



&gt;&gt; Miami's Marlins Park.



&gt;&gt; ROOF POSITION to protect the press box until All-Star break.



&gt;&gt; WINTER SHADE line with lights out in use soccer mode.

## First-year turf review: Marlins Park in Miami

*Editor's note: We asked Chad Mulholland, the director of grounds for the Miami Marlins' new stadium that opened last spring, how his first year went working with the turf in the retractable roof park. Here is his response.*

**A**S WITH ALL RETRACTABLE ROOF STADIUMS we have had our share of good and bad surprises. You have expectations going in and then you realize it's not what you thought it would be like for some situations but it's better for others.

The Celebration bermudagrass was chosen before I was hired. Alan Sigwardt and his crew had some test plots they had used at Sun Life Stadium (in Miami); I believe they had a few different Bermuda varieties as well as a paspalum plot. Over the course of the summer the Celebration out-performed or was close to the best performer of the tested varieties. Being in Florida I think the comfort level of using Celebration was an easy decision. Jordan Treadway, who manages our spring training site in Jupiter, FL uses Celebration and it is in amazing shape year round. We had some moderate success with our Celebration but ran into some unknowns as well as some predictable issues.

The number one problem was natural sunlight. We either had zero or sometimes up to 3 hours per day depending on the area of the field and the time of year. The other big issue that I think affected us was the constant temperature change inside the building. We would go from an air temperature of 115-120 F in July to a temp of 68-72 F by the end of night games. Then we would open back up and it would be in the mid 90s all night. I have never seen a study of constant air temperature changes but I don't think it's healthy for a plant.

Areas where we had ample sunlight such as the center of our outfield I thought the grass performed well after we established a nutrient

base and put some organics into the soil. We are 100% sand and it took a while to keep our nutrients in our rootzone. I believe our sand has some sustainable nutrient base now and we should be better in the upcoming season.

Another issue that was unforeseen was our sod layer. We received some great-looking sod for the install and it was grown on sand, but it was a completely different composition from our rootzone. The sand was approved and appeared compatible, and it was until you added constant shade. The sand the sod was grown on had about 70% fine sands in it; our rootzone had around 17%. Where we had sufficient sun it was not a problem but where we had permanent or a majority of shade it stayed moist and wouldn't shoot any roots.

In those spots the Bermuda thinned out and tried to grow vertically. So we had to resod a significant amount before Opening Day and again in late May. By late May the sun is rising in a different spot and we had sunlight in right field. However, we have a carport type roof in left that blocks sun in left during the summer so our shade issue shifted from right to left. They have a huge window in left that retracts to let in sunlight so we get some early morning sunlight but it is minimal and it shifts quickly as the sun rises. We don't get completely out of shade in left field until about 1:30. We would close the roof about 4-4:30 if weather permitted so on a good game day we received around 3-4 hours of sunlight in left field.

### ROOF CLOSED MORE THAN ANTICIPATED

The roof was closed a lot more than initially anticipated and we never had full control

of the roof until around the All Star break. It was tested at different speeds and adjusted and re-adjusted and re-tested etc. It was a constant pain in our grow-in schedule. So even though it was 90 degrees outside and bright and sunny, we had the roof closed some days to test air conditioning, fix small roof leaks and seals, and to test the roof itself. The roof shuts in about 13 minutes but it isn't that easy; someone has to physically walk the tracks the roof rides on before any buttons are pushed. The whole process from the time I call for a closure until it's actually closed is usually about 30 minutes.

With our being in South Florida and that constant threat of rain, we have a tarp and it saved us a few times during the year. We have tried to use the roof to the best of our advantage. We have five different positions we refer to when closing or partially setting the roof. Even after commissioning we had other small issues to hammer out before we were comfortable with leaving the roof completely open on rain days when the team was on the road. We never installed windows on the press box and we kept the roof about 1/3 of the way closed for any rain threat until early July. If we left it open the press box would get flooded and it leaked to the luxury boxes underneath them. So the entire 1st base side of the skirts never got rain until July and it also robbed us of about 2-3 hours of sun a day as well basically the shade line ran from over top of the pitcher's mound when it was closed in that position.

Another thing we never anticipated was we could use the roof as a tarp if we had a threat of rain overnight we would close the roof till it

covered our dirt and leave centerfield and left field open to receive rainwater. With the threat of rain almost every night we saw it was beneficial to us by not having to tarp every night; our disease suppression was kept to a minimum and it helped on labor by not needing extra staff in early to yank off the tarp.

### WORKING THE SHADE AREAS

Some of the things we did to keep some of the areas playable were reducing our water in the shaded areas as well as treating them with specific product. We had trouble with rooting in the heavily shaded areas and had to be careful with any aeration so we relied heavily on spike aerating in those spots. If I had it to do all over again we would have overseeded to alleviate the appearance of the Bermuda in the shade as it thinned quickly.

