



Court Analysis Survey Report

Huntsville Tennis Center
2305 Airport Road
Huntsville, AL 35805

May 19, 2011
Actual Survey Date

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Report Information
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Date: 7/2011

I. Introduction

This tennis court survey was completed at Huntsville Tennis Center, on May 19, 2011. Roy Hey, Consultant for Har-Tru Sports conducted the survey and site analysis. Joc Simmons, Director of Tennis requested the analysis. The club furnished some of the information in this report. The rest was obtained through personal observational research provided by Har-Tru Sports. All recommendations used herein are in accordance with the ASBA (American Sports Builders Association) formerly the United States Tennis Court and Track Builders Association specifications for tennis courts.

II. Facility Information

Huntsville Tennis Center is located at 2305 Airport Road SW, Huntsville, AL 35801. Telephone (256) 883-3988. The facility consists of 24 Har-Tru tennis courts.

Areas of focus include a general review of the courts along with some focused issues such as surface & base condition and sprinkler system review.

III. Facility History

Huntsville Tennis Center has 24 Har-Tru tennis courts. The court's were originally constructed in 2005 and opened in 2006. The facility is open year round.



Picture 1 Huntsville Tennis Center

Satellite Photo Huntsville Tennis Center



Section IV

Recommendations & Conclusions

Section A

Recommendations and Conclusions

These recommendations can and should be used as a tool to correct problems associated with the tennis courts. The following is a list of issues needing to be considered either individually or in whole. Information gathered during the physical visit to the facility is done using up to date technologies and equipment along with verbal communication with the Tennis Professional and/or the maintenance staff.

A-1.0 Diagnosis

The court's at Huntsville Tennis Center consists of 24 Har-Tru tennis courts. The following are diagnosis and recommendations.

Slope

The 12 batteries of courts have a variety of slopes. Court slope is very important to maintain as it provides the necessary drainage which also helps to shed the court of unwanted finer stone particles. If these finer particles do not migrate off of the courts, the courts can become much harder and compacted. The courts can also take longer to drain causing less play time. Har-Tru courts are built with a slope that is 1" in every 24'-30'.

Courts not within ASBA Slope Spec include:

Court 1	1" in every 31.67'
Courts 4 & 5	1" in every 31.25'
Courts 10 & 11	1" in every 33.33'
Courts 12 & 13	1" in every 33.60'
Courts 14 & 15	1" in every 30.84'
Courts 16 & 17	1" in every 32.25'

Courts within ASBA Slope Spec include:

Courts 2 & 3	1" in every 29.91'
Courts 6 & 7	1" in every 29.41'
Courts 8 & 9	1" in every 29.23'
Courts 18 & 19	1" in every 28.23'
Courts 20 thru 22	1" in every 29.41'
Courts 23 & 24	1" in every 27.78'

Surface Thickness

Surface Thickness varies on all 12 batteries of courts. The surface thickness ranges from ¼" to as much as 1-5/8". Clay courts are built with a 1" consistent Har-Tru surface thickness. Most of these courts are not within ASBA spec. Har-Tru surface naturally migrates from the high side of the courts to the low side of the courts. This natural process rids the courts of finer particles as the water drains off. It also redistributes the surface material causing the high side surface thickness to become thinner and the low side of the courts to become thicker. This surface migration process over time, flattens the court and slows down drainage.

Clay courts usually have to be re-graded every 10-15 years to bring the surface back into ASBA spec of 1" in every 24-30'.

Drainage: Stone Base

Test 1 – Sieve testing was run on the stone base sample. Below is a comparison of actual Sieve test results compared to ASBA spec.

Sieve Size	Actual Pass%	Spec Pass %
3/8"	100 %	100%
#4	90.3%	80 – 100%
#100	15.9%	10 - 30%
#200	15.9%	less than 10%

All materials that passed through sieve #200 are the finer stone particles (dust). The sample profile is not within ASBA spec as compared above. The dust content is above what is recommended. This high dust content obstructs water from seeping down into the profile quickly. Once the base profile is fully saturated, it takes longer to drain or dry out.

Test 2 - A drainage test was taken on the sample base profile. The sample was placed in a container with holes in the bottom for drainage. The sample was compacted lightly and water poured onto the sample profile.

Results: The water took an unusual amount of time to drain down through the sample base profile. Pictures below document process and time.



Picture 2 Water first introduced to sample



Picture 3 15 minutes after water introduced to sample



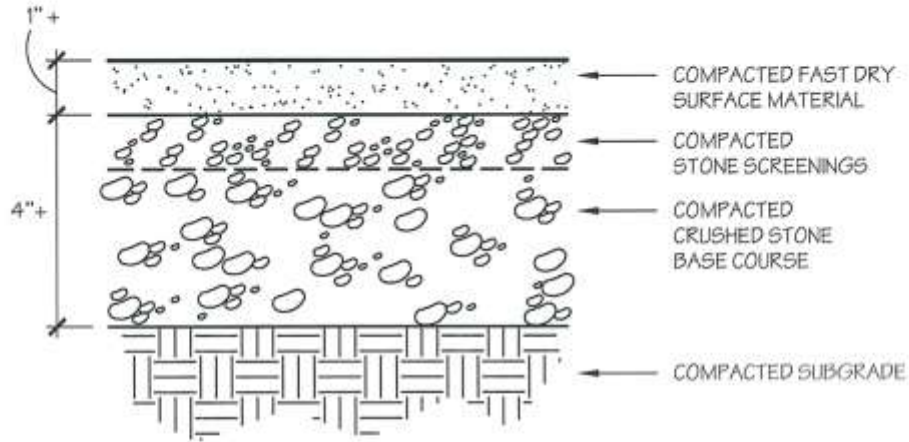
Picture 4 1 hour after water introduced to sample



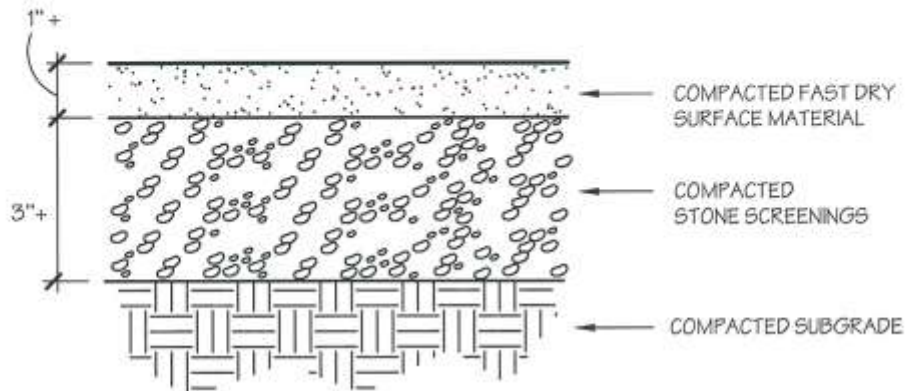
Picture 5 Overnight after water introduced to sample

The base material seems to have a lot of fine particles or dust that delays the water from seeping down through the stone base profile. This causes the Har-Tru surface layer to become overly saturated and lose its integrity thereby becoming soft and mushy. The courts then take a long time to drain and dry for play. Once the water has saturated the base profile, the overly dusty material then absorbs that moisture and holds on to it longer. All of this keeps the courts too saturated for a longer period of time than usual.

NOTE:
RECOMMENDED COURT SLOPE:
FROM: 0.28%
TO: 0.35%



STANDARD BASE



MODIFIED BASE

FAST DRY COURT SECTIONS

NOT TO SCALE 1" (inch)=25.4mm 1' (foot)=305mm

18FDry.AVL.09



DRAWINGS ARE ILLUSTRATIVE ONLY AND ASBA AND USTA
ACCEPT NO RESPONSIBILITY FOR THEIR USE.

Irrigation System

The present irrigation system is delivering approximately 65 – 70% head to head coverage. The water pressure is good and the system has a sufficient amount of heads per court. The sprinkler head spray pattern can be changed and modified by changing each heads nozzle.

Maintenance practices

A consistent court maintenance program is essential in maintaining clay tennis courts. The Maintenance team does an excellent job maintaining the 24 clay courts and has a good knowledge base about the process. To maintain a consistent clay court, budgets need to include annual top dressing, surface material to patch appropriately during the playing season and new court lines every 1-2 years. Maintenance schedules should include down time for daily, weekly and periodical maintenance. Please see Maintenance recommendations this section.

A-2.0 Recommendations

Option 1

The 24 Har-Tru clay courts are experiencing some major issues. The courts become soft and lose their integrity after periods of rain or longer water cycles. They also take a long time to dry after watering or rain. These issues may be caused by a couple of things.

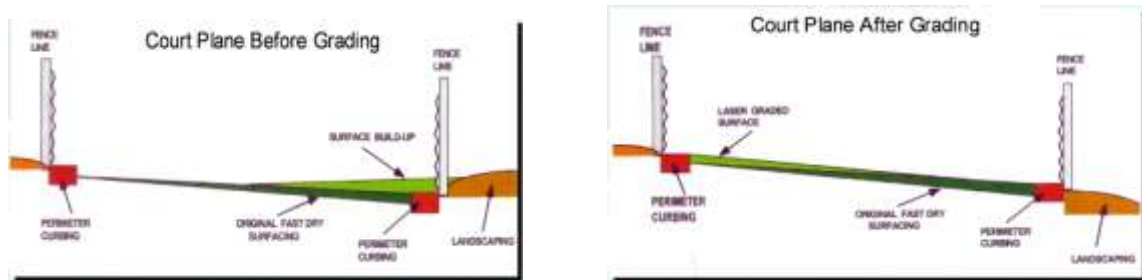
1. The base of the courts is not within ASABA spec and has too many fine stone particles or dust in the base profile.
2. Patching the tennis courts in high play area's is not done periodically which is allowing allot of surface depressions to form. These surface depressions hold water.
3. The surfaces are naturally flattening due to the natural migration of surface from the high side of the courts to the low side of the courts. This delays the appropriate amount of water run-off.

Combating these issues will be primarily done at the surface level since the base profile cannot be changed or modified without rebuilding the courts.

1. Periodically patch all low spots or surface depressions by identifying and filling in the depressions with new Har-Tru material. These depressions can be identified after a watering cycle or rain has taken place. Mark the areas and patch as necessary. See the Maintenance manual for details on how to patch.
2. Performing an annual top-dressing each year will replace the needed Har-Tru surface material that has migrated off of the courts. Adding 2 tons of new Har-Tru surface material each year will also help to keep the surface in check by providing surface material that has the right stone particle specification. Naturally during rolling and play, the surface's stone particles break down and the courts are left with more fines or finer stone particles. If these "fines" are not migrated off of the courts, because the courts become flattened, the surface layer can become harder and less impervious to water which then keeps more water on top of the surface just like we see in the present stone base profile. Also, maintaining the elevation of the surface is important when you are looking at the channel drain systems that are on each court. In some cases the surface is becoming lower than the channel drain. When this happens, the drainage system does not work properly and more water is left on the surface.
3. Water the courts more often at night and in the afternoons by scheduling smaller but multiple cycles. You will need more time for smaller amounts of water to seep into the base profile without an abundance of water sitting on the surface layer.

4. Use a Super Sopper to help eliminate water from the surface more quickly.
5. Hydro-ject – Hydro-ject is a process whereby holes are shot into the surface down through the base layer using water. The holes are filled with a coarse blend material to allow better drainage down into the base layer. A test court could be chosen to see if this process would help the slow drainage situation.

Eventually with this option, a total re-grading with a new layer of Har-Tru surface material will need to occur. The courts are approximately 5 years old. Clay courts usually need to be re-graded with laser guided equipment every 10-15 years as the courts naturally flatten. Some of these courts have already flattened out of ASBA spec and will need to be re-laser graded before this 10 year period.



Picture 6 Court slope before and after laser grading.

Option 2

The base profile is not within ASBA spec and is not allowing for proper water drainage from the surface layer. More testing can be done on individual courts in order to determine if all of the courts have a base layer that is not within ASBA spec.

If this is something that the facility wants to accomplish, Har-Tru Sports can run sieve tests on each court's base layer and provide those findings. We would need for the facility to provide us with a sample from each court.

Approximately 1 pound of base material will be needed from each court and appropriately marked.

After determining which courts have stone bases that are not draining properly, which we suspect all courts were built at one time and all have the same base material, then those courts would need to be re-built according to ASBA specifications using an approved stone base material.

One other test can be performed. Select an area on one court and dig up the existing surface and stone base. A test area approximately 6' x 6' will suffice. Replace the stone base with an approved base layer, Har-Tru Sports can test the product, then replace the Har-Tru surface. Monitor the results of the test area compared to the rest of the court.

This option would have the facility re-build the clay courts within ASBA spec. This option would be necessary if option 1 did not help to alleviate issues pertaining to the over saturation of the surface layer.

Option 3

This option recommends to consider a sub-irrigated system such as Hydro-Court. Sixty percent of all new Clay Tennis courts constructed today have a sub-irrigated system.

The Hydro-Courts can be installed on top of your existing Har-Tru courts. This would eliminate the need to overhaul or upgrade your existing irrigation system.

Hydro-Courts have many benefits such as, using less water, Less maintenance is needed during daily maintenance regiments and less down time during the mid-day hours.

Recommendation Summary

The 24 courts have a slow draining base layer that impedes water from draining down through the base layer away from the Har-Tru surface layer. This creates a softer surface after a heavy rain or water cycle. Option 1 may help to improve the situation but will not solve the drainage issues. The courts have a base layer that is found to be slow draining. The facility would need to re-build the courts if further testing is performed and found that all of the courts have the same slow draining base layer.

A-3.0 Maintenance

A good maintenance schedule or regiment is very important for consistent play on a clay tennis court. The Maintenance department does an excellent job at maintaining the 24 Har-Tru tennis courts at Huntsville Tennis Center. During my visit at the facility, the courts looked really good. The courts are on a regular maintenance regiment and the head of maintenance, Jon Newby seems to be well educated around the maintenance of Har-Tru tennis courts and sensitive to players needs in providing consistent Har-Tru courts.

The following is a list of things that can help the situation caused by the base layers slow drainage:

- Scrape the surface periodically to remove excessive “dead material” of stone particles which have fallen out of the surface profile and will not bind back into the surface. These stone particles can become a slipping hazard as well. You can identify dead material because it’s the first stone particles to dry and they move about the surface loosely. Reference the Har-Tru Maintenance Manual for when and how to scrape.
- Patching the courts especially in high play areas will be necessary to prevent water from creating water puddles on the clay courts. Water puddles can take a lot more time to dry which can delay play time. Patching according to need will help to keep the surface in a consistent plane which will help surface drainage as well as water retention.
- Using Magnesium Chloride will help to keep the court moist during the heat of the day without over saturating the surface.
- Scheduling court down time to perform necessary daily and periodic maintenance practices will help to greatly improve the courts consistency. See Maintenance Manual for these recommended processes.
- Budgeting for a sufficient staff will help to keep the Har-Tru tennis courts in top condition. Using our recommendations of 45-60 minutes per court per day will help to ensure the courts have the right amount of maintenance staff.

Remember to Use the Har-Tru Maintenance Manual for referencing maintenance processes as well as educating your staff on proper methods.

A-4.0 Tools & Equipment Evaluation:

Having the correct tools and equipment to maintain your 24 Har-Tru courts is very important in providing a consistent playing surface. The following is a list of tools and equipment that is necessary for a consistent maintenance program.

Drag Brush: Drag Brushes are important to have on the courts as they provide grooming and keep the surface consistent. Changing out the bristles when needed will keep your Drag Brush in good shape for consistent maintenance. Bristles can be easily replaced without the need to replace the entire brush.

Line Sweepers: Line Sweepers should be kept on court and ready for sweeping the lines when necessary. Make sure that the circular brushes are not worn and are brushing the lines consistently. The circular brushes are replaceable.

Aussie Clean Sweeps: The Aussies are designed to pick up debris that falls on the courts such as pine needles, leaves, etc. The Aussie is also used in place of brushing when you want a less aggressive surface groom and creates less surface drying.

Lutes: Having a couple of lutes available for use will be necessary when you want to periodically scrape up loose and dead material from the courts, in need of a light scarifying and conducting patch and repairs on the surface. Replace the blades as they wear down and become less agitating to the court.

Gator Rake: Having a Gator Rake on hand will be essential in cases where the surface will need a deeper scarification.

Steel Bristle Drag Brush: Having a Steel Bristle Drag Brush on hand will also be necessary when you want a less aggressive scarification than with the Gator Rake.

Super Sopper – A Super Sopper is a cylinder with sponge wrapped around it. This tool is used to help eliminate standing water on the courts.

Rollers: Having a reliable roller on site is important in the maintenance of Har-Tru clay tennis courts. Performing preventative maintenance on your equipment will ensure longevity and consistent results. See Owner's Manual for preventative maintenance schedules.

Note: The Maintenance staff does a great job maintaining and repairing court maintenance equipment.

A-5.0 5 Year Budget Maintenance Plan

The following includes a list of goals and time tables based on the Court Analysis Survey. These timetables can be used in budgeting for short and long term projects.

Subject	Description	Schedule
Laser Grading & 1" lift	Laser grading should be considered every 10 to 15 years.	Every 10-15 years
Top-Dress	Topdressing is necessary for each annual opening. 1-2 tons of Har-Tru per court should be applied with each top-dress.	Annually
Line Tape replacement	Line Tapes should be pulled up prior to top dressing. This will ensure that lines are straight, tight and have no surface material buildup on either side of line tapes during the playing season.	Annually
Windscreens	Windscreens should be replaced every 3-5 years or as they start to fade, discolor and get brittle.	Now & 3-5 years
Fencing-Hard Courts	Fencing should be painted or replaced as needed. Keeping this project in a cycle will help to eliminate a build up of high budgetary costs.	As Needed
Tools & Equipment	Keeping Brushes and Hand tools in good working condition is essential for great Har-Tru courts. Replacing worn brushes, lute blades etc. will keep the tools working properly.	Drag Brushes, Line Masters Lutes Aussie's
Roller	Having a reliable roller on site will be important to ensure the best possible courts. Preventative maintenance will ensure reliable equipment.	Grease annually & perform scheduled Preventative Maintenance
Amenities	Nets, Net Posts, Coolers, Benches, etc. should be replaced as needed.	As Needed

Maintenance Training	Properly maintained Har-Tru courts ensure court longevity and consistent playability which can really affect a facility's bottom line. Making sure the maintenance staff is sufficiently trained is key. We offer information on our website that can provide the training and knowledge needed. Attending maintenance seminars gives a Maintenance Employee an opportunity to learn about best practices and to meet others in the same industry. They get hands on training both in a classroom setting and out on the court. Please contact Har-Tru Sports for more information or go to our website at, www.hartru.com .	Annually
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Section V

Court Analysis Section

Section B

B – 1.0 Court Symptoms

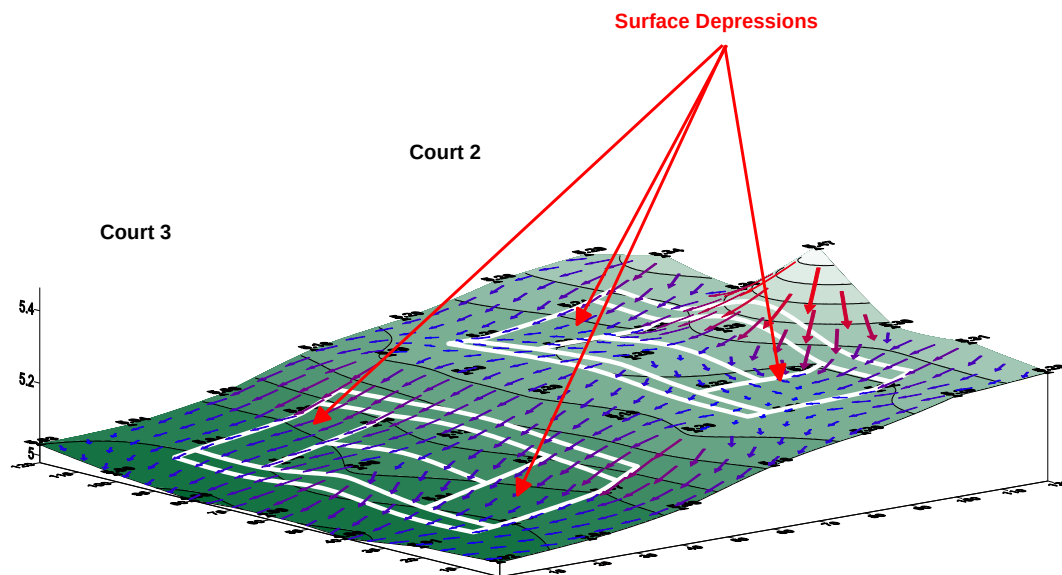
Most of the courts at Huntsville Tennis Center are experiencing slow drainage and water puddles that take a long time to dry. The facility is concerned that it takes 2-3 hours for some of the courts to dry after a prolong rain or watering cycle. Some of the courts seem to lose their compaction and becomes overly soft after a prolong rain.

Surface Depressions

The courts have a lot of low spots or surface depressions that hold water for long periods of time. The courts do not get patched during the play season to re-level these areas.

The map below shows a battery of courts that have low spots in most of the high play areas on the tennis courts. The low spots are caused by players displacing the surface material as they play. Over time these spots become larger and deeper which causes the surface to be in an inconsistent planarity. Water begins to gather during the watering process as well as rain. Silting begins to build up, which is finer stone particles that gather in puddles. This finer particle layer exacerbates the problem by further sealing the low spot or depression which in turn holds water longer.

Every clay court at this facility has low spots and water puddles which takes more time for the water to dissipate into the surface.



Picture 7 Surface depressions

Annual Top Dressing

Annual Top Dressing is not always done on every court. There are some years that some of the courts do not get annual top dressing. Annual top dressing and patching is essential to get the courts surface back into consistent planarity. It also helps to replace the surface thickness that naturally migrates off of the courts.

“Dead Material”

During the physical survey, an abundance of “dead material” or loose particles were found on most courts. This dead material should be periodically scraped and removed as these particles will not compact back into the surface profile. Dead material dries quicker than the compacted surface and may create too much slide. See picture below.



Picture 8 Dead material

Sprinkler System

The sprinkler system seems to have good water pressure although the present system allows for just one court being watered at a time. There is usually no afternoon watering during the day.

Section C Geotechnical Information

Upon inspection of the surfaces the following was determined.

C-1.0 Slope

Grade and slope were examined on the 24 Har-Tru courts. We documented the following information.

Court 1 – This court is sloped in an East to West direction, side-to-side with a total average slope of 2.052" or 1" in every 31.67'. This court is not within ASBA specification of 1" in every 24-30'.

Courts 2 & 3 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 4" or 1" in every 29.91'. This battery of courts is within ASBA specifications of 1" in every 24-30'.

Courts 4 & 5 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 3.84" or 1" in every 31.25'. This battery of courts is not within ASBA specifications of 1" in every 24-30'.

Courts 6 & 7 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 4.08" or 1" in every 29.41'. This battery of courts is within ASBA specifications of 1" in every 24-30'.

Courts 8 & 9 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 4.10" or 1" in every 29.23'. This battery of courts is within ASBA specifications of 1" in every 24-30'.

Courts 10 & 11 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 3.60" or 1" in every 33.33'. This battery of courts is not within ASBA specifications of 1" in every 24-30'.

Courts 12 & 13 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 3.57" or 1" in every 33.60'. This battery of courts is not within ASBA specifications of 1" in every 24-30'.

Courts 14 & 15 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 3.89" or 1" in every 30.84'. This battery of courts is not within ASBA specifications of 1" in every 24-30'.

Courts 16 & 17 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 3.72" or 1" in every 32.25'. This battery of courts is not within ASBA specifications of 1" in every 24-30'.

Courts 18 & 19 – These two courts are sloped in an East to West direction, side-to-side with a total average slope of 4.25" or 1" in every 28.23'. This battery of courts is within ASBA specifications of 1" in every 24-30'.

Courts 20 thru 22 – These three courts are sloped in a South to North direction, end-to-end with a total average slope of 4.08" or 1" in every 29.41'. This battery of courts is within ASBA specifications of 1" in every 24-30'.

Courts 23 & 24 – These two courts are sloped in an South to North direction, end-to-end with a total average slope of 4.32" or 1" in every 27.78'. This battery of courts is within ASBA specifications of 1" in every 24-30'.

Har-Tru courts are constructed on a slope of 1" in 24' -30' in a single plane. As the natural weather erosion processes of wind and water act upon the surface of the court, the slope can be slowly reduced as the particles of Har-Tru slowly migrate from the high side to the low side of the court.

Chart 1 illustrates both the existing & recommended slope of the court surfaces. Red depicts courts not align with ASBA spec.

Court #	Present Slope	Present Direction	Recommended Slope
1	1" in every 31.67'	East-to-West	1" in every 24-30'
2 & 3	1" in every 29.91'	East-to-West	1" in every 24-30'
4 & 5	1" in every 31.25'	East-to-West	1" in every 24-30'
6 & 7	1" in every 29.41'	East-to-West	1" in every 24-30'
8 & 9	1" in every 29.23'	East-to-West	1" in every 24-30'
10 & 11	1" in every 33.33'	East-to-West	1" in every 24-30'
12 & 13	1" in every 33.60'	East-to-West	1" in every 24-30'
14 & 15	1" in every 30.84'	East-to-West	1" in every 24-30'
16 & 17	1" in every 32.25'	East-to-West	1" in every 24-30'
18 & 19	1" in every 28.23'	East-to-West	1" in every 24-30'
20 thru 22	1" in every 29.41'	South-to-North	1" in every 24-30'
23 & 24	1" in every 27.78'	South-to-North	1" in every 24-30'

Chart 1



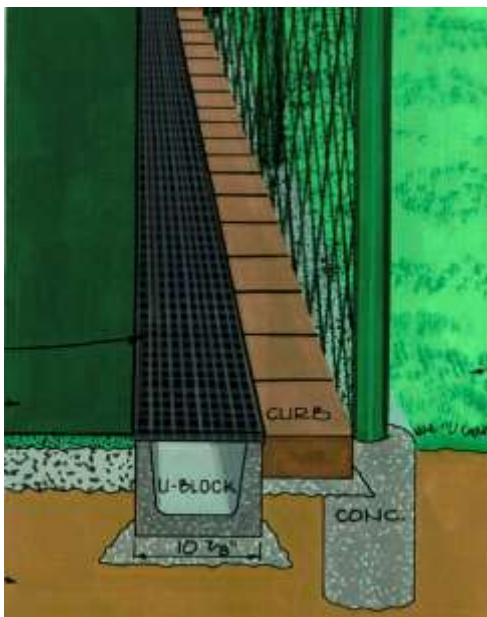
Picture 9 Surface migration over time.

C-2.0 Drainage

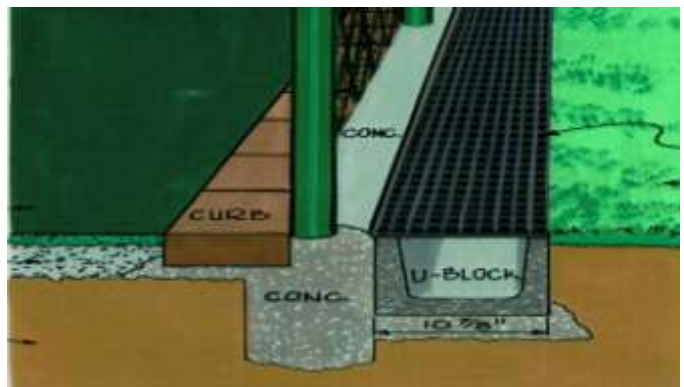
When it comes to drainage, the objective is to get water off the court in the best possible direction on a slope of 1 inch in 24' to 30'.

The slope should be verified every 10-15 years and re-graded using laser guided equipment if necessary.

The courts have a Channel Drain system which is located on the low end of each battery of courts. Picture 10 illustrates the type of drain used on these courts.



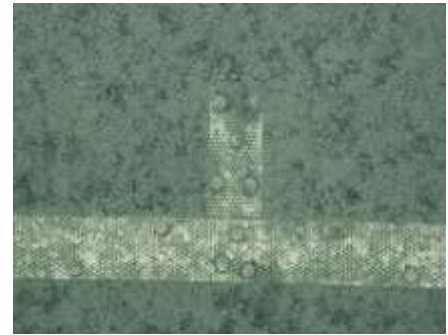
Picture 10 Channel drain installation



Picture 11 Channel drain installation

C-3.0 Silting

Silting is a deposit of finer particles that gather after puddling has occurred. Poor drainage issues can cause silting. Fine particles migrate to puddles on a clay court. The puddles dry leaving a light material which can be picked up by wind and displaced in un-desired areas. Ensuring the correct slope and drainage will help to keep silting from gathering.



Picture 12 shows silting

C-4.0 Surface Thickness

Core testing was taken in strategic locations on the 24 Har-Tru tennis courts. Har-Tru surfacing thicknesses were found to be as follows.

Court 1 – The Har-Tru surface material thickness was found to be from 3/8" thick to 1" thick.

Courts 2 & 3 – The Har-Tru surface material thickness was found to be from 3/4" thick on the high side to 1" thick on the low side of the courts.

Courts 4 & 5 – The Har-Tru surface material thickness was found to be from 1/4" thick on the high side to 1-1/8" thick on the low side of the courts.

Courts 6 & 7 – The Har-Tru surface material thickness was found to be from 3/4" thick to 2" thick.

Courts 8 & 9 – The Har-Tru surface material thickness was found to be from 1/2" thick to 1" thick.

Courts 10 & 11 – The Har-Tru surface material thickness was found to be from 1/2" thick on the high side to 1" thick on the low side of the courts.

Courts 12 & 13 – The Har-Tru surface material thickness was found to be from 3/4" thick to 1-1/4" thick.

Courts 14 & 15 – The Har-Tru surface material thickness was found to be from 1" thick to 1-3/8" thick.

Courts 16 & 17 – The Har-Tru surface material thickness was found to be from 3/4" thick to 1-5/8" thick.

Courts 18 & 19 – The Har-Tru surface material thickness was found to be from 1/2" thick to 1-1/8" thick.

Courts 20 thru 22 – The Har-Tru surface material thickness was found to be from 3/8" thick to 1-1/4" thick.

Courts 23 & 24 – The Har-Tru surface material thickness was found to be from 1/2" thick to 1" thick.

These variations in surface thickness may affect uniform drainage and water retention, particularly in dry weather. These courts are not within ASBA specification of 1" consistent surface thickness throughout the courts.



Picture 13 Surface Thickness



Picture 14 Surface Thickness



Picture 15 Surface Thickness



Picture 16 Surface Thickness



Picture 17 shows ideal surface thickness of 1"

Chart #2 below illustrates the average surface thickness of the Har-Tru courts. As the slope changes over time so does the thickness of the Har-Tru surface. A new court is built with 1" of compacted Har-Tru.

Over time, erosion and water run-off may move some of the Har-Tru toward the low side, reducing the total surface thickness on the high side. This displacement of material can cause drainage problems as well as stone base heaving towards the surface.

Court	Surface Depth
1	< 3/8" - 1"
2 & 3	< 3/4" - 1"
4 & 5	< 1/4" - 1-1/8"
6 & 7	< 3/4" - 2"
8 & 9	< 1/2" - 1"
10 & 11	< 1/2" - 1"
12 & 13	< 3/4" - 1-1/4"
14 & 15	< 1" - 1-3/8"
16 & 17	< 3/4" - 1-5/8"
18 & 19	< 1/2" - 1-1/8"
20 thru 22	< 3/8" - 1-1/4"
23 & 24	< 1/2" - 1"

Chart 2

C-5.0 Base Layers

The base layers of a Har-Tru tennis court serve two purposes – they provide a stable surface to hold the Har-Tru in place, and they act as reservoirs capable of storing and releasing water throughout the day via capillary action. As such, the base must be stable and permeable to function properly. The core samples of the outdoor courts revealed the following.

These courts have a stable and permeable base layer of 2-1/2" to 3-1/4" of Stone Screenings down to the soil.



Picture 18 Base Material – Stone Screenings

Section D General Court Information

Upon inspection of the courts, the following was determined.

D-1.0 Perimeter Edging

Clay court curbing is designed to maintain the integrity of the court as it stabilizes both the stone base and holds the Har-Tru surface material in place.

The curbing around the 24 courts is in good shape, holding the integrity of the courts in place and very consistent. No loose or displaced curbing observed during site visit.



Picture 19 Court Curbing



Picture 20 Court Curbing



Picture 21 Court Curbing

D-2.0 Fencing

The fencing around the 12 batteries of tennis courts is in good structural condition. All gates open and close correctly. The fence looks good ascetically except for a few places where the fence posts will need to be re-painted.



Picture 22 Fencing



Picture 23 Fencing

D-3.0 Windscreen

The Windscreen around the 12 batteries of courts is in good condition with no holes or faded areas.



Picture 24 Wind Screen

D-4.0 Irrigation System

The court's irrigation system is made up of 8 heads per court. All of the heads are Rainbird #6504 Falcon sprinkler heads. The sprinklers were observed while the system was turned on. The sprinklers are providing approximately 65-70% head to head coverage. The sprinkler system seems to be delivering consistent water coverage. Water Pressure is said to be 60-65 psi.



Picture 25 Sprinklers

Specifications

- 1" (26/34) female NPT or BSP threaded inlet
- SAM check device holds up to 10 feet (3,1 m) of head
- Rain Curtain nozzles: 04-black; 06-light blue; 08-dark green; 10-gray; 12-beige; 14-light green; 16-dark brown; 18-dark blue
- Nozzle outlet trajectory is 25°



Picture 26 Rainbird 6504 Falcon

Operating Range

- Precipitation Rate: 0.37 to 1.14 inches per hour (9 to 29 mm/h)
- Radius: 39 to 65 feet (11,9 to 19,8 m)
- Pressure - 30 to 90 psi (2,1 to 6,2 Bars)
- Flow: 2.9 to 21.7 GPM (0,66 to 4,93 m3/h; 0,18 to 1,37 l/s)



Picture 27 Rainbird 6504 Falcon

D-6.0 Amenities

The amenities observed:

Item	
Line Tapes	Herringbone Punched
Net Posts	Welch brand Internal Wind
Nets	Welch brand
Court Numbers	Each court is numbered
Gazebo / Court Seating	Metal seating
Water Coolers	None
Tidi Baskets / Trays	Black – Each Court

Line Tapes

The Court Lines on the 24 tennis courts are Herringbone punched. Some of the Court Lines are worn, especially on the base lines. Some of the edges have started to curl up which could be a tripping hazard. The facility does not replace Court Lines each year.

Tapes should be removed each year prior to top-dressing and then replaced after top-dressing has occurred. This practice will ensure that the surface material does not build up around the court lines.

Court lines that have worn smooth with no pattern can become slippery.



Picture 28 Court Lines

Net Posts

The Net Posts on all 24 courts are holding consistent net tension and seem to be structurally good. Some of the posts need to be re-painted.



Picture 29 Net Post



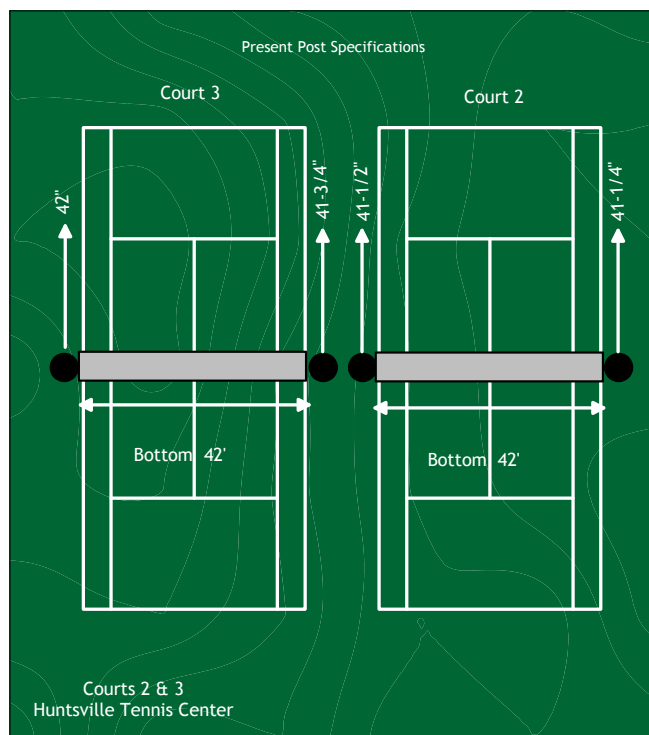
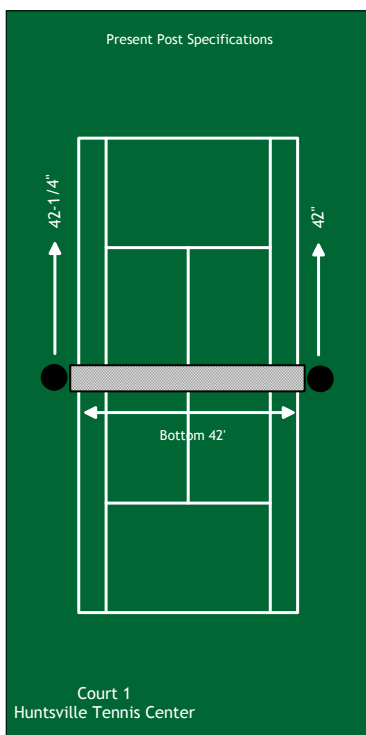
Picture 30 Net Post

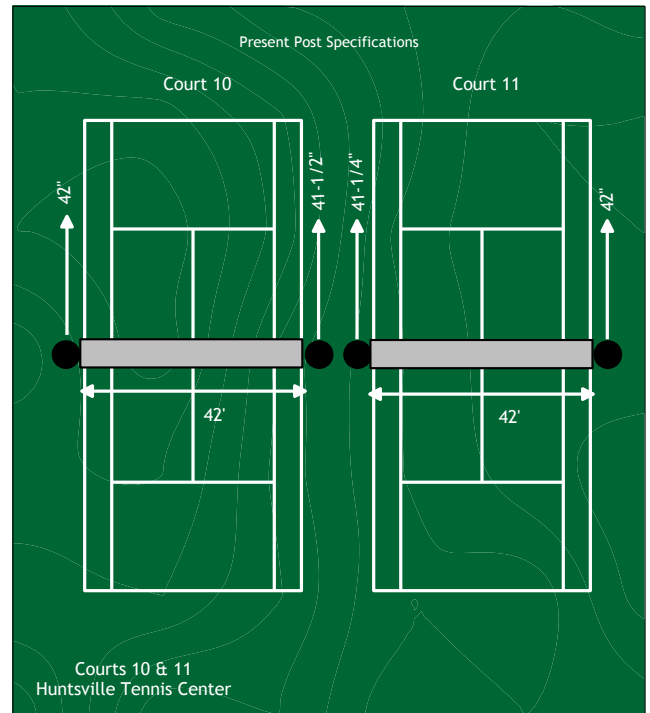
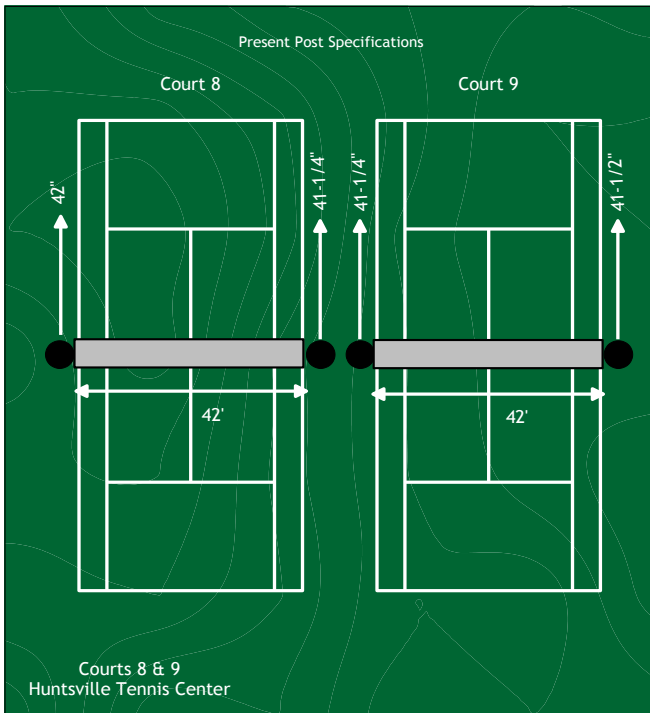
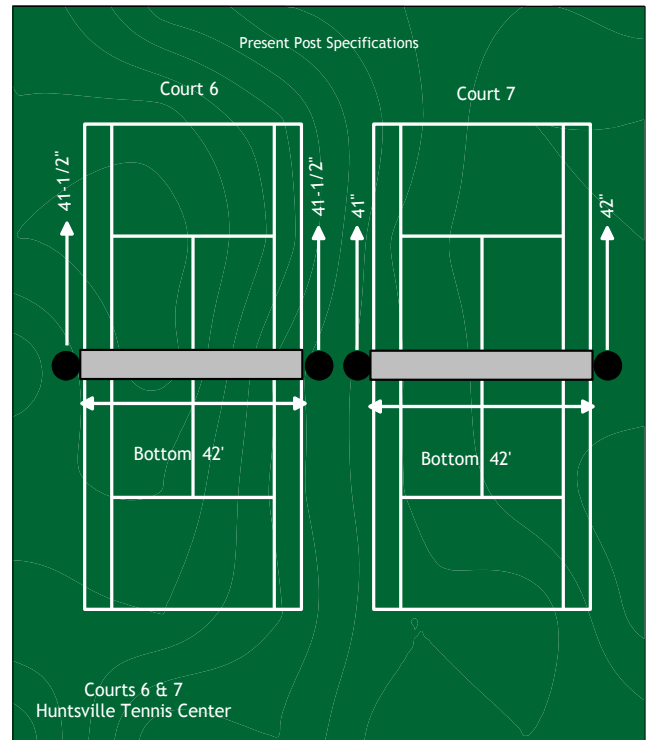
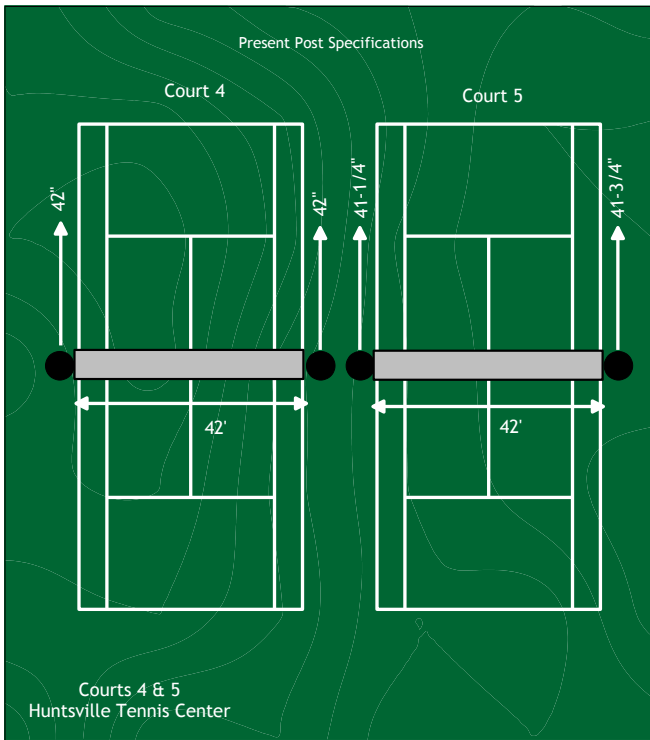
ASBA Specifications

