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A project commissioned by Schiphol and Mainport and Groen.,

In collaboration with Witteveen+Bos, TNO and H+N+S Landschapsarchitecten

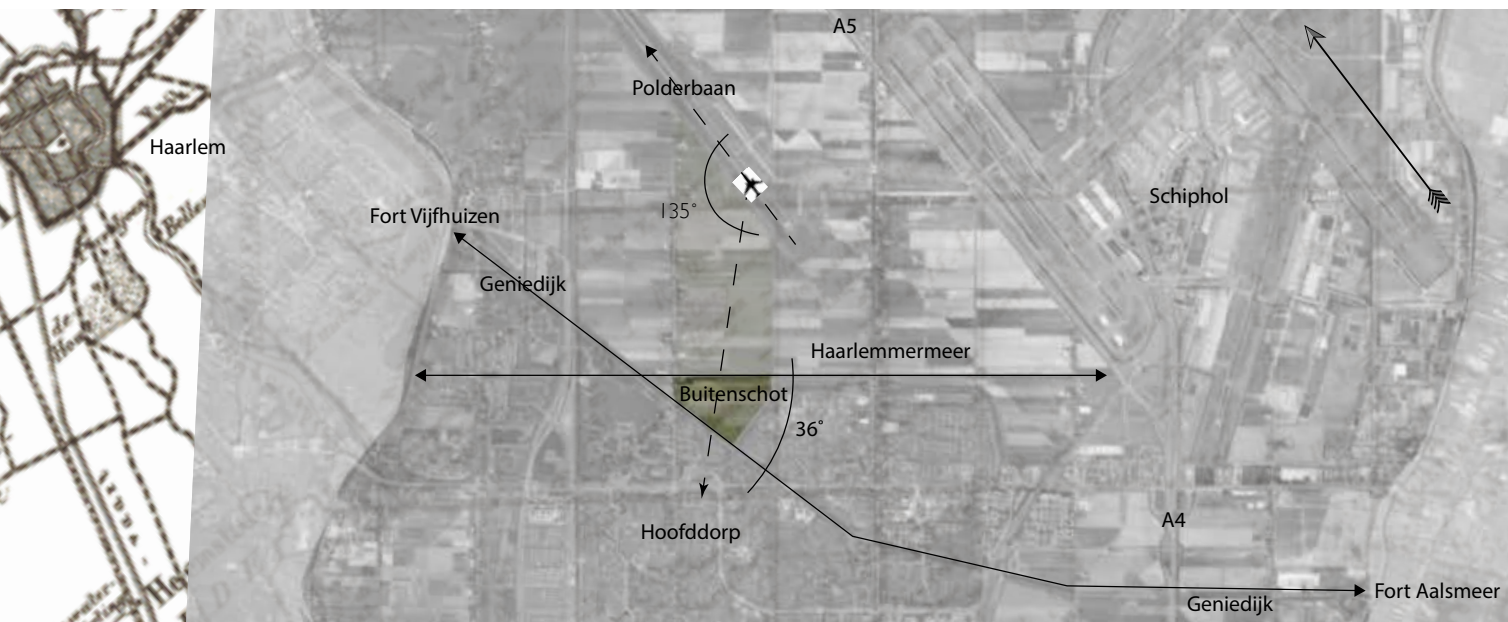


GROUND  SOUND

Paul de Kort

REASON

Low frequency sounds, also known as ground noise (Grond Geluid), are caused by large airplanes making speed at full capacity. Sounds with a high frequency are absorbed by the air and ground. Low frequency sound has a long wave length and is mainly perceived as a low hum. The sound is not absorbed by the ground or stopped by sound walls and carries over great distances. The harder and flatter the surface, the farther the sound carries. The wind rushes the sound, which causes the noise to be even harder a few kilometres along then it is at the source.



When the wind blows from the north, Schiphol uses the Polderbaan as a runway instead of a landing strip. Because ground noise moves in an angle of 135° in regards to the moving source, the sound is aimed at the northern part of Hoofddorp. Measurements and calculations by TNO show that various elongated ground ridges, perpendicular to the direction of the sound, reduce the effect of ground noise significantly. In 2008, H+N+S Landscape architects received the assignment to come up with a design that incorporated these ground ridges in the rural strip between the Polderbaan and Hoofddorp. However, to achieve the wanted sound reduction of 10 dB, the ground ridges had to be installed in the most southern point as well, the area of Buitenschot. Many thought this was in contradiction with the intended function of Buitenschot as a park and recreational area.





