

Foundations and Bases Information Sheet



Introduction

When a new tennis court is constructed, most users have an expectation that it will be trouble free and have an almost indefinite life.

A tennis court is a long life facility that its users generally do not consider it wearing out or breaking down. But a tennis court does have a finite life, albeit many years.

While the life of the most visible part of a tennis court, the surface, is dependent on use, maintenance and its initial installation; the most important factor of a tennis court's life is what is generally not seen. That is, what is below the playing surface has the most influence and impact on the life of a tennis court.

What is below the surface?

When the below playing surface work has been prepared and built satisfactorily, the court should have many trouble free years of tennis and players will probably not be aware of what is actually below the surface. On the other hand if the below playing surface work is not satisfactory, all users of the court will soon be aware that there is a problem.

As with any construction exercise, the correct foundations are essential in ensuring the longevity and stability of what you build on top. Poor foundations ultimately lead to damage, rectification costs and potentially less than optimum life. There are a number of site issues that may need to be taken into account in relation to the foundation works. These need to be considered well before the court construction commences.

These include, but are not limited to:

- Type of soil,
- Soil strength,
- Soil reaction to moisture,
- Surface water,
- Sub-surface water (water table & flow),
- Topography,
- Vegetation influence (type & vicinity),
- Rocks (hard pieces / areas),
- Uncontrolled fill (old refuse dump fill),
- Site cut and fill.



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Foundation

For the purposes of this information paper reference to 'foundation' covers all the work below the playing surface, including but not limited to pre-existing soils, drainage, sub-base and court base.

The foundation's design objective is to reduce the risk of unacceptable performance of the foundation and to ensure that there is sufficient strength and stiffness to accommodate likely foundation movements and still maintain lines and levels for the playing surface. The foundations of the tennis court support its weight and any loads imposed upon it. These loads are relatively minor. The tennis court pavement design is generally not dictated by external loads; but by the need to reduce the impact of natural movements of the soil that are caused by moisture and temperature variations.

The volume changes within the soil are dependent upon the nature of the soil and its moisture variations. In most parts of Australia, moisture variations between summer and winter or wet and dry seasons can be quite large. Soils that are predominantly gravel or sand will produce stable foundations with little likelihood of movement due to moisture variations.

Soils which are predominantly clay or silt may be highly sensitive to moisture variations and it is these soils that require the greatest care. Ground water can have a significant impact on foundations but it is the changes in water levels that can have the most impact.

The influence of surface and sub-surface water may need to be controlled as part of the foundation works. Trees and shrubs can, and do, extract significant quantities of water from the soil and their root systems can have an adverse impact on a tennis court's foundation.

Surface and subsurface drainage may need to be installed to reduce water flow and/or 'ponding'. Good landscape layout and vegetation selection can go a long way to absorbing excess ground water.

There are many factors that have an influence on the design and construction of the most important part of a tennis court, the 'foundation'. Furthermore the foundation has a direct influence on the type of playing surface that can be installed. Everything from the desired playing surface to the ground upon which it is to be built has to be considered together as an integrated package to achieve the best outcome for all.



Conclusion

The design and construction of foundations and bases should be approached in a planned and logical manner as many of the soil types encountered in Australia can cause unacceptable movement of the completed court and need to be recognised and treated at the design and construction stage.

Tennis Australia strongly recommends that a site proposed for a new or upgraded facility is adequately investigated by a qualified geotechnician (soil tester). Whilst there will be a cost involved, it is cheaper than pulling up the court, undertaking rectification works or replacing part of the foundation and rebuilding the court.