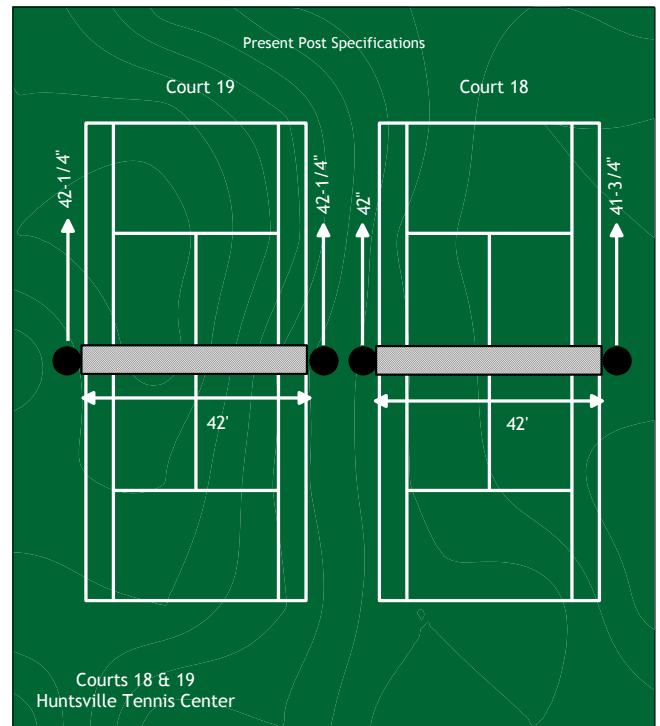
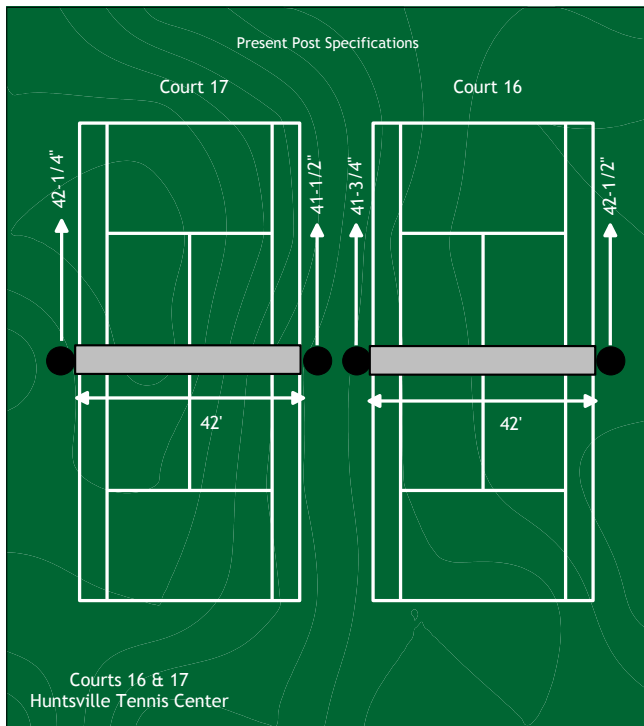
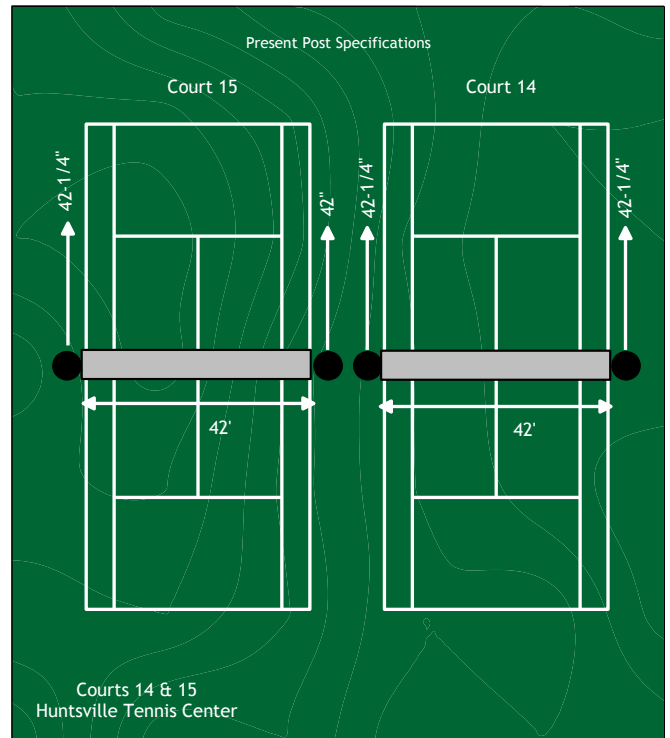
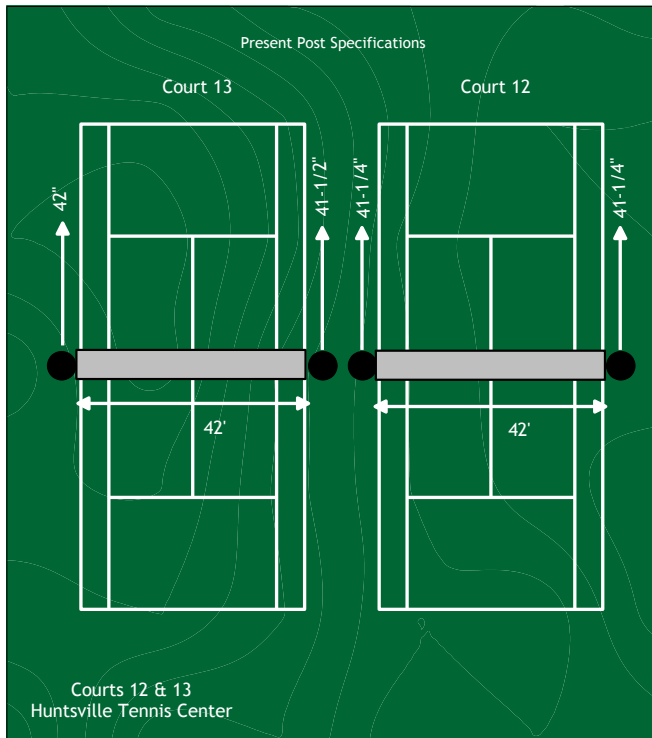
Net Posts and Sleeves

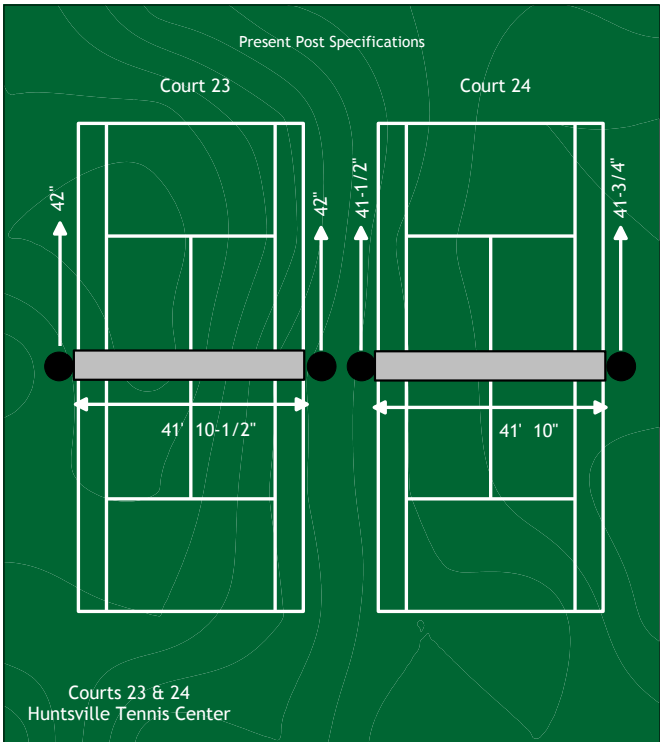
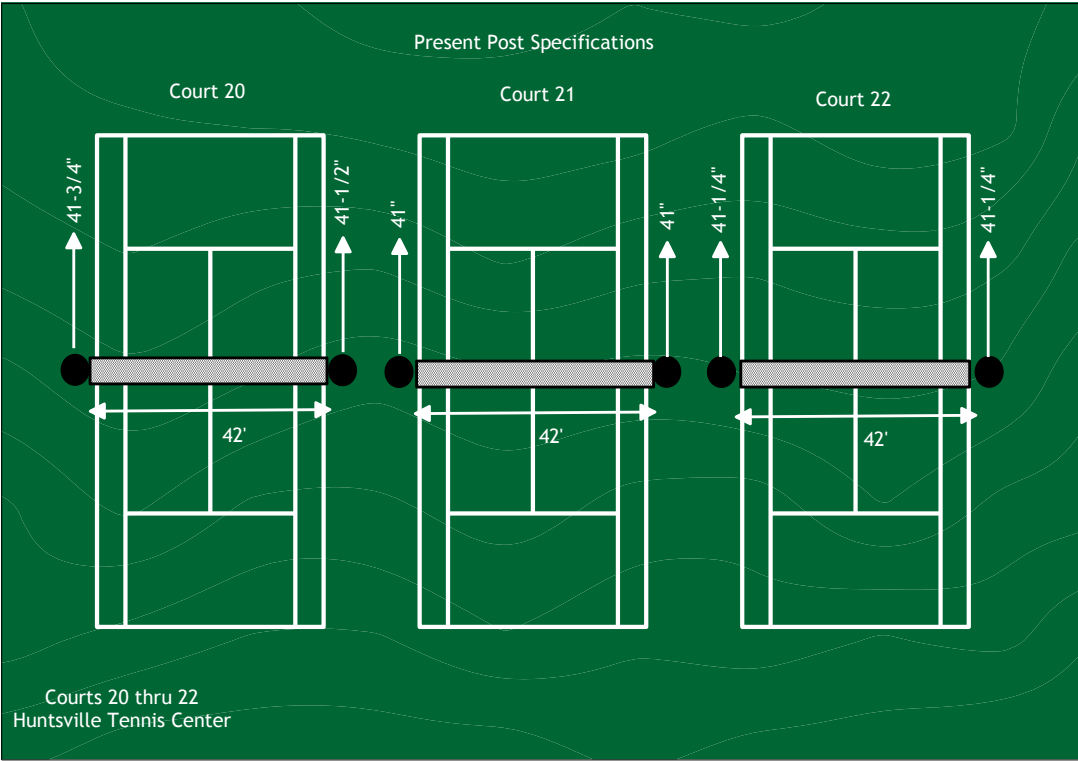
Posts and post sleeves should be set 42' apart for a doubles court, measured from the center of one post to the center of the other. For tournament use, it is recommended that a second set of net post sleeves be supplied 33' (center to center) apart for singles play. Posts should be set plumb and true so as to support the net at a height of 42" above the court surface.

Present Post Configuration









Nets

The nets on all 24 tennis courts are in good condition with no holes or frayed areas. There are a couple of nets that have head bands which are slightly mildewed.

Note: Please reference the Har-Tru Maintenance Manual for tips on how to attach nets to net posts.



Picture 31 Net



Picture 32 Court Numbers

Court Numbers

Each of the tennis courts are clearly marked with court numbers. The court numbers are clean and readable.

Court Seating / Shade Shelters

The courts have metal seating under Shade Shelters on each battery of courts. The Shade Shelters and seating are in good condition and structurally good.



Picture 33 Court Seating / Shade Shelter

E-1.0 Biological Growth

The tennis courts have very little or no weeds, algae or moss growth in the playing area on the tennis courts. Good maintenance practices have kept these growths to a minimum. However there are some algae & moss growing around the perimeter of a few courts. Surface Agitation is the best solution for algae & moss growths. See the Har-Tru Maintenance Manual for weed control recommendations.



Picture 34 Algae growth



Picture 35 Algae growth



Picture 36 Equipment

F-1.0 Tools and Equipment

The following is a list of equipment we observed at the facility noting present condition.

Item	How many
Line Sweepers	5 Line Master – Some in good condition 3 Proline Line Sweeps 12 Line Scrubs – Good Condition
Drag Brushes	3 Drag Brush Lute Hand Models
Grooming Mats	4 Aussies – Good Condition 1 Metal Drag Mat
Scarifiers	6 30" Lutes – Needs blade replacement 2 48" Lutes
Spreaders	2 Gandy Spreaders – Good Condition
Rollers	2 Court Pac Pro Rollers – Good Condition although Throttle Cables keeps breaking 2 Giliberti ServAces – Good 2 Hand Rollers - Good 1 Herring Roller



Picture 38 ServAce

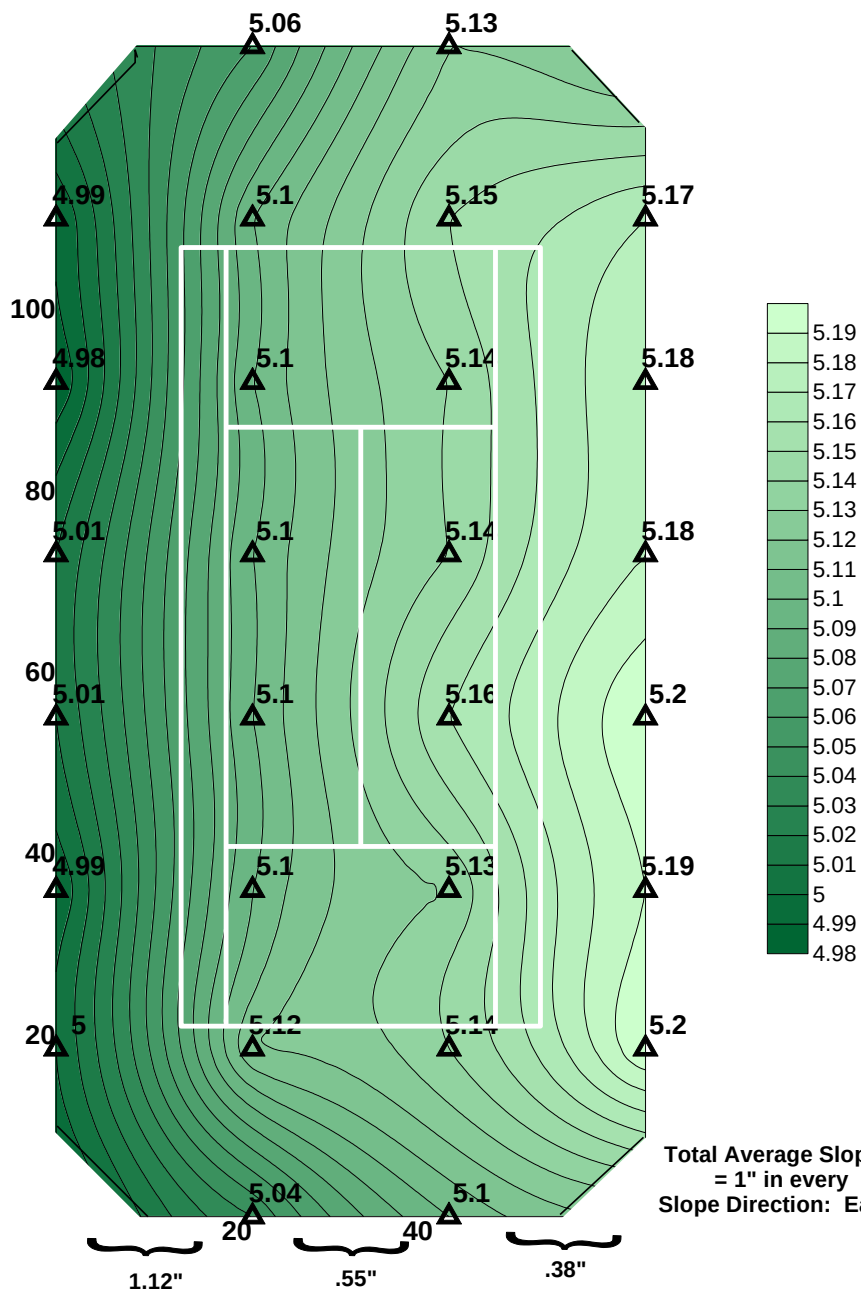


Picture 39 Court Pac Pro Rollers

Section VI

Har-Tru Court Maps & Graphs

Court 1



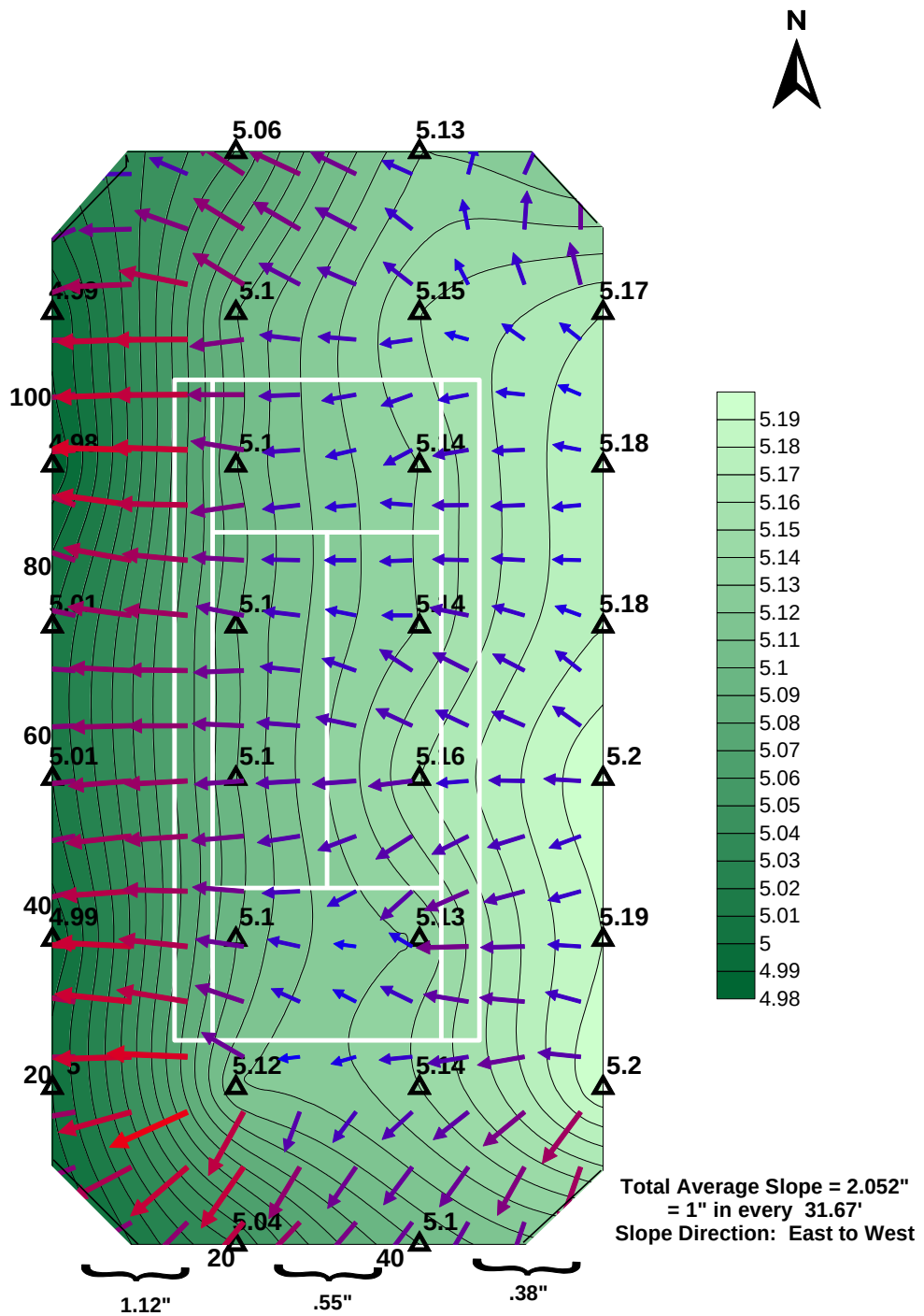
MAP 1

Huntsville Tennis Center Har-Tru Court 1 (65' x 129') Topographical Perspective / Current State

65' x 129'

May 19, 2011

▲ Elevations in Feet



MAP 2

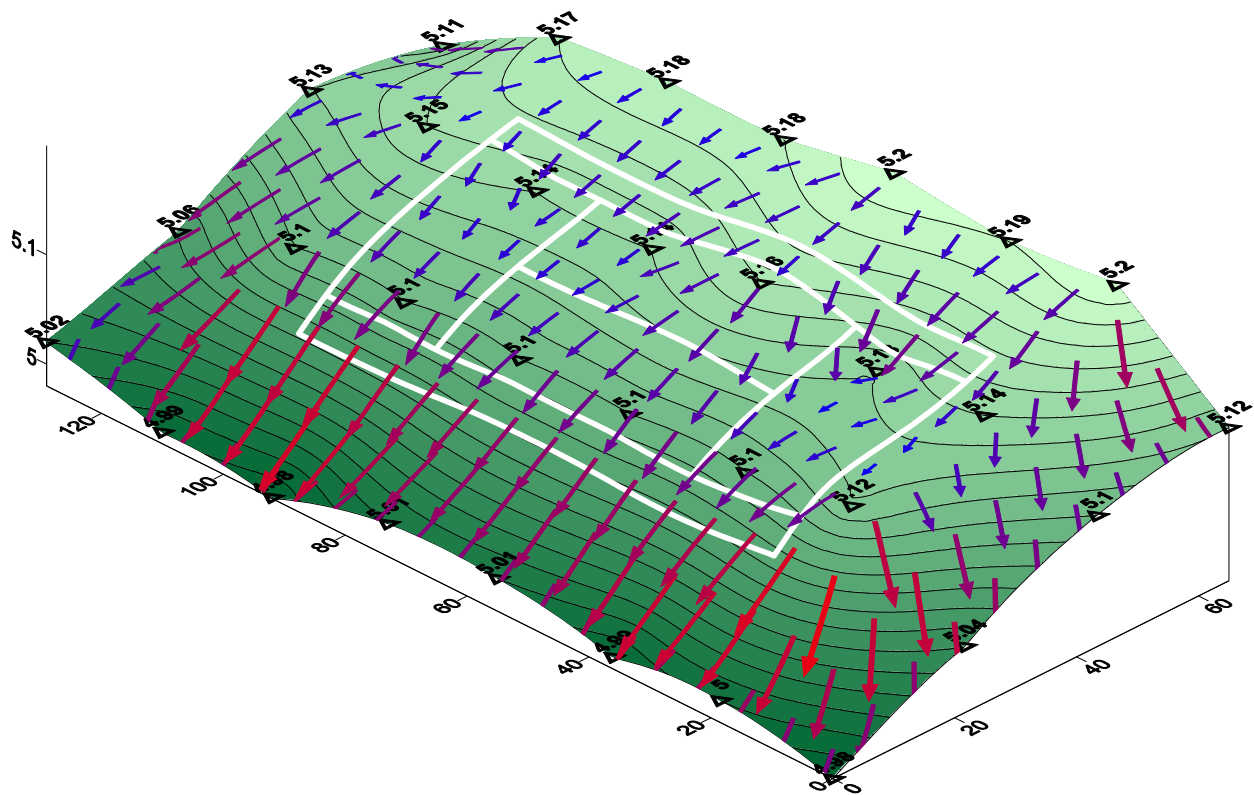
Huntsville Tennis Center Har-Tru Court 1 (65' x 129') Drainage Perspective / Current State

65' x 129'

May 19, 2011

↑ Direction of Water Flow

Court 1



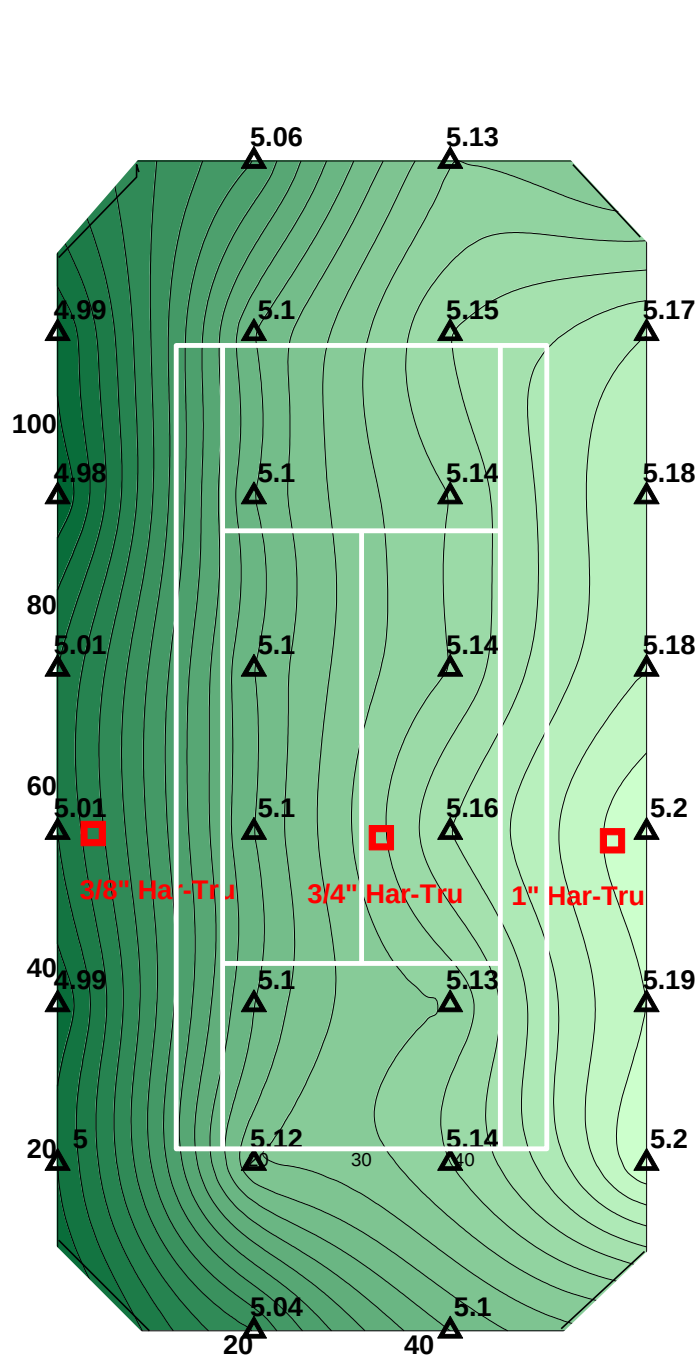
MAP 3

Huntsville Tennis Center Har-Tru Court 1 (65' x 129') 3-Dimensional Perspective / Current State

65' x 129'

May 19, 2011

↑ Direction of Water Flow



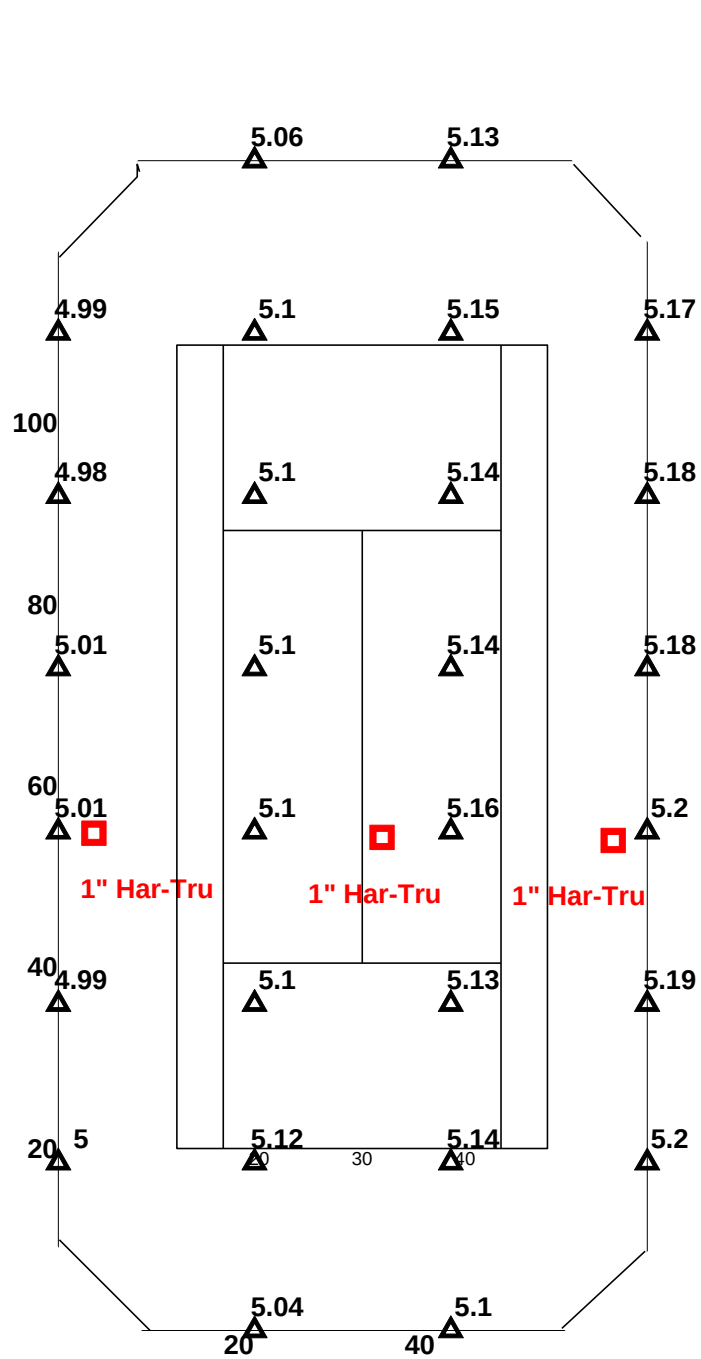
MAP 4

Huntsville Tennis Center Har-Tru Court 1 (65' x 129') Surface Thickness Perspective / Current State

65' x 129'

May 19, 2011

■ Coring Locations
Desired State = 1"



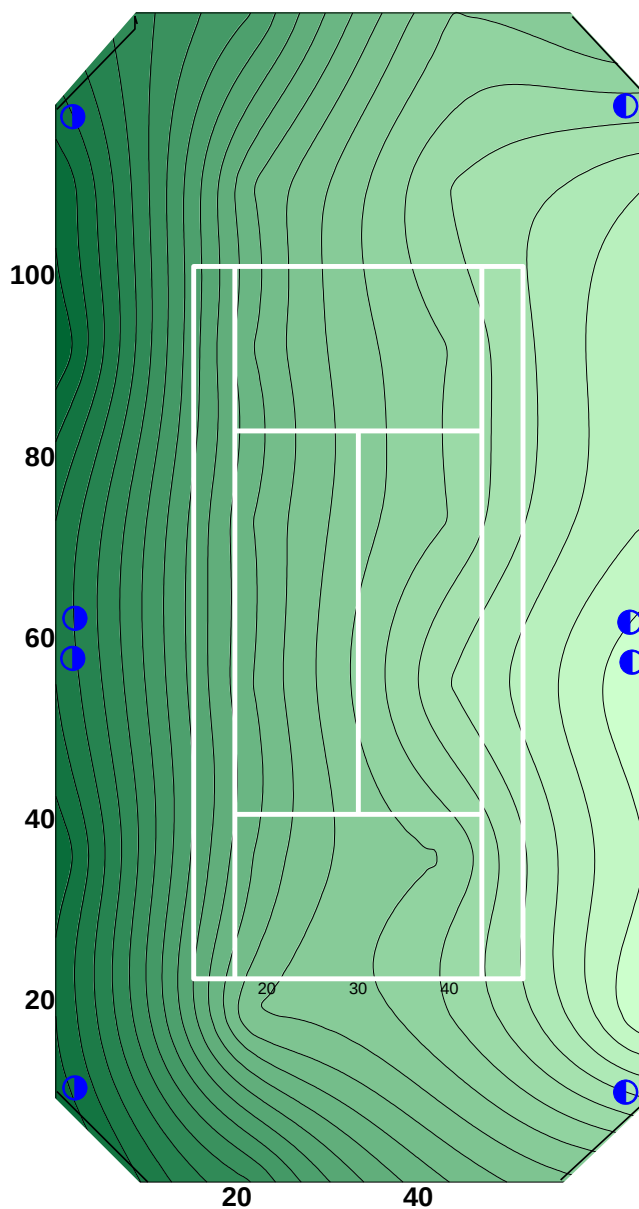
MAP 4A

Huntsville Tennis Center Har-Tru Court 1 (65' x 129') Surface Thickness Perspective / Desired State

65' x 129'

May 19, 2011

■ Coring Locations
Desired State = 1"



MAP 5

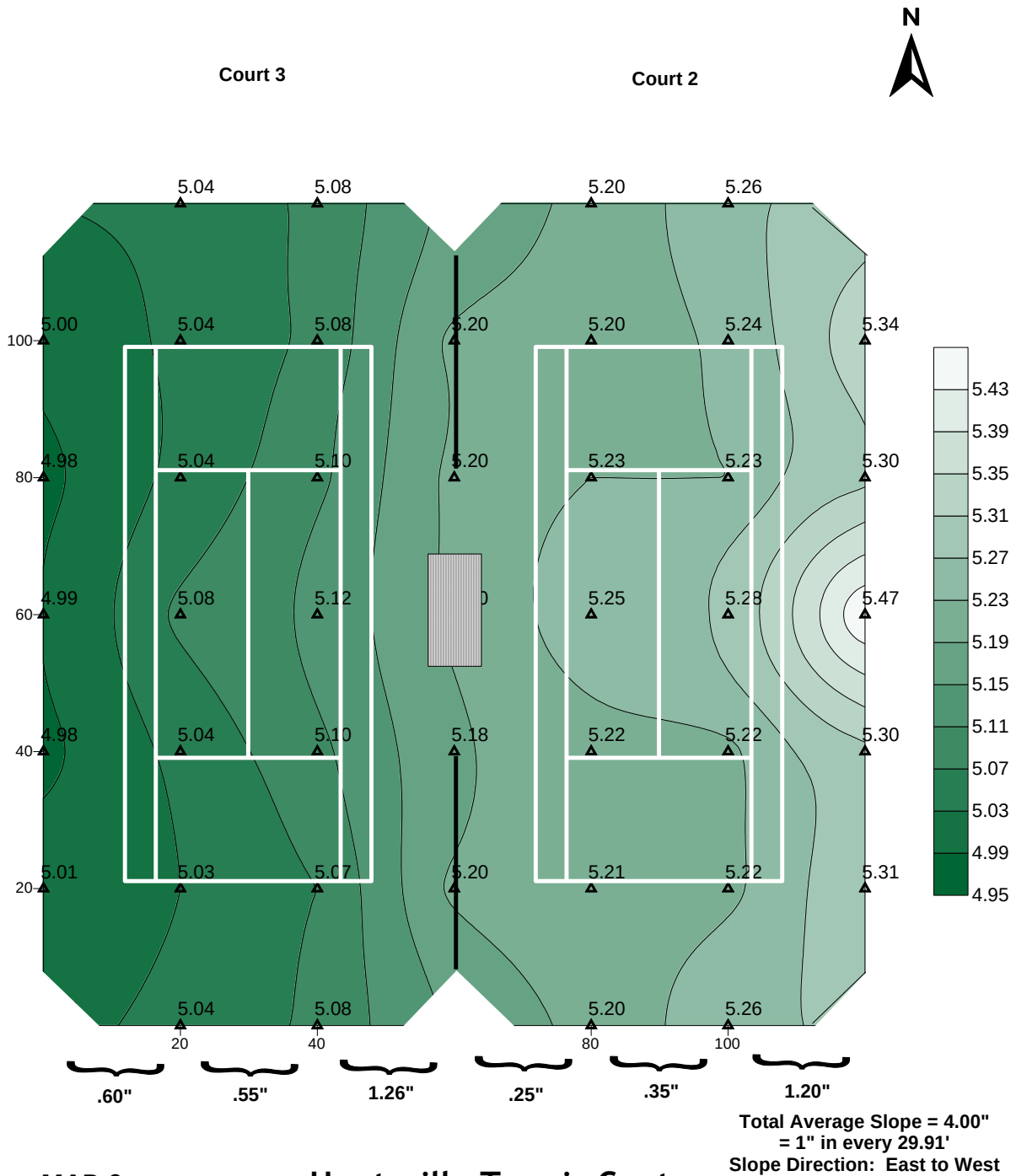
**Huntsville Tennis Center
Har-Tru Court 1 (65' x 129')
Irrigation Prospective / Current State**

65' x 129'

May 19, 2011

 RainBird 6504 Falcon Sprinklers

Courts 2 & 3



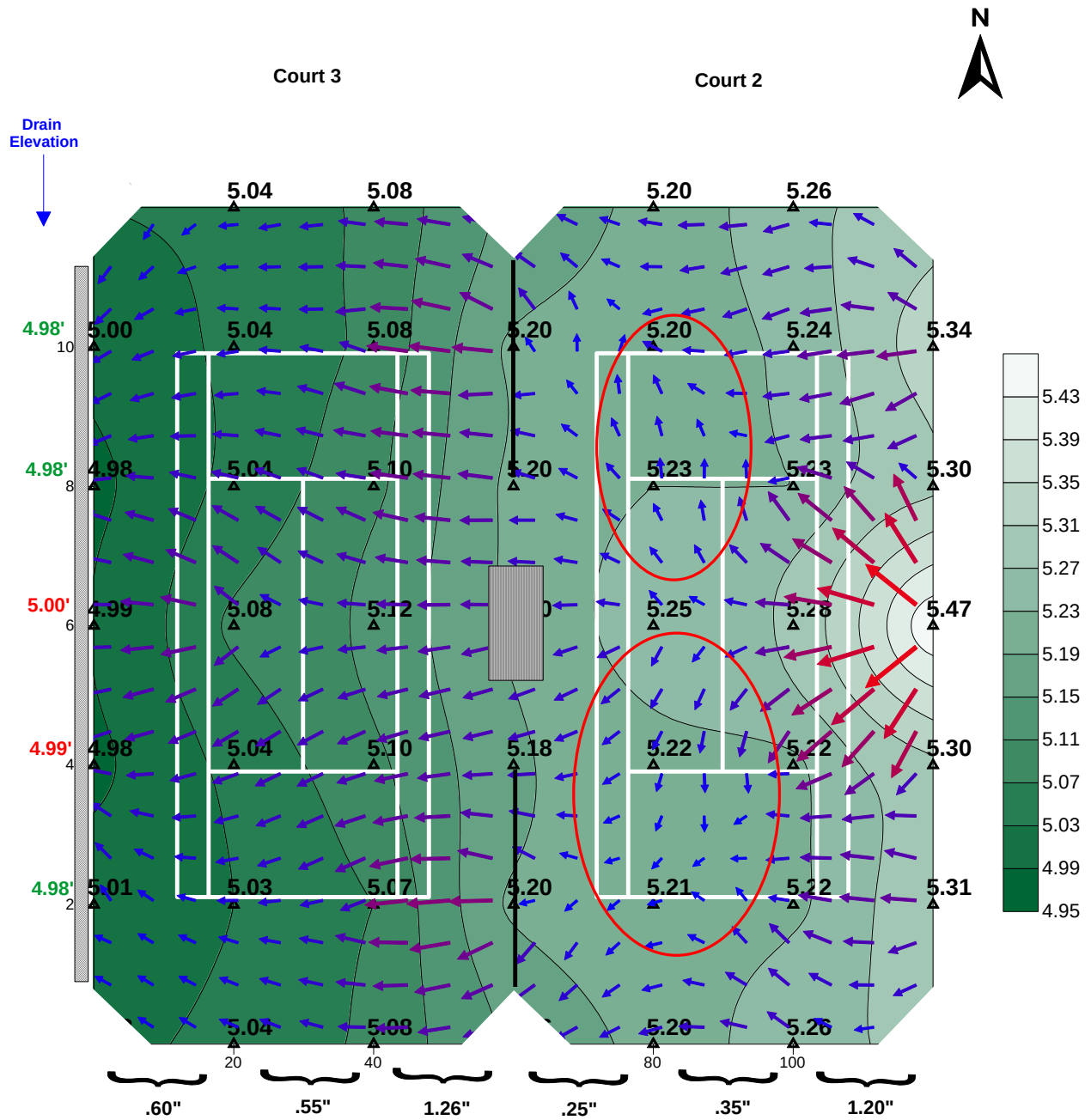
MAP 6

Huntsville Tennis Center **Har-Tru Courts 2 & 3** **Topographical Perspective / Current State**

