A photograph of a baseball field. The infield is made of light brown dirt, and the outfield is green grass. A white base is visible on the dirt. The text "Athletic Field Maintenance" is overlaid in a white, italicized serif font.

Athletic Field Maintenance

Welcome

The Fauquier County Parks and Recreation Department (FCPRD) is responsible for the maintenance of the majority of public athletic fields in Fauquier County, Virginia. Along with staff, the success of the Department's maintenance program depends on many volunteers applying their efforts to provide quality athletic fields.

This manual provides assistance and insight to both the professional and volunteer on proper techniques and tips for maintaining and protecting all types of athletic field surfaces. The maintenance activities demonstrated in this manual do not require special or expensive tools and equipment. All that is needed is the expertise presented herein, some basic tools, and the desire to provide well maintained athletic fields.

Very often the difference between good fields and great fields is not spending more time on maintenance, but getting the most of the time you spend. The techniques described in this manual help maximize your efforts, not only in achieving immediate results, but also by avoiding the problems that can creep up over the course of a season.

You will also see many of the things you can do to avoid damage to fields and determine playability, along with many of the "do's" and "don'ts" of proper field maintenance.

If you are serious about providing well-groomed athletic fields, this manual may be the most important tool in your toolbox and one you will use again and again.

The Department is appreciative of your efforts to properly care for the fields in the county.

SEPTEMBER, 2009

Acknowledgment

The FCPRD would like to thank the Fairfax County Park Authority (FCPA) for granting permission to print this document as a Fauquier County Parks and Recreation Maintenance Manual.

The generosity of FCPA in sharing their knowledge and experience makes this valuable resource possible. Its intention is to elevate the standard of care of ball fields in Fauquier County.



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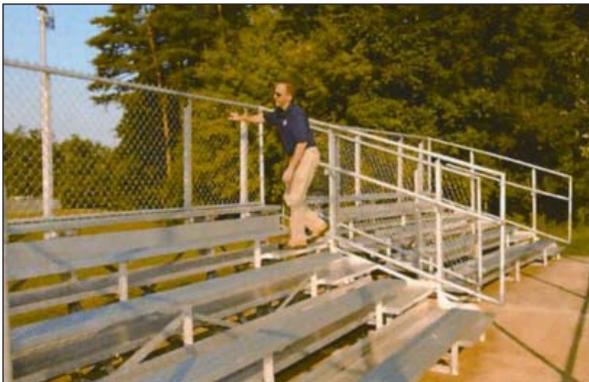
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Section 1

Diamond Field Maintenance

A. Amenity Inspections

- Field amenities should be inspected at least weekly and include: bleachers, player benches, trash cans, fencing, athletic field lighting, irrigation systems, concrete pads, goals, signs, foul poles, scoreboards, and all other components.



- When inspecting an amenity, look for damaged or missing parts, cracks, protrusions or sharp points, loose hardware, items that have been vandalized and anything that could be considered a safety hazard.

B. Lining Techniques

- Only use marking paint and lime that is specifically manufactured for use on athletic fields.



- When using athletic field marking paint, do not put down too much in one application, as this will severely damage the turf. A thin layer of paint is all that is required.
- When using lime, use ONLY products labeled “Athletic Field Marking Lime” or “Non-Caustic.”
- Always use a string as a guide when lining a field for the first time or when the original line can no longer be followed.

- Limit the use of marking lime if at all possible. Marking lime does not organically break brake down quickly, and if used frequently it will build up in the affected areas. Once the lime builds up and it rains, the area where the lime has been repeatedly put down becomes thick and pasty. When the area dries it becomes hard and difficult to rake.
- Consider using lime only when there is an important game for which a field must be lined, such as a playoff or all-star game. When it is necessary to use lime, use it sparingly.
- When lining a ball diamond, run a string from the point of home plate closest to the back stop, to the foul territory side of the foul pole. In other words, run the string to the right side of the right field foul pole and to the left of the left field foul pole. The foul territory side of first and third base should be just touching the string. Once the string has been straightened, apply the marking paint or marking lime to the field side of the string.

