THE ULTIMATE GUIDE TO HARRD COURT

MAINTENANCE, REPAIR, & RENOVATION





THE ULTIMATE GUIDE TO HARD COURT MAINTENANCE, REPAIR, & RENOVATION



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This ebook covers issues that range from private courts, homeowner association courts, private clubs and public courts.

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SIGNAGE - POSTING RULES

Private club members typically know, or have posted on a bulletin board, policies as to when courts are open and closed, how long players have use of a court during busy times, and policies such as no black soled shoes permitted, no food or drink, no bicycles or skateboards, etc. – but homeowner associations and public courts also need to have this information posted to eliminate problems before they start.

Getting foreign materials into the court surface can be a problem because the court surface is porous and "breathes" to allow moisture vapors in and out. This porosity also means that stains can enter the surfacing and leave permanent marks. Not allowing food and beverages onto the court is a good start. This should be followed by allowing only white rubber soled tennis shoes, no bicycles or skateboards or other wheeled toys as black marks left behind cannot be removed.

COURT CLEANING

The single most important protection that can be used to extend and prolong the life of a hard surface is regular washing. Grit and dust in the air settles on a court. Twisting and running shoes which act like sandpaper, grind down the surface and wear it away. Club courts need to be cleaned as often as possible and the same is true for public courts which receive frequent usage. The unfortunate fact of life is that most public courts never get washed. Homeowner association and private courts, again subject to usage, need to be washed every few weeks to once a month. A high volume low pressure wash is recommended.

THE RIGHT CLEANING ACCESSORIES

Routinely, we see courts damaged by the use of inappropriate means for cleaning or getting rid of puddles. Brooms do not belong on a court and should only be used as a last resort for leaves and branches, when a blower is not available. The right way to remove water from a puddle is with either a blower, squeegee or with a sponge roller that both absorbs and pushes the moisture out of the puddle.

Properly maintaining a hard surface court is hand labor and doesn't lend itself to automation. The complete washing of a court and sponging of any small residual puddles can be done in less than a half hour. This process is also aided by having multiple hose bibs with ready access to each of the courts. Quick-disconnect couplers work well as they tend to eliminate unauthorized use.

TREE MAINTENANCE

A well-designed court will not have trees located too close. Many hard surface courts do have trees, and they present a number of maintenance problems. The most visible are the droppings of leaves, sap, twigs, bark and occasional branches. Sometimes elimination of the problems requires either removal of the trees or significant branch cutting. If neither of these options are implemented, regular removal of the debris will be required. One of the most irritating problems is fallen sap that sticks to the surface, is not water soluble and, therefore, just stays and builds up. A related issue is that many leaves will stain a court surface as they become wet and then bleach out with a hot sunny day. Some of these leaf stains will eventually bleach out of the surface again, but they leave a dulled mark in the surface.

Leaves allowed to accumulate on a court also represent a liability issue because a player, running back to reach a high, bouncing lob can readily slip and sustain injuries sufficient to create claims, increased insurance premiums, etc. Adjacent trees also need to be watched closely for roots seeking moisture under the slab of a tennis court. We have seen roots travel over 20 feet in order to get to moisture under a tennis court. Obviously, the type of root structure that a tree has is of great importance. Some have a tap root that goes virtually straight down and others have very large surface roots and still others have both. Roots under a court will raise, and eventually crack, a court surface. You are best advised to approach the problem before the symptoms get out of hand. This entails either tree removal or installation of a root barrier.

WINDSCREENS

The greatest enemy of windscreens is exposure to water from a sprinkler system. This water exposure causes staining of the windscreens and accelerates the ultraviolet ray's deterioration and tearing of the material. Water should not be permitted that close to the courts because it can do a great deal of damage.

Windscreens do not need to be washed and boomed down. Should you need to clean them, do so uniformly, using just a garden hose.

You can add to the life of your windscreens by making certain that they are firmly attached to the fencing at intervals not exceeding 24". A section that is loose and able to flap will, very rapidly become beaten to shreds and begin to tear.