120' X 120'

May 19, 2011

▲ Elevation in Feet



Total Average Slope = 3.92"
= 1" in every 30.61'
Slope Direction: East to West

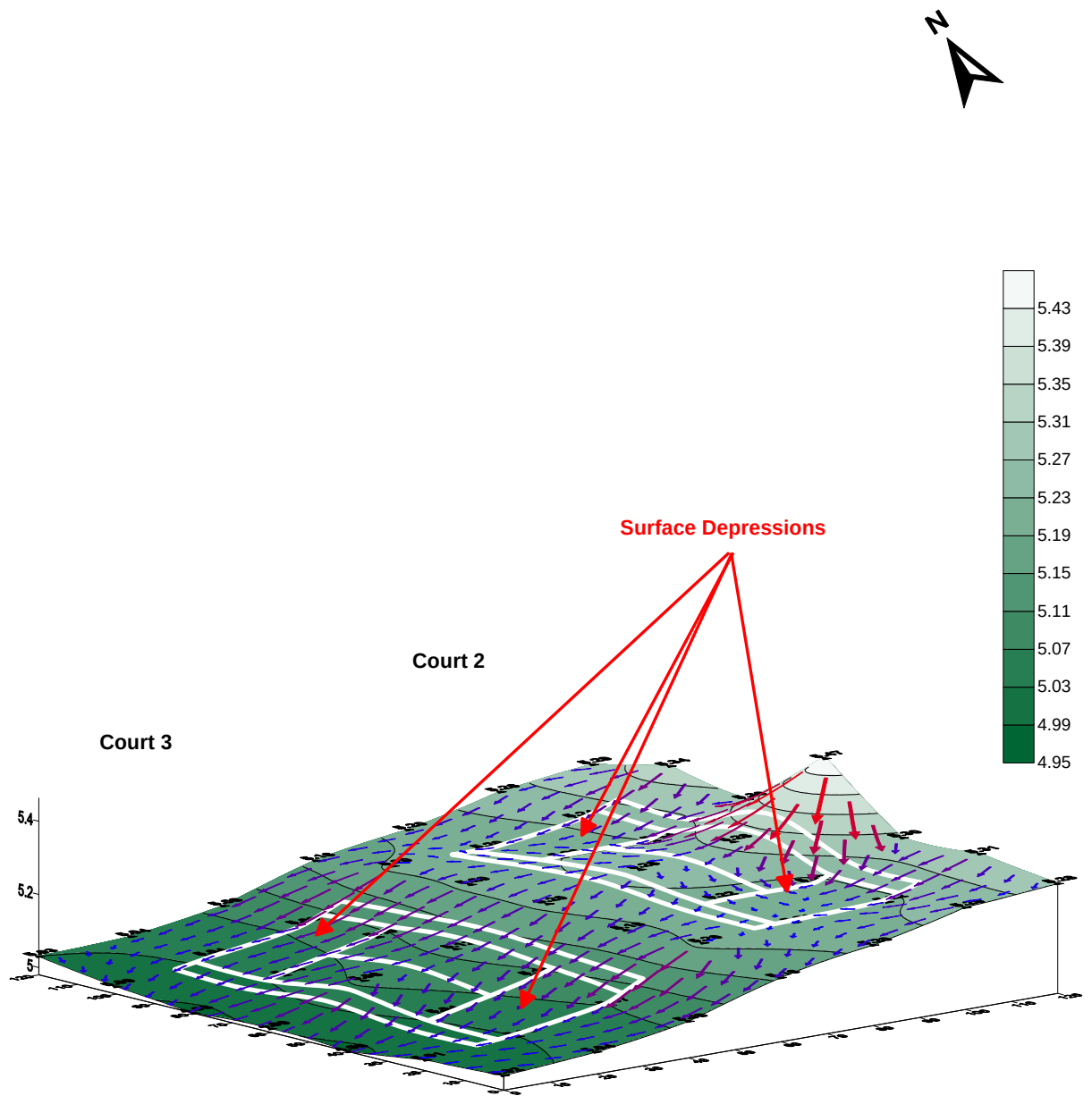
MAP 7

Huntsville Tennis Center Har-Tru Courts 2 & 3 Drainage Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow
○ Water Puddles



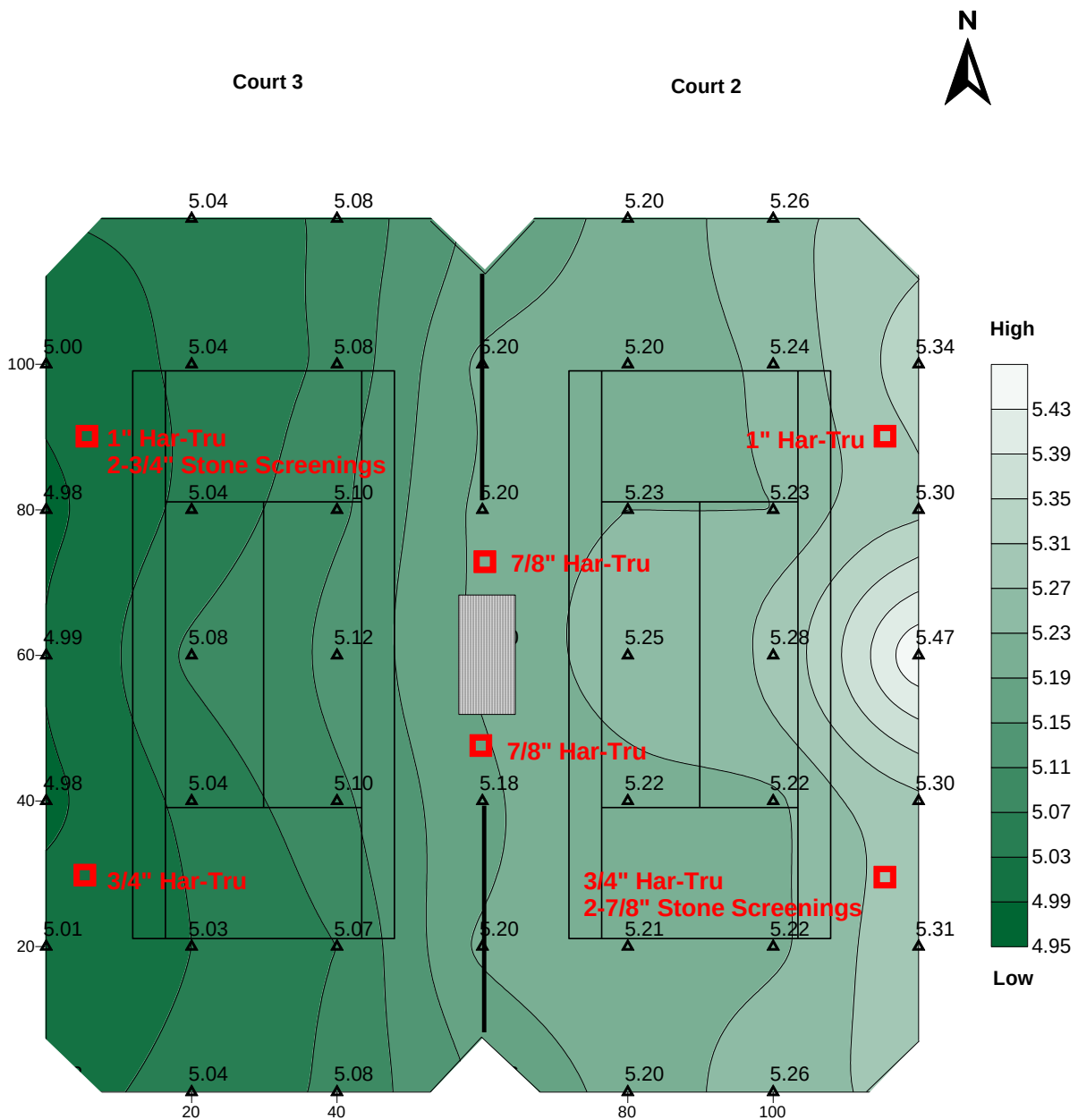
MAP 8

Huntsville Tennis Center Har-Tru Courts 2 & 3 3 Dimensional Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow



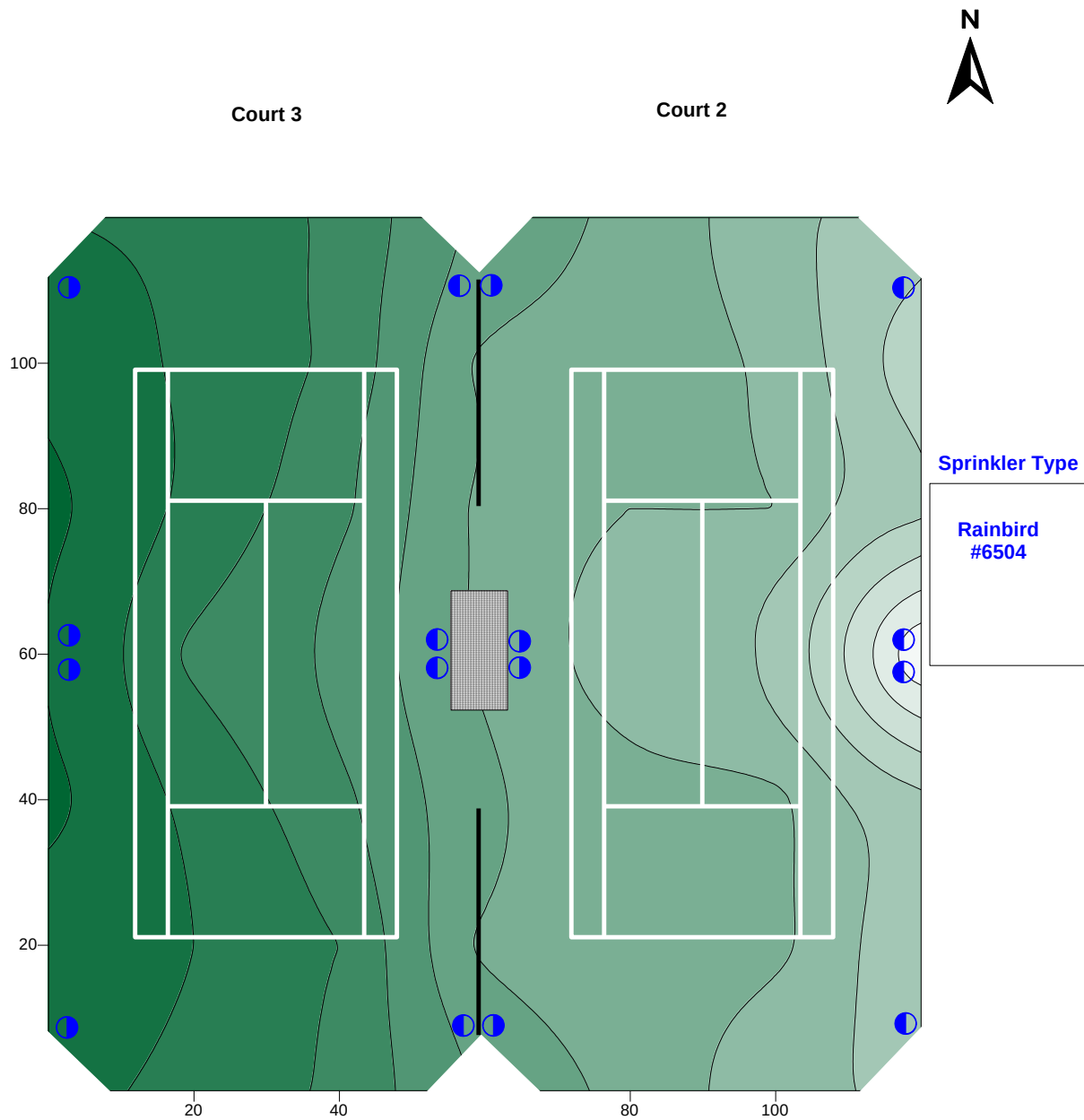
MAP 10

Huntsville Tennis Center Har-Tru Courts 2 & 3 Surface Thickness Perspective / Current State

120' X 120'

May 19, 2011

■ Coring Locations
Desired state = 1"



MAP 11

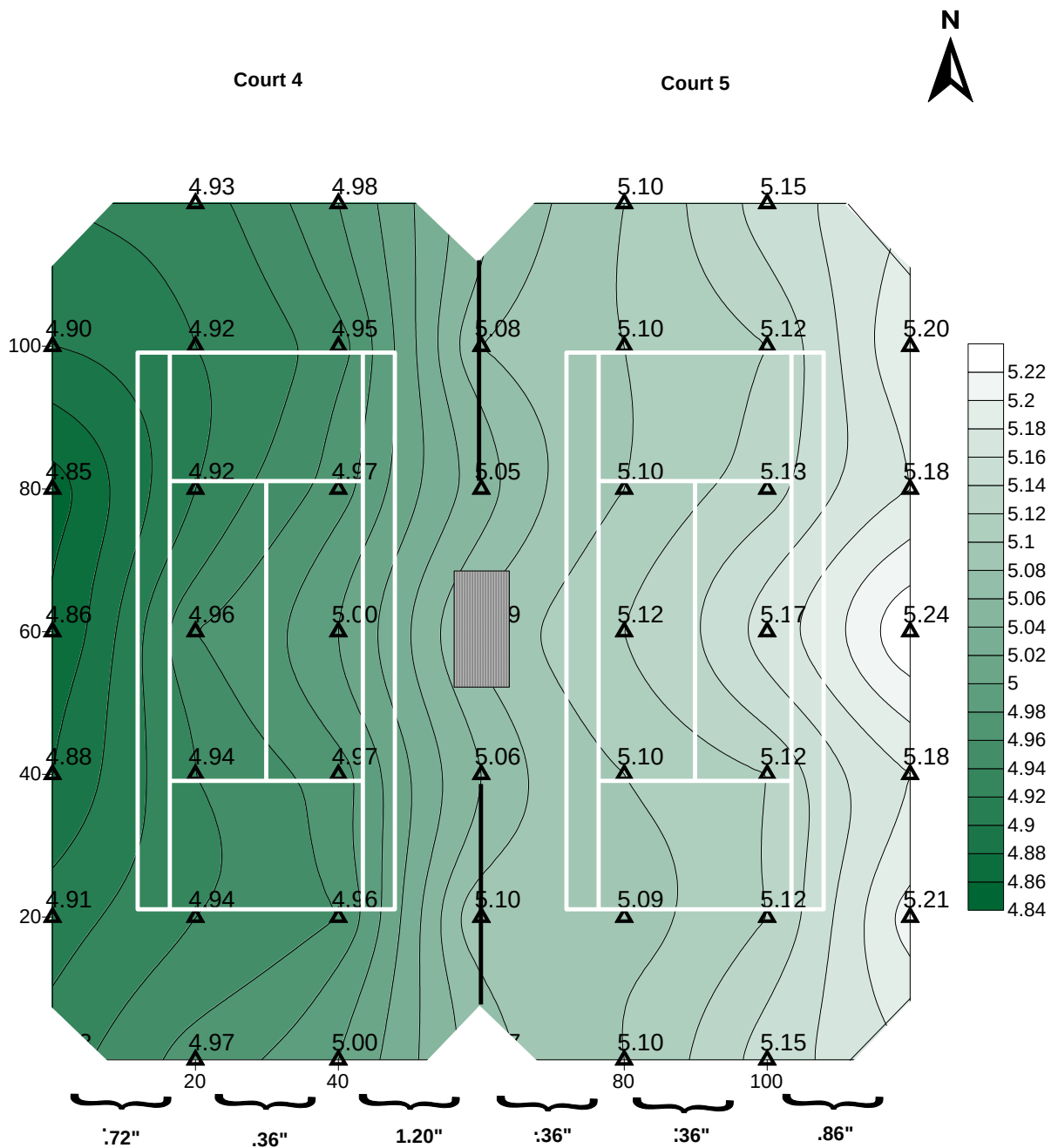
Huntsville Tennis Center Har-Tru Courts 2 & 3 Irrigation Perspective / Current State

120' X 120'

May 19, 2011

 **Sprinkler Head Locations**

Courts 4 & 5



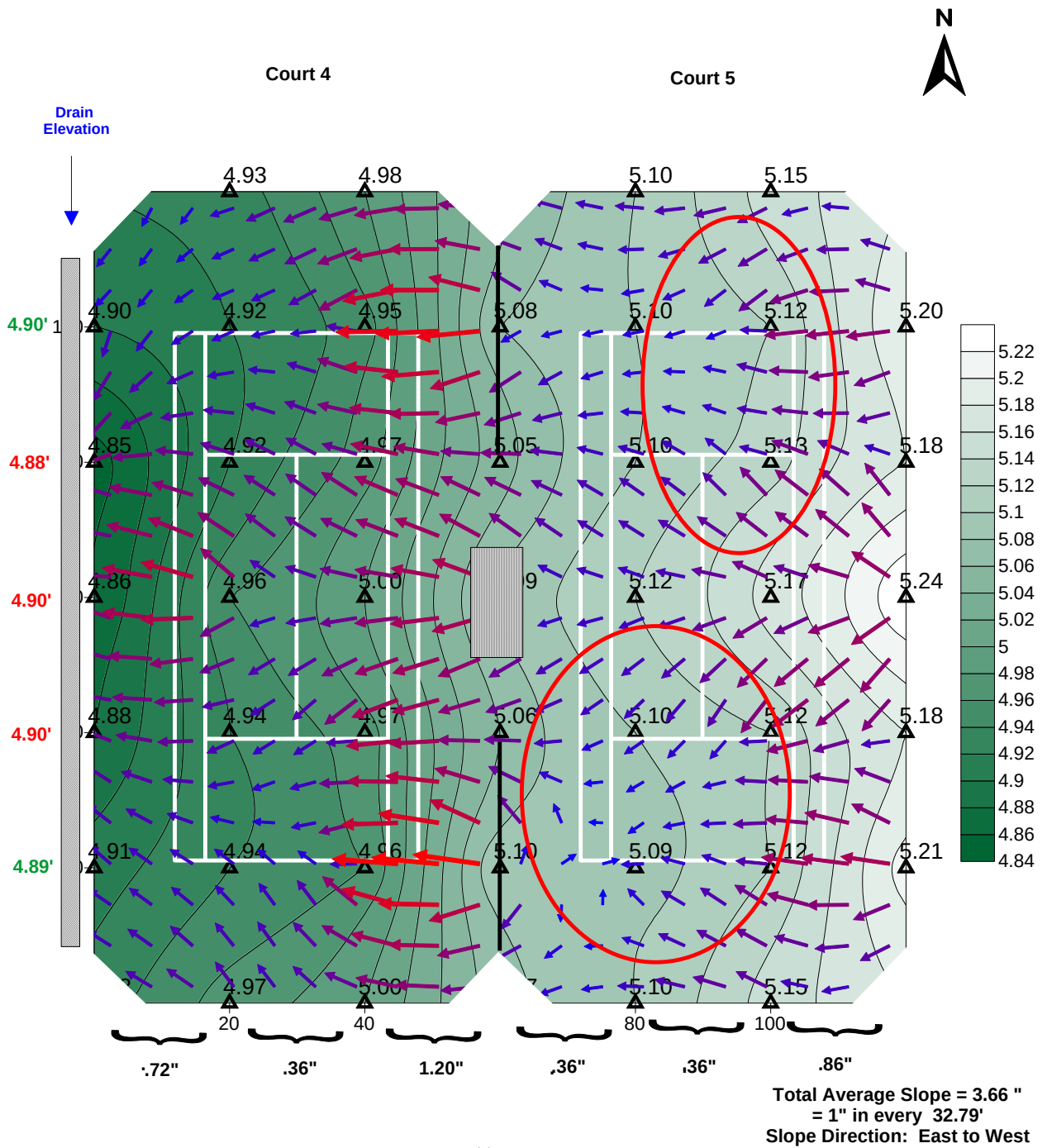
Huntsville Tennis Center **Har-Tru Courts 4 & 5** **Topographical Perspective / Current State**

Total Average Slope = 3.84 "
= 1" in every 31.25'
Slope Direction: East to West

120' X 120'

May 19, 2011

▲ Elevation in Feet



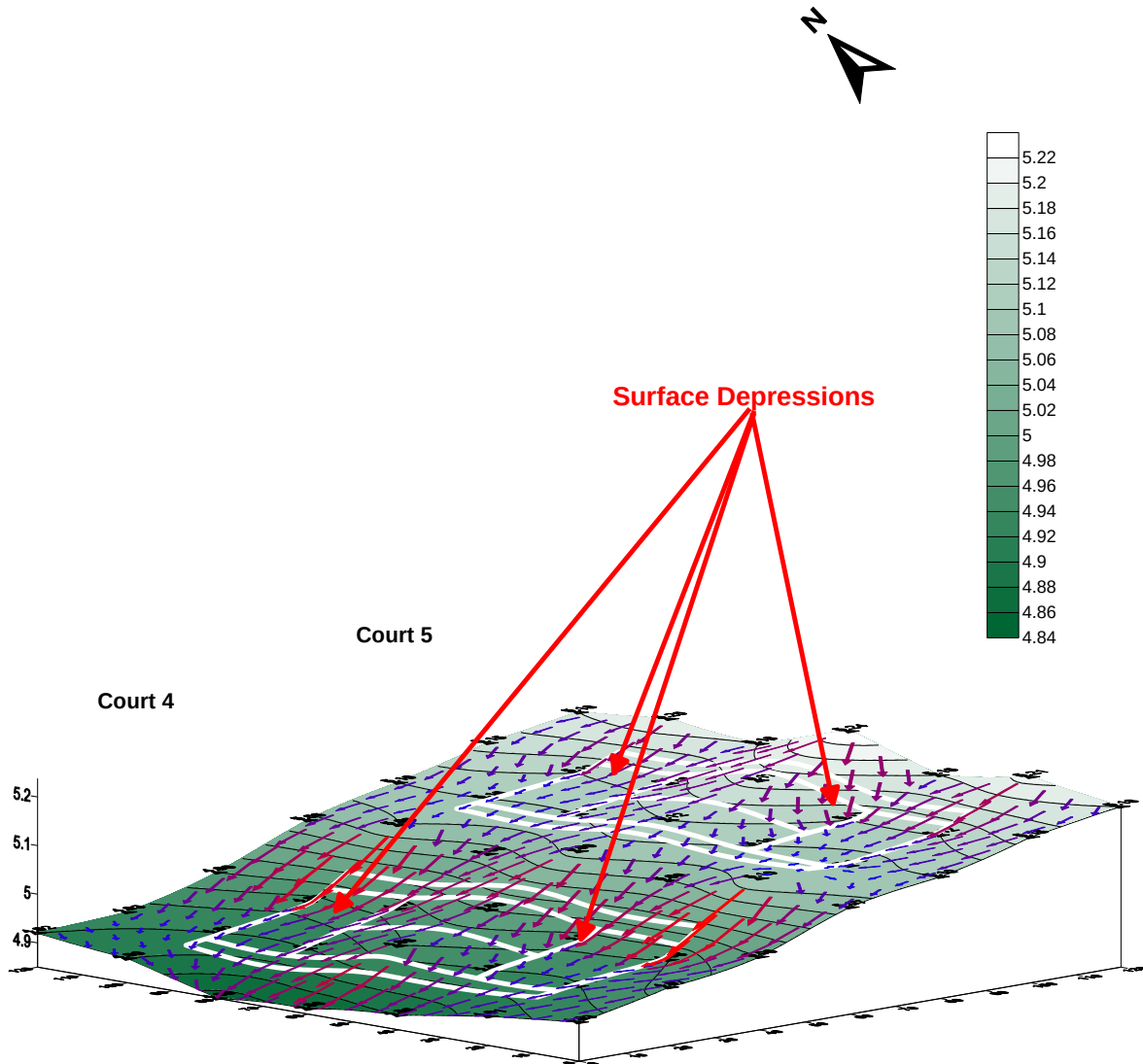
MAP 13

Huntsville Tennis Center Har-Tru Courts 4 & 5 Drainage Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow
○ Low Spots



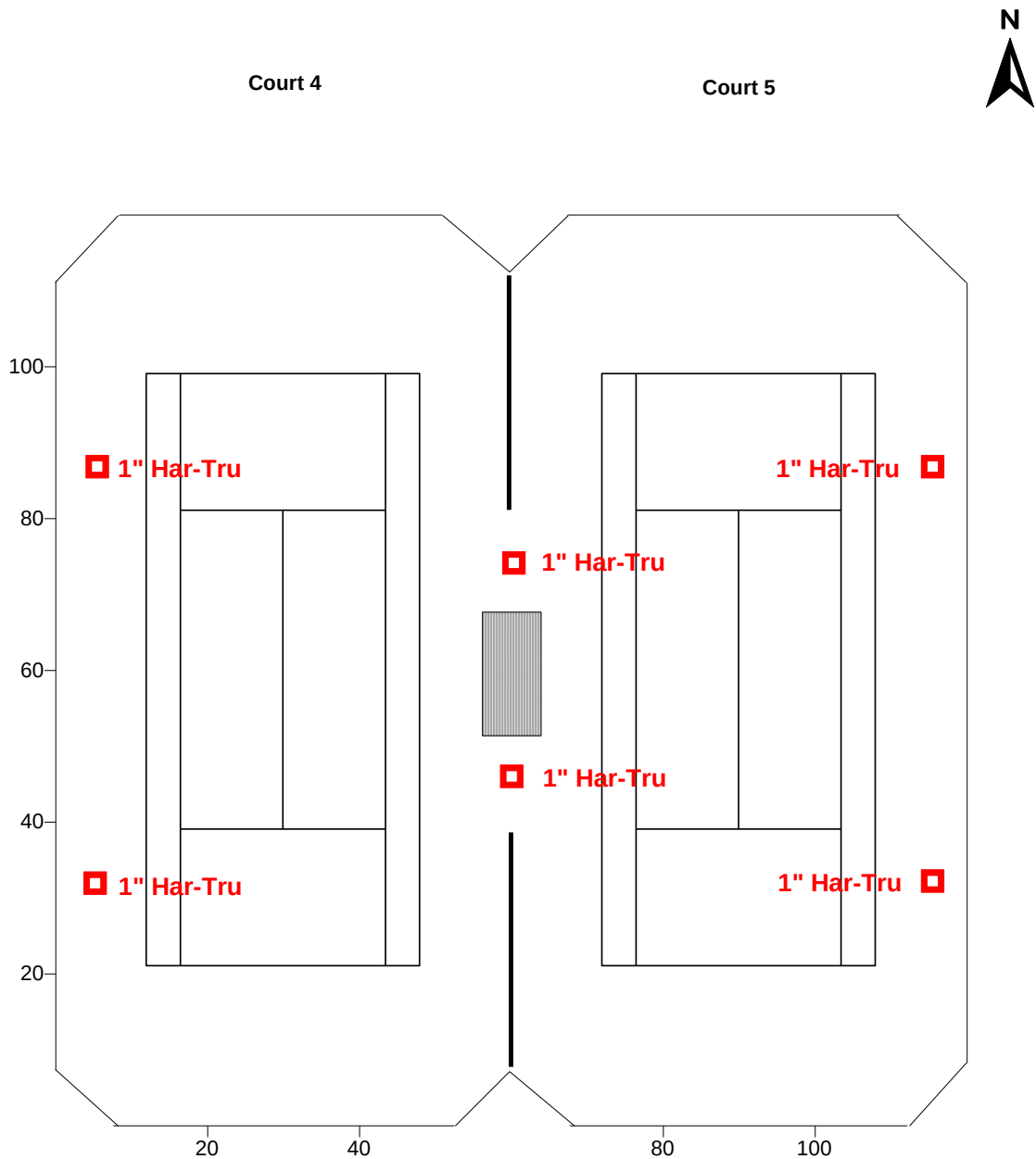
MAP 14

Huntsville Tennis Center Har-Tru Courts 4 & 5 3-Dimensional Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow



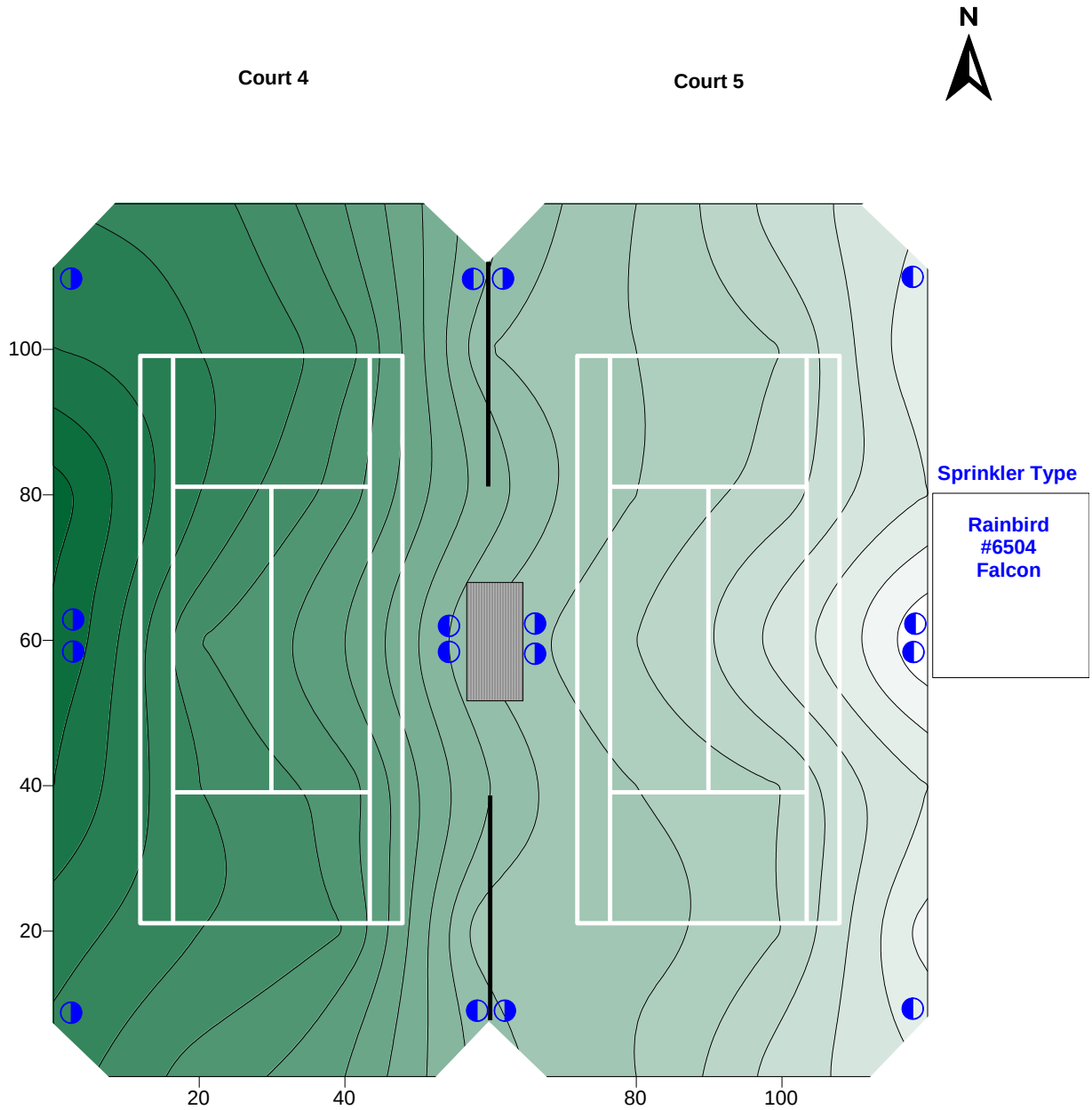
MAP 15A

Huntsville Tennis Center Har-Tru Courts 4 & 5 Surface Thickness Perspective / Desired State

120' X 120'

May 19, 2011

■ Surface Coring Locations



MAP 16

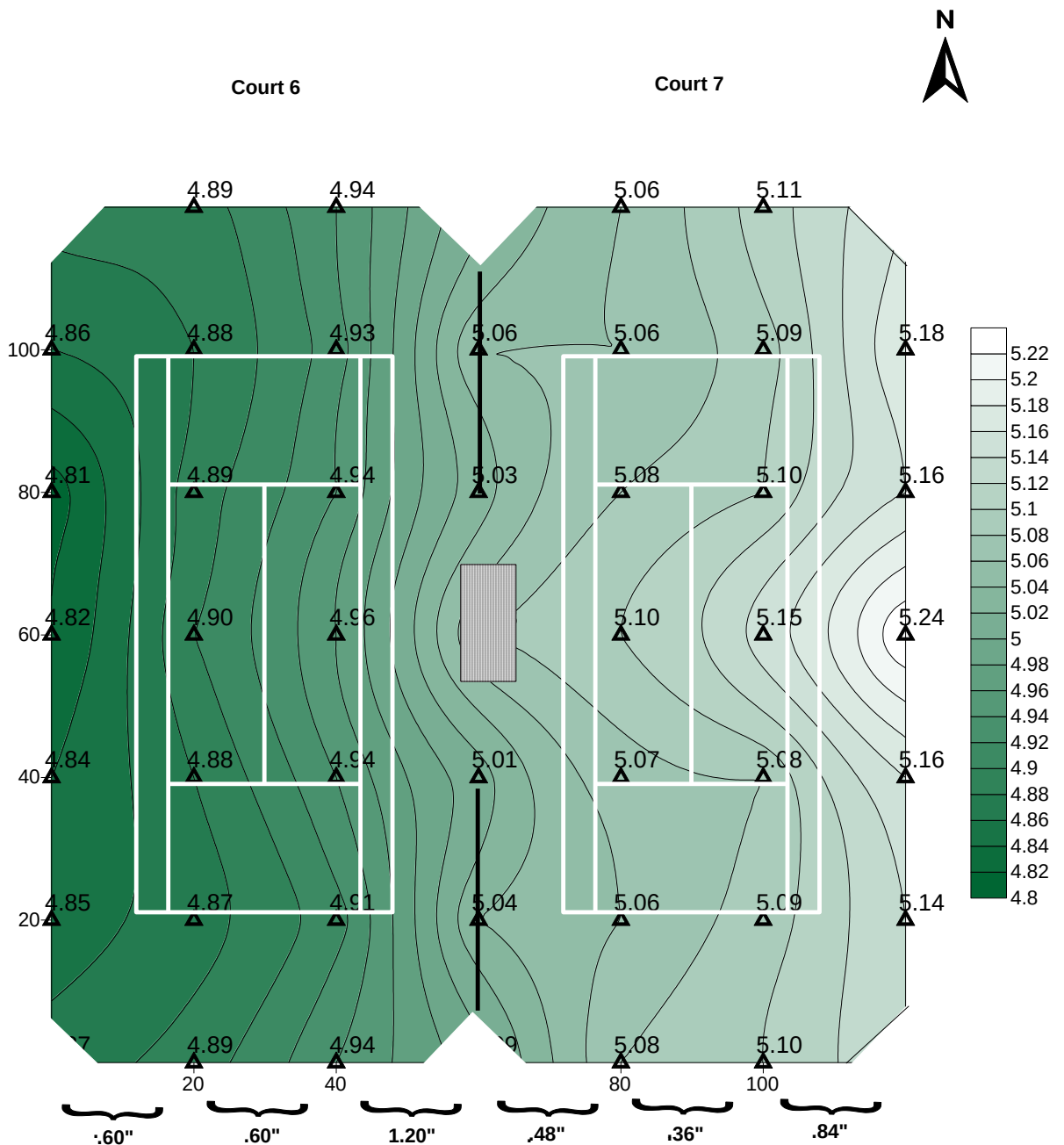
Huntsville Tennis Center Har-Tru Courts 4 & 5 Irrigation Perspective / Current State

120' X 120'

May 19, 2011

 **Sprinkler Head Locations**

Courts 6 & 7



Total Average Slope = 4.08"
 = 1" in every 29.41'
 Slope Direction: East to West

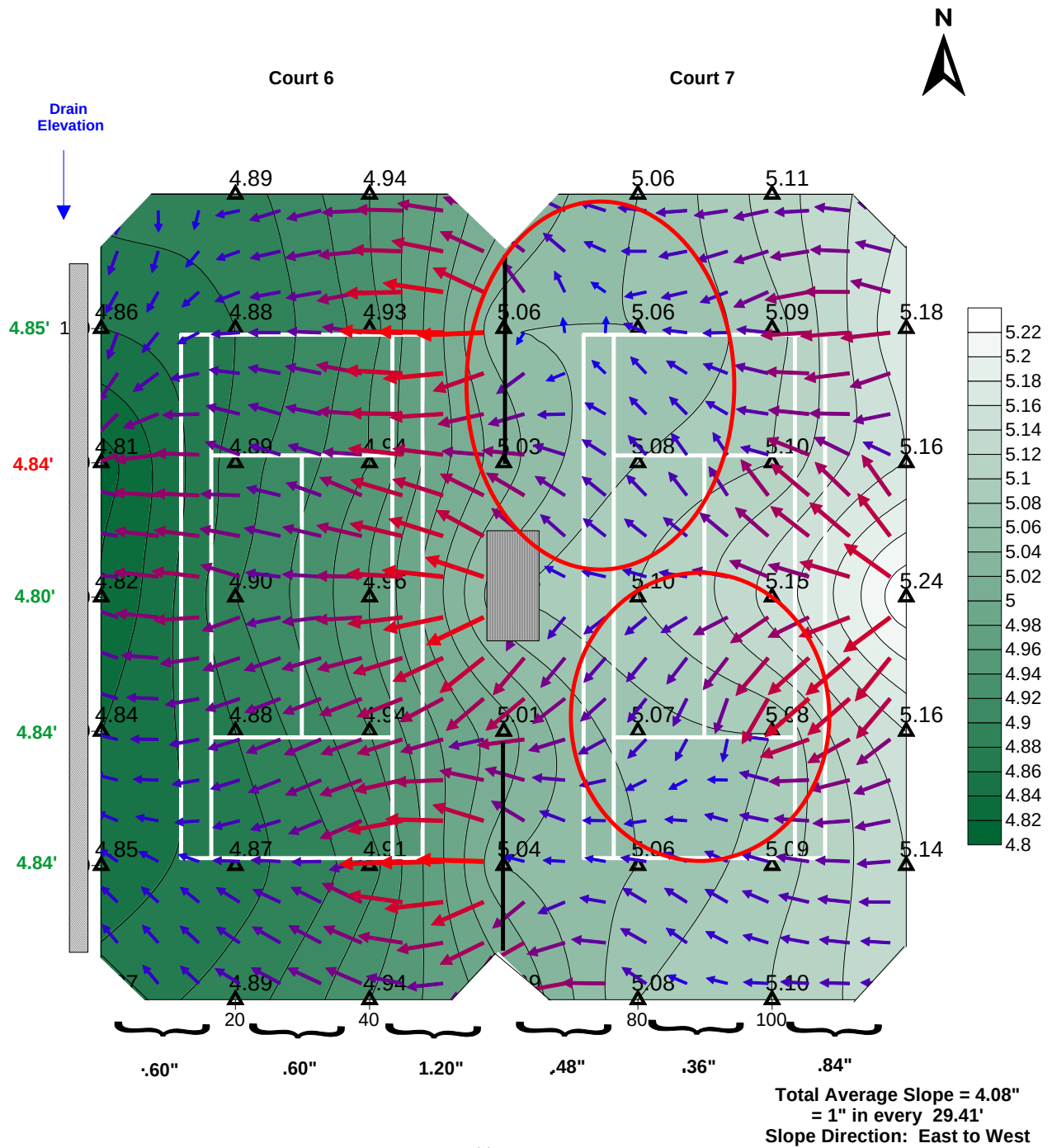
MAP 17

Huntsville Tennis Center Har-Tru Courts 6 & 7 Topographical Perspective / Current State

120' X 120'

May 19, 2011

▲ Elevation in Feet



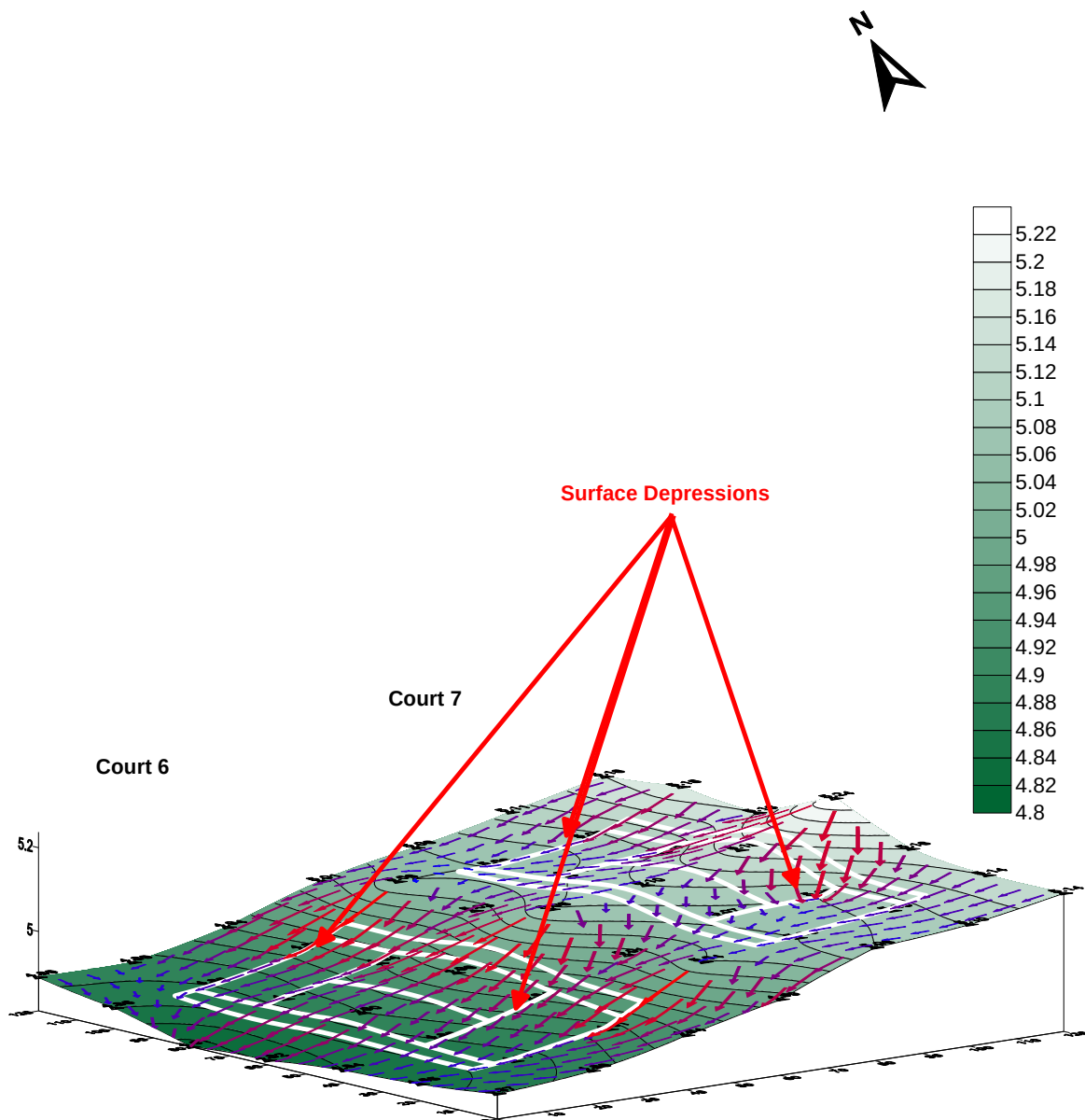
MAP 18

Huntsville Tennis Center Har-Tru Courts 6 & 7 Drainage Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow



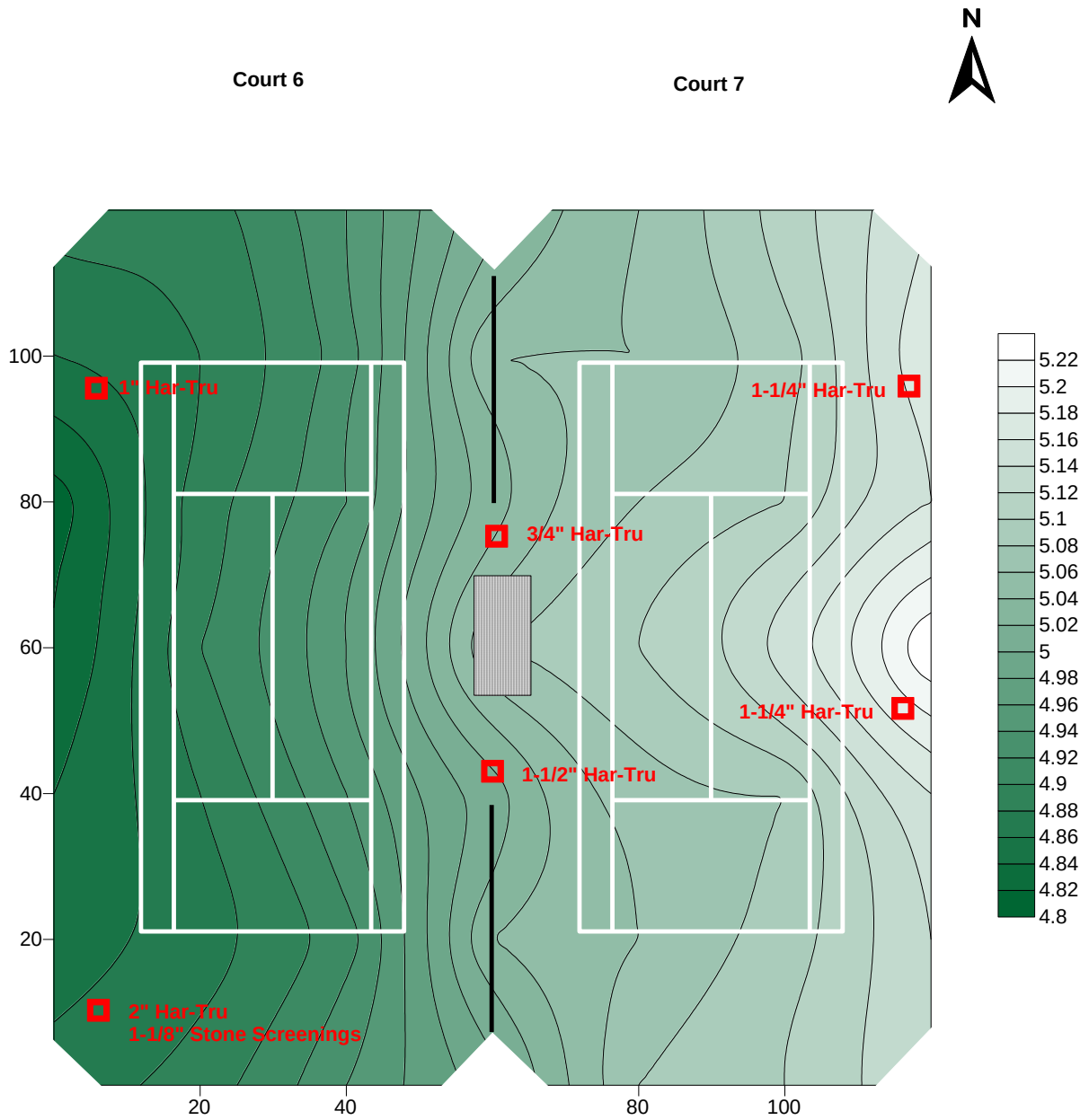
MAP 19

Huntsville Tennis Center Har-Tru Courts 6 & 7 3-Dimensional Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow



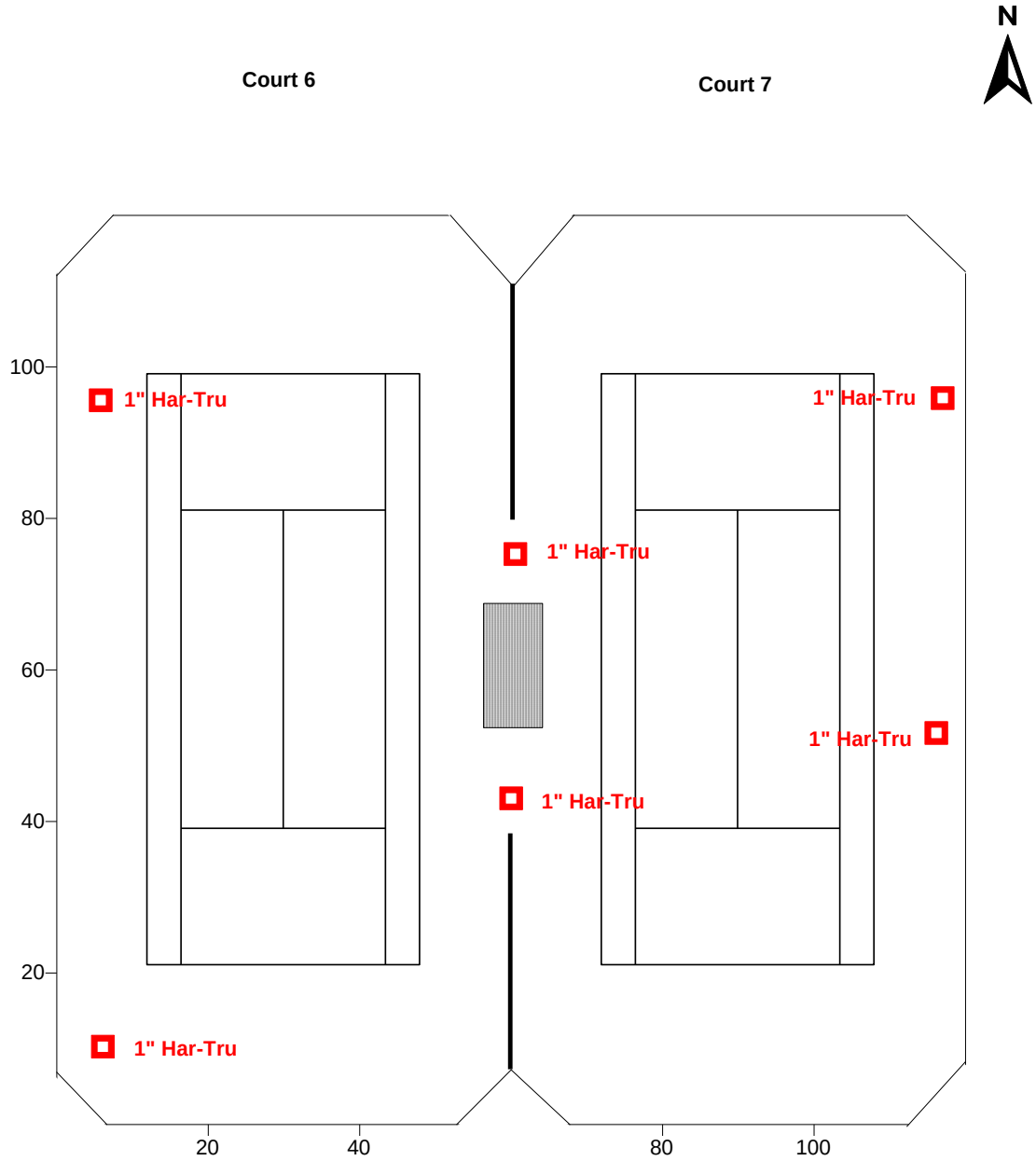
MAP 20

Huntsville Tennis Center **Har-Tru Courts 6 & 7** **Surface Thickness Perspective / Current State**

120' X 120'

May 19, 2011

■ Coring Locations
Desired State = 1"

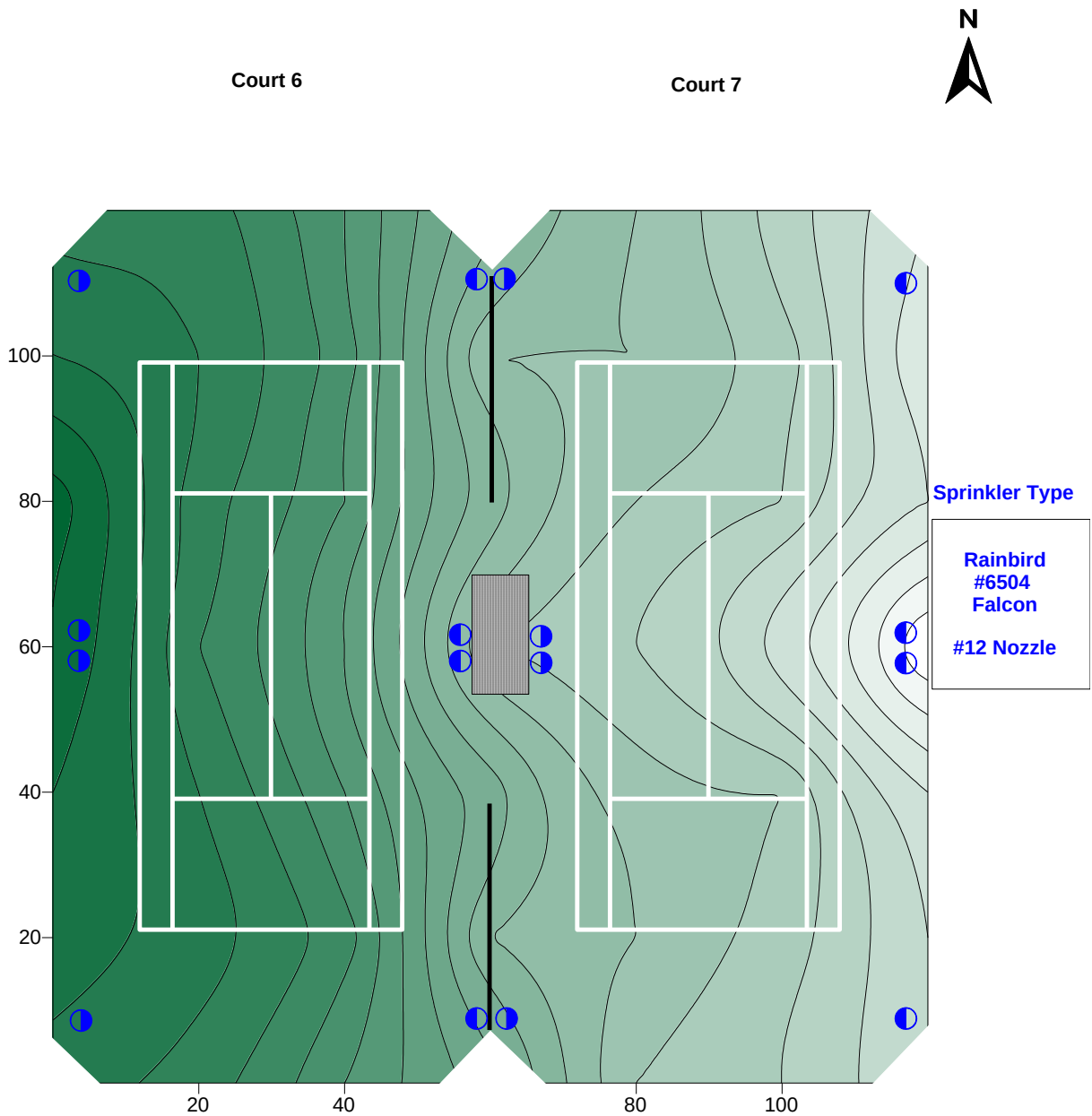


MAP

Huntsville Tennis Center Har-Tru Courts 6 & 7 Surface Thickness Perspective / Desired State

120' X 120'

■ Surface Coring Locations



MAP 21

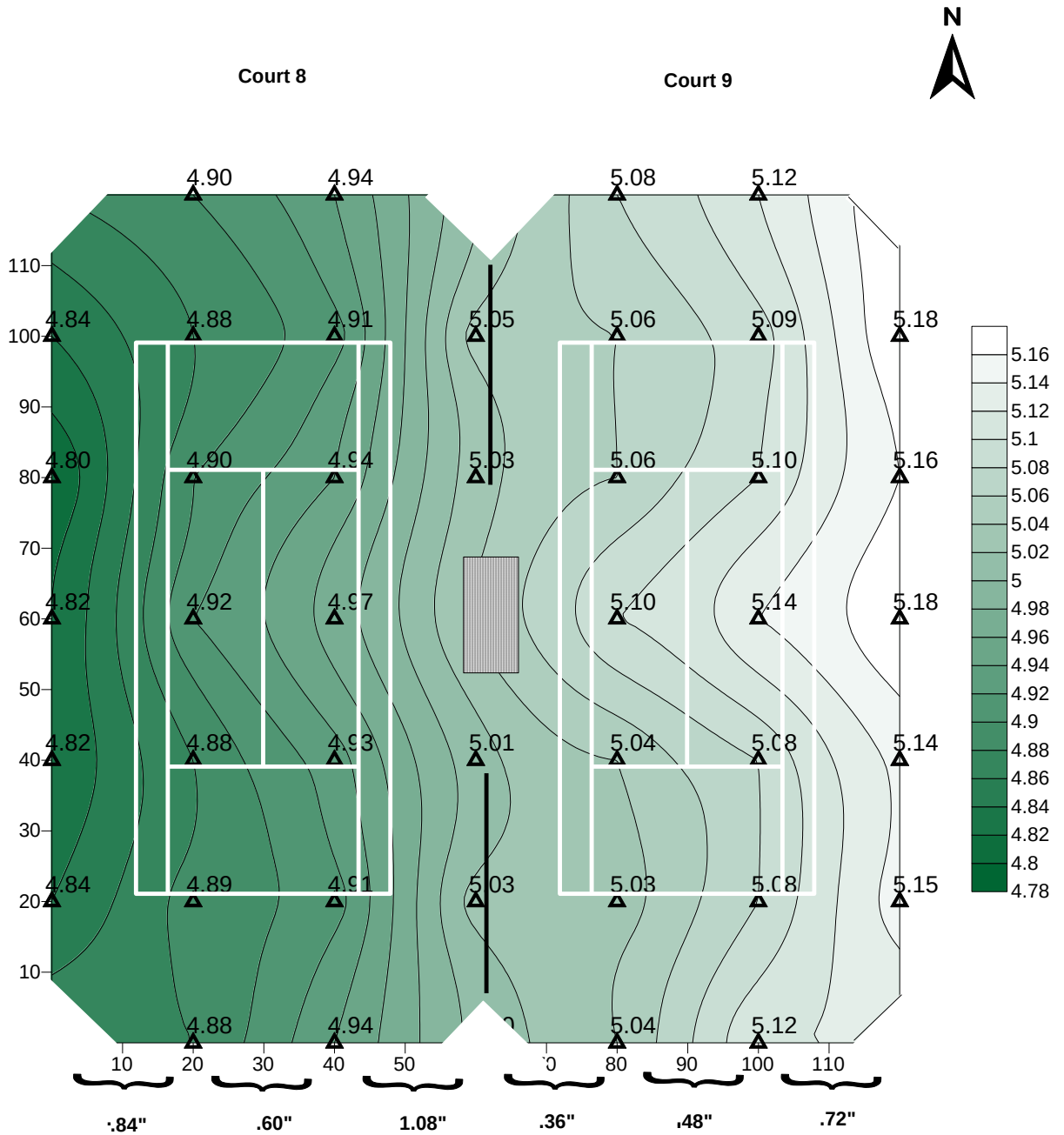
Huntsville Tennis Center Har-Tru Courts 6 & 7 Irrigation Perspective / Current State

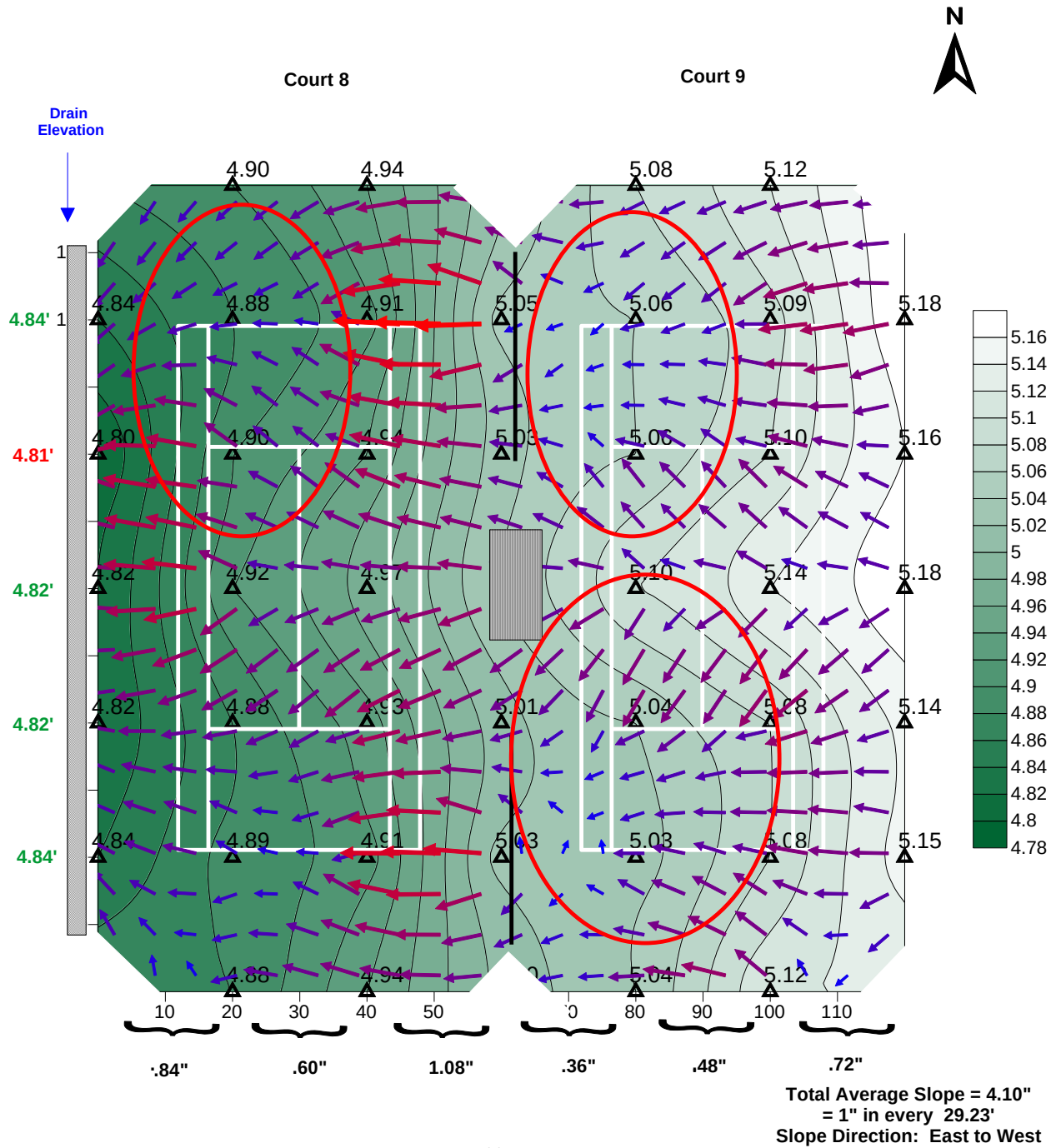
120' X 120'

May 19, 2011

 **Sprinkler Head Locations**

Courts 8 & 9





MAP 23

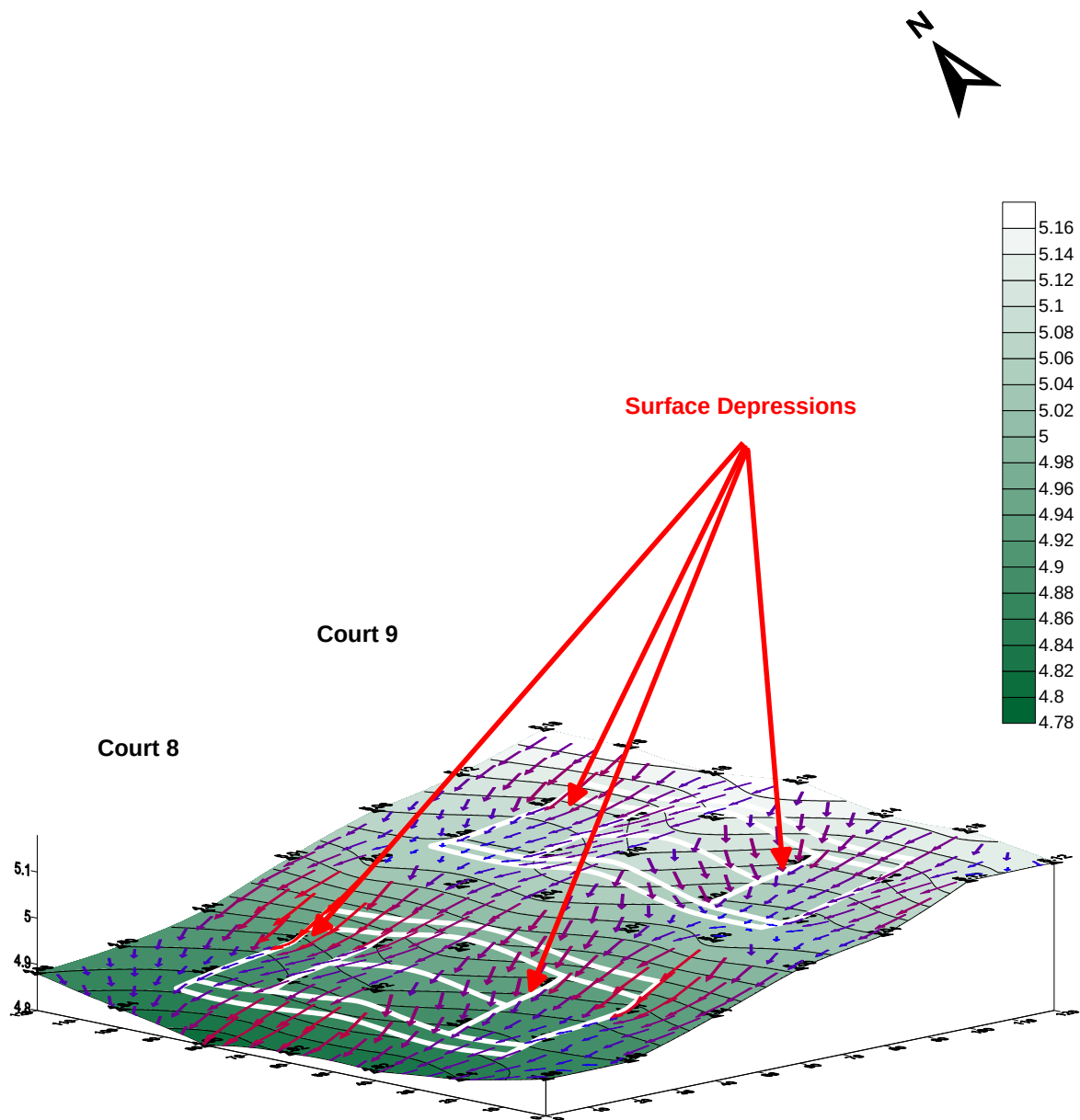
Huntsville Tennis Center Har-Tru Courts 8 & 9 Drainage Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow

○ Surface Depressions

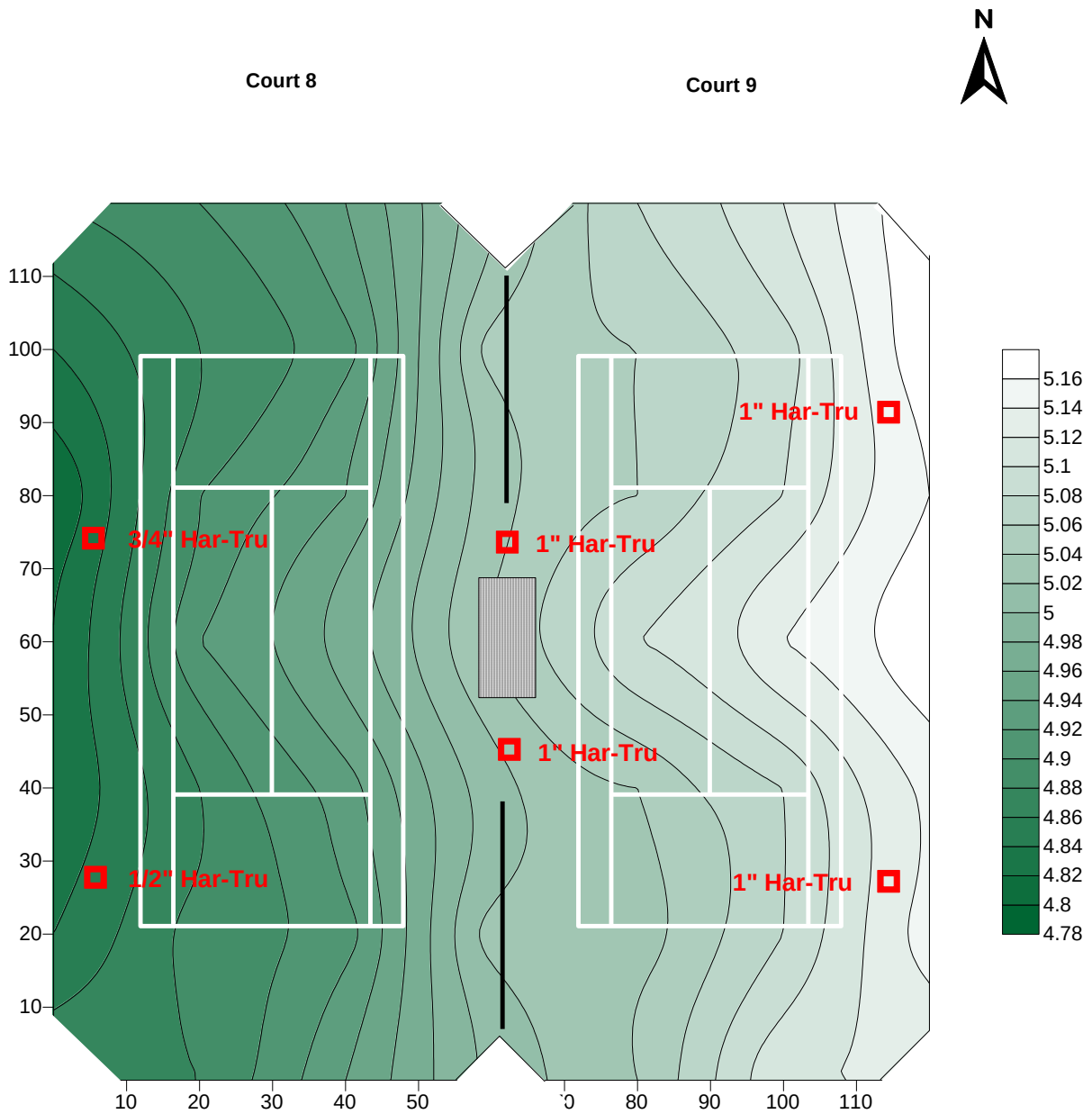


MAP 24

Huntsville Tennis Center Har-Tru Courts 8 & 9 3-Dimensional Perspective / Current State

120' X 120'

May 19, 2011



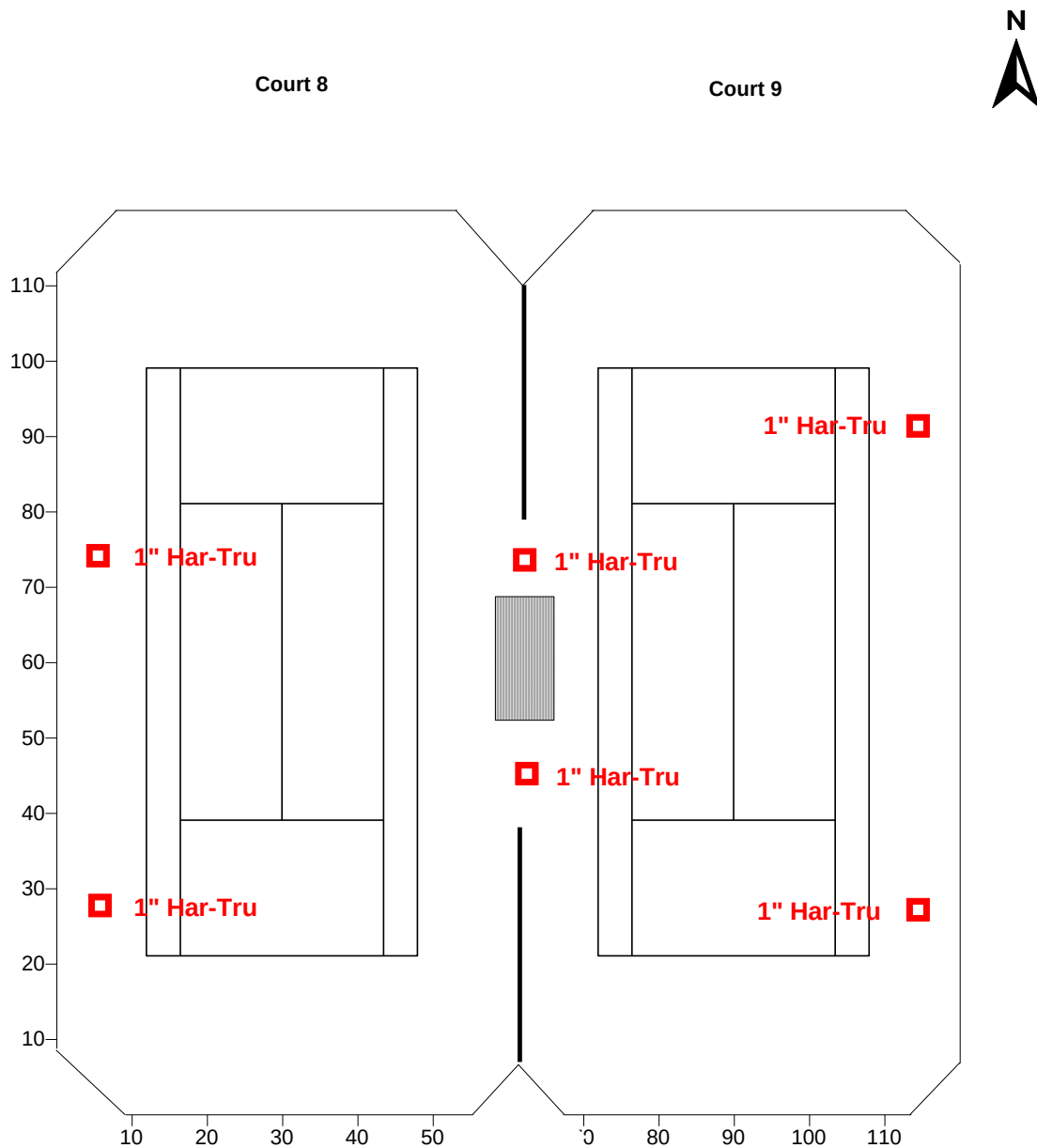
MAP 25

Huntsville Tennis Center Har-Tru Courts 8 & 9 Surface Thickness Perspective / Current State

120' X 120'

May 19, 2011

■ Coring Locations
Desired State = 1"



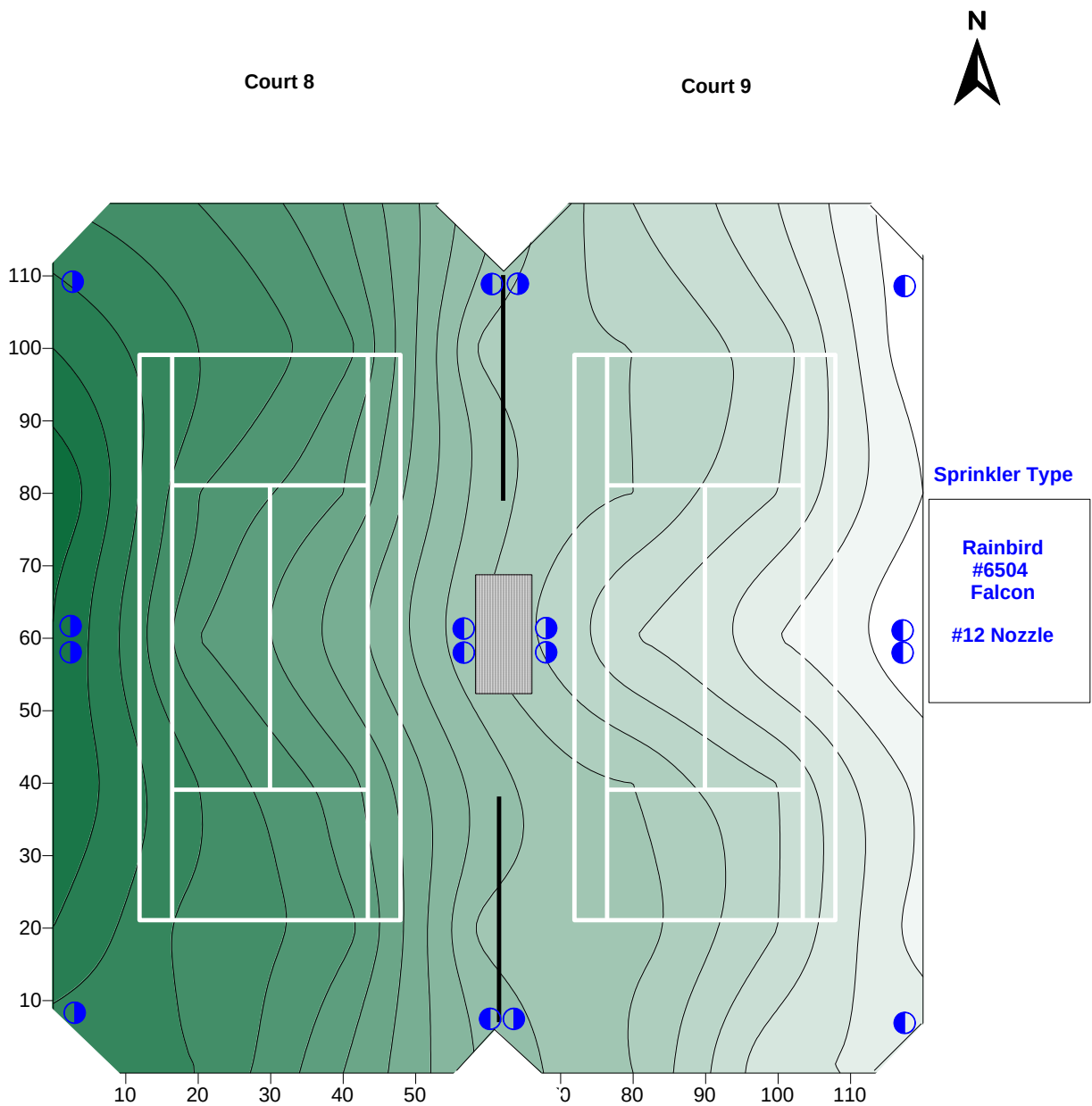
MAP

Huntsville Tennis Center Har-Tru Courts 8 & 9 Surface Thickness Perspective / Desired State

120' X 120'

May 19, 2011

■ Surface Coring Locations



MAP 26

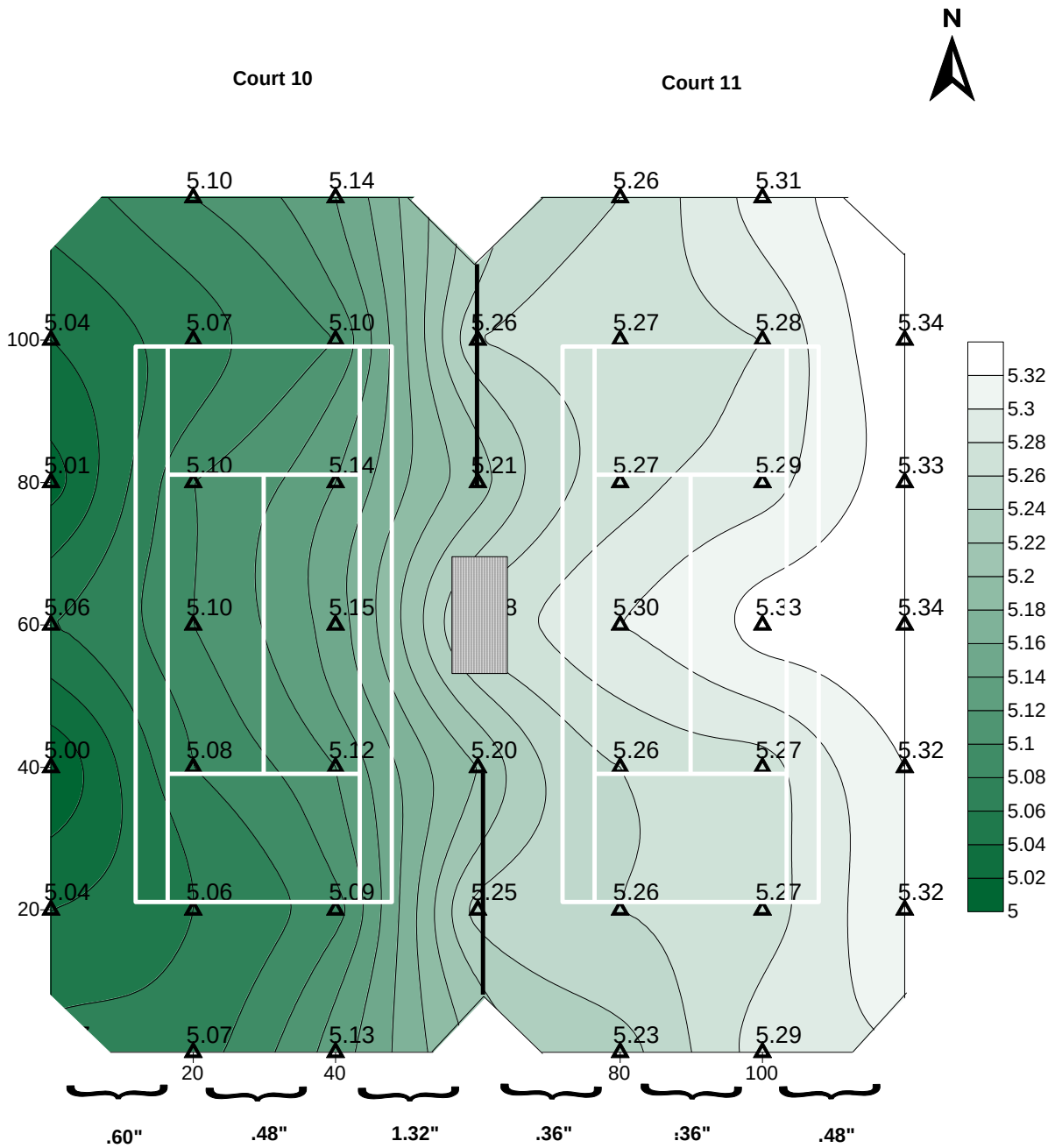
Huntsville Tennis Center **Har-Tru Courts 8 & 9** **Irrigation Perspective / Current State**

120' X 120'

