In short, we envisage a national approach in which the authorities will stand alongside owners rather than in opposition to them.

3.5 Potential new difficulties

When a national approach to the foundations problem is implemented, new difficulties may well arise that have not yet emerged in the current situation, for example, if certain measures will cost one specific group a great deal of money, or if certain measures require substantial scaling up on the part of implementing organisations, investigators, and contractors.

In the sections that follow, we go into greater detail on how to deal with the existing difficulties and potential new ones. With that in mind, we propose four guiding principles and make a number of specific recommendations.

¹¹ We derive this from our discussions with those confronted by damage repair in the province of Groningen.





4 GUIDING PRINCIPLES FOR A NATIONAL APPROACH

4.1 Four guiding principles with *effectiveness* paramount

The difficulties outlined in the previous section have meant that a structural approach to the foundations problem has not so far been launched. In the meantime, the problem is becoming bigger and more urgent, both structurally, financially, and socially. Existing subsidence damage to buildings is increasing in severity, and there are more and more buildings where damage threatens to occur. Moreover, climate change is exacerbating and accelerating the problem, with more and more individual building owners at risk of being affected.

The sum total of all this is that we can speak of a serious societal problem, one that affects entire neighbourhoods and villages, as well as the quality of the existing housing stock. The individual problems of affected owner-occupiers and the lack of prospects for a solution are a combination that can lead to social disquiet – as the earthquake problems in the province of Groningen have made painfully clear (Tweede Kamer, 2023).

At the moment, the pace at which the foundations problem is being addressed is in our view far too slow. We therefore believe that a national approach is needed, one that clarifies the exact extent of the problem and does not seek solutions mainly in the legal responsibilities of parties. This

is because the legal route slows things down and – as we saw in Section 3 – rarely provides satisfaction for building owners who seek a solution through litigation.

We continue to take building owners' own responsibility as the basis, but we also believe that a temporary collective effort is required so as to arrive at an approach to this social problem that offers favourable prospects for building owners and speeds up the process of tackling foundation repair.

For our proposed national approach, we apply four guiding principles, with some receiving greater emphasis than others. We make *effectiveness* paramount. Problems need to be identified quickly and accurately, building owners need to gain control of the problem, and foundation repair needs to be tackled energetically. That is essential, because the Netherlands cannot afford to deal with the problem in a half-hearted manner and pass on the bill to future generations. The adverse effects on the built environment are too far-reaching for that, and the uncertainty that such an approach will create in the lives of those affected – with all the implications it has for their socioeconomic security – is more than merely undesirable. There is then a risk of further juridification of the issue, which is exactly what we wish to avoid. Prioritising effectiveness can prevent the foundations *problem* from escalating into a foundations *crisis*.

Our second principle in formulating an approach is *feasibility*. After all, a national approach will only be effective if it is also capable of being carried out. This places demands on the availability of the necessary information,

on the design and organisation of the repair work, and on the simplicity of procedures.

The third principle that we apply is *fairness*. Among other things, this assumes solidarity with affected building owners and thus an active role for government so as to carry out the necessary redistribution of available resources.

Our fourth guiding principle is *efficiency*. It goes without saying that the approach we advocate must also be implemented efficiently. The intended effect should be achieved wherever possible at the lowest possible cost.

These principles are not black and white; each of them ultimately calls for normative choices to be made. We have interpreted the principles for ourselves and formulated premises for the approach on that basis. Ultimately, it will be up to the politicians to make the definitive normative choices.

We explain our interpretation of the guiding principles in greater detail below. In doing so, we outline the national approach that we propose and our considerations in doing so.

4.2 Effectiveness

Overall, an effective approach means doing the right things so as to achieve the desired societal effects. In tackling the foundations problem,



effectiveness mainly involves speedily pushing ahead with both repair and prevention of foundation damage so as to avoid social disruption. The conditions for this are (a) transparency about the condition of foundations within the property market, (b) a government that actively fulfils its duty of care, and (c) early and intensive involvement on the part of affected building owners so that they can gain control of their own situation. This will (temporarily) require collective action. Building owners do not in fact appear to be taking action of their own accord, and action on the part of individuals is in any case insufficient for addressing a problem of this magnitude.

Specifically, an effective approach will require the following:

- The human aspect must be central so that people can relate to the problem and the solutions offered. Building owners therefore need to be involved proactively in the approach. This requires not only financial incentives and obligations, but also clear communication with, and information from, the government and opportunities to help think up appropriate solutions.
- Uncertainty about foundation risks must be dispelled as soon as possible. Information on current foundation damage, or the likelihood of it, therefore needs to be available in the short term for every building.
- The extent of the problem needs to be limited as much as possible. Local and regional authorities therefore need to put joint preventive measures in place.
- People who lack the necessary resources to successfully tackle foundation repair themselves should be enabled to do so.

- Central government will need to play an active role, given the necessary mandatory elements comprised in the approach, the necessary financial leverage required, and improvement of how market forces operate within the property market.

4.3 Feasibility

Tackling the foundations problem needs to actually be feasible. By this we mean that the required preconditions must have been complied with for all the necessary activities to actually take place. A feasible approach will be characterised by *simplicity*, enabling people to make use of the schemes in a simple manner and, where possible, to be relieved of their concerns.

We discuss below what is needed to ensure the feasibility of three key components of the approach: (a) improving the availability of information about foundation risks, (b) the necessary remedial and preventive interventions, and (c) the organisation and procedures for schemes to support building owners.

Feasibility of improved information provision regarding foundation risks

- All the available information relevant to estimating risks (for example satellite images and information on soil types) must be made accessible as soon as possible so as to avoid unnecessary investigation of foundations.



- The provision of information must be improved by means of proper nationwide coordination. There must also be a clear schedule. That requires collective organisation.
- As far as possible, there should be alignment with existing initiatives for providing information about foundation risks.

Feasibility of remedial and preventive measures

- Repair work and preventive interventions should be deployed collectively whenever possible, given that foundation problems tend to occur at block, neighbourhood, or area level. Respecting and preserving the identity and sense of community in neighbourhoods also demands a collective approach.
- Damage and foundation repair should whenever possible be linked to other tasks in the built environment, such as housing improvement and sustainability measures.
- Standardisation, quality assurance, scaling-up, and innovation in the construction sector should be promoted and facilitated whenever possible so as to increase the capacity for carrying out repair work.

Feasibility of organisation and procedures for support schemes

- Investigation and repair of buildings should be phased in such a way as to create a steady flow of work for market parties. Phasing arrangements should take account not only of technical aspects (such as the subsoil and building type) but also of social aspects (such as sense of community, identity, and preservation of cultural or historical values).

- Temporary (financial) support for building owners should preferably take the form of a contribution that applies to everyone. This will simplify the procedure for owners. It will also prevent further juridification.
- Support and assistance should as far as possible be combined for relevant groups of owners. This will require less capacity on the part of public authorities and the procedure will remain clear to users.

Finally, we wish to emphasise that from a feasibility perspective it is essential that all implementing parties be very closely involved at an early stage in working out the above components of the approach.¹²

4.4 Fairness

Fairness in this context is about whether decision-making is fair and transparent and whether the costs and benefits are distributed fairly between groups within society and between current and future generations (Rli, 2022).

Whether the costs and benefits of an approach are in fact fairly distributed is not viewed by everyone in the same way.¹³ We became aware of that during our discussions with people affected by the foundations problem. We believe that in tackling the problem, there must be solidarity with current building owners. After all, if a national approach leads to it

¹² In this context, see also the recommendations of our recent advisory report *Bridging the Implementation Gap* (Rli, 2023).

¹³ A commonly applied three-way approach to fair distribution involves (a) aiming for the maximum total utility, (b) aiming for equal outcomes for all, and (c) aiming for a sufficient basis for all. Building on that three-way approach, the Scientific Council for Government Policy distinguishes ten possible distributional principles for distributing climate-related costs (WRR, 2023).



becoming known who does and doesn't have problems, the entire costs and worries will be directed onto them – with former and future owners being spared. We do not consider that to be fair.

