CONSTRUCTING AN ARTIFICIAL TURF PITCH

This guide targets everyone contemplating or already in the process of ordering the installation of an artificial turf pitch, as well as those who already have an artificial turf pitch – and wish to prevent rubber granulate from spreading to pitch surroundings.

ARTIFICIAL TURF PITCHES – FOR THE BENEFIT OF PUBLIC HEALTH AND THE ENVIRONMENT

Fact is that the existence of artificial turf pitches increases the number of hours of activity year-round – for the benefit of a lot of athletes as well as public health. You can play on artificial turf pitches all year round, and they withstand more frequent and intensive use than conventional grass pitches – irrespective of weather conditions.

The use of rubber granulate on artificial turf pitches helps ensure that the playing properties, such as resistance and shock-absorption, resemble those of natural grass as much as possible – and that balls roll and bounce naturally. Lying between the grass blades, rubber granules (infill material) support and protect blades from wear and tear – and at the same time, granules protect players from getting injured.

Climate-wise, artificial turf pitches with rubber granulate also have great positive impact; yet, as is also the case in many other contexts, e.g. in connection with the handling of batteries and household plastics, there may be environmentally negative effects, if rubber granulate is not handled correctly. With artificial turf pitches, it is thus important:

1. to ensure that pitches are constructed to help prevent the spreading of rubber granules,
2. to insist that excessive refill and the spreading of rubber granulate be avoided in connection with pitch maintenance (which is indeed possible with simple measures), and
3. to dictate a code of conduct for users, so they e.g. brush granulate off their clothes and empty their shoes, when they have used the pitch.

Rubber granulate for artificial turf pitches has attracted focus due to instances where granulate has unintentionally spread to nature. At Genan, we are striving for a sustainable future, and our factories have the capacity to spare the environment several hundred thousand tonnes of CO_2 emission annually, when end-of-life tyres are recycled into rubber granulate – e.g. for the application in artificial turf. And if Genan's recommendations for the construction and maintenance of artificial turf pitches are followed, you can ensure that rubber granules remain on the pitch – and are not spread to nature.

GENAN

- is a Danish company, which is world leader in the recycling of end-of-life tyres
- is a high-technology manufacturer, working with sustainability, the recycling of valuable resources as well as the responsible use of rubber granulate
- focuses on high quality and the manufacture of products with a high degree of purity.

Genan has made three guides with recommendations for the construction and maintenance of as well as responsible conduct around artificial turf pitches.

These guides have been prepared on the basis of:

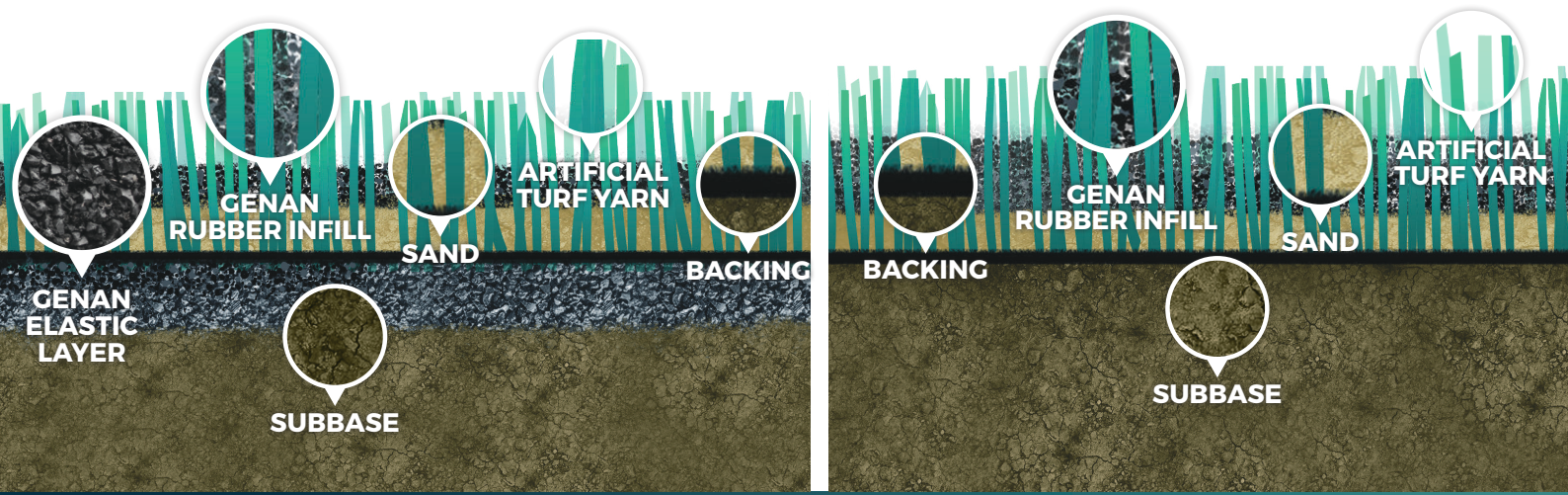
- the results from a newly published, Swedish study
- a new and comprehensive, international literature review on the spreading of rubber granulate from artificial turf pitches, prepared by the Danish Technological Institute (Teknologisk Institut), as well as
- experience from both the Danish and the Norwegian football associations.

