RED POROUS COURT MAINTENANCE GUIDE

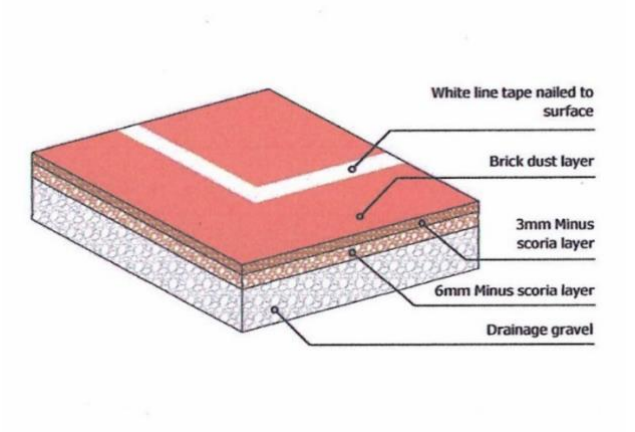
Introduction

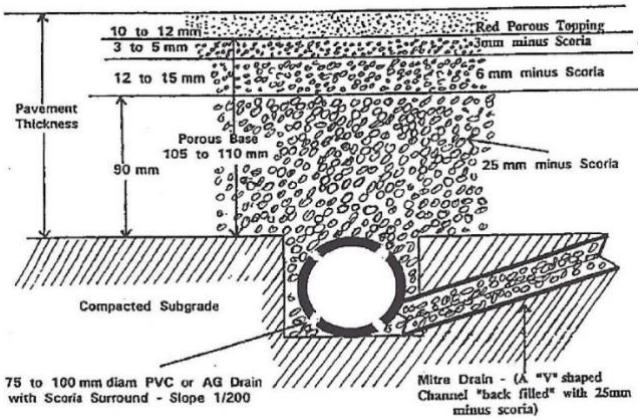
Tennis Victoria produces several fact sheets and articles designed to assist tennis clubs with the maintenance and operation of their facility. The most important aspect of any tennis club (apart from the players) is the courts themselves. This fact sheet outlines tips and advice to keep red porous courts well maintained and ready for play.

Tennis Victoria can be contacted directly for more specific advice related to your facility by emailing tennisvicinfo@tennis.com.au.

Red porous (en-tout-cas) courts

Red porous is a popular surface choice largely constructed from en-tout-cas. It consists of layers of coarse, granular material (generally scoria) and/or a by-product from the manufacturing of bricks. The top layer is brick dust, and subsequent layers become progressively coarser to help provide an optimum playing surface while allowing surface water to drain through the profile. The diagrams below show a cross section of a red porous court, illustrating both material and depth of layers.





Red porous courts offer a surface suitable for a large range of players and have a reputation for being gentle on the body, with a higher ball bounce and opportunity for longer rallies. However, they demand a much higher level of maintenance than most other court surfaces, requiring significant volunteer hours and/or money to keep them in a playable state.

It is vital for red porous surfaces to be frequently groomed and maintained to ensure optimal playing characteristics and to maximise the longevity of the surface. The consistency of play and permeability of the surface will be negatively impacted by poor maintenance practices.

When choosing a red porous court the owner/manager must consider the time and cost associated with maintaining the surface. Dedicated volunteers or a professional red porous specific maintenance company will be required to keep the facility in optimal condition.

Without adequate maintenance, a red porous court can quickly deteriorate into an unplayable surface if it becomes too dry, wet, slippery or uneven. Lack of proper and regular court maintenance leads to a dramatically reduced lifespan, ongoing costly repairs and premature replacement.

The surrounding environment should be considered as it impacts the amount of maintenance a red porous court requires. For example, if the court is constructed in a damp environment with poor drainage, or has large trees positioned close to the court, it will require much more frequent maintenance due to the likelihood of increased weed, moss, algae, dirt, leaf and debris removal.

Asset owners/users need to make provision for future expenses including ongoing maintenance and the eventual renewal/reconstruction of the surface, to keep the courts playing at their best.

It is wise to request and follow the court construction contractor's maintenance guidelines and use the products and methodology they recommend. For newly constructed courts, the contractor should be able to supply this information upon request.