The solidarity we advocate requires an active role of the part of government. This will involve redistributive effects. Some people will find it unfair for non-homeowners to have to help pay for repairing the foundations of owner-occupied houses through income tax, whereas the owners of such houses are often wealthy enough, for example due to the major increase in the value of buildings in recent decades. We advocate not factoring the relevant political choices into the design of the approach itself, because that will detract from its effectiveness. Redistribution issues should be incorporated into the annual tax plan.

Specifically, a fair approach to the foundations problem requires the following:

- Building owners should be enabled to take the lead in tackling the problem themselves. This means that the authorities should actively inform them about the risks. Owners should also be enabled to help devise solutions.
- The national transparency that we advocate regarding the risk of foundation damage must be prevented from resulting in the entire cost of repair and prevention measures falling exclusively on current building owners, with all previous and future owners not needing to contribute at all.

- All building owners with foundation damage must be enabled to cover the cost of repairing it. This calls for a financial safety net for owners who cannot afford repairs.
- Government should relieve building owners of their concerns as much as possible. After all, they find themselves facing an unexpected and complex process that they do not know how to embark on. A helpdesk needs to be set up to help them do so and to provide them with clear information.

4.5 Efficiency

By efficiency, we mean that the relationship between the resources to be deployed (money, time, and capacity) and the effects achieved is as favourable as possible. An approach is therefore efficient when a given budget can be used to achieve maximum effect or, conversely, when an intended effect is achieved at minimum cost.

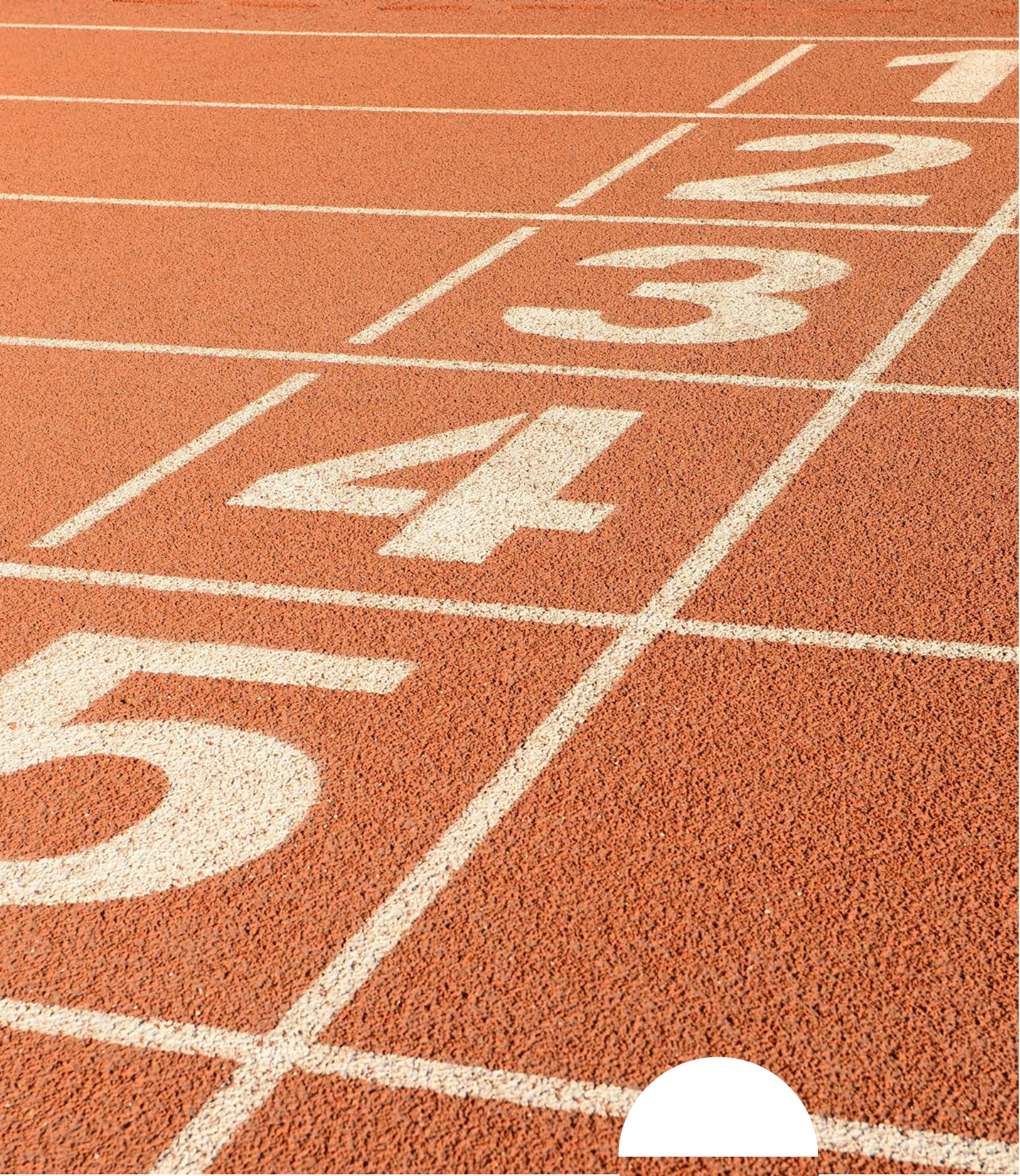
Organising the approach to tackling the foundations problem collectively will contribute to efficiency by increasing the scale. This will bring about cost reductions in the various components of the approach. It should be noted, incidentally, that the efficiency principle is dominant in many policy approaches. We consider that undesirable in the national approach to the foundations problem.



Specifically, the following are needed in order to tackle the foundations problem efficiently:

- Where foundation problems are concerned, action should be taken as swiftly as possible; this avoids unnecessarily high costs. The sooner we tackle the foundations problem, the cheaper doing so will be.
- Central government needs to make firm arrangements with local and regional authorities so that the latter can take preventive action. Preventive measures are necessary so as to minimise damage and the cost of repairing it.
- Wherever possible, tasks should be tackled in combination. Foundation repair, for example, can be tackled at the same time as carrying out overdue maintenance and improving insulation. This can reduce costs.
- If demolition followed by new construction is the most efficient measure for dealing with foundation problems, it should be considered as a serious option.
- Where possible, a block- and area-based approach should be adopted. This will make it possible to tackle foundation damage at the most cost-efficient scale.
- Efforts should be made, together with the construction sector, to scale up the operation. The arrangements previously made with the installation sector on scaling up for the production and installation of heat pumps can be a source of inspiration.





5 RECOMMENDATIONS

Building on the four guiding principles discussed in the previous section, this section provides our recommendations to central government and local and regional authorities. Taken together, these recommendations comprise our proposed national approach to the foundations problem.

Our recommendations are along five tracks:

- 1. improve the availability of risk information regarding foundation damage;
- 2. prevent foundation damage;
- 3. prevent social problems by providing support and relief from the associated concerns;
- 4. create grant and loan options for damage and foundation repair;
- 5. ensure vigorous shared implementation.

These five tracks cannot be viewed in isolation; the various authorities will need to follow them simultaneously if the approach is to be effective. After all, improving the available information about foundation risks will disrupt the property market if there is no simultaneous prospect of (temporary) financial support for building owners in repairing their foundations.

A temporary financial support scheme for building owners also calls for specific efforts to ensure greater transparency within the property market, so that the risk of foundation damage will in future be factored into the

price people pay for a property. Moreover, effective foundation repair is not possible without robust shared implementation being guaranteed.

Our proposal is to set out the national approach to the foundations problem in binding inter-authority agreements and to assign implementation to a National Foundations Problem Coordinator (as detailed in Track 5).

5.1 Track 1: Improve the availability of risk information regarding foundation damage

The availability of reliable information on the risk of foundation damage to buildings is crucial if the foundations problem is to be tackled effectively.