Recent research shows that if the right measures are established, and if artificial turf pitches are both used and maintained responsibly, the spreading of different types of microplastics from these pitches to the environment can be reduced to 100 grammes a year. Approx. 10% of these 100 grammes are rubber granules.

GENAN INSIDE – THINK IN IMPORTANT MEASURES FROM THE VERY OUTSET

It is essential that different measures to prevent the spreading of granulate are taken into account as early as in the planning stage of the installation of artificial turf pitches. Genan recommends the following procedure for the installation of artificial turf pitches with rubber granulate:

1. Give serious thought to the physical position of the pitch; – this may e.g. be a decisive parameter for drainage.
2. The local environmental authorities should be involved in the project from the very beginning; – they may also be of assistance when it comes to applying for mandatory permits.
3. Request documentation from suppliers of e.g. rubber granulate, artificial turf, e-layer/schockpad as well as drainage mats to verify compliance with applicable requirements and standards.



4. Consider making a paved / tiled surface all around the pitch, where excess infill material can be swept up and poured back onto the pitch (cf. Figure 1).

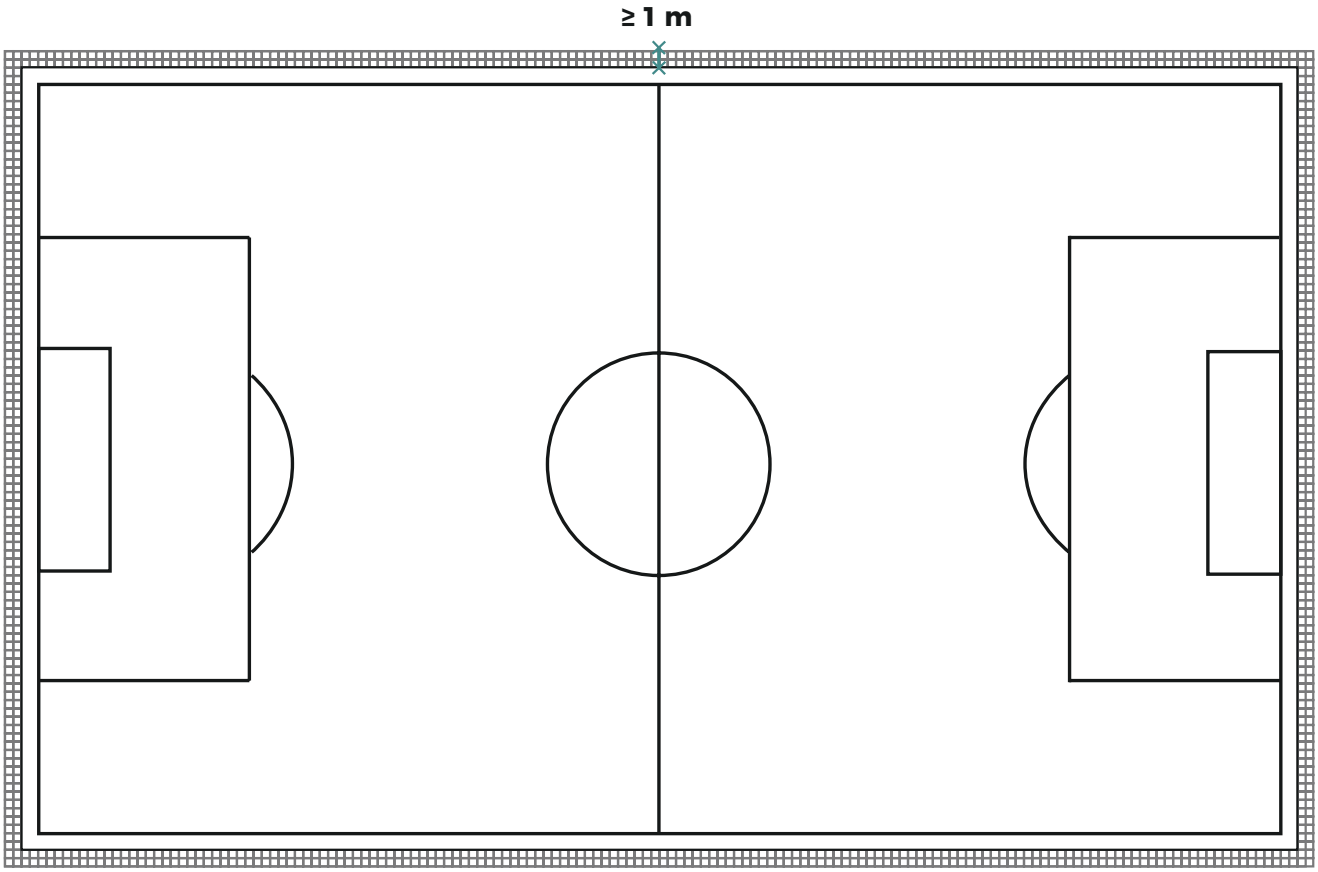


Figure 1 = Bird's eye view of pitch with paving stones all around the pitch perimeter (min. 1 m wide)

