



SUSTAINABILITY STARTS WITH HOU

SUSTAINABLE SOCCER FIELDS TOOLKIT

IN COLLABORATION WITH THE U.S. ENVIRONMENTAL PROTECTION AGENCY

MARCH 2026

EDITION 1

This toolkit has been developed with the support and contributions of numerous volunteers.

SPECIAL THANKS TO:

Stephanie Gray, Children's Environmental Literacy Foundation

Paul D. Fericelli, U.S. EPA

Renee Bellew, U.S. EPA Region 6

Andrew Kuehm, U.S. EPA Region 6

Elizabeth Carlson, Chief Sustainability Officer, Tricon Energy

Manuel Chavarria PhD, Soil and Crop Sciences, Texas A&M University

Wendy Craven, Cheniere Energy

Stephanie Walker, Houston Independent School District

Valerie Holland, Director of Team Environment Houston Dynamo FC

Ana Tapia, Ecologist

Kelli Ondracek, Houston Parks and Recreation Department

Armando Pena, Houston Parks and Recreation Department

Sam Hill, Texas A&M Forest Service



The FIFA World Cup Houston Host Committee partnered with the U.S. Environmental Protection Agency (EPA) to support practical actions that protect health, improve comfort, and reduce environmental impacts at community soccer fields. EPA's role in this collaboration is to share best practices that help communities make informed decisions. This toolkit reflects EPA's mission to protect human health and the environment by translating air quality, water, and solid waste management considerations into usable actions for coaches, referees, maintenance crews, and field managers. The EPA logo is an identifying trademark of the EPA. The EPA logo is used here with permission for informational purposes only and its use does not constitute an endorsement by EPA. EPA does not endorse non-federal entities and their products, services, or enterprises, including the authors, publishers, or other entities featured in this publication.

TABLE OF CONTENTS

1 HOW TO USE THIS TOOLKIT

The three common challenges all soccer fields face

How to Use this Toolkit06
Get Involved and Share Your Feedback.....09

2 KEEPING YOUR COOL

2.0 Why Heat and Air Quality Matter on Soccer Fields.....12
2.1 Strategies for Keeping Your Cool14
2.2 How to Know Your Field and Players are Staying Cool.....15
2.3 What It Takes to Stay Cool and Safe.....16
2.4 Keeping Cool Checklist.....17

3 LET IT DRAIN AND DRY, THEN PLAY ON

3.0 How Good Drainage Keeps Fields Safe 22
3.1 Strategies and Opportunities for Collecting and Storing Rainwater..... 23
3.2 Strategies for Staying Dry and Playing On 23
3.3 How to Know Your Field Is Staying Dry.. 25
3.4 What It Takes to Stay Dry 26
3.5 Stay Dry Checklist - Drainage Management.....27

4 WASTE LESS, PLAY MORE

4.0 Waste Less, Play More: Why managing waste keeps soccer fields clean and safe32
4.1 Strategies for Wasting Less and Playing More 32
4.2 Document Your Progress Towards Waste Free Fields.....34
4.3 What It Takes to Waste Less 35
4.4 Waste Less Checklist..... 36

5 BRINGING EVERYONE ON BOARD

Building habits that support the field..... 40

6 HELPFUL RESOURCES

Useful information that supports the actions in this toolkit

6.0 Keeping Your Cool44
6.1 Good Drainage Keeps Fields Safe.....44
6.3 Waste Less, Play More.....45
6.4 Addendum - Soil and Turf.....46



1 HOW TO USE THIS TOOLKIT



SOCCER FIELDS FACE THREE COMMON CHALLENGES

1. They can get too hot.
2. They can flood or stay soggy.
3. They can accumulate trash that makes the space feel unpleasant.

These challenges can occur at the same time, and they all affect how safe and playable a field is for athletes and families. Sustainable soccer fields are safer, cleaner and easier to keep open for play because they handle heat, rainwater and waste in smart ways that protect the people who use them.

1 HEAT & AIR QUALITY

2 FIELD DRAINAGE

3 MANAGING WASTE

This toolkit helps coaches, referees, facility managers and field maintenance staff make soccer fields safer and more comfortable for players and families. Days with intense heat, heavy rain or busy events are common challenges that change how a field feels and how it can be used. Each of these challenges is matched to a chapter of this toolkit that outlines practical safety and sustainability actions.

THERE ARE FOUR MAIN AREAS WHERE YOU CAN TAKE ACTION AT SOCCER FIELDS.

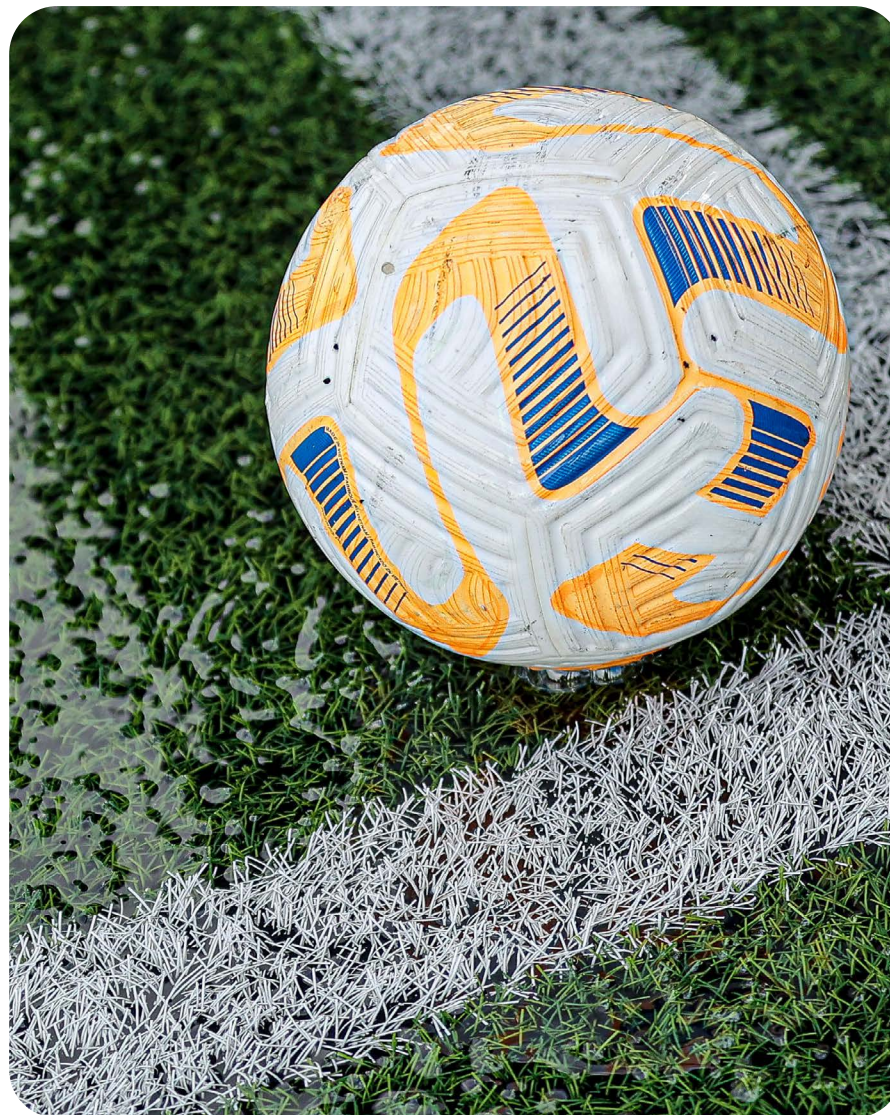
3**BUILT
FEATURES****2****AROUND
THE FIELD****1****THE PLAYING
SURFACE****4****PEOPLE ON
THE FIELD**

Each chapter ends with a short checklist you can use during regular field walks to see what is working and what needs attention, along with a Quick Guidelines for Implementation that offer simple good practices for putting actions into practice. Both the checklist and the general guidelines are easy to use and work for beginners and experienced personnel.