May 19, 2011

 **Sprinkler Head Locations**

Courts 10 & 11



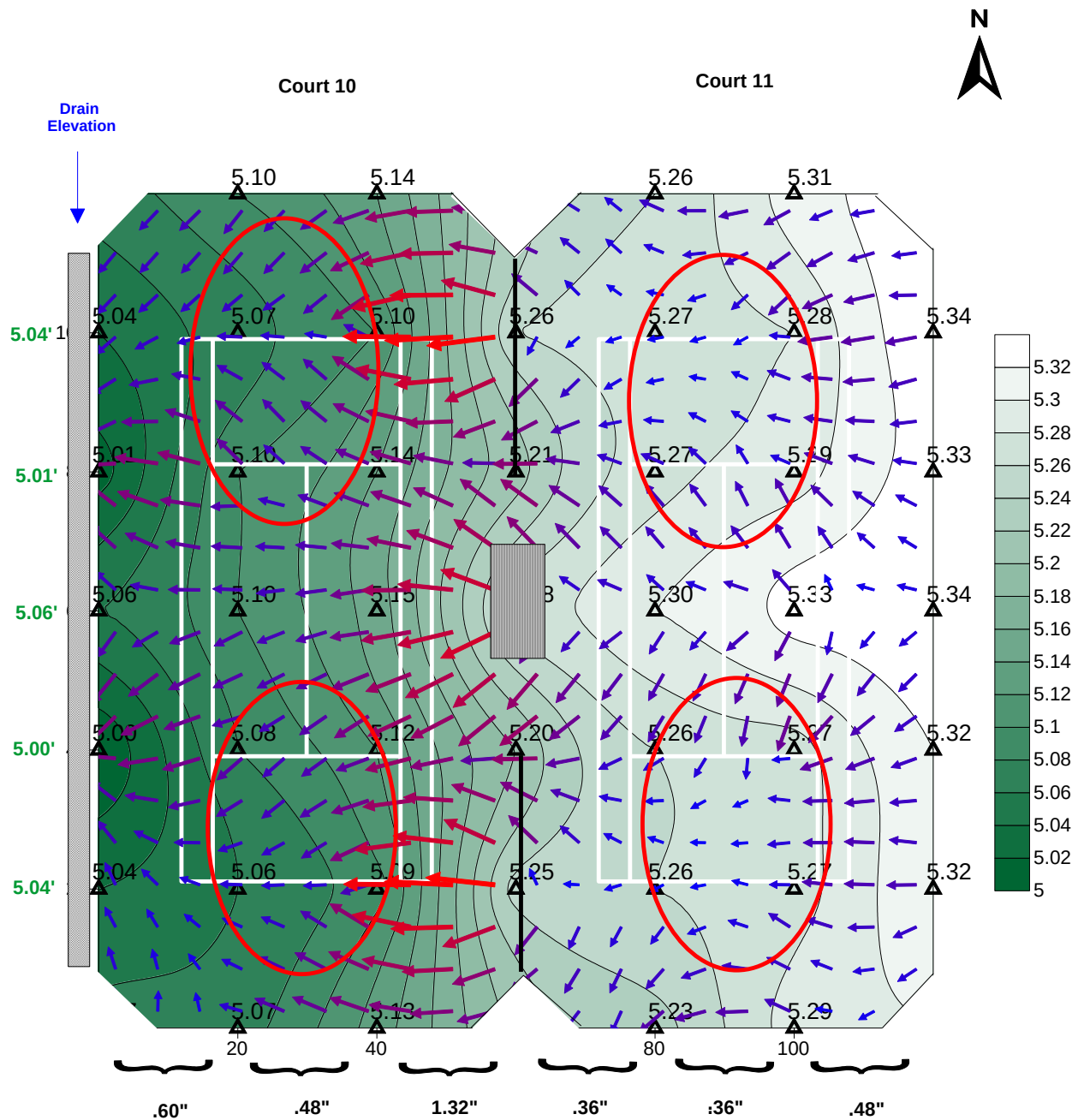
MAP 27

Huntsville Tennis Center **Har-Tru Courts 10 & 11** **Topographical Perspective / Current State**

120' X 120'

May 19, 2011

▲ Elevation in Feet



MAP 28

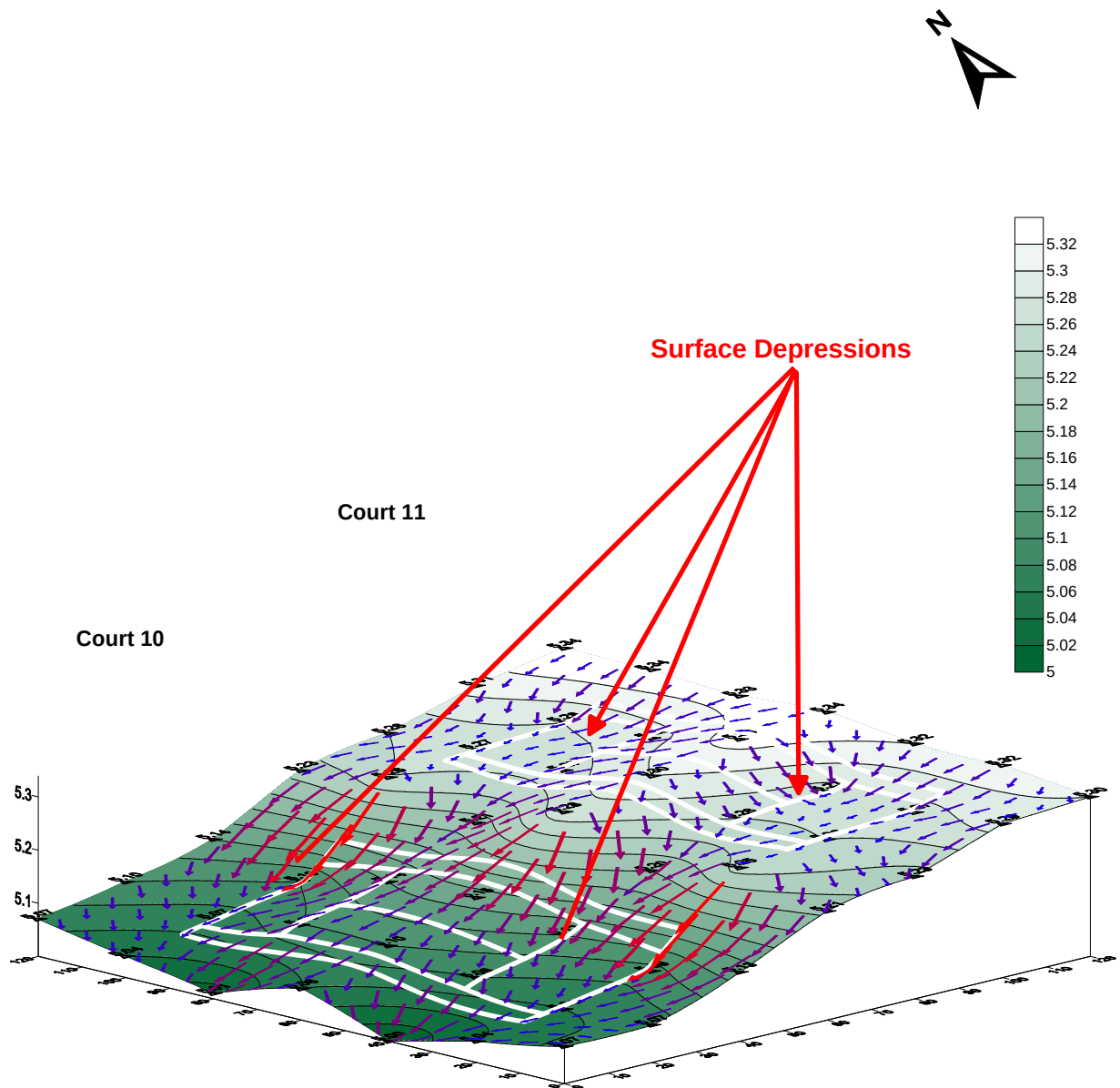
Huntsville Tennis Center Har-Tru Courts 10 & 11 Drainage Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow

○ Surface Depressions



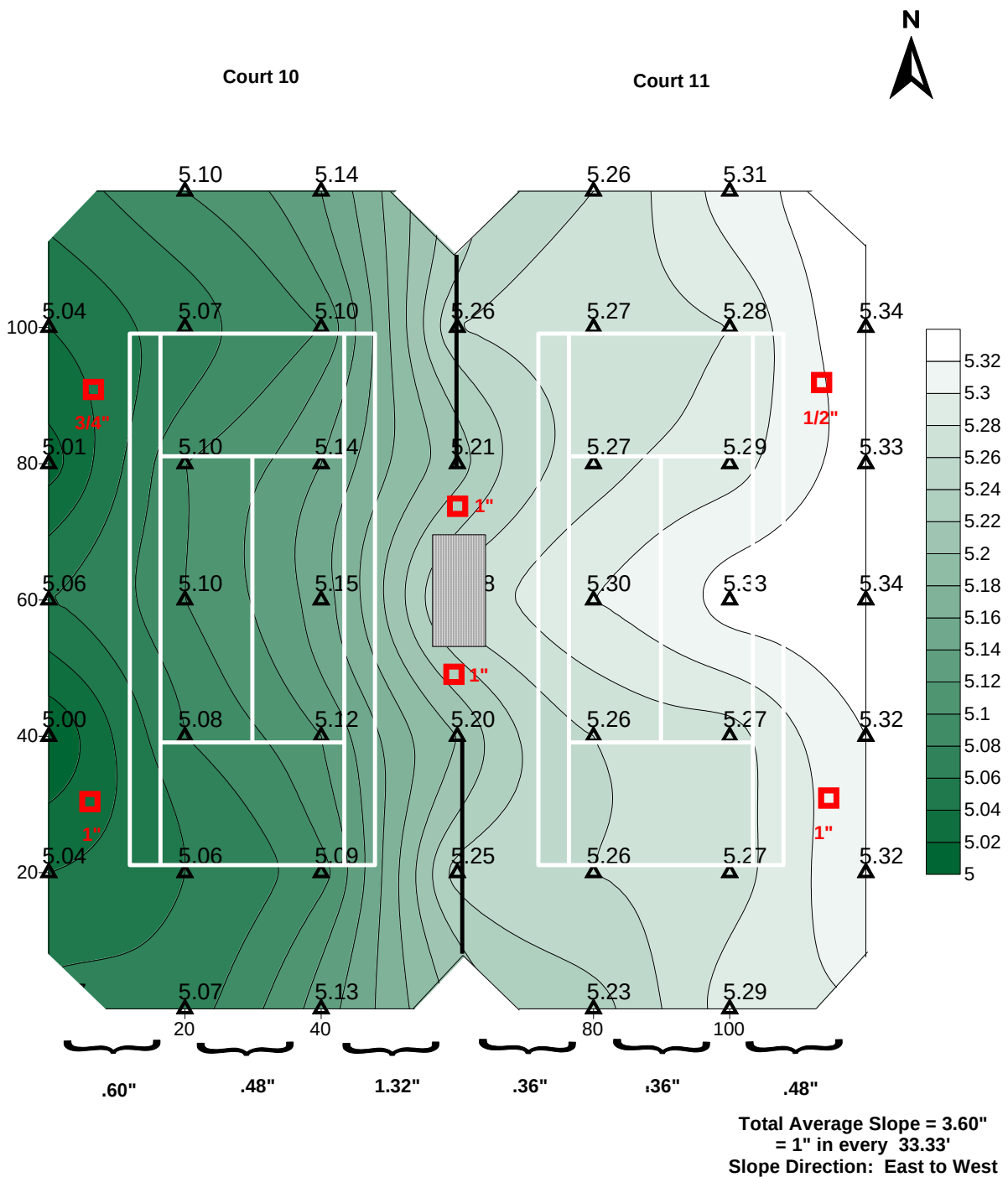
MAP 29

Huntsville Tennis Center Har-Tru Courts 10 & 11 3-Dimensional Perspective / Current State

120' X 120'

May 19, 2011

↑ Direction of Water Flow



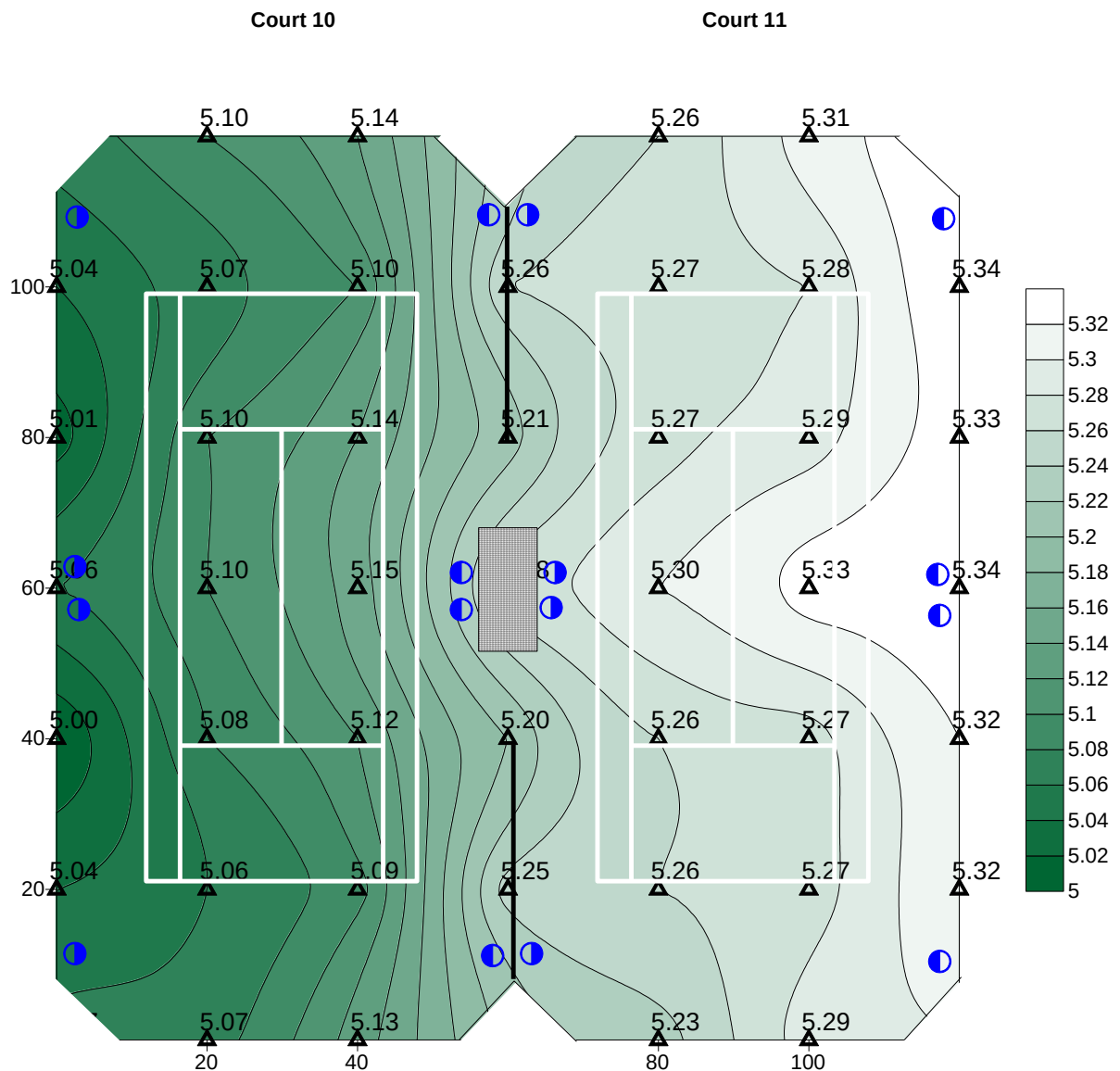
MAP 30

Huntsville Tennis Center Har-Tru Courts 10 & 11 Surface Thickness Perspective / Current State

120' X 120'

May 19, 2011

Coring Locations
Desired State = 1"



MAP 31

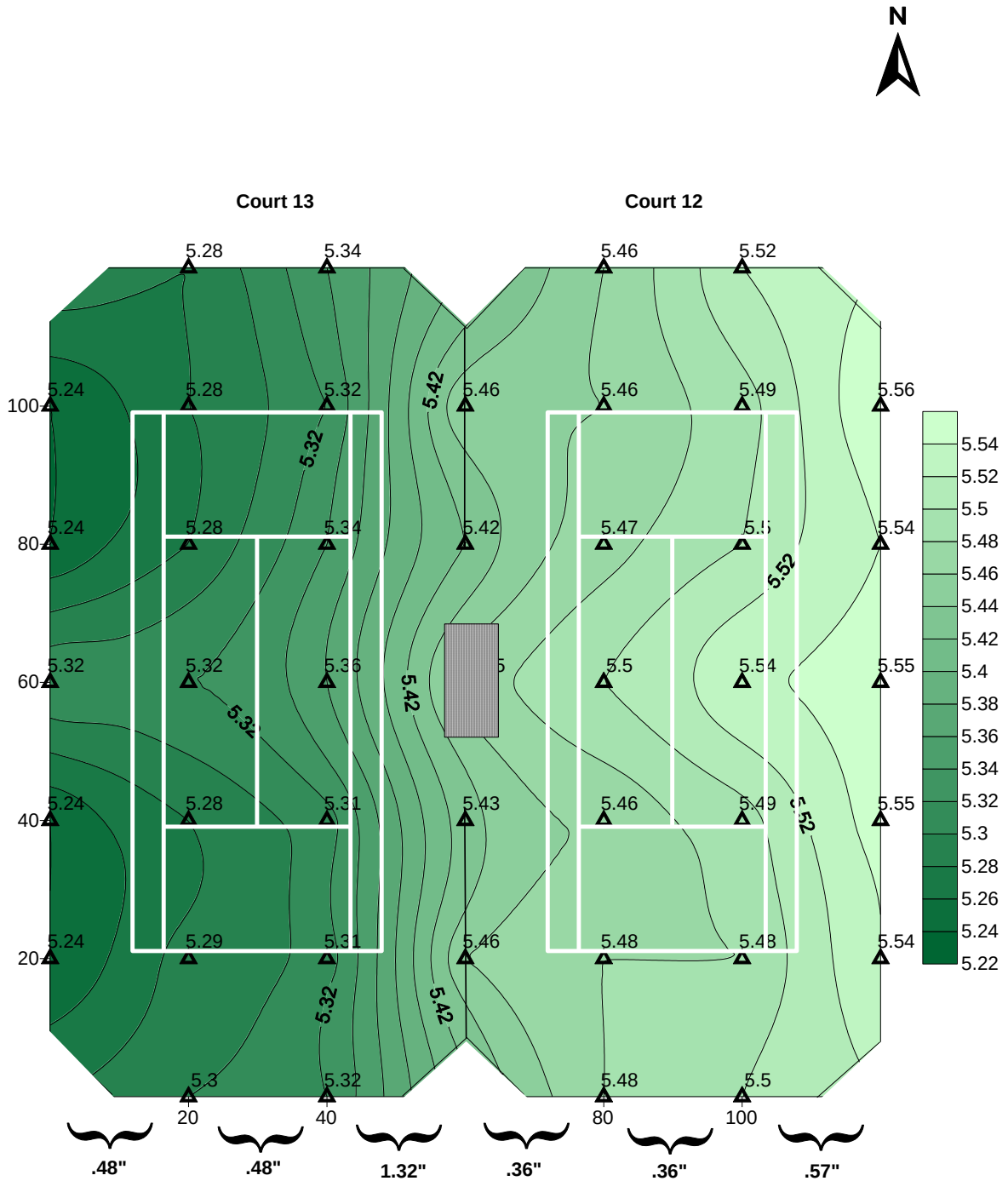
Huntsville Tennis Center Har-Tru Courts 10 & 11 Irrigation System Perspective / Current State

120' X 120'

May 19, 2011

 Sprinkler Head Locations

Courts 12 & 13



MAP 32

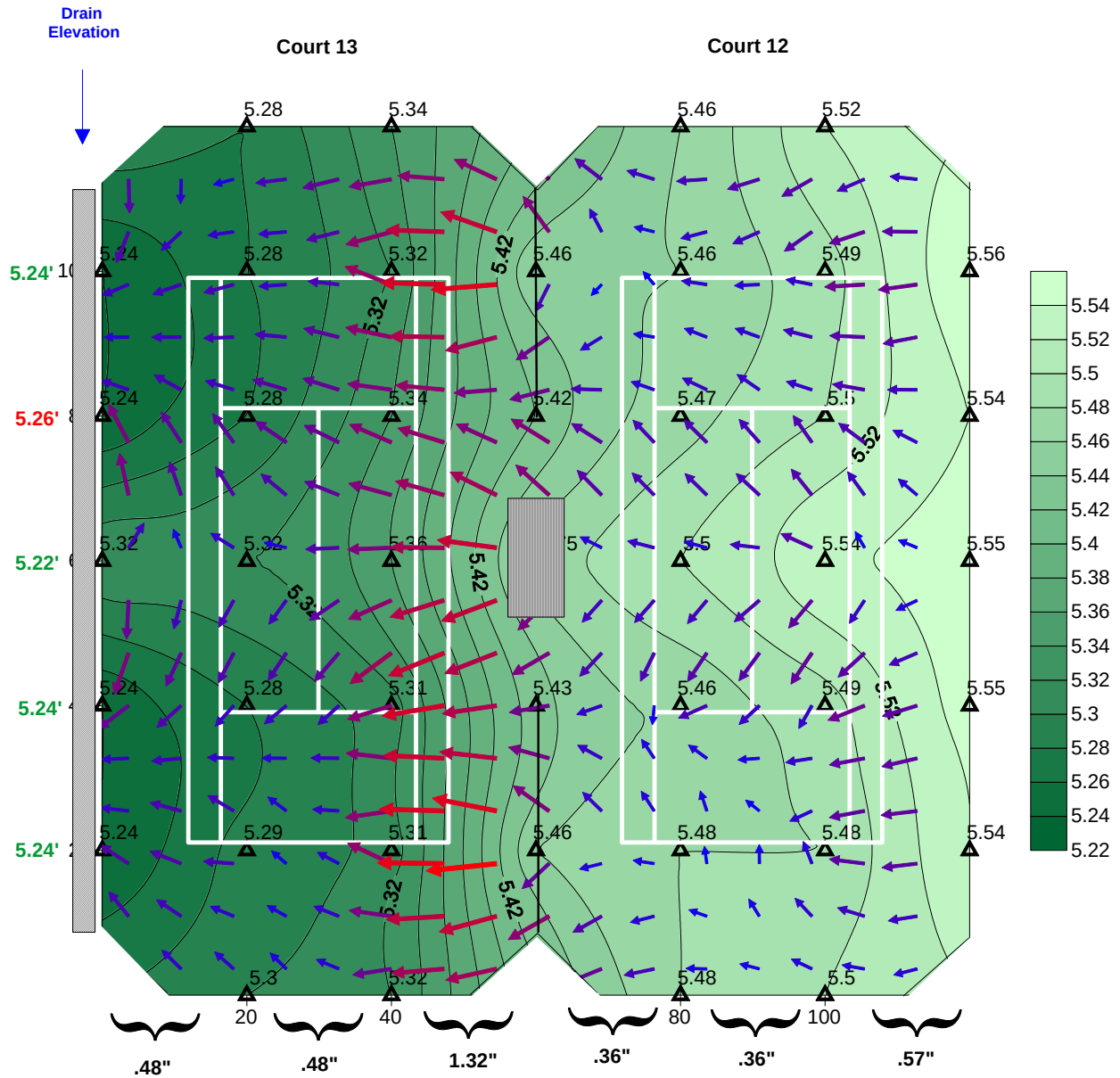
**Huntsville Tennis Center
Har-Tru Courts 12 & 13
Topographical Perspective / Current State**

**Total Average Slope = 3.57"
or 1" in 33.60'
Slope Direction: East-to-West**

120' x 120'

May 19, 2011

▲ Elevations in Feet



MAP 33

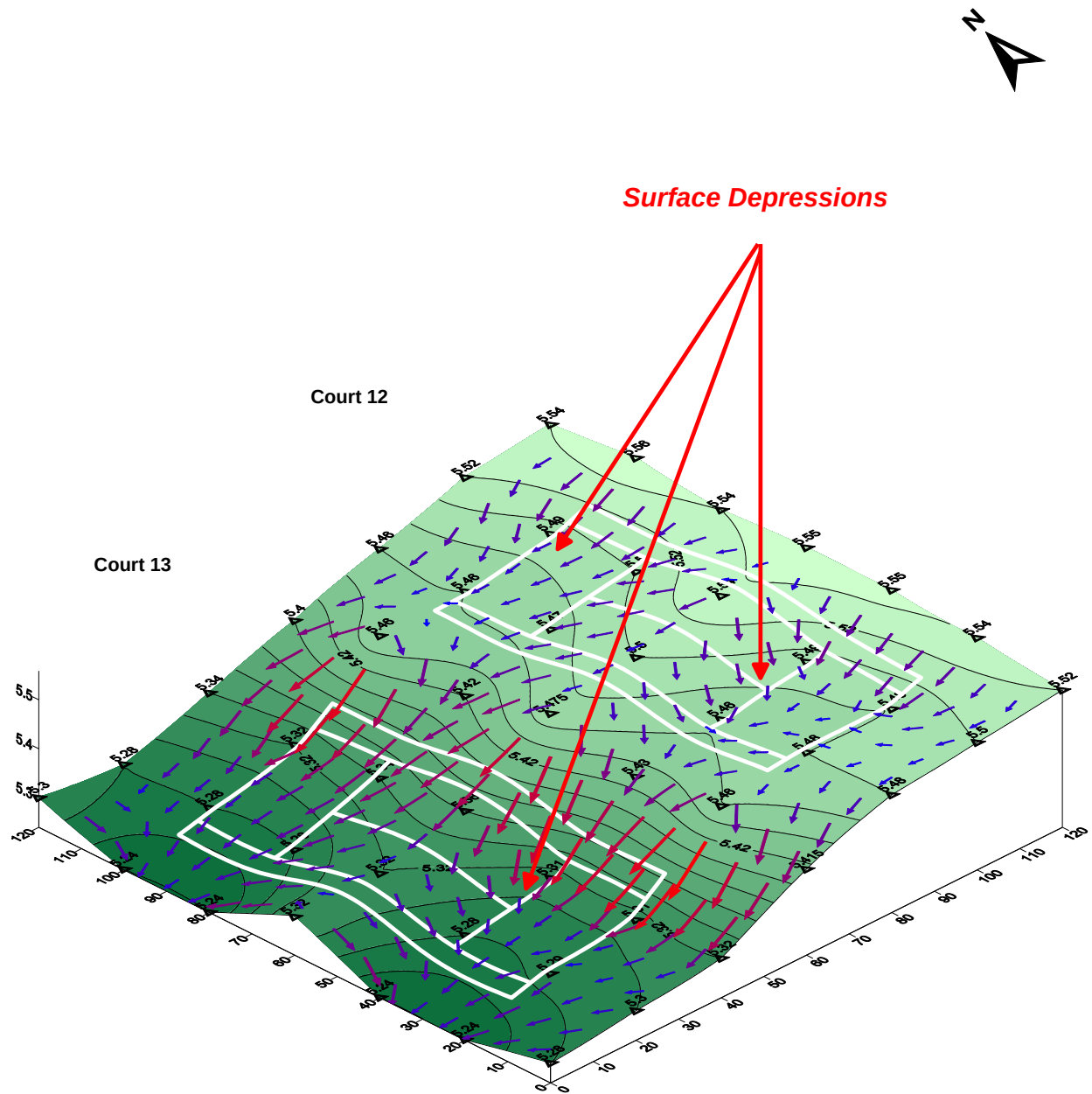
**Huntsville Tennis Center
Har-Tru Courts 12 & 13
Drainage Perspective / Current State**

**Total Average Slope = 3.57"
or 1" in 33.60'
Slope Direction: East-to-West**

120' x 120'

May 19, 2011

↑ Direction of Water Flow

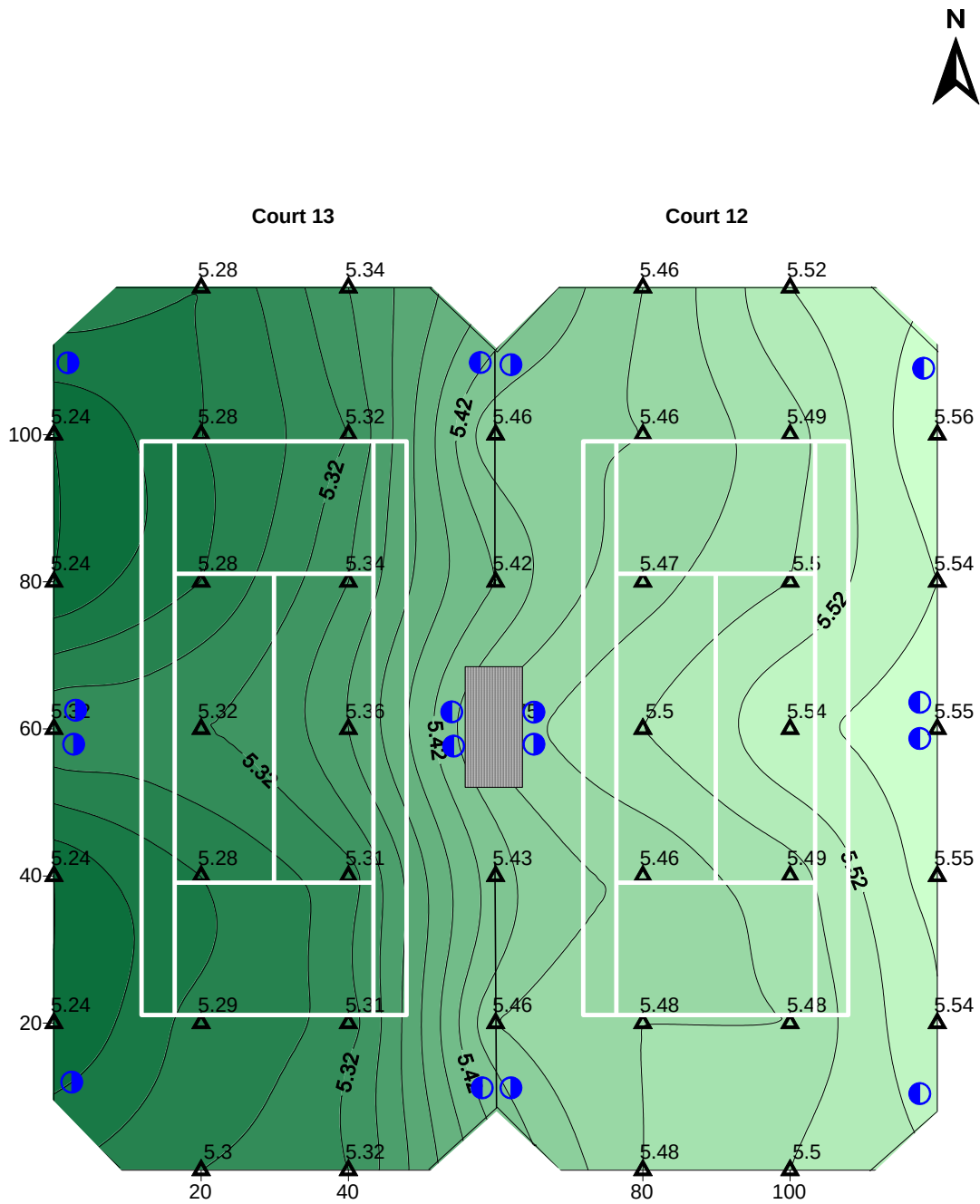


Huntsville Tennis Center
Har-Tru Courts 12 & 13
MAP 34 **3-Dimensional Perspective / Current State**

120' x 120'

May 19, 2011

↑ Direction of Water Flow



MAP 36

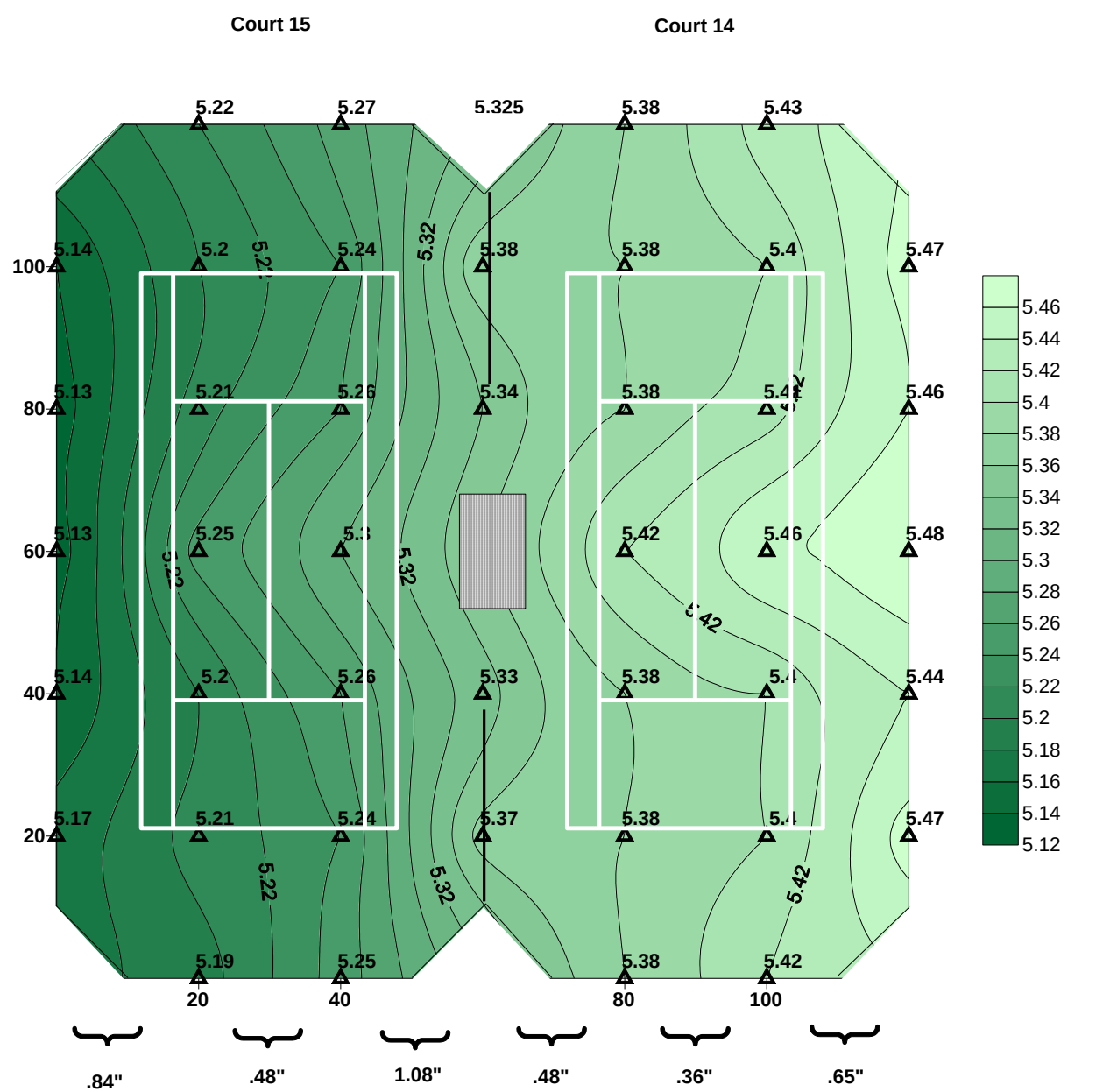
**Huntsville Tennis Center
Har-Tru Courts 12 & 13
Irrigation System Perspective / Current State**

120' x 120'

May 19, 2011

 RainBird 6504 Falcon
Sprinkler Head Locations

Courts 14 & 15



Total Average Slope = 3.89"
Slope = 1" every 30.84'
Slope Direction: East-to-West

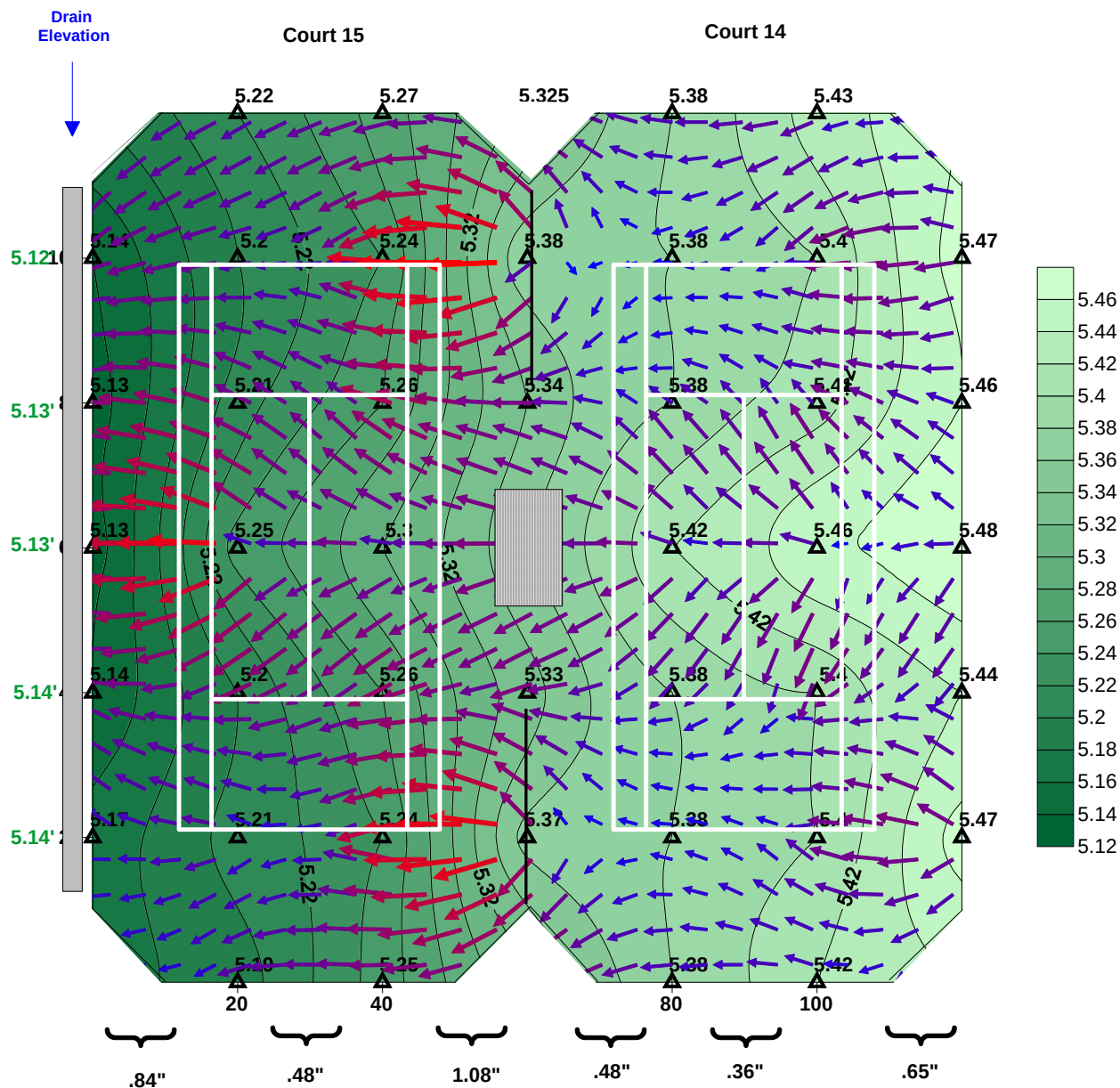
MAP 37

Huntsville Tennis Center Har-Tru Courts 14 & 15 Topographical Perspective / Current State

120' x 120'

May 19, 2011

▲ Elevations in Feet



Total Average Slope = 3.89"
Slope = 1" every 30.84'
Slope Direction: East-to-West

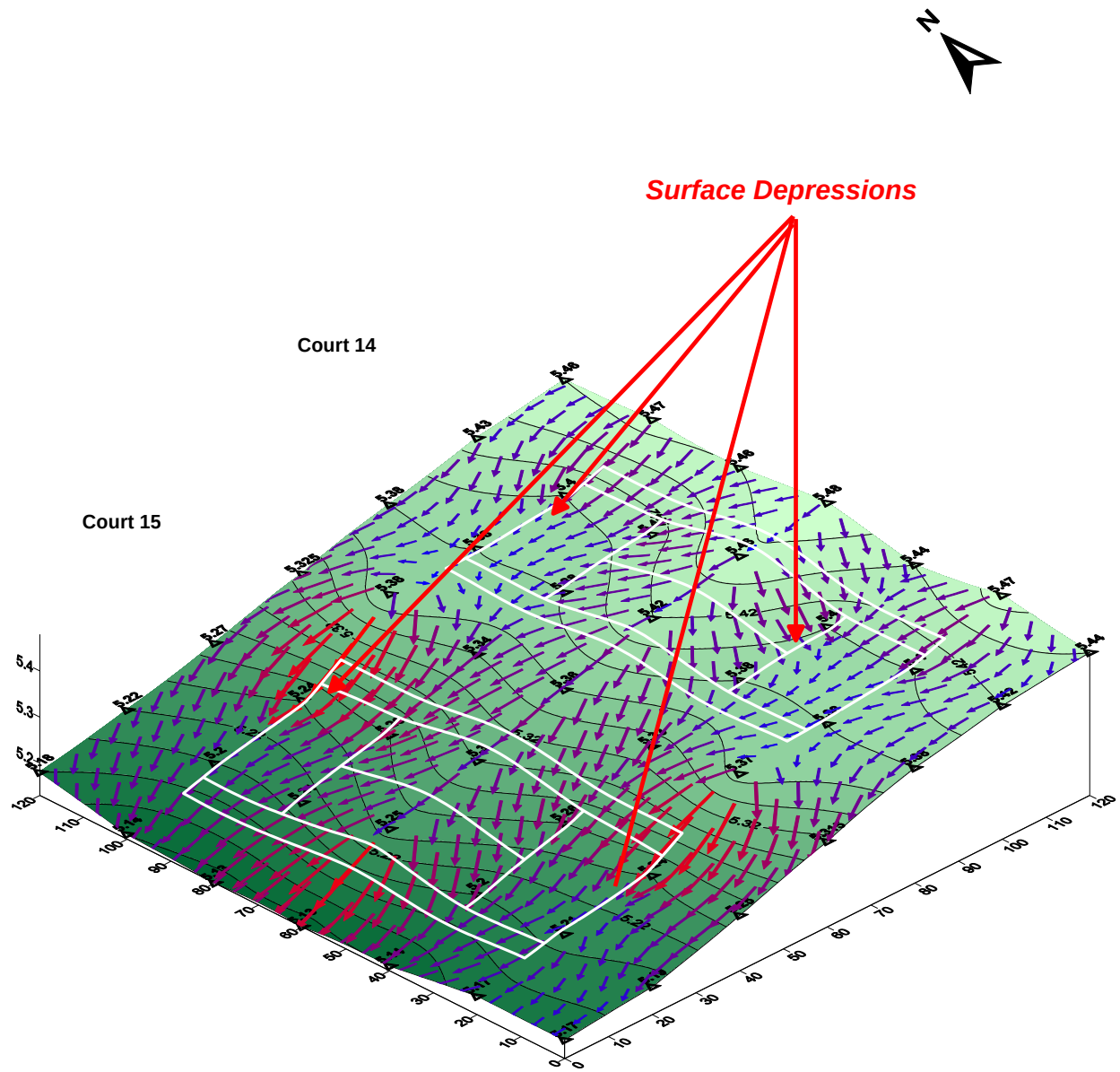
MAP 38

Huntsville Tennis Center Har-Tru Courts 14 & 15 Drainage Perspective / Current State