'The 18th century physicist Ernst Chladni scattered sand on a surface he afterwards made vibrate with a string bow. As soon as the strummed surface sounded a fundamental, the sand jumped up and organised itself into a geometric pattern. The invisible fundamental became visible in the sand.'

GROUND AND SOUND

Ground and sound are contradicting terms; like mass versus energy, material versus immaterial, static versus dynamic, solid versus thin. It is these kind of contradictions that, when put together, appeal to the imagination.

In 2011, H+N+S Landschapsarchitecten invited me to collaborate and achieve the double goal of sound reduction together with a recreational function into an attractive park landscape.

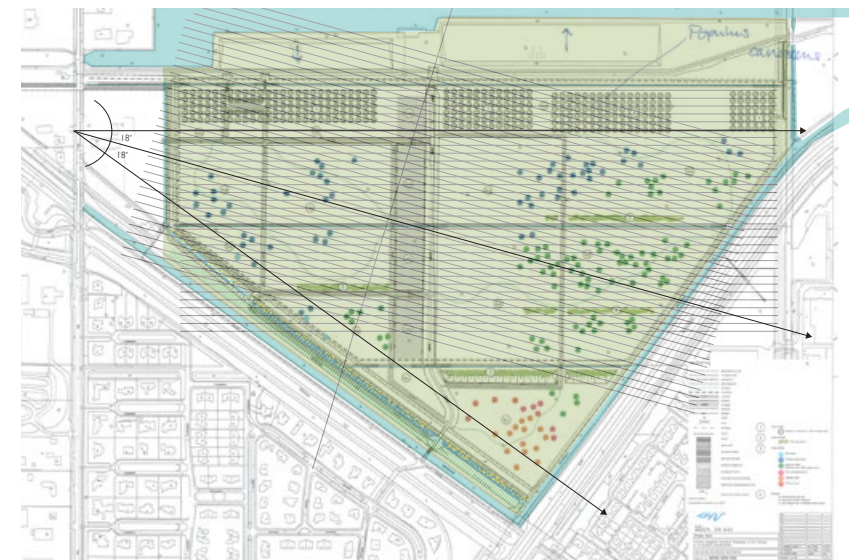
To do so, I weighed the primary requirements, such as the intended sound reduction, as well as practical and financial feasibility, against the more secondary values, such as the cultural-historic layers of the landscape, poetic associations and artistic licence.

The Haarlemmermeer was formerly a big lake directly underneath Amsterdam, where the wind induces waves and lets them fall upon the shores. Ever since this area has been impoldered, this has become a slow and vast landscape of big, rectangular plots in close ranks. The Geniedijk causes a break in this strict grid, being a remainder of a defence line that has become obsolete since the use of airplanes.