As we see it, improving the provision of information must result in a complete picture of foundation damage, or the likelihood of such damage, for each building. The intention is for the foundations problem to play a transparent role in pricing within the property market, and for buyers and sellers to be able to take that into account. We offer four recommendations in that regard.

Recommendation 1.1 Clarify the likelihood of foundation damage per building by setting up a public foundations database

Currently, the information needed to reliably estimate the likelihood of damage for each building in the country is lacking. Statistical knowledge is available, but it is dispersed across a variety of sources. For example, the Knowledge Centre for Addressing the Foundations Problem (KCAF) works

with the FunderMaps application, Deltares utilises its own foundation risk model in its Climate Impact Atlas, and the Netherlands Enterprise Agency (RVO) is developing a risk map based on satellite data. We recommend having all this information combined and making it publicly accessible by means of a foundations database. This will create a single recognised and reliable location where owners, buyers, tenants, financiers, and public authorities can access reliable, unambiguous information about the likelihood of foundation damage to specific buildings. The database should at least clarify:

- what kind of foundations have been used for the building;
- what the likelihood is of foundation damage, and to what degree.

The foundations database must meet a number of requirements:

- Unambiguous definitions that can be understood by owners need to be developed. The currently existing initiatives often involve slightly different basic principles and apply slightly different definitions of types of foundations and risks.
- Buildings should only be classified in the foundations database if that can be done with a high degree of certainty; otherwise, they should be assigned a separate designation (“unknown”). The buildings so designated will then require further investigation (see below).
- The foundations database should be independently managed by a single non-profit party, as is the case with the master records held by the Land Registry.
- It is important to keep the foundations database constantly updated. To that end, interested parties must be obligated to provide up-to-date



information that they have acquired on the basis of investigation. The party managing the foundations database should create links to other relevant databases (for example topographic map layers).

We propose that the foundations database be established according to a growth model, meaning that classifications will gradually become available for more and more buildings. We believe it should be possible to develop and populate the foundations database between 2024 and 2027. At the end of that period, classifications will then be available for the vast majority of buildings in the country.

Recommendation 1.2 Encourage area-based surveys of the condition of foundations

For the foundations database to be reliable, more investigation is needed into the condition of foundations. We therefore advocate municipal area-based survey programmes in the period from 2025 to 2028. These programmes will include organising collaboration and relieving owners of their concerns. The latter must still remain in control of what happens to their own building.

The survey programmes must ensure that for large numbers of buildings the necessary information becomes available rapidly. Municipalities – in consultation with, for example, housing associations and other building owners – can determine the neighbourhoods and districts for which a survey programme represents added value. Timely communication with residents and owners about the surveys and their close involvement in

setting them up is crucial. The National Coordinator must ensure proper coordination between the surveys that are carried out on the basis of this area-based approach and the surveys that take place at owners' own initiative (see Recommendation 1.3).

Most efficient way to investigate the condition of foundations

The best way to investigate the condition of foundations depends very much on the particular situation. In neighbourhoods and villages, it is often inefficient to determine the state of the foundations on a building-by-building basis. An area-based survey is then much smarter, given that information about even just a few buildings can often clarify matters regarding a large number of them. Such an approach does require integrated examination of building shells, groundwater levels, etc. This survey approach is applied in Dordrecht and Zaanstad, for example, and we advocate that it should be adopted nationwide.

Survey programmes should focus on areas where there is as yet little information about the foundations, but where realistic foundation risks can be foreseen in view of the subsoil and the year of construction of the buildings. However, the cultural and historical value of buildings, neighbourhoods, and villages must also be taken into account when scheduling surveys. The results of completed surveys must then be made public on a building-by-building basis in the foundations database discussed above (see Recommendation 1.1).



Recommendation 1.3 Subsidise foundation surveys for owners

Owners must also be able to commission their own foundation survey. This fits in with their responsibility as owners and contributes to their sense of ownership. The cost of a full foundation survey can amount to as much as €6,000 per building.

We recommend providing a grant to cover 90% of the cost for people who have their foundations surveyed. We propose that the grant should be conditional on the survey being carried out by a certified firm (see Recommendation 5.3). A second condition will need to be that the results of the survey are submitted for inclusion in the foundations database (see Recommendation 1.1).

Not all foundation surveys will be equally invasive. There are three types of survey that building owners can have carried out. In order of increasing complexity, these are: 1. an archive search for relevant documents, 2. a quick physical scan without soil needing to be excavated, and 3. a full investigation of the foundations. The kind of survey needed depends on the foundation information already available for the building concerned. This will need to be determined by a certified survey firm. One requirement for certification should also be that the survey firm designs the survey in such a way that it provides as much information as possible about the entire structural unit within which the building is located (see Recommendation 5.3).

In order to save on costs, we considered excluding housing associations and commercial landlords from the grants scheme in our recommendation. However, we advise against this. Indeed, we expect that excluding these parties would severely limit the effectiveness of the national approach to the foundations problem.¹⁴

Recommendation 1.4 With effect from 1 January 2029, oblige sellers and landlords to provide information on the likelihood of foundation damage when selling a property or in new lease agreements

We recommend that the statutory obligation to disclose information that is incumbent on owners when selling a property be made more specific. Currently, the law states that the seller of a building must disclose all defects known to him/her that prevent “normal use” of the building (Section 7:17 Dutch Civil Code). Sellers are thus required to provide all information about foundation risks that is available at the time of sale. It is unclear, however, to what extent a seller can or must be aware of these risks.

The statutory obligation to disclose information in the event of a sale will need to be specified more precisely. With effect from 1 January 2029, sellers must be obligated to provide information on the likelihood of foundation damage. They can comply with this obligation by stating the classification of the property in the foundations database (see Recommendation 1.1). If the building to be sold does not have a classification in the database, the owner

¹⁴ In the case of housing associations, this can be laid down in national performance agreements.



will need to be required to have a survey carried out of the condition of the foundations (see Recommendation 1.3).

To prevent sudden disruption of the property market, we recommend announcing the amended disclosure obligation well in advance. Specifically, we propose that the new obligation be announced by the end of 2024, and that the public be proactively informed of it, in collaboration with real estate agents, mortgage lenders, and financial advisers. Building owners who are planning to sell a property will then have sufficient time to prepare to comply with the new disclosure obligation.

We also recommend that landlords be obliged, with effect from 1 January 2029, to inform new tenants of the risk of foundation damage when concluding leases with them. The risk may namely also affect tenants, for example as regards moisture problems, cracks in walls, or jamming doors. Such damage can also result in tenants having to move out (temporarily) because repairs are needed. Foundation information is also relevant for tenants when they invest in a kitchen or bathroom. They must be clear about any risks when concluding their lease and must be able to take those risks into account.

A key point: prevent homes becoming unsaleable due to the disclosure obligation

Enforceability of the disclosure obligation will depend on (a) the extent to which the foundations database can be successfully populated and (b) the capacity available at consulting and survey firms for carrying out swift foundation surveys with effect from 1 January 2029 when relevant requests are received (for buildings without a classification in the foundations database). It goes without saying that the disclosure obligation must not lead to homes becoming unsaleable as a result of bottlenecks regarding these two aspects. We recommend evaluating this prior to introduction of the disclosure obligation and, if necessary, putting additional measures in place to prevent homes becoming unsaleable due to a lack of capacity.

5.2 Track 2: Prevent foundation damage

Many foundation problems can be avoided by means of preventive measures in the vicinity of buildings. The extent to which such measures are needed to preclude foundation problems in new buildings must also be assessed. We specify below what preventive measures are specifically needed.

Recommendation 2.1 Have prevention plans drawn up by local and regional authorities



We recommend that water authorities, municipalities, and provinces be mandated by central government to jointly draw up plans, in 2025-2026, for preventing and mitigating foundation damage in the built environment.¹⁵ The National Coordinator will oversee preparation of the prevention plans.

