SPECIAL MEETING AGENDA
November 29, 2004 at 6:00 PM
Council Board Room of Troy City Hall
500 West Big Beaver
Troy, Michigan 48084
(248) 524-3317

CALL TO ORDER

ROLL CALL

Mayor Louise Schilling	Martin Howrylak
Robin Beltramini	David Lambert
Cristina Broomfield	Jeanne Stine
David Eisenbacher	

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1. Update on Proposed Minor League Baseball Facility

PUBLIC COMMENT

ADJOURN

Respectfully submitted,

John Szerlag, City Manager

November 23, 2004

TO: The Honorable Mayor and City Council Members

FROM: John Szerlag, City Manager

SUBJECT: Update on Proposed Minor League Baseball Facility

At our study meeting of November 15, 2004 I was asked to identify and address those elements deemed to have salience relative to the proposed minor league baseball facility. And as a result of our table discussion and subsequent resident input, the following major project components surfaced:

1. Benefit to the Community
2. Site plan issues
3. Environmental issues
4. Financing

Within the context of these main issues, staff members copied below and I had a series of meetings with Mr. Andy Appleby and Ms. Dana Schmidt of General Sports so we could begin addressing these elements with specificity. Our financial advisor, Mr. Bendzinski, was also in attendance at some of these meetings. As such, attached is a report from staff as well as one from General Sports; both of which provide an update on the possible development of this multi-use stadium.

All components of the attached reports are important. Having said that, there are specific challenges inherent in a project like this where a zone of comfort is needed before the governing body decides which way to go. They follow:

<u>The stadium should be sited just north of the Troy Marriott hotel on the Civic Center site with no encroachment on property owned by the Troy Employees' Retirement Board</u>

This has been accomplished. Please refer to the attached schematic design.

<u>Parking should be sufficient to accommodate a full house without any variances or use of Library and/or City Hall parking lots</u>

This can be accomplished.

<u>Noise from the multi-use facility should not exceed 65 decibels at the property line</u>

This can be accomplished for residential properties. However, this 65 decibel level cannot be met for some surrounding commercial properties. Staff/General Sports will delve further into this matter at the study meeting.

Infrastructure Improvements by the Downtown Development Authority (DDA)

These costs could run up to approximately $2 million, and the DDA should provide input on this matter. Determining what infrastructure is eligible for payment by the DDA still needs to be firmed up.

Stadium Financing

As proposed, there will be no cost and no liability to the City of Troy for constructing and/or operating this facility. Again, the particulars of the financing structure will continue to be discussed within these parameters.

I have been advised by General Sports that they need a decision on whether to proceed by the end of this year. Given this, my intention is to provide an update at every council meeting so as to provide the governing body with an opportunity to advise what you want to do. And assuming that you are comfortable with this process thus far, my next step would be to get input from the Parks and Recreation Board, Downtown Development Authority, Planning Commission, and the Civic Center Priority Task Force relative to this project.

As always, please feel free to contact me should you have any questions.

c: Carol Anderson, Parks & Recreation Director
Andy Appleby, General Sports
Lori Grigg Bluhm, City Attorney
John M. Lamerato, Assistant City Manager/Finance & Administration
Mark Miller, Planning Director
Brian P. Murphy, Assistant City Manager/Services
Dana Schmidt, General Sports
Doug Smith, Real Estate and Development Director

November 18, 2004

TO: John Szerlag, City Manager

FROM: Brian Murphy, Assistant City Manager/Services
John Abraham, Deputy City Engineer/Traffic Engineer
Steven J. Vandette, City Engineer

SUBJECT: **Traffic, Infrastructure and Environmental Issues Related to the Proposed Minor League Ballpark**

Drain, MDEQ and Wetlands:

The storm water detention basin for the Civic Center site is located along the east side of Civic Center Drive from the Library to just south of Town Center Drive. This basin is approximately 700 feet long, 100 feet wide and approximately 8 feet deep. It is man made with a storm water inlet at one end, an outlet pipe at the other and has side slopes of turf grass that are mowed in summer. The bottom center of the basin, about 5 to 10 feet wide, is usually wet with water flowing from inlet to outlet during low flow conditions. The vegetation within this long narrow strip consists of some cattails but predominately phragmites, which is an invasive species. The phragmites are very dominant and their density inhibits the growth plants. Vegetative removal with harvesting or burning only makes the phragmites grow faster. Phragmites somewhat favor wet clay soils, but are generally not considered an indicator for wetlands. As indicated in the attached memo from Jennifer Lawson, Environmental Specialist and member of the Engineering Department, the detention basin should not be classified as a regulated wetland under state law. The city has no local ordinance regulating wetlands; therefore jurisdiction resides with the Michigan Department of Environmental Quality (MDEQ). Elsewhere on the site there are no regulated or potentially regulated wetlands located within the ballpark area on the Community Center site.

We believe that no MDEQ permit will be required for modifications to the detention basin, however; should a new discharge be constructed to the open drain flowing east along the north side of the Community Center, an MDEQ permit will be required for this new “tap.” This type of permit is considered routine and should not pose any significant time delay problem.

Construction of the ballpark north of the Marriott hotel may impact the detention basin. Should this occur, there are several alternatives that may be considered. The detention basin could be relocated by enlarging the existing basin constructed west of the Community Center, it could simply be reshaped to accommodate the ballpark footprint or it could be reconfigured and integrated into the ballpark site using sustainable storm water design techniques. It is this latter alternative that we believe provides an

exceptional opportunity to accomplish four (4) very desirable goals: 1) A reduction in flow rate and quantity of storm water runoff leaving the Civic Center site. 2) On-site treatment of storm water to improve water quality. 3) Reuse of storm water for irrigation. 4) Use of the water for enhancing site esthetics by incorporating water features such as a waterfall, pond or fountain into the site. Additionally, a series of ponds could be designed including a pond for ice-skating in the winter, which is one of the recommendations of the Civic Center Task Force. Another benefit could include use of various *LEED* design certification elements (Leadership in Energy and Environmental Design) into the site design that could achieve the abovementioned goals. The most notable, and only *LEED* site in Troy is the Kresge Center, currently under construction, which utilizes green roofs, porous paving, water storage for irrigation and other innovative water solutions. Perhaps the most well known *LEED* site in Michigan and worldwide is the Ford Rouge Plant, which received certification at the Platinum level, the highest level of certification for a site that also has the world's largest living roof.

Traffic and Parking:

1) Parking Facilities: The proposed major parking facilities are the Liberty Center parking structure (1,200 spaces) and the parking lot north of the Community Center by the skate park (348 parking spaces). The north court parking area, located north of the court and Police buildings (108 spaces), is being considered for busses and employee parking and the Modern Engineering site on the north side of Town Center Drive has 344 spaces for a total count of 2,000 spaces. General Sports is also in touch with the Zion Christian Church to use their parking lot for busses and employee parking during game nights.
   a) Parking enforcement: General Sports will need to and intends to staff people in each of the City parking lots (City Hall, Library, Court, Police) to prevent game related parking in these lots.
   b) Traffic control before and after games: General Sports will need to make arrangements for traffic control personnel at each egress/ingress point, and/or if required, will have an arrangement in place with the Troy Police Department for traffic control.
   c) Pedestrian Traffic: Pedestrians will be converging to the stadium from the north and from the south parking areas. As a part of the stadium development, an adequate network of pedestrian pathways, a bridge north of the community center and sidewalks will be required. Additional lighting may be required depending on what other lighting elements are included in the stadium development.

2) Ingress and Egress from the Major Thoroughfares:
   a) Trip Generation: The number of trips generated by the facility would depend on the capacity of the stadium and the average attendance for games. The stadium is proposed to house 4,300 fixed seats and 340 suite seats. If the stadium is full for any given game, a total of 5,500 people may be inside the stadium. Occupancy rate of vehicles that come to the stadium ranges between 2.5 and 4

people per vehicle. Information from Grand Rapids indicates an occupancy rate of 2.5. Other experiences around the country for similar facilities (minor league, more family oriented) show occupancy rates between 3 and 4. For purposes of this initial study an occupancy rate of 3 per vehicle is assumed.

b) If the baseball stadium is filled to capacity, assuming around 8% of the people came by charter busses (10 busses), approximately 1,690 vehicles can be expected. Approximately 22% of these vehicles (around 350 trips) will enter through Town Center drive to the north parking Lot. The rest of the vehicles may come down to the Liberty Center Parking Garage. The Liberty Center parking garage has two driveways on Livernois and one on Big Beaver.

c) Major thoroughfares that will be used to access the stadium parking are Livernois and Big Beaver Roads. Livernois is 5 lanes wide with a center lane for left turns. Big Beaver is a 6-lane boulevard with median opening to facilitate left turns. Weekday baseball games are estimated to start between 7:00 and 7:30 PM with matinees on Sundays. Weekday traffic would be after the rush hour for the major thoroughfares surrounding the park. During arrival and departure times, as with any other special event, there may be delays for motorists getting in and out of the parking facilities. During the afternoon peak hour, the intersection of Livernois and Big Beaver handles around 6,225 vehicles (2,775 on Livernois both directions and 3,450 on Big Beaver both directions). Between 6:00 PM and 7:00 PM on weekdays, even with the addition of stadium traffic to the existing traffic, the signalized intersection of Livernois and Big Beaver will operate under an acceptable level of service. The existing major roads and traffic signals can easily accommodate Sunday game day traffic.

d) Machine traffic counters were placed on all the Liberty center driveways the week of November 15th. The results show the following:

   (a) Driveway Just North of Big Beaver: 873 vehicles in a day; peak-104 vehicles in an hour
   (b) Second Drive North of Big Beaver: 2244 vehicles in a day; peak – 260 vehicles in an hour
   (c) Marriot / Liberty combined drive onto Big Beaver: 3694 vehicles in a day peak-386 vehicles in an hour.

Given that most of the games are held after 7 PM, stadium traffic can be expected to arrive between 6 PM and 7PM and will be moving into the parking structure while the majority of the parking structure traffic will be moving out. Therefore, the existing three (3) driveways onto the major thoroughfares can adequately handle the stadium traffic parking at the Liberty Center.

Infrastructure:

Sanitary sewer within the Livernois right-of-way and looped water mains easily serves

the proposed site from the Community Center and Marriott sites. Approximately 1,000 feet of sanitary sewer and 500 feet of water main, not including hydrant runs, would be needed.

Storm water runoff and detention can be managed by reconfiguring the existing detention basin and incorporating *LEED* design elements or by relocating the Civic Center detention basin and expanding the basin just west of the Community Center.

Additional infrastructure needs may include reconfiguration of overhead electric and communication lines along the north and east side of the Ford and Earl site and along the north side of the Marriott and the Liberty Center. Other miscellaneous items could include landscaping and irrigation, parking lot repairs, pedestrian paving and bridge construction over the open drain, walkway lighting and other activities such as site investigation and preparation, soils investigation, testing and engineering surveys. The potential cost of all infrastructure items ranges from $1.5 to $2.0 million dollars.

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November 18, 2004

TO: Steven J. Vandette, City Engineer

FROM: Jennifer Lawson, Environmental Coordinator

SUBJECT: **Wetlands at City-owned property, Ballpark site**

The manmade detention pond on the City property (across from the Library on Civic Center Drive) is not a regulated wetland.

Phragmites australis, or common reed, dominates this pond as a monoculture, striking out all other types of vegetation. This invasive plant can grow up to 6 meters high in dense stands and is long-lived. *Phragmites* is capable of reproduction by seeds, but primarily does so asexually by means of rhizomes. Cutting or burning is not recommended for management of this vegetation. It is best to remove the soil and seedbed, and to start fresh with a new base soil.

Although *Phragmites australis* grows predominately in wetlands, it can also grow in any site conditions presented. This plant can thrive in the cracks of sidewalks, and will eventually buckle concrete. This plant is not an indicator species for wetlands.

This detention basin is not classified as a regulated wetland under state law.

Act 451 of 1994 (NREPA), Section 30301 of Part 303 defines regulated wetlands as:

(p) "Wetland" means ***land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh and which is any of the following:***
(i) Contiguous to the Great Lakes or Lake St. Clair, an inland lake or pond, or a river or stream.
(ii) Not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and more than 5 acres in size; except this subparagraph shall not be of effect, except for the purpose of inventorying, in counties of less than 100,000 population until the department certifies to the commission it has substantially completed its inventory of wetlands in that county.
(iii) Not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and 5 acres or less in size if the department determines that protection of the area is essential to the preservation of the natural resources of the state from pollution, impairment, or destruction and the department has so notified the owner; except this subparagraph may be utilized regardless of wetland size in a county in which subparagraph (ii) is of no effect; except for the purpose of inventorying, at the time.

The term "contiguous" is defined in the administrative rules promulgated under Part 303. (R 281.921 (b)) (See next paragraph)

"Contiguous" means any of the following:

(i) A permanent surface water connection or other direct physical contact with an inland lake or pond, a river or stream, one of the Great Lakes, or Lake St. Clair.

(ii) A seasonal or intermittent direct surface water connection to an inland lake or pond, a river or stream, one of the Great Lakes, or Lake St. Clair.

(iii) A wetland is partially or entirely located within 500 feet of the ordinary high watermark of an inland lake or pond or a river or stream or is within 1,000 feet of the ordinary high watermark of one of the Great Lakes or Lake St. Clair, unless it is determined by the department, pursuant to R 281.924(4), that there is no surface water or groundwater connection to these waters.

(iv) Two or more areas of wetland separated only by barriers, such as dikes, roads, berms, or other similar features, but with any of the wetland areas contiguous under the criteria described in paragraph (i), (ii), or (iii) of this subdivision. The connecting waters of the Great Lakes, including the St. Marys, St. Clair, and Detroit rivers, shall be considered part of the Great Lakes for purposes of this definition.

No MDEQ wetlands permit will be required for modifications to the detention basin, however; should a new discharge be constructed to the open drain flowing east along the north side of the Community Center, an MDEQ permit will be required for this new "tap." This type of permit is considered routine and should not pose any significant time delay problem.

The development of this site offers an opportunity to the City of Troy to be an example in sustainable development. Handling the stormwater on this site could be done in such a way to utilize the stormwater as an amenity, rather than a nuisance. Options include:

1. Aesthetic water features
2. Habitat creation/management
3. Stormwater collection/flow abatement

TROY CITY COUNCIL UPDATE REPORT ON POSSIBLE DEVELOPMENT OF MULTI-USE STADIUM IN CITY OF TROY

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I. INTRODUCTION

This report has been prepared to update the Troy City Council on work that has been undertaken since the City Council meeting on November 15, 2004 on the possible development of a multi-purpose stadium facility on the Troy Civic Center site. As a reminder, the proposed multi-purpose facility will serve as home to a new minor league baseball team, and it also will be designed to accommodate many other possible community uses.

II. BENEFIT TO COMMUNITY

The multi-purpose stadium facility will be designed for use in a variety of capacities that will make the facility a major community asset and gathering place. The stadium uses and programming opportunities will include:

A. MINOR LEAGUE BASEBALL TEAM OPERATIONS

1. Minor League Baseball Team Will Be Great Community Asset

The facility will be designed to accommodate play by a professional minor league baseball team that will become a major community asset and source of terrific, wholesome, affordable family entertainment. The minor league baseball team will be operated by General Sports and Entertainment, LLC, a Rochester, Michigan-based firm with a national reputation for excellence and experience in operating sports teams and sports and entertainment facilities. The team will play virtually all of its games on evenings and weekends from May through September.

The minor league baseball team staff will work actively with the Troy community to get kids and families involved in the team and to come out to the stadium for games and other events throughout the year. In communities all across the country, minor league baseball teams have become the center of activity and serve as a gathering place for communities in cities from Schaumburg, Illinois to Fort Wayne, Indiana to Jupiter, Florida to Frisco, Texas and Lake Elsinore, California to Brooklyn, New York to Dayton, Ohio to Lansing, Michigan. The target audience for minor league baseball teams is families, so it makes good business sense for minor league teams to reach out into the community to build strong bonds with citizens and residents of all ages.

