NON-TURF CRICKET PITCHES/ MATCH PITCH

In the UK we are governed by the England and Wales Cricket Board (ECB). The ECB 'standard' is now seen as the standard for artificial pitches around the world.

We were one of the companies consulted by the ECB when the 'standard' was put together back in the early 2000s.

Match pitches are installed in the middle of a field and games are played on the pitch between teams.

Match pitches should be 30m long by 2.74m wide full depth 135mm.
22 yards (20.12m) long, stumps to stumps.

However, the bowlers run up is very important. Especially the point where the bowler takes off and lands - we call this the delivery stride.

The delivery stride is different for every bowler, it can be a small step for a spin bowler say 1.00m or a large takeoff and landing of say 2.00m-3.00m for an adult male fast bowler.

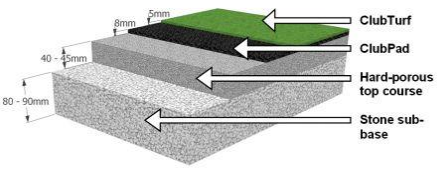
For match pitches the ECB minimum length is 30.00m long, which provides 4.94m beyond the stumps at either end of the pitch. Match pitches are used in both directions.

The base construction is very important, ClubTurf can liaise with you over the excavation depths and quantities of materials.

An artificial cricket pitch base is made up of 2 layers of angular hard stone aggregate.

- The lower base is 80-90mm thick and is ideally 14mm-to-dust or 0-14mm or 14mm-down.
- The upper base is 40-45mm thick and is ideally 3mm-to-dust or 0-3mm or 3mm-down

This is readily available in the UK and ClubTurf will be able to source a similar material locally in Norway. The key is that it has all the different size particles graded through the material with a slightly larger percentage of the smallest particle size called dust or fines.



The practice area has to fall within a single plane and the ECB maximum gradients are as follows:

- We are allowed a fall of 2% across the width of the facility. Two bay width 7.92m maximum fall 158mm
- We are allowed a fall of 1¼% along the length of the facility. Two bay minimum length 26.00m maximum fall 325mm

The maximum undulation under a 2.00m straight edge across and along the pitch area is 6mm. We are allowed 10mm under a straight edge on the infill surrounds and to the natural grass surrounding the facility.

The bowling end of the facility will have to marry into the levels of the existing land to allow the bowlers run up to extend outside the facility. So, the bowling end existing levels are your datum point for the rest of the facility.

The maximum excavation is 120mm - 135mm depth for the pitch areas but we only excavate to 40-45mm outside of the pitch areas under the infill surrounds.

ClubTurfs Installation team can carry out as little or as much of the installation as you would like but, they are better doing final levelling and compaction of the upper base as they know what is required.

ClubTurfs Installation Manager is over the 5,500 pitch mark.

For reference ClubTurf use a 3 tonne mini excavator to excavate out the bases and a 2 tonne mini dumper to move the turf and topsoil to the spoil laydown area.

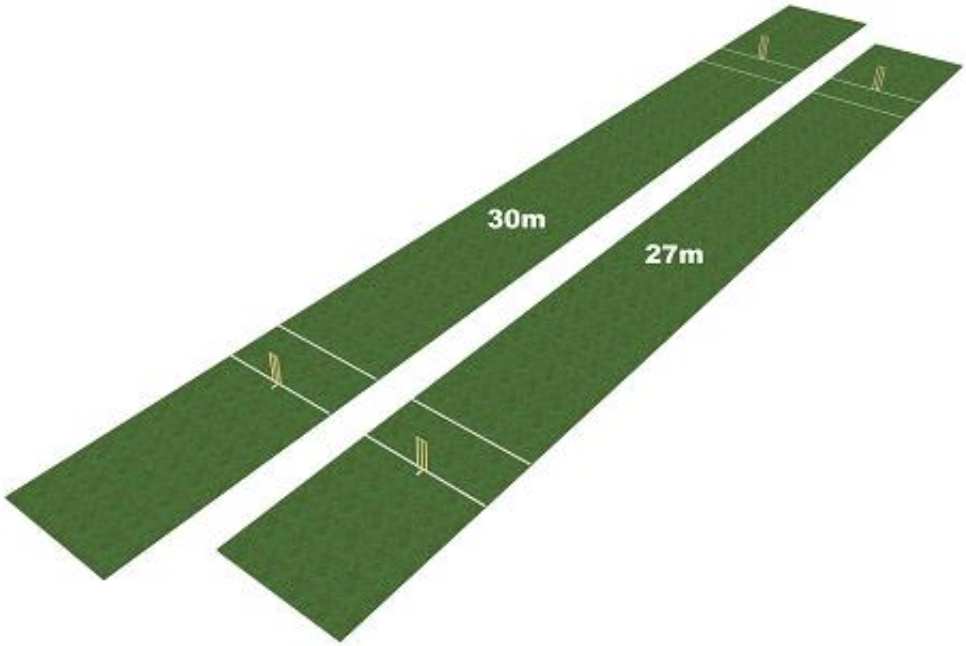
Then they load the aggregate on to the dumper using the digger and install the base materials over into the installation.