C. Determining Field Playability

- **REMEMBER:** Standing water occurs because the ground is saturated. Removing standing water does not eliminate the saturation. It is the saturation, and not standing water, that causes damage and unsafe conditions.



- Determining the playability of an athletic field is crucial to the continued health of the turf and the sustainability of the field throughout the season. The Department will close its athletic fields if park staff determines that fields are too wet for play, or if other issues arise that would compromise patron safety. **Leagues users have the responsibility to close fields for play when safety and/or field damage is possible.**

• An athletic field should be considered closed for play if any part of the field becomes unsafe for field users or if conditions exist where use will cause damage to the field.

• An athletic field should be considered closed if any of the following conditions exist: There is standing water present on any part of the field that cannot be removed without causing damage to the field.

• There are muddy conditions present that will not dry by the start of the game.

• While walking on the field water can be seen or heard with any footstep.

• If water gathers around the sole of a shoe or boot on any portion of the field.





- While walking in turf areas any impression of your footprint is left in the surface.
- While walking on the infield portion of the field, an impression of ½” deep or more is left by a footprint.

D. Water Removal Techniques for Ball Diamond

• **IMPORTANT NOTE:** Water removal should only be undertaken to accelerate the drying of fields. Water removal **should not** be undertaken with the expectation that fields will be available for play.



- A broom with water-resistant bristles or a water roller can be used to disperse water on infield mix areas.
- **Never** sweep or push water in the grass. The water should be spread out on the infield mix portions of the field only.
- When removing water from puddles, **do not** remove mix along with it.

• When dispersing water, always try to pull, not push the water with the tool. Pulling with the tool allows you to maintain better control over the end of the tool and therefore less likely to remove any mix from the area being swept.

• Once the water is dispersed, use a rake to loosen all wet areas to accelerate drying.



• Do not move muddy materials from one portion of the field to another; or remove muddy material from the field. If muddy material is not dry by game time, the field should be closed until the material dries.

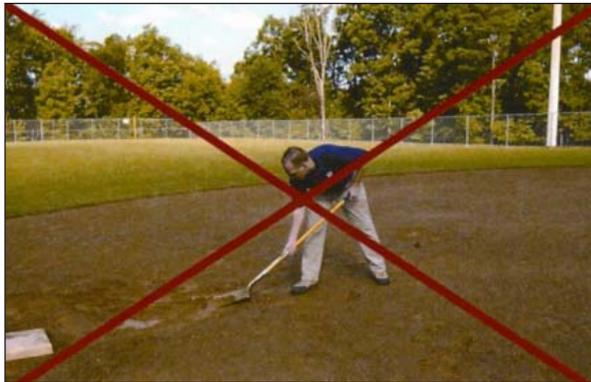
• A hand pump or bucket can be used to remove the water in areas where it cannot be removed without pushing it into the grass. A small hole may have to be temporarily dug in the lowest part of the wet area, in order to gather all of the water in one spot. The pump will then be able to more easily remove all of the water. Once the bucket is filled, dispose of the water **outside** of the field of play. Once the water has been removed, fill in any holes where possible and rake the area to accelerate drying.



- The Department discourages the routine use of drying agents (e.g., - Turface, Pro Choice, etc). It is recommended that drying agents be used very sparingly and only in cases where it will ensure the field conditions are immediately playable. The Department has found that the widespread use of drying agents is not cost effective or efficient. If the steps above are followed routinely when maintaining wet areas, field conditions will become as readily playable as if drying agents had been used. If overused, drying agents can create safety and maintenance problems.



- **In turf areas**, the use of materials such as drying agents, wood chips, peat moss, or sand to dry water or mud is **not recommended** due to secondary problems that occur as a result of their use.