The need for great, wholesome family entertainment is a big reason why minor league baseball has grown and become so popular over the last decade. Minor league baseball has been the fastest growing segment of the sports industry over the past 10 years. In 2004, more than 40 million Americans attended minor league baseball games. It is baseball in its purest form, played “under the stars”, where the players care about the game and are an 0-for-10 streak away from their next occupation. It’s all about wholesome, affordable family entertainment. Furthermore, minor league baseball is unique among sports options, as the sport of baseball holds a special status within American heritage. It is a source of great commonality between generations. **It is Americana at its best!**

The management team at General Sports has the experience to make this dream of minor league baseball a reality, and we have already done it before. The 2004 season marked our fifth full year of operating the Fort Wayne Wizards baseball club, the Class "A" minor league affiliate of the San Diego Padres. It was a year of unsurpassed accomplishment. In 2004, the Wizards were awarded three of the Midwest League's four year-end awards – the John H. Johnson President's Trophy, which is awarded to the League's best franchise, the Larry MacPhail Promotional Trophy, which is awarded to the team with the best promotions, and the Midwest League Executive of the Year, which was awarded to Wizards' General Manager Mike Nutter. This is the second consecutive year that the Fort Wayne Wizards were awarded the President's Trophy, which is given to the franchise that best exemplifies the standards of the complete baseball franchise, including financial success, contributions to baseball in the community, and long-term franchise stability. Under General Sports management, the Wizards have become one of Fort Wayne's greatest community assets.

"There is no place other than Fort Wayne where we would choose to have our Midwest League team located. This is in large measure a function of the ongoing support we receive from Mike Nutter and his accomplished staff. Their attention to detail, subtle grasp of marketing and promotions, willingness to make Padres personnel feel welcome and cared for, and commitment to the Fort Wayne community serves to distinguish this particular minor league operation. I know that you take great pride in having the Wizards in the General Sports family."
Tim Katzman, Director, Corporate Communications, San Diego Padres

"It was a wonderful experience for our kids. They saw baseball the way it really was supposed to be - FUN! The Wizards are doing everything right. What a fun time!"
Delphos Little League Association

In addition to the baseball, the entertainment environment we create will be focused entirely on wholesome family entertainment. More than half of our games will feature special entertainment during the game like the Zooperstars, Birdzerk, Myron Noodleman and Jake the Diamond Dog, all of which will be designed to provide entertainment to fans of all ages (we have enclosed with this report a CD with highlights of this in-game entertainment). Entertainment options like this have been used for years at other minor league games, and they have never failed to make fans laugh and enjoy the experience. Everyone will be walking out of this stadium for the next several decades with smiles on their faces, and it won't even matter who won the game, because minor league baseball is about much more than baseball. It is about communities and families coming together to share wonderful summer evenings filled with laughter and good times under the stars.

2. Community Service, Civic & Academic Benefits

Many of the initiatives that the minor league baseball team will undertake will have strong elements of community service and provide civic and even academic benefits to the City of Troy and its residents. Some of the initiatives will include:

- **Reading Club Program:** The minor league baseball team will institute a Reading Club Program with local schools, where kids will receive a ticket to one of the minor league

team's games for every 10 books they read. In Fort Wayne, Indiana, there are 85,000 kids participating in our minor league team's Reading Club Program.

- **Youth & Disabled Baseball & Softball Clinics and Camps:** The minor league team will offer regular baseball and softball clinics and camps for area youth and disabled persons with the team's coaches.

- **Other Youth Group Outings:** The minor league team will host outings at the stadium for various other youth groups like the Boy Scouts, Girl Scouts, Boys and Girls Club, Special Olympics, etc. For example, in Fort Wayne, our minor league team hosts an annual Boy Scouts sleep over outside on the field at the stadium.

- **Charity Initiatives:** The minor league team will participate in various local charity fundraising initiatives with groups like Little League Baseball and Softball, Troy High School Athletics, and the Troy Cowboys, to name a few. For example, in Fort Wayne, our minor league team has worked with area Little Leagues to develop fundraisers that have raised almost $200,000 for those Little League organizations over the past four years.

- **Discounted Tickets for Troy Residents:** The minor league team will offer discounted tickets to select home games for Troy residents.

- **Jobs & Internships:** First, depending upon the final design of the stadium, the operator and manager of the minor league team and stadium facility, General Sports, would like to move its corporate offices to the stadium facility, which would result in bringing at least 20 full-time jobs to the city. In addition, General Sports will be hiring a front office staff for the minor league baseball team, which will include at least 15 full-time employees. The minor league team also will provide between 60 and 100 seasonal jobs for game-day staffing positions from May through September during the baseball season. Both General Sports and the minor league team also will offer many internship opportunities. These seasonal jobs and internships will be great opportunities for area college and high school students.

- **Career Placement Opportunities:** By developing a strong relationship with General Sports and the minor league baseball team, young people looking for careers in sports also will have opportunities to potentially be placed in an entry-level position with a professional sports team at various locations across the country, as General Sports also operates one of the top Executive Placement Divisions in the sports industry.

B. POTENTIAL FACILITY USAGE BY CITY & COMMUNITY GROUPS

Similar to what has taken place in Lansing with Oldsmobile Park, the new facility will present the City of Troy with the opportunity to create year-round programming that will attract all members of the Troy community, from families to youth to seniors of all ethnicities and backgrounds. Some possible facility uses and programming options by the City's Parks and Recreation Department and other community groups affiliated with the City are highlighted below.

1. Possible Programming Ideas & Community Uses

- **Amphitheater –** The City could use the facility as a venue for outdoor concerts and other musical or theatrical performances in the summer months.
- **Outdoor Summer Movie Venue –** The City could use the facility for summer movie nights outdoor at the stadium, similar to the "Park After Dark" summer movie night series held at Oldsmobile Park in Lansing. The minor league team also may decide to host several of these movie nights as well.
- **Fall / Halloween Celebration –** The City could stage a Fall/Halloween themed experience at the stadium to bring families, youth and other area residents to the Civic Center in the fall. The experience could include a Haunted House similar to the "Fright Night" Haunted House that is created each year at Oldsmobile Park in Lansing.
- **Venue for Use by Troy Little League and Softball –** In addition to clinics and camps put on by the minor league team, the facility could be used by the Troy Little League Baseball and Softball teams for playoff games or a series of games to be played at the stadium each year to give each Little League team the chance to play at least one game at the stadium.
- **Venue for Use by Troy School District –** The Troy School District will have the opportunity to schedule many school district uses at the stadium, including high school baseball and softball games or tournaments, high school marching band competitions, senior night celebrations and graduation ceremonies.
- **Venue for Use by Other Troy Community Organizations such as Troy Cowboys, Troy Baseball Boosters, Troy Youth Soccer League –** Other Troy Community Organizations, such as the Troy Cowboys, Troy Baseball Boosters and the Troy Youth Soccer League could use the facility for their programs.
- **Venue for Festivals and Outdoor Exhibits –** The facility would be a perfect venue for outdoor festivals and exhibits.
- **Venue for 5K Runs** – The facility would be a perfect starting and ending point for 5K runs.
- **Venue for Senior Programs –** The facility could be a site for programs designed specifically to meet the needs of area seniors, such as a morning walking program around the stadium's warning track, a health fair, and a Senior Olympics.
- **Outdoor Ice Skating Venue or Venue for Warming Area and Restrooms for Adjacent Skating Area –** The facility could be used in the winter months as a beautiful outdoor ice skating venue, complete with lights for night-time skating, music, locker rooms that could be used by guests for changing into their skates or for warming areas, concession stands for food and warm beverages, rest room facilities, and possibly a restaurant that could be open for lunch and dinner. Alternatively, if the City prefers to develop more of a pond-like setting outside the stadium for ice skating, the stadium facility could be used for restrooms and as a warming center.
- **Venue for Troy Fourth of July Celebration –** In years when the minor league baseball team is on the road, a musical and fireworks celebration to commemorate the Fourth of July could be held at the facility. Similar celebrations are held at almost every minor league baseball park across the country, including Lansing, Battle Creek, Grand Rapids, Toledo, Fort Wayne and Indianapolis.
- **Adjacent Plazas and Fountain Serve as Community Gathering Place –** The facility will be designed to have a fountain plaza with outdoor seating areas adjacent to the exterior of the

stadium that will help to create a natural community gathering place even on days when there are no major events taking place at the stadium.

- **Cornerstone for Beautiful Campus Setting –** The proposed multi-purpose stadium facility could serve as the crown jewel in the development of campus setting on the Civic Center site.
- **Fountain Funds to be Used for Future Civic Center Development in Line with CCPTF:** The fountain also could be used as a fundraising mechanism, with the change collected from the fountain being put into a fund to help pay for the future development of the gardens, pathways and other green spaces on the Civic Center site as was contemplated by the Civic Center Priority Task Force report.
- **Venue for Troy Sports Camps:** The facility could be used as a venue for Troy Sports Camps.

2. Direct Expenses

As indicated in Section V.D. to this update report, General Sports will manage and operate the stadium year-round. This will require General Sports to hire a full-time facility manager at its sole expense. General Sports will pay for all regular maintenance and repair to the stadium year-round, so the City will not have to bear the burden for such expenses.

Furthermore, if the City or groups affiliated with the City desire to use the stadium for City programming or events, General Sports will ensure that the stadium is open and ready for use, and General Sports will not charge any rental or use fee to the City or its affiliated groups. The City and its affiliated groups will staff their own programs at the facility. The only costs that would be incurred by the City or its affiliated groups for use of the stadium would be the actual out-of-pocket expenses that would be incurred by General Sports for any such programs (such as utilities, maintenance and repair, cleaning, etc., directly attributable to each event).

C. SAMPLE CALENDAR OF EVENTS

Attached to this update report as Exhibit A is a sample calendar of events for the first year of operation of the multi-use facility (May 2006 through April 2007). The types of events and event dates set forth in the calendar are intended only to serve as a general idea of a possible calendar.

General Sports and the minor league team also will be able to use the stadium for a maximum of 100 event dates per year for its home baseball games, tryouts, practices, as well as some other family-oriented events. Some of the other potential events that General Sports and/or the minor league team could hold at the facility include movie nights, symphony concerts, circus performances, Little League clinics, and batting practice sessions for season ticket holders and sponsors.

The City of Troy, or other groups affiliated with the City, will have the opportunity to use the facility for up to 265 days each year for various community events. The types of possible City and community events and programming are outlined in Section II.B.1. above.

D. OVERALL BENEFITS

- The existence of the new facility on the Civic Center campus will attract thousands of families to the campus and add to the overall family-oriented atmosphere of the city. It also would be consistent with the city's recent selection in 2004 as the *Sports Illustrated* "SportsTown" for the State of Michigan. This will significantly increase the profile of the City of Troy both regionally and nationally, and will help to make Troy an even more desirable community for families.

- The minor league baseball team will be operated by a locally-based first-class management group that will deliver a Disney-like experience in every way, from the friendliness of the game day staff (many of whom would be local high school and college students) to the incredible family entertainment experience that will be created for each of the minor league baseball team's home games.

- The stadium facility will be a first-class facility designed specifically for providing wholesome family entertainment.

- The operator will launch a major publicity campaign surrounding the facility and the team that will generate national exposure for the City of Troy, and the local press coverage of the facility and the minor league baseball team will bring strong additional positive attention to Troy.

- The minor league baseball team's executives will promote the City of Troy throughout Michigan and across the country.

- The new stadium will help to foster continued strong feelings of pride about the City of Troy among current residents and prospective new residents.

- Attracting local fans and families to the Troy Civic Center campus provides the city with the opportunity to market itself to a whole new group of potential future residents who are currently not aware of the many benefits of living in the city and its many programs for residents. The city will receive this marketing opportunity without additional investments of its marketing budget.

- The City will receive all of these benefits without the use of any general funds or resident tax dollars, and the City will not have to take on the additional responsibility of operating the facility but will have the benefit of having a truly first-class operator to run the facility.

III. SITE PLAN

Over the past two weeks, the developer and the City have worked on a very basic site plan and related issues. The following paragraphs provide updated information on these issues.

A. Conceptual Stadium Facility Footprint on Southern Civic Center Site

We have attached to this update report as Exhibit B, a concept for a possible site plan for the stadium. This drawing was prepared by the developer's architect for the primary purpose of demonstrating that the stadium footprint will fit on the southern Civic Center site in the area east of Civic Center Drive and west of the Community Center, and it is not intended to be a final site plan or to address all site planning issues. This drawing also demonstrates that it will be possible to develop the stadium on that site without touching the ERS Board property that is currently being used by Ford & Earl. Lastly, this drawing also shows the direction that the developer intends to orient the stadium's seating bowl, which is toward the southeast. Other aspects of the site development will need to be worked on by the developer and the city in consultation with the developer's architect if Council ultimately approves development of this facility.

However, although the facility design has not been completed, the basic facility concept provides for a maximum capacity of approximately 5,500 people, with approximately 4300 permanent seats, suites with seating for approximately 340, and some lawn seating. The facility concept also includes picnic areas, a club/restaurant, concession stands, restrooms, two locker rooms, a team store, a children's play area, and offices for team and management staff. It will be lit for nighttime use, and will include a state-of-the-art scoreboard and sound system (specifically designed to direct sound away from area neighborhoods). The facility will be designed with full access for disabled persons (compliant with the Americans with Disabilities Act). Finally, it will be designed in a style reminiscent of a miniature Fenway Park or Wrigley Field, and it will include one or more adjacent plazas, with a fountain and potentially other water features with benches and access to food in the adjacent stadium facility. The facility will be designed to serve as part of an overall Civic Center campus, so that it will become a part of the landscape of the entire Civic Center area and flow easily into the surrounding green spaces.

B. Parking and Control

We have developed a parking plan that will have as small of an impact on the Civic Center site and its existing facilities as possible. The only parking lot on the Civic Center property that the minor league team will plan to use for patron parking is the lot directly north of the proposed stadium site and adjacent to Town Center Drive. The other primary lot that we plan to use will be the Liberty Center parking structure and lot. We have already received a preliminary agreement from Joe Trinkle, President of the Liberty Development Corporation, to use the Liberty Center parking. These lots combined total 1548 parking spaces. We also are engaged in discussions with several other surrounding businesses and office buildings to secure approval to use their lots for possible overflow parking. These businesses include Modern Engineering, which has 344 spaces just north of Town Center Drive, the Heartland office building on the corner of Livernois and Big Beaver, the Columbia Center on Big Beaver, and the Zion Church on Livernois. We anticipate securing approval at these off-site lots for a minimum of 500 additional parking spaces, which would bring the secured parking space total to about 2,000. The surrounding parking is more than sufficient to handle the number of cars that would be parking for an event at the stadium, even in the case of a sold-out event. Our parking data in Fort Wayne for the 2004 baseball season indicated that there were 3.8 people per vehicle.

As far as control and enforcement of parking on the Civic Center site, General Sports and/or the minor league team has agreed that for each event it hosts at the stadium, it will provide two staff people for each lot on the Civic Center property to monitor the lots to ensure that people attending events at the stadium do not park in the lots at City Hall, the Court, the Police Station, the Library, the Aquatics Center or Racquet Club, or at the Community Center.