Concerning windscreens, buy either the cheapest (actually truck tarp material) and plan to replace them frequently or, get good quality open mesh material, rather than the solid. The low-cost material doesn't need a hem or grommets, but a better material needs a reinforced hem that is quadruple sewn.

When you replace windscreens, try to do all of them at once, as one new windscreen suddenly makes all the others look much older and in worse condition than they really are. Black windscreens have twice the life expectancy of any of the other colors. The best value (cost versus life expectancy) in windscreens is open mesh polypropylene which is border hemmed and has grommets approximately every 24".

TENNIS & PICKLEBALL NET POSTS AND NETS

Many older courts have bent, damaged or rusted net posts with exterior crank systems that are rusted and barely operative. Unfortunately, most of these net posts are set directly into concrete or asphalt and replacing them means jack hammering and damaging your playing surface. While you can get replacement cranks and try to straighten the bent poles, the outcome is seldom satisfactory.

The old canvas and cord nets are still available, but seldom last much more than a season, as they are victims of both moisture and ultraviolet rays. The best value in nets

is found in those with a nylon upper trim which is quadruple sewn with nylon thread, has nylon braided material to form the net, a vinyl steel clad cable and a quadruple sewn bottom seam at the base.

In Florida, nets get year-round use and are not, therefore, subject to winter removal. There is very little to do with respect to preventive maintenance; however, it is helpful to have a canvas needle and some white nylon thread to reinforce failing seams and get many extra months out of a net.

BASKETBALL GOALS

Florida's weather can be hard on anything placed outdoors and basketball goals are no different. They should always be included in the maintenance schedule to look for rusted areas that may rust through the metal and collapse and cause injury to players and the court surface. Depending on the back boards composition they can become rusted, cloudy (some acrylic backboards), or loose with play. Many of today's basketball rims are breakaway rims and they too can become rusted and loose over time. In many cases these small compnet repairs can be done to the existing goals but others may need to be replaced entirely. Many times we see that the pole padding is gone or deteriorated to the point where it becomes unsightly or missing. These pads are very important as they provide safety to players in the event that they crash into them, without them they can cause serious injuries to players. Be sure to ask your sport specialist what is best for your situation.

LIGHTING - EXISTING

If you are happy with the quality of your existing lighting, you will want to do everything you can to properly maintain it and maximize its effectiveness. Bulbs, just like old tennis players, don't shine the way they used to. Therefore, you should have a regular program of bulb replacement. The means of access to 20' or higher fixtures can be solved by scissor lifts, scaffolding or a tall A-frame ladder. Beware of these leaving tread marks on an asphalt court. At a minimum, the lower glass and the inner reflectors should be cleaned once a year. You will be amazed at the sudden improvement in light. These things get covered with dirt, grime and dead bugs. While this cleaning is taking place, it also makes sense to install some inexpensive strips of

one side gummy insulation material you would use to seal cracks around a door or window, around the light housing door that opens which will minimize dust and insect entry.

You will also notice that light housings pick up overnight dew and then drop it onto the court below. If once a year light cleaning includes some spray paint, where needed, you can prevent the rust staining of your court that will otherwise result.

You will find that one-at-a-time bulb replacement is costly unless you actually own the right equipment to do it yourself. Many clubs find that it makes sense to set up a program to replace all the bulbs at one time. They end up with better lighting and a lower effective cost than just replacing bulbs when they burn out.

LIGHTING - REPLACEMENT AND UPGRADING

Many older courts have the old-style lights which have baseball or parking lot types of bulb housings that point up and out at an angle. This type of lighting is no longer favored as it is not energy efficient, and does a very inadequate job of lighting the courts.

If consideration is given to a lighting upgrade, it should start with a photometric analysis, a sectioned diagram of your court(s) showing the actual foot-candles of light you are presently getting. We then take your present pole placement and, via computer, see what can be done to improve the lighting through better fixtures and with or without the addition or replacement of poles. This normally produces a number of options that will let you relate costs to FOOTCANDLES, versus what you have at present.

It is very helpful if the individual or committee involved can come to a determination as to the level of desired lighting. This becomes a target for the computerized analysis of the best ways to achieve it.