Some heat and drainage challenges are influenced by soil, turf, and grass type decisions made during field construction or renovation. A separate Soil and Turf Addendum is included for readers who want background on how these factors affect field performance.



ADDENDUM SOIL AND TURF



GET INVOLVED AND SHARE YOUR FEEDBACK

WE HOPE THIS TOOLKIT HELPS YOU CREATE SAFER, CLEANER, AND MORE ENJOYABLE SOCCER FIELDS. YOUR EXPERIENCES AND INSIGHTS ARE INVALUABLE TO US. WE INVITE YOU TO SHARE YOUR FEEDBACK AND ANY SUGGESTIONS YOU MAY HAVE FOR FUTURE EDITIONS OF THIS TOOLKIT.

- > PLEASE CONTACT US AT [HOUSTONSPORTS.ORG](https://houstonsports.org) WITH YOUR THOUGHTS, SUCCESS STORIES, OR ANY CHALLENGES YOU ENCOUNTER. TOGETHER, WE CAN CONTINUE TO IMPROVE THE QUALITY AND SAFETY OF SOCCER FIELDS FOR EVERYONE.**
- > THANK YOU FOR YOUR COMMITMENT TO CREATING BETTER PLACES FOR PLAYERS TO GROW AND ENJOY THE GAME!**



2 KEEPING YOUR COOL

Why heat and air
quality matter on
soccer fields



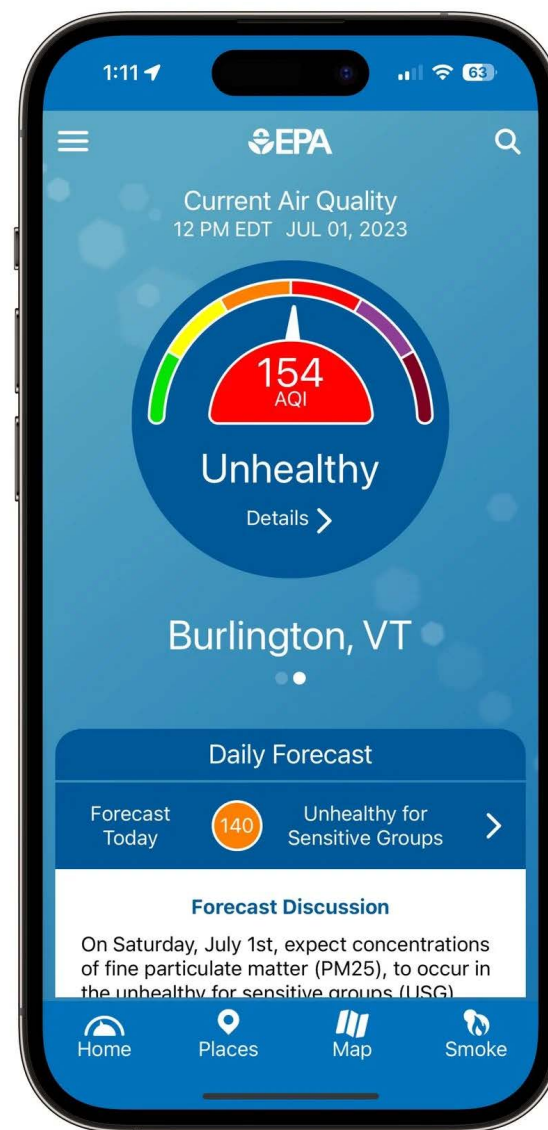
2.0 WHY HEAT AND AIR QUALITY MATTER ON SOCCER FIELDS

Hot weather can make a soccer field uncomfortable and even unsafe. On sunny days, artificial turf and paved surfaces can reach temperatures of over 100 degrees Fahrenheit (°F) even when the air is cooler.

High humidity makes heat more dangerous because sweat evaporates slowly. Playing in hot or humid conditions can lead to heat exhaustion, cramping, and heat stroke. Adjust activities based on the [heat index](#) or [wet bulb globe temperature](#), a measure that combines heat, sun, and humidity. Use the forecast heat index or wet bulb globe temperature to guide decisions. Encourage players and their families stay hydrated, utilize shade and sunscreen.

Hot sunny days can also contribute to [ground-level ozone](#), which can harm our health by making it harder to breath. People most at risk from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. When air quality is poor, local agencies may issue an Ozone Action Day advisory (or an advisory pertaining to other air pollutants) with additional guidance.

The **U.S. Air Quality Index or AQI** is EPA's tool for communicating daily air quality and **AirNow** is a one-stop source for local, state and national air quality data. AirNow reports the AQI, a color-coded index designed to communicate whether air quality is healthy or unhealthy for you. Visit [AirNow.gov](https://airnow.gov) or download the [AirNow App](#) to learn more about local air quality. When you know the AQI in your area, you can take steps to protect your health.

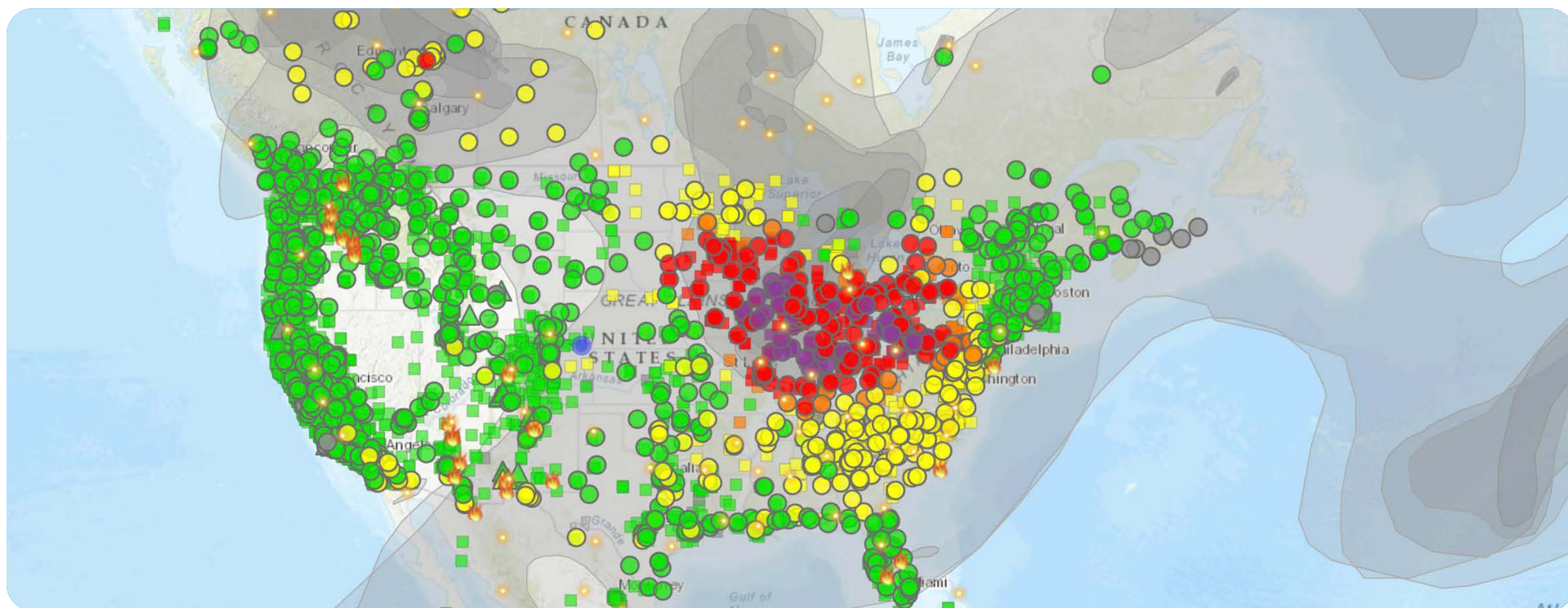


Wildfires can contribute to high levels of air pollution too, and when smoke events coincide with heat events, the combination can be dangerous. People who are at increased risk from the health effects of wildfire smoke are also likely to be at increased risk from heat. This includes people with heart or lung disease, older adults, children and teenagers and pregnant women. People who spend more time exposed to wildfire smoke and heat (such as people exercising outdoors) are also at increased risk. Check the [AirNow Fire and Smoke Map](#) for up-to-date information about smoke conditions and suggested actions to protect health. For specific tips about reducing exposure both outdoors and indoors, see the Protect Yourself from [Smoke and Heat fact sheet](#).