IV. ENVIRONMENTAL ISSUES

A. Noise

General Sports has retained the services of WJHW, one of the premier sound engineering consultants in the country, to conduct a preliminary analysis of the sound requirements at the proposed stadium and to provide an opinion letter with respect to the ability to design a stadium and sound system that will be able to meet the requirements of the City's noise ordinance. The preliminary opinion letter is attached hereto as Exhibit C, along with the resumes of WJHW and principal Jack Wrightson. It indicates that with careful design of the stadium structure, orientating the stadium toward the southeast, and using the most state-of-the-art distributed sound system, we will be able to limit the decibel level of noise from the stadium at the nearest residential property line to a level at or below 65 decibels, which is the equivalent of the noise level inside a luxury vehicle traveling on the highway. This opinion letter has been provided without conducting measurements of the ambient noise from I-75, Big Beaver and Livernois traffic, which will only serve to further reduce the sound that will carry from the stadium to residential areas.

B. Lights

General Sports has conferred with several lighting companies that offer lighting systems and options that can provide great controls on the amount of light that escapes from the immediate stadium area. One lighting company that we have conferred with, Musco Lighting, offers a lighting system called the SportsCluster-2, which is a modular lighting system developed to meet the specific lighting requirements of sports fields by providing relatively high levels of smooth lighting over large areas while also providing maximum energy efficiency. The SportsCluster-2 system is environmentally sensitive in that it is designed to redirect wasted spill light back on to the field, it uses up to 25% less energy than other similar systems, and it offers an option called Level-8™ that achieves up to 95% reduction in spill light and glare. We have attached for your reference as Exhibit D a letter from Mark Knoblauch of Musco Lighting detailing the SportsCluster-2 with Level-8™ light control product, as well as several charts that show the level of spill light from outside the stadium from this lighting system. This information shows that even at the brightest lighting on the field (70 footcandles), when you move just 150 feet away from the field area, the light level decreases to 2.19 footcandles. Given the lighting technology available, this information shows that there will not be any spill light reaching anywhere close to any residential areas.

All of the major lighting companies have systems and options similar to those offered by Musco Lighting. We will work diligently with the lighting company to ensure that we achieve the least environmental impact from the stadium lights as possible. Fortunately, technology with lighting

systems is so advanced today that we will be able to light the stadium with very little impact on surrounding areas.

C. Transit – Vehicular & Pedestrian

As patron parking for the minor league games and other General Sports events at the stadium will be limited to the Liberty Center lot and the lot north of the stadium off of Town Center Drive (with some overflow parking possible at Modern Engineering, Zion Church, Heartland office building and the Columbia Center), the traffic flow pattern will be fairly simple, as most cars will not even enter the Civic Center property to park for the game. The majority of vehicular traffic will be contained to Big Beaver and Livernois. In order to assist in traffic flow and control, General Sports will make arrangements for traffic control at each ingress and egress location, the cost of which will be paid for by General Sports.

Furthermore, because minor league baseball games are attended largely by families, minor league games generally do not have the same type of traffic concerns as the major league sports. First, the number of people per car averages 3-4 people per car. So, even for sold-out games, parking should be sufficient, as indicated in Section III.B. above. In addition, because the fan base is mostly families, the fans tend to leave the games in a gradual flow as opposed to a rush at the end of the game. The operator also will allow children to run the bases after each game, which generally results in a further staggering of the departures from the stadium after each game.

As far as pedestrian traffic and ingress and egress patterns, we will work on a site plan that will allow for the majority of fans to enter the Civic Center property by walking north from the Liberty Center along the west side of Livernois and making a left onto the Civic Center property at its southern most point along Livernois. The stadium will be designed with entry gates in the outfield area to accommodate the majority of fans who will be walking to the stadium from the Liberty Center to the southeast. We also will need to develop a walking path for fans parking in the lot to the north, which will be a smaller number of fans, as the north lot has only 348 spaces.

D. Drain/MDEQ

There do not appear to be any issues with respect to conducting work in and around the drain that runs north and south (and to the east of Civic Center Drive) in the vicinity of the proposed stadium site. It appears that the drain is a man-made drainage basin that does not constitute a wetland, therefore there should not be a need for any significant involvement or approval by MDEQ. However, in developing an overall site plan for the stadium, both the developer and the city will take into account the desire to try to retain the drain as an enhancement to the site, and we have discussed potentially enlarging the drainage basin in the area directly to the north of the proposed stadium site to perhaps allow for a more natural, pond-like setting for winter ice skating.

V. FINANCING

A. Ownership

The City will own the stadium, and will continue to own the land upon which the stadium facility will be built.

B. Financing Structure

The City will issue municipal securities for the development of the stadium facility, and the City will enter into a Development, Operation and Management Agreement with General Sports for it to develop, operate and manage the stadium. Pursuant to the Development, Operation and Management Agreement, General Sports will be responsible for making payments on the municipal securities, and General Sports and the investment group acquiring the minor league baseball team will provide the necessary guaranties to market the municipal securities. Sufficient guaranties will be provided so that the City will not be liable for repayment of any municipal securities issued with respect to this project, and so that no general funds will be used to pay for this project.

C. Infrastructure

The Downtown Development Authority will be asked to contribute funds toward infrastructure in preparing the site for the stadium construction. In consideration of the DDA providing support for infrastructure needs, General Sports will provide and pay for an experienced facility manager to operate the stadium, as well as the regular maintenance, repair and operation costs throughout the year, which we estimate will be in the range of $300,000 or more each year. In addition, with respect to each individual baseball season, General Sports agrees that once it has reached a paid attendance of 240,000 people for that season's home games, it will contribute 15% of ticket revenue received from paid attendance in excess of 240,000 back to the Downtown Development Authority. It is the developer's hope that these funds, or a portion of these funds, could be directed toward reinvestment in and beautification of the Civic Center site.

D. Facility Management/Operating Costs

The Development, Operation and Management Agreement will provide for an initial term of between 30 and 40 years, with options on extensions of the term being possible. Under the Agreement, General Sports will manage and operate the stadium year-round. This will require General Sports to hire a full-time facility manager at its sole expense. General Sports will pay for all regular maintenance and repair to the stadium year-round, so the City will not have to bear the burden for such expenses. General Sports/minor league team will manage the box office at the stadium, and will handle all sales of tickets, suites, sponsorships/advertising, concessions, and merchandise/novelties, and will retain all revenues therefrom. General Sports/minor league team will manage all concessions, and with respect to any alcohol sales, General Sports/minor league team will institute a comprehensive alcohol action plan after discussion and negotiation with the City.

Furthermore, as indicated in Section II.B.2. to this report, if the City or groups affiliated with the City desire to use the stadium for City programming or events, General Sports will ensure that the stadium is open and ready for use, and General Sports will not charge any rental or use fee to the City or its affiliated groups. The City and its affiliated groups will staff their own programs at the facility. The only costs that would be incurred by the City or its affiliated groups for use of the stadium would be the actual out-of-pocket expenses that would be incurred by General Sports for any such programs (such as utilities, maintenance and repair, housekeeping, etc., directly attributable to each event).

E. Taxes

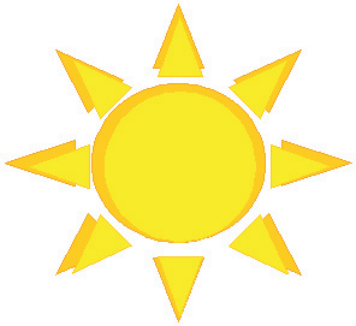
As the City will own the stadium, the developer, General Sports, and/or the minor league baseball team will be assessed real property tax on those portions of the stadium facility that are exclusively controlled by General Sports and/or the minor league team. General Sports and/or the minor league team will also be assessed personal property taxes on any personal property, such as office equipment, baseball equipment, etc.

F. Insurance

General Sports and the minor league baseball team will carry all required comprehensive general liability insurance, liquor liability insurance, business property insurance on its personal property, and all required employer's liability and workers' compensation insurance.

2006

Sample Calendar of Events



at Troy Multi-Purpose Facility

May

Sun	Mon	Tues	Wed	Thu	Fri	Sat
	1 Local Tryouts	2 Local Tryouts	3	4	5	6
7	8	9	10	11	12	13 Media Day
14	15 *Spring Training*	16 *Spring Training*	17 *Spring Training/ Sponsor Appreciation Day*	18 *Spring Training*	19 *High School Playoffs*	20 *High School Playoffs*
21 *High School Playoffs*	22 *Spring Training*	23 Home Game	24 Home Game	25 Home Game	26	27 Home Game
28 Home Game	29 Home Game	30	31			

- *GSE/Minor League Team Events*

- *Troy Based Community Events*

June

Sun	Mon	Tues	Wed	Thu	Fri	Sat
				1	2 *High School Graduations*	3 *High School Graduations*
4 *High School Graduations*	5 Home Game	6 Home Game	7 Home Game	8 Summer Evenings Concert Series	9 Home Game	10 Home Game
11 Home Game	12	13	14	15 *Movie Night*	16 *High School Graduations*	17 *High School Graduations*
18 *High School Graduations*	19 Home Game	20 Home Game	21 Home Game	22 Summer Evenings Concert Series	23 Home Game	24 Home Game
25 Home Game	26	27 Home Game	28 Home Game	29 Home Game	30 *Symphony Night*	

2006

Sample Calendar of Events

at Troy Multi-Purpose Facility

July

Sun	Mon	Tues	Wed	Thu	Fri	Sat
						1 Fireworks Show
2	3 Home Game	4 Home Game	5 Home Game	6 Summer Evenings Concert Series	7 Home Game	8 Home Game
9 Home Game	10 Little League Baseball	11 Senior Walks	12 Little League Baseball	13 *Little League Clinic*	14 Movie Night	15 Family Festival
16 Festival	17 Little League Baseball	18 Senior Walks	19 Little League Baseball	20 Home Game	21 Home Game	22 Home Game/ Boy Scout Sleepover Night
23	24 Home Game	25 Home Game	26 Home Game	27 Summer Evenings Concert Series	28 Season Ticket/ Sponsor Holder B.P.	29 Movie Night
30	31					

- GSE/Minor League Team Events

- Troy Based Community Events

August

Sun	Mon	Tues	Wed	Thu	Fri	Sat
		1 Home Game	2 Home Game	3 Home Game	4	5 Food Festival
6 Food Festival	7 Home Game	8 Home Game	9 Home Game	10	11 Home Game	12 Home Game
13 Home Game	14	15 Home Game	16 Home Game	17 Home Game	18 Summer Evenings Concert Series	19 Movie Night
20	21	22 Senior Walks	23	24 Home Game	25 Home Game	26 Home Game
27 Season Ticket/ Sponsor Holder B.P.	28	29 Senior Walks	30 Summer Evenings Concert Series	31 *Little League Clinic*		

2006

Sample Calendar of Events

at Troy Multi-Purpose Facility

September

Sun	Mon	Tues	Wed	Thu	Fri	Sat
					1 Potential Baseball Playoffs	2 Potential Baseball Playoffs
3	4	5	6 Potential Baseball Playoffs	7 Potential Baseball Playoffs	8	9
10 Potential Baseball Playoffs	11 Potential Baseball Playoffs	12	13	14	15	16
17 Troy Cowboys	18	19	20	21	22	23 Troy Cowboys
24 Troy Cowboys	25	26	27	28 Season Ticket/ Sponsor Holder B.P.	29	30 Troy Cowboys

- *GSE/Minor League Team Events*

- *Troy Based Community Events*

October

Sun	Mon	Tues	Wed	Thu	Fri	Sat
1 Troy Cowboys	2	3	4	5 Season Ticket/ Sponsor Holder B.P.	6	7 Troy Cowboys
8 Troy Cowboys	9	10	11	12	13	14 Troy Cowboys
15	16	17	18	19	20 HAUNTED	21
22	23	24 World Series Party	25	26	27 HOUSE	28
29	30	31				

2006

Sample Calendar of Events

at Troy Multi-Purpose Facility

November

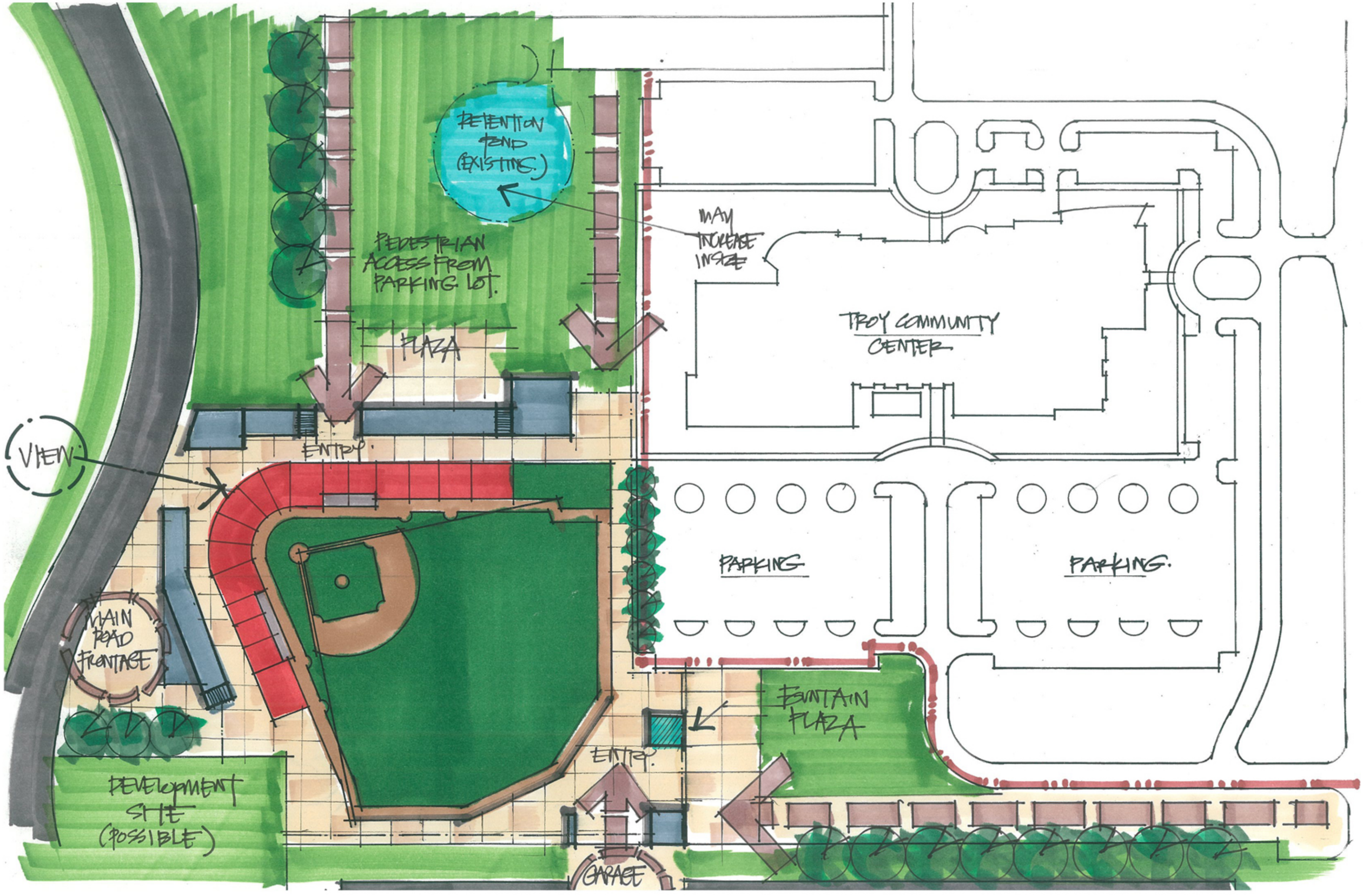
Sun	Mon	Tues	Wed	Thu	Fri	Sat
			1	2	3 *Fall Fest*	4 *Fall Fest*
5 *Fall Fest*	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

December

Sun	Mon	Tues	Wed	Thu	Fri	Sat
					1	2 *Ice Skating*
3	4	5	6	7	8	9 *Ice Skating*
10 *Festival of Lights*	11	12	13	14	15	16 *Ice Skating*
17 *Festival of Lights*	18	19	20	21	22	23 *Ice Skating*
24	25	26	27	28	29	30 *Ice Skating*
31						

- GSE/Minor League Team Events

- Troy Based Community Events


RETENTION POND (EXISTING.)
MAY INCREASE IN SIZE
PEDESTRIAN ACCESS FROM PARKING LOT.
PLAZA
TROY COMMUNITY CENTER
ENTRY.
VIEW
PARKING
PARKING.
MAIN ROAD FRONTAGE
FOUNTAIN PLAZA
ENTRY.
DEVELOPMENT SITE (POSSIBLE)
GARAGE

Company Overview

Wrightson, Johnson, Haddon & Williams, Inc. is a 34-person consulting firm offering design services in acoustics, noise and vibration control, and audio, broadcast, video, theater and telecommunications systems. Our strengths lie in the combined talents of principals and employees, our diverse technical and business skills, and experience accrued over the years from hundreds of successful projects.