The bottom line on court lighting is that you want a MINIMUM average of 60+ footcandles on the playing surface without any dark zones. This level of lighting will normally satisfy from the youngest to the oldest players, virtually all levels of play and can also keep the neighbors happy. The neighbor issue is a significant one, because the newer light designs shine directly down onto the court with a minimum of overspray.

When you are thinking about the installation of brand new lighting, be aware that it might require the upgrading of your electric panel and service to accommodate the new energy demand. While this needs to be a potential concern, the opposite can sometimes be the result. Better and improved fixtures give better light and draw less current. New lighting should also be planned in conjunction with any court renovation or resurfacing because this may also entail having to excavate for conduit, poles, etc. and this can be accomplished inexpensively, in conjunction with resurfacing.

COLOR COATING

The symptoms of a need for new color coating are when colors are very faded, specific areas are worn through, the court has alternate fast and slow areas or a combination thereof. In the real world, most asphalt & concrete courts are scheduled for color coating well before any of these symptoms occur. In many cases, cracks that need patching will move up the date for color coating. We will talk about cracks and patching in the next section.

Our experience has been that it takes a new worker a minimum of 2 years of day-in-and-day-out experience in color coating before he or she can do a reasonable quality of work. Consequently, you need to use some judgment when it comes to the person hired to do the work. It is more of an art form than a science. All of the materials are applied with a squeegee, not a roller or a paint brush. The mixing of materials with water to get the recommended coverages during the temperature conditions encountered at the time of application, is again an art form.

We are all familiar with "blind items". These are items about which it is really impossible to tell value. Different merchants offer what appear to be the same thing, but at great variations in price. Color coating is this type of a "blind item". There are very low cost and low-grade materials on the market and there are applicators who water down the product, skimp on the number of coats and use inexperienced personnel. While their courts look good when they leave the project, the courts simply don't have the life expectancy that they should. The sand needs to be thoroughly screened and of relatively uniform size. This is hardly the type of material obtained by one local applicator who gets his sand from nearby beaches, where he runs it through a sieve and bags it.

All the acrylic color coating materials are diluted with a certain amount of water to match the temperature conditions at the time of application. Applicators can easily dilute the product down so that the actual amount of coating material is minimal. Watered down paint on a house will have the same problems as watered down acrylics on a tennis court. You need to specify that they be applied per manufacturer's specifications and be prepared to either audit the correct application or trust the reputation and integrity of the firm that you have hired. You must know that the work will be done correctly and that if there are ever any problems, this firm will take care of them.

When you have your court(s) color coated, it is important that you get a written, minimum one-year guarantee which covers peeling, flaking, delamination or surface cracking (don't confuse this with cracking of the asphalt).

Color coating is a place where it pays to use premium grade materials and experienced personnel. Consequently, your best value will normally not be the lowest bidder. Inferior materials or quality materials incorrectly applied will be characterized by sand working loose, a rapid fading of the brightness of the colors and wearing of the materials.

REPAIRING CRACKS, UPHEAVALS AND DEPRESSIONS IN COURTS

When you get cracks in an asphalt court, it is vital to understand that you are looking at a symptom, rather than the problem. Patching a crack and recolor coating is going to temporarily hide the symptom, but will do nothing to prevent it from recurring. You might optimistically disagree with the preceding statement, but we can assure you it is 100% accurate, even though a court will look perfect after patching and recolor coating. The cracks will return!

The following represents a listing of the types of cracks that you may encounter, followed by a brief description of each. Following these "definitions", you will find that the next section explains the most probable causes of each of the types of cracks and the alternatives with respect to repair or renovation.