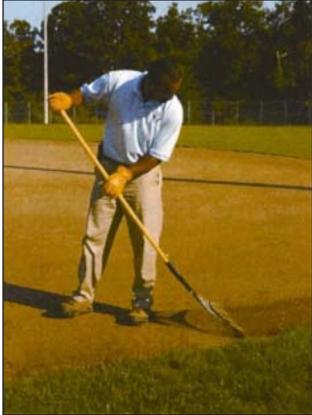


E. Grass Edge Maintenance

- Grass edge maintenance can be performed using a leaf rake, stiff blade push broom, or a power broom. Infield mix migrates into the grass borders due to game play, maintenance, wind, rain and other factors. If infield mix is not routinely removed from the grass, it builds up and forms a lip. Lips then become a safety concern, as they are a trip hazard and can cause a ball in play to unexpectedly change direction. Lips also form a barrier, preventing water from properly draining and causing puddles. This can delay or cancel games and make it more difficult to prepare a field ready for play.



- This task should be performed regularly as part of all routine prepping operations. Another excellent time to perform this task is after a rain shower, if conditions allow (i.e.- the field is not too muddy to be worked on).



- Concentrate your efforts on the infield mix in the grass, not on the mix in the infield. This is done by raking in a direction perpendicular to the turf line, which will prevent lips from forming. Once all of the grass edges have been properly maintained, hand raking and dragging can take place.

- In areas where dragging will take place, use a leaf rake to rake along the grass edge surrounding the area to be dragged. By raking along the grass edge in this manner, the infield mix along the grass edge will be leveled and an approximately 18" wide border will be created so the drag will not need to drag directly next to the grass. This will help reduce the chance of the drag running off into the grass.

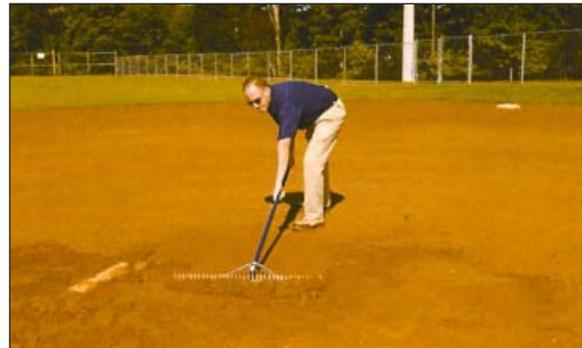
- All grass edges should be edged at least once per year. Edging is required for the purposes of safety, ease of maintenance, and appearance. Grass edges can be edged using a sod cutter, power edger, or shovel. Always follow a string or paint line to maintain a straight edge when edging a field. For aesthetic value and ease of maintenance, always keep your grass edge distances symmetrical. In other words, if you edge the outside of the first base baseline at 4', then edge the outside of the third base baseline at 4' as well.

F. Base, Home Plate, and Pitching Rubber Maintenance

- A ball-field rake, iron rake and tamper can be used to perform this task.

- All low areas and holes in the infield, including ones that develop away from bases and home plate areas, should be filled and leveled to the surrounding grade.

- When performing this task, **always** remove the bases.



- When performing this task, **always** push or pull this infield mix from the high side to the low side into the area to be filled. If the high side is not visibly obvious, then try to imagine where the infield mix goes when a player is batting at home plate, running the baselines and bases, sliding into the base, and covering a base or home plate.



- Tamp the area being filled each time you perform maintenance. If the infield mix is too dry, it may be necessary to add some water in order to make the infield mix more compacted. If the area to be filled is deep, it may be necessary to fill and tamp the area in layers in order for the tamping to be effective.

- Bases should be pulled and inspected routinely.

- When inspecting bases, look for cracked metal, missing or loose bolts, tears in the rubber cover, or warping that will not allow the bases to sit flush with the ground. If any of these problems are found and cannot be corrected, or are severe enough to be considered a hazard, then the base should immediately be removed and replaced.



- When inspecting home plate and pitching rubbers, look for tears in the rubber cover, make sure that the top of the plate or rubber is level with the grade of the field and that it is not protruding above the ground.

- Before installing the base, level the field surface so that the base will sit flush with the ground. The anchor sleeve into which the base inserts should be cleaned using a dig out tool.

- Do not install the bases until the infield has been dragged.
- Do not drag over the top of home plates or pitching rubbers. If unavoidable, do so slowly.