The plans will need to identify the opportunities for preventive measures to reduce the likelihood of foundation damage in a given area. This will require consideration of differences in building type, subsoil type, and the hydrological situation. It is, after all, the buildings, the subsoil, and the hydrological situation that largely determine the risks and the optimum preventive measures.

These could include measures in the water and soil system that follow the policy line *Water and soil as guiding principle* (IenW, 2022), such as altering the extent of drainage, improving infiltration, constructing fine-meshed drainage systems around structural units, or applying new technology to halt or slow down timber rot (possibly as a pilot project). But making new decisions on functions and uses in the area can also form part of a prevention plan.

In line with their responsibilities for water management, municipalities and water authorities are in our view the appropriate parties to take the lead in drawing up these plans, in consultation with the National Coordinator. The provinces will play a supporting role.

¹⁵ It is advisable to explore whether these plans can take on the character of a programme as one of the key tools of the Environment and Planning Act.

Importance of National Programme for Rural Areas in mitigating foundation problems

As part of the National Programme for Rural Areas, draft versions of provincial plans for rural areas were published towards the end of 2023. These plans comprise proposals that will help reduce nitrogen and CO₂ emissions. This includes raising the groundwater level, which will have the side effect of helping to prevent subsidence, and hence foundation problems. The National Programme for Rural Areas thus provides an important basis for the prevention plans recommended above.

Recommendation 2.2 Prevent damage in the case of new construction

As far as is known, relatively new buildings constructed on concrete piling do not generally have foundation problems, given that modern building standards take subsidence and pile deterioration into account.

In the event of subsidence, however, problems may still occur in new buildings on concrete piling. If the concrete piles under a building do not sink along with the surrounding public space and infrastructure, the building's connection to sewers, cables and pipes may fail, or it may become difficult to access the building. This phenomenon is usually recognised by municipalities and infrastructure managers and included as part of regular management. That is beyond the scope of our proposed approach to the foundations problem.



For new buildings with shallow foundations, constructed on subsoils with clay layers, we do however foresee realistic risks of foundation damage, primarily due to climate change. But given the current state of knowledge, nothing certain can be said about the extent of the risks posed by shallow foundations on subsoils with clay layers. We therefore recommend commissioning further investigation of this particular group of buildings during 2024-2025. If the results warrant it, additional statutory measures (for example in building standards) may be needed to eliminate foundation risks in new buildings in these specific areas.

5.3 Track 3: Prevent social problems by providing support and relief from the associated concerns

As our analysis shows, foundation problems can cause a great deal of worry and uncertainty for building owners. The national approach to the problem should therefore focus not only on the financial and constructional side of the issue, but also on guiding owners and relieving them of their concerns (as far as possible). That does not mean taking over responsibility, but by standing alongside owners and consulting with them as to the best approach to be followed.

This applies to all five tracks in the approach. We make three specific recommendations in this respect.

Recommendation 3.1 Set up a helpdesk that building owners and residents can approach with questions about foundation damage

We recommend setting up a national helpdesk that will proactively support owners and residents. Its tasks should include:

- providing assistance in engaging experts to determine the risk of foundation damage and/or to draw up repair or renovation plans;
- helping building owners select reliable parties to repair their foundations;
- advising on preventive measures that building owners can implement themselves;
- assisting with applications for a grant for a foundation survey, remedial plans, and repairs.

The helpdesk should be set up on a nationwide basis but should be accessible locally. It should be available by 2025, simultaneously with the entry into force of the subsidy schemes that we recommend.

It is essential for the helpdesk to be organised on a close proximity basis, with preferably a single point of contact. One aspect of such a proximity-based organisation is that it should proactively notify owners of buildings that are at risk of foundation damage (according to the foundations database) about the possibility of applying for a grant for foundation surveys, remedial plans, and repairs (see Recommendations 1.3 and 4.2).

The helpdesk can be set up by combining and reinforcing existing initiatives such as the Knowledge Centre for Addressing Foundation Damage (KCAF) and the Subsidence and Foundations Knowledge Centre (KBF). Given its work on the foundations problem, one could also call on the know-how of the Netherlands Enterprise Agency (RVO). The National Foundations Problem Coordinator (see Recommendation 5.2) will take the lead in setting



up the foundations helpdesk and organising it in such a way that it really does stand alongside owners and residents.

If municipalities already have a properly functioning public helpdesk, they may choose to keep it operational. The national organisation can then function as the “second tier”. It is advisable to adopt a “no-wrong-door principle”, meaning that queries received by the national helpdesk are passed on smoothly to the equivalent desk at the relevant municipality.

Recommendation 3.2 Strengthen the position of municipalities so as to develop an area-based approach to repairing foundation damage and consequential damage

We advocate strengthening the position of municipalities in such a way that, in specific neighbourhoods and villages, they can adopt an area-based approach to damage repair. We make two proposals for doing so:

- Provide government funding to help draw up area plans so as to develop a collective approach to foundation repair. Drawing up area-specific plans will be particularly useful in areas where (given the building structure) a collective approach can be expected to result in economies of scale, where there are also major sustainability tasks, or where the presence of cultural or historical features calls for a joint approach.
- Draft model regulations for using the statutory power to issue a notice [*aanschrijvingsbevoegdheid*]. This power allows municipalities to oblige building owners to carry out foundation repairs, even if it is not yet immediately necessary for their particular building but is necessary for

other buildings in the structural unit to which it belongs. A number of municipalities, for example Haarlem and Dordrecht, have already gained experience with utilising this statutory power for this purpose (see Section 7 of Part 2). Based on such model regulations, all municipalities will be able to make use of the same method.

At the same time as strengthening the position of municipalities, attention will also need to be paid to owner-occupier participation in these areas. Timely collaboration with them is necessary for the approach to be effective. That was an important lesson from the repair projects in the province of Groningen.

Special attention will also need to be paid to areas where municipalities have specific plans for urban renewal, with demolition followed by new construction as an important component. In such areas, deciding to have foundations repaired may amount to destruction of capital, because the building concerned will in any case be included in the urban renewal project in the near future. We propose that such areas should be subject to additional rules for the allocation of grants for damage and foundation repair (see Recommendation 4.2). The basis for this will need to be that building owners will only be eligible for a subsidy if the municipality agrees. The available grant can then be used for financially attractive expropriation of the property owner. This will increase the financial leverage available to municipalities and offer building owners the prospect of attractive compensation. It will not eliminate the sadness that sometimes accompanies urban renewal, but it will provide the basis for open and honest discussion of it.



5.4 Track 4: Create grant and loan options for damage and foundation repair

In order to gain control of the foundations problem, it is important to get down to work on damage and foundation repair. We believe that public authorities have a supporting role to play in this regard in the coming years, not only as regards facilitating it but also in a financial sense. Without both these kinds of support, damage and foundation repair will not get off the ground sufficiently, and the severity and extent of the foundations problem will only increase.

Recommendation 4.1 During the transition phase to full transparency regarding foundation risks, offer building owners a 70% grant for commissioning a remedial plan

The proposed national approach to the foundations problem will clarify whether and which buildings have sustained moderate to severe damage to their foundations. Building owners who are affected will need to have a remedial plan drawn up, if required with the support of the helpdesk (see Recommendation 3.1). That plan should clarify (a) the optimum method for repairing the damage to the foundations and (b) whether it is possible to repair the building's foundations independently or whether that needs to be done within a larger structural unit. Development of a standard catalogue of types of work and prices would be useful in this regard (see Recommendation 5.3).

We propose provision of a grant to cover 70% of the cost of drawing up a remedial plan in the period from 2025 to 2035. This way, government will

bear most of the cost, but the building owner – who is the party responsible for having a remedial plan drawn up – will also contribute.

Recommendation 4.2 During the transition phase to full transparency regarding foundation risks, offer building owners a 30% grant for repairing damage to their foundations

The cost of repairing foundation damage is considerable. Because there is currently no nationwide foundations database with information on foundation risks, people purchasing a property are usually unable to take this cost item into account.