5. It is an advantage if a sizeable area is available, where snow can be deposited during winter. This may be an extra artificial turf area, a tiled / paved area (e.g. asphalt) or an area where crop protection fleece is laid out on the ground.
   When the snow melts, the remaining piles of rubber granulate may be reused on the pitch.

   Important is the existence of a solid or close-meshed demarcation fence along the snow deposition area. The height should match the height of the expected snow piles.

6. Make room for a closed container for granulate collected for reuse.
   Provided that granulate swept up from outside the pitch is not mixed with other waste, granules should be poured back onto the pitch, where the need for refill is the most pronounced.

   Granulate mixed with other waste must be disposed of with such waste.

7. To keep granules on the pitch, a solid barrier / infill fencing panel, at least 50 cm in height, should be mounted all along the perimeter of the pitch (cf. Figures 2a + 2b). In many places, advertising boards, the height of which is typically more than 1 m, are used for this purpose.

   If the artificial turf pitch is located in a residential area, using close-meshed canvas instead of solid boards could be an advantage, as the former will result in less noise nuisance for nearby residents. The canvas barrier can be mounted onto the fence typically surrounding the pitch.

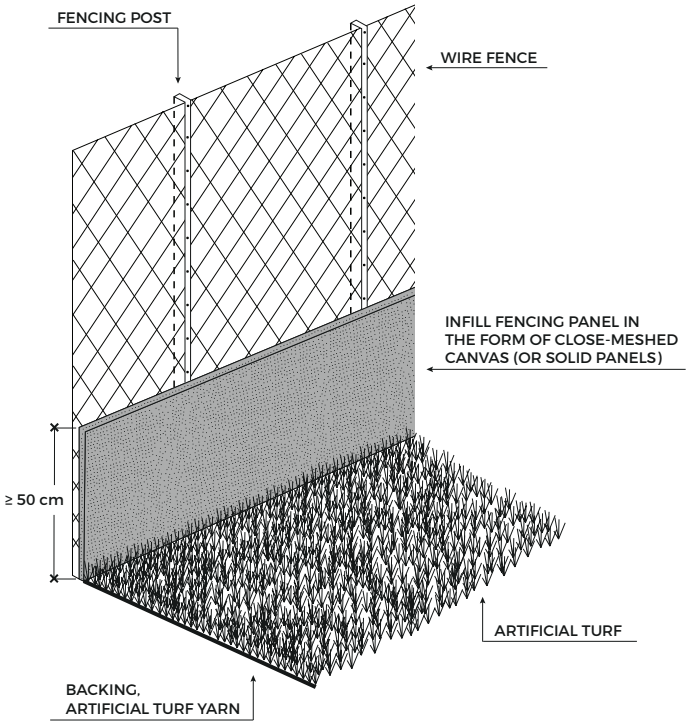


Figure 2a = Fence with infill fencing panel (solution with artificial turf all the way out to the fence)

