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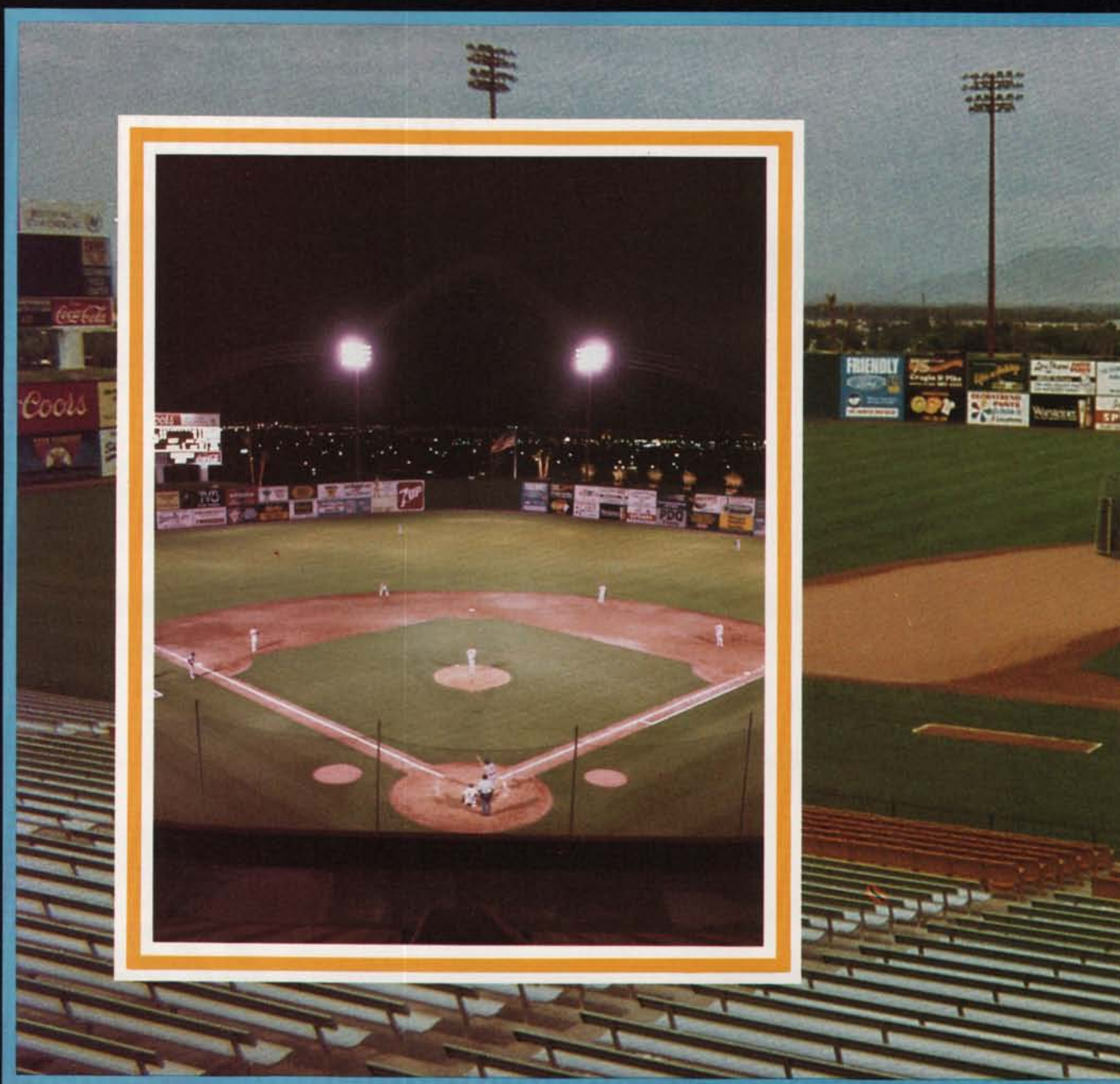
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Cashman Field

Matching Technology With



Las Vegas Stars play ball in the cool of the evening. Fans are treated to Las Vegas' neon horizon between innings. Players enjoy a smooth, firm turf surface.