- HAIRLINE CRACKS very narrow, both sides of the crack level; the crack has been there for a long time and has not grown in either length or width;
- VERTICAL DISPLACEMENT CRACKS cracks of varying widths where one side of the crack is higher than the other;
- UPHEAVAL CRACKS a crack of varying width where both sides are uplifted;
- **DEPRESSIONS** low spots that are saucer shaped in varying sizes;
- UPHEAVALS high spots, like an upside-down saucer, with the areas of varying sizes;
- LINE CRACKS cracks that are primarily on, adjacent to or follow the playing lines;
- NET POST AND CENTER TIE DOWN CRACKS circular cracks around these areas;
- GROWING CRACKS OF SIZABLE LENGTH varying width, growing in width and can be measured as being wider when the slab is cold and narrower when the temperature is higher;
- CRACKS THAT ARE PARALLEL TO AN EDGE OR END OF A COURT these cracks are clearly
 parallel to an edge or end of the court and over a period of time they develop into
 multiple rows, a few or several inches apart, and reach back into the court
 surface;
- **CRACKS THAT SEEP WATER** varying widths and length; water comes out of the cracks for a few days after it rains and there are normally slight stain marks left from where the water has evaporated and left calcium or other deposits;

- NICKEL SIZED UPHEAVALS THAT BLEED these range from dime to quarter sized upheavals (bumps) that grow; eventually, the top breaks open and they bleed and stain the court with a brownish red color;
- SLIGHT UPHEAVALS THAT HAVE AN OPEN HOLE CAVITY they start out as described just above and ultimately become slight upheavals with an open core, much like a miniature, collapsed volcano.

We will deal first with concrete courts and then address asphalt courts. Concrete courts that develop cracks seldom become vertical displacement or very wide as the steel rebar reinforcement holds the slab together. An exception to this is where a major root has been growing for a significant period of time. This can cause vertical displacement upheavals and bend the rebar (and sometimes actually break it), and in the upheaval process, the cracks can become relatively wide. If the crack is relatively short in length (not all the way across a section of court), it normally means that it has not become an expansion crack, one with significant movement related to temperature changes. These cracks can normally be completely sealed using a specialized concrete epoxy adhesive that bonds both sides of the crack together. The joint itself becomes stronger than other sections of the concrete. After the epoxy is applied, color coating completely hides the repair.

If a concrete court has developed an expansion crack that opens and closes with temperature changes, an epoxy application will only cause the court to crack again right next to where the original crack was located. The movement of the slab is not to be denied. In this instance, you fill the crack with a permanently pliable waterproof material that has a sanded upper coating. This material bonds to both sides of the crack and the sand permits the surfacing materials to bond to it. This pliable material allows the crack to expand and contract, yet maintain a watertight seal to stop entry of water to stimulate soils movement.

HAIRLINE CRACKS are very narrow and, typically, relatively short in length. These cracks (that have not grown in some time), can normally be filled with an asphalt emulsion material which usually prevents their return. In many instances, they are caused by the evaporation of oils and binders in the asphalt. The surface material has shrunk and cracked. These cracks are surface cracks and usually do not go all the way through the asphalt slab. This type of cracking is prevented in driveways, roadways and parking

lots by slurry sealing that keeps the asphalt "tight". The color coating and surfacing materials on a tennis court perform a similar function.

VERTICAL DISPLACEMENT CRACKS are dangerous on a court because tripping becomes a major hazard. They are almost always the result of underlying soils movement, caused by expansive soils having varying degrees of moisture. This action has pushed up the surface, broken the asphalt and the course of "least resistance" is to allow one side of the crack to be lifted. The message is, that you have underlying soils problems and moisture is getting into the soils. Because the rupturing of the asphalt is so complete, temporary grinding down and patching is virtually guaranteed to fail. You need to address the moisture getting under the court (the least expensive approach) and/or digging out the court, reworking the soils and putting down new asphalt or you can consider remedial moisture remedies and what is called an **OVERLAY** (see later discussion below).

UPHEAVAL CRACKS are usually indicative of root damage. This is a root growing under the slab and lifting the asphalt to the point of cracking. The upheavals and cracks normally have a pattern that can be followed to determine the location of the offending tree. We recently had a mystery court with classic upheaval cracks (indicating roots) but we found nothing but lawn adjacent to the court. Later, the owner "remembered" that a tree had been removed a few years earlier. The solution is removal of the asphalt, excavation of the root (you can't leave it to rot and collapse the asphalt), compaction of all of the soils and then hot patching with new asphalt. Attempting to bond new asphalt to old almost invariably means that a crack will appear between the two surfaces.