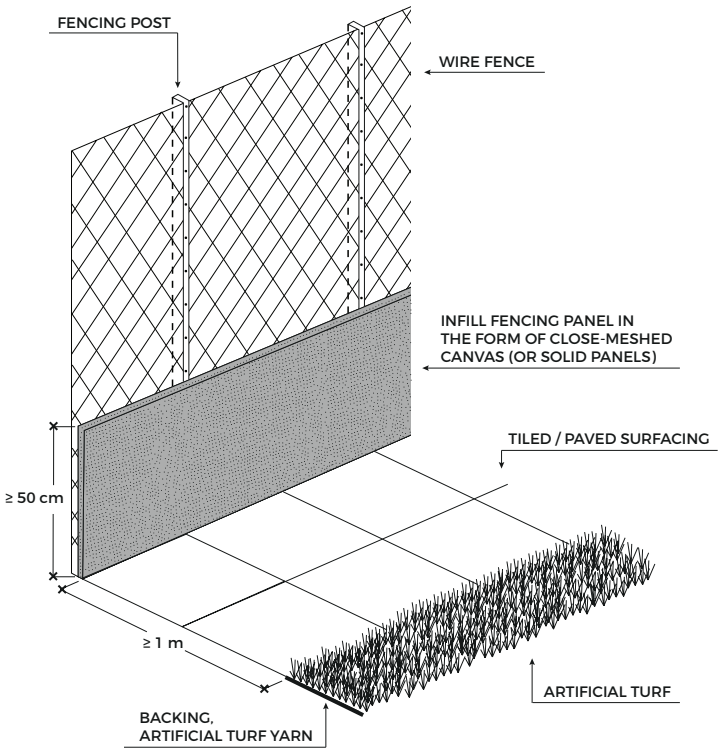


Figure 2b = Fence with infill fencing panel (solution with a tiled area between fence and turf)

8. Place benches on the pitch-side of the fence and/or in a clean-down exit area, where players can sit down, brush granulate off their clothes and socks and empty their shoes – alternatively change their shoes.

   The clean-down exit areas must be equipped with mesh gratings as well as shoe/boot brushes (cf. Figures 3a + 3b).

   In connection with play on natural grass pitches, it is common practice to take off and clean football boots before entering the changing rooms. With the right infrastructure, it should thus be possible to create a similar culture in connection with the use of artificial turf pitches.