Local Conditions



n's management wasn't sure the bermudagrass sod, laid in the winter, would come
ormancy in time for the April opener. A field cover acted as a greenhouse to help
knit sooner.

In the middle of the seventh inning in most major league ball parks, the fans get up to stretch. Usually the organist will play "Take Me Out to the Ball Game" and the fans sing the verse;

Take me out to the ball game
Take me out to the park
Buy me some peanuts and crack-
erjacks
I don't care if I ever get back
Let me root, root, root for the home
team
If they don't win it's a shame
For it's one, two, three strikes you're
out
At the ole ball game

That is almost what happened to Gene Stephens. Stephens is the director of facilities for the Cashman Field Center in Las Vegas, Nev. With two strikes on him, some folks were expecting Gene to strike out, but as the old saying goes, "The game is not over until the last strike." Gene instead managed to hit the home run and left the home fans ecstatic.

If you were to visit Las Vegas this year and wanted to see a ball game you would go to Cashman Field. As you enter this complex, it would surprise you that the facility is three years old. It still maintains that immaculate look. As you look across the field, you would never believe that it took three attempts to get it right.

Las Vegas is the gaming capital of the country. Its reputation is worldwide. In the middle of the desert, Las Vegas is truly a plush oasis. The city boasts an enthusiasm for sports.

Major boxing matches originate from here. The city is home for the University of Nevada's basketball team and the Stars, a triple-A farm team of the San Diego Padres.

Cashman Field sits just minutes from the downtown area in a complex that also houses a convention center. The facility opened in 1983 and is the home field for the Stars.

Stephens took the first strike in 1982 when a contractor was awarded the contract to install the playing field. The field was sodded with hybrid bermuda and it wasn't until one week prior to the 1983 season opener that "everyone realized there were elevation problems with the playing field as a result of the field installation by the general contractor," remembered Stephens.

"With the opener just a week away, we really didn't have time to make any corrections." It was decided to go through the season and periodically topdress the low spots hoping they would rise to the right elevation.

Needless to say, the topdressing did not cure the ills and when the season was over, the contractor was called back to do the corrective work.

Those in the business of managing high-traffic turf areas can appreciate what it really takes to produce a fine playing

continued on page 14

Cashman Relies on Fertigation



Tanks for liquid fertilizer and injectors in underground vault.

Sand rootzones like Cashman Field require a steady feeding of fertilizer. Also, George Goto, field consultant, wanted as much control of field conditions as possible.

The liquid fertilizer is injected into the Rain Bird irrigation system. The delivery system for the fertilizer is very important. Goto chose Automated Fertilizing Systems Inc. (AFS) to design and install the fertigation system.

AFS selected the Anderson fertilizer injector as being the best suited to the particular needs of landscape sprinkler systems.

Pumps are hydraulic (water driven) up to flows of 160 gpm, which means that no electricity is needed. This reduces costs, allows field installations, and minimizes retrofitting problems. Pumps for flows of 160 to 1200 gpm are available, using electricity or batteries to run electronic metering devices to control pumpheads. The vast majority of installations in Las Vegas, including Cashman Field, use water operated pumpheads.

The injectors are serviced in the field by AFS so there is no need for gaps in the program by having to ship pumps back to the factory. The proportion of fertilizer to water is widely variable with the turn of a knob.

The pumps have a wide range of pumping accuracy. For example, two-inch injectors like the ones at Cashman Field, can accurately meter fertilizer to water at flows as low as five gpm up to 160 gpm. This means these injectors can serve an irrigation system which uses drip irrigation on one valve and a high flow lawn system on the other. No matter what the flow or pressure within the above ranges, the ratio of fertilizer to water will always be the same.

The injectors at Cashman Field are installed in underground precast vaults to protect the equipment from vandalism

and heat. A by-pass is installed to allow for ease of servicing or for periods when non-fertilized water is desired. Two 150 gallon liquid fertilizer storage tanks are installed in the vaults with the injectors. On larger capacity systems, the concentrate tanks can be installed underground near the vaults.