They then use a single drum pedestrian roller 0.5t, to compact the different layers firstly the lower base and then the upper base.

ClubTurf then use the auger attachment on the digger to install the ground sockets for the Netcage and install the ground sockets in fast setting concrete.

They then fit the carpets and roll the pitches again and mark the pitches ready for use.

ClubTurf would never recommend an installation deeper than 150mm under any circumstances



SPESIFICATION

The first artificial, synthetic or non-turf cricket pitches were developed in the UK by Nottingham County Council in the 1970s. The Nottinghamshire pitch was the result and the majority of the pitches installed around the world still follow the basis of this system. Our brand ClubTurf were the original installers of the Nottinghamshire pitch from 1978.

The principle of the pitch base system is two layers of aggregate with the surface carpet(s) installed on top. The ratio of lower base to upper base was originally 2:1 with 2mm of lower base to every 1mm of upper base. However, some systems are now 1:1 but that is based on the materials they use.

Lower base

The principle of the lower base is to provide a solid foundation with good drainage. It is important that the aggregate is angular hard stone and that it is graded with all different size particles to ensure that the aggregate compacts together like a jigsaw leaving gaps to ensure that the lower base is very porous.

It is a fine line between the lower base being too porous and not porous enough. The research found that Type 1 MOT or road stone with 40mm to dust drained too well and too fast. At the other end of the scale anything under 10mm to dust held to much moisture so wasn't porous enough. So, the consensus is in between.

The research showed that the optimum largest particles should be between 10mm and 20mm and that this should be graded down to dust/fines meaning that every sieve size should have a proportion of the material retained with the emphasis on more dust/fines (smallest particle size). This provided the best compaction and the best drainage. We use 14mm to dust.

We have found that 14mm to dust is the optimum as it drains well but retains moisture in the upper base for longer improving compaction. We would rather go down to 10mm to dust rather than up to 20mm to dust but if it is a wet climate 20mm will be better and if it is a dry climate 10mm will be better. It is about retaining just enough moisture in the upper base.

The lower base depths range from 50mm to 100mm and this is dependent on what the upper base specification is. If the upper base is less angular / more rounded and harder to compact such as "olisett" then you need a greater amount of moisture retained in the upper base so you use a shallower lower base.

If the upper base is very angular and retains moisture better what we call "hard porous" then you can provide a deeper lower base. We set our depth at between 80mm - 90mm and this provides a good foundation as well as good drainage. In areas of high rainfall or heavier clay soils we will aim for 90mm in lower rainfall well drained soils we will aim towards 80mm.

Upper base

The upper base is the most important layer this is what determines the performance of the pitch. The compaction/hardness and the flatness/levelness of the pitch base determines how well it plays. The ball impacts on to the upper base through the carpet(s) and it is the interaction between the ball and the upper base that determines how the ball bounces.

There are two materials used for the upper base either angular hardstone or the more rounded sport aggregate called “olisett”. The research showed that no particles larger than 6mm should be present and that there should be a large amount of dust/fines in the material. There is no such product as dust/fines it tends to be at the smallest 3mm to dust to the largest 6mm to dust. The 3mm to dust is better than the 6mm to dust as it holds the moisture better.

If you think of aggregate as a pile of Lego blocks laid randomly on the floor the larger the blocks the more air or gap there is between the blocks. The more air there is between the aggregate the more porous the material is. We want to maintain moisture in the upper base so the less porous the upper base the better but we still need that moisture to drain.

The research shows the optimum depth of the upper base to be between 40mm and 50mm. In areas of high rainfall 40mm is more than adequate but in areas of low rainfall 45mm-50mm may be better to hold the moisture for slightly longer. In the UK we would never go above 45mm upper base and this allows us to stick to our 2:1 ratio.

So, our specification is 40mm to 45mm upper base and 80mm to 90mm lower base. This provides the 2:1 ratio that the research recommends but with scope to design the perfect depth for each different site. The annual rainfall in Norway is 774mm average compared to 885mm average in the UK so similar conditions so the design and depths should be the same.