When it is hot or humid, it is easy to feel pressure to keep pushing and tough it out. Health comes first. If risk is high, slow the pace, shorten sessions, add more breaks, or move activities to a cooler time or location. Coaches or referees should adjust or reschedule as needed. Players should speak up early about any symptoms without penalty because heat illness can develop quickly.

Some heat issues on natural surfaces are influenced by soil compaction, shallow roots or turf conditions that limit moisture and cooling near the surface. The Soil and Turf Addendum provide background on how these conditions affect field temperatures.

This chapter presents simple ways to mitigate high temperatures where players and families spend time.



EPA AirNow Fire and Smoke Map

2.1 STRATEGIES FOR KEEPING YOUR COOL

Every action in this section helps keep the field safer and more comfortable on hot days. All actions are grouped into parts of the field.

A. Playing Surface

Keeping the field surface cooler protects players from heat stress and makes the game safer and more comfortable.

What to look for

- Excessive heat on artificial turf
- Bare or worn areas in grass fields
- Lack of shade where players wait and along the side lines
- Heat radiating near goal areas

Actions you can take

Facility managers and field maintenance staff:

- Lightly water artificial turf before play, where feasible
- Protect grass cover by resting worn areas
- Create shaded areas for players and fans

Coaches and referees

- Adjust practice times to avoid the hottest hours
- Move practice and warmups to shaded areas
- Reschedule games to mornings or cooler days

Healthier turf and shaded areas can help lower surface temperatures and keep players safe. Preventing damage to natural fields during high temperature days helps to better maintain the field and reduce overall field temperatures.

B. Around the Field

Shade along the edges can make the whole field feel cooler and provides important sun protection for players and fans.

What to look for

- Little or no shade along the edges and in viewing areas
- Heat radiating from dark pavement
- Sun exposure in waiting zones

Actions you can take

Facility managers and field maintenance staff:

- Add tents or other shade screens near sidelines
- Plant trees or larger vegetation along edges
- Provide shade for seating and walkways
- Choose lighter colored surfaces when replacing pavement

Coaches and referees

- Encourage players and spectators to utilize shade to extent possible.

Increasing shade around the field cools the ground and nearby air which helps players and spectators be safer and more comfortable outdoors.

C. Built Features

Seating, walkways and gathering areas can heat up fast.

What to look for

- Benches too hot to sit on
- Water stations in full sun
- No shade for team waiting areas
- No shade in spectator areas

Actions you can take

Facility managers and field maintenance staff:

- Place portable benches in shaded areas
- Add shade structures over seating
- Keep water stations out of direct sun
- Improve dark pavements by testing cool coatings, when possible
- Utilize bench materials that does not heat up easily

Coaches and referees

- Encourage players and spectators to use shade where available

2.2 HOW TO KNOW YOUR FIELD AND PLAYERS ARE STAYING COOL

These checks help you determine whether your actions are lowering heat risks and making the field more comfortable.

What you can observe

- Players recover faster during breaks
- Less discomfort from hot surfaces
- More shaded options during games
- Better breathing comfort on hot days or Ozone Action Days

What you can measure

- Check surface heat by touch in known hot spots
- Track how quickly players cool down when resting in shade
- Monitor how shaded areas are actually used during play
- Watch more closely on days with poor air quality, like Ozone Action Days, for any breathing discomfort

Simple records to keep

- Areas that improved after adding shade
- Notes on water breaks and player feedback
- Changes made when heat increased

These checks show what is improving and help set future goals.

2.3 WHAT IT TAKES TO STAY COOL AND SAFE

Zero to low-cost actions:

- Adjust practice schedules or locations
- Provide shaded places to rest
- Lightly water artificial turf before play where feasible
- Ensure adequate supply of cold fluids
- Rotate warm up spots
- Offer frequent water breaks
- Monitor air quality from trusted sources

Medium to high-cost improvements:

- Add shade structures
- Plant trees and native vegetation
- Use lighter colored paved surfaces
- Upgrade turf materials

\$ Why Cooling Investments Pay and How to Fund Them

Cooling upgrades protect health, reduce the number of missed games, and support turf care. Many shade and drainage improvements can work together to meet heat and rainwater management goals.

To secure funding, document heat impacts such as high surface temps, cancellations, and adverse health incidents. Start with a small pilot, and leverage co benefits to tap into funding avenues like:

1. City and park capital budgets and maintenance funds
2. Urban forestry or shade tree grants
3. Stormwater and green infrastructure grants (shade and drainage co benefits)
4. Corporate and community sponsors (local businesses, health systems)
5. Youth club fundraising and league partners

The checklist on the following page can help you spot heat risks before they become safety issues.



2.4 KEEPING COOL CHECKLIST

Use this checklist during a regular field walk. Mark 'Yes,' 'Somewhat' or 'No' for each item. 'Yes' items are wins you can keep building on. 'Somewhat' items are quick improvements you can tackle soon. 'No' items are opportunities you can plan for the long term.

PLAYING SURFACE	YES	SOME WHAT	NO	BUILT FEATURES	YES	SOME WHAT	NO
THE SURFACE IS NOT TOO HOT TO TOUCH IN THE MAIN PLAY AREAS	☐	☐	☐	PORTABLE BENCHES AND SEATING ARE PLACED WHERE SHADE IS AVAILABLE	☐	☐	☐
WORN OR BARE SPOTS ARE BEING RESTED OR CARED FOR	☐	☐	☐	METAL SEATS DO NOT BECOME TOO HOT FOR PLAYERS OR FAMILIES	☐	☐	☐
WATER IS USED TO COOL ARTIFICIAL TURF ON VERY HOT DAYS WHEN POSSIBLE	☐	☐	☐	DARK PAVEMENT NEAR SEATING OR WALKWAYS ARE BEING IMPROVED	☐	☐	☐
PRACTICE TIMES AND/OR LOCATIONS ARE ADJUSTED WHEN THE SURFACE FEELS UNSAFE	☐	☐	☐	WATER STATIONS ARE SITUATED IN SHADED AREAS	☐	☐	☐
SHADE IS PROVIDED WHERE PLAYERS WAIT ON THE FIELD	☐	☐	☐				
AROUND THE FIELD	YES	SOME WHAT	NO	PEOPLE ON THE FIELD	YES	SOME WHAT	NO
THERE ARE SHADED PLACES WHERE SPECTATORS CAN SIT OR STAND	☐	☐	☐	PLAYERS HAVE SHADED PLACES TO REST	☐	☐	☐
TREES OR VEGETATION PROVIDE SHADE ALONG PARTS OF THE FIELD EDGES	☐	☐	☐	WATER BREAKS ARE FREQUENT	☐	☐	☐
TEMPORARY SHADE IS ADDED WHEN NATURAL SHADE IS NOT ENOUGH	☐	☐	☐	WARMUPS OR WAITING ZONES ARE MOVED TO COOLER AREAS WHEN NEEDED	☐	☐	☐
WALKWAYS TO SEATING AND REST AREAS OFFER SOME SHADE DURING EVENTS	☐	☐	☐	PRACTICE OR GAMES SCHEDULES ARE CHANGED ON EXTREME HEAT DAYS	☐	☐	☐
				ON OZONE ACTION DAYS, ACTIVITY IS REDUCED OR ADJUSTED TO PROTECT BREATHING	☐	☐	☐

Quick Heat and Shade Guidelines for Implementation

These guidelines provide simple best practices to support decisions about heat and shade on soccer fields. They are not design standards.