. . . problem solvers

The ability to probe for the real needs of the client, extract this information and produce an imaginative, but practical, set of design and recommendations is the foundation of what we do. We are more than designers and technicians – we are problem solvers. We have developed a detailed understanding of spectator facilities through many years of experience and we are able to develop recommendations that produce results.

. . . design philosophy

Our sincere client interest, ability to listen, orientation toward technical excellence, on-time delivery, adherence to cost control, and dedication to team communication make Wrightson, Johnson, Haddon & Williams, Inc. a valuable consulting resource to the design community. Our design philosophy is to offer recommendations which are based on proven concepts while at the same time providing imaginative and creative design solutions.

. . . meeting needs

Wrightson, Johnson, Haddon & Williams, Inc., offers a great deal of experience in spectator facilities, the important aspect is how that experience leads to an understanding of facilities function and how it applies to meeting the needs and long term goals of the owner, operator, and tenants. We constantly strive to provide guidance which will enhance the enjoyment of the spectators and which will also enable the owners to maximize the long-term profitability of the facility.

. . . design capabilities

Acoustical analysis and systems design capabilities are aided by computer design programs. AutoCAD 2005 is utilized. Wrightson, Johnson, Haddon & Williams, Inc., has an extensive library of acoustical, architectural and technical products, in addition to professional texts and journals. In-house acoustical analysis and recording instrumentation is available and utilized as needed.

. . . milestones met

In order to meet project milestones, weekly staff coordination meetings are held to discuss project progress, manpower allocation and coordination. Peer review is performed on all released drawings, specifications and major documents. Milestone dates and deadlines are posted and observed.

Capabilities

Sound System Design

- System Programming
- Development of Design Studios
- Preparation of Biddable Contract Documents
- Bid and Submittal Review
- Acceptance Testing and Equalization of System
- Owner Instruction and Training

Television and Radio Broadcast & TV Production Studio Design Services

- Full Video Replay System Design
- TV Production Studio Design
- Camera Platform / Location Consulting
- Broadcast Requirements Coordination
- Design and Specification of Broadcaster Cabling
- Coordination of Broadcast Transmission Needs

Scoreboard & Video Display

- Consultation on Scoreboard Design & Configuration
- Design of Video Production / Replay System
- Preparation of Contract Documents
- Preparation of Technical Request for Proposal
- Bid & Submittal Review
- Acceptance Testing and Check of Installed Systems

Coaching Video Facility Design

- Consultation on Appropriate Video Technologies
- Development of Contract Documents
- Satellite Downlink Design and Specification
- Design and Specification of SMATV Systems
- System Testing and Operator Training

Video Surveillance

- Custom, Computerized Seating Bowl Surveillance
- Traditional Video Surveillance Consulting
- Design of Video Surveillance Systems
- Design of Custom Intercom Facilities

WJHW

Wrightson Johnson Haddon & Williams, Inc.

Acoustics

- Acoustical Simulation
- Room Acoustics
- Sound Isolation & Speech Privacy
- Open Plan Design
- Field Measurement and Analysis

Mechanical Noise Control

- Selection of Criteria
- Vibration Isolation of Electro-Mechanical Equipment
- Planning for Quiet System Layout
- ASHRAE Noise Analysis

Multi-Media Systems Design

- System Programming
- Development of Design Solutions
- Preparation of Biddable Contract Documents
- Bid and Submittal Review
- Acceptance Testing and Check of Completed System

Technology (Voice, Video and Data) Systems Design

- Telecommunications and Data Systems Programming
- Design of the Telephone System Backbone and Cabling Infrastructure
- Design of the Data System Backbone and Cabling Infrastructure
- Design of the POS System Backbone and Cabling Infrastructure
- Coordinate Low Voltage Drawings and Specifications Packages

Lighting & Rigging Systems Design

- Theatrical Lighting Systems
- House Lighting Systems
- Theatrical Rigging Systems
- Fire Safety Curtain
- Theater Technical Communications & Cueing Systems

Environmental Noise

- On-Site Measurements
- Prediction of Noise Impact and Contour Development
- Building Skin Design for Noise Reduction
- Use of Barriers
- Recommendation to Mitigate Noise

WJHW

Wrightson Johnson Haddon & Williams, Inc.

Stadium Projects

The following representative projects contain design issues and elements, which are similar to many of the issues routinely faced during the design of a spectator facility such as a stadium. The principals and staff of Wrightson, Johnson, Haddon & Williams, Inc. have provided project management and design responsibility for acoustics, noise control, sound system design, video system design or broadcast facilities on the following projects:

The following is an abbreviated listing of some of the most recent stadiums on which WJHW is providing recommendations and design:

- Boston College Alumni Stadium; Boston, MA
- Bright House Networks Field; Clearwater, FL
- Colorado State University, Sonny Lubick Field, Fort Collins, CO
- Des Moines Menace Soccer Stadium; Des Moines, IA
- Fenway Park Sound System Upgrades; Boston, MA
- Georgia Tech, Memorial Stadium Renovation, Atlanta, GA
- Isotopes AAA Stadium; Albuquerque, New Mexico
- Michigan State University, Spartan Stadium, East Lansing, MI
- Montgomery "A" Ballpark; Montgomery, AL
- New Jacksonville Baseball Stadium; Jacksonville Florida
- New Florida Marlins Stadium
- New York Mets New Stadium, New York, New York
- New York Yankees New Stadium, New York, New York
- Oregon State University, Reser Stadium, Corvallis, OR
- Paetec Park Soccer Stadium, Rochester, NY
- Ross Ade Stadium Expansion, Purdue University; Lafayette, Indiana
- Sao Paulo Corinthians Stadium; Sao Paulo, Brazil
- Stockton Ballpark; Stockton, CA
- United States Naval Academy Stadium; Annapolis, MD
- University of Alabama, Coleman Coliseum Renovation, Tuscaloosa, AL
- University of Alabama, Bryant-Denny Stadium Expansion, Tuscaloosa, AL
- University of Colorado, Folsom Field; Denver, CO
- University of Iowa, Kinnick Stadium Renovation, Ames, IA
- West Virginia University, Milan Puskar Stadium; Morgantown, WV

New Busch Stadium

St. Louis, Missouri

Construction has begun on the new downtown home for the National League's St. Louis Cardinals. The new 46,000 seat ballpark, located adjacent to the existing Busch Stadium, will be built in what is presently the south parking lot. The Cardinals will continue to play in Busch Stadium while the new ballpark is being built. This will eventually require closing part of the existing seating to accommodate the new construction. Cost of the new ballpark is estimated to be $345 million. A Spring 2006 opening is planned. WJHW has been given the responsibility for design of the following: Sound Systems, Distributed Video Systems, Broadcast Cable Provisions, Broadcast Cable Systems, Satellite Downlink Systems, Scoreboard/Video Display Systems, Video Replay System, Video Surveillance Systems, Access Control and Door Monitoring, Coaching Video System, Acoustics, Noise, and Vibration Control as well as for providing Production Staff Consultation for Game Day Entertainment Operations.

WJHW

Wrightson Johnson Haddon & Williams, Inc.

Heinz Field

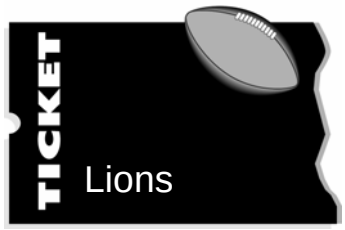
Pittsburgh, Pennsylvania

In August 2001, the NFL's Pittsburgh Steelers began playing in their new $252 million home. The stadium is an open-air configuration with natural turf. Seating is provided for 65,000 fans. 6,600 club seats are a part of the stadium along with approximately 122 suites and two club lounges. A unique component of this facility is the Grand Hall. The Big East Pitt Panthers also play their home games in this facility. WJHW was responsible for the design of the sound, video, broadcast, scoreboard and surveillance video systems.

SBC Park

San Francisco, California

SBC Park, the new home for MLB's National League San Francisco Giants, successfully opened in March 2000. This $330 million baseball-only stadium seats 40,800 with 5,500 club seats, 2,400 field club seats, and 67 luxury suites. There are also five 100-seat club level and adjacent parking for 5,000. WJHW was responsible for the design of the sound, video, broadcast, scoreboard, acoustics and surveillance systems.



Ford Field

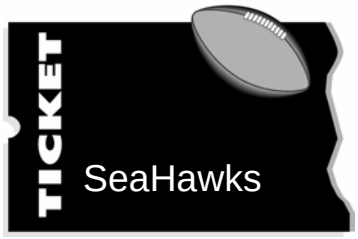
Detroit, Michigan

The Detroit Lions of the NFL have a new domed stadium in downtown Detroit. The Lions occupied this $300 million facility in August 2002. The stadium contains 65,000 permanent seats for football along with 8,500 club seats and 120 private suites. The building is adjacent to the new Comerica Park, home of The Detroit Tigers. WJHW designed the acoustical envelope of the building as well as the sound, distributed video, broadcast television, satellite downlink, surveillance video and scoreboard systems.

Comerica Park

Detroit, Michigan

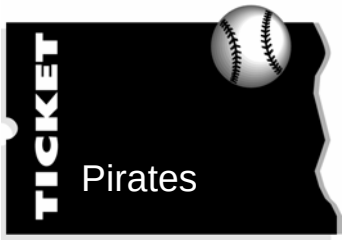
The new stadium for the Detroit Tigers is built on a downtown site adjacent to Ford Field, home of the Lions. The building seats 40,400, including 90 private and 12 party suites, 4,000 club seats, a 5,000-square-foot Tiger Den Lounge, a 2,000-square-foot Club Lounge, and a 300-capacity Ballpark Club. There is a total suite seat capacity of 2,000 seats. The natural grass stadium, costing $300 million, opened in April 2000. WJHW designed the sound, distributed video and surveillance video systems for the building as well as the base building broadcast cable provisions. Recommendations were made for acoustics and noise control.



Qwest Field & Qwest Center

Seattle, Washington

Opened on a site near the where the Kingdome sat prior to demolition, the new building is home to the NFL's Seattle Seahawks and to the MSL's Sounders. Play began in the new facility in August 2002. Built at a total cost of $360 million, the complex includes a 72,000 seat domed stadium as well as 200,000 square feet of exhibition space within the Exhibition Center component of the project. The stadium contains 92 private suites, 8 party suites and approximately 10,000 club seats. WJHW provided the design of the following systems: Sound, Distributed TV, Broadcast, Satellite Downlink, Coaching Video and Scoreboard/Video Display. Recommendations were also offered for acoustics and noise control throughout the complex.



PNC Park

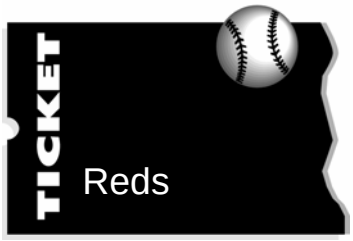
Pittsburgh, Pennsylvania

This $233 million stadium is the new home to the Pittsburgh Pirates of MLB's National League. The Pirates occupied their new home on April 9, 2001. Seating is provided for 38,200 and includes 65 corporate suites, 4 owner suites, 2,500 club seats, 400 home plate seats, and a 400-capacity rooftop party deck. Wrightson, Johnson, Haddon and Williams designed the sound, video, broadcast, scoreboard and acoustical systems.

Petco Park

San Diego, California

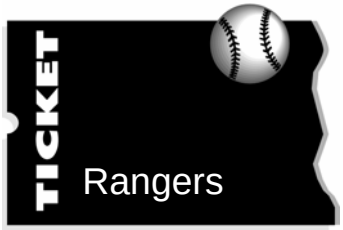
The San Diego Padres spectacular new facility opened in April 2004. The new facility is an open air, natural grass ballpark located within San Diego's Sports and Entertainment District. The $449 million ballpark complex seats 46,000 in three seating decks. 58 suites are a part of the project including 5 party suites. A unique feature of the complex is the "Park at the Park", a multi-use entertainment venue located beyond the outfield wall. WJHW provided the design of the following systems: Sound, Distributed TV, Broadcast, Satellite Downlink, Coaching Video and Scoreboard/Video Display. Recommendations are also being offered for acoustics and noise control throughout the complex.



Great American Ballpark

Cincinnati, Ohio

Built next to Cinergy Field near the banks of the Ohio River, the $280 million new home for the National League's Cincinnati Reds was inaugurated in April of 2003. The new ballpark has a seating capacity of 42,000 with 3,000 club seats and 51 Luxury suites. Each suite has a seating capacity of 30 seats. WJHW provided the design of the following systems: Sound, Distributed TV, Broadcast, Satellite Downlink, Coaching Video and Scoreboard/Video Display. Recommendations were also offered for acoustics and noise control throughout the complex.



Ameriquest Field in Arlington

Arlington, Texas

Home of the Texas Rangers, this ballpark is the centerpiece of a sports entertainment complex. The ballpark, which opened in April 1994, cost $191 million and seats 49,200 with 120 luxury suites, 5,700 club seats, and stadium seats. Each suite has a seating capacity of 14-20 seats. The press and media facilities are state-of-the-art with accommodations for fiber optic local and network broadcast feeds. Building-wide distributed TV system serves the suites, concourses and administrative areas. A distributed sound system serves the spectator seating. Wrightson, Johnson, Haddon & Williams, Inc. designed each of these sound, broadcast, and video systems.

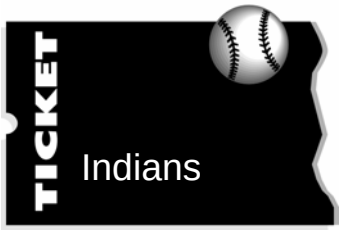
Turner Field (1996 Summer Olympics Stadium)

Atlanta, Georgia

This $242 Million stadium was constructed to initially accommodate the 1996 Summer Olympics. Seating in this configuration was approximately 80,000. At the completion of the Olympics, the building structure was reconfigured to serve the needs of the Atlanta Braves. The baseball mode seats 49,800, including 5,372 club sets and 59 luxury suites. Each suite has a seating capacity of 14-22 seats. Wrightson, Johnson, Haddon and Williams designed the sound, video, broadcast, scoreboard and acoustical systems.

WJHW

Wrightson Johnson Haddon & Williams, Inc.



Jacobs Field

Cleveland, Ohio

Opened in April 1994, this $180 million facility serves as home to the Cleveland Indians. The stadium is an open-air stadium seating 42,000. Located in the Gateway complex, the building has a stadium club, 2,400 club seats, 118 premium suites and 10 diamond suites. Each suite has an average seating capacity of 12 seats. Special attention was required during sound system design in order to minimize the intrusion of unwanted noise into the surrounding community. Wrightson, Johnnson, Haddon & Williams, Inc. provided design and consulting for the sound, video, broadcast, and scoreboard systems.