Performance pads

The original Nottinghamshire pitch was installed in the late 1970s and early 1980s the surface carpet was laid directly on to the upper base with no performance pads. From the early days ClubTurf installed shock pads in the bowling ends to protect the bowlers from the jarring/impact injuries on the aggregate surface through the carpet.

The Nottinghamshire pitch became known as the hard-porous pitch system and we still supply this option to customers 40 years on called our ClubTurf “Natural” pitch system. The pitch is low maintenance compared to a natural grass pitch but still relatively high maintenance.

The ball impacting directly on the hard porous when wet left dint marks/indentations in the surface. These couldn’t be allowed to dry and become hard as this would cause the ball to deviate off the indentation in a dangerous way. Therefore, you had to roll the upper base after use in wet conditions to iron out all the indentations.

In the 1980s geotextile technology advanced greatly with the materials being made more porous and stronger yet with shorter piles. The introduction of these new geotextiles into the artificial cricket pitch industry protected the upper base from the ball impact spreading the impact over a wider area.

Over time you would need to roll out these wider indentations but not every time you used the pitch in wet conditions. The geotextiles were called performance pads and they impact on the performance of the pitch.

The ball has to pass through every millimetre of carpet before impacting on the upper base. Every extra millimetre slows the ball down and makes the bounce of the ball less realistic. There are many different thicknesses 6mm to 10mm still available today but the performance pad we use called InterPad is the thinnest available at 6mm thick.

We found that the hard-porous pitches didn't get rolled and started to play more and more inconsistently. The pitches protected by geotextiles played more consistently and although they were less realistic, over time, they played better than the neglected hard porous pitch systems. Over the decades there has been a move to performance pads systems.

Some systems have multiple pads in them above and below the upper base which makes installation easier but the pitch less realistic these are called envelopes. Similarly, some systems use multiple pads above the hard-porous layer without a lower base these are called shallow. If the aim is high performance these systems, in my opinion, should be avoided.

The assumption, when installing in a country like Norway where cricket is a growing but not fully developed sport, is that the levels of cricket groundsmanship is not available to maintain and look after the artificial pitches. Therefore, the lower maintenance performance pads pitches are the better option. This is why we have always recommended the ClubTurf "International" for the pitches in Norway.

Surface carpet

The surface carpet is the most expensive component. It is designed to be very tough and durable as the cricket ball will be impacting on it directly and it is also open to the UV rays from the Sun which are very damaging to carpets.

As I have explained under performance pads every millimetre of carpet impact on the realism of the ball bounce so we want our carpets short but very strong. There are three types of carpets that have been used as the surface of cricket pitches.

Wilton woven

The original and, in my opinion, the best carpet is woven. The weaving processes make the carpets fully porous and the weave is naturally tough with the warp and weft process providing double strength. This extra strength means that we can produce the carpet at a lower height (5mm-6mm) without losing strength.

There are different types of woven carpets the most common are Axminster for highly patterned carpets and Wilton for plainer stronger harder wearing carpets. We use the wilton woven process to make our ClubTurf carpets. The average life expectancy for our carpets is 12 years so we allow 10-12 years for life expectancy.

Tufted

The tufting process is very different the thread is punched through a backing material and then the backing is glued sealing all the carpet tufts. This makes the material non-porous. Therefore, holes have to be punched through the backing at regular intervals to make the carpet porous.

The tufted carpet has a minimum height of 10mm impacting on the ball more than our carpets. By design the tufted process is not as hard wearing as the wilton woven process so there is a drop-in life expectancy to 6-8 years. The process is cheaper but the amount of extra thread required to maximise life expectancy to 6-8 years offsets the price.

We have chosen not to offer a tufted carpet although the carpets are cheaper the price per annum the customer pays over the lifetime of the carpet is higher with a tufted carpet making it less value for money for our customers.

Needlepunch

Similar process to tufted but porous but the pile is less strong than woven and tufted. The life expectancy is similar to tufted at 6-8 years and the price is significantly lower as there is no need for the extra thread. The performance is not as good as the other two materials which is why it is seen as a low budget option.

I am not sure of the availability of carpets in Norway. However, carpets wilton woven from polypropylene are only manufactured in 4 countries in the world to my knowledge. UK, Netherlands, China and India. The wilton woven carpets imported from the Netherlands have failed on standard over a 2-3-year period twice in the last decade.

The UK wilton woven looms were nearly all moved to India and China as the demand for cheap tufted carpets exploded and the demand for the hard-wearing expensive Wilton and Axminster woven carpets dropped. There is only one supplier with looms left in the UK.