H1. Shade placement

H1.1 Place temporary shade about 25 to 50 feet from team benches and spectator seating. This reflects common park and sports field planning practice that keeps shade close enough to be useful while staying clear of play areas and drainage paths.

H1.2 Keep shade outside the field of play and clear of sightlines.

H1.3 For local tree spacing and sitting in Houston see the City of Houston Tree and Shrub Ordinance. www.houstontx.gov/planning/DevelopRegs/tree_shrub.html

H2. Trees and vegetation

H2.1 Place trees along field edges, walkways, and gathering areas, not inside play zones.

H2.2 Keep trees far enough from sidelines to avoid root damage and trip hazards.

H2.3 Avoid species that drop heavy fruit, sticky sap, or brittle branches near seating.

H2.4 Work with parks or forestry staff on tree species and placement.

H3. Surface cooling

H3.1 Lightly water artificial turf or dusty surfaces shortly before play on very hot days when water is available.

H3.2 Do not water when the surface is already saturated.

H4. Timing and use

H4.1 Use extra heat precautions when heat index values are high or when alerts are issued.

H4.2 Check local heat advisories through Houston Extreme Heat Preparedness. <https://www.uh.edu/emergency-management/be-prepared/extreme-heat/index.php>

H4.3 Shift practices and games to early morning or evening during extreme heat.

H4.4 Increase water breaks and use shaded rest areas as heat and humidity rise.

H5. When to pause and coordinate

H5.1 Installing permanent shade.

H5.2 Changes that affect turf roots or drainage.

H5.3 Ongoing heat problems that persist after shade, water, and schedule changes.



3 LET IT DRAIN AND DRY, THEN PLAY ON

How good
drainage keeps
fields safe



3.0 HOW GOOD DRAINAGE KEEPS FIELDS SAFE

Soccer playing fields can capture, infiltrate, and temporarily store rainwater below the surface. They serve as vital infrastructure for urban areas that face water stress. Capturing rainwater from sports fields requires careful planning, design, and construction. Many communities across the United States now view their sports fields as a water resource that can mitigate flooding and capture rainwater.

A further benefit is cooling. Fields that are designed to capture rainwater can cool the playing surface and reduce ambient temperatures. Natural grass primarily promotes infiltration and aquifer recharge. Storage for later reuse usually requires added capture systems such as underdrains that route water to cisterns or ponds. Artificial turf can be built over underground detention that temporarily stores rainwater for controlled release or reuse. Any water that is intended for reuse generally needs filtration and disinfection.

Water can collect in goal areas. It can create soft, muddy spots and wash soil away from places where players need firm footing. Giving water more opportunities to drain and soak in the ground helps keep fields playable and reduces flooding. A field that temporarily holds water is performing as intended. Let it drain and dry, then play on. Reopen only after simple observable safety checks are met.

Standing water does not need to be deep to cause problems. An overly saturated pitch can cause slipping and damage turf. The speed of drainage is often shaped by soil structure and turf conditions below the surface rather than what is visible on top. The toolkit's Soil and Turf Addendum explains how these underlying conditions influence drainage and recovery after rain. Routine maintenance supports faster infiltration and recovery on natural grass. This includes aeration, topdressing, decompaction, and keeping outlets clear. Synthetic systems benefit from grooming, cleaning of filters and sump pumps, and careful infill management.

Ideally, playing fields should clear surface water quickly by routing it into underground storage and into adjacent swales, drains, or rain gardens. This keeps the surface playable while the site detains, infiltrates, and reuses water. When key parts of the field stay wet for too long, games may be delayed or canceled or moved to backup fields that may be less convenient or desirable. Always follow local wet field policies and hotlines. For example, in Houston, Texas, teams follow the Houston Parks and Recreation Department rainout hotline and permit rules. Houston Youth Soccer Association field representatives and referees make playability decisions. South Texas Youth Soccer uses the Perry Weather dashboard to provide real time information on elite league field closures. Houston Sports Park uses a delayed first approach to adverse weather and a cancel second approach when necessary.

3.1 STRATEGIES AND OPPORTUNITIES FOR COLLECTING AND STORING RAINWATER

This section outlines options for capturing rainwater at soccer fields. The actions are grouped into general awareness, opportunities for natural fields, and opportunities for artificial turf. These actions help field managers and park departments incorporate rainwater capture and storage into their planning efforts.

A. General Awareness

Understanding that the playing field provides multiple benefits such as environmental benefits and flood mitigation.

What to look for

- Is your community at risk for extreme weather events, such as drought or flooding?
- Could your existing soccer field be used to collect rainwater and reduce flooding?
- Could playing fields be moved or built in areas that could collect rainwater and reduce flooding?

What you can do

- Talk to community leaders, planners, and developers about the weather risks and opportunities in your community.

B. Opportunities for natural fields

- Natural grass fields that are properly designed and graded can allow water to soak in and allow excess water to flow into designed areas that won't impact the play surface.

C. Opportunities for artificial fields

- Artificial turf fields can be designed to have cisterns or holding tanks underneath them that can capture rainwater and allow it to either percolate into the ground or to be used elsewhere following federal, state and local regulations as applicable.

3.2 STRATEGIES FOR STAYING DRY AND PLAYING ON

The actions in this section help keep fields safer and more playable after rain. These actions are grouped into four parts of the field.

A. Playing Surface

Keeping the field firm and dry helps prevent slipping

What to look for

- Puddles near goals, the area around the center mark, or elsewhere
- Soggy or muddy ground
- Worn areas that collect water
- Depressions that keep water from moving

Actions you can take

Facility managers and field maintenance staff:

- Aerate compacted soil to help water soak in
- Rest worn spots and fill low areas with soil and seed
- Improve grass cover to protect soil and support drainage

Coaches and referees:

- Don't play on fields with standing water or that are soggy.
- Conduct warm-ups off the field to reduce impacts if games must be played

Ensuring proper field grading and preventing surface water from running onto the playing field by adding culverts, berms or vegetation can play a critical role in keeping fields dry and safe.

B. Around the Field

Landscape management around the field determine how water moves on and off the turf. Trees around the field can provide shade around the edges, like in the previous section. Trees can also capture water in their canopy to reduce flooding on the field. Trees root systems can also absorb water once the water percolates down.

What to look for

- Water running from higher ground onto the turf
- Bare areas losing soil to erosion
- Drains blocked by leaves or trash
- Standing water near sidelines

If puddles return quickly after rain or after land maintenance, the issue may be related to underlying soil or turf system conditions rather than maintenance alone. See the Soil and Turf Addendum for context on when drainage issues should be escalated.

Actions you can take

Facility managers and field maintenance staff:

- Clear drains and channels so water can flow
- Plant vegetative cover to slow water and protect soil
- Shape edges of the playing field so water moves away from the playing surface
- Ensure proper field grading to improve surface drainage

Coaches and referees:

- Report drainage issues to facility managers and maintenance staff

C. Built Features

Walkways, seating and other built structures can collect water and become slippery. Every action in this section helps keep the field safer and more playable after rain.

What to look for

- Pooling near bleachers or team benches
- Slippery surfaces after rain
- Drainage blocked near buildings or paved areas
- Low land spots where people step off walkways

Actions you can take

Facility managers and field maintenance staff:

- Check that paved areas drain away from seating
- Add mulch, or permeable material near benches
- Clear debris from drains near fields, parking areas, and buildings
- Redirect water from downspouts away from walkways
- Place portable benches and gathering spots in dry locations

when rain is expected

Coaches and referees:

- Report built structure issues to facility managers and maintenance staff

D. People on the Field

How players and families move and gather affect field conditions and safety. Every action in this section helps keep the field safer and more playable after rain.