DEPRESSIONS can be paving defects that were not fixed at the time of surfacing or, more likely, caused by underlying soils that have settled. Underground soils will settle because they were not properly compacted in the first place, or because water is flowing into them and erosion or natural compaction is taking place. The good news is, that if it isn't water related, once the settlement has taken place and stabilized, the depression on the court can be filled in a number of different ways and then be followed by color coating without a high incidence of recurrence. Carefully investigate depressions along the side of a court area as these can also indicate settlement of a hillside or some other type of earth movement problem.

UPHEAVALS in many cases are underground soils that have expanded, but not enough to crack the surface. Look to soils moisture related problems or excavation and remedial soils work. If the situation has stabilized, it is possible to grind down the uplifting or heat up the asphalt to remove a sufficient amount to level the area, followed by color coating. The other major cause of upheavals is underground growth of a root or some form of plant life.

LINE CRACKS are normally the result of the application of too much line paint which causes a heat differential from the lines dramatically reflecting more sunshine (and therefore more heat) than the adjoining surfaces. The resulting varying rates of expansion cause the asphalt to crack. If the cracks are limited to the surface (i.e. not through the entire slab) they can normally be repaired and recolor coated. If the lines are applied correctly, there is hope that they will not reappear.

NET POST AND CENTER TIE DOWN CRACKS are caused by the concrete footing coming flush to the surface. Thus, the adjoining asphalt and concrete with different rates of expansion soon crack. Normal patching and color coating soon has these returning. Best solution is to thoroughly clean the cracks, widen them to about 2/16" and fill them with a permanently pliable waterproof material (upper surface containing sand) that can accommodate the expansion/contraction movement without reopening and admitting water.

STRAIGHT GROWING CRACKS OF SIZABLE LENGTHS might have started out as a "cold joint" (when the court was built a portion of asphalt cooled before the adjoining layer was placed next to it) or it might have been created by soils movement. In almost all cases it is soil movement that has found "the weakest link in the chain", a seam between two sections of asphalt. This has caused a relatively straight-lined crack. Irregular cracks of considerable length are unrelated to any paving issues and are simply underlying soils movement that has cracked the surface. Once these cracks are above a certain size, you can never patch them and keep them sealed because they have become entirely separate slabs as far as concerns expansion and contraction. Even pliable sealant in them will be ruptured. Again, you need to look at water related issues, remedial soils work and consider an **OVERLAY** (see later text).

CRACKS PARALLEL TO ONE END OR AN EDGE OF A COURT are where they are because they are signaling that adjacent and underlying soils are moving and causing the cracking. They

fall into three general categories: those that are water related, those that are hillside related, or a combination of the two. If the area adjoining the court is relatively level, the cracks are telling you where the water is coming from. It is coming in from the edge of the court, soaking back in under the slab, causing the soils to expand and contract and subsequently cracking the asphalt. Solve the water intrusion and you will have taken a big step toward solving the cracking.

If the edge of the court near these parallel cracks is a downward sloping hillside or embankment, put a level on the fence posts. The chances are you will find that they are leaning outward. What is happening is that the embankment is slowly settling and as it settles, it is moving the edge of the court out and slightly downward. This action causes the cracking and the settlement. Soils such as this might not have been properly compacted, or they are moving because the sloped embankment is too steep and, in all likelihood, these soils are getting water into them. As the water gets into these adjacent soils (runoff from the court or from under slab water flow) it facilitates expansion/contraction movement that is also impacted by gravity, which causes it to settle down and outward.

Address the water issue and you will address the settlement. Downward and outward settlement can be resolved by a retaining wall, with either piers or a foundation down into solid material.

CRACKS THAT SEEP WATER are a clear indication of what is called hydrostatic pressure. That is, water getting in under the slab and pushing up. Patching of these cracks is difficult because you not only have the normal problems of asphalt patching, but you also have the underside water pressure. Search for how the water is getting there and sometimes you can solve the issue by vertically drilling in under the court and inserting a perforated drain line to bleed the moisture out of the soils. Again, attach the underlying problem, not the symptom.