We therefore advocate a grants scheme for owners of buildings with moderate to severe damage to their foundations. This means affected foundations which will lead to damage to the shell of the building within fifteen years because of subsidence, rotation, and/or other factors (see Section 6 of Part 2). Our proposal is to provide this support during the transition phase (2025-2035) to a situation in which there is full transparency regarding foundation damage and risks in property transactions thanks to the existence of the national foundations database.

With the grants scheme that we propose, we aim to ensure that damage and foundation repair are carried out for considerably more buildings, and more rapidly than at present. At the same time, the grants scheme will mitigate the effects of the disclosure obligation that we advocate (see Recommendation 1.4).

The proposed grants scheme is intended to contribute to the cost of repair work. We believe that 30% of the cost of the work could be subsidised,



up to a maximum of €40,000. Owners would then need to borrow the remaining 70% (or more if the maximum grant amount applies) or pay it from their own reserves. The meeting of experts that we held with representatives of mortgage lenders revealed that most building owners have sufficient borrowing capacity for this purpose. Mortgage lenders have a responsibility to ensure that these loans are in fact provided so that the foundations problem can really be tackled effectively. The proposal is for relevant arrangements to be made in an agreement with the sector (see Recommendation 4.3). We propose a separate solution for owners who do not in fact have this borrowing capacity (see also Recommendation 4.3).

Explanation of proposed grant percentage

The grant percentage that we propose (30%) could also be set differently based on political considerations. Given the legal responsibility of owners, we consider it fair for them to bear at least half the cost during the transition phase. An effective approach does call, however, for a bold gesture on the part of government – a genuine incentive to ensure that foundation repair really is tackled on a large scale. We believe that with a percentage of 30% the scheme will be effective enough to significantly limit the number of lawsuits – and thus the amount of time lost in taking action. And given the potentially disruptive nature of the foundations problem for Dutch society, we consider a sizeable grant contribution to be appropriate.

A finite period for providing grants will encourage a dynamic approach to the foundations problem. At the same time, an eleven-year period will help stagger the number of buildings to be repaired each year, thus ensuring that the task remains manageable. It also gives building owners who wish to get started with repair the flexibility for scheduling the operation at a time that suits them. Well before expiry of the grants scheme, it will be necessary to evaluate whether the market has been able to achieve the foreseen pace of repair or whether additional measures are needed, including possible extension of the grants period.

Certain conditions will need to apply. We consider that grants for repairing foundation damage should only be provided if:

- the condition of the foundations is moderate to poor;
- the remedial plan has been drawn up by a certified firm (see Recommendation 5.3).

In some cases, the conclusion of the remedial plan will be that the only viable option is demolition followed by new construction. In such cases too, we propose that the grant should basically be paid, up to the above-mentioned maximum of €40,000 (for the situation in which demolition followed by new construction is involved, see also Recommendation 3.2).

We propose that the grants scheme outlined above should be open in principle to all building owners, with two exceptions:

1. commercial property owners;
2. public authorities that act as property owners.



We wish to exclude the first category of owners from the scheme because they can already offset the cost of damage repair in their tax returns. And we wish to exclude the second category so as to prevent public authorities “pumping money around” among themselves. This exception will need to be specified in greater detail when the scheme is designed. It is also conceivable that some additional exceptions may be necessary or desirable (for example as regards holiday homes or company warehouses).

As with foundation surveys, we believe that the way foundation repair is tackled by housing associations should also be set out in new national performance agreements. In this way, central government can encourage housing associations to as far as possible adopt an integrated approach to sustainability, renovation, and repairing the foundations of their properties.

We consider that when working out our proposed subsidy scheme, special arrangements will need to be made for buildings with an Association of Owners (VvE) and buildings that are of exceptional cultural or historical value. VvE’s often own relatively large buildings, meaning that repair work on the foundations will cost many times more than the average per building. The maximum grant amount will need to be adjusted accordingly. Creating additional loan facilities for VvEs also requires attention. The regulations regarding listed buildings may also be a reason for customisation.

We were unable to conduct an in-depth study of this matter during the time available for drawing up the present report.

Recommendation 4.3 Ensure that everyone can borrow the amount needed for foundation repair over and above the amount of the grant (if necessary with interest charges being waived and repayment being deferred)

Some building owners will be able to pay the unsubsidised portion of the cost of foundation repair from their own reserves. Other owners will be able to take out a mortgage loan for that purpose based on their own income and any excess value that their property may have. It is important for the cost of necessary foundation repair to be incorporated into the lending standards for mortgage lenders as laid down in the Temporary Regulations on Mortgage Credit. When taking out a new mortgage, the borrower must be left with sufficient borrowing capacity to finance foundation repair. Mortgage lenders have a responsibility to ensure that that is the case, as well to be flexible in providing this supplementary mortgage, in so far as that is possible. It is therefore not only a matter of setting standards, but also of how they are applied. We therefore recommend that the National Coordinator make relevant arrangements in an agreement with the financial sector.

There will also be building owners who do not have their own reserves and who also fail to qualify for a regular supplementary mortgage. We believe that the national approach to the foundations problem must provide that basically *anyone* can borrow the required amount after deduction of the grant. The Minister of the Interior and Kingdom Relations recently took a significant initial step in that direction by announcing (on 9 October 2023) that the Sustainable Foundation Repair Fund (FDF) – which has existed since



2017 but to which only five municipalities are currently affiliated – will apply nationwide (BZK, 2023).

The FDF offers loans to building owners who cannot get a mortgage from a regular mortgage lender. People who borrow money from the FDF are granted deferred repayment and a waiver of interest charges as long as their income is insufficient to cover these charges (according to the guidelines of the National Institute for Family Finance Information (NIBUD)). This “customised loan” applies for a period of three years. After each such period, the borrower must basically start paying the normal interest and repayments, unless a reassessment shows that their income is still below the level set in the guidelines.

While we welcome the intention to give the FDF nationwide effect, we think the conditions are still too strict in a number of respects. This limits the effectiveness of the scheme. For an effective and fair arrangement, we propose the following alterations:

- *Remove the upper lending limit.* Building owners must be able to borrow the full cost of repair, as stated in the remedial plan and after deduction of the grant, from the new FDF.
- *Scrap the charges for reassessment.* The reassessment that people with an FDF loan must apply for and pay for every three years needs to be carried out by default, free of charge. This will relieve borrowers of the associated concerns, and they will pay what they are actually able to pay.
- *Relax the rules for repaying the residual debt.* In the exceptional situation in which a borrower has not repaid any of the loan during the entire term, the arrangements for repaying the residual debt must be made more

flexible. We believe that a borrower who have difficulty repaying should only be obligated to do so at the point when the property is transferred to a buyer or heir. In our view, concerns about paying off residual debt relating to foundation repair are inappropriate in this context.

- *Make loans for foundation repair combined with sustainability measures possible again.* Following a recent review of the FDF (Rebel Strategy & Development, 2023), it was decided to exclude costs of sustainability measures that are not directly related to foundation repair from qualifying for a loan. The reason was that other schemes and facilities are available for such a loan. We acknowledge that such alternative arrangements are available, but for a building owner it is better to take out a single loan, permitting a combined approach to sustainability measures and foundation repair. Matters will otherwise become needlessly complex for the applicant. We therefore propose that the combination be made possible once more.

5.5 Track 5: Ensure vigorous shared implementation

An effective approach to the foundations problem will benefit from vigorous implementation. We specify below what efforts on the part of government and the implementing organisation we consider necessary to make progress and ensure joint implementation.

Recommendation 5.1 Appoint a coordinating minister for the foundations problem



Central government will need to make a significant contribution to following tracks 1 to 4. It is therefore desirable that a single coordinating minister be appointed within the government to take charge of the foundations problem. Given the way the problem is interlinked with the national housing stock, the logical course of action – based on the current ministerial structure – would be to assign coordinating responsibility to the Minister of the Interior and Kingdom Relations.