We tried a few products that were meant to emulate sunshine or at least supply protein that sunshine would let the plant produce if it had sunshine. I am reserved on my opinion on them because I don't think they made a difference since we had no sunshine at all. But when we had any sunshine even in small amounts we did notice improved turf conditions. We tried to aerate as much as we could to rid the sod layer of the sand that came in with it and we had a pretty good stand of grass and started to see good rooting once the roof was under our control.

It really turned out to be a blessing that the roof was shut as much as it was in the early part of the year because management saw what a difference the roof made in quality of turf. Since this is our first winter in the building we are not real sure what we can do to improve the situation we are in. We will learn more as the winter time goes on.

When I took this position I knew we were an all-season venue. We have certainly lived up to that in our first season and we are still learning our stadium and what will and will not work and the changes we need to make. It leaves us with very little time for repair or rest. It isn't uncommon to have a dinner event followed up by a sporting event on back to back days or in the same week. What really hurts is that whether we have inclement weather or ideal weather the roof is often shut to accommodate our guests.

Our best tool for repair has become sodding. It isn't our first choice but due to no sunlight at all it is our best tool to guarantee a safe and playable field in our south end. We have tried to customize our maintenance schedule

as much as possible to accommodate for the shade but it's just impossible to grow grass without sunlight. We have altered our watering, our feeding and our agronomic practices but still have the same problem shade.

### GOING TO PASPALUM IN 2013

We will be changing grass variety and sod producer this coming up season in combination with a more suitable sand profile so we hope that eliminates some of our issues. We will have Platinum TE paspalum on our infield and sidelines and 419 Bermuda in our outfield. In 2014 we will be converted over to all Platinum TE. Dan Bergstrom of the Houston Astros made the switch a few years back and after consulting with him over the past 9 months we feel it is our best way to move forward. Houston's environment is probably the closest to Miami's of all the retractable roof stadiums.

The one thing I have learned is that even though we have retractable roofs we all have different problems due to weather or positioning of our stadiums. I have an even deeper respect for the guys who have been dealing with the roofs for years. In my mind I thought we would be fine due to our air temperature and our soil temperatures but I couldn't have been more wrong; the amount of light is everything.

Our infield material comes from Natural Sand in Pennsylvania. Grant McKnight has been a huge resource not only for his infield mix but his knowledge of soil gradations in general. We made the mistake of not getting the proper compaction for our exhibition games, and Grant came down the next day to help us with our problem. I had worked with the Natural Sand product in the past but never had to use the same compaction method as we did here. Once we had our ideal compaction it performed as expected. We just had to be careful of our watering schedule and the roof closures. If we have a 1 pm Sunday game and we close the roof at 10:30 am we have to have our base saturation already completed and the infield nailed up while we have sunlight.

If we don't get crusting with the nailed up material because we wait too long, the roof traps the moisture and it slows down the drying of the loose material. By closing the roof 10-15 minutes early it has cost us 2 hours of preparation time during the season. So we really have to be in constant communication with our front office. We will not make any changes to the dirt this year other than we now have expectations of how it will perform with the roof open or closed and our time table of when to

do certain maintenance practices. We really like our infield mix and have no intention of changing it. The only thing we might change is the color or the sizing of our conditioner.

We did not overseed the turf in 2012; it came from our sod supplier unseeded and very green. It looked fantastic. It only started to change colors when it got limited sunlight and consistent air temp changes from some of the AC testing. This year we will overseed but nothing too heavy. It adds to the visual appeal for our fans and management and also buys us some time with the shade issues. We know once we get sunlight our Bermuda will survive. So our thinking is we can keep the turf's appearance with the grow lights and delay the Bermuda decline somewhat in check with the lights as well. Once summer gets here we will just move the lights to left field and concentrate on the shaded areas affected by the sun's summer position. We think if push came to shove we could probably keep some ryegrass in the turf year round with the roof being closed as much as it is. We would just have to be very alert with the fungicide applications when the team is on the road and the roof is opened as much as possible.

We got mixed reaction from the players; some of them were curious on the decline of the conditions because they are not around during road trips and they assumed the roof is always open or unaware of events held on the field that affect the turf directly or the roof being closed as well as flooring on the turf. Once we educated some of the guys most of them knew we were doing our best but some just never understood the limitations we faced.

We got pretty good feedback as far as some of them knew there would be growing pains. We got compared to Arizona and Houston as they struggled the first few years as well. It was really good to hear some of our players as well as some of the visiting teams tell us of the improvement they saw as we gained more control of our growing environment. Late in the year Jeff Porter, the Braves trainer, told us he thought we looked better at the end of the year than any of the retractable roof stadiums had in their first year. We didn't get many compliments so we took it as a positive sign we were doing something right.

The one thing we realized is we have no wiggle room if we miss something. If we don't anticipate a prolonged roof closure or a week-long spell of bad weather it affects us more than most venues. We just simply don't have the same ability to recover as rapidly. ■