

# Temporary protection of animal burrows with road plates

## A low-cost and seemingly effective solution

### What was the challenge in which context:

When high water is expected, levee managers need to make sure that there are no weak spots on the levee that can compromise its structural integrity. Animal burrows on a section can constitute weak spots that have to be urgently repaired in anticipation of high water. Within the context of overflow experiments, a temporary protection with road plates was installed on a section where mole burrows had been previously detected, and where the presence of an extensive subsurface system of mole tunnels had been verified. The set-up was subsequently tested against overflow.

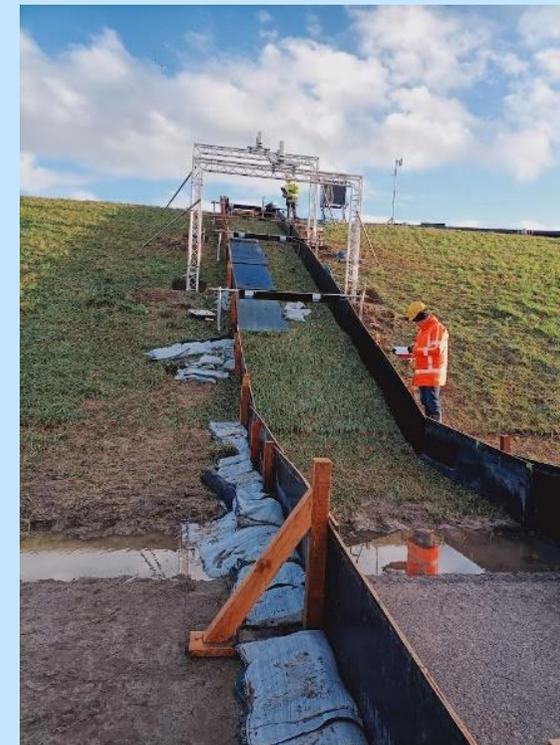
### Configuration of the solution

- Road plates (figure 1) combined with metal pins (figure 2) and bicycle inner tubes were used to build the solution.
- Three road plates of (3x1) m were placed in the flume in a linear set-up adjacent to the flume wall.
- The plates were installed in such a way that most detected burrows within the flume were covered by them.
- In order to minimize the passage of water under the plates, t-peg herings were used at their periphery to attach them to the ground.
- The plates were placed so that they overlapped with each other by about 50 cm, with the lowest plate being fully attached to the ground, the second overlapping with the first, and the third overlapping with the second.
- At the overlapping areas, the elastic tubes were placed on the top and pinned on the ground to provide additional resistance to the uplifting forces of the water.
- At the edges of the overlapping areas and at the upper edge of the assembly, synthetic sandbags with handles were placed and pinned on the ground to provide extra protection against water passage under the plates.

### Preparation

Materials needed

- 3 HMPE roadplates, sized (300x100x1) cm.
- 30 cm-long t-peg herings to secure the periphery of the road plates.
- 30 cm long steel ground pins (zigzag and straight) to secure the elastic tubes on the ground.
- 4 20-inch bike tubes, to further secure the connections between road plates.
- 5 synthetic sandbags with handle.



## Characteristics of event

### Theme lesson learned

Emergency interventions on levee sections

### Contact

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## Installation and testing

- The installation was completed in 15 min by a team of 3 people.
- The installation was tested against overflow for 10 hours and 18 minutes.
- Different discharges were applied, ranging from 39 l/s.m to 500 L./s.m (1000 l/sec).

## Evaluation

- The installation of the solution was quick and easy and all materials were of low-cost. This makes the solution deployable in various settings.
- The configuration of the solution is case-specific though. This means that a different configuration may be needed depending on the size and spatial distribution of burrows on the section. This requires that the team has good insight on the shape and size of the weak area on the levee.
- The installation appears to have worked well, as no erosion was detected after completion of the experiment on the covered area
- The sandbags did not provide any essential protection as they were washed away by the water flow very early in the experiment.
- The road plates, herings, pins and bicycle tubes remained intact.
- The road plates and herings were also used in many other overflow experiments to protect scour holes at the transition between grass and asphalt at the toe, and their performance there was always satisfactory. This provides confidence about the suitability of this method to protect larger burrows and other discontinuities too.
- Further testing of this solution at locations with larger burrows and other discontinuities but also under different loads (e.g. overtopping) is necessary for its final benchmarking.

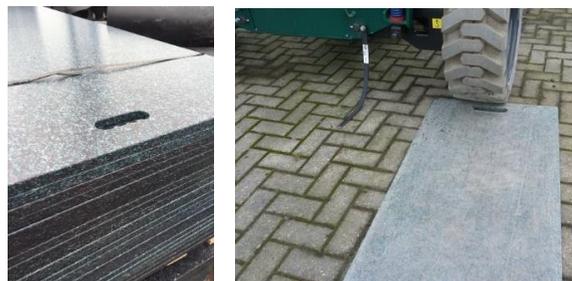


Figure 1: HMPE road plates.



Figure 2: T-peg hering (left) and pins (middle and right) that were used for the installation of the temporary protection.

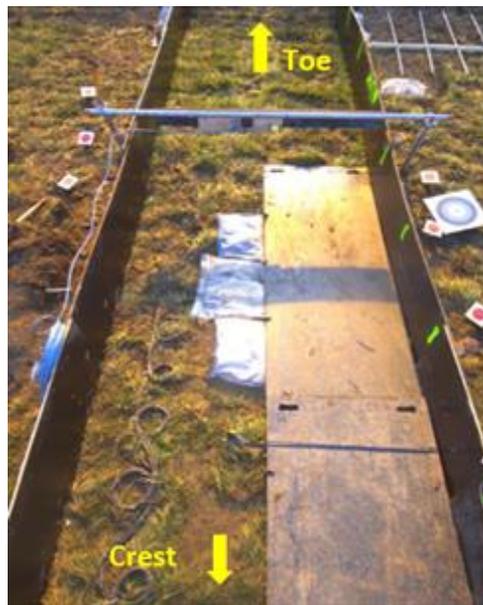


Figure 3: Top view of the solution before commencement of the overflow test.

Mission or  
exercise name

Overflow experiments Nov-Dec  
2021

Relevant  
publication with  
hyperlink

[Management of harmful animal activity on levees: Fact finding fieldwork in the Living Lab Hedwige-Prosperpolder](#)