120' x 120'

May 19, 2011

← Direction of Water Flow



MAP 39

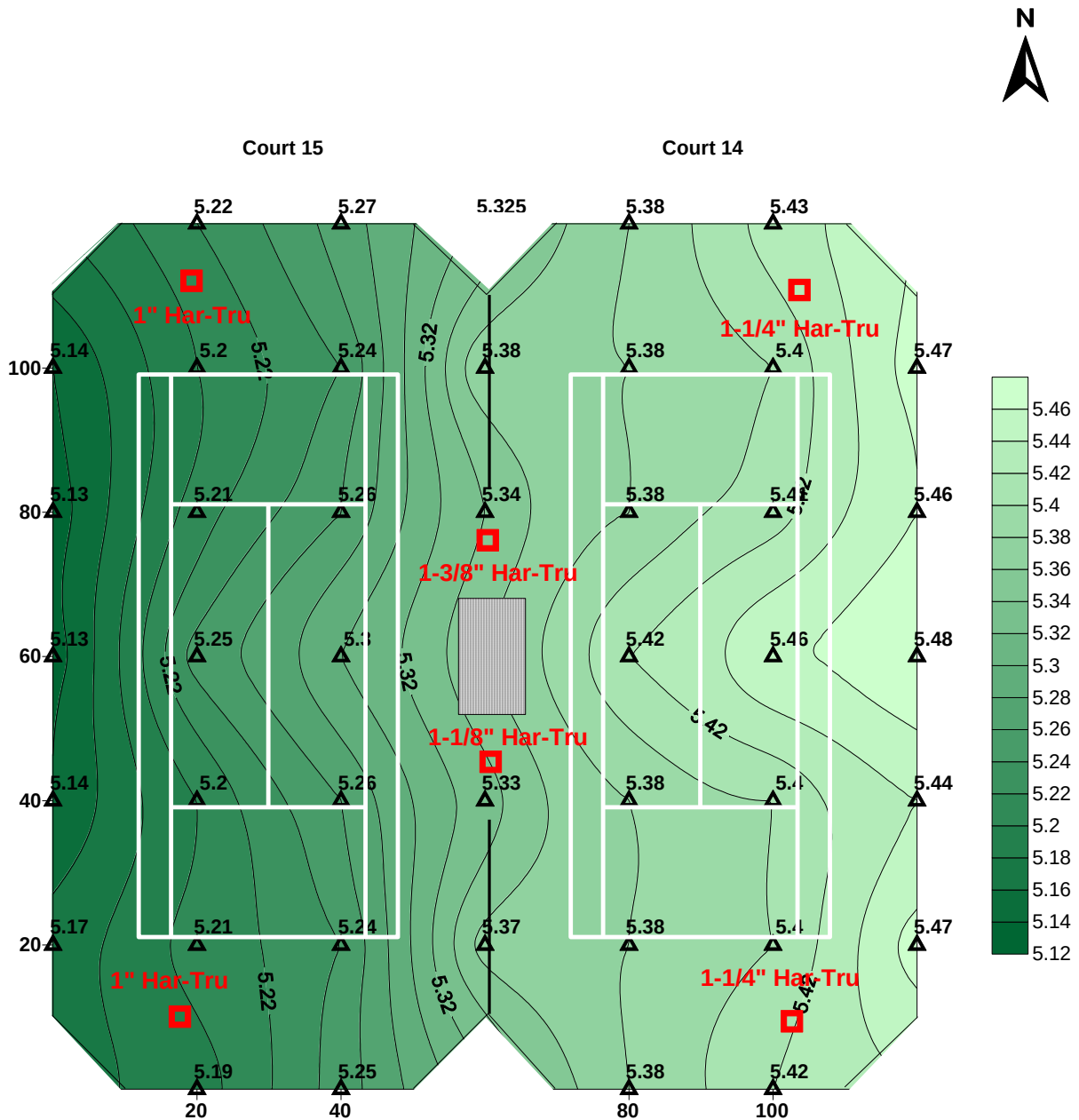
**Huntsville Tennis Center
Har-Tru Courts 14 & 15
3-Dimensional Perspective / Current State**

120' x 120'

May 19, 2011



Direction of Water Flow



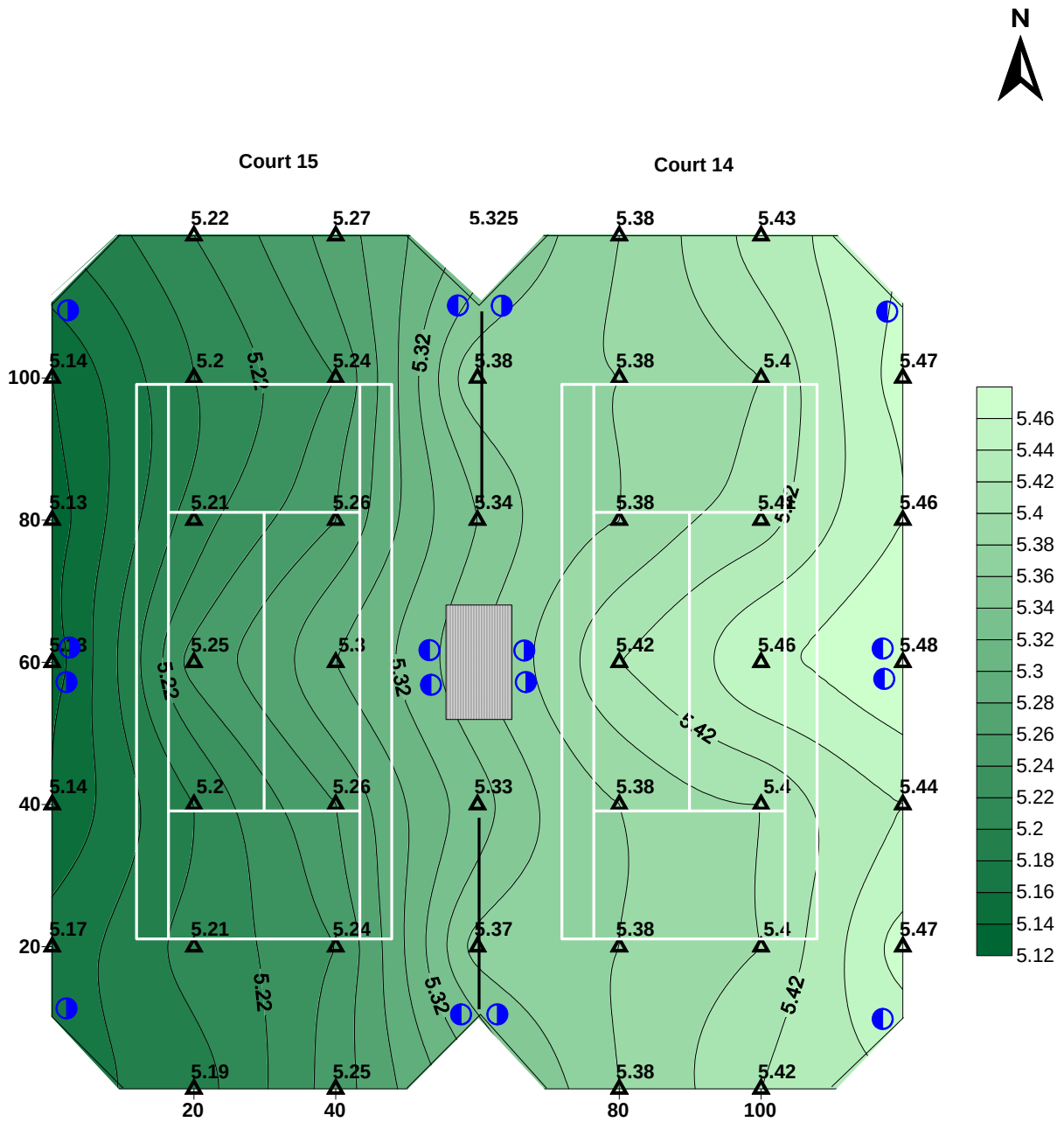
MAP 40

Huntsville Tennis Center Har-Tru Courts 14 & 15 Surface Thickness Perspective / Current State

120' x 120'

May 19, 2011

 Coring Location
Desired State = 1"



MAP 41

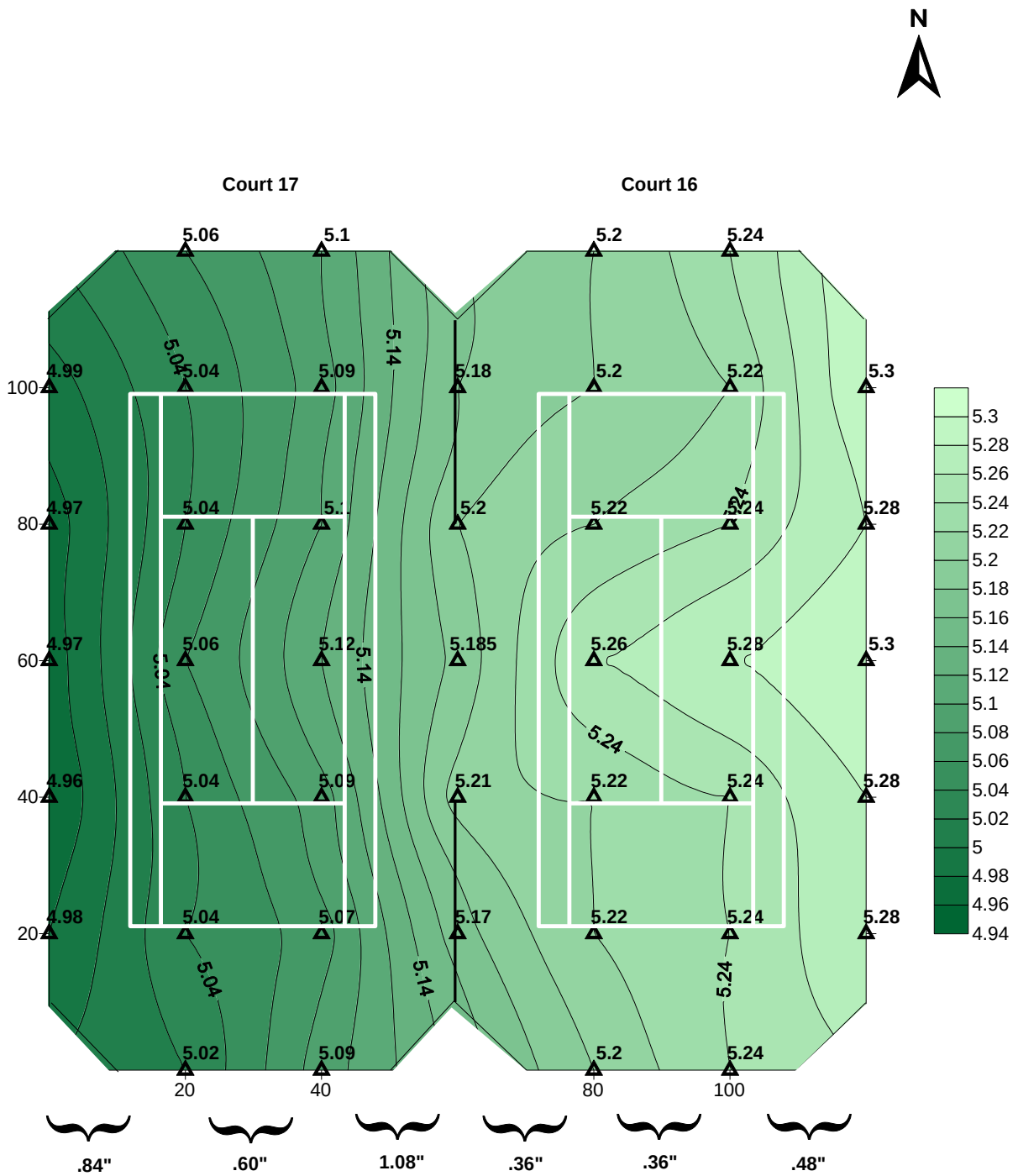
Huntsville Tennis Center Har-Tru Courts 14 & 15 Irrigation System Perspective / Current State

120' x 120'

May 19, 2011

 RainBird 6504 Falcon
Sprinkler Head Locations

Courts 16 & 17



MAP 42

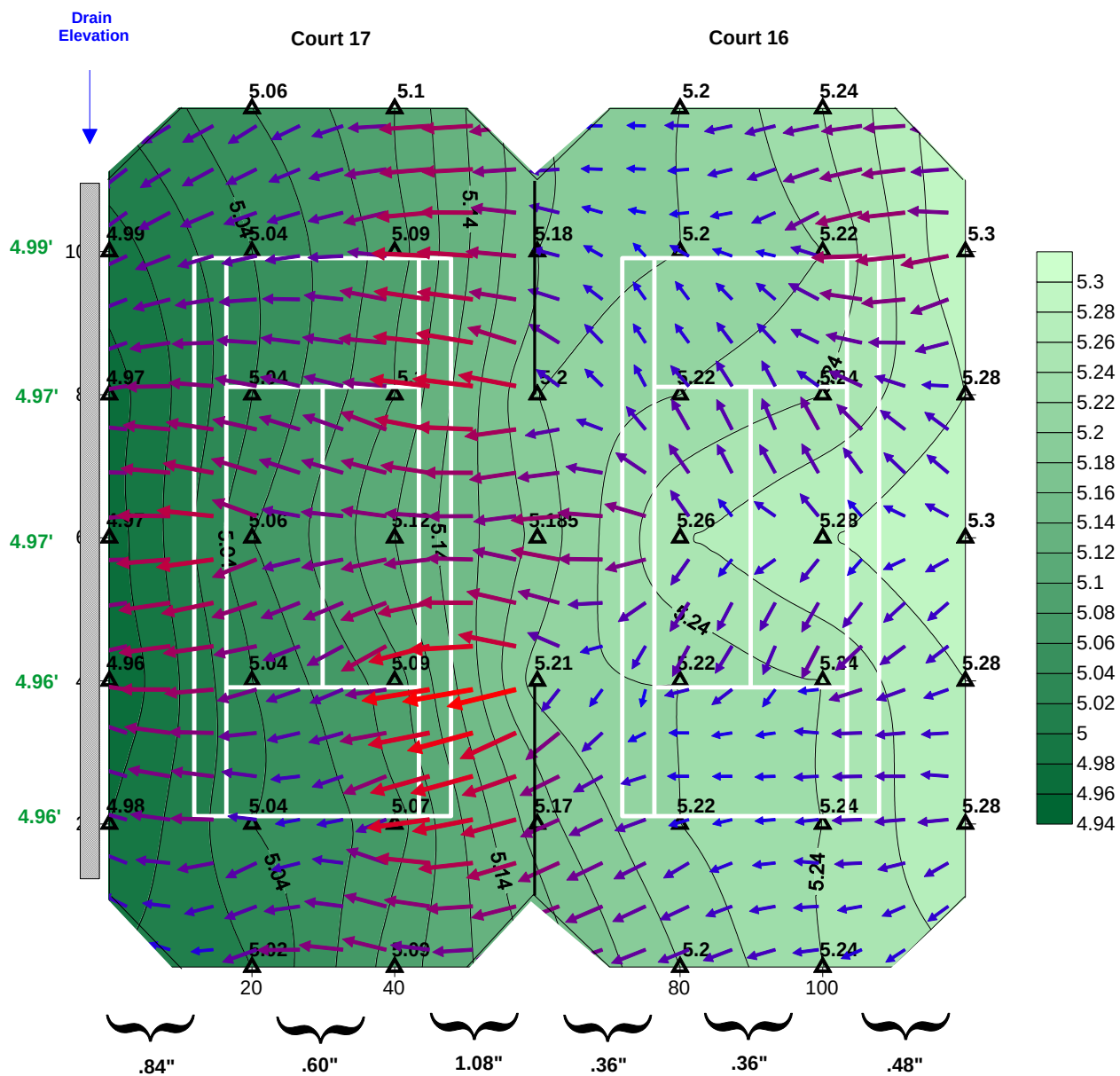
Huntsville Tennis Center Har-Tru Courts 16 & 17 Topographical Perspective / Current State

Total Average Slope = 3.72"
or 1" in 32.25'.
Direction of Slope: East-to-West

120' x 120'

May 19, 2011

▲ Elevations in Feet



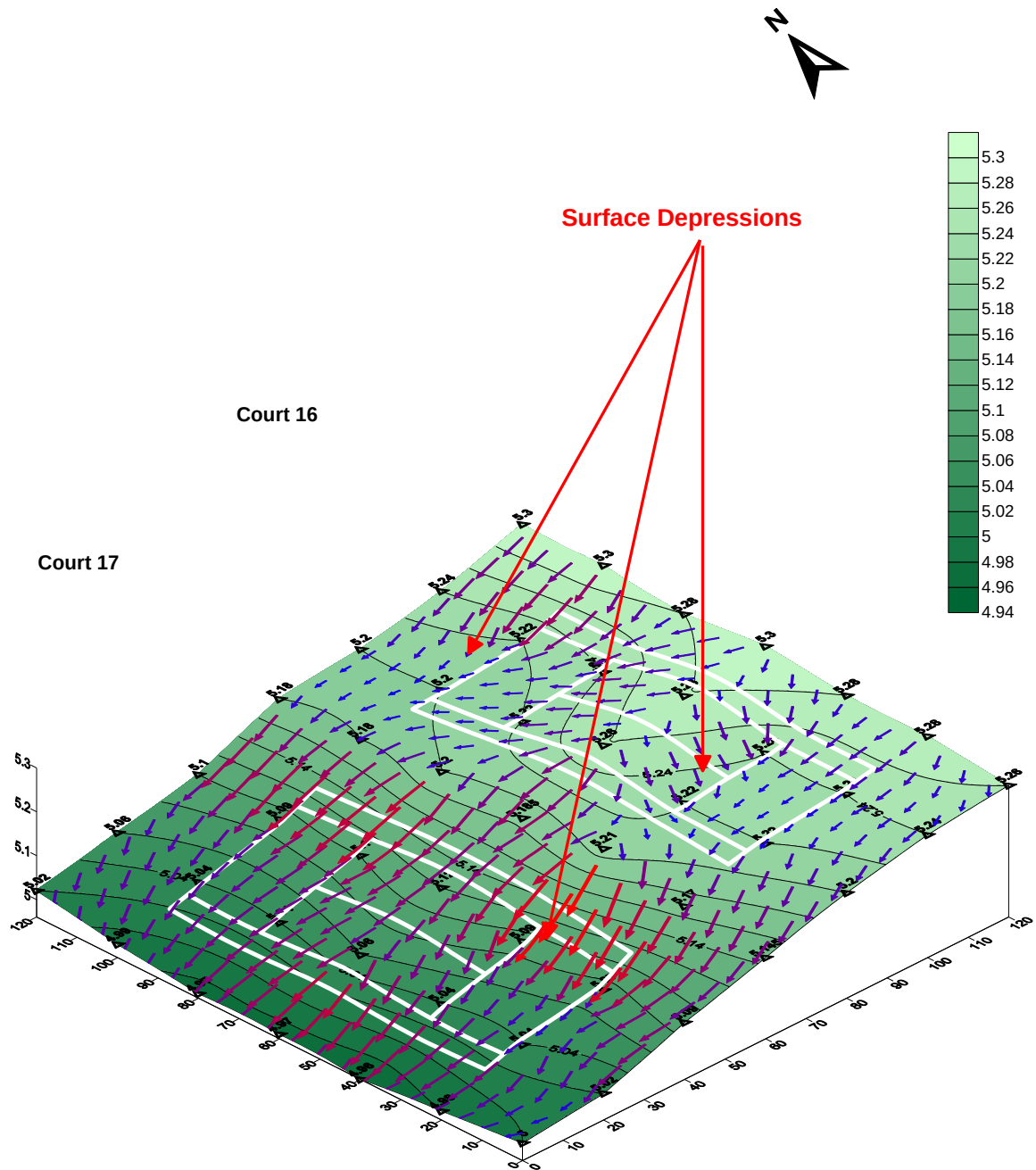
MAP 43

**Huntsville Tennis Center
Har-Tru Courts 16 & 17
Drainage Perspective / Current State**

120' x 120'

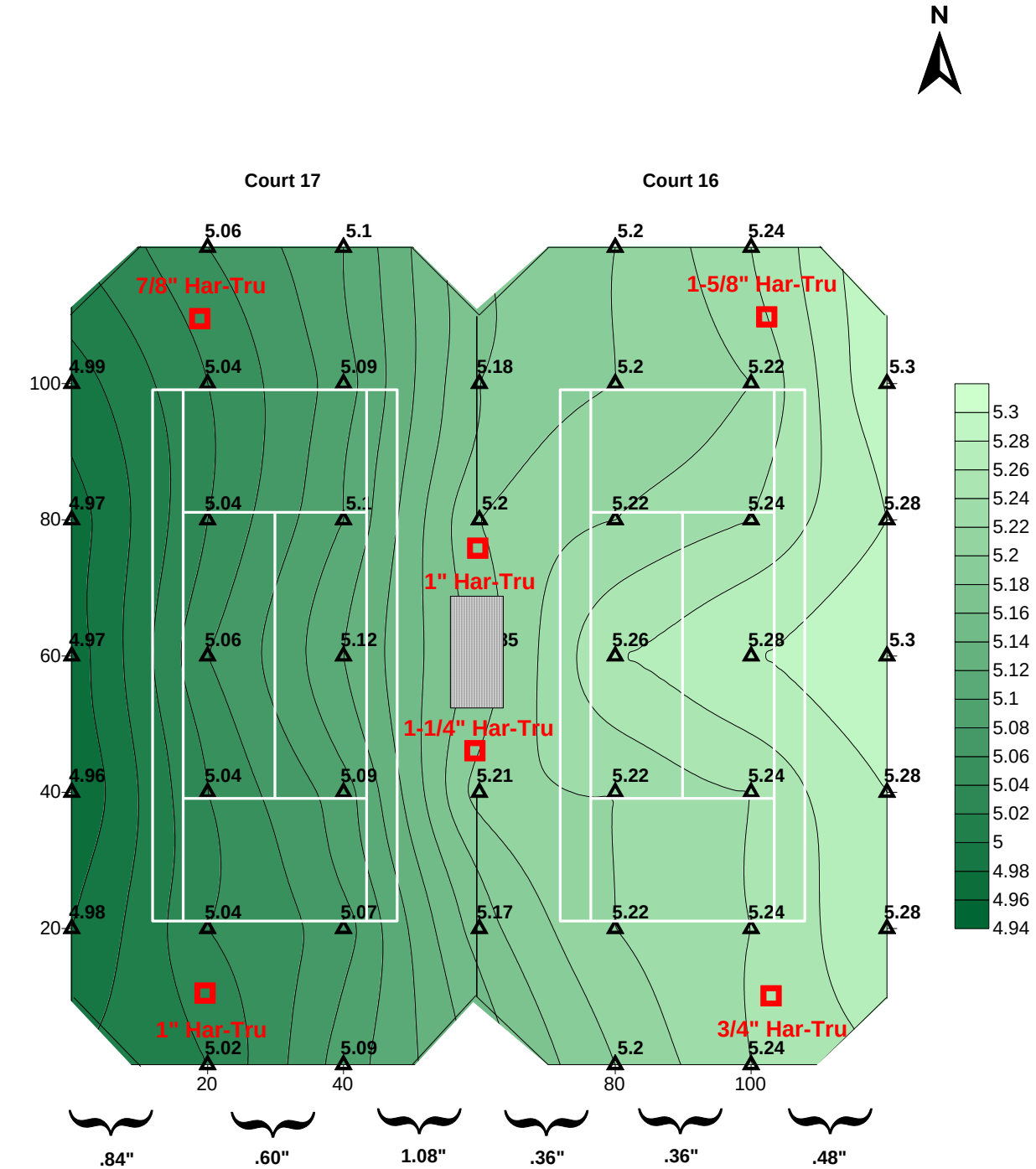
May 19, 2011

↑ Direction of Water Flow



MAP 44

Huntsville Tennis Center Har-Tru Courts 16 & 17 3-Dimensional Perspective / Current State



Total Average Slope = 3.72"
 or 1" in 32.25'.
 Direction of Slope: East-to-West

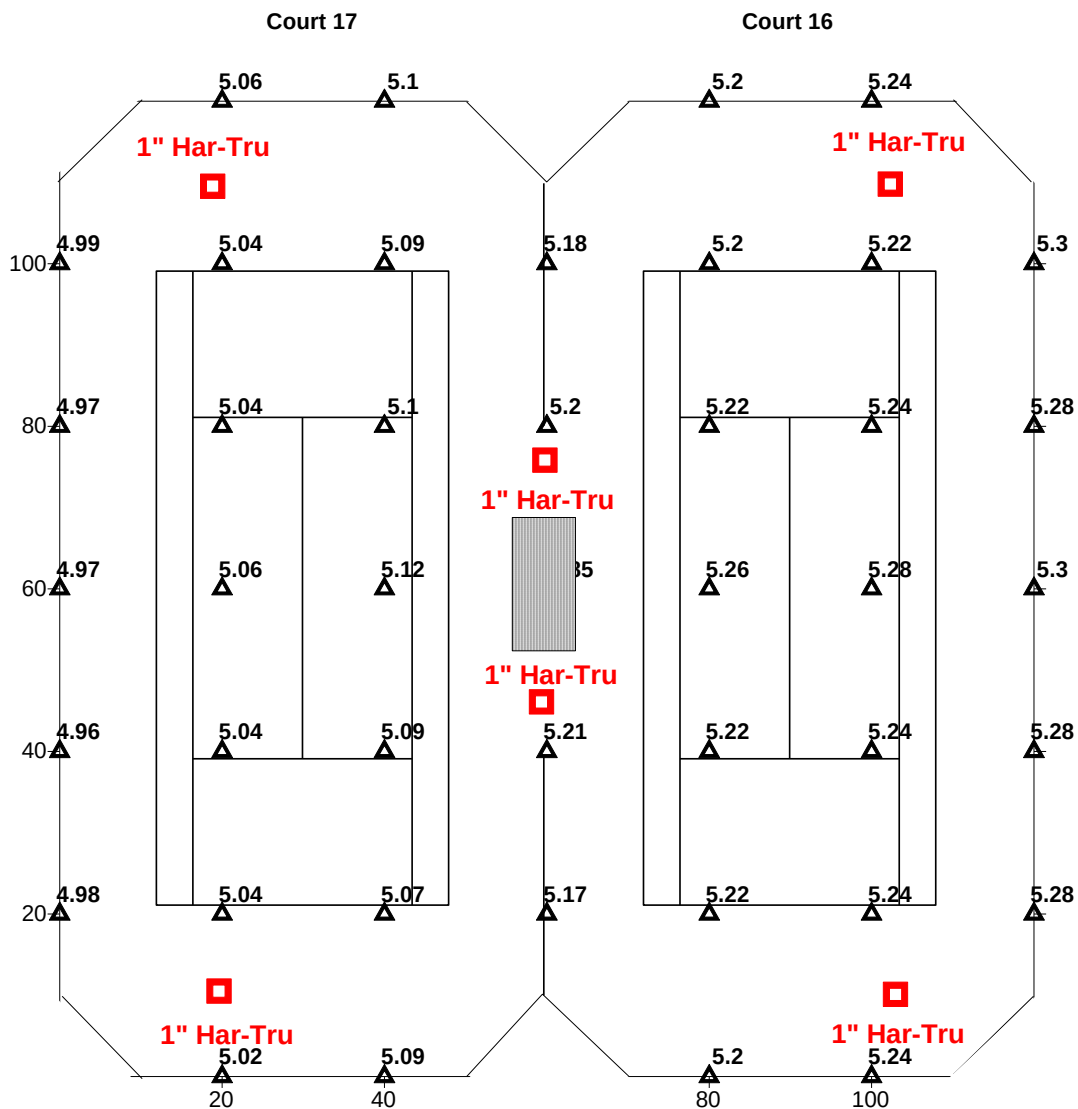
MAP 45

Huntsville Tennis Center Har-Tru Courts 16 & 17 Surface Thickness Perspective / Current State

120' x 120'

May 19, 2011

 Coring Locations
 Desired State = 1"



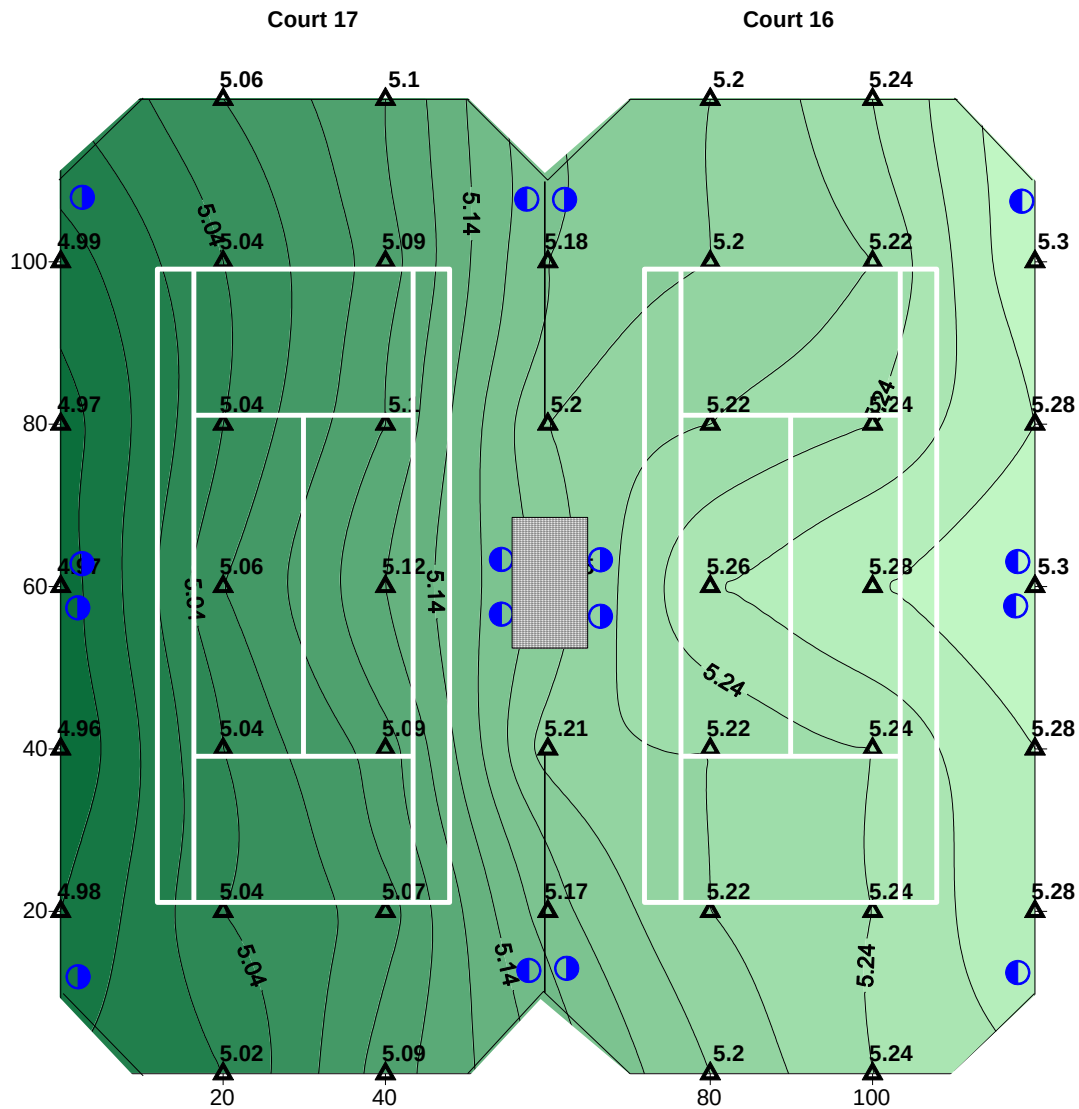
MAP 45A

**Huntsville Tennis Center
Har-Tru Courts 16 & 17
Surface Thickness Perspective / Desired State**

120' x 120'

May 19, 2011

 Coring Locations
Desired State = 1"



MAP 46

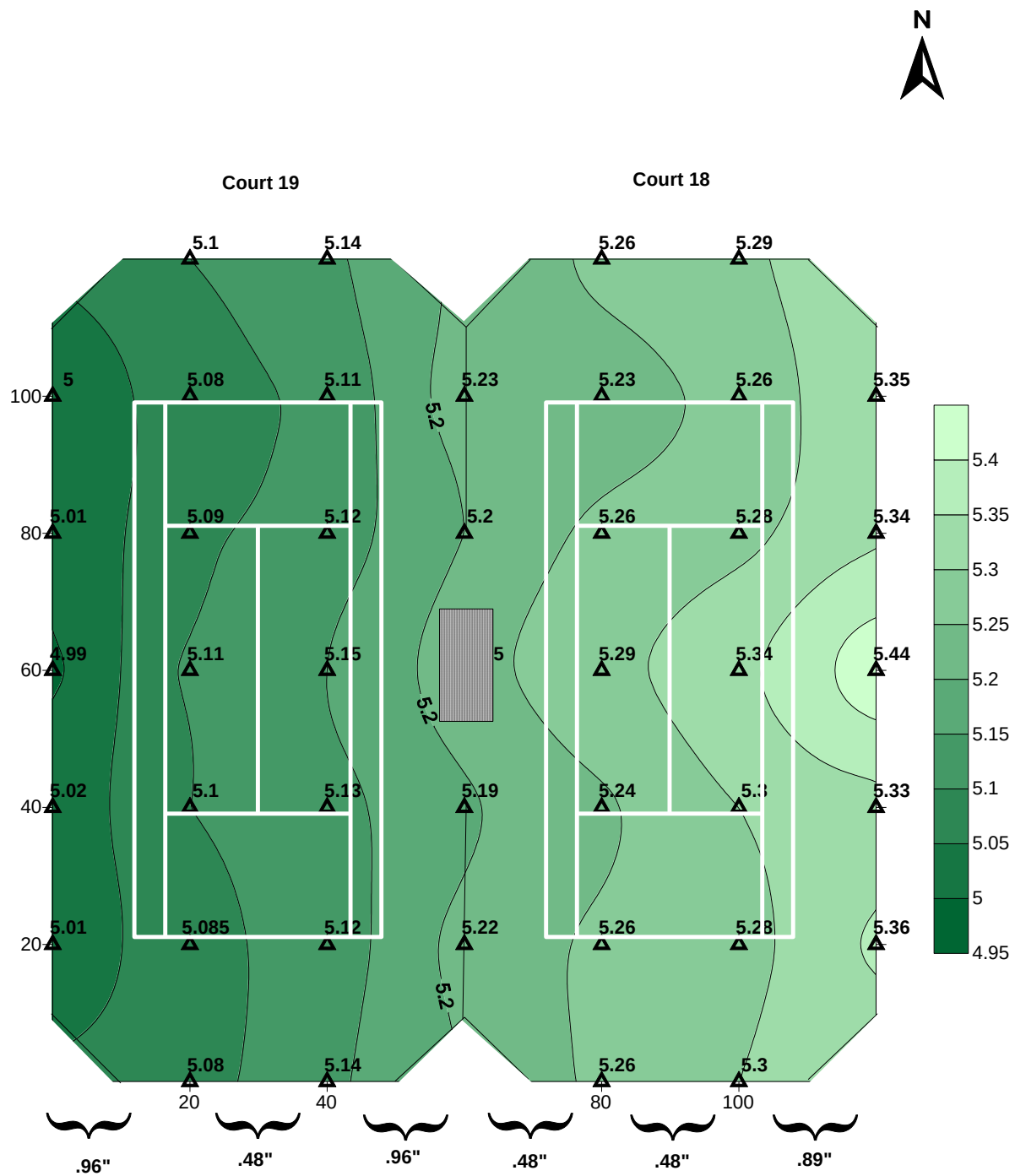
**Huntsville Tennis Center
Har-Tru Courts 16 & 17
Irrigation System Perspective / Current State**

120' x 120'

May 19, 2011

 RainBrid 6504
Sprinkler Head Locations

Courts 18 & 19



Total Average Slope = 4.25"
or 1" in 28.23'
Slope Direction: East-to-West

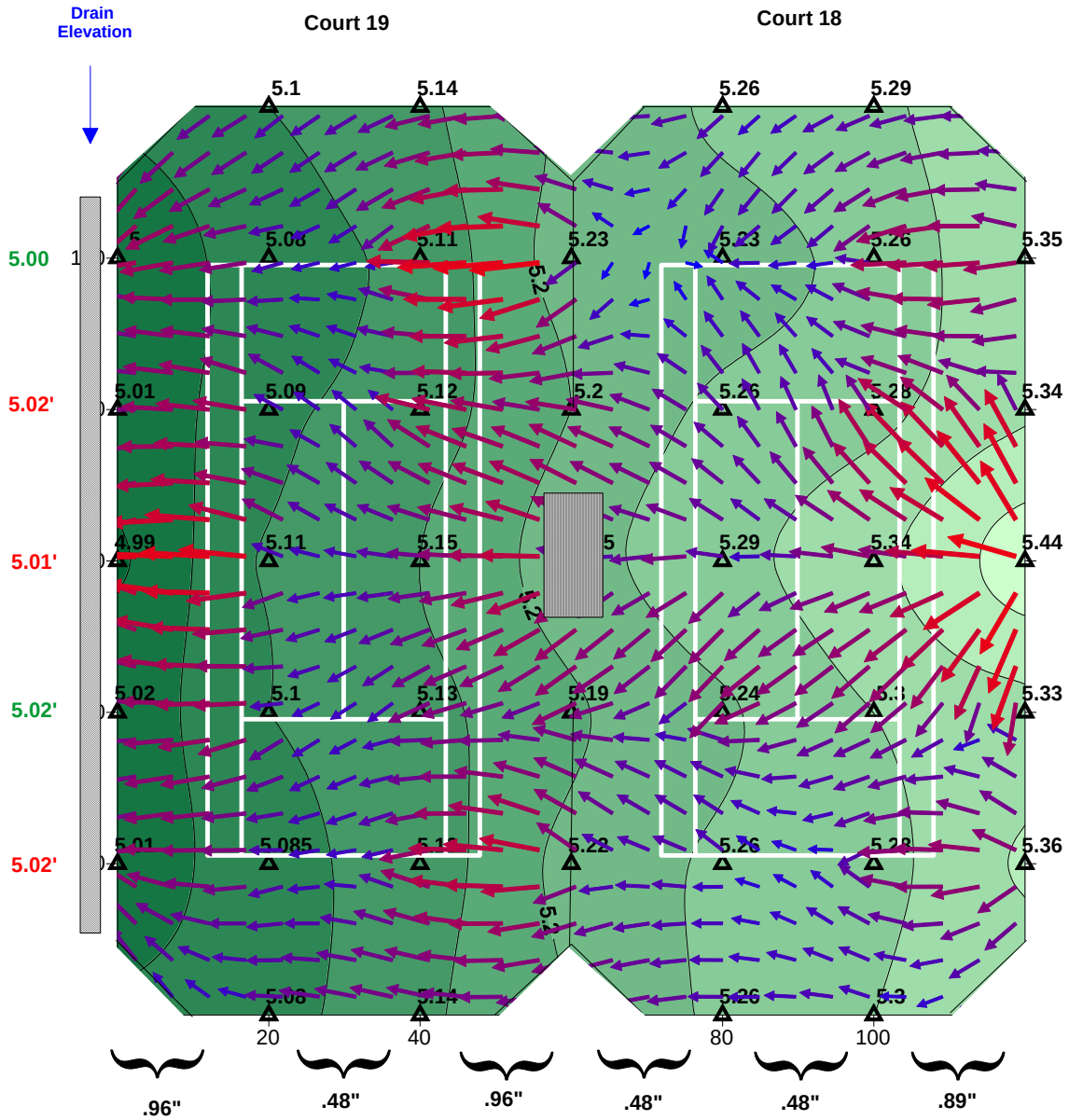
MAP 47

Huntsville Tennis Center Har-Tru Courts 18 & 19 Topographical Perspective / Current State

120' x 120'