ROAMING LANDSCAPE

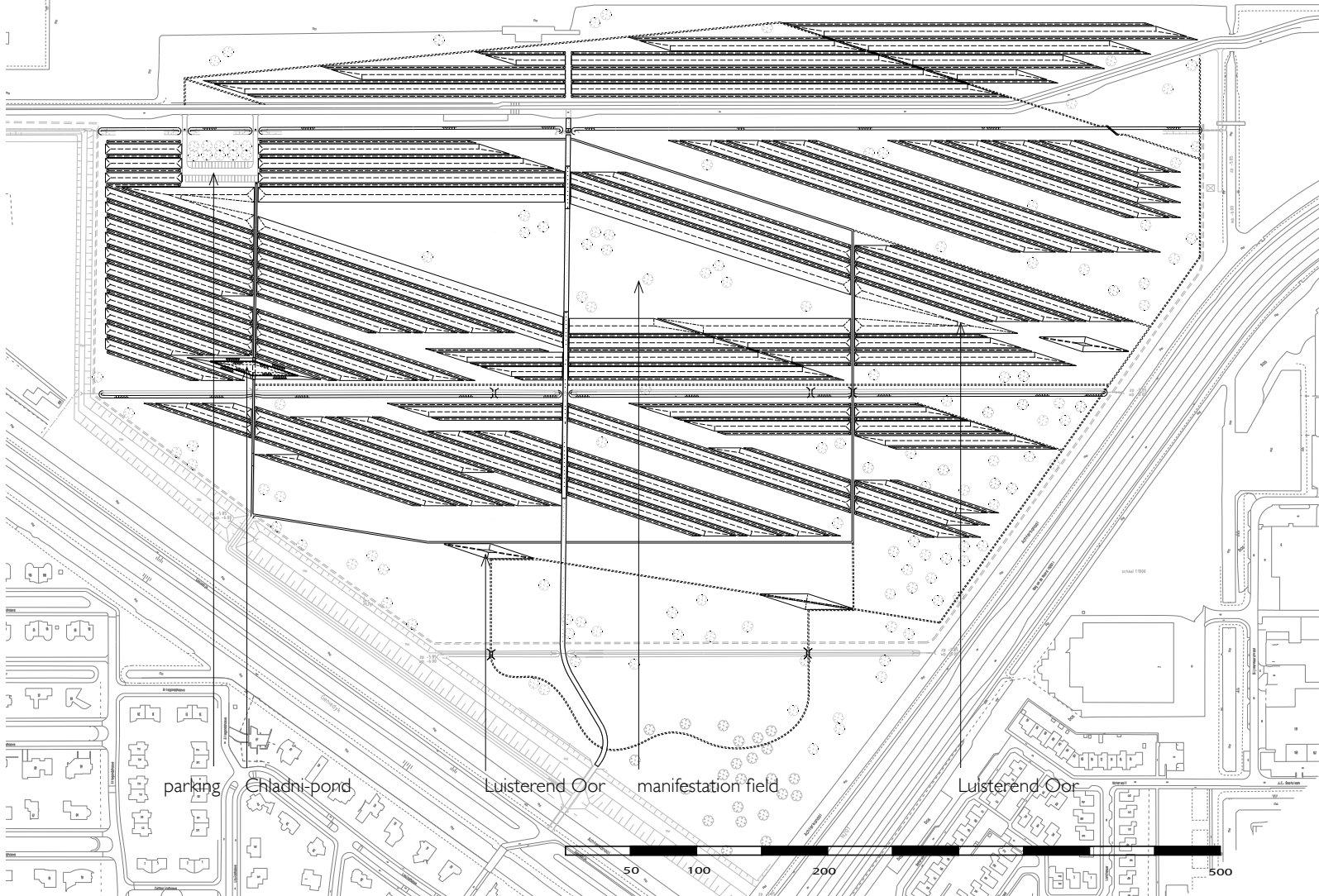
Calculations by TNO show that the distance between the tops of the ideal ridge pattern are similar to the wave length of the low frequency sound. Allowing some artistic licence it could be said that the invisible sound could be made visible through the ground ridges: solidified sound. If we assume that this is true, the dying out of the ground noise can also be made visible by creating a 'dying out' pattern of ground ridges.

The ridge structure, which follows the subdivision of the polder, will be intertwined with a second layer that is turned at an angle of 18° . Just as waves in the surf zones turn to the coastline, the pattern of ridges turn to the Geniedijk, which cuts through the subdivision of the Haarlemmermeer at an angle of 36° . This causes the second layer of ridges to be even more conveniently placed along the direction of the sound. The introduction of the second layer creates a grid that showed me the possibilities of creating a landscape to roam in.



LANDART PARK BUITENSCHOT

Because of the 18° twist most of the ridges end up in a small point, which gives the pattern a sloping and smooth character. Various sheltered and open places, smaller and bigger rooms and halls are created by the grid. These spaces encourage sports, games and recreation. The diamond-shaped heart measuring 400 x 800 meters offers the possibility of hosting big events. From north to south, the grid thins until it dissolves in various elongated pyramids. These are located a bit higher than the ridges, and when standing on top of them, offer a beautiful view over Buitenschot.





Land art park Buitenschot is completed in 2013



Your Captain aerial photography, image edited by Paul de Kort



Near the parking space and alongside the bicycle path are information objects showcasing the pattern of ridges in relief.



Aerial photo Karel Törner

A LISTENING EAR

Special objects are located in two places in the area, inspired by the parabolic 'sound mirrors' alongside the English coast at the beginning of WWII, meant to enable people to hear enemy air traffic from a great distance. A fan of CorTensalen segments forms a parabolic disc. When standing in the object, your head is exactly in the focal point of the parabola. In a Listening Ear, the surrounding sound, and this includes the air traffic, is focused on one point. With your ear in the heart of a Listening Ear sound is perceived in a concentrated and magnified manner.



The Listening Ears seen from the Geniedijk, the control tower of Schiphol in the background

CHLADNI-POND

In one of the most quiet places in the park the Chladni-pond is located. Visitors can work a wave mechanism via a foot pedal on the deck. The mechanism creates linear waves on the surface of the water of the diamond-shaped pond. Creating a game of wave frequencies and reflections against the hard shores causes diamond-shaped interference patterns to form like echoes of the large ridge pattern in the park.



Interference patterns in the Chladni-pond





The manifestation field is enclosed by a ring of ridges slightly higher than the surroundings.



Landartpark Buitenschot as seen from the Weg om de Noord, Hoofddorp



Alongside the Weg om de Noord the ridges end in a sea of flowers (the end of May 2015)