Recommendation 5.2 Appoint a National Foundations Problem Coordinator to direct an inter-authority programme for tackling the problem

We recommend that the government appoint a National Foundations Problem Coordinator. This official will report to the coordinating minister referred to in Recommendation 5.1, but will have an independent and autonomous role. The National Coordinator will lead an inter-authority programme team and must have his or her own implementing organisation and the financial resources needed to implement the programme.

He or she will develop an inter-authority programme in which central government, provinces, municipalities, and water authorities cooperate with one another, and will direct implementation of that programme. Broadly speaking, the tasks of the National Coordinator will be:

- to inform and involve residents, public authorities, and market parties;
- to improve the provision of risk information about foundation damage (including regarding the provision of grants);
- to manage the creation and implementation of prevention plans;

- to prevent foundation risks;
- to encourage damage and foundation repair (including the provision of grants);
- to drive innovation and quality assurance among parties carrying out foundation surveys and repair.

The National Coordinator should be explicitly given scope for making independent decisions on the deployment of instruments within the set frameworks. This is a prerequisite for customisation to be possible and for responding to the needs of the owners to whom support is being offered.

The inter-authority programme will need to specify which activities will be undertaken by the various authorities and which will be entrusted to the National Coordinator's implementing organisation. The National Coordinator will arrange for the distribution of financial resources. Local and regional authorities will have an important role in drawing up prevention plans, organising area-based surveys, and ensuring that building owners are involved. Sufficient capacity must be made available to ensure that the approach is truly people-centred and that no unnecessary delays and waiting times arise in the contacts between the homeowners and the implementing bodies.

In addition to the tasks described above, we propose that the National Foundations Problem Coordinator should be responsible for establishing and positioning the foundations helpdesk (see Recommendation 3.1).

In our proposal, the National Coordinator will act on behalf of the cooperating public authorities within the inter-authority programme. The



independent role of the National Coordinator means that he or she will need to be empowered to independently provide parliament with information on the progress of the programme when necessary. This will reinforce the independent position of the National Coordinator vis-à-vis the government.

Recommendation 5.3 Introduce certification for foundation surveys and remedial plans

Building owners and authorities must be able to trust that the survey of their property's foundations is reliable and that the remedial plan comprises a sound estimate of both the necessary work (including consideration of whether to proceed with demolition-new construction) and the associated costs. We therefore advocate the introduction of mandatory certification of firms that conduct foundation surveys and draw up remedial plans as a condition for the provision of grants. The National Coordinator, in consultation with the sector, will ensure the establishment of a certification system.

A key principle in the approach, and therefore a prerequisite for certification of foundation survey firms, is that the latter maximise the scope of their surveys. Surveys should be designed in such a way that statements can be made about the entire structural unit and not just about an individual property. Certified survey firms must also be able to reliably determine the type of survey needed (based on standards to be agreed with the foundations sector). This may involve (in order of increasing complexity): an archive search for relevant documents, an on-site investigation of the

foundations without soil needing to be excavated, and an investigation that does involve excavating soil.

Firms that then draw up remedial plans will need to make reliable decisions as to the work that is needed. Here too, it is important to make clear agreements with the foundations sector – in this case on what type of work should take place in which situation and what costs are involved. This could be laid down, for example, in a “standard catalogue of foundation work”. Certified firms that draw up remedial plans will be required to comply with these agreements.

The requirements formulated by the KCAF for the accreditation of survey and consultancy firms provide a sound basis for a certification system. It is important that the certification methodology becomes available as soon as possible. The National Coordinator must ensure that firms continue to meet the requirements for certification.

Recommendation 5.4 Promote scaling-up and innovation

The sector that currently carries out foundation surveying and repair is still quite a small one. Only about 1,000 foundations are currently repaired annually throughout the entire country. Our proposed introduction of a disclosure obligation for owners who are selling their property will entail a greater need for specialised firms that can carry out foundation surveys. There will also be an increased demand for firms specialising in foundation repair. The foundations sector will therefore need to scale up to so as to meet this demand.



The scaling-up that we advocate will need to be accompanied by standardisation of processes, methods and techniques, as well as technological innovation. These can, after all, reduce the cost of foundation repair while simultaneously increasing the work rate in the sector. The cost of foundation repair has risen sharply in recent years, while the methods have hardly developed.

The National Foundations Repair Coordinator will need to conclude agreements with the foundations sector on standardisation, quality assurance, scaling-up, and innovation. The arrangements already made with the installation sector on scaling up heat pump installation can be a source of inspiration. Cataloguing and standardisation of solutions, including the necessary quality assurance, should form an important part of these agreements. We advocate housing associations also being party to the agreements, given that they have options for tackling foundation repair on a large scale.

Innovation is also vital so as to make possible the necessary scaling-up of foundation work. Innovation can promote feasibility by making new, smarter methods and ways of working applicable, as well as helping to reduce costs. We therefore advocate devoting 3% of the estimated budget for implementing the national approach to innovative pilots and experiments.¹⁶

¹⁶ With this, we refer to the target – set out in the Memorandum to Parliament accompanying the Innovation and Valorisation Action Plan (EZK, 2022) – of devoting 3% of GDP to Research & Development.





6 FINANCING AND PHASED TIMETABLE

In Section 5, we outlined the national approach to the foundations problem that we wish to recommend to the Dutch government. In this section, we work out in greater detail an estimate of the annual cost for each component of the approach and we outline the phasing of implementation. Such specificity as regards our recommendations means that the advice we offer is more detailed than usual for the Council. By providing such more specific advice, we are responding to the request we received from the Ministers of the Interior and Kingdom Relations (BZK), Infrastructure and Water Management (IenW), and Agriculture, Nature and Food Quality (LNV) for a detailed approach to the foundations problem. Besides, we believe that the urgent nature of the problem does indeed call for a fleshed-out approach that can be launched quickly.

6.1 Finances

We have drawn up an indicative estimate of the costs involved in our recommendations to central government. In doing so, we worked with KPMG to develop a calculation model based on our assumptions and basic principles (see Section 9 of Part 2). As we envisage it, the national approach to the foundations problem will require a total budget of more than €12

billion over the period from 2024 to 2035. We wish to emphasise that that amount is an indicative estimate.

The table below gives an indication of the distribution of costs per year (in millions of euros). Substantiation for this is worked out in greater detail in Section 9 of Part 2.

Table 1: Indicative estimate of annual cost per recommendation, 2024-2035 (in millions of euros)

Recommendation	Cost in mln €	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1.1 Public foundations database	56	6	6	6	6	4	4	4	4	4	4	4	4
1.2 Area-based foundations surveys	24	0	6	6	6	6	0	0	0	0	0	0	0
1.3 Grants for foundations surveys	1,379	0	207	207	207	207	79	79	79	79	79	79	79
1.4a Obligation to disclose foundation damage	3	1	1	1	0	0	0	0	0	0	0	0	0
1.4b Information campaign	3	0	0	1	1	1	0	0	0	0	0	0	0
2.1 Drawing up prevention plans	16	3	3	3	3	3	0	0	0	0	0	0	0
2.2 Preventing damage in new buildings	6	2	2	2	0	0	0	0	0	0	0	0	0
3.1 Foundations helpdesk	23	2	2	2	2	2	2	2	2	2	2	2	2
3.2a Area-based approach to damage repair	76	0	19	19	19	19	0	0	0	0	0	0	0
3.2b Model regulations for power to issue a notice	2	0	1	1	0	0	0	0	0	0	0	0	0
4.1 Grants for remedial plans	885	0	44	44	89	101	101	101	101	101	101	101	0
4.2 Grants for damage and foundation repair	9,559	0	0	478	478	956	1,092	1,092	1,092	1,092	1,092	1,092	1,092
4.3 Optimal relief from burden by FDF	0	0	0	0	0	0	0	0	0	0	0	0	0
5.1 Coordinating minister	0	0	0	0	0	0	0	0	0	0	0	0	0
5.2 National Foundations Problem Coordinator	46	4	4	4	4	4	4	4	4	4	4	4	4
5.3 Introduction of certification	20	5	5	5	5	0	0	0	0	0	0	0	0
5.4 Promoting scaling-up and innovation	360	0	36	36	36	36	36	36	36	36	36	36	0
Total	12,457	23	336	815	855	1,339	1,318	1,318	1,318	1,318	1,318	1,318	1,181

As mentioned above, we propose that central government bear the cost of the proposed grant schemes and not local and regional authorities. For many of these, an increase in workload will lead to a budget deficit, which will need to be made up via central government. Direct funding from the national budget will then be more effective. Moreover, involvement of local and regional authorities is already ensured through the inter-authority programme.



