NATURAL TURF ALLIANCE

NATURAL TURF VS SYNTHETIC TURF: WHAT SCHOOLS NEED TO KNOW

Why This Matters

For schools, outdoor fields are part of everyday learning—not just sport. Students use them for recess, lunchtime, physical education, and organised activities. In many cases, children are exposed to the same surface **every school day for up to 13 years.**
That level of long-term, daily exposure changes the conversation. This is not simply an infrastructure decision. It is a decision about student health, safety, and the environment they grow up in.

Can Natural Turf Meet School Demand?

A common belief is that only synthetic turf can cope with heavy school use. However, modern evidence suggests that this assumption is outdated.
Independent technical analysis shows that **well-designed natural turf fields can handle high levels of use,** comparable to intensively used fields across Sydney. When constructed to best-practice standards, natural turf can support more than 2,000 hours of annual use and accommodate substantial weekly player loads—often exceeding current demand.

In practical terms, this means:

- Natural turf is not a "low capacity" option when built properly
- Performance depends on design, drainage, and maintenance—not just surface type
- Schools can meet both student and community needs without relying on synthetic surfaces

Heat and Student Safety

One of the most immediate differences between natural and synthetic surfaces is temperature.
Synthetic turf absorbs and retains heat. On warm days, surface temperatures can exceed 80°C when air temperatures rise above 30°C. In real-world conditions, particularly during Australian summers, temperatures can climb even higher.
Natural grass behaves very differently. Through evapotranspiration, it actively cools the surrounding environment, creating a more stable and comfortable surface for students throughout the day.
Synthetic turf can also affect the biodiversity of the school. It overheats tree and shrub roots and reduces the natural play availability of playgrounds.

For schools, this translates into a number of practical consequences:

- Students are exposed to higher surface temperatures during everyday use
- Fields may need to be closed during hot weather—not just for sport, but for general play
- The usability of the space becomes less reliable during peak terms of the school year
- Modelling has shown that synthetic surfaces can experience more closure days due to heat than well-constructed natural turf.

Injury Risk and Student Wellbeing

Surface type also plays a role in how children move, fall, and recover during daily activity. Synthetic turf is generally firmer and provides more resistance underfoot than natural grass. Over time, this can increase stress on developing joints and ligaments, particularly in the feet, ankles, and knees. While this may not be immediately obvious, repeated exposure during everyday play can contribute to cumulative strain.

There are also more immediate and visible impacts. Falls on synthetic surfaces are more likely to result in **skin abrasions or "turf burns."** These injuries are not only painful but can create open wounds that are more susceptible to infection—especially in school environments where children return quickly to play.

From a practical perspective, schools may observe:

- A higher incidence of surface abrasions compared to natural grass
- Increased likelihood of minor injuries during unstructured play
- Greater wear and tear on younger students who are still developing coordination and balance

Natural turf provides more cushioning and surface give, which can reduce the severity of falls and better support everyday movement.

Microplastics and Environmental Impact

Synthetic turf is a plastic product. Over time, the fibres that make up the surface degrade through use, weather, and UV exposure. As they break down, they form microplastics that move beyond the field itself.
Monitoring of school-adjacent fields has identified thousands of microplastic particles entering drainage systems during rainfall events. Once mobilised, these particles:

- Travel through stormwater systems into local waterways
- Accumulate in surrounding soils and ecosystems

Persist in the environment for long periods without breaking down

Importantly, this process occurs regardless of the type of infill used. Even where "organic infill" is installed, the plastic grass fibres themselves continue to fragment.
For schools located near bushland or waterways, this creates an ongoing environmental pathway that is difficult to control once established.