May 19, 2011

▲ Elevations in Feet



Total Average Slope = 4.25"
or 1" in 28.23'
Slope Direction: East-to-West

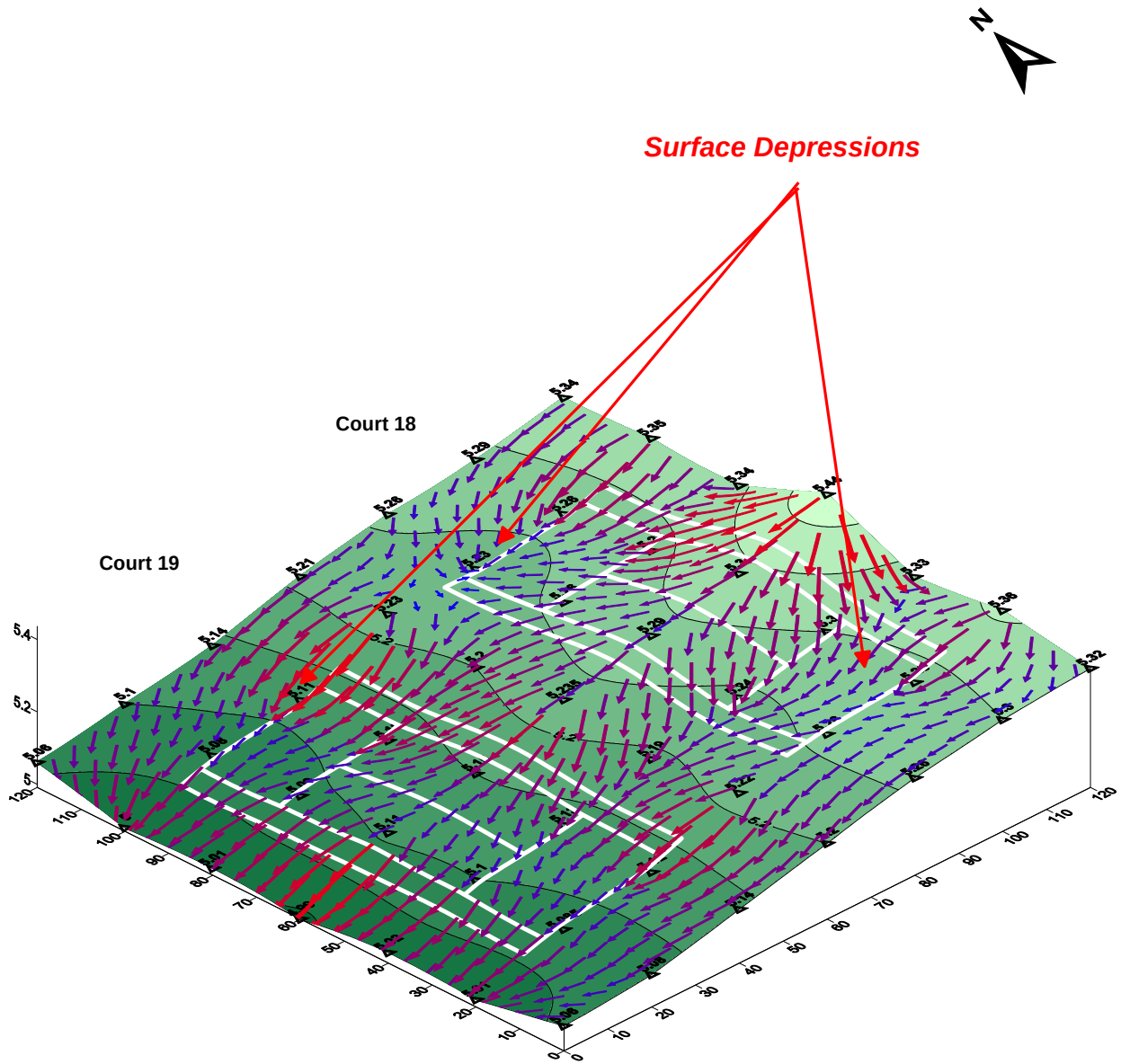
MAP 48

Huntsville Tennis Center Har-Tru Courts 18 & 19 Drainage Perspective / Current State

120' x 120'

May 19, 2011

← Direction of Water Flow



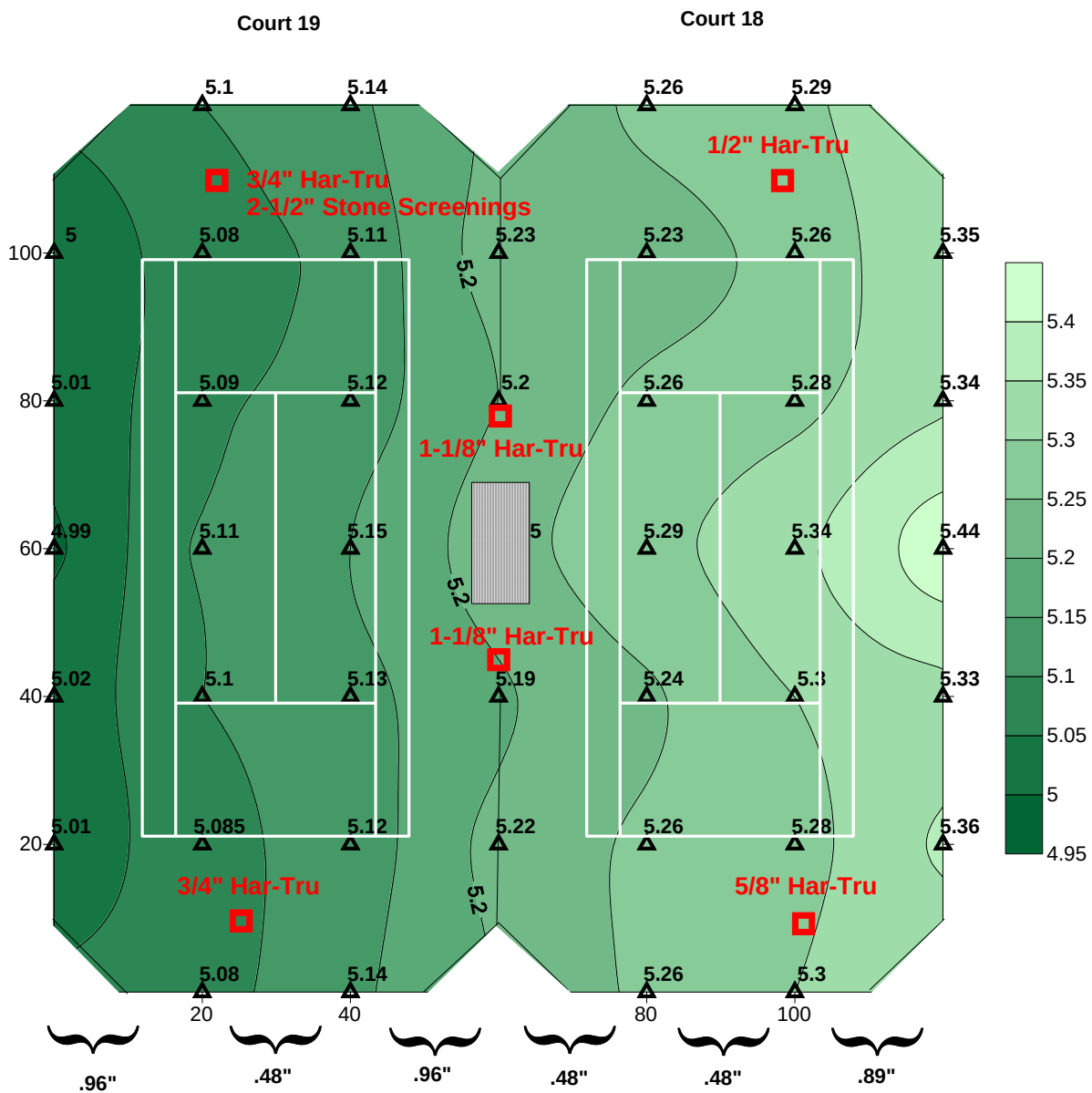
MAP 49

Huntsville Tennis Center Har-Tru Courts 18 & 19 3-Dimensional Perspective / Current State

120' x 120'

May 19, 2011

← Direction of Water Flow



MAP 50

Huntsville Tennis Center Har-Tru Courts 18 & 19

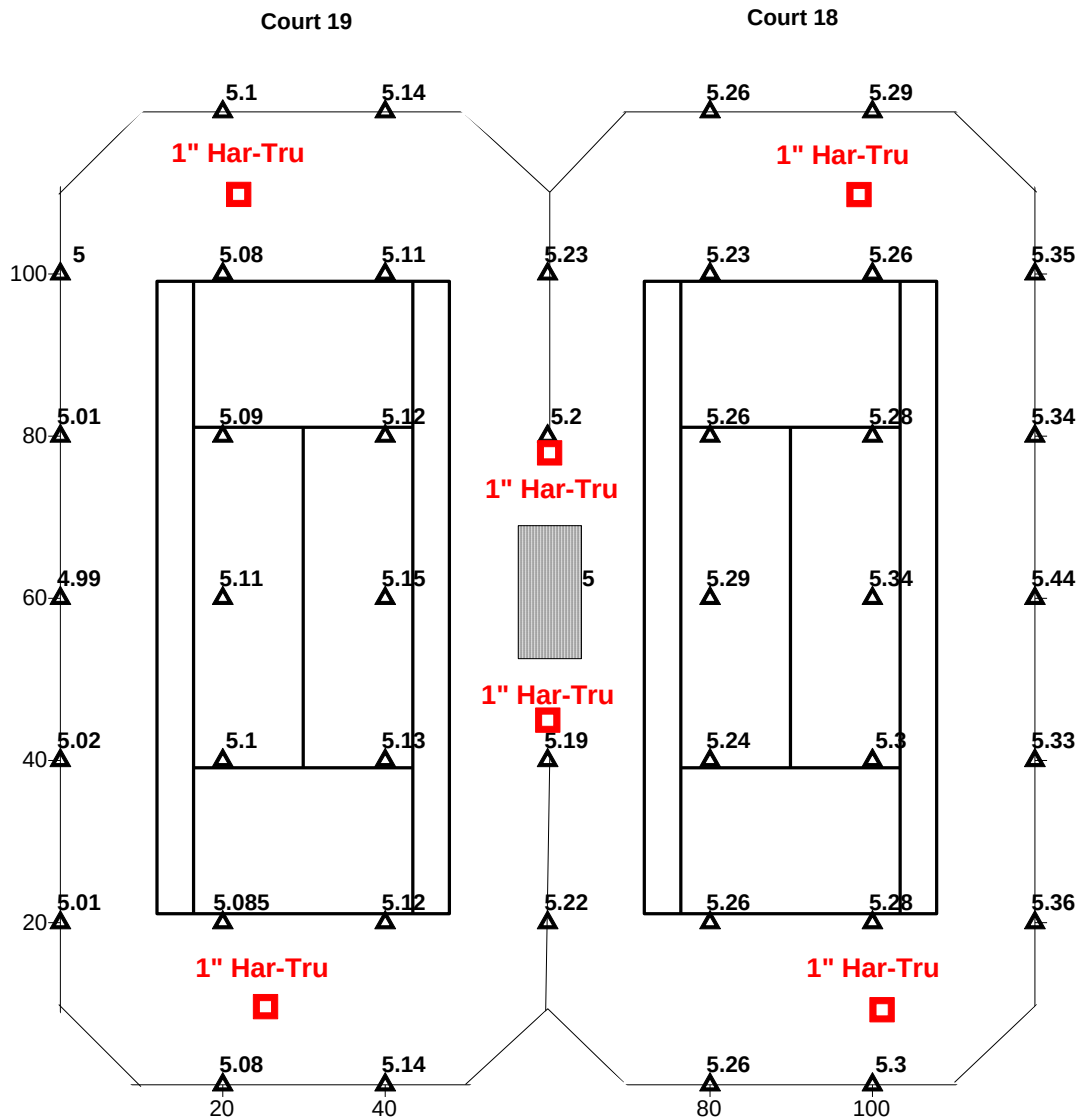
Surface Thickness Perspective / Current State

120' x 120'

May 19, 2011

Total Average Slope = 4.25"
or 1" in 28.23'
Slope Direction: East-to-West

 Coring Locations
Desired State = 1"



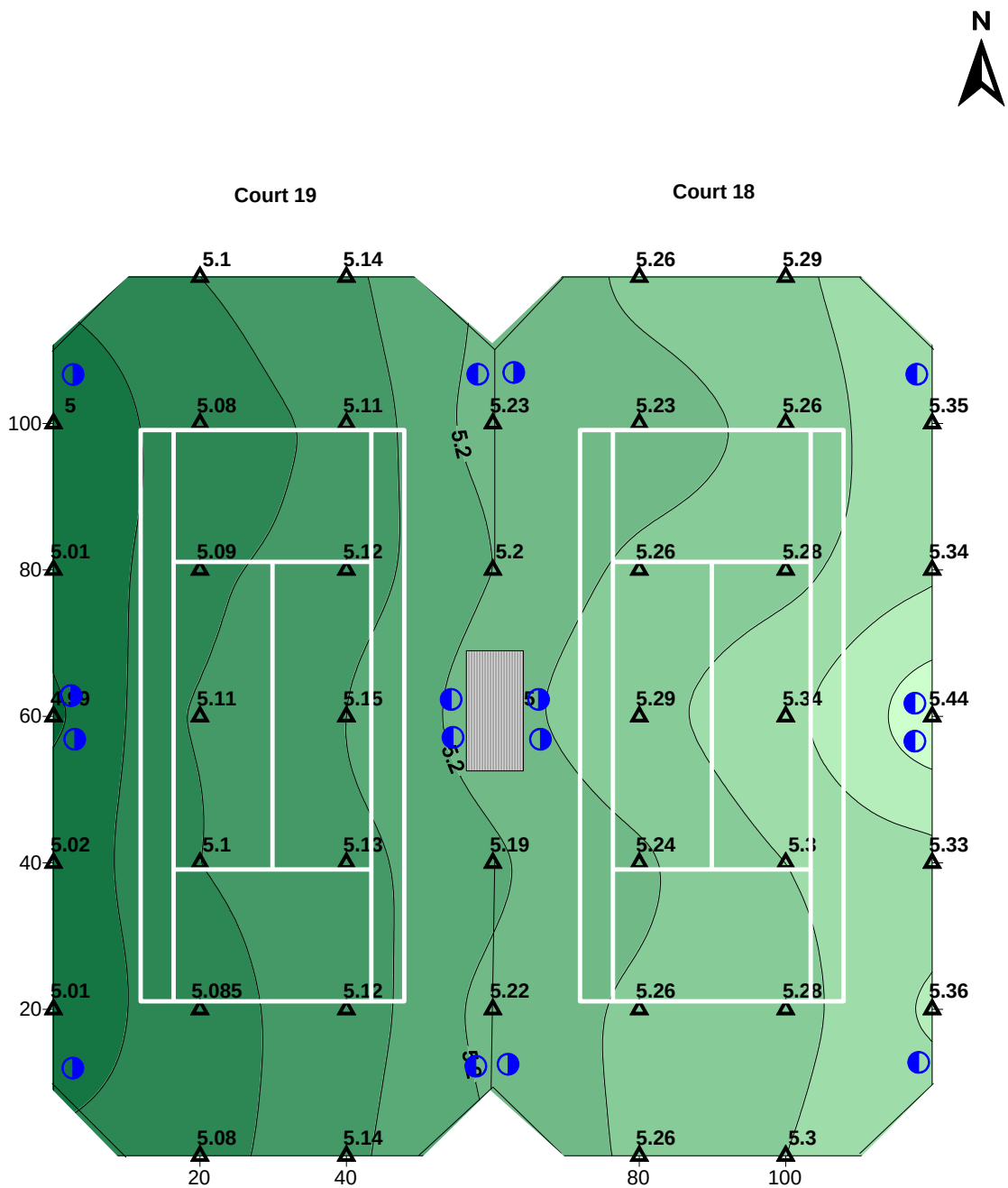
MAP 50A

Huntsville Tennis Center Har-Tru Courts 18 & 19 Surface Thickness Perspective / Desired State

120' x 120'

May 19, 2011

 Coring Locations
Desired State = 1"



MAP 51

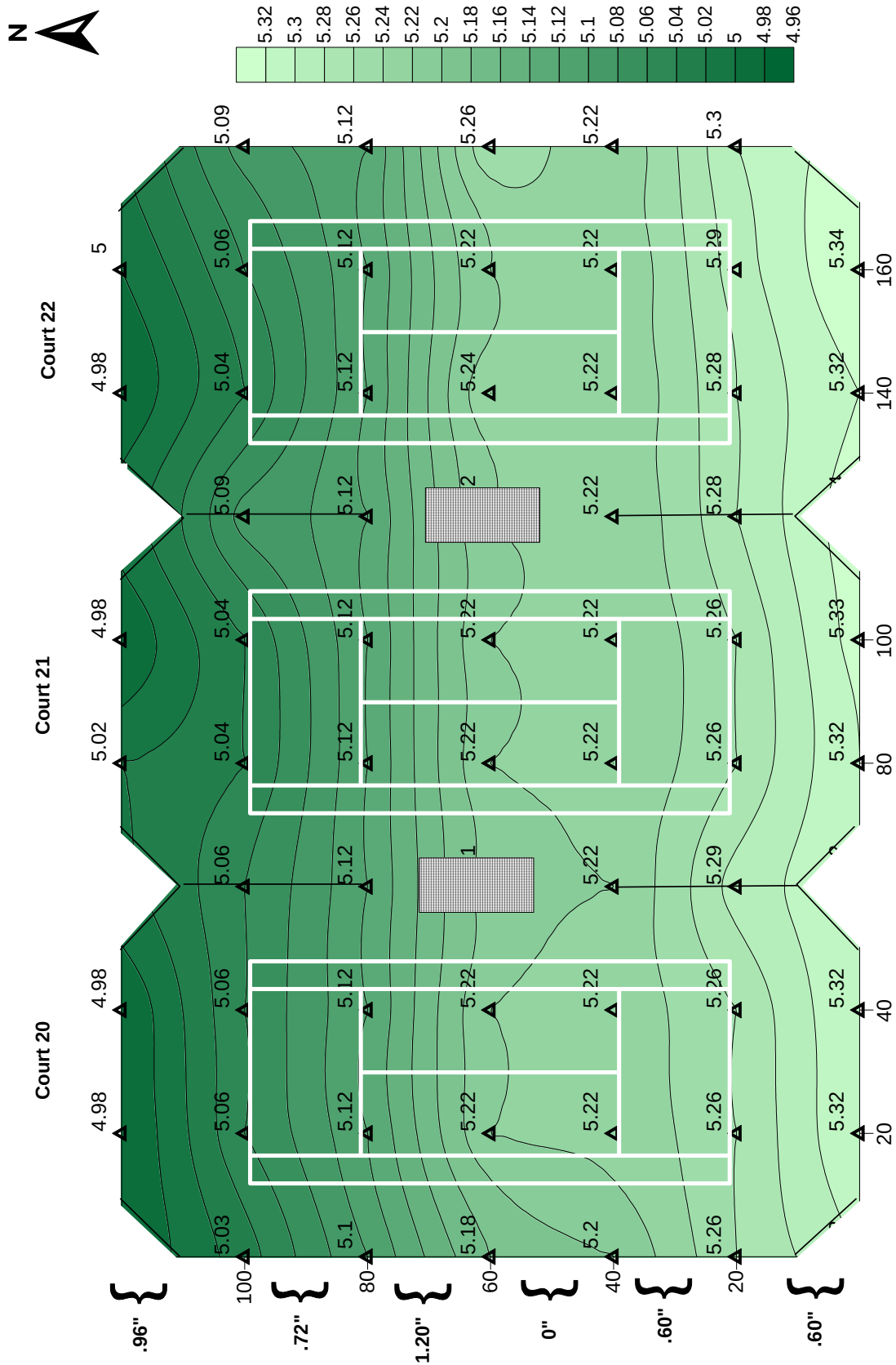
Huntsville Tennis Center Har-Tru Courts 18 & 19 Irrigation Sysem Perspective / Current State

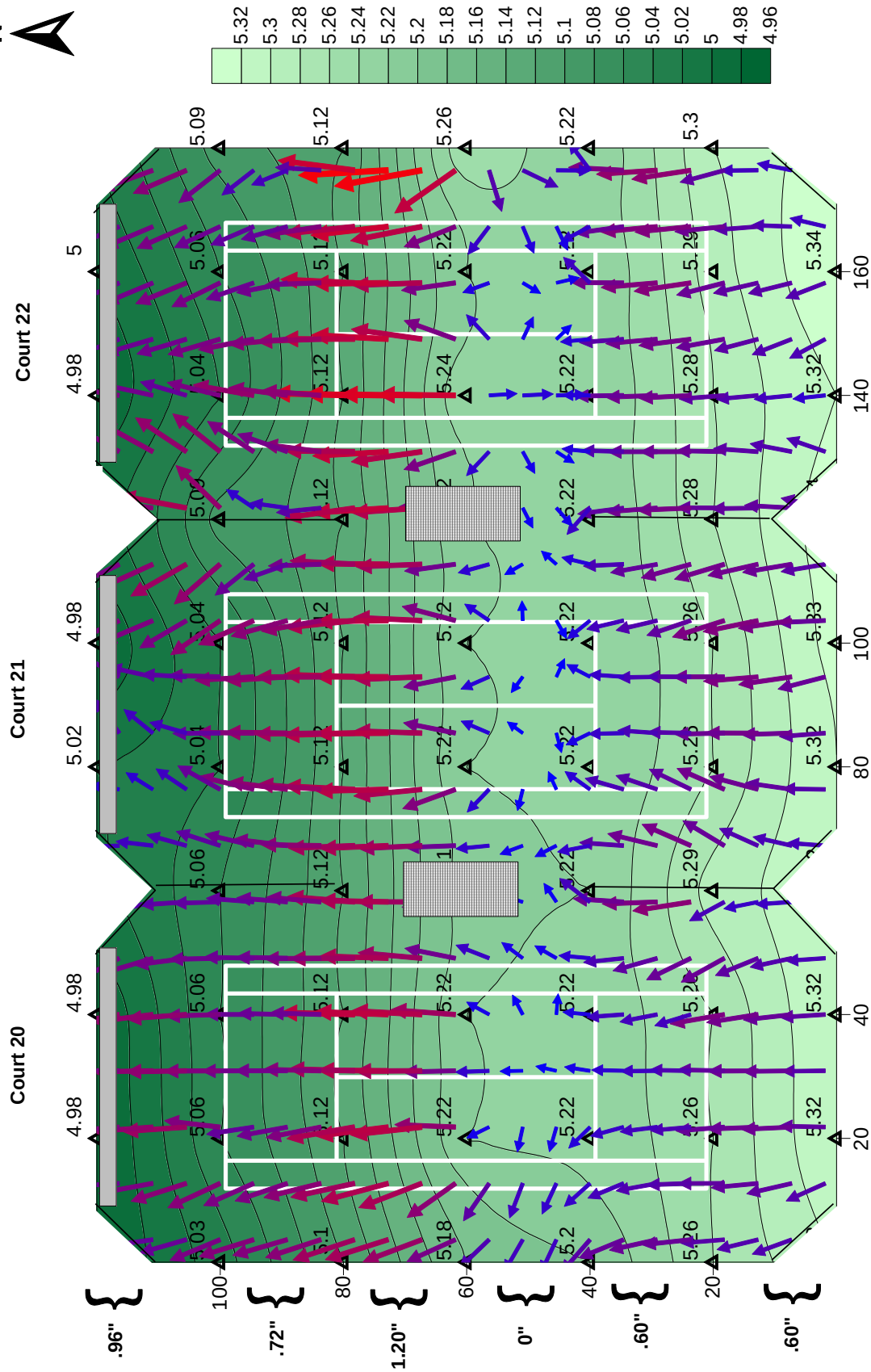
120' x 120'

May 19, 2011

 RainBird 6504
Sprinkler Head Locations

Courts 20 thru 22





Total Awvegae Slope = 4.08"
or 1" in 29.41'.
Slope: South-to-North

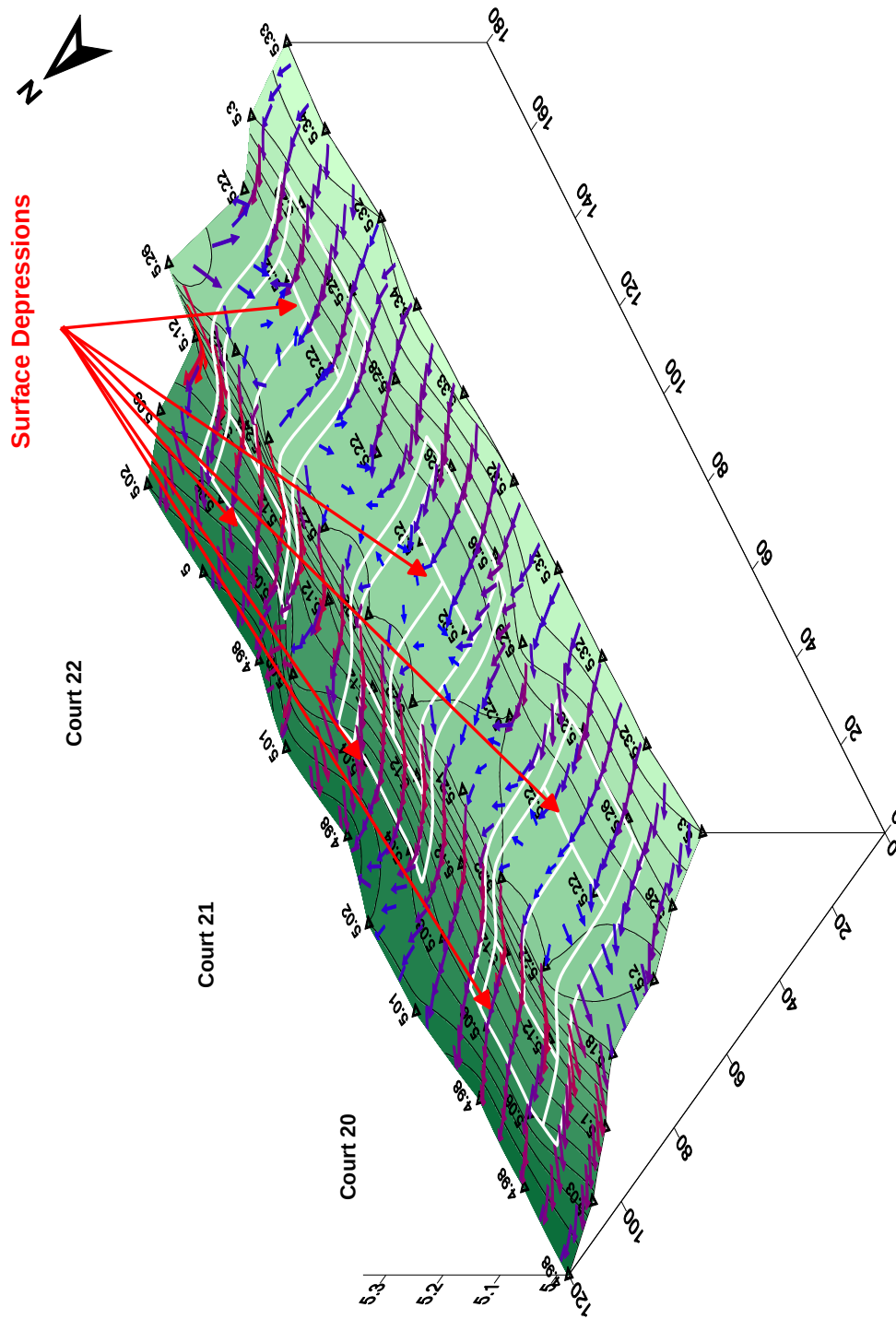
Channel Drain
↑ Direction of Water Flow

Huntsville Tennis Center Har-Tru Courts 20-22 Drainage Perspective / Current State

MAP 53

May 19, 2011

120' x 180'



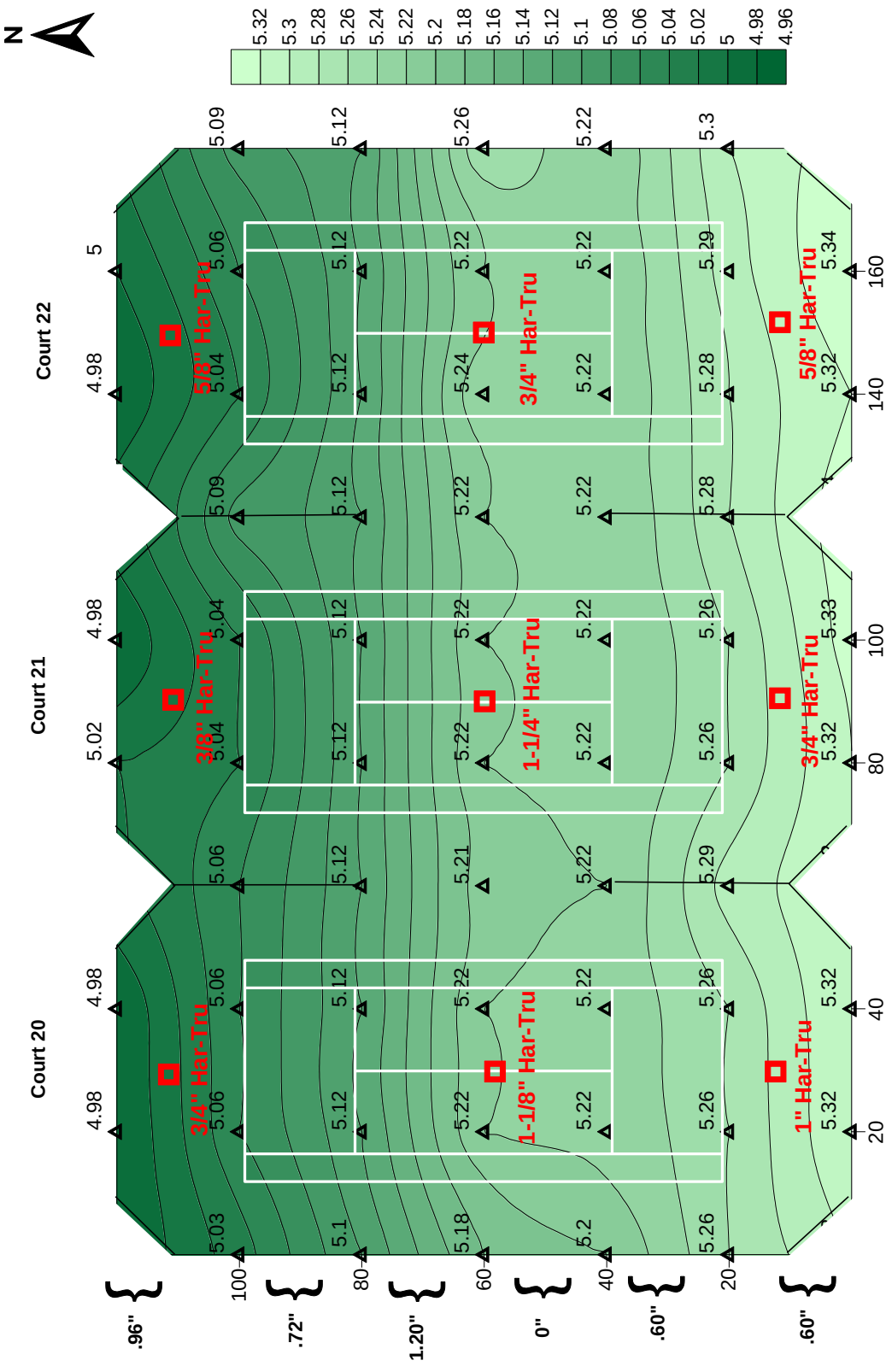
MAP 54

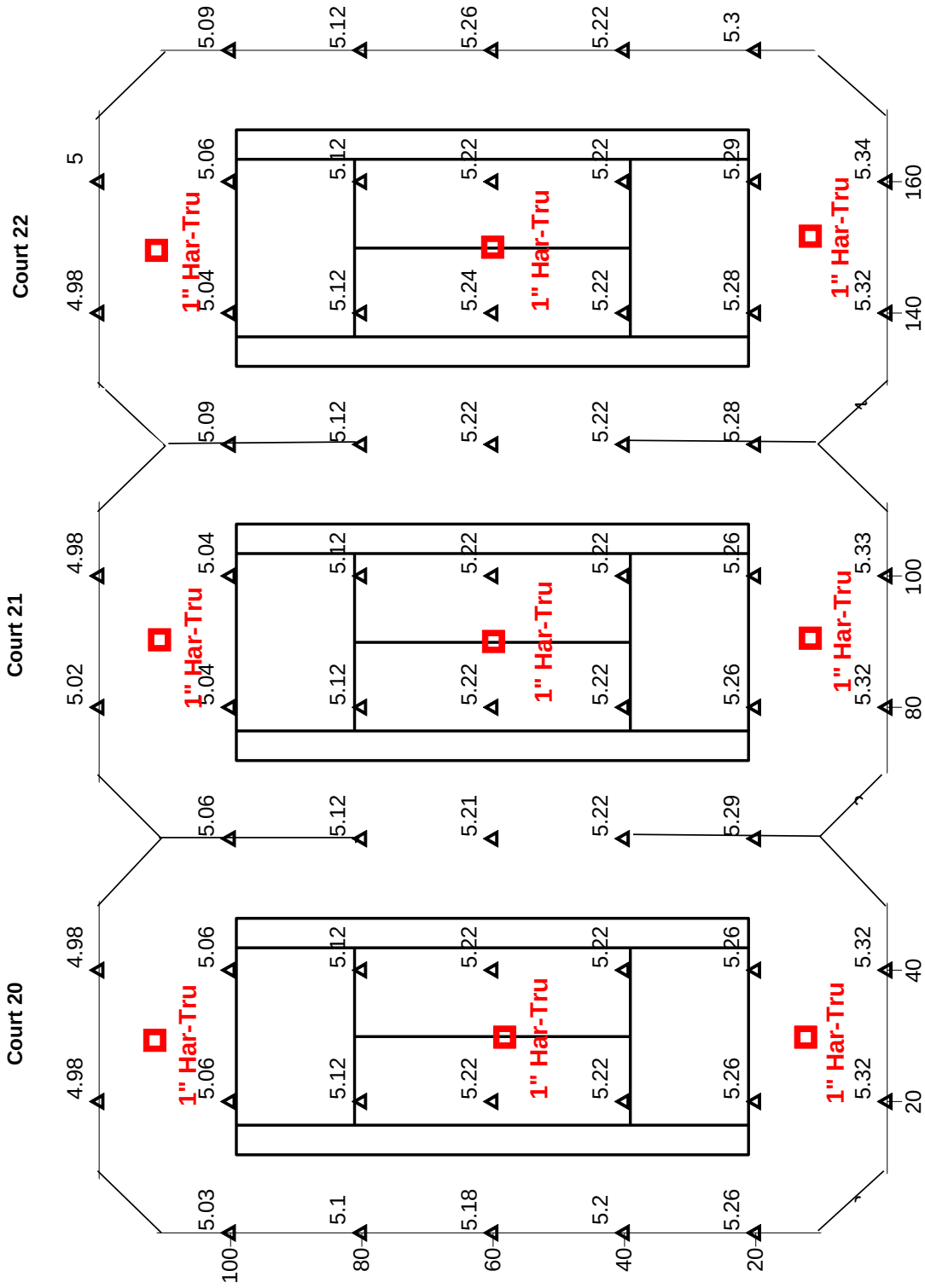
Huntsville Tennis Center Har-Tru Courts 20-22 3-Dimensional Perspective / Current State

120' x 180'

May 19, 2011

↑ Direction of Water Flow





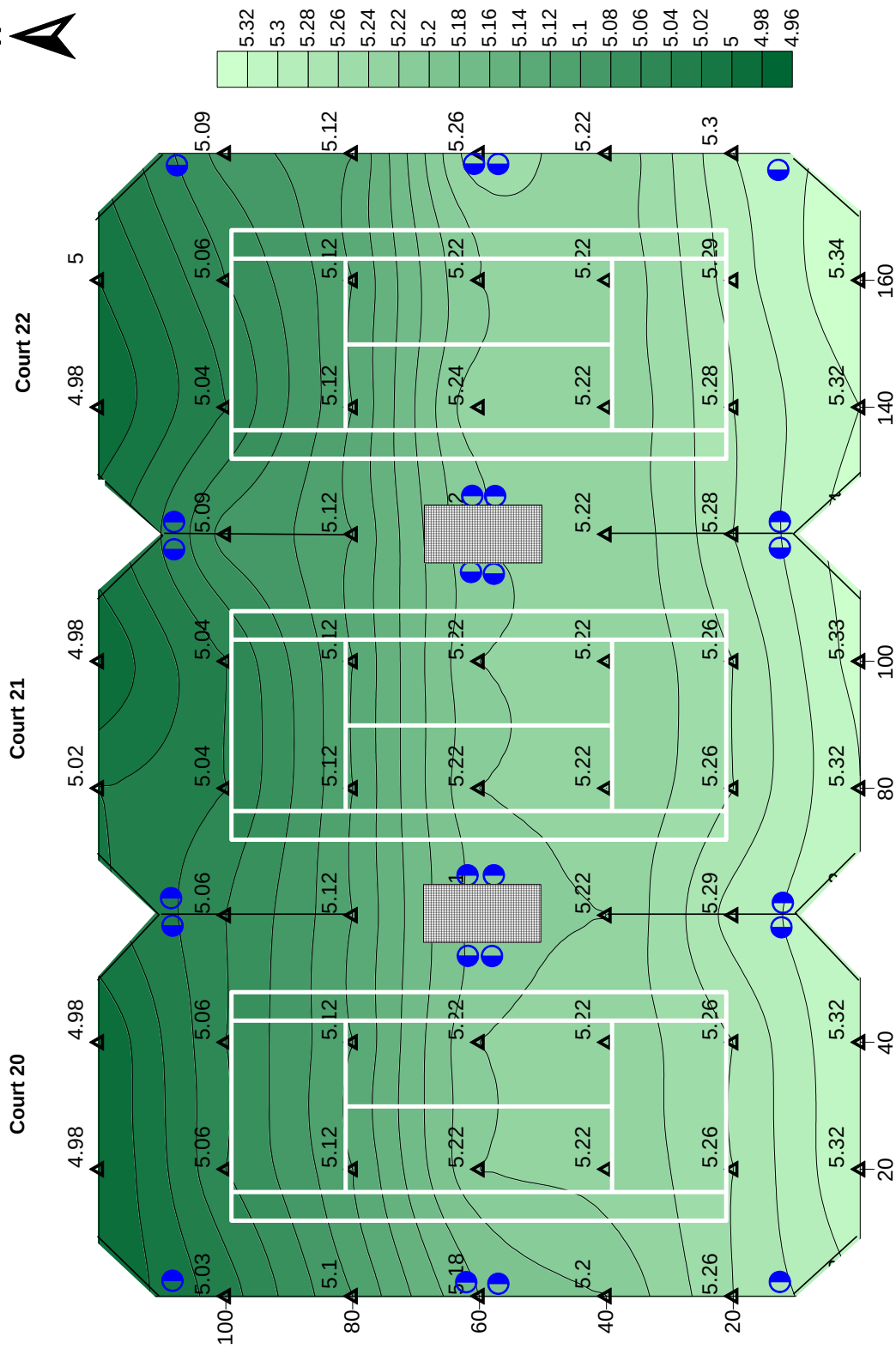
MAP 55A

Huntsville Tennis Center Har-Tru Courts 20-22 Surface Thickness Perspective / Desired State

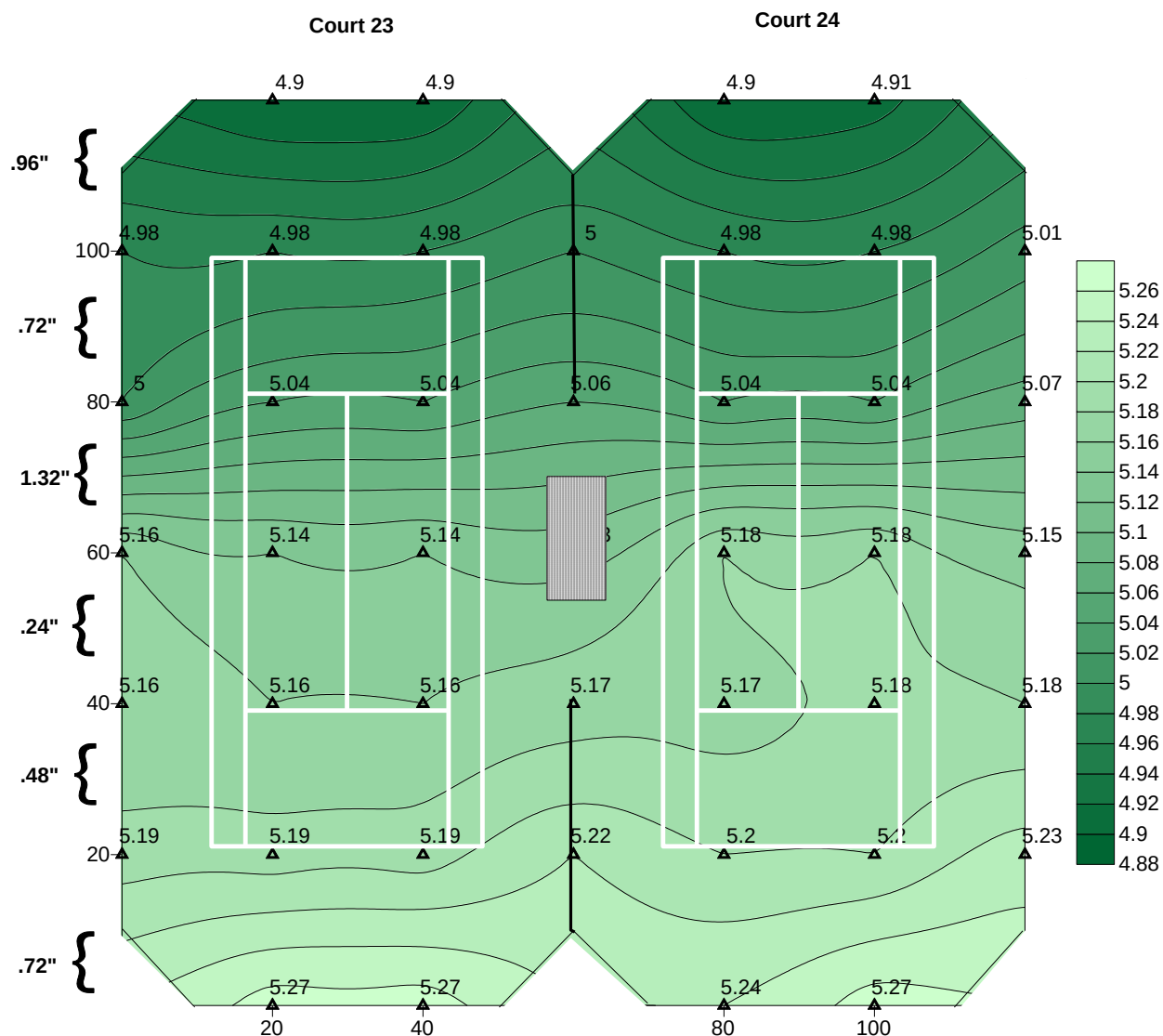
120' x 180'