Planning

It is important to maintain a consistent and safe surface by preventing premature wearing of the red porous surface and maintaining its permeability. The lifespan will also be increased by adopting a 'proactive' regular maintenance regime that ensures the surface doesn't become contaminated by debris and weeds. This includes continually grooming red porous surface to remove debris and evenly spread the toppings to ensure an even and consistent surface. A periodic extensive rejuvenation to remove surface build up and repair low areas is also highly recommended.

Many tennis courts receive ad-hoc reactive maintenance whereby the asset owner only grooms the surface once the effects of lack of maintenance start to impact the playability of the court surface. This can lead to a surface that has premature wear and quickly becomes unplayable.

Although much of the maintenance can be carried out by club personnel daily, weekly and monthly, it is still appropriate to engage a professional court maintenance company at regular intervals to rejuvenate the court surface. This ensures small issues don't become larger and more expensive to deal with.

It is recommended that the asset owner inspects and schedules a regular maintenance regime that includes both club volunteers and engaged professionals. Major maintenance should be scheduled in the

off seasons. It can take a considerable amount of time to seek quotes and schedule the maintenance works. Therefore, planning is essential to avoid disruption to club scheduling.

As a guide the following process is recommended:

- Inspect the courts and identify any issues, such as slippery areas, trip hazards, excess surface build up, worn areas, weed growth, debris, drainage issues, trees overhanging the courts and/or lights, etc.
- Write a thorough works brief for the purpose of seeking quotations for the works.
- Ensure a court contractor provides an itemised quotation, outlining exactly what the works will include and the cost.
- Engage the successful contractor to complete the works, taking into account their experience, time taken to complete the works and price.
- Allow adequate time and access for the contractor to complete the works. The contractor should outline the time required and how long the courts will be out of action.

Contact Tennis Victoria if you need a facility assessment or advice on works required. Selecting suitably qualified and experienced contractors will provide greater certainty of achieving a positive outcome.

New Court Maintenance

New red porous courts are sensitive to extreme damage if they are not gradually 'played/worn in' by limiting play and carrying out specific 'new court' maintenance.

Adhering to the following recommendations to 'wear in' new red porous tennis courts will significantly increase the likelihood of the club using the courts to their full potential within the recommended timeframes.

Limited Play

Start with limited low level junior play and slowly increase the level of play and regularity to include older age players, older juniors and then regular competition play. This should be gradual, and if at any time the court shows any signs of deterioration, the level and intensity of use should be decreased or immediately stopped and the courts professionally assessed. Higher level men's and women's competition play can commence once all parties are happy with the condition of the courts. There should be no coaching, portable equipment or mechanical ball machines or the like on the new courts throughout the three month 'wearing in' period.

Players

Before play, at the end of each set, and at the completion of play, players must:

1. Drag (bag) the entire court, including run-off areas, from fence to fence.
2. Ensure there are no debris or foreign materials caught in the drag mat that could gouge the new court surface.
3. Thoroughly hand water the court using a hose with a consistent fine spray from fence to fence. The aim is to make the court quite damp but not enough to puddle. Ensure the water does not displace the surface material as this protects the court base.

Club

The club must drag (bag), water and roll the entire court, including run-off areas.

- Every second day for the first week.
- Every third day for the second week.
- Every fourth day for the third week.
- Every week thereafter until the expiration of three months.

The works must include the following:

1. Drag (bag) the entire court and run-off areas in both directions from fence to fence.
2. Saturate the entire court and run-off areas by gentle hand watering using a hose with a consistent spray in a downward direction, being careful not to displace the protective surface material.
3. Sweep the lines lightly so that the broom sweeps the lines only and does not sweep away or gouge the surrounding court and run-off surface.
4. Roll the court in two directions at right angles from fence to fence using a non-vibrating roller of at least ¼ tonne in weight.

Every 3 – 4 weeks 'service' the baseline areas by carrying out the following:

1. Gently scrape all 2.5 mm particles back approximately two metres behind the baseline tape.
2. Spread approximately one wheelbarrow of new brick dust behind the baseline tapes.
3. Water the new materials in, allowing fines to settle.
4. Bag surface and let settle.