Distribution effects

For the approach to be effective, we advocate a simple set of regulations that (a) mitigates the consequences of transparency for building owners, (b) encourages owners to get started on the necessary restoration work, and (c) avoids further juridification as much as possible. This also means that we consider financial solidarity with affected homeowners to be necessary. That will have what are technically referred to as “distribution effects”. Some people will consider it unfair that the entire Dutch population will need to help pay for repairing homeowners’ foundations, especially because those owners are in some cases well-to-do, although certainly not all of them. Each decision made to provide financial support for certain groups and not for others has its own effects and groups that are impacted financially.

In the past, attempts were often made to overcome distribution effects within the policy approach. Practice shows that this results in complex arrangements, high implementation costs, and also decreased effectiveness. Because the problem is then not solved, or not solved quickly enough, the social costs incurred and dissatisfaction with the approach not infrequently boomerang back on government.

We therefore advocate that the distribution effects of our proposed measures be properly identified, but then weighed up within the entire taxation package. Any corrections to redistribution effects should be made in the annual tax plan and not within the national approach to the foundations problem itself.

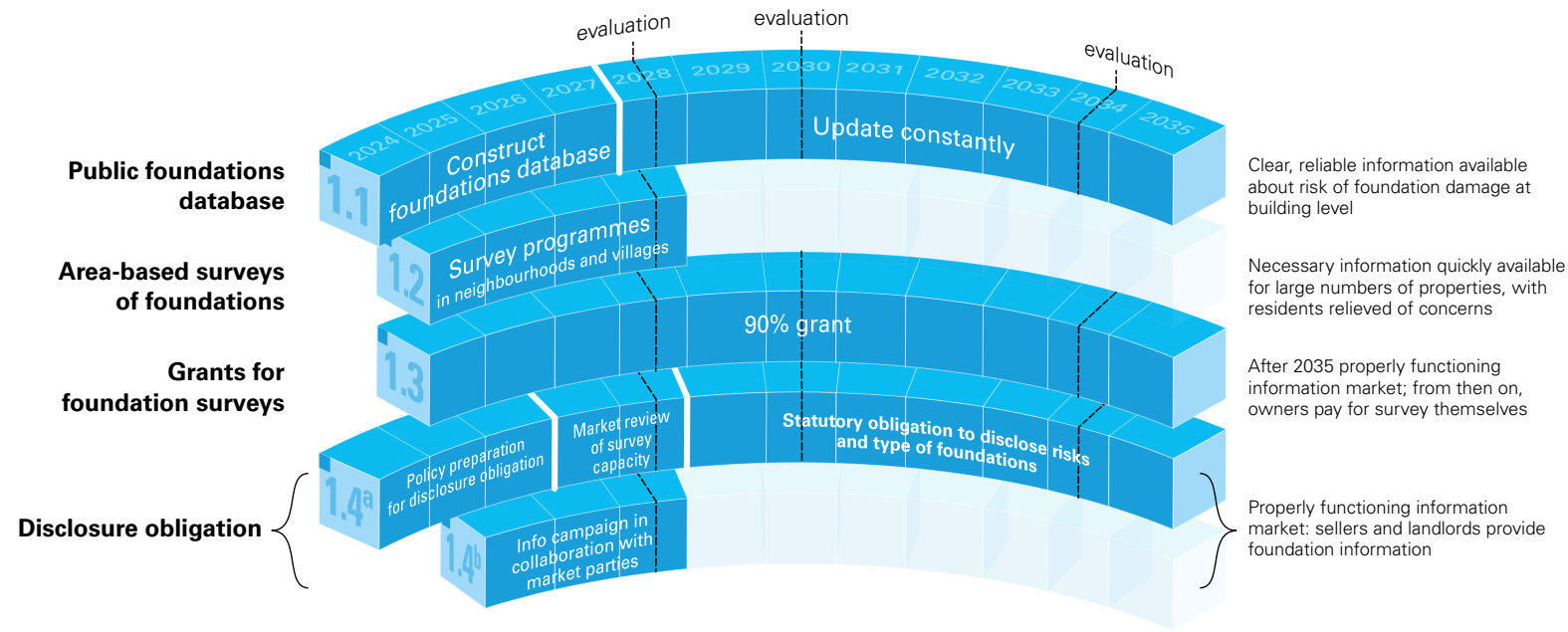
6.2 Phased timetable

We considered what phasing is needed in order to address the foundations problem effectively. For building owners, it is important to clarify in the short term whether the government will indeed decide on a national approach working towards (a) nation-wide transparency regarding the condition of the foundations of buildings for sale, (b) serious prevention of foundation damage, and (c) relieving those affected of their concerns and providing (temporary) financial support. The current process of forming a new government presents an appropriate time to agree on this. In drawing up the sequence of phases below, we have therefore assumed that when the new government is formed there will be clarity regarding implementation of the approach outlined in this report.

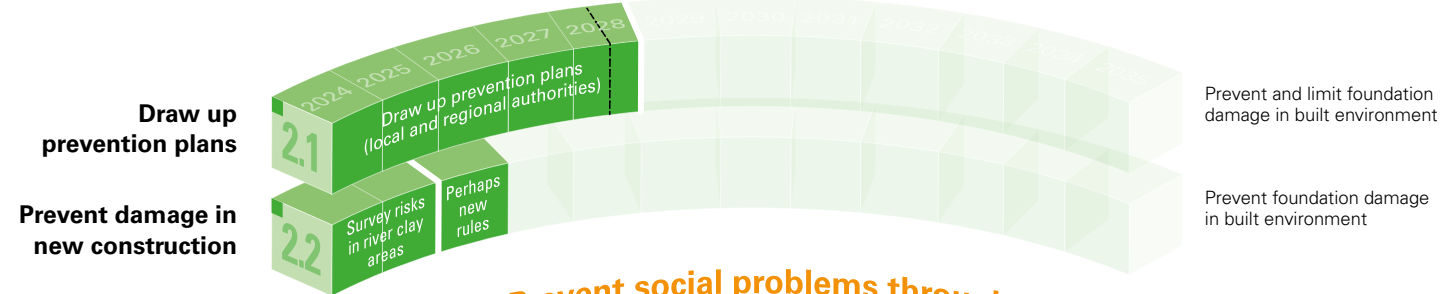


Infographic setting out recommendations over time

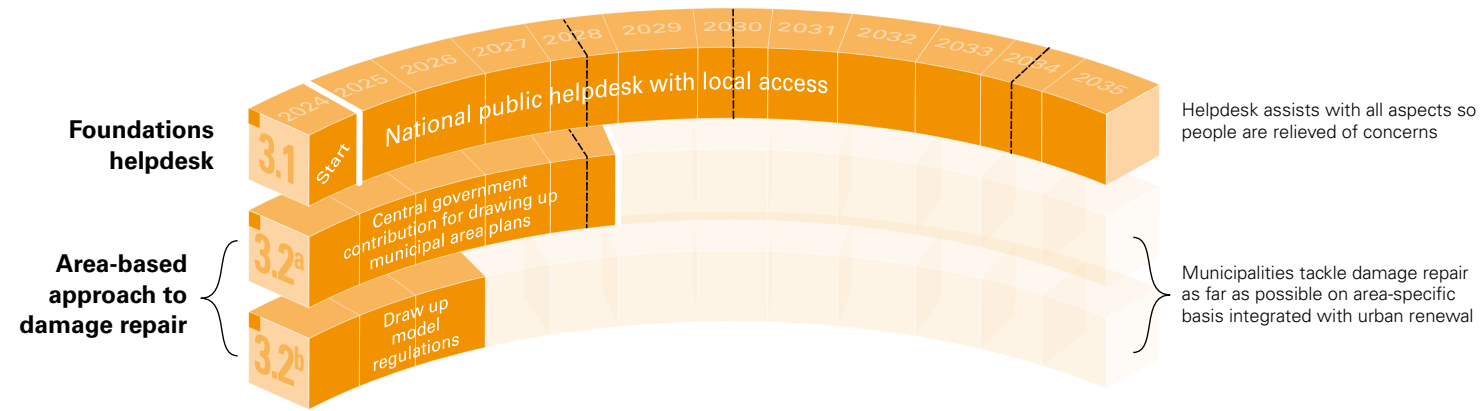
Improve availability of risk information about foundation damage