Minute Maid Park

Houston, Texas

In March 2000, the Houston Astros of MLB's National League inaugurated their new $276 million home. It is located in Southeast downtown Houston. The baseball-only design includes a fully retractable roof with a seating capacity of 42,200, including 75 private and two party suites, and 4,800 club seats. Each suite has a seating capacity of 12-14 seats in addition to the party suites. Wrightson, Johnson, Haddon & Williams, Inc. was responsible for the design of the sound, video, broadcast, security and scoreboard systems.

Oriole Park at Camden Yards

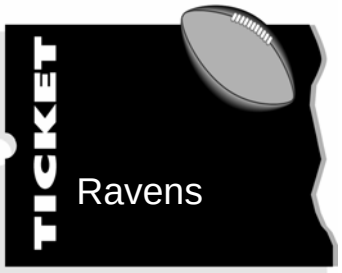
Baltimore, Maryland

The home of the Orioles, located in the Camden Yards area of Baltimore's Inner Harbor, has won critical acclaim from some of the nation's toughest architectural critics. The inaugural game was played on April 6, 1992. The stadium, which was built for $235 million, seats 48,000, including 72 luxury suites, 4,631 club seats, and 5 party suites. Each suite has a seating capacity of 10-14 seats per suite and 75 seats per party suite. The sound system was designed using distributed loudspeakers to minimize noise exposure to the surrounding residential neighborhoods. The video system features full stadium television distribution, a video replay production suite, and full broadcast systems cabling.

US Cellular Field

Chicago, Illinois

The New Comiskey Park is the $150 million home of the Chicago White Sox. The inaugural game was on April 18, 1991. The stadium seats 44,321, including 1,822 club seats and 103 luxury suites. Each suite has a seating capacity of 18-30 seats. The sound system is of the distributed type and features sophisticated suite program options. The video systems provide distribution of television signals throughout the facility; a prewired broadcast cabling system along with state of the art video replay and scoreboard systems. An innovative crowd surveillance system designed by Wrightson, Johnnson, Haddon & Williams, Inc. personnel is utilized here for the first time. In March 2001, WJHW undertook a series of security system and broadcast renovations. In 2002, WJHW was engaged to design upgrades to the sound and video systems.



M&T Bank Stadium

Baltimore, Maryland

Baltimore is now home to a NFL team for the first time since the Colts left the city. The Ravens play in the $223 million, 68,400 seat stadium which opened on September 6, 1998. The stadium has 7,500 club seats and 108 luxury boxes, with 2,396 seats total. Wrightson, Johnson, Haddon & Williams, Inc. designed the sound, video, broadcast, scoreboard and acoustical systems for the building.

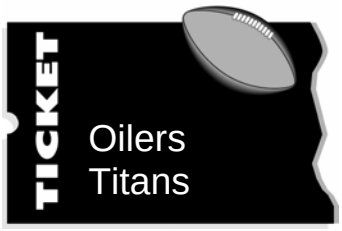
WJHW

Wrightson Johnson Haddon & Williams, Inc.

The SkyDome

Toronto, Ontario, Canada

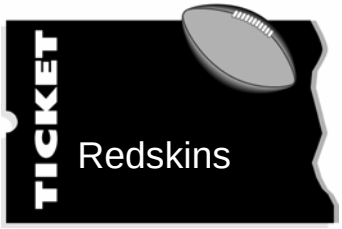
This exciting building, which was completed and opened in June of 1989, at a cost of $382.6 million (CD), is the first domed stadium in the world with a fully retractable roof. The stadium seats more than 60,000 including 161 luxury suites and 5,700 club seats. Each suite has a seating capacity of 16-22 seats. The stadium can also be configured for football, baseball, basketball, and many other special functions by using a fully featured exhibition floor. Popular music and touring opera have been successfully performed in this versatile space. The Stadium is home to the American League's Toronto Blue Jays and the Canadian Football League's Argos. Wrightson, Johnnson, Haddon & Williams, Inc. staff was responsible for the design of the building's acoustical envelope.



Nashville Coliseum

Nashville, Tennessee

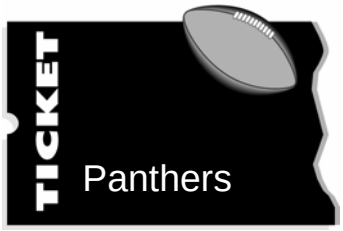
With the move of the Houston Oilers to Nashville, Wrightson, Johnson, Haddon & Williams, Inc. was selected to design the sound, video, broadcast, scoreboard and acoustical systems for the new $292 million, 68,400 seat stadium, which opened on August 27, 1999. This includes 156 suites and 11,800 club seats. Each suite has a seating capacity of 16-18 seats. Completed and opened on September 12th 1999, the Tennessee Titans now call Nashville home. The facility features 144 suites and 11,700 club seats. The coliseum is also home for the local Tennessee State University Tigers, which uses the lower 28,000-seat bowl for most of their games.



FedEx Field

Landover, Maryland

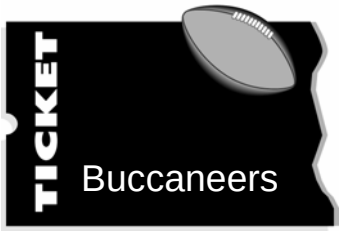
This new $250.5 million stadium was successfully opened on September 14, 1997. It is the new home of the NFL's Washington Redskins. Wrightson, Johnson, Haddon & Williams, Inc. designed the video, broadcast, scoreboard and acoustical systems for the building. The new stadium seats 78,600, including 15,000 club seats and 281 suites on two levels. There are a total of 4,280 suite seats.



Bank of America Stadium

Charlotte, North Carolina

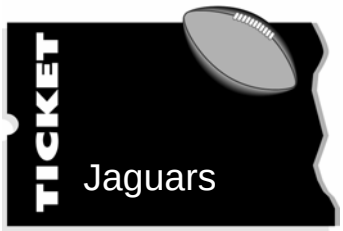
This $248 million facility opened in August of 1996. The stadium is the home for the Carolina Panthers of the NFL. Seating capacity is 72,685, including 11,358 club seats and 158 party suites. Each suite has a seating capacity of 10-40 seats. Wrightson, Johnson, Haddon & Williams, Inc. provided scoreboard and video display design and negotiation consultation in addition to designing the stadium distributed TV and sound reinforcement system.



Raymond James Stadium

Tampa, Florida

Opening to a sell-out crowd on September 20, 1998, this new, $168.5 million stadium seats 75,000, including 12,000 club seats and 195 luxury suites. Each suite has a seating capacity of 8-32 seats. Raymond James Stadium is home to the Tampa Bay Buccaneers of the NFL. Wrightson, Johnson, Haddon & Williams, Inc. designed the sound, video, broadcast, scoreboard and acoustical systems for the stadium.

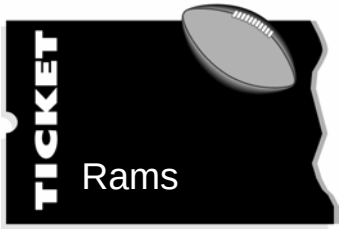


Altel Stadium

Jacksonville, Florida

The new $138 million stadium was built on the site of the demolished Gator Bowl. The stadium is home to the Jacksonville Jaguars, one of the two expansion NFL franchises awarded for the 1995-96 season. The inaugural game was played August 18, 1995. The stadium seats 73,000 for NFL games and 82,000 for college games, including 10,500 club seats and 91 luxury suites. Each suite has a

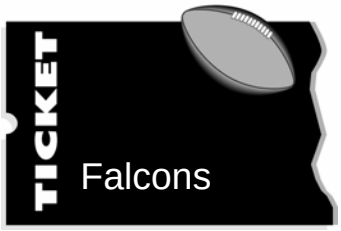
seating capacity of 16, 24 or 50 seats. Wrightson, Johnson, Haddon & Williams, Inc. was responsible for the design of the sound and distributed TV systems as well as the acoustics of interior spaces.



Edward Jones Dome

St. Louis, Missouri

This $290 million multipurpose domed stadium located in downtown St. Louis serves both spectator sports and the convention needs of the area. The facility, which opened in 1995, is home to the St. Louis Rams of the NFL, seats approximately 67,000, including 6,300 club seats and 124 luxury suites. Each suite has a seating capacity of 10-28 seats. The sound system provides coverage to the spectator seating area during sporting events and onto the floor to meet the needs of exhibitors when the building is used for conventions or exhibits. When in the Exhibits mode, the building provided 185,000 square feet of exhibit space plus 40,000 square feet of meeting rooms and support space. Broadcast video systems and distributed video systems are key functional elements of the building.



Georgia Dome

Atlanta, Georgia

This $214 million stadium which opened in 1992, is the home of the Atlanta Falcons of the NFL. The stadium seats 71,500 for football, including 5,600 club seats and 203 luxury suites. Each suite has a seating capacity of 16-24 seats. The facility is part of the Georgia World Congress Center and hosts exhibitions, concerts and large plenary sessions. The sound system was designed by Ron Baker and the acoustics by Jack Wrightson.

Veterans Stadium

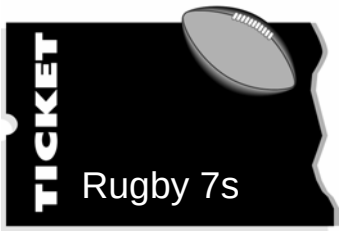
Philadelphia, Pennsylvania

Wrightson, Johnson, Haddon & Williams, Inc. designed a new sound system for this $49.5 million, two-team facility. The stadium has a seating capacity of 62,600, including 89 suites and 1,348 club seats. Each suite has a seating capacity of 12-30 seats. Both the MLB Philadelphia Phillies and the Philadelphia Eagles of the NFL call "The Vet" home. The existing sound system proved inadequate to meet the current production styles of the teams. The system was designed to install in a "fast-track" manner to be operational in time for the 1996 MLB All Star game.

Hubert H. Humphrey Metrodome

Minneapolis, Minnesota

The sound reinforcement system, which was originally installed prior to the opening of the stadium in 1982, was judged by the owner to be inadequate for their present day needs. In 1995 Wrightson, Johnson, Haddon & Williams was commissioned to prepare the design for a new system. The new system, operational in time for the Minnesota Twins home opener in April 1996, features a distributed loudspeaker arrangement. The stadium seats 64,000 for football and 55,000 for baseball, including 115 suites. Each suite has a seating capacity of 12-18 seats. The $75 million Metrodome is also home to the Minnesota Vikings of the NFL and the University of Minnesota Gophers.



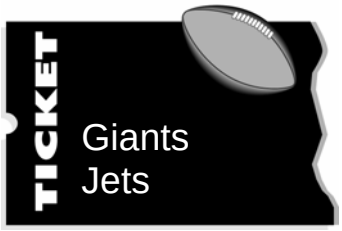
Hong Kong Stadium

Hong Kong

Total spectator seating for this facility, which opened in 1995, is 40,000. Expansive upper decks on both the east side and west side of the stadium provide seating for a total of 18,000 fans. Fifty private suites and 4,000 club seats are also part of the facility. Rugby and soccer are the principal activities taking place in Hong Kong Stadium. The building is prewired for broadcast video and incorporates a state of the art video surveillance system. The sound system was designed to be sympathetic to the environmental concerns of the surrounding community. Wrightson, Johnson, Haddon & Williams, Inc. provided the design for each of these systems.

WJHW

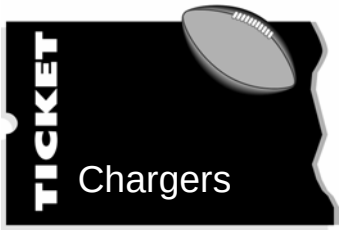
Wrightson Johnson Haddon & Williams, Inc.



Giants Stadium

East Rutherford, New Jersey

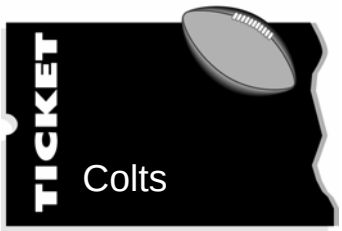
The existing sound system in this well known $68 million Meadowlands Stadium had served since the initial construction of the facility. Since then, age and the advent of new technology combined to fuel the desire to upgrade the outdated sound system. Wrightson, Johnson, Haddon & Williams, Inc. designed a new distributed sound reinforcement system to replace the old, technology central cluster system. Coverage is also provided to the suite addition, which includes 119 suites and 124 club seats. Each suite has a seating capacity of 10-30 seats.



Qualcomm Stadium

San Diego, California

Design recommendations were prepared for this $27 million Southern California facility for the Vyvx Choice Seat interactive display system by Wrightson, Johnson, Haddon & Williams Senior Associate, Jim Faber. The stadium has 112 suites and 7,800 club seats. There are 2,135 club seats in the infield and 1,770 club seats in the outfield. Each suite has a seating capacity of 8-36 seats.



RCA Dome

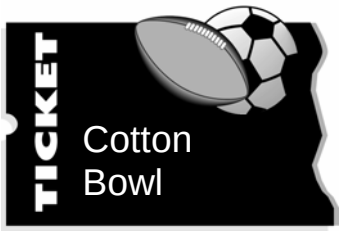
Indianapolis, Indiana

Wrightson, Johnson, Haddon & Williams participated in the $20 million renovation of the RCA Dome by providing design recommendations for the upgrade of the sound and video systems. The stadium is complete with 104 suites and 5,000 club seats. Each suite has a seating capacity of 12-36 seats. The project was completed in 1999.

Busch Stadium

St. Louis, Missouri

Busch Stadium had an old sound reinforcement system that was the object of continued fan and management complaints. It consisted of an old technology cluster system in center field. The system was replaced by a distributed speaker system which placed loudspeakers around the stadium to increase the uniformity of coverage onto the spectator seating areas, and to effectively improve the overall fidelity of the system. Ron Baker and Jack Wrightson designed the system. Busch Stadium has 67 luxury suites and 225 club seats. Each suite has a seating capacity of 12-24 seats.



Cotton Bowl

Dallas, Texas

This building, located in Fair Park near downtown Dallas, is host to the annual Cotton Bowl classic, the great annual Texas-OU rivalry, the Southern Methodist Mustangs, and numerous other sporting competitions. The current seating capacity is approximately 72,000 chair-back seats for football and 68,252 seats for soccer. A new sound system was designed to provide better coverage and fidelity into the spectator, press and VIP areas while also improving the television networks' ability to show action occurring on the field.

Sam Boyd Stadium

Las Vegas, Nevada

Design work began in 1998, which resulted in the addition of 12,000 seats to the University of Nevada Las Vegas facility. The current seating is 43,500. Wrightson, Johnson, Haddon and Williams provided recommendations for seating bowl sound and TV broadcast system design as well as for general acoustical recommendations throughout the facility.

WJHW

Wrightson Johnson Haddon & Williams, Inc.

University of Oklahoma Football Stadium

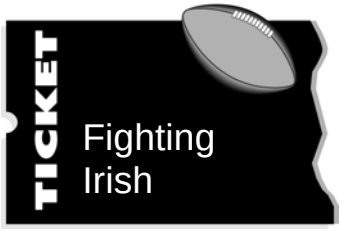
Norman, Oklahoma

Wrightson, Johnson, Haddon & Williams designed a video surveillance system for the stadium, which will give security personnel the ability to monitor activities in and around the stadium as well as in the hall of fame. In 2001, design recommendations were made for sound system and video board improvements.

Pro Player Park

Miami, Florida

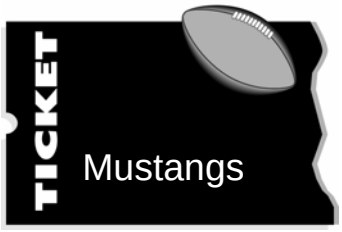
Built originally as the home of the NFL's Miami Dolphins, at a cost of $145 million, the park opened in 1987. The stadium was renovated in 1993 when awarded an MLB franchise, the Florida Marlins. Current seating capacity is 74,916 for football and 47,662 for baseball, including 183 suites and 10,200 club seats. Each suite has a seating capacity of 12-36 seats. Ron Baker designed the original sound reinforcement system and was later responsible for the baseball upgrades including those made to the press area.