Expert tips:

- Ideally two people should be involved in the above processes, so that one waters as the other rolls.
- The bagging works should be undertaken using a 1.8m extension rope or chain attached to the existing bag mat chain to ensure the leading edge of the mat acts as a screed, ensuring any high spots are smoothed out. Should any low spots appear, these should be immediately filled with porous fines and smoothed out.
- A rain gauge should be purchased and installed at the side of the court. Each day a reading should be taken and recorded on a 'Maintenance Schedule for Wearing in Period'.
- The new courts are highly porous allowing water to pass quickly through the surface. Each section should be saturated until the water begins to appear on the surface. Once the water disappears, rolling can commence.
- Watering and rolling are not to take place if any surface water is showing or if the surface shifts underfoot.
- If the club does not have the volunteer resources to ensure these necessary tasks are undertaken to a consistently high standard, then a professional court maintenance company should be engaged.

Providing these instructions are carried out, the settlement and hardening of the surface crust will provide an excellent base when full competition play commences. Remember that water is the essential ingredient to good surface preparation.

We recommend engaging a professional company to look after the courts for three months post installation to ensure the courts are settled in adequately. This can cost anywhere between $3000-$5000 but is well worth the investment. The maintenance team may also offer advice to club members on how to look after the court surface on an ongoing basis.

Regular Maintenance, Costs and Timing

Clubs and Councils should budget to have the court facility regularly maintained. A sinking fund is recommended to ensure works can be completed when they are required. This will allow the asset owner/user to keep the court surface in optimum playing condition and maximise the court's lifespan. Red porous tennis courts require specific care to maintain a uniform and consistent playing surface, decrease the level of ongoing maintenance required and increase their longevity. The following works, cost estimates and timing can be used as a guide.

In addition to the new court 'must do' items above, a good ongoing maintenance regime should include daily, weekly, monthly and yearly maintenance. Each stage complements the next, reducing overall costs and increasing the court's playability and lifespan.

Daily/as often as necessary

(no cost - club volunteers and players)

Players

Before play, at the end of each set, and at the completion of play, players must:

1. Drag (bag) the entire court, including run-off areas, from fence to fence and ensure there is no debris or foreign materials caught in the drag mat that could gouge the new court surface.
2. Sweep the lines to remove toppings.
3. Thoroughly hand water the court using a hose with a consistent fine spray. Ensure the water does not displace the surface material as this protects the court base.

Above left – use a broom to drag the mat, this keeps the front bar down and helps with even distribution of the toppings.

Above right – combined drag and leaf litter removal mat.

Weekly, or as often as necessary

(no cost - club volunteers)

Weekly maintenance by the club will improve the playability of the courts and greatly increase the lifespan of the surface.

1. Removal of debris

Remove all debris including leaf litter as it collects. Debris will contaminate the loose surface material and make redistribution of the material across the courts difficult.

2. Redistribute surface material evenly

Avoid the build-up of excess surface material in the run-off areas, in the centre of the court and where court equipment (e.g., hoses) are located. Screed the surplus material from the built-up areas and court perimeter. Sieve the material to remove large debris and extraneous matter and redistribute the porous material evenly over the court and water the surface thoroughly.

Rolling when damp-wet is critical to binding this material to existing materials.

All surplus materials should be carved from the court and stockpiled where possible to redistribute when required.

3. Water the courts

Both old and new courts should be flooded weekly to settle disturbed fines and to allow crust to set.

Coaches should concentrate on watering high traffic areas at least 30 minutes prior to coaching and add required amounts of water between each lesson.

4. Removal of stormwater from courts

Never sweep or drag off water with brooms, bags or mats as this removes toppings and exposes the underlying scoria and causes any dips in surface levels to become worse. Do not use a fork to make holes in the surface. Any attempts to correct drainage issues should only be made by experienced people and needs extreme care. Water is best removed with sponges or absorption rollers, which remove relatively small amounts of toppings only.

5. Removal of weeds

Spray any small weeds (preferably with a continuous sprayer) with an approved weed killer (Zero/Roundup) as they appear. Do not pull weeds out and this will disturb the surface and bring the underlying scoria material to the surface resulting in soft spots and failures.

6. Treat algae

Algae should be treated as it appears. Algae normally appears in areas where drainage is poor and/or the court surface remains shaded for an extended period (e.g., to the south of a building or where large trees shade the court). An effective way to treat algae is to spread regular pool salt over the affected area or use of an approved algaecide.

Algae growing under net line

Weeds, moss and algae thrive in the following conditions:

- In damp environments and where shade overshadows the court for extended periods ie: south side of a building or tree.
- In open sites that are dry and dusty.
- In treed areas where debris and leaf litter settles.