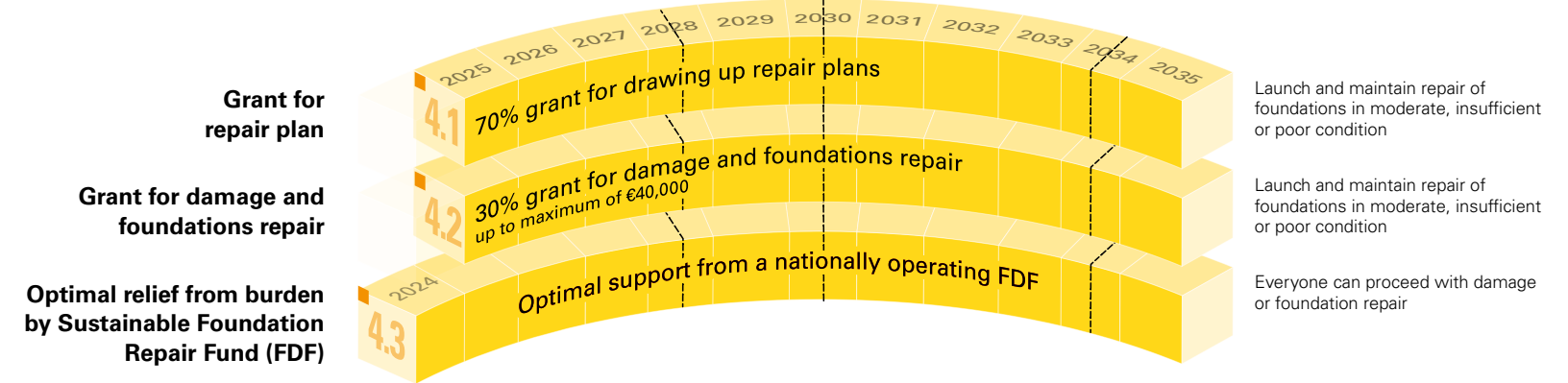
Prevent foundation damage



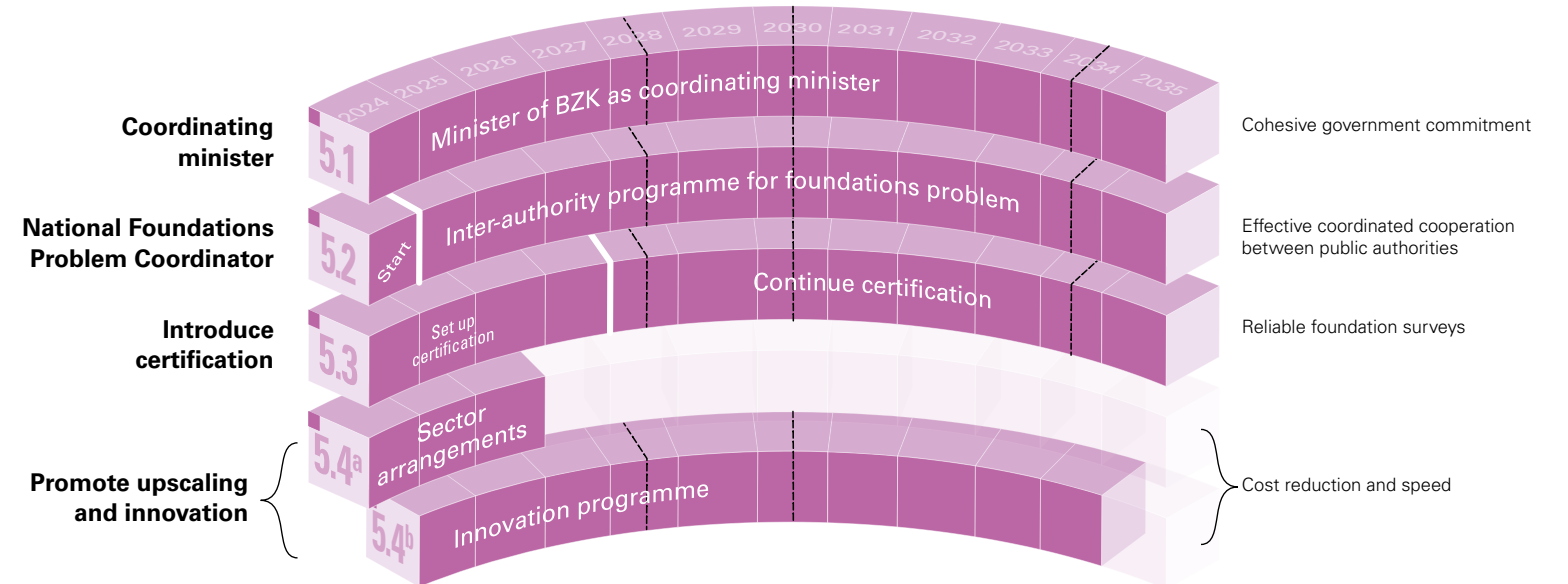
Prevent social problems through support and relieving concerns



Create grant and loan options for damage and foundations repair



Ensure robust joint implementation



Key dates in the approach we propose are introduction of the disclosure obligation on 1 January 2029 and termination of the grants schemes on 31 December 2035. It is important to evaluate the progress of the national approach prior to those dates, and to determine whether additional measures are needed. This may be relevant, for example, if there is insufficient capacity at certified firms for conducting foundation surveys or at approved repair contractors for carrying out repairs. In addition, we propose that there be an evaluatory review in 2030. We propose that at that point it should be determined to what extent the foundations problem has already been factored into property market prices, rooted in the awareness of buyers and sellers, and converted into scaled-up implementation capacity. If all three of these are in fact the case, then we can envision phasing out of the aforementioned subsidy percentages (for example, by 5% a year).

The inter-authority programme should commence in 2025. Prior to that point, the feasibility and legal soundness of our proposed approach will need to be assessed more thoroughly than we were able to do within the time available for drawing up this report.

Assessing feasibility and viability is necessary because numerous impeding factors may emerge that complicate and delay implementation of the national approach. In our recent advisory report *Bridging the Implementation Gap* (Rli, 2023), we described five such potential “spanners in the works”: (1) accumulation of policy; (2) hesitancy on the part of administrators to take the necessary steps; (3) inadequate organisation

of implementation; (4) unequal distribution of costs and benefits; and (5) structural scarcity of human resources.



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Original title

Goed gefundeerd: Advies om te komen tot een nationale aanpak van funderingsproblematiek

Copy editing (dutch version)

Saskia van As, Tekstkantoor Van As, Amsterdam

Infographics

Frédéric Ruys, Vizualism, Utrecht, The Netherlands (pages 12, 15, 58)

Photo credits

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Graphic design

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Publication Rli 2024/01

February 2024

Translation

Acolad, Maastricht

Preferred citation

Council for the Environment and Infrastructure (2023). Firm Foundations: Recommendations for a National Approach to the Problem of Unsound Foundations. The Hague.

ISBN 978-90-8513-062-8

NUR740