G. Hand Raking

- A ball-field rake or iron rake can be used to perform this task.

- The following areas should be hand raked: home plate, baselines, coach's boxes, pitching mounds, first and third base areas if there is infield grass present, and dug out/warm up boxes if the area in front of the dugouts is cut out.

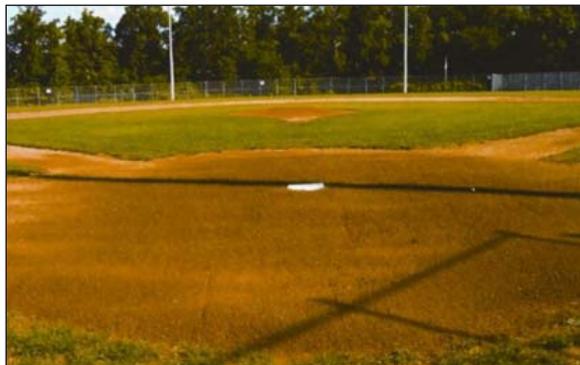


- To avoid raking infield mix into the grass, always rake parallel to grass edges. If excessive material builds up next to the grass edge, rake material away from the edge prior to parallel raking and dragging.

- If it becomes necessary to rake towards a grass edge, then lift the head of the rake several inches before getting to the grass edge. After raking towards or away from a grass edge, always rake par-

allel to the grass edge to keep the infield mix next to the grass edge level.

- When pushing or pulling a hand rake, always lift the head of the rake at the end of the stroke to keep the infield mix from building up in spots.
- To leave a nice finished appearance, all rake strokes should be in the same direction. This will provide an appearance similar to mowing in a back and forth pattern.



H. Mound Maintenance

- A ball-field rake, iron rake and tamper can be used to perform this task.



- When performing this task, the same techniques listed under “Base, Home Plate and Pitching Rubber Maintenance” and “Hand Raking” applies.

- On 90’ baseball diamonds, the mound is to be installed with the top of the rubber 10” above the top of the home plate. The mound has a 9’ radius. This radius is measured from a point 18” away from the center edge of the pitching rubber on the home plate side.

- On 90’ baseball diamonds, there should be a 3’ by 5’ flat area on the top of the mound. The flat area starts 1’ away from the edge on the home plate side of the pitching rubber and goes 3’ towards second base. The 5’ portion of the flat area is centered on the pitching rubber and runs parallel to an imaginary line running from first base to third base.

- On 60’ baseball diamonds, the mound is installed with the top of the rubber 6” above the top of the home plate. The mound has a 5’ radius. This radius is measured from a point 1’ away from the center edge of the pitching rubber on the home plate side.

- On 60’ baseball diamonds, there should be a 2’ by 3’ flat area on top of the mound. The flat area starts 8” away from the edge on the home plate side of the pitching rubber and goes 2’ towards second base. The 3’ portion of the flat area is centered on the pitching rubber and runs parallel to an imaginary line running from first base to third base.



- On both 60' and 90' diamonds, the pitcher's landing areas should be maintained in essentially the same way. Imagine a box that is as wide as the flat areas on top of the mound and goes from the flat area on top of the mound to the bottom of the mounds on the home plate side. Within this imaginary box, the mound should be maintained flat and level from side to side and should slope from top to bottom.
- On both the 60' and 90' diamonds, the remaining portions of the mound should slope from the flat area on top of the mound and pitcher's landing area, down to the edge of the mound's radius.

I. Infield Dragging Techniques

- Prior to infield dragging, **ALWAYS** remove the bases and then place a plug in the base anchor sleeve.
- Prior to infield dragging, **ALWAYS** perform edge maintenance, then hand fill and tamp the low areas. Remember to complete the grass edge maintenance task by raking along the edge of the grass in the areas of the infield where dragging will take place. If excessive material builds up next to the grass edge, rake material away from the edge prior to parallel raking or dragging.



