CONSTRUCTING A SYNTHETIC TURF FIELD

This guide is for everyone involved with the process of ordering the installation of a synthetic turf field, as well as those who already have a synthetic turf field – and wish to prevent rubber granulate from spreading to its surroundings.

SYNTHETIC TURF FIELDS – FOR THE BENEFIT OF PUBLIC HEALTH AND THE ENVIRONMENT

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

The use of rubber granulate on synthetic turf fields helps ensure that the playing properties, such as resistance and shock-absorption, resemble those of natural grass as much as possible – and that the ball rolls and bounces 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.

Synthetic turf fields with rubber granulate also have great positive impact on the environment; 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 synthetic turf fields, it is thus important:

1. to ensure that fields 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 field 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 field.

Rubber granulate for synthetic turf fields has drawn attention due to instances where granulate has unintentionally spread to nature. At Genan, we are striving for a sustainable future. Our factories have the capacity to spare the environment several hundred thousand tons of CO_2 emission annually, when end-of-life tires are recycled into rubber granulate e.g. for the application in synthetic turf. If Genan's recommendations for the construction and maintenance of synthetic turf fields are followed, you can make sure granulate stays on the field and doesn't spread to nature.

GENAN

- is a Danish company, which is world leader in the recycling of end-of-life tires
- 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, maintenance, and responsible conduct around synthetic turf fields.

These guides are based on:

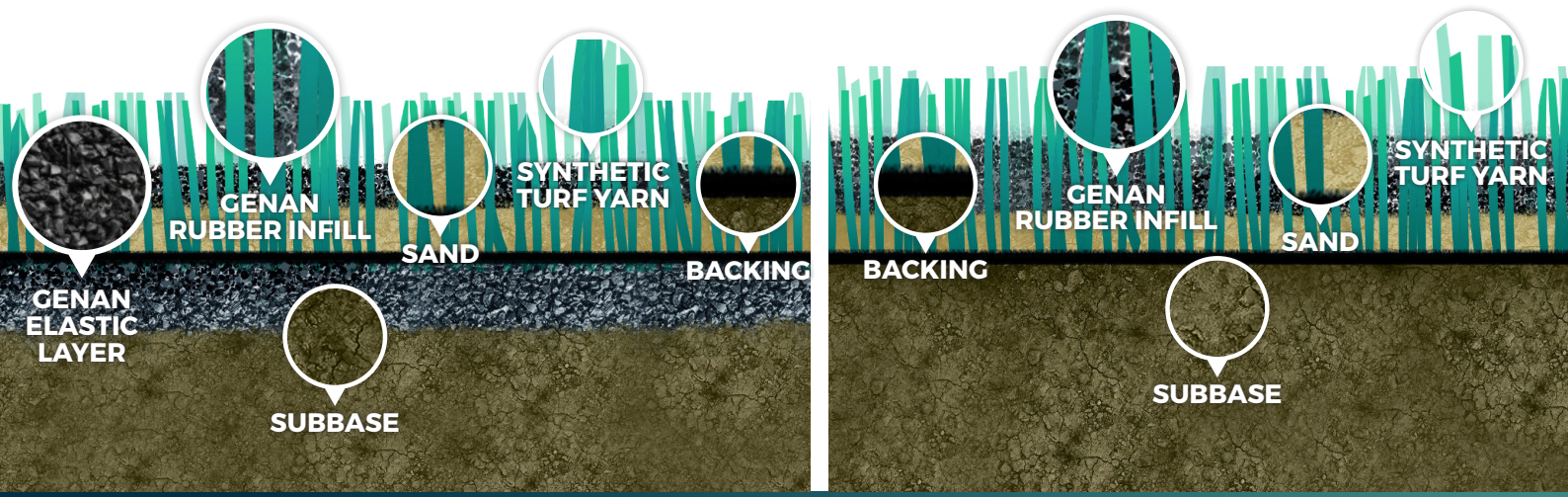
- the results from a newly published, Swedish study
- a new and comprehensive, international literature review on the spreading of rubber granulate from synthetic turf fields, prepared by the Danish Technological Institute (Teknologisk Institut), as well as
- experience from both the Danish and the Norwegian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

Recent research shows that if the right measures are taken and fields are both used and maintained responsibly, the spreading of different types of microplastics from the fields to the environment can be reduced to approx. 3½ ounces a year. Approx. 10% of this amount is rubber granulate.

GENAN INSIDE – BE PROACTIVE FROM THE START

To prevent the spreading of granulate, we must take different measures into account early in the planning stage of the installation of synthetic turf fields. Genan recommends the following procedure:

1. Give serious thought to the physical position of the field; – 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 granules, synthetic 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 field, where excess infill material can be swept up and poured back onto the field (cf. Figure 1).