PFAS and Chemical Exposure

Alongside microplastics, there is increasing focus on PFAS—persistent chemicals that are now the subject of global regulatory attention.
Testing around synthetic turf installations has identified PFAS compounds in stormwater runoff, including levels above environmental trigger thresholds in some cases. These substances:

- Do not readily break down in the environment
- Can accumulate over time in soil, water, and living organisms
- Are increasingly being scrutinised by regulators and public health bodies

It is important to note that claims of "PFAS-free" products often reflect testing thresholds rather than absolute absence. As a result, independent testing—particularly using Total Organic Fluorine (TOF) methods—is increasingly seen as a more reliable way to assess risk.
For schools, the key consideration is cumulative exposure. Where students are using a surface daily over many years, even low-level environmental pathways become more relevant.

Bushfire and Site Safety

For schools located near bushland, surface selection also intersects with broader safety considerations.
Synthetic turf introduces additional fuel load due to its plastic composition. In a fire event, these materials can contribute to heat intensity and generate toxic smoke. This is particularly relevant in areas classified as bushfire-prone, where evacuation routes, radiant heat, and ember attack must all be considered.
While this may not be the primary driver of decision-making, it is a factor that sits alongside environmental and safety considerations in bushland-adjacent school settings.

Usability and the Student Experience

A school field is not just a sports facility—it is a shared space that supports a wide range of daily activities.
Natural turf contributes to a more flexible and inclusive environment. It allows students to sit, gather, and engage in informal play in a way that feels natural and comfortable. It also supports broader outdoor learning by maintaining a connection to green space.

Synthetic turf can limit these uses, particularly during warmer periods. Surfaces may become too hot for passive recreation, reducing the ability of students to use the space freely throughout the day.
From a school perspective, this affects not just sport, but the overall **quality and usability of outdoor space.**

Lifecycle and Long-Term Considerations

When comparing surface options, it is important to look beyond installation and consider how each system performs over time.

Synthetic turf typically involves:

- Replacement cycles every 8–10 years as the surface degrades
- Removal and disposal of large volumes of plastic material
- Ongoing maintenance to manage performance, hygiene, and safety

Natural turf requires consistent maintenance, but it does not involve the same periodic replacement cycle. It also avoids the need to dispose of synthetic materials at the end of its life.
From a long-term perspective, the comparison is not simply about maintenance effort—it is about whole-of-life cost, sustainability, and environmental responsibility.

Key Questions for Schools and Parents

Before making a decision, it is worth stepping back and asking a small number of fundamental questions:

- Does the evidence show that natural turf can meet our actual usage requirements?
- How will heat affect the day-to-day usability of the field for students?
- What environmental pathways are created through microplastics and runoff?
- Has independent testing been undertaken for PFAS and related chemicals?
- How does this decision interact with bushfire risk and overall site safety?
- What are the full lifecycle implications, including replacement and disposal?

Key Takeaways

When viewed over the full life of a school environment, several points become clear:

- Best-practice natural turf can meet the performance demands of modern schools
- Synthetic surfaces can reach extreme temperatures, reducing safe usability
- Harder surfaces increase the likelihood of abrasions and joint-related injuries
- Microplastics and PFAS introduce long-term environmental and exposure pathways
- Synthetic fields require ongoing replacement and disposal of plastic materials

A Balanced Way Forward

This decision is often framed as a simple trade-off between durability and practicality. In reality, it is more complex.

For schools, the key consideration is not just how a field performs on day one, but how it performs **every day, over many years, for the students who use it most.**

A balanced approach prioritises:

- Student safety and comfort
- Long-term environmental responsibility
- Reliable, year-round usability

References

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https://www.planningportal.nsw.gov.au/draftplans/made-and-finalised/synthetic-turf-public-open-space-guidelines

5. Technical Standards — https://education.nsw.gov.au/technical-standards.html

Visit the NTA Document library: **https://naturalturfalliance.org/document-library/**

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Natural Turf Alliance Inc (NTA) is a Registered Association consisting of community groups committed to preserving and developing natural grass open spaces including sporting fields.
Our core focus is engaging with local councils and sporting groups in relation to best practice natural turf construction and maintenance.