- To perform this task, a mat drag is the most affordable and effective tool available. It can be pulled by hand or by a piece of equipment. A standard size mat drag, 72" wide by 40" long, is most effective when field conditions are dry. When field conditions are wet, a standard size mat drag that has been shortened to 12" to 18" long should be used.
- The following pieces of equipment can be used to pull a mat drag: infield conditioner, utility vehicle, utility tractor, or riding mower. Other types of dragging attachments may be purchased along with these pieces of equipment. Some of these attachments may work better than a mat drag when dragging in wet conditions, but most will not be as effective as a mat drag in dry conditions.
- If an artificial turf batter's box is present at home plate: do not pull the drag over the batter's box.
- On skinned infields where grass is present between the infield mix and the fence, do not drag around home plate. The home plate area should be maintained with a hand rake only.
- On grass infields, never drag the home plate area, baselines or around first or third base. All of these areas should be maintained with a **hand rake only**.

- When dragging skinned infields, start by dragging around the outside perimeter of the infield. Make two to three passes around the outside perimeter, overlapping the previous pass with six to twelve inches of the drag. Next, make one pass through the center of the field. Then, at the center of the area remaining to be dragged, begin circling around the one pass made in the center of the field. Follow this circular pattern, overlapping the previous pass with six to twelve inches of the drag, until the entire infield as been dragged.



- In order to provide the best quality finished surface, be sure to drag slowly.
- Routinely alternate the direction the field is dragged. Sometimes drag the infield in a clockwise direction, the other times drag in a counter clockwise direction.
- Never take the drag into the grass. When done dragging, stop at the edge of the grass, shake off the built up infield mix from the drag, roll up and remove the drag, and then rake out the area where the drag stopped.
- When dragging is complete, exit the infield at a different location each time to eliminate the forming of a hump in the infield mix. An exception to this rule is if there is a low spot at the edge of the infield that requires filling.

Diamond Field Maintenance- DO'S and DON'TS

- To prevent lips from forming, insure that all infield mix has been raked out of and away from all grass edges prior to dragging fields: baselines, home plate, pitching mound, infield perimeter and coach's boxes.
- Prior to dragging, bases are to be removed and inspected, and all holes around the bases and pitching area are to be filled and tamped.
- Fill all holes and low areas completely to insure safe playing conditions and to eliminate areas where water can collect, which create muddy conditions.
- Do not shovel, scoop, rake or sweep water, ; mix or topsoil into grass area.
- Do not bring foreign material onto fields to fill wet areas or low spots.
- Do not use any field when such use will cause damage to the field or risk personal injury.
- Do not hit or pitch balls into fences.
- To minimize damage, do not practice hitting or pitching from any **turf** areas within the field of play.

Section 2

Rectangular Field Maintenance

A. Amenity Inspections

- Field amenities should be inspected at least weekly and include: bleachers, player benches, trash cans, fencing, athletic field lighting, irrigation systems, concrete pads, goals, signs, scoreboards, and all other components.
- When inspecting an amenity, look for damaged or missing parts, cracks, protrusions or sharp points, loose hardware, items that have been vandalized and anything that could be considered a safety hazard.
- Goals should be inspected to ensure they are securely anchored and will not tip over.



B. Lining Techniques

- **Only use marking** paint and lime that is specifically manufactured for use on athletic fields.
- Always use a string guide when lining a field for the first time or when the original line can no longer longerbe followed.



- When using athletic field marking paint, do not put down too much in one application, as this will severely damage the turf. A thin layer of paint is all that is required.

C. Determining Field Playability

REMEMBER: Standing water occurs because the ground is saturated. Removing standing water does not eliminate the saturation. It is the saturation and not standing water that causes damage and unsafe conditions.



- Determining the playability of an athletic field is crucial to the continued health of the turf and the sustainability of the field throughout the season. The Department will close its athletic fields if park staff determines that fields are too wet for play, or if other issues arise that would compromise patron safety. **League users have the responsibility to close fields for play when safety and/or field damage is possible.**

• An athletic field should be considered **closed** for play if **any** part of the field becomes unsafe for field users or if conditions exist where use will cause damage to the field.