As a rule of thumb, if the court is in an open built-up area with little overhanging trees with well-maintained green surrounds, you will only need to apply algaecide once a year. However, this may increase to three times a year for a shaded/damp/dirtier area. Courts shaded for extended periods of the day by buildings and/or large trees may require frequent applications.

After the application of algaecide, any moss or algae should die within two to three days and turn brown. This dead material should then be carefully removed from the court through the court grooming process and a second application be applied to the growth spots. When there is a small break-out of spot algae, diluted liquid chlorine or sprinkling salt on it can be used to check the growth.

Monthly or as often as necessary

($500 per court for materials)

Inspect the courts at monthly intervals to identify issues that can be addressed quickly and to forecast works required. This will maximise the lifespan of the court surface and allow adequate planning time.

1. Base lines

The court baseline areas need the most regular attention as they receive the most wear and tear. Scraping back from the lines, ramming down the lines and regular additions of new porous fines to the baselines should be made. Approximately one barrow of fines at each end, every three months, should be allowed for, spreading a little evenly each month and watering thoroughly each time – timing depends on the amount of court use. This will minimise hollows forming behind the baseline tapes, etc.

The area from the baselines to the fence requires twice the amount of water compared to the playing surface to ensure consolidation of the base and surface materials. The addition of new material should always be watered and rolled in.

2. Build-up around court perimeter

Controlling build-up of material around the entire perimeter of the court, exposing the perimeter edging, will improve the playability and reduce ongoing maintenance. This is completed with a long handle square mouth shovel. One to two wheelbarrows should be carved from round the edges and this material should be re-distributed behind the baseline tape. To build up a low-lying area this must be completed over the course of a few weeks with heavy watering and levelling between each application a few weeks apart.

When applying fines from the perimeter back into baseline/low lying areas it is important to remove all 2.5 mm particles from surface prior to spreading materials. Once fines have been spread, levelled and flooded, the 2.5 mm particles should be distributed on top of the levelled fines to ensure the surface doesn't become soft in low lying areas.

3. Roll the courts

Rolling of the entire court and run-off areas should be carried out every three months.

4. Drainage clean out

All surface drains should be emptied every month to ensure discharge pipes remain clear, are not blocked with brick dust build-up and allow free flow of water.

Expert Tips:

- If club personnel are unsure what material build up looks like, use the corner of a shovel, checking the thickness of clay on top of the scoria sub-base. If materials are thicker than 7-10mm, is considered build up. A square mouth shovel is required to carve build-up from the surface neatly.
- Redistribution and topping up of surface material, bagging and watering will be required after heavy rain events.
- Where the crushed rock sub-base is very visible in high traffic areas, all fine scoria particles have been dislodged over the court's life. This generally indicates signs of serious wear and tear. Courts may require isolated or full reconstructions if this is the case. Engaging a court maintenance expert to assess and provide advice is the best course of action.
- Normal maintenance of a court surface requires 1 tonne (20 bags) of fine porous surface material per court each year.
- At no stage should a vehicle be driven on a red porous court without appropriate surface protection. Any top-up material needed for maintenance works should be brought onto the courts in a wheelbarrow.

Every six to twelve months

(allow $4,000 per court for a professional, assuming the club has undertaken regular monthly club maintenance)

Major maintenance and surface grooming works and repairs

The timing of the major maintenance work will be greatly reduced if the daily, weekly and monthly maintenance regime is followed. It is a good idea to engage a professional to do the major grooming works annually, noting that some clubs do invest in the equipment and undertake the works themselves.

Depending on the skill and/or availability of club personnel, a major rejuvenation of the court surface is best completed by a professional red porous court builder. In addition to the rejuvenation works, they can assess the condition of the courts and provide club volunteers with feedback and tweaks to the ongoing maintenance regime.

Areas of heavy use (such as the baseline area) may require rebuilding once or twice over the life of the court and will need to be budgeted for. These works can be forecast in advance by the surface expert to prevent disruptions to the club's playing schedules.

Issues that should be addressed as required are:

1. Uneven surface distribution
2. Excess surface material in the run-off, court corners and perimeter
3. Line tape - height, condition and trip hazards
4. Drainage inefficiencies
5. Trees overhanging the courts and/or lights etc.
6. Worn areas, dips or low areas in surface. These form puddles and are commonly referred to as 'bird baths'. These should be repaired if they form, to continually correct surface levels and prevent further deterioration.

Any major court reconstruction, low area remediation and/or repairs should be undertaken by a professional court builder as they have the appropriate equipment and skill required to key and bed in the layers of the red porous court.