There are currently 24 such systems operating in Las Vegas, the oldest in its fifth year of troublefree service. Most are in commercial or institutional applications. AFS is currently installing its largest system to date at McCarran International Airport in Las Vegas to feed a landscape of more than 40 acres.

In addition to the design, installation and service, AFS offers a turnkey service by providing custom blended liquid fertilizer. Soil testing provides the basis for blending fertilizer to meet the variable conditions of soil type, seasonal changes, and water source.

All major and minor nutrients can be fed through the system as well as pH adjusters.

Cashman Field is currently using a closely managed system of monthly soil analysis. High concentrations of nitrogen and phosphorus, low potassium, and ample trace elements are applied. The current formula is equivalent of 16:11:8 with iron and other trace elements added.

Because of high traffic and wear typical of a baseball field, we are attempting to promote fast growth, which is not a problem due to frequent mowing and excellent drainage. The salinity of the soil has remained favorably low, currently at 1.6 ECe. The pH of the soil is 7.7, about normal for the area.



Editor's Note: The above information was provided by Harold Goldsmith, founder and president of Automated Fertilizer Systems.

Cashman

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field. More importantly, to manage it properly so that it continues to look good and play well. Equally as important we begin to appreciate the skills and knowledge that are required. But like everything else, it takes experience. It should have been obvious that the general contractor who was awarded the contract did not know much about installing sports fields.

When called back to do the corrective work, the contractor brought in more soil, laid it right on top of the hybrid bermuda already there, and resodded the field with a fescue/bluegrass mix that was locally grown.

Those who ran the complex felt pretty good about the appearance of the field after the resodding. But that was in the fall; as they got into spring, the ground crew began to notice spots in the turf. At first they thought that possibly a fungus had developed.

"As the outfield began to develop large spots, we finally identified the problem," Stephens stated. "We realized that the contractor, in doing the corrective work, just put the soil over the bermuda sod. When the field was irrigated and the water percolated down to the level of the original sod, it would send up gases and kill the grass above.

Summer comes early to the desert and by June, Las Vegas reaches high temperatures. In July and August the temperature has been known to climb easily to 115 degrees.

Back in the fall, when the decision was made to use fescue/bluegrass sod, the weather was cooler and maybe the sod made sense. Possibly the contractor felt they would have better luck with this type

Cashman Field grandstand is modern for a minor league team.



of turf. He sold the complex authority on it by stating they would have a year-round grass that would stay green. However, by the time the summer arrived, the field, with its second sod turf, became a disaster all over again.

"We found out later that a fescue/bluegrass field would not survive the heat of the summer," commented George Goto, a consultant hired by the sports complex. "Especially when we had to keep it cut short."

The fans who supported the baseball team became more irate as each week passed and the field continued to deteriorate. The players complained. All in all it was a dismal time.

Strike two.

Stephens realized he had to do something. But this time it had to be right. He felt one more disaster and he would have to look for another job. He hired Goto, who had lived in Las Vegas since 1951 and knew the tricks it takes to keep turf healthy there. He has been involved in the horticultural field in the desert for almost 30 years. He exuded confidence.

"I told them if they gave me a free hand and let me do it, I would guarantee the field," Goto remarked. A budget of \$330,000 was allocated to completely redo the field.

Stephens and Goto flew to the Pacific Sod facility in Camarillo, Calif., to look over some fields and try to find out what not to do this time around. Time was running out; no one could afford any more mistakes.

It was finally decided that Cashman Field would have a new playing turf. This time it would be Santa Ana bermudagrass. It would be grown in sand to avoid any contamination. They also specified the sod would come from a recently fumigated field.

continued on page 47



Stephens (center) looks for seam in sod as Culbertson (standing) and Goto (kneeling) watch.

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DESIGNING AN IRRIGATION SYSTEM FOR SPORTS TURF



by Bob Cloud, ASIC

Irrigation as a separate entity is unnecessary. The need for an irrigation system arises when the idea to landscape a project is conceived. The magnitude of this need depends upon many factors, including the location of the project, the time available for watering, the level of sophistication desired, and the degree of liability exposure acceptable.

In any event, some form of irrigation will be required to ensure the survival and growth of the horticultural investment. This requirement takes on other dimensions based on the particular project activities.