- An athletic field should be considered closed if any of the following conditions exist:

- There is standing water present on any part of the field that cannot be removed without causing damage to the field.
- There are muddy conditions present that will not dry by the start of the game.



- While walking on the field water can be seen or heard with any footstep.
- While walking on the field of play any impression of your footprint is left in the surface.
- If water gathers around the sole of a shoe or boot on any portion of the field.

D. Water Removal Techniques for Rectangular Fields.

• **IMPORTANT NOTE:** Water removal should only be undertaken to **accelerate** the drying of fields. Water removal **should not** be undertaken with the expectations that fields will be available for play.

- **NEVER** sweep or push water into the grass.

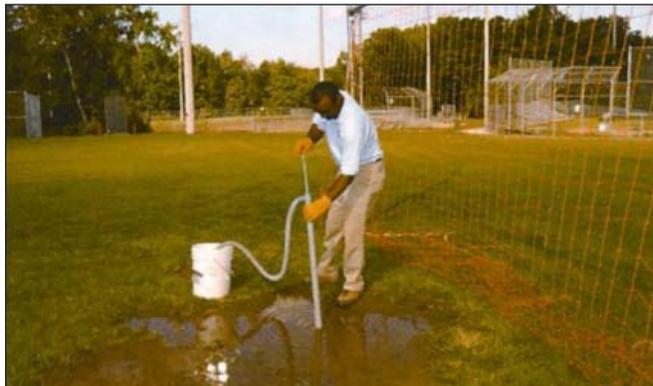
- **NEVER** move muddy material from one portion of the field to another. **NEVER** remove muddy material from the field. If muddy material is not dry by game time, the field should be closed until the material dries.

- A hand pump and bucket can be used to remove water in areas where there are puddles. Once the bucket is full, dispose of the water **outside** of the field of play. However, this will not make the field immediately playable; it will only accelerate drying of the affected area.

- **In turf areas**, the use of materials such as drying agents (i.e.- Turface, Pro Choise, etc.), wood chips, peat moss, or sand to dry water is **not recommended** due to secondary problems that can occur as a result of their use.

- Rectangular Field Maintenance- DO'S and DON'TS

- Fill all holes and low areas completely to insure safe playing conditions and to eliminate areas where water can collect, which create muddy conditions.



- Do not bring foreign material onto fields to fill wet areas or low spots.

- Do not use any field when such use will cause damage to the field or risk personal injury.

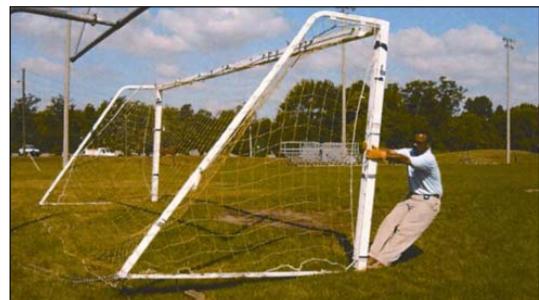
- Do not kick or throw balls into fences.

- Do conform to guidelines for use of portable goals.

E. Portable Goal Maintenance and Labeling

- If portable goals are used, they **must** be properly labeled and securely anchored to the ground.

NOTE: See the Appendix for CPSC guidelines about portable goals.



- When securing portable goals, the method used to secure the goals must not create a safety hazard, such as a protrusion or a sharp edge that could cause injury.



F. Safety Zones

• The Department recommends that ALL rectangular athletic fields have a minimum of 15' between the boundary lines of the field and any objects outside the field (such as bleachers, player benches, trash cans, light poles, fences, asphalt trails, concrete pads, signs, etc.). While this is not currently the case on all FCPRD rectangular fields, it should be considered in the design of fields. This provides the users an area in which they can safely stop without running into any other objects. For example, if there are permanent benches on both sides of the field and the benches are 210' apart, then the widest you should safely mark the field would be 180' wide. Goals that are part of the playing field should be the only exceptions to this rule.

• The 15' safety zone must be relatively flat, and a field boundary line should not be put down less than 15' from the edge of a hillside or drainage ditch.