NICKEL SIZED UPHEAVALS are caused by what is called "reactive aggregate" in the asphalt. This aggregate has iron ore or a closely related compound in it and moisture in the asphalt has seeped into the aggregate and it has begun to rust. As it rusts, it expands, causing the uplifting. It will eventually pop open with a slight opening and the rust will start to drain out. This rust stains the court and the staining will continue until all of the material has drained out and these become slight upheavals that have an open hole cavity.

SLIGHT UPHEAVALS THAT HAVE AN OPEN HOLE CAVITY – The first thing to accept is that there is water under the court (hydrostatic pressure) which is forcing its way into the slab. The second issue is that the asphalt contains reactive aggregate. Color coating over the stains will look good for a few months, but the stains will bleed through again. The first step is to address how the water is getting under the court. The next step is to examine the court during the early morning or late afternoon, or by flashlight, conditions which will more clearly reveal the uplifting. Each uplifting needs to be dug out, the reddish/brown powdery material cleaned out and the cavity patched before recolor coating. It is labor intensive, but it is the only way to permanently get rid of the problem, provided you have solved the source of the water intrusion.

STATEMENT ABOUT CRACK PATCHING ON ASPHALT COURTS

From time to time, a variety of repair people have come up with creative "gimmicks" to fix cracks in asphalt. These include epoxies, reheating the cracks (by torch, laser or some other means), etc. The bottom line is that these kinds of repairs have a dismal track record. If any of these approaches really worked, one of the first things you would see is extensive testing and use of these methods by FDOT and other cities and counties which maintain thousands of square miles of asphalt. These are the people who really know asphalt and they know what works and what doesn't. Epoxies don't work because the sides of an asphalt crack are very difficult to bond to and getting something to stick to a crumbling surface is next to impossible. Even if you can get it to stick to the outer layer, it soon separates very easily from the next inner layer.

The reheating gambit also overlooks two proven facts: the aggregate in asphalt is the strongest part of it, and it is almost impossible to bond new (or reheated) asphalt to old asphalt and have it strong enough to overcome soils movement or expansion and contraction pressures which caused cracking in the first place. We have seen numerous installations of "reheated" or "laser heated asphalt" courts that have retraced within months of doing this relatively expensive work. Once asphalt cracks, other than the exceptions stated herein, if the underlying causes are not addressed, the cracks are going to come back. Even after addressing the underlying issues, patched or reheated

asphalt will still tend to reopen because these cracks have become expansion joints. Short of taking out the offending soils and cracked asphalt and starting over from scratch.

BENT FENCING

Fencing can appear to be bent if settlement is taking place when the fence foundations are starting to lean out. This can be remedied by solving the reason for the settlement. Fence posts that have been bent because of high winds need special attention. Just pulling on them tends to put a new bend just above the first bend, which leaves them unsightly. The answer is to "sleeve" them. The sleeve is a new pipe with an outside diameter that is just slightly smaller than the inside diameter of the existing bent posts. The sleeve should be if the existing post and when you use a block and tackle to pull on the bent posts, the sleeve reinforces all the pipe above the bend, so that your bending pressure is concentrated in correcting the bend. As the post straightens, the sleeve slides down inside the original post, you cut off the top and replace the cap and you have not only straightened out the problem, but you have permanently reinforced the fence posts.

PREVENTIVE MAINTENANCE VS. REPAIR AND RENOVATION

As with most things, building them correctly in the first place provides the lowest cost form of ownership. This is closely followed by regular maintenance and attention to preventive maintenance. A case in point is when cracks first appear in a court. If they are immediately sealed, you can stop water from seeping into the cracks, which reduces the deterioration of the asphalt itself and the damage caused by the seepage into the underlying soils. Whether you have a single court or are responsible for 20 courts, they represent a significant outlay of capital. Intelligent maintenance can protect and preserve the investment.

CONCLUSION

We thank you for having taken the time to review far more information about tennis courts than you ever wanted to know. Retain this ebook for future reference and call

Armor Courts at **561-501-0885** or <u>visit our website</u>, "the hard court experts" whenever you need court related assistance. We offer complete court local free evaluations and proposals that will get you court back in shape.