Every two years

(allow $800 per court)

Supporting infrastructure

It is important that the supporting infrastructure is kept in good working order to minimise deterioration and keep the courts safe and secure.

Items to check:

- Nets and net posts should always be kept in good working order. Lubricate all moving parts (winders, etc.) on net posts and ensure posts are not leaning so nets can be set to the correct height.
- Nets should be free of holes and torn tapes. Net repairs can be undertaken by net and mesh suppliers as needed.
- Fencing and gates should also be free of holes, curling chainmesh and loose wires. Gate hinges need to be lubricated and free moving.
- Fencing is retaining its shape and strength when properly fitted with supporting top and bottom rails and the required three strands of tensioning wires.

Every three to five years

(allow $1,200)

Watering/irrigation systems

Conduct maintenance on the court watering system to ensure appropriate water flow and good coverage is maintained. A specialist contractor may need to be engaged to undertake maintenance, adjustment or repairs.

Every four to six years

(allow $2,000 per one to three courts)

Lighting infrastructure cleaning

Ensuring light fittings are well maintained will maximise lighting output and provide the best condition possible for night tennis. Items to address can include:

- Engaging a contractor to clean all light fittings to ensure optimum light output. Works usually require a travel tower/scissor lift to reach the height of the towers, but weight should be kept to a minimum and the court surface always protected.
- Trimming trees or vegetation away from the towers to prevent shadowing on the courts.
- Ensure all light fittings are working and replace when needed.
- Re-aim light fittings to ensure uniform lighting across the court.

Every ten to fifteen years

(allow $12,000 per court)

When undertaking major court renovations or reconstructions only use a reputable red porous court contractor. The time between rebuilding high wear areas is approximately ten to fifteen years and total reconstruction approximately 30 years, depending on the court's usage, maintenance regime, the court surrounds, environment, and climate.

Rebuild of high wear areas or court reconstruction

Works may include:

- Remove existing court lines and pavement/surface.
- Rebuild the extensive court layers including surface toppings.
- Install the lines ensuring compliant court dimensions.
- Undertake a three-month new court 'settling in' program as per recommendation within this document.
- Adopt a long-term maintenance program and allow for the associated costs.

All clubs should have a sinking fund to fund the ongoing maintenance regime, associated repairs, high wear area rebuilds and full court reconstruction at the end of a court's expected lifespan (~30 years).

Drainage

Poorly drained courts can lead to premature wear and greatly reduce the lifespan of the courts. Surface ponding can lead to premature deterioration of the court surface and can indicate maintenance practices may need review.

All court drainage infrastructure such as swale drains, pipes, pits, open and grated drainage channels as well as surrounding sub-surface (agi) drainage should be flushed out regularly to remove any surface toppings, debris build up and blockages.

To help the drainage system operate efficiently ensure the court lines are flush with the surrounding court surface to allow water to pass through the line areas to the drainage system. The courts, including run-off areas, should be free of surface build up to allow water to drain easily into the drainage system.

Watering

The most important element of red porous court maintenance is correct watering. A continuous and reliable water supply is required to keep moisture levels adequate to maintain optimal playing performance and surface longevity.

As a minimum, the courts should be watered:

- Before and after each set.
- Thirty minutes before coaching and between each lesson.
- Each night during the warmer months (timed sprinklers).
- Before and after bagging and/or rolling.
- During and after redistribution surface toppings.
- Courts should be flooded weekly to settle disturbed fines and to allow crust to set.

The courts must be kept damp to protect the court surface from damage but also to vastly improve the playing characteristics.

- Give the court a good water from fence to fence (not just a sprinkle to settle the dust). The court should be quite damp but not enough to produce puddling. The ball bounce will be greatly improved, and players will get increased traction. Five minutes of watering each end when totally dry should be used as a rule of thumb.
- When watering, always spray upwards and allow the droplets to fall like rain. Watering downwards may damage the courts.

Hand watering using a good length of 20mm reinforced hose service is required together with correct water pressure and sprays or nozzles to provide a fine spray. Heavy watering breaks the court surface and exposes the scoria foundation so must be avoided.

Once new courts have completely settled in and the courts have been approved for all levels of play, an automatic sprinkler system is an efficient way of maintaining an even cover of moisture over the surface, especially during the warmer months. Automatic controls should be set on a two-cycle program in summer and a single cycle in winter, thus enabling better penetration of surface and low water loss due to evaporation.