University of Notre Dame

Notre Dame, Indiana

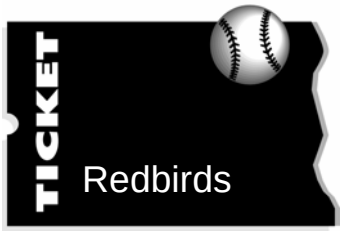
A major expansion of the stadium was undertaken in 1995. Approximately 20,000 seats were added to the stadium to increase the total seating to approximately 80,000. Wrightson, Johnson, Haddon & Williams, Inc. was contacted and invited to participate in the renovation by redesigning the sound system. The new system, operational in time for the Fighting Irish home opener in September 1997, is a central cluster system located on the pressbox.



Gerald J. Ford Stadium, Southern Methodist University

Dallas, Texas

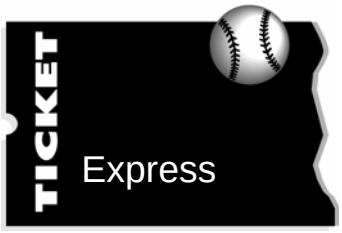
The new Gerald J. Ford Stadium was built on a site formerly occupied by Ownby Stadium. The 32,000 seat stadium (expandable to 45,000) is the centerpiece of a $56.8 million complex which includes a 72,000 square foot All-Sports center. The stadium includes bleacher back seats, 24 suites, and 600 club seats. The facility was completed in for the Mustangs home opener in September 2000. WJHW provided the design for the sound, broadcast and distributed video systems.



Autozone Park

Memphis, Tennessee

Opened in April of 2000, Autozone Park is home to the AAA Memphis Redbirds. The stadium, which cost $46 million, seats 12,100 including 9,000 armchair seats, 1,000 bleacher seats, 2,100 left-field grass berm seats, 1,500 club seats, and 46 suites. WJHW provided design recommendations for the sound, broadcast, distributed video, scoreboard, coaching video, replay and security systems. Additionally, coordination of all low voltage systems was provided. The sound system is of a distributed configuration and includes the seating bowl and other stadium related spaces as well as the parking garage and the retail/festival spaces.



Dell Diamond

Round Rock, Texas

Owned by former major league ace, Nolan Ryan, the Round Rock Express began playing in their new $25 million, 11,000 seat home on April 16, 2000. 7,816 permanent seats are part of the facility including 24 private suites and three 75-person party suites, 500 bleacher seats, berm seating in the outfield for another 2,700 fans, as well as a 10,000-square-foot conference center. WJHW designed the sound, distributed television, broadcast-cable provisions, acoustics and scoreboard system.

WJHW

Wrightson Johnson Haddon & Williams, Inc.

P&C Stadium

Syracuse, New York

P&C Stadium opened on April 3, 1997. The $32 Million facility seats11, 115, including 14 suites. The stadium is the new home of the SkyChiefs, an AAA team in the International League. The sound system utilizes a central loudspeaker cluster located beyond the outfield fence.

Essex County Sportsplex

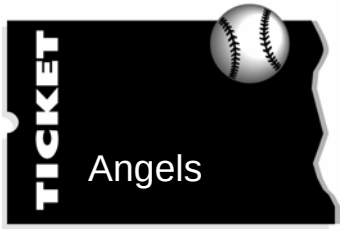
Newark, New Jersey

Completed in spring of 2002, the Essex County Sportsplex serves as a dual purpose stadium providing seating for 6,000 on the baseball side and another 6,000 on the soccer side. The baseball side contains 22 suites. Wrightson, Johnson, Haddon & Williams, Inc., designied the sound reinforcement systems and provided recommendations for the broadcast cable provisions. The sound system is distributed on the baseball side and a central cluster on the soccer side.

Peoria Sports Complex

Peoria, Arizona

This facility is the spring training home for the San Diego Padres and Seattle Mariners. Wrightson, Johnson, Haddon & Williams, Inc. provided the sound system, distributed TV system design, and acoustical/noise control consulting. The stadium opened in April 1994 and seats 10,000.



Tempe Diablo Stadium

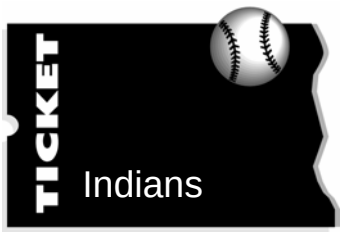
Tempe, Arizona

Opened in April of 1993, Tempe Diablo Stadium is the spring training home for the California Angels of the American League. The stadium seats 6,500 and utilizes a central cluster-type sound system located in the outfield. Included within the building is a press and media area.

Scottsdale Stadium

Scottsdale, Arizona

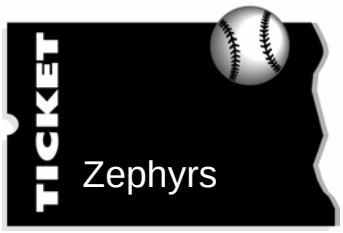
This facility, which was opened in April 1992 at a cost of $8 Million, seats 9,000: 5,000 in the main bowl, 2,000 on bleachers and another 2,000 on the surrounding berms. The San Francisco Giants use the facility for spring training and the City of Scottsdale utilizes the facility for municipal events including games played by rookie league teams. Environmental noise issues were addressed early so that the sound system design is sensitive to community noise issues.



Victory Field

Indianapolis, Indiana

This new facility which opened on July 11, 1996, at a cost of $18 Million is the new home to the Indianapolis Indians of the AAA American Association. The building seats 13,600 with berm seating for an additional 3,000. Included also are 29 suites and 2 party decks. WJHW provided the design for the distributed sound reinforcement system and for building's broadcast cable provisions.



Jefferson Baseball Park

Kenner, Louisiana

This $20 Million stadium which opened on April 11, 1997, was built to seat 10,500 initially with expansion capability to 15,000. In addition to being the new home of the New Orleans Zephyrs of the AAA American Association, the facility will be used for collegiate baseball, MLB exhibition games and concerts. 16 suites are part of the building. WJHW designed a distributed sound system for the building.

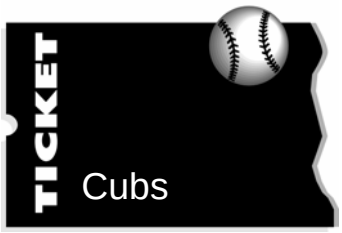
WJHW

Wrightson Johnson Haddon & Williams, Inc.

Joseph P. Riley, Jr. Stadium

Charleston, South Carolina

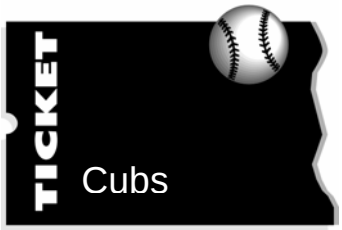
This new stadium, which opened on April 7, 1997, is the home to the Charleston RiverDogs of the AA South Atlantic League. Seating is 5,000. Wrightson, Johnson, Haddon & Williams, Inc. work includes design of the distributed sound reinforcement system and the scoreboard.



Principal Park

Des Moines, Iowa

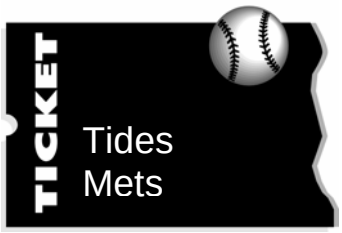
This $10 Million stadium which opened in April 1992, seats 10,500 and is home to the AAA Iowa Cubs of the American Association. The building contains 32 suites and 2 concourses. As with many stadiums of this size, a concern during design existed for the noise, which would impact the surrounding community from the building sound system. The system, which is of the central cluster type with distributed loudspeakers in various ancillary areas.



HoHoKam Stadium

Mesa, Arizona

Opened on February 28, 1997, this 10,000-seat facility is on the site of the old HoHoKam Park. The $12 Million building is the spring training home of the National League's Chicago Cubs. Wrightson, Johnnson, Haddon & Williams, Inc. designed a distributed sound reinforcement system to serve the spectator seating area of the stadium as well as systems to accommodate the press area.



Harbor Park

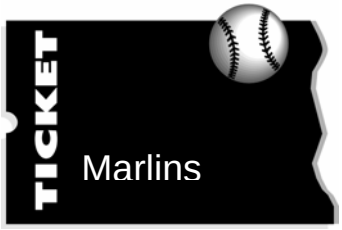
Norfolk, Virginia

Harbor Park is the home of the Norflolk Tides, an AAA team in the International League. The team is part of the New York Mets organization. The $13 Million stadium opened in 1993, and seats 12,000 on two levels and includes 22 suites and a 300-seat club. Wrightson, Johnnson, Haddon & Williams, Inc. designed a distributed sound system that was installed in the building.

City of Palms Park

Fort Myers, Florida

The City of Palms Park is the spring training home of the Boston Red Sox. Completed in April of 1993, at a cost of $13.4 million, the facility seats 7,000. WJHW designed a distributed sound system for the spectator seating areas of the building as well as the sound systems serving the pressbox, the concourses, the clubhouse and the administrative areas.



Florida Marlins Spring Training Facility

Cocoa Beach, Florida

In 1993, Wrightson, Johnson, Haddon & Williams, Inc. developed the sound system design for the new sound system in the building when the original design/build specification proved inadequate for the Marlins needs.

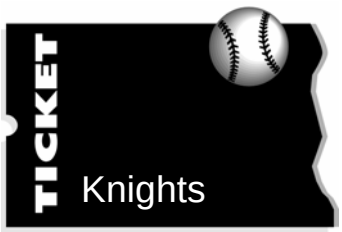
Durham Bulls Ballpark

Durham, North Carolina

The ballpark opened on April 6, 1995, and is home to the Durham Bulls, an A-team in the Carolina League. The new $16 Million stadium seats 7,500 and is designed to allow for future expansion to 10,000. Included are 12 skyboxes. The building utilizes a distributed sound system designed by Wrightson, Johnson, Haddon & Williams.

WJHW

Wrightson Johnson Haddon & Williams, Inc.



Charlotte Knights Stadium

Charlotte, North Carolina

Known as the "Knights Castle", this minor league stadium features an outfield central-cluster sound system. The stadium seats 10,000. The sound system was completed for the 1989 season and transferred from the Knights temporary field to the new stadium for the opening of the 1990 season.

Tucson Electric Park

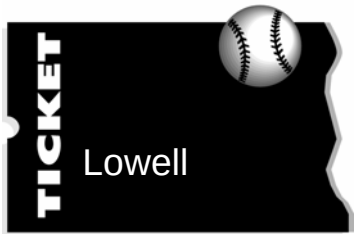
Tucson, Arizona

The inaugural game was played in this new facility on February 27, 1998. Tucson Electric Park is the spring training home to the Chicago White Sox, the Colorado Rockies and the Arizona Diamondbacks. The stadium seats 11,000 and includes 8 suites. Wrightson, Johnson, Haddon & Williams, Inc. designed a distributed loudspeaker system for the building.

Roger Dean Stadium

Jupiter, Florida

The St. Louis Cardinals and the Montreal Expos utilize this $25 Million facility for their spring training. The opening game was played on February 28, 1998. Seating is provided for 7,500 with another 2,500 fans accommodated in the berm seating areas. Included also are 6 suites. Wrightson, Johnnson, Haddon & Williams, Inc. designed a distributed loudspeaker system for the building.



Edward A. LeLacheur Park

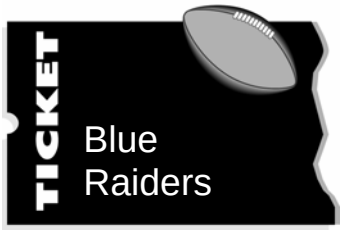
Lowell, Massachusetts

Opened in April 1998, this $7 Million stadium seats 6,000 and is home to the Lowell Spinners, an "A" minor league team. Spectator seating for 6,000 is provided. Wrightson, Johnnson, Haddon & Williams, Inc. designed a central-cluster loudspeaker sound reinforcement system for the stadium.

Rutgers University Stadium

East Brunswick, New Jersey

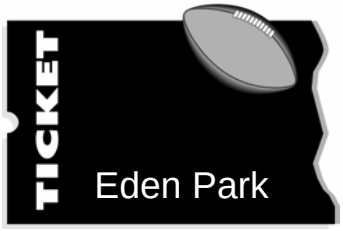
In 1992, Wrightson, Johnson, Haddon & Williams, Inc. engaged to design a sound reinforcement system for the campus football stadium expansion. In addition to the spectator-seating bowl, coverage was extended to include the concourses, restrooms and other support areas.



Middle Tennessee State University Stadium

Murfreesboro, Tennessee

Completed in time for the opening of the 1998 football season, this $25 Million stadium renovation exceeds the 30,000 seating capacity required by NCAA for its Division 1-A teams. The capability exists for an eventual expansion to 70,000. 16 suites are part of the facility. Wrightson, Johnson, Haddon & Williams, Inc. designed the sound reinforcement system for the stadium. In addition, Wrightson, Johnson, Haddon & Williams, Inc., was responsible for the design of the distributed TV, scoreboard and security systems as well as for the broadcast provisions and the acoustics and noise control.

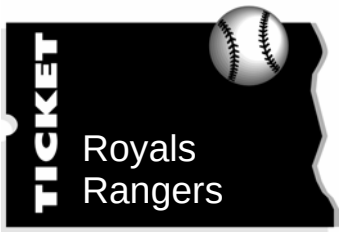


Eden Park

Aukland, New Zealand

Wrightson, Johnson, Haddon & Williams, Inc. assisted the Eden Park Trust Board in developing a master plan to upgrade the sound system at this world-renowned rugby and cricket facility. The first phase of the sound system upgrade was energized during 1999, with the completion of the new north stand seating 20,000. This north stand includes numerous luxury suites, as well as an extensive club lounge that functions as a dining and ballroom space for up to 1,000 patrons. Eden

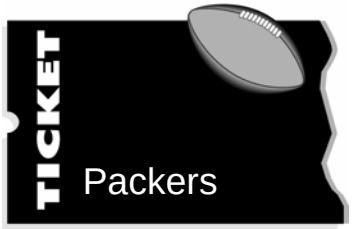
Park, Built in a special public use zone, has stringent environmental noise restrictions applied to the design and operation of its sound system.



Kansas City Royals/Texas Rangers Spring Training Facility

Surprise, Arizona

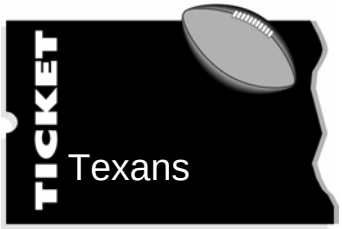
This $45 million facility will serve as the spring training home to both the Kansas City Royal and the Texas Rangers. The shared use arrangement calls for both teams to move out of their present respective homes in Florida. Opening of the facility was in 2002. Wrightson, Johnson, Haddon and Williams is responsible for design of the sound, broadcast, distributed television, scoreboard and acoustical systems.



Lambeau Field

Green Bay, Wisconsin

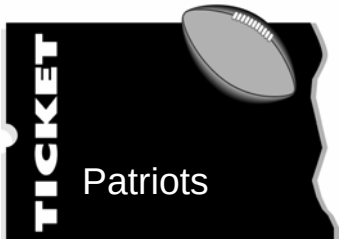
This facility was originally built in 1957. Recently renovations were undertaken to upgrade the entire facility. Completed in August 2003, the stadium will now seats approximately 71,000. The improvements cost an estimated $295 million. Included are 198 suites and 6,300 club seats. Each suite has a seating capacity of 14 seats. Lambeau Field is home to the Green Bay Packers of the National Football League. WJHW was responsible design of the sound, distributed video, broadcast cable, satellite downlink, coaching video and video surveillance systems.