May 19, 2011

■ Coring Locations
Desired State = 1"



Courts 23 & 24



Total Average Slope = 4.32"
= 1" in every 27.78'
Slope Direction: South to North

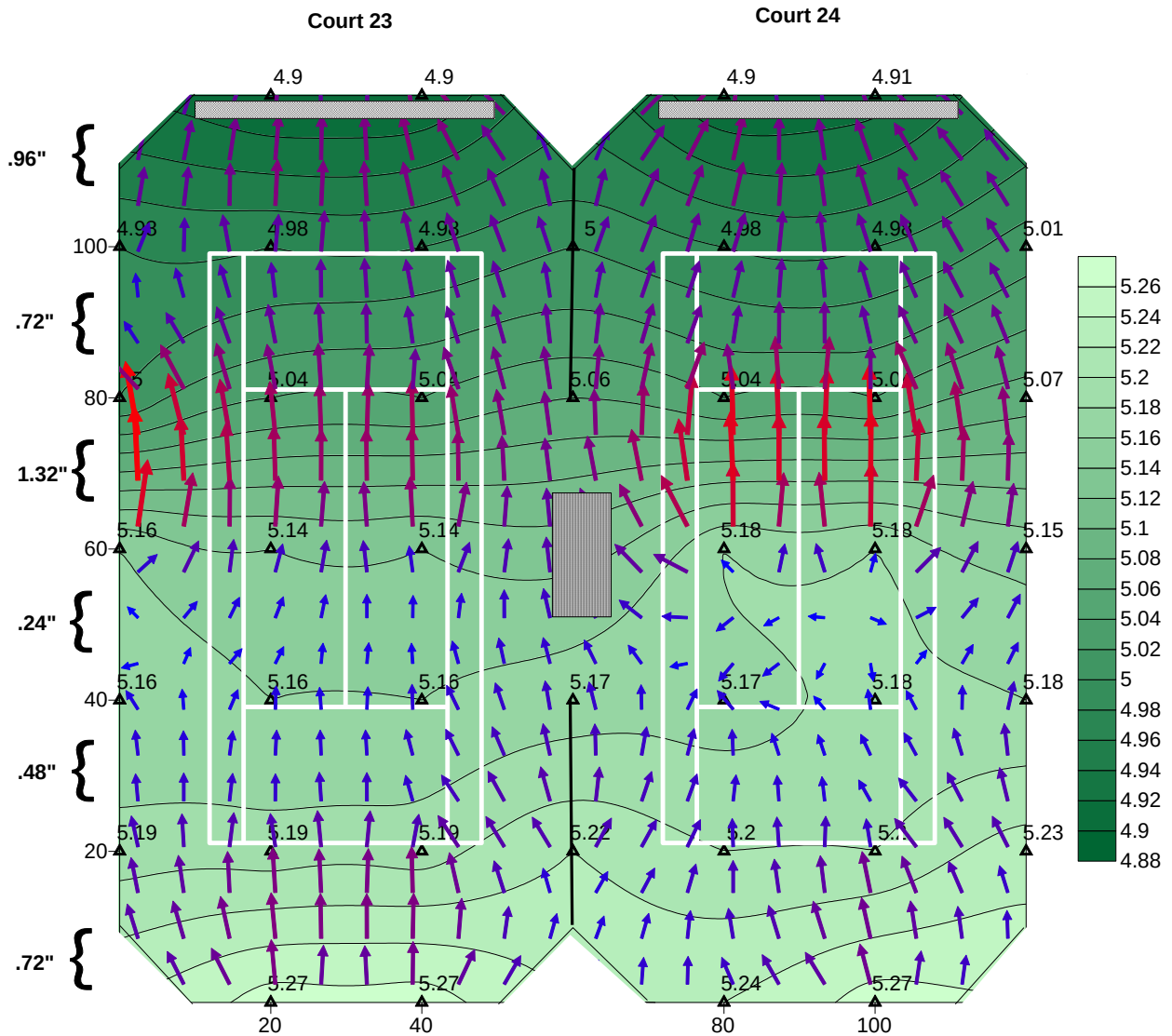
MAP 57

**Huntsville Tennis Center
Har-Tru Courts 23 & 24
Topographical Perspective / Current State**

120' x 120'

May 19, 2011

▲ Elevations in Feet



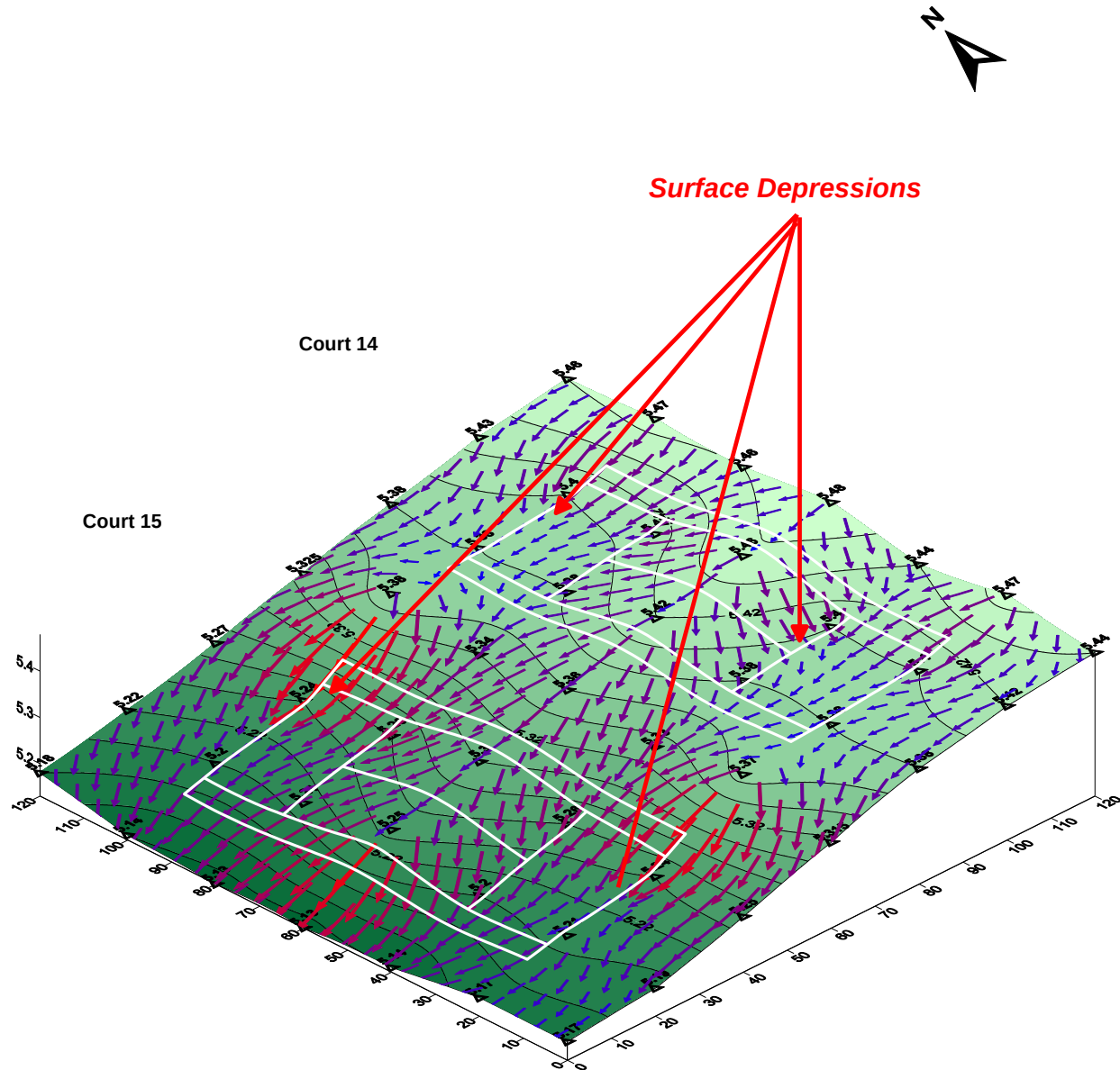
MAP 58

Huntsville Tennis Center Har-Tru Courts 23 & 24 Drainage Perspective / Current State

120' x 120'

May 19, 2011

 Channel Drain
 Direction of Water Flow



MAP 39

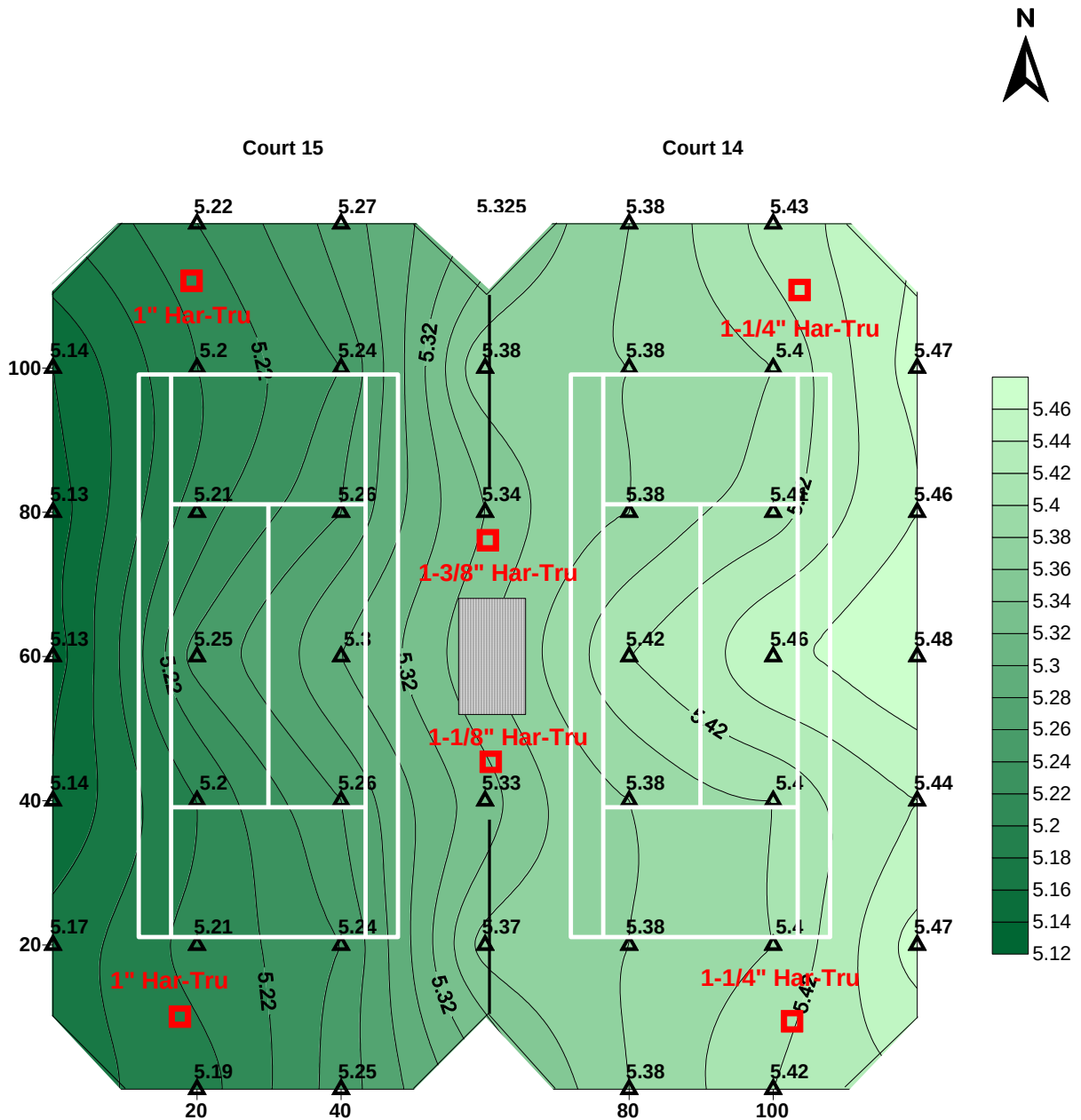
**Huntsville Tennis Center
Har-Tru Courts 14 & 15
3-Dimensional Perspective / Current State**

120' x 120'

May 19, 2011



Direction of Water Flow



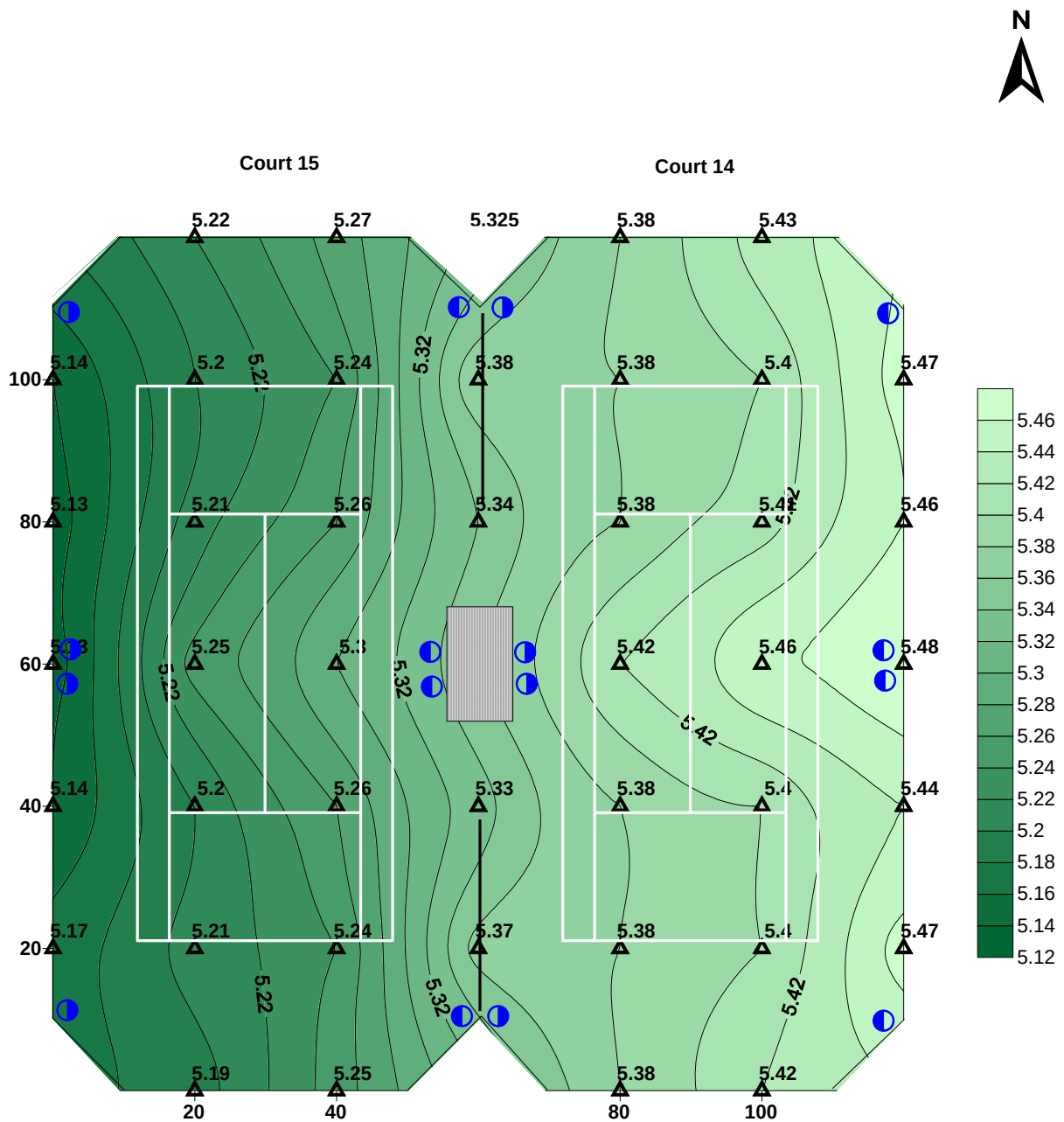
MAP 40

Huntsville Tennis Center Har-Tru Courts 14 & 15 Surface Thickness Perspective / Current State

120' x 120'

May 19, 2011

 Coring Location
Desired State = 1"



MAP 41

Huntsville Tennis Center Har-Tru Courts 14 & 15 Irrigation System Perspective / Current State

120' x 120'

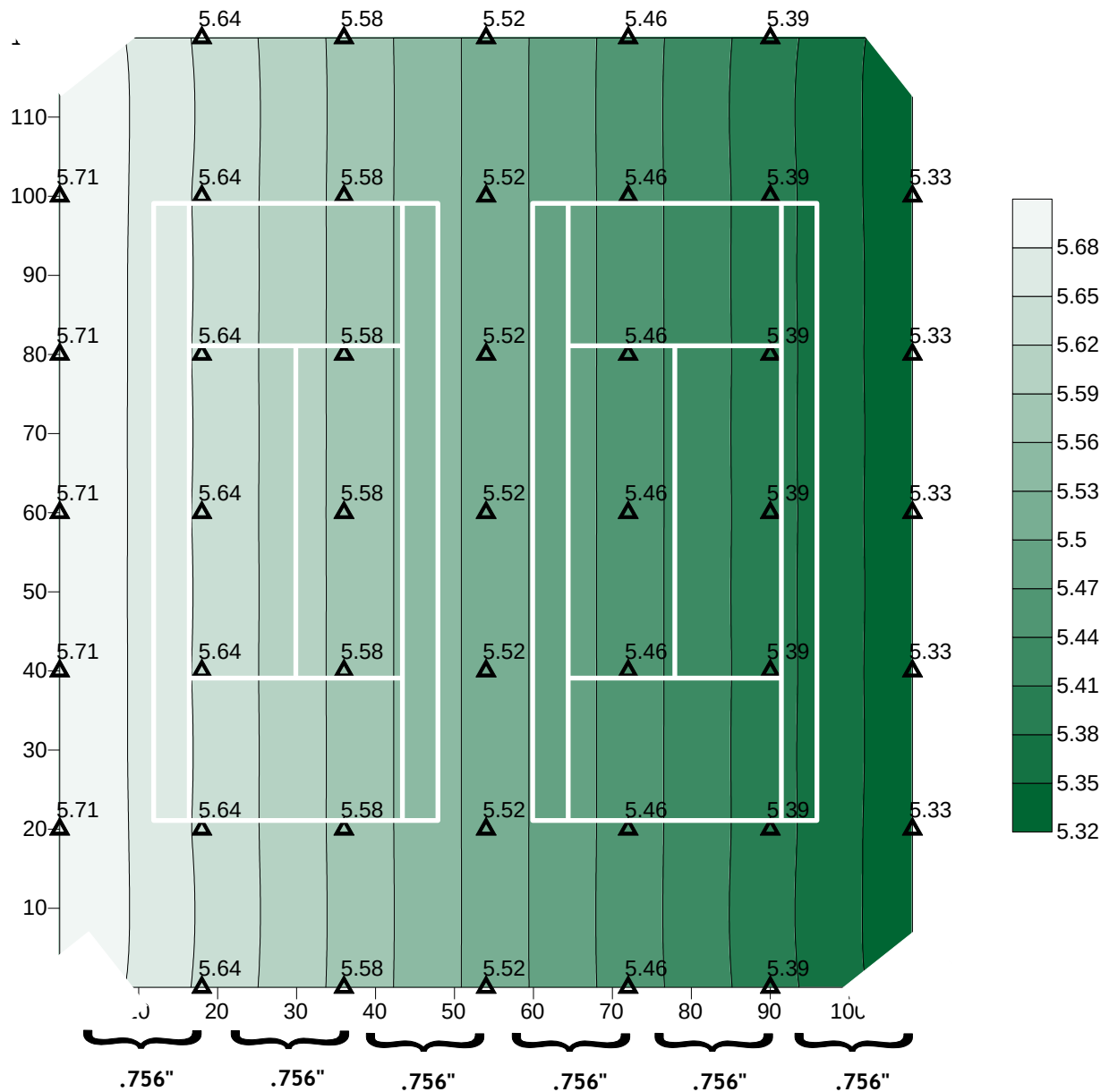
May 19, 2011

 RainBird 6504 Falcon
Sprinkler Head Locations

Topographical Maps

Desired State

Desired State Topography

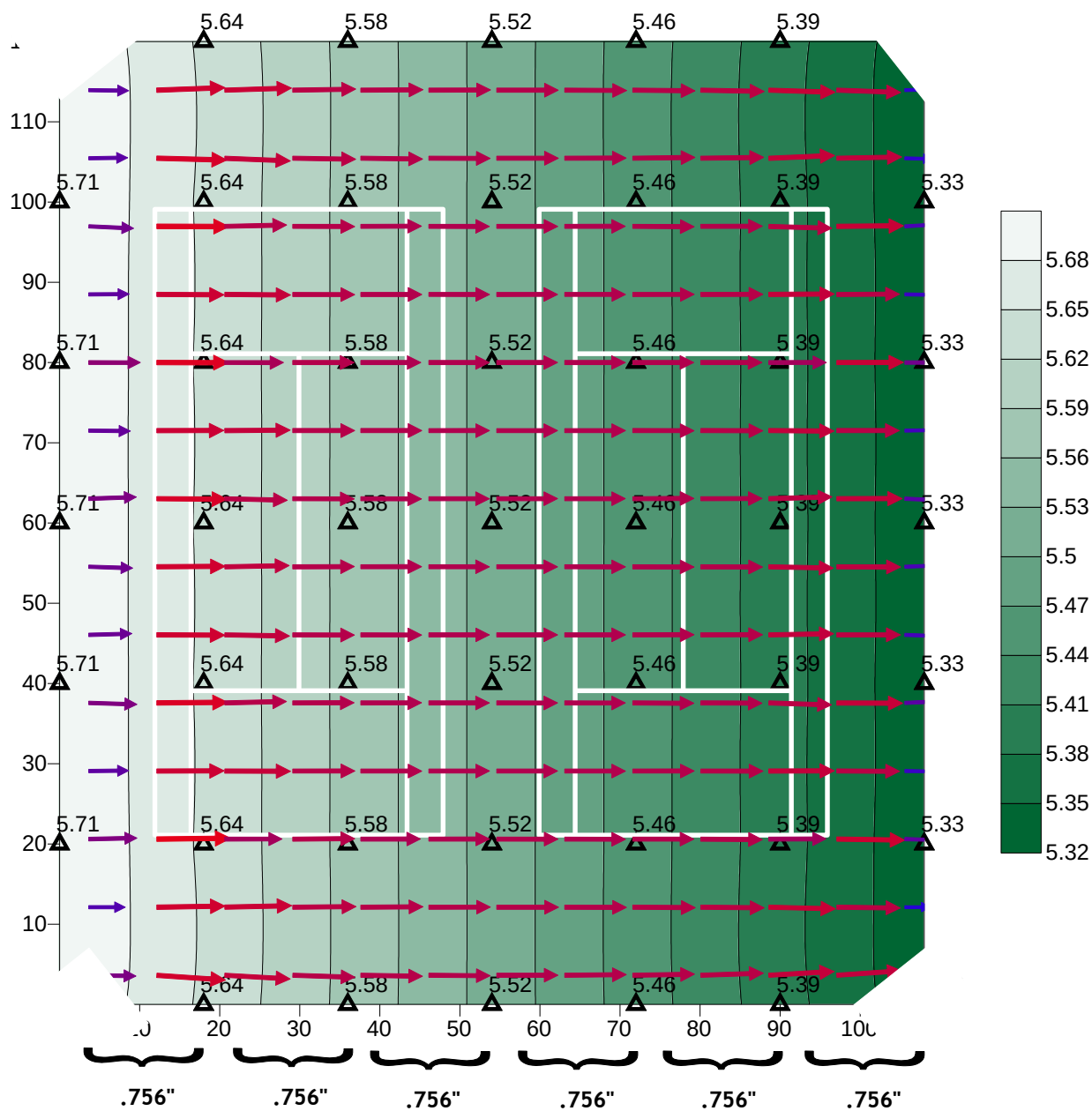


Present Slope 4.53"
= 1" in every 24'
West to East slope direction

110' x 120'

▲ Elevation in feet

Desired State DrainageTopography



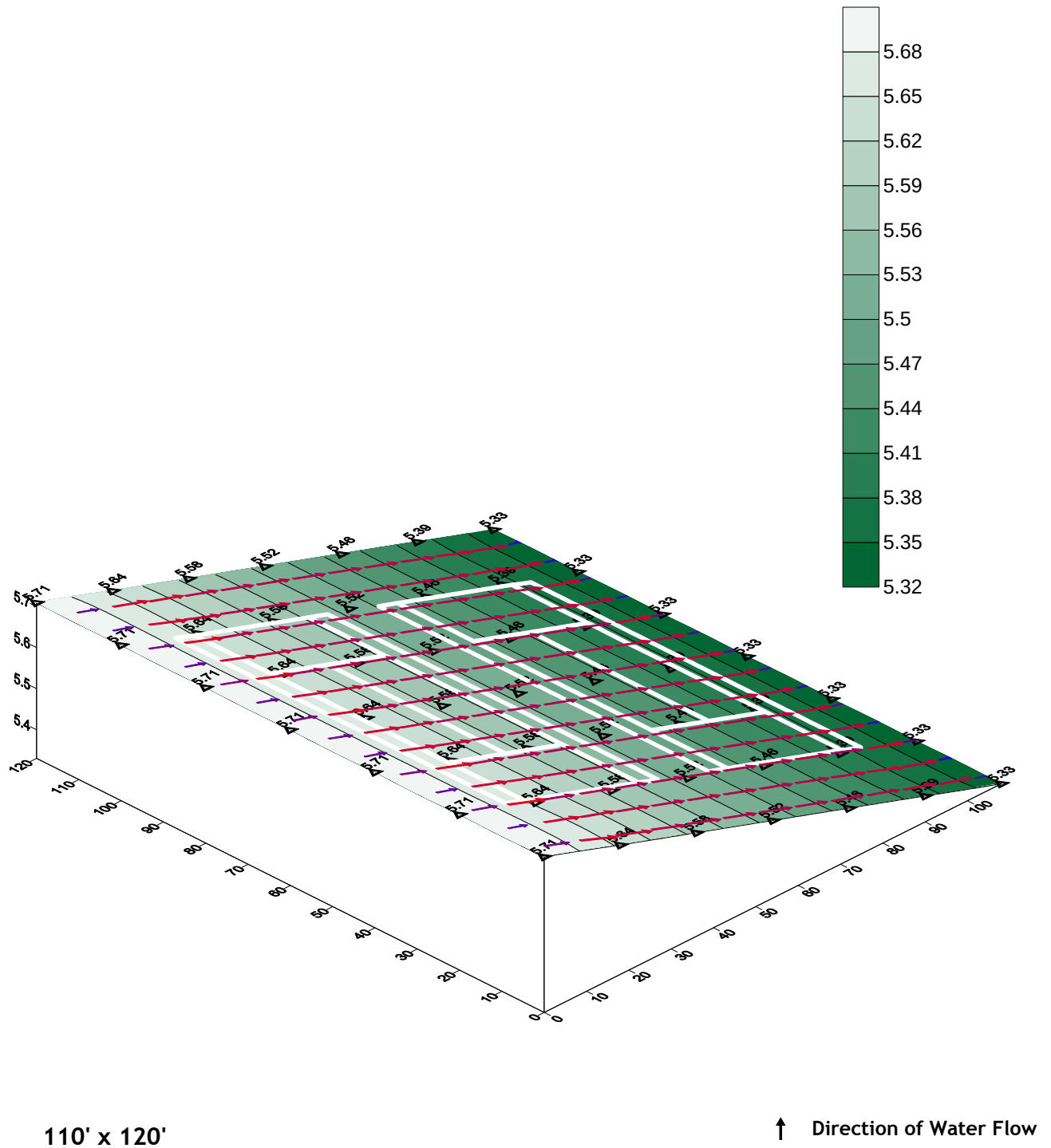
Present Slope 4.53"
= 1" in every 24'
West to East slope direction

110' x 120'

↑ Direction of Water Flow

Desired State

3-Dimensional Topography



Section VII

Court Maintenance

VII. Desired Maintenance Process-Har-Tru Tennis Courts

A. MORNING

1. Inspect Har-Tru surface for minor scuffing. If baseline areas require divot repair, lute and re-dress as necessary.
2. Remove any weed growth problems and foreign debris from the surface.
3. Inspect tapes and nails for lifting or shifting.
4. Groom surface with an Aussie Clean Sweep, Court Rake or a Drag Brush. Make wide turns with the Drag Brush to avoid accumulation of Har-Tru material. The Aussie Clean Sweep serves a dual purpose; as a smoothing/leveling tool (with teeth in the up position) and a debris remover (with teeth in the down position).
5. Sweep the line tapes. Ensure the line tape area beneath the net has been swept. Use a Line Scrub to remove surface material that adheres to the line tape.
6. Roll the surface if necessary. Make wide turns. Avoid twisting and turning motions that cause surface damage.
7. Sweep the tape lines after the surface has been rolled for a cleaner looking line (optional).
8. Ensure that the net and center strap is set correctly.
9. Clean benches, coolers, cooler stands, ect. If these items are kept on-court during the season, move them and groom the surface below on a regular basis.
10. Wash out the Tennie Two-Step on a daily basis if possible.
11. Inspect Windscreens.
12. Ensure Line Sweeper, Aussie Clean Sweep, Court Rake and Drag Brush are stored properly and do not pose a hazard to players.

B. MID-DAY

Mid-day maintenance keeps the court looking and playing as well during late afternoon as it plays in the morning. The ideal situation would be for maintenance time to be scheduled so courts could be brushed, lines swept and the surface watered properly. The moisture level in the court profile should remain adequate until the next maintenance period.

C. EVENING

Adequate brushing and thorough watering will ensure quality playing conditions the following day.

1. Brush in alternate directions, particularly around baseline areas to smooth surface prior to watering. Alternate direction of brushing on a nightly basis.
2. Water the court in a "cycling method" to accomplish a thorough watering during the course of an evening with as little run-off of water as possible. Proper timing of watering cycles is best determined by observation. The ideal situation would be for the court profile to retain adequate moisture until the next maintenance period.

1.0 PERIODIC MAINTENANCE

1. Inspect court surface material for any build-up to be removed; particularly along the net-line.
2. Inspect the court surface for weed growth. Algae control is best achieved by following these guidelines:
 - a. Agitate low traffic areas on the court periodically. Use the Court Rake, Lute/Scarifier, Steel Bristle Drag Brush, Court Devil or the Lee Tow Scarifier.
 - b. Stay on top of growth problems by regular observation and **preventive** maintenance practices such as frequent surface agitation.
 - c. **Consult** your local county agricultural cooperative extension agent prior to the purchase and application of any chemicals.
 - d. **Always** read the entire chemical label and follow any safety precautions prior to application.
3. Periodic leveling/smoothing of the court surface may be required, particularly in areas of heavy play. The best time of the day for smoothing the surface is during the afternoon when the surface is drier, just before turning on the watering cycle. Use a regular or Steel Bristle Drag Brush.
4. Periodic observation of the irrigation heads while irrigation system is running is the best preventive measure to ensure thorough and even water distribution.

2.0 END OF SEASON MAINTENANCE

1. Tennis Nets: Remove and attach a tag noting any repairs needed.
2. Windscreens: Inspect for needed repairs, label for easy relocation next season and fold neatly for storage in a plastic bag. Wait until the windscreen is dry (afternoon) before removing. Fence maintenance during the "off-season" can be accomplished much easier without the windscreens hanging on the fence.
3. Net posts: Remove and inspect for repairs.
4. Cover net postholes to prevent water, surface material and debris from entering during the off-season.
5. Remove the tapes and nails. Ensure all nails have been removed from the court surface.
6. Coolers: Wash inside and out. Repair spouts if necessary.
7. Benches: Wash, repair and paint if necessary.
8. Line Sweepers, Drag Brushes and other accessories: Wash clean, inspect for repairs and hang properly to protect the bristles.
9. Roller: Consult owner's manual for proper servicing.
10. Aussie Clean Sweep: Wash clean, inspect for repairs and hang to protect rubber matting.

3.0 END OF SEASON HAR-TRU SURFACE MAINTENANCE

1. Brush and roll repeatedly to fill in and compact old nail holes.
2. Covering court surface with a nylon reinforced plastic cover for the winter months reduces the amount of reconditioning required the following spring.

4.0 FALL SURFACE RECONDITIONING

Fall surface reconditioning is increasing in popularity because the tennis courts can be opened earlier in the spring when demand for play is strong and time available for reconditioning is short, particularly during a wet spring. The maintenance staff is under less time constraint in the fall, allowing for better quality control in providing a superior playing surface. More time is available for other important (and often postponed) spring maintenance duties around the tennis court. Fall weather patterns are more stable & predictable for reconditioning. Initial expense to purchase a tennis court cover is justified considering the life of the cover, benefits to the players and increased productivity of the maintenance staff.

5.0 WINTERIZING THE IRRIGATION SYSTEM

1. Turn off main water supply.
2. Ensure manual valves at base of sprinkler heads are open.
3. With an air compressor, blow out the irrigation lines by activating each zone separately for approximately 5 minutes, do not exceed 60 psi. Open each zone valve box cover and inspect valves for any needed repairs while the system is being blown out.
4. Repeat step 3 until all water has been blown through the system.
5. Remove any debris from inside the valve boxes.
6. Replace valve box lids.
7. Note any repairs or improvements needed for the system before the next season

6.0 CONTINUING EDUCATION

Several educational aids are available for staff training; the General Maintenance Outline for Har-Tru Tennis Courts, the Maintenance Video, the maintenance DVD and other resources. Visit our web-site at www.hartru.com for additional information. These products are ideal for keeping your staff informed, on a regular basis about the most efficient methods of Har-Tru tennis court maintenance.

Note: A copy of the Har-Tru Maintenance Manual is included with your report for your review.



Did you know, there is continuing health issues with Water Coolers located on Tennis Courts? They can harbor germs and bacteria which can contaminate water and cooler spouts.



Did you know, facilities are experiencing some puzzling issues with Windscreen? Holes are appearing without reason or so it seems! Leaf blowers are being used around the courts to blow leaves and debris. When the exhaust from the blowers get too close to the windscreen, it melts a hole almost instantly.



Did you know, brushing your courts excessively can dry them out?



Did you know, When algae problems occur on your clay courts, you can spread the contamination by not discarding the contaminate surface? Spreading the contaminated surface just spreads the problem!



Section VIII

ASBA Specifications Reconditioning Clay Courts

Section II.N. - Reconditioning Fast Dry Tennis Courts

1.0 Definition

Fast dry is a porous tennis court surface material consisting of natural crushed stone, brick, or tile, that is ground, screened, well graded, and may or may not be mixed with a chemical binder to form a stable homogeneous mixture having an affinity for water.

2.0 Introduction

Periodic reconditioning is important to both the performance and life of a fast dry tennis court. Proper maintenance, both daily and yearly, will maintain a tennis court in good playing condition and extend the useful life of the court.

Reconditioning is the seasonal replacement of surfacing material lost due to play, wind and water erosion.

3.0 General Requirements

An annual application of approximately 5 lbs./sq. yd. (2.8 kilos/sq. m.) of fast dry surface material should be applied, depending on type of irrigation system, intensity of play, and local climatic conditions. 5 lbs./sq. yd. (2.8 kilos/sq. m.) represents 2 tons (1814.4 kilos) per court.

4.0 Procedure

A. Preparation

In preparation for reconditioning, the fast dry court should be cleaned of debris, groomed by brushing, and then rolled. The rolling insures the bonding of all usable material. After rolling, the excess loose ("dead") granules should be gathered into piles and removed from the court. Extra care should be exercised not to remove more material than necessary. If blowers are used, caution should be exercised so as not to remove usable surface material.

The loose ("dead") granules may be used at a later time as top dressing material on bald, slick and wet areas and on subsurface irrigated fast dry courts.

B. Location of Depressions

Depressions are generally located in the base line and in the service court areas. Exact locations may be determined by circling areas retaining water after a rain, as well as by stretching a string line in several directions and marking low areas.

C. Correction of Minor Depressions

The correction of a depression may necessitate the removal of portions of the line tapes.

Ideally, the court should be relatively dry before applying new surfacing.

The depression should be scarified to a depth of 1/8" (3mm) to 1/4" (6mm) and filled with new fast dry surface material. The new surface material should be spread and compacted in a dry state, then leveled to surface grade with a straightedge, scraping off any excess materials. The area should be watered to its full depth and compacted. After watering, light play may resume.

Occasionally, the new surface material may have a tendency to shift and adhere to the roller. In cases where shifting persists, the area should be cut out to a depth of 1" (25 mm) below the grade and filled with new fast dry surface material. The new surface material should be compacted by hand and leveled. After watering and rolling, play may resume when the patch is firm. After play, additional maintenance may be required to these repaired areas for several days.

D. Correction of Major Depressions

In the event that a depression is too broad for a straightedge, a "screed strip" should be placed in the center of the depression with the top edge set at surface grade. This strip should be set with an instrument or by stretching a string line to points at proper surface grade outside the depression.

In leveling the newly applied fast dry surface material, one end of a straightedge should rest on the screed strip with the other end on the court area outside the depression. The screed strip acts as a guide for leveling each half of the depression. After the surface material is installed, the screed strip is removed and the remaining void patched with surface material.

For correction of major depressions, it is advisable to contact a qualified tennis court contractor or surface manufacturer.

E. Correction of High Spots in the Aggregate Base

In areas where the base is high, to the extent that aggregate is exposed in localized areas, the surface and aggregate should be removed to 1" (25 mm) below surface grade and filled with new fast dry surface material. After the surface material is compacted and leveled, the area should be watered and rolled. Play may resume when the patch is firm.

F. Top Dressing

After the loose "dead" material has been removed and the depressions filled and compacted, appropriate top dressing material should be applied. Above ground irrigated courts and subsurface irrigated courts may require different top dressing materials. It may be advisable to contact a qualified tennis court contractor or surface manufacturer to determine the appropriate material. A fertilizer-type spreader may be used to apply the top dressing material in several directions, brushing afterwards. If a spreader is not available, the fast dry top-

dressing material should be applied by spacing the bags evenly and spreading the material as uniformly as possible. The newly applied surfacing should then be brushed in several directions to insure a uniform distribution of the material. The top-dressing material should be hand-watered with a fine spray and rolled. All line tapes which have been removed should be reinstalled.

It may be necessary to brush, water and roll successively over several days to insure a bonding of the top-dressing to the existing fast dry surface before resuming play.

The same procedure should be repeated if additional applications are required.

Subsurface irrigated courts may require special procedures.

5.0 Courts Requiring Additional Conditioning

Courts which are badly worn may necessitate the use of more than the normal 5 lb./sq. yd (2.8 kilos/sq. m.) (2 tons). The additional fast dry should be applied according to the procedure above in applications not to exceed 5 lb/sq yd (2.8 kilos/sq. m.). It is not recommended that more than 10 lbs/sq yd (5.7 kilos/sq. m.) (4 tons) be used as a top dressing. Courts worn to a greater extent should be resurfaced with no less than 80 lbs/sq yd (45.6 kilos/sq. m.) (32 tons) using screed strips and a proper straightedge or laser controlled techniques as discussed in Section 6.0.

For courts requiring extra conditioning, it may be advisable to contact an experienced contractor or manufacturer.

6.0 Laser Controlled Resurfacing

Fast dry courts that have lost their original slope and planarity may be regraded using laser controlled equipment, returning the court's proper slope and planarity. Prior to determining the amount of new fast dry surfacing required, the court or courts should be surveyed on a 20' grid, recording the surface elevations and the depth of surface material. After regrading, a minimum of 1" of compacted fast dry surface should be maintained throughout.

Again for courts requiring this type of resurfacing, a qualified tennis court contractor and/or surface manufacturer should be consulted.

Note: Refer to Guidelines for:

[I.A. General Conditions for Construction](#)

[II.A. Tennis Court Orientation](#)

[II.B. Tennis Court Dimensions and Related Measurements](#)

[II.D.1. Fast Dry Tennis Courts for Use with Above Surface Irrigation](#)

[II.D.2. Fast Dry Tennis Courts for Use with Subsurface Irrigation](#)

[II.F.1. Above Surface Irrigation Systems for Clay and Fast Dry Tennis Courts](#)

[II.F.2. Retrofit Subsurface Irrigation Systems for Fast Dry Tennis Courts](#)

Notice

These Construction Guidelines are intended for use by architects, engineers, contractors, tennis court and running track owners. Parties not experienced in tennis court or running track construction are advised to consult a qualified contractor, consultant and/or design professional. Experienced contractors, consultants and/or design professionals can be identified through the American Sports Builders Association. Due to changing construction technology and techniques, only the most recent version of these Guidelines should be used. Variances in climate, soil conditions, topography and other factors may make these Guidelines unsuitable for certain projects.

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We would like to express our gratitude for allowing us to come to your facility and perform this CAS (Court Analysis Survey). It is very important to us that customers using our products are completely satisfied. We at Har-Tru Sports realize the importance of providing to your facility top of the line service not only helping our customers but in the end helping your customers.

This Court Analysis Survey is designed to provide Clubs and other facilities a professional review of the present state of their tennis courts. Once the physical evaluation is performed, this report is generated to be used as a guide to help correct any problems found. Once the report is complete, a copy is sent to the club for their records. If requested, Har-Tru Sports would also send a copy of this report to a contractor when major issues require outsourced work.

We would be more than happy to discuss the findings in this report as well as options for renovation and construction. If you have any questions concerning Har-Tru tennis court construction, maintenance, or equipment, please do not hesitate to contact me at 1-877-4HARTRU or email us at rhey@hartru.com or emontecalvo@hartru.com

Our Vision

"Developing Champions Around the World"