Photos courtesy of Brad Young

Constructing World Class Tennis Courts

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In theory, a grass court can be any piece of flat grass that is large enough to have the proper dimensions on which to play tennis. However, this is not really the case. There are three main elements which make up any grass court – the turf, the soil and the base – and only when all three are in synergy can a proper patch of land be called a grass court.

QUOTABLE QUOTE

"A grass court's playing characteristics (such as the height, speed and trueness of the ball bounce), as well as its durability, depend on the quality of a court's component parts and the skill of the grounds staff in looking after it."[1]

The first step in having a proper grass court is solid construction, where building a good base is the key. Most grass tennis courts are constructed similar to USGA greens. There are specific recommendations that should be followed when constructing a court and the cross-section drawing of a tennis court looks very similar to that of a USGA green. The following construction procedure was carried out at The All England Lawn Tennis and Croquet Club, home of the Wimbledon Tennis Championships.

Construction of a court will vary from site to site based on the type of sub soil present. The first step for any construction project is to do your locates. Before any excavation can begin, a land survey must be done in order to find out where any underground utilities such as water, hydro or phone lines are so that when excavation is done, all utilities can be avoided. Once the survey has been completed, excavation can begin. The ground is excavated to a depth of 18", with an additional trench dug into that for the drainage lines. The drainage lines can be laid in one of two ways, herringbone or grid. Figure 1[2] shows examples of both.

The courts at Wimbledon use the grid system of drainage, where the main 4" line runs down one side of the court and the lateral 3" lines run almost perpendicular to the main line at a slope of 1% so the water will continue to flow. The drainage tile is perforated to allow water to enter.

Once the drainage has been laid, then construction on the drainage layer can begin. This is the first layer that goes in over top of the drainage tiles. The drainage layer is usually made up of washed (dust-free) hard stone between 5/16" and 3/8" that won't crush when compacted. It is comprised of aggregates that are angular so they lock together and compact well while remaining well draining. This layer is approximately 6" thick, but can be thicker depending on site conditions and the sub-soil underneath. The drainage layer is the foundation of the court and one of the key elements in maintaining a successful grass tennis court.

Once the foundation or base has been laid, the next layer to be installed is the

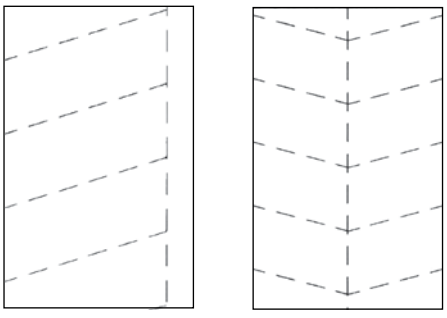


Figure 1. Alternative drainage systems. A grid system is on the left and a herringbone is pictured on the right.

binding layer, similar to a binding layer in a USGA green. This binding layer brings together the base and the topsoil, while preventing the topsoil from moving down into the base. The binding layer is made up of coarse sand and compacted – again to prevent the topsoil layer from penetrating to the foundation. This layer is usually about 2" thick, and although it is made of compacted sand, it is still very porous and allows for water filtration. Careful consideration should be made when choosing the type of sand for this binding layer. It should be lime-free to prevent altering the pH of the topsoil above it.