What to look for

- Players crowding into soft, muddy areas
- Well-worn paths from repeated foot traffic
- People standing into wet zones while waiting or watching

Actions you can take

Facility managers and field maintenance staff:

- Limit the playing field use right after heavy rain so turf can recover

Coaches and referees:

- Move warmups away from soft areas after storms
- Guide foot traffic along the firmest routes
- Set up team and family areas in drier spots that are easy to reach

3.3 HOW TO KNOW YOUR FIELD IS STAYING DRY

These checks help you see whether drainage is improving and **What you can observe**

- Fewer puddles after heavy rain
- Faster recovery in goal areas and corners
- Firmer footing in places where players turn and jump
- Safer movement around seating and walkways

What you can measure

- Press your foot on known trouble spots and notice if they feel firmer over time
- Count puddles right after rain and again one hour later
- Track how often practices are restricted due to wet turf

Simple records to keep

- Drainage tasks that were completed
- Areas that improved after changes

3.4 WHAT IT TAKES TO STAY DRY

Zero to low-cost actions:

- Clear drains and ditches
- Move warmups to drier spots
- Fill low spots in the playing field, in the surrounding landscape or next to walkways
- Add mulch near common wet areas
- Use cones or ropes to protect soft ground while it recovers

Medium to high-cost improvements:

- Improve drainage around trouble spots
- Add swales or channels to guide water
- Install permeable surfaces in busy zones
- Plant vegetation that protects soil and slows water

Establishing green infrastructure helps reduce flooding and protects field conditions.



Investing in Drainage and How to Fund It

Better drainage protects players and spectators, helps keep games on schedule, and reduces repair time. Because these upgrades also manage stormwater, they may qualify for city or water authority funding. Make the case with simple evidence. Note last season's weather closures, photograph puddle-prone spots and how long they take to drain, record slip or mud incidents and maintenance hours, and run a small pilot such as a short bioswale or a permeable path to estimate playable hours gained. With those results in hand, approach stormwater, urban forestry, and parks programs or local sponsors to fund and scale the improvements.

Use the checklist on the next page after rain to see how quickly your field recovers.



3.5 STAY DRY CHECKLIST – DRAINAGE MANAGEMENT

Use this list after rain or during your regular field checks. Mark ‘Yes,’ ‘Somewhat’ or ‘No’ for each item. ‘Yes’ items show what already keeps players safe and dry. ‘Somewhat’ items are quick wins to improve recovery after storms. ‘No’ items are future upgrades to plan for when support and funding are available.

PLAYING SURFACE	YES	SOME WHAT	NO	BUILT FEATURES	YES	SOME WHAT	NO
THE SURFACE FEELS FIRM IN THE MAIN PLAY AREAS	☐	☐	☐	WALKWAYS AND STEPS STAY DRY AND SAFE TO MOVE THROUGH AFTER RAIN	☐	☐	☐
PUDDLES ARE NOT FORMING IN COMMON RUNNING ZONES	☐	☐	☐	SEATING AREAS DO NOT COLLECT WATER UNDER OR AROUND THEM	☐	☐	☐
GOAL BOXES AND CORNERS RECOVER WELL AFTER RAIN	☐	☐	☐	PORTABLE BENCHES ARE PLACED IN DRY LOCATIONS	☐	☐	☐
LOW SPOTS ARE FILLED AND GRASS COVER IS IN GOOD CONDITION	☐	☐	☐	DRAINS OR GRATES NEAR BUILDINGS STAY OPEN	☐	☐	☐
WARMUPS ARE MOVED IF SOFT TURF STARTS TO WEAR DOWN	☐	☐	☐				
AROUND THE FIELD	YES	SOME WHAT	NO	PEOPLE ON THE FIELD	YES	SOME WHAT	NO
WATER FLOWS AWAY FROM THE FIELD AND NOT ONTO IT	☐	☐	☐	TEAMS DO NOT GATHER IN THE SAME SOFT OR MUDDY AREA	☐	☐	☐
EDGES HAVE VEGETATION OR OTHER NATURAL COVER TO REDUCE EROSION	☐	☐	☐	FOOT TRAFFIC IS DIRECTED AWAY FROM WET ZONES	☐	☐	☐
DRAINAGE CHANNELS OR DITCHES ARE CLEAR OF DEBRIS	☐	☐	☐	FIELD USE IS LIMITED RIGHT AFTER HEAVY RAIN TO PROTECT TURF	☐	☐	☐
WET SPOTS NEAR THE SIDELINES RECOVER QUICKLY	☐	☐	☐	SEATING AND GATHERING SPOTS ARE SET UP IN DRIER AREAS	☐	☐	☐

Quick Drainage Guidelines for Implementation

These guidelines provide simple best practices to support decisions about rainwater and field drainage. They are not design standards.

D1. Surface drainage

D1.1 Fields should shed water so that rain does not pool in active play areas.

D1.2 Low spots that collect water after storms should be flagged for monitoring and repair.

D1.3 Water should move away from goals, sidelines, and high use areas.

D1.4 For local common practices consult the City of Houston Public Works Drainage Design Manual online. <https://www.publicworks.houstontx.gov/stormwater/drainage-design-manual>

D2. Slopes and grading

D2.1 Field surfaces usually have gentle slopes that move water off the playing surface without being noticeable to players.

D2.2 Sudden dips, ridges, or uneven areas often signal grading problems.

D2.3 Changes in slope that affect ball roll or footing should be flagged for coordination.

D3. Standing water

D3.1 Puddles that remain more than about one hour after rainfall often indicate deeper drainage issues.

D3.2 Repeated puddling in the same locations is a sign the problem is below the surface.

D4. Surface treatments

D4.1 Light surface repairs can help short term drainage in worn areas.

D4.2 Repeated surface treatments that do not last should be paused rather than repeated.

D4.3 Adding sand or other material that does not match what is below the surface.

D5. When to pause and coordinate

D5.1 Repeated flooding in the same areas.

D5.2 Any work that changes field slope or grade.

D5.3 Changes that affect grade or runoff may require coordination with local stormwater permitting. See the City of Houston permitting information. www.houstonpermittingcenter.org



Why managing
waste keeps soccer
fields clean and safe

4 WASTE LESS, PLAY MORE



4.0 WHY MANAGING WASTE KEEPS SOCCER FIELDS CLEAN AND SAFE

Busy sidelines and water breaks can leave bottles, wrappers and food scraps behind. Improperly managed waste does more than look messy.

It can also attract pests, create hazards, and end up in waterways. Waste includes food and beverage packaging that is littered when it could have been placed in the appropriate trash or recycling bin. Reducing, reusing, and recycling waste helps protect the environment and keep shared spaces cleaner and more enjoyable, so players, coaches, and fans can focus on the game.

4.1 STRATEGIES FOR WASTING LESS AND PLAYING MORE

This section provides simple ways to prevent waste before it happens, keep fields tidy during events, divert recyclables from landfills, and handle food scraps in more sustainable ways.

A. Playing Surface

A clean field prevents injury and keeps pests away.

What to look for

- Trash such as bottles and wrappers left on turf after games
- Food scraps dropped on the turf
- Tape, caps or smaller items hiding in the turf

Actions you can take

Facility managers and field maintenance staff:

- Ensure there are enough trash and recycling bins conveniently located near the field
- Encourage the use of reusable containers for drinks and food

Coaches and referees

- Walk the field after each practice or game to ensure thorough cleanup
- Encourage teams to pick up their trash after games
- Keep snacks and drinks off the turf

B. Around the Field

Bench areas on the sides of the field where players and coaches sit and keep their equipment tend to collect a lot of waste.