All sprinkler systems have a great deal



Bob Cloud

in common in that they require pipe and fittings, and various forms of water applicators. Depending on the frequency of use, the system must apply the water without interfering with the main purpose of the facility. This generally entails some form of automation (and other related devices) to facilitate watering at night. The primary differences in systems result from the function of the facility.

Sports turf is probably the most demanding of any type of development. Not only must the water requirement be satisfied, but this must be accomplished without hindering the sports activities.

continued on page 18

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creating a hazard, or causing unacceptable conditions which interfere with the athletes peak performance. Recognizing these criteria is one thing, but meeting them is far more difficult.

Until recently, the choice of materials and equipment to assist in this endeavor were rather limited. Another limitation was the imagination required to conceive an alternative to the old conventional methods.

Before beginning the design, certain requirements must be established:

- Is uniformity of texture of primary importance?
- Is it unacceptable to apply water other than where needed, resulting in unplayable conditions?
- Has the issue of personal injury been addressed?
- Obstructions that are part of the irrigation system are not only potential hazards but can also affect the athlete's performance.

These important issues must be addressed and the problems solved throughout the design. Too often, the cost dictates the system. Instead, realistic criteria should be established, then the system should incorporate these requirements in the most economical way possible.

A vivid example of one solution is the use of artificial turf. In some respects, artificial turf eliminates many problems, but at an extremely high cost. It also does not afford the athlete a good playing surface. Living turf can be not only aesthetically equal, but will provide far more playable conditions. It is also safer than artificial turf, provided all the concerns are addressed and full advantage taken of the resources readily at hand.

We have to change the approach to creating, constructing, and maintaining facilities. Irrigation is a major consideration. Improperly handled, it can create unplayable conditions, be inefficient, and can be a hazard.

How should an irrigation system be designed for sports turf?

In general, athletic areas can be separated into two main categories; competition and non-competition. The difference in irrigation requirements between these two categories is determined by the degree of athletic expertise. These two main categories can be divided again into three sub-categories: general play areas (not strictly confined to one sport); track, field and football; and the baseball field. Each category has its own peculiarities and irrigation considerations.

The general play areas are, by far, the most simple to irrigate. Aside from possible modifications required for safety reasons, a conventional type irrigation system is usually appropriate.

The baseball field is basically composed of an outfield and an infield. The outfield is rather simple, since it is all turf. The infield however is a different matter. It usually consists of a skinned area, which involves the baselines from home plate to first and third base, and a much larger area between first and third base around second base. The square turfed center usually has concave half circles at each of the bases.

Two innovative systems are available to complement these demanding conditions, subterranean injected and microporous tubing. Both systems are installed at the lawn root zone, and emit water without spraying nor having any surface devices. Both systems are designed in a grid pattern, depending on the nature of the soil, from between 12 inches to approximately 24 inches on center. The primary difference between



Irrigation consultant and superintendent together check coverage of sprinklers near green.

The turf areas need a great deal more water than the skinned area, which is generally only dampened to minimize dust and for tension control, so two entirely different requirements must be met. Conventional sprinklers may be used in the outfield, with the only special

the two systems is that the microporous tubing works on very low pressure and "sweats" or oozes the moisture, whereas the sub-injected system works at a higher pressure and utilizes orifices inserted into the tubing approximately 18 inches on center to relieve water at a higher rate. This makes the sub-injected tubing less prone to clogging.

Both systems depend greatly on soil capillary action for uniform application. The less the soil capillary action, the closer these grids must be spaced. Moisture sensing equipment will control the water application and maintain a precise level of tension.

The cost of these systems will vary, depending on the nature of the soil and the grid spacing, from approximately \$.80 to \$1.20 per square foot. In view of the increasing demand for good playing conditions and widespread concern regarding liability, either of these systems can be an economical solution.

The more all-purpose fields, involving track, football and soccer play, are somewhat similar but have other irrigation requirements as well.

In general, the oval track has facilities at each end for field and track. The area along either side is used for other games, concentrated around the outer edges of

Sports turf is probably the most demanding of any type of development

consideration being that the sprinkler heads be either rubber covered or of the type that recesses below the turf, with the smallest diameter top.