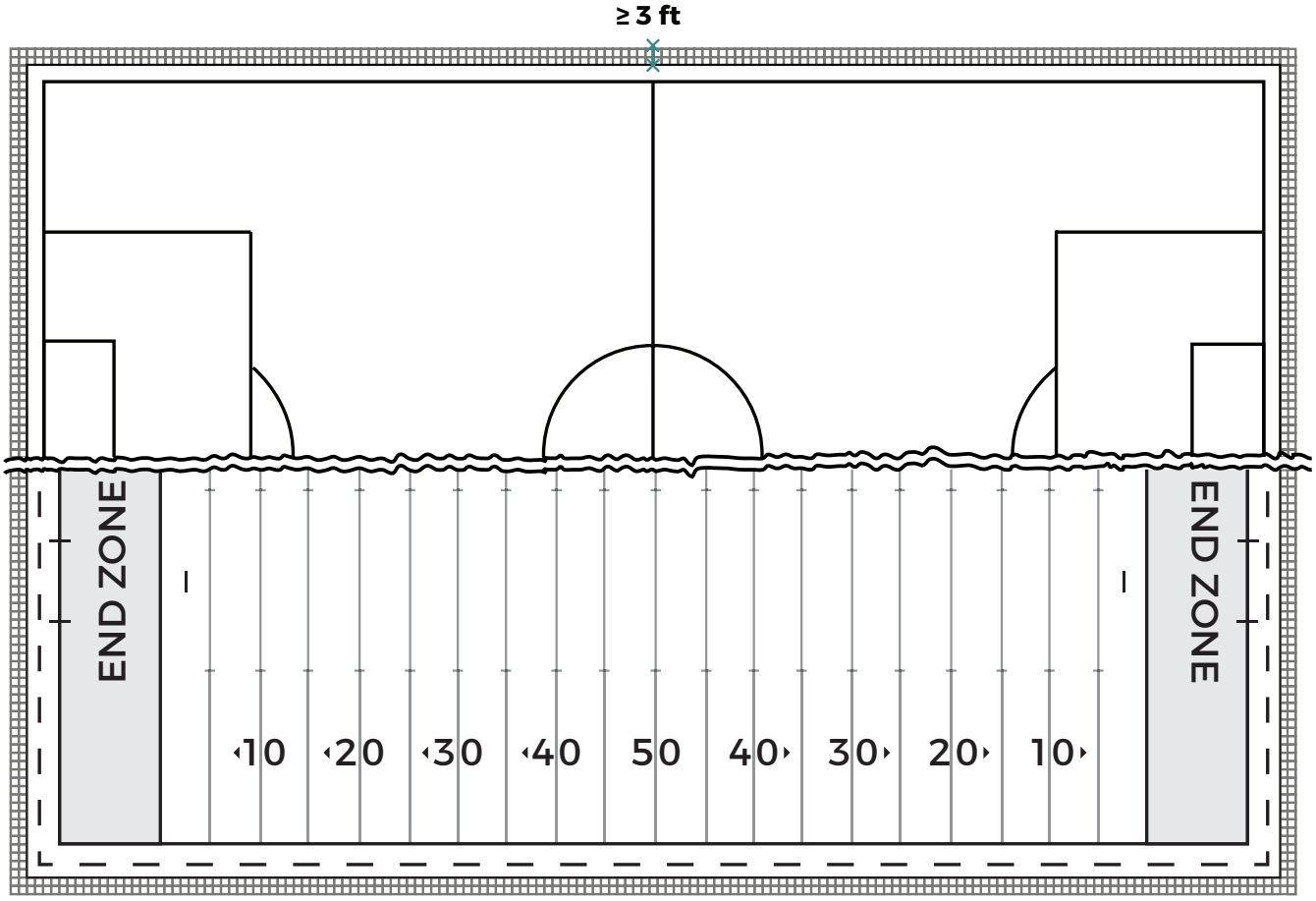


Figure 1 = Bird's eye view of pitch with paving stones all around the field perimeter (min. 3 ft wide)

5. It's always best to have a large area where snow can be deposited during winter. This may be an extra synthetic 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 field.

   Having a solid or tightly-woven mesh fence around the snow piling area is important. 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 field isn't mixed with other waste, granules should be poured back onto the field, where the need for refill is the most obvious.

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

7. To keep granules on the field, a solid barrier / infill fencing panel, at least 20 inches in height, should be mounted all along the perimeter of the field (cf. Figures 2a + 2b). Oftentimes, advertising boards that are about 3 ft in height will be used for this purpose.