What to look for

- Trash littered around the benches
- Overflowing bins during and after events
- Recyclables thrown into trash bins and vice versa
- Waste spread across the sidelines or endlines by the goal

Actions you can take

Facility managers and field maintenance staff:

- Place bins by team benches
- Pair recycling bins with trash bins so sorting is easy
- Empty bins often so they do not become too full
- Add clear signs with pictures that show what goes in recycling versus trash bins

Coaches and referees

- Ensure thorough cleanup after games
- Encourage the use of reusable containers for drinks and food

C. Built Features

Walkways, seating, concession stands, and other gathering areas can collect a lot of waste.

What to look for

- Trash around seating areas
- Overflowing bins or spills near bleachers or concessions
- Lack of trash and recycling bins near seating or walkways

Actions you can take

Facility managers and field maintenance staff:

- Place trash and recycling bins near seating areas
- Add signs with pictures so recyclable sorting is easy for spectators
- Use easy to clean surfaces around concessions
- Encourage concession stands to engage in sustainable procurement and offer reusable or recyclable containers and packaging as well as bulk/refillable condiment dispensers

D. People on the Field

Habits matter. How teams use the space will affect how clean it stays.

What to look for

- Teams leaving bottles or wrappers
- Players dropping tape or gear on the field and sidelines
- Lack of clear messaging about post-game cleanup
- Confusion about what is recyclable
- Lack of nearby trash and recycling bins

Actions you can take

Facility managers and field maintenance staff:

- Post educational signage around the facility about proper waste management
- Ask coaches to educate their players about waste and recycling

Coaches and referees

- Encourage reusable bottles and snack containers for players
- Provide cleanup reminders before everyone leaves



4.2 DOCUMENT YOUR PROGRESS TOWARDS WASTE FREE FIELDS

These checks help you see whether cleanup habits are improving and waste is handled better over time. Be sure to make observations and collect data before and after you implement changes so you can track your progress.

What you can observe

- The amount of trash left on the turf and sidelines
- How clean the walkways and seating areas
- Whether waste is being correctly sorted between recycling and trash bins
- Nearby waterways that trash could end up in

What you can measure

- How many areas need routine cleanup
- How much litter (weight or volume) is collected from various areas
- How many hours of routine cleanup are needed before and after implementing changes
- Track recycling contamination and waste diversion by conducting a waste audit

Simple records to keep

- Notes on problem spots that improve or return
- Days and times when bins fill up quickly and need to be emptied
- Cleanup support from certain teams or families



4.3 WHAT IT TAKES TO WASTE LESS

Zero to low-cost actions:

- Locate bins where people gather
- Pair recycling and trash bins
- Add clear signage to recycling and trash bins
- Promote reusable bottles and food containers via signage and digital messages
- Quick clean up walkthroughs to reset the field after events
- Organize a volunteer “Green Team” to help clean up and educate teams and parents
- Use or set up email or group-messaging tools to send educational info and reminders to teams and families

Medium to high-cost improvements:

- Durable, covered bin stations to stop wind from blowing trash
- Add durable, multilingual signage with pictures by recycling and trash bins
- Explore composting options to more sustainably manage food scraps such as orange and banana peels
- Upgrade surfaces under seating and concession areas that are easier to clean
- Encourage concession stands to engage in sustainable procurement and offer reusable or recyclable containers and packaging as well as bulk/refillable condiment dispensers



Investing in Waste Management and How to Fund It

Cleaner fields reduce maintenance time, improve recycling diversion, discourage pests, and improve the overall experience for players and families. These outcomes, along with stormwater benefits from keeping litter out of drains, can unlock support from city programs, waste haulers, and sponsors. To make your case, document specifics about your site including cleanup time after events, amounts of litter collected, photos of litter hot spots and bin overflow, and contamination in recycling bins. You can even try to pilot improvements such as updated signage and education or a durable covered bin station with clear labels near a busy sideline. Use the results to request grant funds or in-kind support from your local city government and then scale up what works. Be sure to check your local recycling guidelines and any relevant city ordinances when creating educational materials or considering composting operations.

The checklist on the next page helps reinforce cleanup habits during busy game days.



4.4 WASTE LESS CHECKLIST

Use this during or right after practices and games. Mark 'Yes,' 'Somewhat' or 'No' for each item. 'Yes' items show strong habits that keep the field clean. 'Somewhat' items show easy wins with small reminders. 'No' items refer to upgrades that support cleaner play in the future.

PLAYING SURFACE	YES	SOME WHAT	NO	BUILT FEATURES	YES	SOME WHAT	NO
THE TURF IS FREE OF BOTTLES, WRAPPERS AND OTHER DEBRIS	☐	☐	☐	SEATING AND WALKWAYS STAY FREE OF TRASH AFTER EVENTS	☐	☐	☐
FOOD AND SNACKS ARE KEPT OFF THE PLAYING FIELD	☐	☐	☐	RECYCLING AND TRASH BINS HAVE PROPER SIGNAGE FOR EASIER SORTING	☐	☐	☐
GEAR AND TRASH ARE PICKED UP BEFORE TEAMS LEAVE	☐	☐	☐	STORAGE OR CLEANING SUPPLIES, WHERE PRESENT, ARE EASY TO ACCESS	☐	☐	☐
REGULAR CLEAN-UP ROUTINES ARE IMPLEMENTED	☐	☐	☐	SURFACES AROUND CONCESSION STANDS ARE CLEAN AND SAFE	☐	☐	☐

AROUND THE FIELD	YES	SOME WHAT	NO	PEOPLE ON THE FIELD	YES	SOME WHAT	NO
BINS ARE PLACED BY TEAM BENCHES AND WHERE FAMILIES GATHER	☐	☐	☐	PLAYERS BRING REUSABLE BOTTLES AND SNACK CONTAINERS WHEN POSSIBLE	☐	☐	☐
BINS ARE NOT OVERFLOWING AFTER GAMES	☐	☐	☐	TEAMS KNOW WHERE TO FIND TRASH AND RECYCLING BINS	☐	☐	☐
RECYCLING AND TRASH BINS HAVE PROPER SIGNAGE FOR EASIER SORTING	☐	☐	☐	VOLUNTEERS ENSURE THOROUGH CLEAN-UP BEFORE LEAVING	☐	☐	☐
SNACK WASTE IS MOSTLY FOUND AROUND SEATING AREAS AND CONCESSION STANDS, WHERE PRESENT, NOT SCATTERED	☐	☐	☐	CLEAN-UP REMINDERS ARE PROVIDED AT EACH EVENT	☐	☐	☐

Quick Waste and Field Cleanliness Guidelines for Implementation

These guidelines provide simple best practices to support decisions about waste management and field cleanliness. They are not design standards.

W1. Bin placement and spacing

W1.1 Place waste and recycling bins where people already gather.

W1.2 Space bins so they are no more than short walking distances apart.

W1.3 Pair trash and recycling bins together, when possible, to reduce confusion.

W1.4 For local waste container placement guidance and related requirements in Houston, read the City of Houston Solid Waste Management placement guidelines. <https://www.houstontx.gov/solidwaste/garbage.html>

W2. Timing and servicing

W2.1 Empty bins before games and practices to prevent overflow.

W2.2 For multi-game events, consider scheduled emptying at halftime or between matches.

W2.3 Include trash and recycling collection in pre-event setup checklists.

W3. Signage and behavior cues

W3.1 Use clear signage on bins to show what goes where. For example, ensure that signs line up with what concessions offer.

W3.2 Place signs at eye level near main gathering spots and high-traffic pathways.

W3.3 Reinforce waste management practices through announcements during events when possible.

W3.4 Include multilingual signage depending on the local population.

W3.5 For broader waste and litter controls, consult the City of Houston Solid Waste and Litter Control ordinances online: <https://www.houstontx.gov/solidwaste/chapter39.pdf>

W5. When to pause and coordinate

W5.1 Installing new permanent bin stations or enclosures.

W5.2 Modifications near storm drains, curbs, or drainage systems may need review with local stormwater or permitting authorities.

