



DUTCH  
SAFETY BOARD

# Summary

## Hoisting in the heart of the city:

Accident at Rijnstraat building site



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Accident at Rijnstraat building site

*The Hague, April 2017*

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*Photo cover: Police / national unit*

## **Dutch Safety Board**

When accidents or disasters happen, the Dutch Safety Board investigates how it was possible for them to occur, with the aim of learning lessons for the future and, ultimately, improving safety in the Netherlands. The Safety Board is independent and is free to decide which incidents to investigate. In particular, it focuses on situations in which people's personal safety is dependent on third parties, such as the government or companies. In certain cases the Board is under an obligation to carry out an investigation. Its investigations do not address issues of blame or liability.

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|---------------------|--|-----------------|--|
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NB: This report is published in the Dutch and English languages. If there is a difference in interpretation between the Dutch and English versions, the Dutch text will prevail.

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# CONSIDERATION AND RECOMMENDATIONS

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## **The accident**

During morning rush hour on 26 May 2016, an accident occurred during the renovation of the former building of the Ministry of Housing, Spatial Planning and the Environment (VROM) at Rijnstraat 8, opposite The Hague Central Station. While hoisting scaffold parts, 20 lattice girders came loose. They fell down from a height of more than 60 metres and partly ended up outside the building site. A woman who was passing by was hit and died.

## **Building site safety in an urban environment is a difficult puzzle**

In the Netherlands, a lot of building work is performed in city centres. These are large and extensive projects, such as the building of Zalmhaventoren in Rotterdam, the renovation of the station area in Utrecht and the renovation of the former VROM building in The Hague. City centres are busy and space is scarce. Major building projects may therefore be subject to increased safety risks. At small building sites enclosed by a busy urban area, the risks are higher that an accident will also have consequences outside the site fence. Guaranteeing environmental safety in these projects is therefore crucial. It may be a difficult puzzle, as safety measures may affect other interests, such as accessibility and habitability.

## **Rijnstraat accident reveals hidden field of tension and insufficient buffer**

When the building work at Rijnstraat 8 commenced, the builder and the Municipality of The Hague thought they had solved this puzzle. However, the accident on 26 May 2016 reveals a hidden field of tension between the accessibility of the station area and the safety around the building site. Every day thousands of people passed the building site. Some of the scaffold parts that fell from the crane ended up outside the building site, right among the pedestrian and cycling traffic of the morning rush hour. The Board recognises that the Municipality of The Hague leads the way when it comes to matters such as specifying minimum distances between an active crane and the site fence, but also concludes that these rules provided an insufficient buffer to protect the surrounding area against the scaffold parts that fell from the crane. They fell up to twice as far away as taken into account by the rules.

## **Prior analysis of surrounding area by commissioning authority helps to prevent issues**

The assumption made by the parties involved in coordinating matters regarding the building site was that it was safe outside the site fence, as the contours of the building site had been determined based on the municipality's safety rules. However, environmental safety is not a static and absolute fact (safe or unsafe). Fitting a building site into the surroundings is precisely about the interaction and possible tension between the intended safety of the surroundings and other environmental factors and interests. The sooner they are revealed, the more they can be taken into account. The Board therefore sees an important role for commissioning authorities of building projects in the

preparation of a building project. Before issuing a call for tenders, the commissioning authority could carry out an analysis of the surrounding area in close consultation with the municipality. During this process, all relevant environmental factors, such as the location of the building site, the intensity of various traffic streams and the arrangements made with the parties involved, would be mapped out. This kind of prior environmental analysis helps the commissioning authority to prepare a realistic and sound building assignment, giving a builder enough time, money and space to work safely. Afterwards, the builder should consider what is required and possible to guarantee safety of the surrounding area and which building method suits this.

### **Mapping out risks and preventing them through policy**

The municipality approves a building project, setting requirements for the level of safety. This requires a clear picture of the hazards that may occur at the building site, the chances of them occurring, the possible effects and the factors that may affect this. One example of such a risk is objects falling from a crane. It is important here to know how far objects may fall and how this is affected, for example, by the mass and shape of the hoisting load, the hoisting height, crane movement, wind and objects in the fall path (such as scaffolds). The Board believes that the Minister of Housing and the Central Government Sector should be mapping out risks in this manner, in collaboration with the building industry.