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

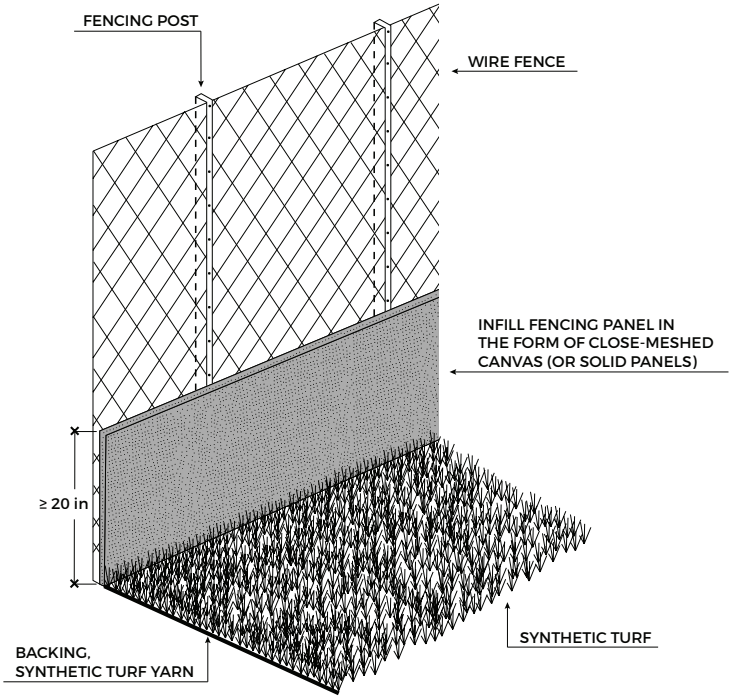


Figure 2a = Fence with infill fencing panel (solution with synthetic turf all the way out to the fence)

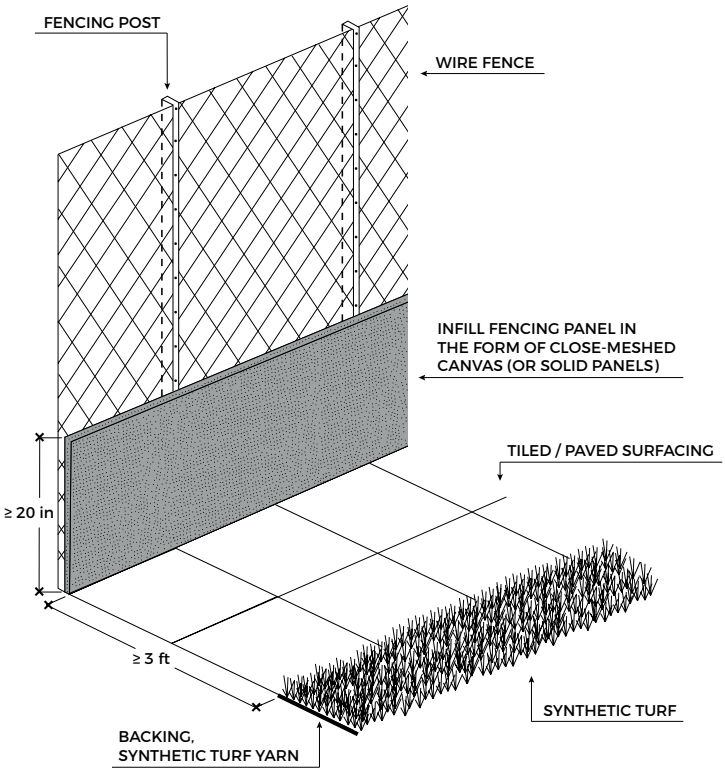


Figure 2b = Fence with infill fencing panel (solution with a tiled area between fence and turf)

8. Place benches on the field-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/cleat brushes (cf. Figures 3a + 3b).

   In connection with play on natural grass fields, it is common practice to take off and clean cleats 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 synthetic turf fields.