W5.3 For broader stormwater quality and runoff guidance, read Harris County Flood Control District publications: <https://www.hcfc.org/resources/publications>

Building habits
that support
the field

5 BRINGING EVERYONE ON BOARD



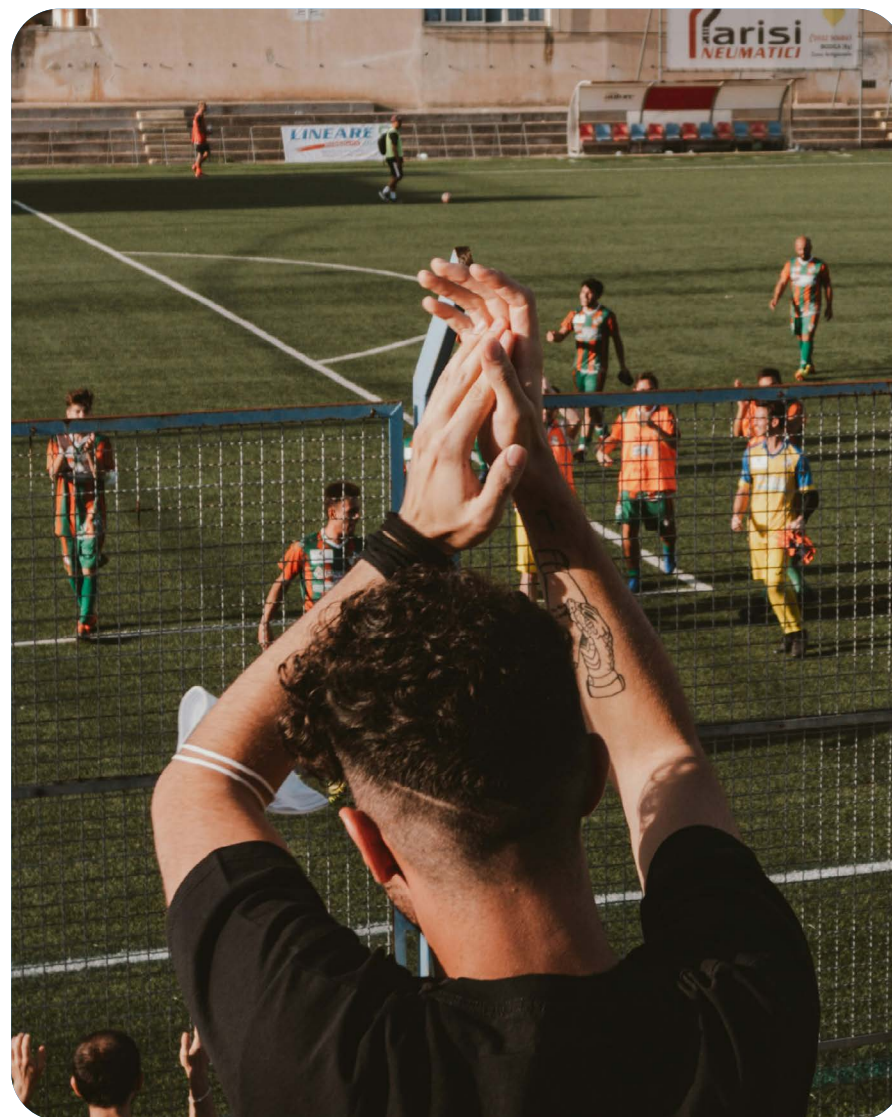
5.0 BRINGING EVERYONE ON BOARD

Keeping a soccer field safe, clean and comfortable does not happen through field upgrades and waste management alone. The way players, fans, and families use the space each day is what keeps those improvements working. A sustainable soccer field handles heat, water and waste in ways that protect the people who use it and keep the game moving.

Simple reminders can help build habits that support the field. These habits are just as important as shade structures, drainage fixes or better bins. When everyone participates, the field stays open longer and needs less repair.

What helps

- Signs near bins, shaded areas and walkways that highlight the right choices
- Short reminders from coaches before teams leave the field
- Volunteers for a quick reset after busy games or practices
- Keeping snacks and drinks in one place for faster cleanup
- Showing families where to sit and rest on the coolest and driest sides



Sample reminders

- Take breaks in the shade and drink water in reusable bottles to stay cool and healthy.
- Avoid soft or muddy areas so the turf can recover and stay safe to play.
- Keep the field clean by using the trash and recycling bins before heading home.

Why this matters

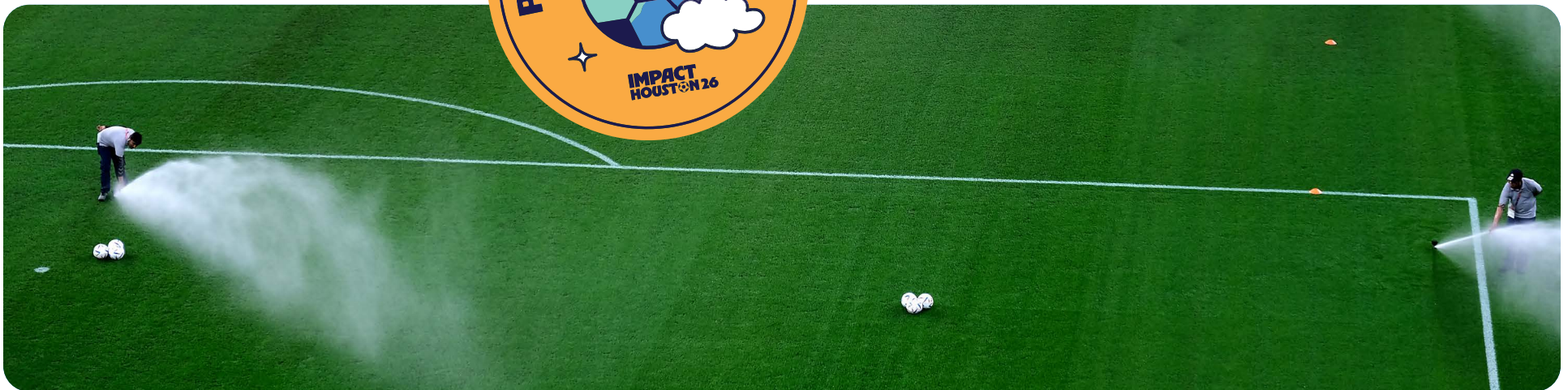
- Better habits make cooling, drainage and cleanup work better.
- Families and players feel proud of the field and want to take care of it.
- Fewer problems mean more time for play and less time fixing issues.

Implementing an outreach strategy

Helping people make the right choices can take resources. Sometimes costs are small such as printing signs or organizing volunteers. Other times towns and clubs may need help from partners who support good field care.

Funding support for outreach can come from local nonprofit groups, schools, team sponsors, or city programs. Businesses may help provide signs or bottle stations. Volunteer groups and youth teams can support cleanup after games and help spread the right messages. Education grants from local governments may also support outreach that protects health and community spaces.

Working together can often accomplish what no single group can achieve alone.



Useful information
that supports the
actions in this toolkit

6 HELPFUL RESOURCES



HELPFUL RESOURCES

These following resources offer useful information that supports the actions in this toolkit to keep soccer fields safer, cooler, cleaner and ready for play.

A. Keeping Your Cool

1. Heat and Air Quality Basics

<https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics>

How hot days can affect air quality and why Ozone Action Days matter for outdoor sports.

2. Understanding Heat Islands

<https://www.epa.gov/heatislands>

How different surfaces warm up in the sun and ways to lower temperatures around play areas.

3. Cooling With Trees and Vegetation

<https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>

Ideas for using shade and plants to make soccer fields more comfortable for players and families.

4. Heat Risk Application from the U.S. Centers for Disease Control and Prevention (CDC)

<https://ephtracking.cdc.gov/Applications/HeatRisk/>

Allows the public, schools and coaches see heat risk for upcoming days at a specific location and get practical guidance on precautions.