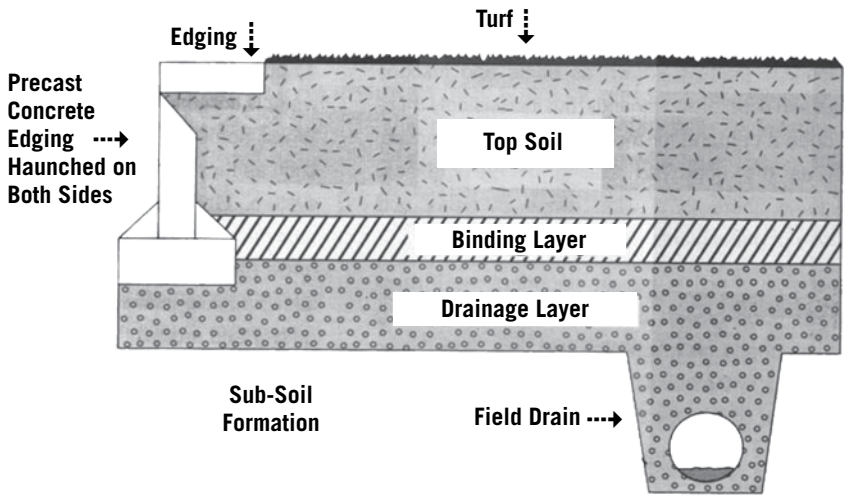
The final layer is the second of the three important elements of a grass court, the topsoil. This layer is usually the thickest of the layers at approximately 10". A soil should be chosen that will be the best possible for grass growth and also compacts well allowing for a firm playing surface. Ideally, the topsoil will contain around 5% organic matter. The courts at Wimbledon contain up to 20% clay in the topsoil to allow for consistency across the courts and firmness. The topsoil layer is laid in 2" lifts, raked, and compacted twice to remain consistent throughout. Installing this layer can be a time consuming and labour intensive procedure.

The edging of a court is made up of concrete with drains on either side to allow for the surface water to run off into a drain. Figure 2[3] shows a typical cross-section of a grass court.

The final portion of building a grass court is of course the grass. There are many species to choose from: creeping bentgrass, annual bluegrass, fine fescues, perennial ryegrass, etc. Some tennis facilities use a mixture of perennial ryegrass and fine fescue; in fact Wimbledon did that up until 2001 at which time they switched to a mixture of different perennial ryegrass cultivars. They made the switch to 100% perennial ryegrass because of its durability and wear tolerance.

"Independent expert research from The Sports Turf Research Institute in Yorkshire, UK, proved that changing the grass seed mix to 100% perennial ryegrass (previously 70% rye/30% creeping red fescue) would be the best way forward to combat wear and enhance court presentation and performance without affecting the perceived speed of the court."[4]

Figure 2. Typical cross-section of a court.



Establishing Grass

There are two obvious options for establishing grass on a new court, sodding and seeding, and there are advantages and disadvantages to both. Sod will create an instant court look, however will still take a while to grow before it can be played on. Sod can be cut and rolled sooner than a seeded court, and will be ready for play a lot faster. However, when laying sod one must ensure the soil that is on the sod is the same as the topsoil on the court. Otherwise, layering will be created, and the court will not drain properly. Also, if sod is not laid properly, it can create bumps and an uneven playing surface.

Seed on the other hand, will create a much more uniform playing surface, use the existing soil as its soil base, and will therefore not create a new layer, allowing for proper drainage. The major downside to seed is that it takes up to one year to establish fully before there can be play on the courts. Wimbledon, despite the amount of time it takes to establish fully, seeds rather than sods all of its courts.

Maintaining A Grass Court

Once the grass on the court has been established, it is up to the ground staff to maintain the high level of quality and playability that is expected at Wimbledon. There is maintenance work done on the courts through three of the four seasons, winter being the only one where little to no work is done. There are, however, growing lights installed on Centre Court at Wimbledon to keep the grass growing throughout the winter months. The grass court playing season usually begins in mid-late May and carries on through to the end of September.

The grass courts at Wimbledon are among the best in the world. The ground staff work tirelessly to ensure that the courts are of the highest quality and performance. For two weeks out of the year, they are beaten and bruised, but have proven to stand the tests of time and competition. I am proud to say that I am among those people working hard to maintain such a high expectation.

References

1, 2 & 3. www.lta.org.uk/Resources/Clubs/Grass%20Courts.pdf
4. www.wimbledon.org/en_GB/about/infosheets/grasscourts_general.html

EDITOR'S NOTE

The cross section of the Wimbledon court corresponds very closely with the specifications for a Class 2 athletic field as described in the STA's Athletic Field Construction Manual. A Class 2 rating is due to the inclusion of 20% clay in the top soil mix.