Reliant Stadium

Houston, Texas

With the opening of Houston's new NFL stadium, the nation's 4th largest city is once again home to an NFL team. At a cost of $367 million, this domed facility has a retractable roof structure and natural grass. The first game played in the new stadium was on September 8, 2002. The Houston Texans beat the Dallas Cowboys by a score of 19 -10. The facility is home to the Harris County-Houston Sports Authority, the Texans of the National Football League and the Houston Livestock Show and Rodeo. Seating capacity is 69,560. This includes 78 lower and 88 upper luxury suites with specialty bars and dining areas, 8,000 club seats, and future end zone Halo suites. WJHW was responsible design of the sound, distributed video, broadcast cable, satellite downlink, coaching video, scoreboards and video surveillance systems.



Gillette Stadium

Foxboro, Massachusetts

Completed in the fall of 2002, this $325 million facility seats approximately 68,000, including 42 suites. Each suite has a seating capacity of 8-20 seats. Gillette Stadium is home to the New England Patriots of the National Football League. WJHW was responsible design of the sound, distributed video, broadcast cable, satellite downlink, coaching video, scoreboards and video surveillance systems

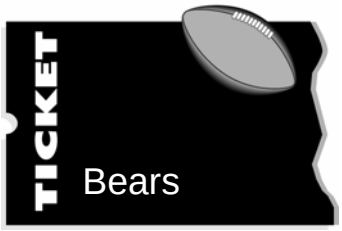
Grande Communications Stadium
First American Bank Ballpark

Midland, Texas

Opened in 2002, the Scharbauer Sports Complex consists of two separate stadiums. The football stadium is home to high football and soccer events and the baseball stadium is home to the Class “A” Midland Rockhounds. It features a large concourse and an open concession area that allows spectators to remain close to the game. It seats 15,000 seat with an additional 3,000 berm seats, a club seat section and suites. The cost for the entire project was $35 million. The baseball stadium seats 6,500 including 12 suites. WJHW was responsible for a distributed sound system at the baseball stadium an endzone cluster for the football stadium and DTV, broadcast cabling, for both stadiums.

WJHW

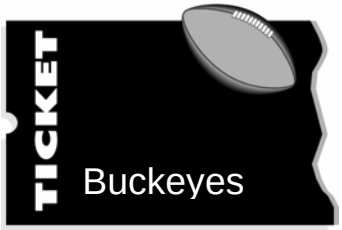
Wrightson Johnson Haddon & Williams, Inc.



Soldier Field Renovation- Chicago Bears Stadium

Chicago, Illinois

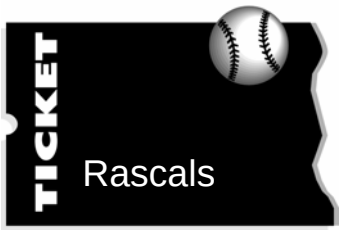
At a cost of $365 million, the renovated stadium, home to the Chicago Bears of the National Football League, occupies the same footprint as it did prior to the renovation. The facility opened in September 2003. Seating capacity is now 63,000, including 133 suites - with typical seating of 20, 8600 club seats and a 10,000 sq. ft. club lounge. WJHW was responsible for design of the sound, distributed video and television broadcast systems as well as for the scoreboards.



Ohio Stadium
Ohio State University

Columbus, Ohio

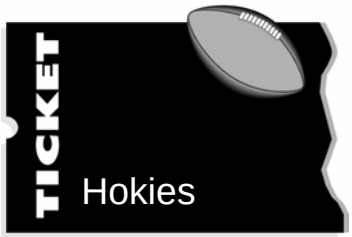
Home to the Buckeyes of the Big 10, Ohio Stadium has undergone a major renovations. Seating has been increased from 89,000 to 99,000 and significant improvements have been made to the press facilities. The $187 million renovation opened in August 2001. WJHW was responsible for sound, distributed video, broadcast, low voltage cable design as acoustics/noise control.



T. R. Hughes Ballpark

O'Fallon, Missouri

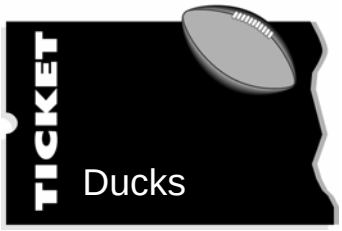
Opened June 1999, the stadium is home to the River City Rascals, a Class-"A" baseball team of the independent Frontier League. The sound system design started as an outfield cluster but was changed the next year to a distributed system because of noise concerns of the neighbors who were only a couple of 100 yards away. WJHW was responsible for the design of the sound system. The stadium seats approximately 5,000 and contains 10 - 12 "tent suites" along the 3rd base line.



Virginia Tech

Blacksburg, Virginia

Home to the Virginia Tech Hokies, the renovation of Lane stadium is scheduled to be complete in the fall of 2004. The cost of the renovation is estimated at $37 million. Seating is 66,000, including 51 suites and 2361 club seats. WJHW is responsible for design of the sound system in the new suites and press boxes, the RF distribution infrastructure and broadcast cable infrastructure.



Autzen Stadium
University of Oregon

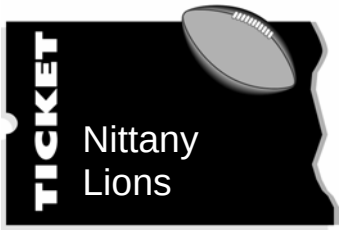
Eugene, Oregon

Opened in 2001, the overall project increased seating from 43,000 to 55,000. Autzen stadium is home to the Ducks of the PAC 10. The budget for renovations was $80 million. WJHW responsibilities included sound systems, distributed television, broadcast cable systems, acoustics/noise control as well as design of the radio control center and the video surveillance system.

Richmond County Bank Ballpark at St. George

Staten Island, New York

Successfully opened in June 2001, this stadium is home to the New York-Penn League Class A Staten Island Yankees and cost an estimated $29.5 million. The ballpark is located right on the water looking toward Manhattan Island, the World Trade Center, and the Statue of Liberty. The batter's eye retracts between innings so fans can enjoy the view. It seats 7,500, including 21 suites. WJHW was responsible for the design of the sound system.



Penn State Beaver Stadium

University Park, Pennsylvania

At a cost of $95 million, the expansion of this home to the Big 10 Nittany Lions was completed in the fall of 2001. Seating capacity has been increased from 97,000 to 108,000, and includes 104,000 permanent seats, 60 skybox suites, 4,000 club seats, and a 28,000-square-foot Mt. Nittany Lounge. WJHW was responsible for design of the sound system in the bowl, interview room, and suites, RF distribution in suites and new grandstand structure, broadcast conduit infrastructure in the new addition and seating bowl surveillance cameras.

Fresno AAA Ballpark

Fresno, California

At a cost of $28.5 million, this facility was completed in spring 2002. The facility is home to the Fresno Grizzlies, and will seats 15,000, including 35 suites. WJHW was responsible for the design of the sound system (an outfield cluster), the distributed television system and for the broadcast cable provisions.

Jack Wrightson

Principal

Jack Wrightson is a founding Principal of Wrightson, Johnson, Haddon & Williams, Inc. He directs the sound system design activities on all of the projects and manages the work of the firm on large sports facilities and public assembly projects. Jack personally guides and participates in the firm's activities on these efforts to ensure meeting project milestones and maintaining accurate and timely communication with the project team.

Experience

Jack Wrightson has extensive experience in sports and public assembly work. He has worked in the field of acoustics since 1978. He specializes in assessing the needs of owners and tenants prior to design efforts. His association with sports events and their venues has given him deep insight into the technical problems and requirements of high quality presentations and promotions. Jack oversees Wrightson, Johnson, Haddon & Williams, Inc.'s work on sound systems, acoustics, and noise control, and the environmental noise impact of outdoor events.

Education and Professional Associations

Bachelor of Arts in Biopsychology, Rutgers University; 1977

Master of Science in Psychoacoustics, University of Wisconsin - Milwaukee; 1981

Master of Business Administration, Southern Methodist University; 1991

Acoustical Society of America

Audio Engineering Society

Contributing Editor, *Sound & Video Contractor* Magazine

Representative Projects

Jack has extensive experience in sound system design and project management for a broad base of clientele. Examples of his work include:

Boston College, Conte Forum, Boston, Mass.
Western Kentucky University, Diddle Arena, Bowling Green, Kentucky
University of California Davis Stadium; Davis, California
New Mexico State University Arena; Las Cruces, New Mexico
United States Naval Academy Stadium; Annapolis, MD
Memorial Stadium Renovation, Georgia Tech; Atlanta, Georgia
Ross Ade Stadium Expansion, Purdue University; Lafayette, Indiana
University of Oklahoma Football Stadium, Norman, Oklahoma
University of Notre Dame, Notre Dame, Indiana
Gerald J. Ford Stadium, Southern Methodist University, Dallas, Texas
Rutgers University Stadium, East Brunswick, New Jersey
American Airlines Center, Dallas, Texas
PSINet Stadium, Baltimore, Maryland
Enron Field, Houston, Texas
Ericsson Stadium, Charlotte, North Carolina
FedEx Field, Landover, Maryland
Gaylord Entertainment Center, Nashville, Tennessee
National Car Rental Arena, Sunrise, Florida
Ford Field, Detroit, Michigan
New Seattle Football Stadium, Seattle, Washington
Xcel Energy Center, St. Paul, Minnesota
Pepsi Center, Denver, Colorado
PNC Park, Pittsburgh, Pennsylvania
Rose Garden, Portland, Oregon

WJHW

Wrightson Johnson Haddon & Williams, Inc.

Chris Williams
Principal

Chris Williams is one of the four founding Principals of Wrightson, Johnson, Haddon & Williams, Inc., His specialty is the design of electronic presentation systems for corporate, commercial and educational facilities, as well as for arenas and stadia. His work involves: multi-media systems design, video projection and display systems, television and broadcast video systems design and provisions, distributed video systems and scoreboard video design.

Experience

Chris Williams has provided broadcast consulting and video system design for many contemporary sports venues in this country and abroad. Since 1978, he has worked in many aspects of video systems design and operation. He has prepared programming studies, design recommendations and detailed design documentation for a wide range of video, multi-media and teleconferencing systems, for corporate clients as well as the specialized sports and public assembly facilities markets.

Recently Chris completed the unique wide screen replay systems used by the Tampa Bay Buccaneers at Raymond James Stadium. Other venues where 16x9 design has occurred are for the Kansas City Chiefs, the Cleveland Browns, at Turner Arena and at Air Canada Centre.

Education and Professional Associations

Bachelor of Science in Electrical Engineering, University of Texas at Arlington, 1983

Advanced Seminars in Electroacoustic Systems

Society of Motion Picture and Television Engineers

Representative Projects

Chris has extensive experience in video system design and project management for a broad base of clientele. Examples of his work include:

Middle Tennessee State University Stadium, Murfreesboro, Tennessee
Ohio Stadium, Ohio State University, Columbus, Ohio
Virginia Tech, Blacksburg, Virginia
Autzen Stadium, University of Oregon, Eugene, Oregon
Penn State Beaver Stadium, University Park, Pennsylvania
Phillips Arena, Atlanta, Georgia
American Airlines Center, Dallas, Texas
Air Canada Centre, Toronto, Ontario, Canada
American Airlines Arena, Miami, Florida
FedEx Field, Landover, Maryland
Corel Center, Ottawa, Canada
Ericsson Stadium, Charlotte, North Carolina
Hong Kong Stadium, Hong Kong
Jacobs Stadium, Cleveland, Ohio
Gaylord Entertainment Center, Nashville, Tennessee
National Car Rental Arena, Sunrise, Florida
Nationwide Arena; Columbus, Ohio
New Comiskey Park, Chicago, Illinois
Orioles Park at Camden Yards, Baltimore, Maryland
Pacific Bell Park, San Francisco, California
Pepsi Center, Denver, Colorado
Raymond James Stadium, Tampa, Florida
Rose Garden, Portland, Oregon
Xcel Energy Center, St. Paul, Minnesota
Staples Center, Los Angeles, California

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Gary White

Senior Associate

Mr. White is responsible for developing and refining the initial parameters, as well as the design and final documentation for sound systems, which are installed in stadia of various sizes and configurations. He has provided sound system designs for both new facilities and for renovations of existing facilities.

Experience

Mr. White has been designing sound reinforcement systems for the past 21 years. This experience has enabled him to advance and enrich his skills in project management as well as in the design of electronic systems.

Gary works closely with clients to assess their needs and requirements. Taking this information, he then develops systems which meet the expectations of the users. He is involved throughout the entire design and construction process from system programming, design development, specification writing, construction administration, final testing and equalization.

Education and Professional Associations

Baylor University, Scientific Studies, 1974-1978

University of Texas at Dallas, Additional Studies, 1979-1980

Technical Seminars, Sound System Design

Representative Projects

Gary has extensive experience in sound system design and project management for a broad base of clientele. Examples of his work include:

Albuquerque AAA Ballpark, NM
Alltel Stadium, Jacksonville, FL
AutoZone Park, Memphis, TN
Ballpark at St. George, Staten Island, NY
Bobby Dodd Stadium, Georgia Tech, Atlanta, GA
Brighthouse Field, Clearwater, FL
Carolina Stadium, Charlotte, NC
Charleston Stadium, Charleston, SC
Conseco Fieldhouse, Indianapolis, IN
Dell Diamond, Round Rock, TX
Durham Bulls Stadium, Durham, NC
Edward A. LeLacheur Park, Lowell, MA
Essex County Sportsplex, Newark, NJ
Fresno AAA Ballpark, Fresno, CA
Gerald J. Ford Stadium, SMU, Dallas, TX
Giant Center, Hershey, PA
HoHoKam Park, Mesa, AZ
Husky Stadium, University of Washington, Seattle, WA
Jacksonville Arena, Jacksonville, FL
Jacksonville Ballpark, Jacksonville, FL
Littlejohn Coliseum, Clemson University, Clemson, SC
Mississippi River National Education and Conference Center, Dubuque, IA
Montgomery Riverwalk Stadium, Montgomery, AL
Nationwide Arena, Columbus, OH
New Orleans Arena, New Orleans, LA.
Norfolk Stadium, Norfolk, VA
Notre Dame Stadium, South Bend, IN
Ohio State University Stadium, Columbus, Ohio
P&C Stadium, Syracuse, NY
Paetec Park Soccer Stadium, Rochester, NY
Peoria Spring Training Facility, Peoria, AZ
Raymond James Stadium, Tampa, FL
Roger Dean Stadium, Jupiter, FL
Russ Chandler Stadium, Georgia Tech, Atlanta, GA
Ryan Center, University of Rhode Island, Kingston,
Scharbauer Sports Complex, Midland, TX
Scottsdale Stadium, Scottsdale, AZ
Seattle Stadium, Seattle, WA
Sioux Falls Civic Center, Sioux Falls, SD
Surprise Stadium, Surprise, AZ
T. R. Hughes Ballpark, O'Fallon, MO
Tempe Diablo Stadium, Tempe, AZ
Tucson Electric Park, Tucson, AZ
University of Missouri Arena, Columbia , MO
Verizon Arena, Manchester, NH
Victory Field, Indianapolis, IN
Wells Fargo Arena and Hy-Vee Hall, Des Moines, IA
World Arena, Colorado Springs, CO
Yuma Baseball Stadium, Yuma, AZ
Zephyrs Stadium, Kenner, LA

WJHW

Wrightson, Johnson, Haddon & Williams, Inc.
Designers and Planners for Sound, Video, Multi-Media, Telecommunications, Broadcast, Theatre & Acoustics

Dallas • San Antonio

fax: (248) 601-2400

November 22, 2004

Ms. Dana L. Schmitt
General Sports and Entertainment, LLC
400 Water Street,
Suite 250
Rochester, Michigan 48307

Subject: Troy Stadium
Stadium Noise Impact Review

Dear Ms. Schmitt:

At your request, we have reviewed the potential for noise impact from stadium operations from the proposed Troy Stadium located on the Civic Center site in Troy, Michigan. This review and conclusions are based on the preliminary architectural site plan and stadium design along with a copy of the City noise regulation provided by your office.