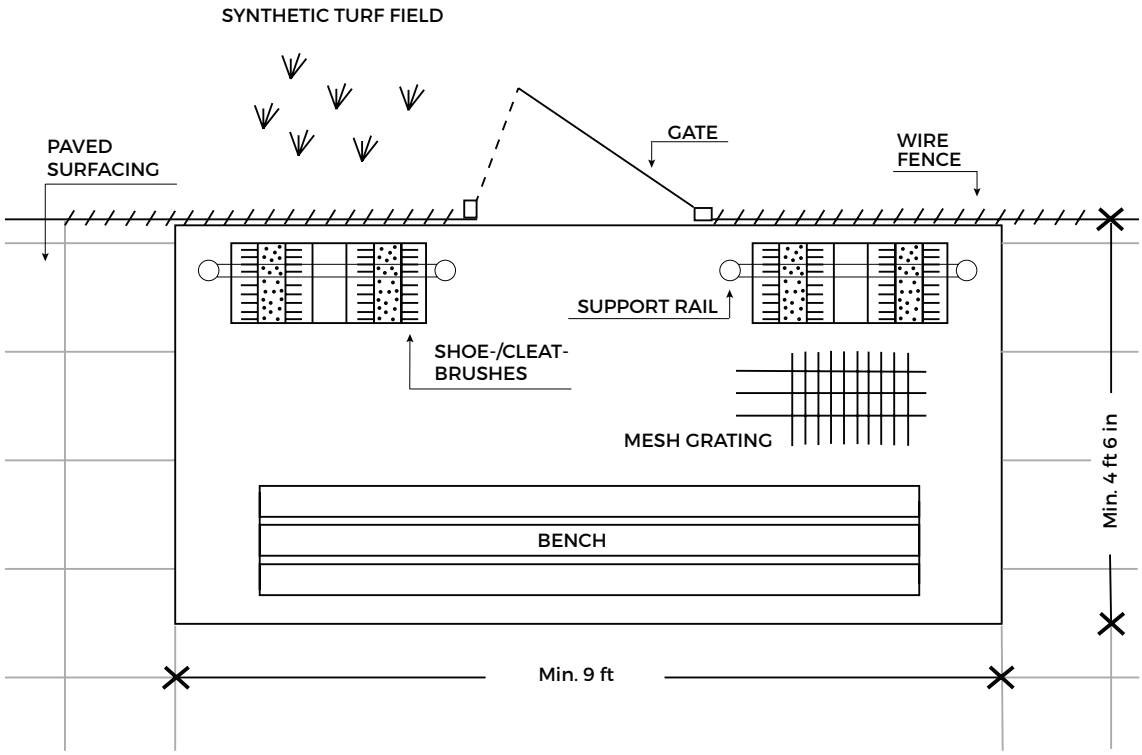


Figure 3a = Design example of a clean-down exit area – bird's eye view

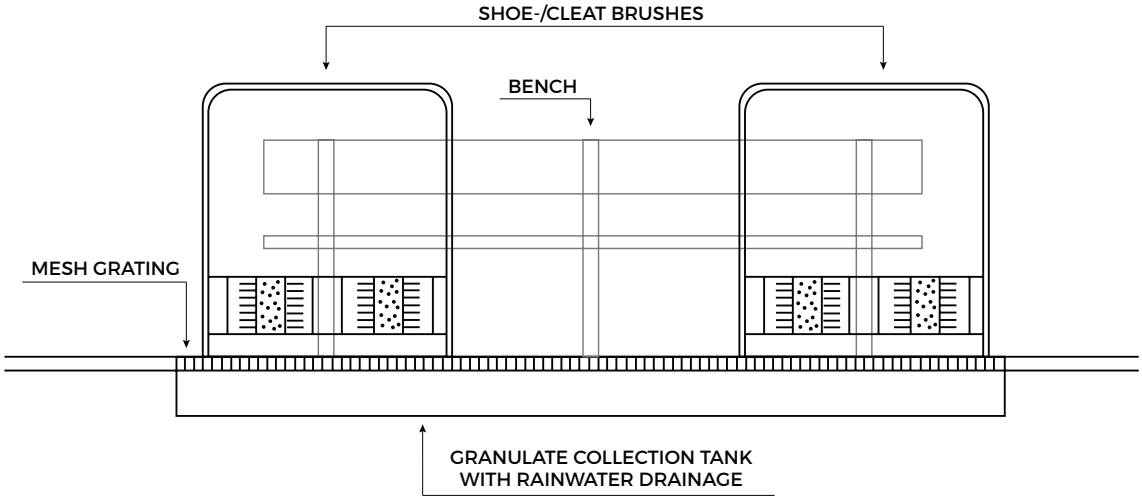


Figure 3b = Design example of a clean-down exit area – normal perspective

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

FIND OUT MORE

Apart from the fact that synthetic turf fields should be constructed in the right way, field maintenance and user conduct on and around the field are also important factors to ensure that granules remain on the field. Consult the guide "Maintenance of Synthetic 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 synthetic turf pitches", by the Norwegian Football Federation)*
- *"Etablér en miljøvenlig kunstgræsbane", DBU.dk ("How to construct an environmentally friendly synthetic turf pitch", by the Danish Football Association)*
- *"Vejledning om kunstgræsbaner", Miljøstyrelsen, 2018 ("Guide on Synthetic 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 Synthetic Turf Pitches in Denmark", by Genan, January 2020*

genan®

GENAN Inc. | 18038 Beaumont Hwy. | Houston TX77229
genan@genan.us | www.genan.com