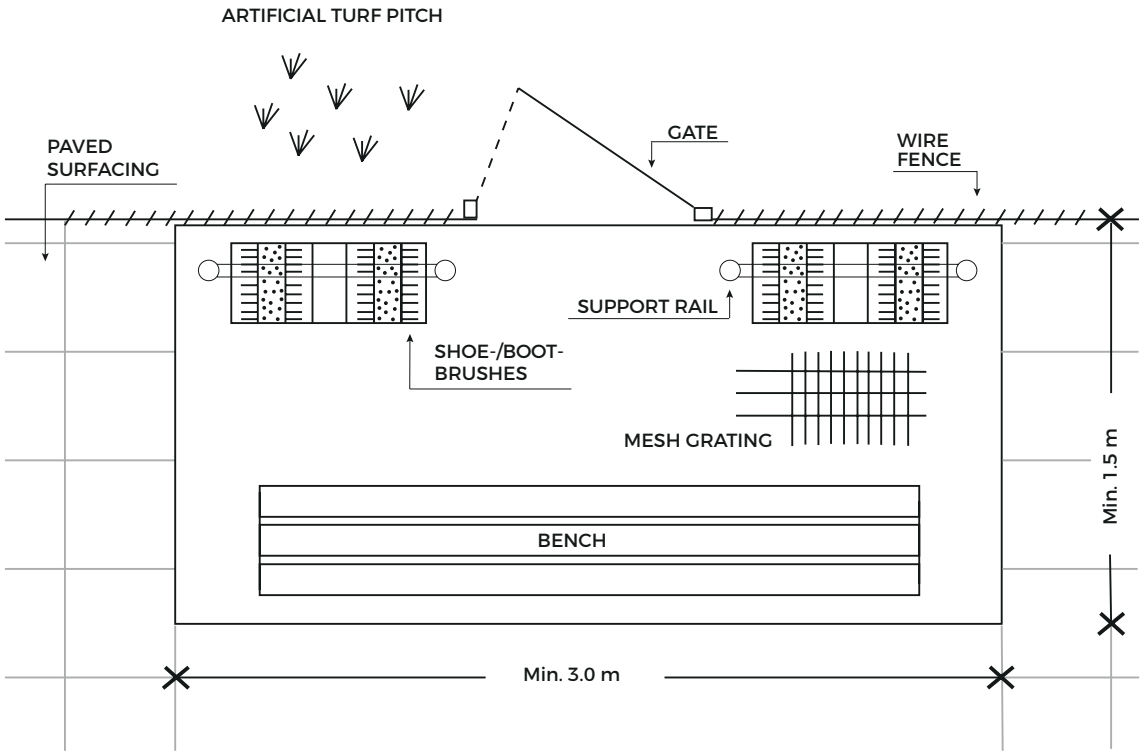


Figure 3a = Design example of a clean-down exit area – bird's eye view

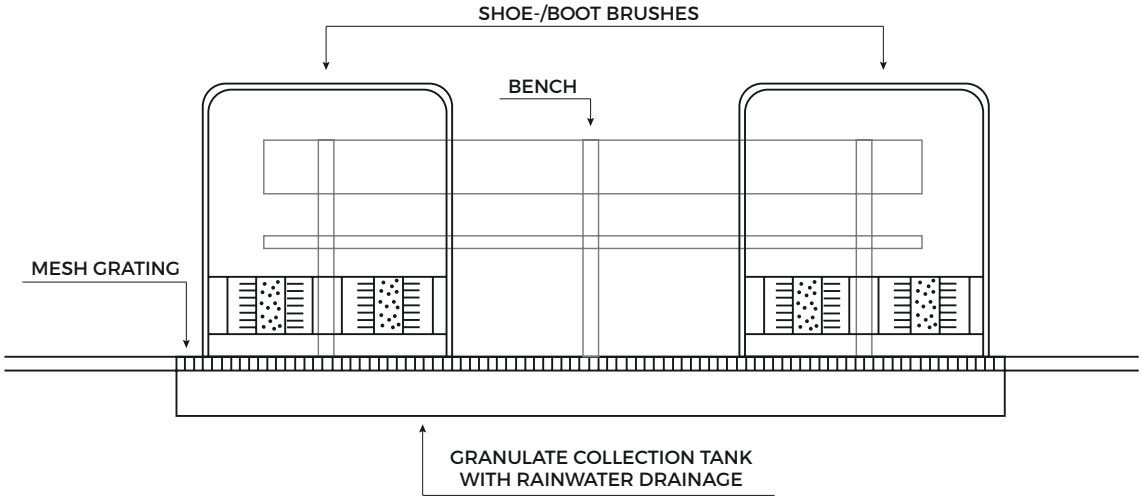


Figure 3b = Design example of a clean-down exit area – normal perspective

9. Mesh gratings at clean-down exit areas must be emptied regularly – and granules reused.
10. In so far as possible, avoid open wells and discharge points to drainage systems close to the pitch. Inspection holes for drainage systems should be placed outside the pitch.
11. Install "granulate traps" in open wells around the pitch, if any – and in changing room drains.
12. In connection with pitch installation, think in a paved / tiled cleaning area (or perhaps an area on the artificial turf), where granulate can be swept off vehicles and other machinery.
13. At pitch access points, clear signage should encourage users to handle rubber granulate responsibly.

FIND OUT MORE

Apart from the fact that artificial turf pitches should be constructed in the right way, pitch maintenance and user conduct on and around the pitch are also important factors to ensure that granules remain on the pitch. Consult the guide "Maintenance of Artificial Turf Pitches with Rubber Infill – Genan Inside", which may be downloaded on www.genan.eu.

If you wish to read more about the knowledge and documentation, on which Genan's recommendations are based, we make reference to the following:

- *"Dispersal of microplastic from a modern artificial turf pitch with preventive measures – Case study Bergaviks IP, Kalmar," by Fredrick Regnell, Ecoloop, October 2019*
- *"Utforming av miljøvennlige kunstgressbaner", Norges Fotballforbund ("Designing environmentally friendly artificial turf pitches", by the Norwegian Football Federation)*
- *"Etablér en miljøvenlig kunstgræsbane", DBU.dk ("How to construct an environmentally friendly artificial turf pitch", by the Danish Football Association)*
- *"Vejledning om kunstgræsbaner", Miljøstyrelsen, 2018 ("Guide on Artificial Turf Pitches", by the Danish Environmental Protection Agency, 2018)*
- *"Mass balances of rubber granulate disappearing from artificial turf pitches with focus on discharge to the water environment", by the Danish Technological Institute, December 2018 / revised May 2019*
- *"Fact sheet – Rubber Granulate for Artificial Turf Pitches in Denmark", by Genan, January 2020*

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