5. Heat and Athletes Fact Sheet

<https://www.cdc.gov/heat-health/risk-factors/heat-and-athletes.html>

Explains how heat affects people during sports and provides practical guidance on preventing and responding to heat illness.

B. Let it Drain, Then Play On: How Good Drainage Keeps Fields Safe

1. Green Infrastructure

<https://www.epa.gov/green-infrastructure>

Ways to help rain soak into the ground so fields dry faster and stay safer after storms.

2. Texas A&M Forest Service's Plan My Land Operation (PMLO) web tool

<https://texasforestinfo.tamu.edu/pmlo/>

This tool assists in planning land management activities, including custom mapping, operational assessments based on soil properties, and infrastructure planning.

3. Texas Tree Planting Guide

<https://texastreeplanting.tamu.edu/>

This interactive tool developed by the Texas A&M Forest Service help you select and care for the right trees for your specific location.

4. Planting steps

<https://tfsweb.tamu.edu/arborday/plantingsteps/>

The guide from the Texas A&M Forest Service covers crucial aspects such as proper planting depth, hole preparation, watering schedules, and correct mulching methods.

5. City of Houston Planning Department street trees list

<https://www.haufc.org/street-trees>

This resource lists various tree species by size and includes scientific names and growth specifications to aid in selecting trees suitable for urban environments in the Houston area.

6. Houston Area Urban Forestry Council species suggestions

<https://www.haufc.org/species>

The guide includes detailed information on various native species for the greater Houston area, such as scientific names, leaf descriptions, bark characteristics, and growth habits, and is intended for future expansion.

C. Waste Less, Play More:

1. Recycling and Waste Reduction

<https://www.epa.gov/recycle>

Tips for reducing waste and keeping shared spaces clean and safe for the community.

2. Model Recycling Program Toolkit

<https://www.epa.gov/circulareconomy/model-recycling-program-toolkit>

Materials in the toolkit can help communities increase participation in recycling programs and reduce contamination in the recycling stream.



ADDENDUM – SOIL AND TURF

Purpose of This Addendum

This addendum provides simple background on how soil conditions, turf systems, and grass types can influence heat, drainage, and field durability on soccer fields. Many of the issues coaches and maintenance crews see on the surface are shaped by decisions made below the ground and during field construction or renovation. This addendum is not a how to guide and does not replace day-to-day field management practices. Its purpose is to help readers recognize when soil and turf conditions may be contributing to ongoing problems and know when to seek additional support. In Houston, the Texas A&M AgriLife Extension is a key technical partner that provides region specific expertise and support to help communities better understand and address these complex field conditions.

The Quick Guidelines for Implementation in the toolkit provide practical best practices for heat, drainage, and waste, while this addendum explains how soil, turf systems, and grass types can influence whether those actions work as intended.

A. Why Soil and Turf Matter for Soccer Fields

What happens on the surface of a soccer field is strongly influenced by what lies beneath it. Soil conditions, turf systems, and grass types all play a role in how hot a field feels, how quickly it drains after rain, and how well it holds up under regular use. Many of the challenges coaches and maintenance crews face during a season are shaped by these underlying factors even when daily care is done well.

Soil affects how water moves and how roots grow. Compacted or layered soil can limit water soaking into the ground, which can lead to puddles, slippery areas, or runoff during storms. These same conditions can also reduce cooling on hot days because moisture cannot move up toward the surface to help lower temperatures. Turf systems and grass types influence how quickly fields recover from

wear, how much water they need, and how they respond to heat and heavy use.

B. How Soil Conditions Affect Heat and Drainage

Soil plays a major role in how a soccer field handles both heat and rain. When soil structure allows water to soak in and move through the ground, turf stays healthier and fields recover faster after storms. When soil is compacted or layered, water can sit on the surface or run off instead of draining, which can create soggy areas and uneven footing. These soil conditions help explain why some actions in the Heat and Drainage Quick Guidelines work well in some places and not in others.

The same soil conditions that affect drainage also influence how hot a field feels. Moist soil supports deeper roots and helps move water toward the surface, which can reduce surface temperatures on hot days. When soil is tightly packed or damaged by repeated traffic, this cooling effect is limited. As a result, fields may stay hotter even when watered or shaded.

Some common signs of soil related issues include puddles forming in the same spots after rain, turf thinning in high use areas, and surfaces that dry unevenly or remain hot despite regular care. These conditions are often linked to what is happening below the surface rather than to daily maintenance practices alone.

Understanding these connections can help coaches and maintenance crews recognize when adjustments to use and scheduling are appropriate and when deeper evaluation may be needed.

C. Turf Systems and Why Drainage Behaves Differently

Not all soccer fields are built the same way. The type of turf system used during construction or renovation plays a major role in how water moves through the field and how quickly it recovers after rain. These differences are often invisible from the surface but strongly affect playability and maintenance challenges.

Some fields rely mostly on native soil and surface grading to move water away. Others include added layers such as sand or internal drainage systems designed to move water below the surface. When these systems work well, fields drain faster and stay firmer. When they do not, water can become trapped below the turf and return to the surface, creating soggy conditions even after short rain events.

In some cases, surface treatments may appear to help at first but do not last. For example, adding material to the surface can sometimes slow drainage if it does not match what is below. This can lead to repeated puddling in the same areas and frustration when routine fixes do not hold up.

Understanding how turf systems move water can help crews decide when drainage issues can be addressed through routine care and when it should be handled through the Drainage Quick Guidelines. When drainage problems persist despite regular care, it is a signal that the issue may be related to how the field was built rather than how it is being used.

D. Grass Types and Setting Realistic Expectations

Different grass types respond differently to heat, rainwater, and wear. These differences affect how a soccer field looks and performs over a season and help explain why some fields recover quickly while others need more rest or adjustment. In many cases, the grass type was selected during installation or renovation and cannot be changed in the short term.

Some grass types are better suited to hot weather and heavy use but may require more frequent watering to stay healthy. Others use less water but recover more slowly from foot traffic or stress. Grass types also vary in how well they tolerate shade, how they respond after heavy rain, and how quickly they cool down on hot days. No single grass performs best in all conditions.

Understanding these tradeoffs can help coaches and maintenance crews plan realistic schedules and make small adjustments that protect the field. For example, fields with slower recovery may need

more rest between uses, while fields that struggle in heat may require added precautions during hot weather. These adjustments support safety and playability without placing blame on daily field care.

When questions arise about how a specific grass type is expected to perform in local conditions or whether ongoing issues are related to grass selection rather than maintenance practices, expert guidance can be helpful.

E. When to Pause and Ask for Help

Some field issues cannot be solved through routine maintenance or short-term adjustments. Knowing when to pause and seek support can save time, money, and prevent damage that gets worse over time.

Consider reaching out for additional help when the same problems return season after season, such as puddles forming in the same locations, turf thinning despite rest and watering, or fields staying unusually hot even after adding shade and water breaks. Conflicting advice from vendors or repeated trial and error fixes that do not last are also signs that the issue may be linked to soil, turf system, or grass type decisions made below the surface.

In the Houston area, Texas A&M AgriLife Extension is a key technical partner that can help communities better understand these conditions and connect them with appropriate training, diagnostics, and next steps.

This addendum supports the main toolkit by providing simple background on soil, turf, and grass related factors that influence field conditions. It is not a substitute for daily field care or local policies. By understanding when issues are driven by conditions below the surface, coaches and maintenance crews can make informed decisions about use and safety and know when to seek additional support to keep soccer fields safer, more playable, and open for the season.

THANK HOU.

VISIT US ONLINE:

[FWC26HOUSTON.COM/
ENVIRONMENTALSUSTAINABILITY](http://FWC26HOUSTON.COM/ENVIRONMENTALSUSTAINABILITY)

MARCH 2026