• Safety zones cannot overlap. If two fields are side by side and there is nothing but level open space in between them, the two fields should be no closer than 30' to each other.



Rectangular Field Maintenance- DO'S and DON'TS

- Fill all holes and low areas completely to insure safe playing conditions and to eliminate areas where water can collect, which create muddy conditions.
- Do not bring foreign material onto fields to fill wet areas or low spots.
- Do not use any field when such use will cause damage to the field or risk personal injury.
- Do conform to guidelines for use of portable goals.

Diamond Field Maintenance Checklist

Item	Task	Before Use	After Use	Weekly	Monthly	Seasonally	Annually
Water	Spread water out on the infield mix portions of the field only - use pull, not push strokes	x					
Water	Once water is dispersed, use a rake to loosen all wet areas to accelerate drying	x					
Water	Use a hand pump or bucket in areas where it cannot be removed without pushing it into the grass	x					
Grass	Remove infield mix from grass		x	x			
Grass	Rake Grass Edges to prevent "lip"		x	x			
Grass	Hand raking and dragging			x			
Grass	Use mat drag to drag either skinned infield or grass infield- work in circular motions				x		
Grass	Edge grass, maintaining straight, symmetrical edge						x
Bases / Dugout	Fill and level holes or low areas			x			
Bases / Dugout	Pull and inspect bases			x			
Bases / Dugout	Hand rake bases, baselines, and pitching mound			x			
Bases / Dugout	Hand rake dug out, coaches' and warm-up boxes			x			
Bases / Dugout	Level field surface to make base flush				x		
Pitching Mound	Check that mound is flat and level from side-to-side and slope from top-to-bottom				x		
Pitching Mound	Install pitching mound according to field size					x	
Determining Field Playability	An athletic field should be considered closed for play if ANY part of the field becomes unsafe for field users or if conditions exist where use will cause damage to the field	x					
Inspection	Look for damaged or missing parts, cracks, protrusions, loose hardware, or anything that could be considered a safety hazard			x			

Diamond Field Maintenance Checklist

Item	Task	Before Use	After Use	Weekly	Monthly	Seasonally	Annually
Goals	Ensure goals are securely anchored	x					
Portable Goals	Must be labeled properly and securely anchored to the ground.			x			
Safety Zones	Minimum of 15' safety zone, must be relatively flat						x
Lining	Apply thin layer of marking paint and lime manufactured specifically for use on athletic fields	x		x			
Determining Field Playability	An athletic field should be considered closed for play if ANY part of the field becomes unsafe for field users or if conditions exist where use will cause damage to the field	x					
Water	Techniques are used only to accelerate drying	x	x				

Athletic Field Equipment

- Riding mower
- Utility Tractor
- Infield Conditioner
- Utility Vehicle
- York Rake
- Box Drag
- Nail Drag

Athletic Field Tools

- Ball field Rake
- Garden Rake
- Leaf Rake
- Tamper
- Square Point Shovel
- Round Point Shovel
- Water Resistant Bristle Broom
- Stiff Bristly Broom
- Base Sleeve Dig Out Tool
- Base Plugs
- Hand Pump
- Water Bucket
- Water Roller
- Measuring Tape, 200' Long Minimum
- Reel of String
- Trash Pickers
- Mat Drag
- Marking Lime Liner
- Marking Paint Liner
- Tool Box with Assorted Hand Tools (Pliers, Screwdrivers, Hammer, etc.)

Standards for Athletic Field Accessories

- For Bases: use “Impact” or “Hollywood” style bases with welded on stanchion. Use double first base on fields with “Girls Softball” use.
- For Home Plates: use a 3” thick wood or waffle core buried home plate.
- For pitching Rubbers: use 4-sided pitching rubber with PVC or metal sleeve core, or use a wood core step down pitching rubber.

Portable Goal Maintenance and Labeling Information

- CPSC Document #326: Guidelines for Removable Soccer Goal Safety:
<https://www.cpsc.gov/cpsc/pub/puts/326.htm>