However, in order for a conventional system to thoroughly irrigate the infield, the skinned areas are often unplayable due to excessive water. In addition, the high level of activity in this area makes conventional heads hazardous. Therefore, new irrigation concepts are needed to truly address the infield requirements.

Irrigation System

the oval track. These areas are relatively narrow and involve irregular turf areas.

Non-turf areas should not be watered. If water is allowed to settle on the running tracks, it is difficult to dispose of and floods into the sand pits, causes discoloration, and creates other maintenance problems. To avoid such situations, the sprinkler system should not rely on the conventional large rotor heads which spray water everywhere.

The best approach is to divide all irregular areas, including approximately ten feet on either side of the oval playing field, and develop two different categories of area to be watered. For economy, the large area generally reserved for football or soccer would utilize a more conventional sprinkler, similar to that recommended for the baseball outfield. All other areas would use sub-injected or microporous systems, confining water to the lawn areas.

Although the initial installation cost on these systems is higher, this difference is soon recouped many times over. Not only will more playable conditions be assured but undue maintenance in other areas will be avoided.

Another consideration when utilizing these new types of systems is water conservation. Depending on the efficiency of

the previous operation, anywhere from thirty to sixty percent less water need be applied to properly grow the turf than with a conventional system. In view of the increasing cost of water, the savings can be significant, especially since sports facilities usually involve substantial acreage.

***It is best to select a
sprinkler with the
smallest possible
diameter pop-up top
that also recesses
an inch below surface***

If a greater degree of refinement is desirable, such as when professional sports are involved, the larger areas can also be equipped with the sub-injected or microporous tubing systems to facilitate a more level field, conducive to optimum play and improved control of moisture and soil tension.

In areas where conventional sprinklers are used, special attention should be paid to the selection and placement of such equipment. All sprinkler heads not

located next to fences or other hard surfaces should be rubber covered. However, it is best to select a sprinkler head with the smallest possible diameter pop-up top, capable of recessing an inch or so below the surface of the turf.

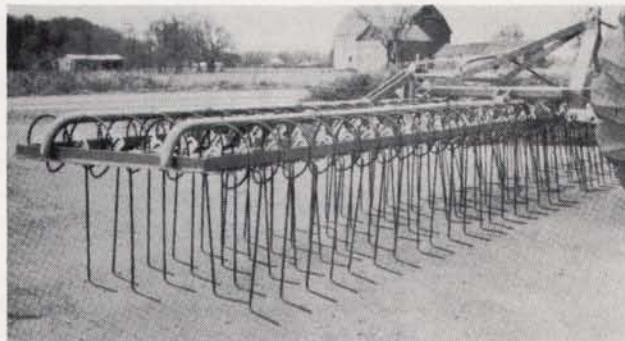
All control valves which require an access box for periodic adjustment or maintenance should be located outside the playing area whenever economically possible. If the additional expense involved to do this is unacceptable, a more economical solution is to locate the valve within the playing area, burying the box approximately six inches below finish grade. The box is then equipped with a rubber covered sleeve to identify the valve location and provide access to the throttling device.

I contend that through proper design and selection of equipment, and conscientious installation, operation and maintenance, the irrigation system can be an efficient tool. When unsatisfactory conditions are recognized, along with the threat of personal injury liability and the need to conserve water, the knowledge that there is a better solution leaves us no alternative but to address these concerns and use today's irrigation technology and advances.

Editor's Note: Bob Cloud is president of Associated Irrigation Consultants, Los Angeles, Calif. ▶

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PRO SPORTS FEAR LOSS OF BUSINESS TICKET SALES

Among the changes proposed by President Reagan in his tax reform package is the disallowance of ticket purchases as a business expense. This could jeopardize nearly half the sales of tickets to baseball and hockey clubs. Football teams would feel less impact due to a smaller number of games per season.

Management at Philadelphia's Spectrum and Pittsburgh's Three Rivers Stadium are holding improvements up until a final word arrives on the tax changes.

Ticket prices would have to rise to make up for the loss in business ticket sales say stadium owners.

Financial problems of team owners were a main factor in the recent baseball players strike negotiations. Loss of business ticket sales could push a number of teams over the edge.