The problem with China and India is that the quantities you have to purchase carpets in is very high and it is difficult to ensure that the carpets are of the right quality. You are crippled by stock and have to pay huge amounts of money to ship them half way around the world.

From our industry knowledge the only supplier in Western Europe who can supply quality polypropylene wilton woven carpets is UK based and is our supplier. We have worked with this carpet factory to develop our product over the last 25 years. There is no off the shelf product available that is remotely close to ClubTurf carpet on quality.

Wilton woven carpet looms were historically 2.74m (9') wide. They have been increased in the last decade to 3.66m (12') wide but the industry standard width is still 2.74m (9') wide. For reference the given width of a cricket pitch is 3.05m the return creases which mark the width of the crease are only 2.64m wide. Special mention is made within the Laws of cricket on allowance for the width of artificial pitches being under 3.05m at 2.74m.

A cricket pitch is 20.12m (22 yards or 66 feet) long. It is not deemed acceptable to transition from natural to artificial grass in the bowler's action. There is a difference of opinion on minimum length

of bowlers run up with 4.00m or 5.00m being the debate. In match pitches the recommended length for adults is 30.00m long allowing 5.00m of bowlers run up at either end.

Site recommendations – match pitch

There are a number of factors to look at when planning an artificial cricket pitch.

Orientation - ideally North-South to avoid the impact of the setting sun. Minimum 30 degrees from East West if North-South not available.

Drainage - If the site has standing water in the summer then extra field drainage may be required. Cricket can't be played with standing water.

Access - We have to be able to get plant and materials on to site to install the pitches.

Levels on existing square - If we are installing an artificial pitch on a cricket square, we will have to follow the contours of the cricket square. Artificial pitches are usually installed on the edge of the square. If installed in the middle you will lose half a pitch width either side so 2 pitch widths altogether.

Levels off existing square – Pitches have to be installed in a single plane. The recommended maximum fall across the run of play is 2% so 54mm across the 2.74m width. The maximum fall along the line of play is 11/4% so 375mm along the 30.00m length.

We usually recommend that the artificial pitch be installed near the social accommodation so that spectators have a clear view of the game. If the artificial pitch is installed on the far side of the field then spectators will sit away from the social accommodation lowering revenues.

Set an area for material and spoil laydown accessible from the road.
Specification – match pitch

Surface – Wilton woven carpet 30.00m long by 2.75m wide
Performance pad – Geotextile membrane 30.00m by 2.50m wide
Upper base – 45mm thickness of 4mm to dust angular hardstone aggregate
Lower base – 90mm thickness of 14mm to dust angular hardstone aggregate

Installation – match pitch

Use a mini excavator/digger (roughly 3 tonnes in weight) to excavate a trench 30.00m long by 2.50m wide by 120mm to 135mm deep ensure sharp clean precise edges. Remove topsoil to spoil laydown area using a mini dumper (roughly 2 tonnes in capacity).

We recommend against the use of edging boards or kerbs as experience has shown us that they can rise over time creating a trip and ricochet hazard. Land moves and board and kerbs don't move with the land they work against the land.

Install the pitch lower base as detailed under the previous sections compacting at regular intervals to ensure proper compaction. Once the lower base is in place then install the upper base material. This

is a very specialist part of the work and we would recommend that the final compaction and sign off be carried out by an industry expert.

Similarly, the fitting of the performance pad and the surface carpet are very specialized parts of the work and will require experienced artificial cricket carpet fitters to carry out the work. The last two parts of the work will determine how well the pitch will play.

Finally, the industry expert will carry out a further rolling programme to ensure the correct compaction and then mark the pitch with paint ready for play to commence. Our consultant and team of industry experts will advise on quantities of aggregate required for the pitch bases.

Site recommendations – practice area

There are a number of factors to look at when planning an artificial practice area.

Orientation - ideally North-South to avoid the impact of the setting sun. Minimum 30 degrees from East West if North-South not available.

Drainage - If the site has standing water in the summer then extra field drainage may be required. We are installing a large sump of aggregate so if there is nowhere for the water to go it will just fill up and flood.

Access

We have to be able to get plant and materials on to site to install the facility.

Levels

Pitches have to be installed in a single plane. The recommended maximum fall across the run of play is 2% and the maximum fall along the line of play is 11/4%.

We usually recommend that the practice facility be installed near the social accommodation or near to the car park for ease of access.

Set an area for material and spoil laydown accessible from the road.

ClubTurf is available to speak and guide during working hours in the UK. They can also provide their Installation Managers contact telephone number, who can liaise about installation.

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