Once the manifestation and effects of building risks have been investigated, municipalities can draw up or amend policy rules to prevent these risks. Prior to this process, the Minister of Housing and the Central Government Sector should determine the intended level of environmental safety. The implementation of the municipal policy should then ensure that this intended safety level is actually achieved.

### **During all building process phases, keep checking closely whether safety levels are sufficient**

To prevent accidents, (environmental) safety must be made explicit and handled in an integrated manner during all phases of the building process. The builder, commissioning authority, local stakeholders and municipality will have to collaborate here and should check time and time again whether (environmental) safety is sufficiently guaranteed. The safety level to be set by the Minister must be a point of reference in each phase of a project when making decisions and weighing interests. The leading question should always be: what effect does this have on (environmental) safety? And then: if (environmental) safety is being compromised, is that acceptable and are measures possible? If the safety level is about to drop below the limit set, could that, for example, lead to the schedule being adjusted, accepting more nuisance or reduced accessibility, or even (temporarily) stopping a project?

The Board expects a leading role from the municipality in coordinating matters regarding the building site and the surrounding area. The municipality protects the interests of the city and approves building projects. In case of conflicting environmental interests, its role is to weigh them carefully, but also efficiently, and then to make a clear and sound decision. The Board believes that the Municipality of The Hague can take steps to accelerate this process. For Rijnstraat 8 the municipality required six months to arrive at an approval decision, which delayed the build and caused the builder to face financial losses.

## **Safety margin reduces effect of accident, working more safely reduces risk of accident**

The ultimate result of all the safety considerations and efforts should be that environmental safety is not fully on the shoulders of the team performing the work at the building site. If an error is made, there must be enough of a margin to ensure that this error does not immediately lead to a serious accident. At the same time, the Board concludes that safety can still be significantly improved at the building site. The building industry has the highest number of accidents of all sectors of industry, both in an absolute and relative sense.<sup>1</sup> If work is performed more safely, fewer accidents will happen. Builders are and remain primarily responsible for a safe build.

## **Recommendations**

*To the Central Government Real Estate Agency and the members of the Commissioning Authorities Forum for the Building Industry*

1. Before starting the tendering process for building projects, map out the relevant environmental factors and use them to formulate a building assignment that is realistic and can be developed safely.

*To the Minister of Housing and the Central Government Sector*

2. In collaboration with the building industry, improve the knowledge of the scale and nature of building risks to the area surrounding a building site:
  - a. To this end, keep track of features, causes, consequences and the frequency of incidents in a structured manner and publish these details as open data.
  - b. In addition, investigate the falling behaviour of objects that fall from cranes and publish the results.
3. Use the results of recommendation 2 to set a safety level for the area surrounding building sites.

*To the Housing and Building Control Association*

4. Incorporate the data, the results of the investigation and the safety level set stated in recommendation 2 and 3 in the National Building and Demolition Safety Guideline.<sup>2</sup>

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<sup>1</sup> In 2013 there were almost 9,000 accidents with an injury that required emergency care in the building industry; that is about 2,200 per 100,000 workers. The average number of accidents across all sectors was about 3,500 and 750 per 100,000 workers. The accidents not attributed to a sector were not taken into account here (source: Stichting VeiligheidNL, 2016).

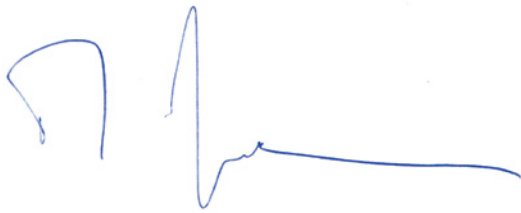
<sup>2</sup> This national guideline is currently in development on the initiative of a number of larger municipalities under the banner of the Housing and Building Control Association.

*To the Municipality of The Hague*

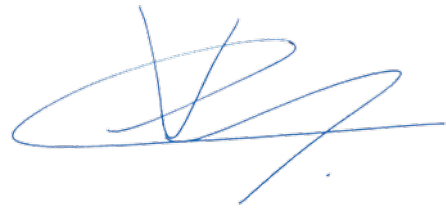
5. While preparing a building project, check whether the safety level is being attained and continue to keep an eye on this. Use the results from recommendation 2 for this. Focus on the features of the area surrounding the building site and the possibility that other environmental interests conflict with the intended safety levels.
6. Improve the efficiency of the coordination with local stakeholders involved before the approval decision. Appoint a project leader who can make a clear and sound assessment in case of conflicting interests to reach a decision more quickly.