The change in deductions would also impact golf too. Golf Digest magazine says tax reform will jeopardize the cost of pro-am spots, tournament tickets, and sponsorship of golf events. The magazine quoted golf course developer Tom Fazio, "The bill won't stop golf developers, it will just delay them until new ways of doing business within the law."

Frank Hannigan, senior executive director of the U. S. Golf Association, doesn't expect golf to receive any special treatment from Congress. "If you can't write off sky-boxes in Giants Stadium in the Meadowlands, you won't be able to get an exclusion for golf."

TURF FIELD DAY DRAWS 400 TO OREGON



A closest to the pin contest showed turf managers the toughness and durability of properly selected and well-managed turf.

Anyone curious about how turfgrasses are improved to provide better sports surfaces should plan to attend the Turf Seed Annual Turf Field Day next June. This year's event attracted more than 400 turf managers to Hubbard, Ore. where Turf Seed Inc. opens up its research center for a day each year.

Attendants heard, saw, and touched current and future turfgrasses for sports turf. Improved tall fescues, bentgrasses, perennial ryegrasses, and Kentucky bluegrasses are shown in heavy-wear, dense shade, and various water and fertility conditions. Research director Bill

Meyer explains each step in breeding and selecting better turfgrasses for sports.

Demonstrations reveal the benefits of various grasses. A closest to the pin contest, volleyball game, egg drop, and walking tour showed turf managers first-hand how grasses vary in performance.

Wildflower and forage grasses were added to the research tour this year. New tall fescues, perennial ryegrasses, and fine fescues are now in production by the company.

Bill Rose hosts the event. He farms more than 10,000 acres of turf seed, wildflower, and sugar beets.

DENVER, SAN FRANCISCO YEARN FOR BASEBALL PARKS

Baseball team owners don't like to share their "parks" with football teams, tractor pulls, and rock concerts, at least not in Denver and San Francisco.

Denver's famous Mile High Stadium may be the most utilized natural grass stadium in the country. But Denver sports barron John Dikeou wants a major league baseball franchise in the city and would like a new stadium as home field.

Not too many fans have left their hearts in San Francisco's Candlestick Park, a stadium wracked with construction problems ever since it was built. Rumors abound that a 40,000 seat just-baseball facility with charm and a view is in the planning stage.

The chance of passing a bond issue for \$70 million for a stadium in either city appears remote. But the cry for a just-baseball facility is growing. Dodger Stadium in Los Angeles is mentioned by

sportswriters in both cities as being the last of the true baseball parks, and it was built in 1962.

The stadia would have to be built by private owners. Gerald Phipps, former owner of Mile High, says real estate taxes make private ownership unprofitable, especially for baseball. He turned Mile High over to Denver in 1968. Phipps too mentions Dodger Stadium as an example of a "privately-owned stadium that works."

Field managers Barney Barron in San Francisco and Steve Wightman in Denver are too busy to really speculate on what competitive facilities would do to their stadia. But, talk to them long enough and you will sense their desire for the charisma of the old ball park with ivy on the walls, the smell of grass and hot dogs, and a view of mountains, a fountain, or a river.

Big screen television on million dollar scoreboards doesn't replace the sensations of smell, sound, and closeness to the field. Any good sports turf manager will tell you that.

SPORTS FESTIVAL GETS LUKEWARM RECEPTION

The Sixth Annual U. S. Sports Festival ended Aug. 4 without a mention on most metropolitan television stations. The annual event, designed to keep competitive fever alive between Olympics, would draw national attention in some countries. But, forced to compete with exhibition football games, professional baseball and summer vacations, the event attracted only 210,000 to Baton Rouge, La., and lost \$1.3 million.

William Bankhead, director of the 12-day Festival, said the U. S. Olympic Committee will help defray some of the losses. The fate of \$215 million profit from the 1984 Olympics is yet decided. He was happy with the facilities at Baton Rouge and said he is recommending the city for the 1991 Festival.

The events drawing the most attendance, and most coverage by ESPN, were gymnastics, swimming and diving, cycling and hockey. Basketball, boxing and track and field drew small crowds.