In windy conditions, hand watering may need to be undertaken to supplement the sprinkler system, to ensure an even coverage is achieved to minimise the surface toppings from blowing away and the court drying out.

On-line video tips

Red porous expert court builder John Richards from ET Richards provides tips and demonstration on how to maintain a red porous tennis court at Glen Iris Tennis Club. Click on the following link to view.

En-tout-cas court maintenance

Maintenance equipment

Ideally, clubs should have purpose-built storage shed to accommodate the surface toppings and red porous maintenance equipment. The following list details standard tools for red porous court maintenance.

- Drag mats plastic matting 1.8m - 2.7m wide
- Court scrapers for levelling
- Line/court rammer
- Court line sweep flicker type or hand broom
- Pull along leaf litter collector, such as a leaf litter drag mat (never a blower as this will move the fine red porous topping) to collect the leaves and debris
- Heavy roller split type weight 250kg
- Absorbent type roller for removing water
- Leaf sweeper with rotating brushes and catcher
- Herbicide and fungicide along with associated protective equipment

Signage

Placing informative signage at various places around the facility allows the club to communicate the terms of use and court care to all users. The signage should be easily visible at each court's entry and exit point(s) and be consistent throughout the facility.

Suggested wording for your court signage is:

Our red porous tennis courts require specific care to ensure they are kept in good playing condition for everyone's enjoyment. Please follow these requirements when using these courts.

- Wear approved flat sole tennis shoes only (runners/trainers with a ripple sole or heel are not permitted as they damage the court surface).
- Hand water the entire court to the fence lines prior to the commencement of play.
- Bag and hand water the courts from fence to fence between each set or every 30 to 60 minutes.
- Bag the court from fence to fence at the end of play.
- Do not drag the hoses over the courts playing areas.
- Hang drag mats and brooms on the fence or in the area provided.

Examples of effective court care signage are included below.

How to reduce court maintenance requirements

The surrounding environment and conditions can greatly influence the extent and cost of a court's maintenance. Courts subject to a moist environment and heavy airborne pollution such as dust, tree leaf litter and traffic fumes, are classified as high maintenance areas. There are several actions an asset owner/user can do to reduce maintenance needs.

1. Install windbreaks to the court boundaries wherever possible. Note that fences must be structurally designed to withstand additional wind forces caused by windbreaks. Windbreaks will minimise the amount of surface toppings lost and lessen the drying of the court surface.
2. Address drainage to ensure courts remain draining efficiently. Surface water and surrounding ground water must be captured and directed away from the courts.
3. Minimise dirt and dust on the court surface by landscaping the surrounding grounds and keeping them green and well kept.
4. Lop any tree branches or trim all vegetation away from the court area to minimise the shade, reduce debris on the surface and reduce any stress on the fencing and lighting infrastructure. Heavy plantings on the northern and western sides can create dark, damp areas on the court for long periods of time, which in turn encourage algae growth and a very slippery surface.
5. Do not plant trees within approximately 20 – 30 metres of the courts and never plant large or invasive species.
6. Ensure tree root barriers are installed to protect the court pavement from tree root invasion. An arborist should be engaged to provide advice for existing large or mature trees.
7. Construct paths or concrete entry points at the main gate entries and wipe shoes before entering the court to prevent stones, twigs or debris being carried onto the surface.
8. Erect signs at the court entry points, listing the most important dos and don'ts of court care.

Summary of maintenance costs and timing

Frequency	Item	Cost	Who
Daily	Bag and water	$0	Club
Weekly	Inspection and Minor Grooming	$0	Club
Monthly	Minor grooming and materials	$500 per court	Club
Six months to one year	Major grooming and repairs	$4,000 per court	Specialist contractor
Four to six years	Maintenance of supporting infrastructure, lighting and watering system	$5,000 per one to three courts	Specialist contractor
Ten to fifteen years	Rebuild court high wear areas	$12,000 per court	Specialist contractor

Estimated costs are based on 2025 market rates and assume a court will be maintained. Major grooming and/or rebuilds will be required more often and at a greater cost if the daily, weekly and monthly maintenance regime is inadequate.

This guide has been prepared by 2MH Consulting, a provider of facility advisory services to Tennis Victoria.

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For more information on 2MH Consulting telephone (03) 5422 2176 or go to www.2mhconsulting.com.au.