*To Royal BAM Group N.V.*

7. Make concrete arrangements about working safely and check that these arrangements are understood and observed at the building site.

A handwritten signature in blue ink, consisting of a large, stylized 'J' followed by a series of connected loops and a long horizontal stroke.

T.H.J. Joustra  
Chairman, Dutch Safety Board

A handwritten signature in blue ink, featuring a large, circular loop at the top, followed by several sharp, intersecting strokes and a long horizontal tail.

C.A.J.F. Verheij  
Secretary Director



## **1. Rijnstraat accident underlines importance of working safely in the building industry**

During morning rush hour on 26 May 2016, an accident occurred during the renovation of the former building of the Ministry of Housing, Spatial Planning and the Environment (VROM) at Rijnstraat 8, opposite The Hague Central Station.

While hoisting scaffold parts, 20 lattice girders came loose. They fell down from a height of more than 60 metres and partly ended up outside the building site. A woman who was passing by was hit and died.

As the load was not correctly fastened, a collision with a protruding mast caused it to slide out of the slings and drop down. When the hoisting load was fastened, the builder's internal arrangements were not followed: hooking-up was delegated to someone who had not been appointed for this and an unsafe loop was used to fasten the load. These decisions were the direct cause of the accident and underline the importance of working safely at a small building site.

The Board did not investigate whether the errors made when fastening the hoisting load are part of a wider safety issue at the building site. In previous investigations the Board concluded that increased safety awareness and a greater sense of responsibility are required in the building industry.

## **2. The Hague at cutting edge regarding hoisting rules, but level of protection is inadequate**

The hoisting rules of the Municipality of The Hague should protect passers-by in the public space against the risks of falling objects. The rules therefore specify a minimum distance between a predefined hoisting zone and the site fence: the building safety zone. The higher the hoisting height, the larger the building safety zone. Setting such a limit makes the municipality a forerunner and an example for other municipalities.

However, the distances in the policy rules appear to have no empirical, statistical or mathematical substantiation. This makes it unclear what level of protection they actually provide. During the accident, the lattice girders fell up to twice as far away from the crane as the policy rules took into account, probably due to colliding with the mast climber located underneath. Almost half of the hoisting load ended up outside the site fence and in the public space. The accident therefore shows the necessity of making explicit and substantiating the level of protection provided by the hoisting rules.

### **3. Lots of focus on traffic, not much on risk of many people passing by small building site**

To find enough space for the building site, part of the Rijnstraat and Oranjevuitensingel would have to be closed and traffic would have to be diverted. The builder had to ask permission for this from the municipality and had to coordinate its plans with the urban transport authority, the road manager for The Hague city centre and officials of the City Management Department. These parties extensively discussed how trams, cars, cyclists and pedestrians could be led past the building as safely as possible and with a minimum level of nuisance. It took six months for them to agree on how the traffic situation around the building site would have to be set up.

During the coordination they no longer considered the risks of materials falling down at the building site. The assumption was that these risks had been covered by the environmental permit and the underlying building safety plan. As a result, the risk of an object falling down and ending up outside the building site was not taken into account. The parties also did not take into account that the results of their coordination affected safety around the building site: maintaining a temporary tram stop next to the building site created a large flow of passers-by (2000 per hour during rush hour, apart from regular cycling and pedestrian traffic). The municipality and urban transport authority did not recognise the risk-increasing effect of the limited size of the building site combined with the large number of tram passengers boarding and alighting at that side of the building.

### **4. Pressure on environmental safety and building process**

Environmental safety was not part of the award criteria and the builder was not allowed to discuss this with the municipality and the other local stakeholders involved until the contract had been awarded.

Based on the contract, the builder was fully responsible for finding enough building space and guaranteeing safety around the building site. However, it depended on the municipality's approval for this, with the municipality being consulted by the local stakeholders involved. Each of these parties had a different perspective on the traffic situation around the building, so it took a long time for them to agree.

The builder got stuck between the firm deadlines of the contracts with the commissioning authority and financiers, plus the delays due to the prolonged coordination process.

This eventually resulted in a financial disadvantage for the builder and additional time pressure on a schedule that was already tight, which reduced the safety margin. Due to a lack of focus on safety during the tendering process, the commissioning authority contributed to the pressure on the builder's budget and schedule. Furthermore, this did not reflect the complexity of the consideration that had to be made to fit the building site into the environment and guarantee the environmental safety levels.

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