Introduction

The project is a minor league baseball stadium with seating capacity of 4300 fixed seats in the seating bowl, with a maximum capacity of 5500. It is sited with home plate facing south/south east on the southern portion of the Civic Center site, between Civic Center Drive and the Community Center. Existing residential neighborhoods are located between 800 and 1500 ft. to the north (across Town Center) and east (across Livernois) of the proposed stadium site.

There are two primary sound sources which can cause community impact from sports facilities. The first is crowd noise from the crowd cheering and responding to game action. The other is the stadium sound system. Of these two, it is our experience that complaints from neighbors are far more prevalent due to the stadium sound system rather than crowd noise. Rarely are complaints received due to crowd noise This difference in response is due to the sound system being:

- Much higher in source sound level. While the overall level measured in the seating areas may be similar for the sound system and the crowd, the acoustic power level of each of the sound system loudspeakers is much higher than an individual fan.
- The sound system is operated much more frequently at a high level. Maximum crowd noise is relatively infrequent by comparison, and tends to be brief in duration.
- Sound system programming occurs quite often during a baseball game (pre and post-game, between innings, prior to some individual at-bats, etc.) and contains speech and music, which are more easily identifiable at a distance and at low sound levels, due to information and rhythmic content.

As crowd noise is typically far less of an impact, many noise regulations specifically exempt crowd noise for athletic events. For this reason, along with its dominance in determining the perceived noise impact of the stadium, our analysis is limited to the sound system.

City Noise Level Limits

The City Zoning Ordinance (39.90.08 state that "The emission of measurable noises from the premises shall not exceed sixty-five (65) decibels as measured at the boundary property line, except that where normal street traffic noise exceed sixty-five (65) decibels during such periods, the measurable noise emanating from premises may equal, but not exceed such traffic noises." For the purposes of this report, we have focused on the impact of sound from the stadium sound system at the nearest residential property line and assumed "A" weighted dB levels, as dBA is the most common metric for community noise analysis and enforcement, worldwide.

4801 Spring Valley Road Suite 113 Dallas Texas 75244
972.934.3700 voice 972.934.3720 fax

Predicted Noise Levels

The calculated noise levels for the stadium sound system are based on the following:

- Preliminary HOK site plan and sections of the proposed stadium including upper level suite structures.
- A fully distributed loudspeaker sound system configuration, with numerous small loudspeakers mounted throughout the stadium, in lieu of an outfield or centralized speaker system which provides sound for the entire stadium from a single location. The distributed system mounts speakers to stadium structure (roof/canopy, upper level structure above open air seating, etc.). This creates a condition where the sound is being projected from behind the majority of the seats, towards the field and away from areas outside the stadium.
- Maximum source sound levels of 85-90 dBA in the seating areas. This is typical of professional baseball stadium levels
- The neighborhoods to the north and east are essentially "off axis" from the main radiation pattern of the distributed system loudspeakers.
- Field measurements of existing baseball stadiums with distributed sound systems.

These assumptions lead to projections of noise levels to the neighborhood north of the stadium to 57-59 dBA. This is for the closest homes, with direct line of sight to the stadium site. For other residences which are farther away or partially shielded from the stadium by wooded areas (such as those in the south east corner of this neighborhood), stadium sound levels should be lower.

For the residential neighborhood to the east, sound levels will be slightly higher at 59-61 dBA. This is due to the fact that the distance to the stadium is slightly less in comparison with the residences north of Town Center and that the neighborhood is more "on axis" with speakers on the 3rd base side of the stadium.

Note that this analysis does not include the impact of the existing ambient or background noise levels caused by traffic on Civic Center, Town Center and Livernois (and other surrounding roadways), which if over 65 dBA, will increase the allowable level and decrease the perceived audibility of stadium sound.

While the levels from the proposed stadium sound system are within the City limits, compliance with the City zoning standard does not guarantee that the sounds from the stadium will be inaudible in the residential areas. Depending upon the background noise level, weather conditions, etc., stadium sound may be audible at any given residence.

I trust that this information is of use. Please don't hesitate to call should you have any questions or require additional information.

Best Regards,
Wrightson, Johnson, Haddon & Williams, Inc.

Jack Wrightson
Principal

Cc: Bruce Miller – HOK S+V+E

MUSCO LIGHTING-Michigan
215 Buchanan St.
Hudson, MI 49247
PHONE: 866-269-0898
Fax: 517-448-3434
Home: 517-448-5927

Ms. Dana Schmitt
General Sports

Ms. Schmitt,

Please find attached the field light level scans and spill light scans for your potential baseball project. The spill light scans are the actual foot candle measurements 150' from the edges of the playing field. This is based on a basic design and the actual levels may vary slightly based on actual site conditions. I have also attached a product summary that describes the Musco LV-8 light control product in detail. Based on our discussion, the light levels at the homes and business's 1200' from the field will be nonexistent. Musco has designed and installed this product in many Michigan locations where spill light was a critical issue, including the University of Michigan Fisher Field Baseball Stadium, and Lansing Sexton and Everett High School Football stadiums. We are currently designing the lighting for UM Soccer and Field Hockey, which will be located within 100' of a residential area. If this project moves forward, Musco can assist with the design and specification preparation for this project to assure that the project results meet the needs of the community. Please feel free to contact me if you have further questions or require more information.

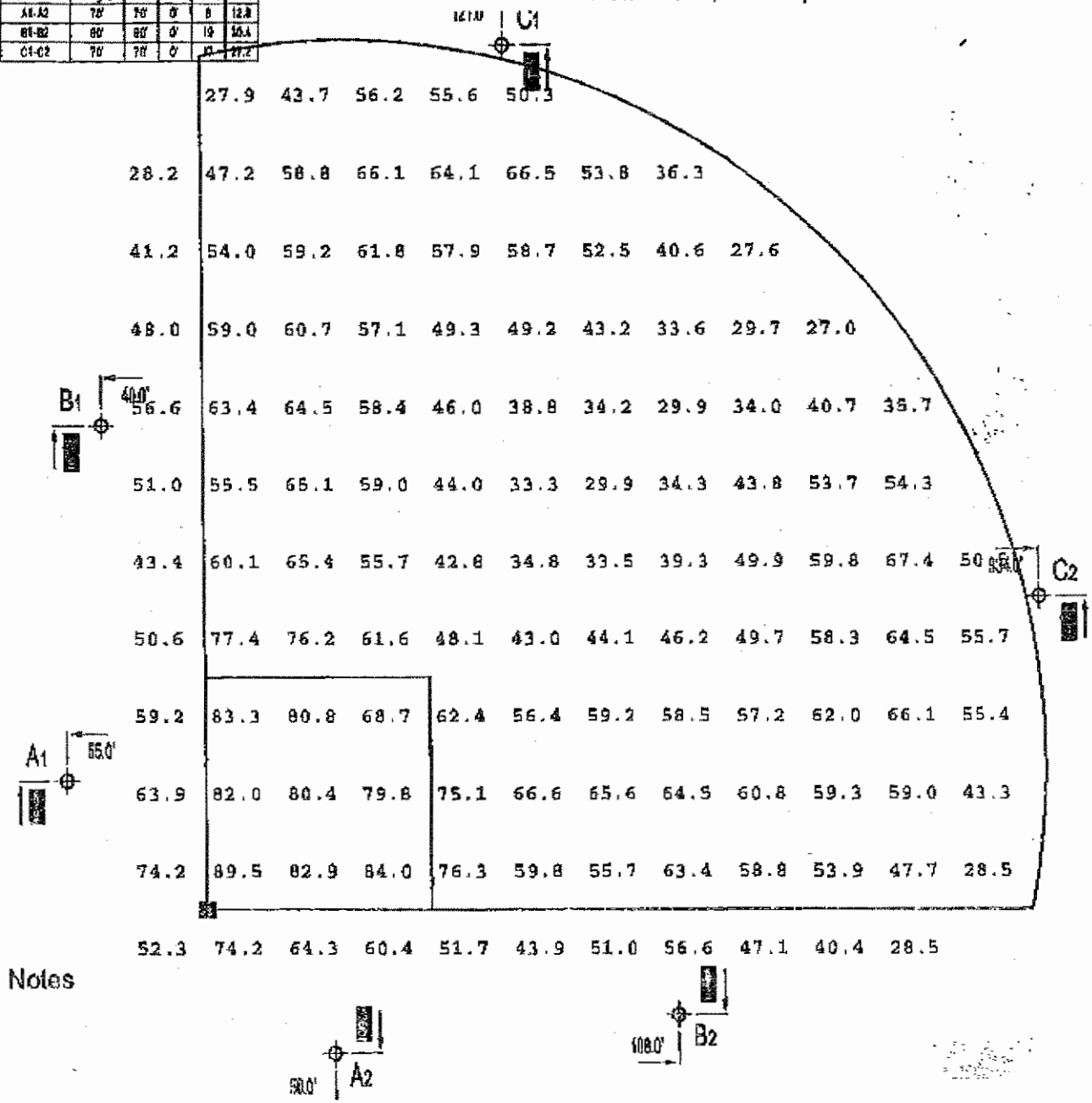
Sincerely,

Mark Knoblauch
MI Musco Rep.

Project Name, City, State

330'/360'/330', 90' Basepath

EQUIPMENT LISTING						
Pole Unit	Pole Location	Mounting Height	Pole Size	Elev.	Fixt. Unit	Kilowatt Unit
2	A1-A2	70'	70'	0'	8	12.8
2	B1-B2	60'	60'	0'	10	16.4
2	C1-C2	70'	70'	0'	10	27.2



Notes

Pole location dimensions are relative to 0,0 reference point

Fixture Type: LV-8 MZ
Lamp Type: 1500W MZ
Lumens: 155000
File # / Date: 8B140-1 / 24-May-2001
Prepared By: N/A

MUSCO
GUARANTEED PERFORMANCE

MAINTAINED ILLUMINATION
BASEBALL
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	100
Average:	70.37	50.24
Maximum:	89.48	67.37
Minimum:	48.09	27.03
Avg/Min:	1.464	1.859
Max/Min:	1.861	2.492
UG (Adj pts)	1.536	1.692
CV:	0.168	0.227

Number of Luminaires:	88
* KW Consumption:	140.80
**Average Tilt Factor:	0.988
***Recoverable Light Loss Factors: x	0.800
Total Light Loss Factor(LLF)	0.774

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:
Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location

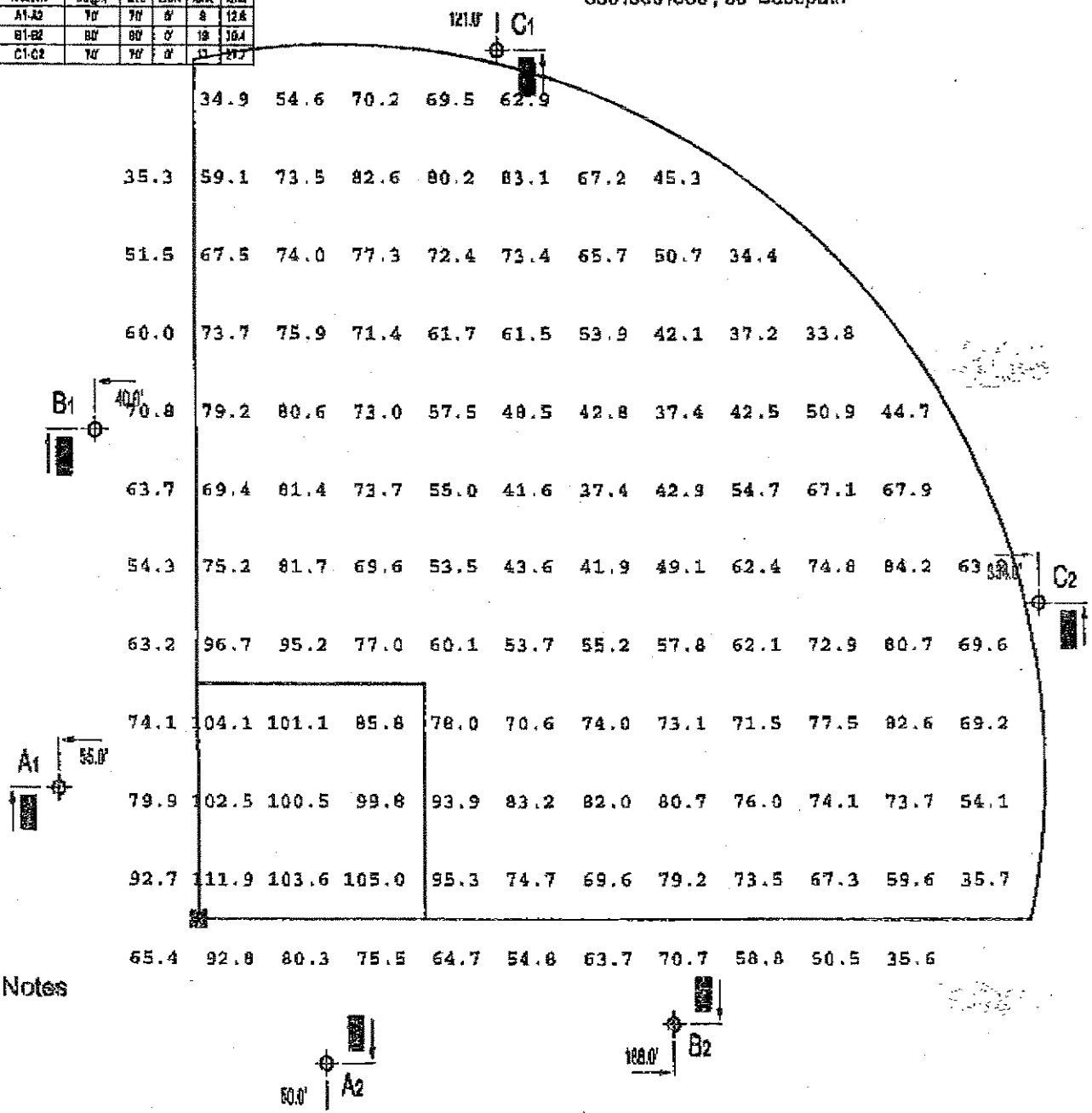
SCALE IN FEET

0 60 120

Project Name, City, State

330'/360'/330', 90' Basepath

EQUIPMENT LISTING						
Pole Quant	Pole Location	Mounting height	Pole size	Elev.	Flat Aim	Glare Aim
2	A1-A2	70'	70'	0'	8	12.6
2	B1-B2	80'	80'	0'	19	30.4
2	C1-C2	70'	70'	0'	13	27.7



Notes

Pole location dimensions are relative to 0,0 reference point

Fixture Type:	LV-8 MZ
Lamp Type:	1500W MZ
Lumens:	155000
File # / Date:	BB140-1 / 24-May-2001
Prepared By:	N/A

MUSCO
GUARANTEED PERFORMANCE

INITIAL ILLUMINATION
BASEBALL
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	100
Average:	87.97	62.81
Maximum:	111.85	84.22
Minimum:	60.11	33.79
Avg/Min:	1.464	1.859
Max/Min:	1.861	2.492
UG (Adj pts)	1.530	1.692
CV:	0.168	0.227

Number of Luminaires:	88
* KW Consumption:	140.80
**Average Tilt Factor:	0.988
***Recoverable Light Loss Factors: x	1.000
Total Light Loss Factor(LLF)	0.988

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

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= Pole Location

SCALE IN FEET

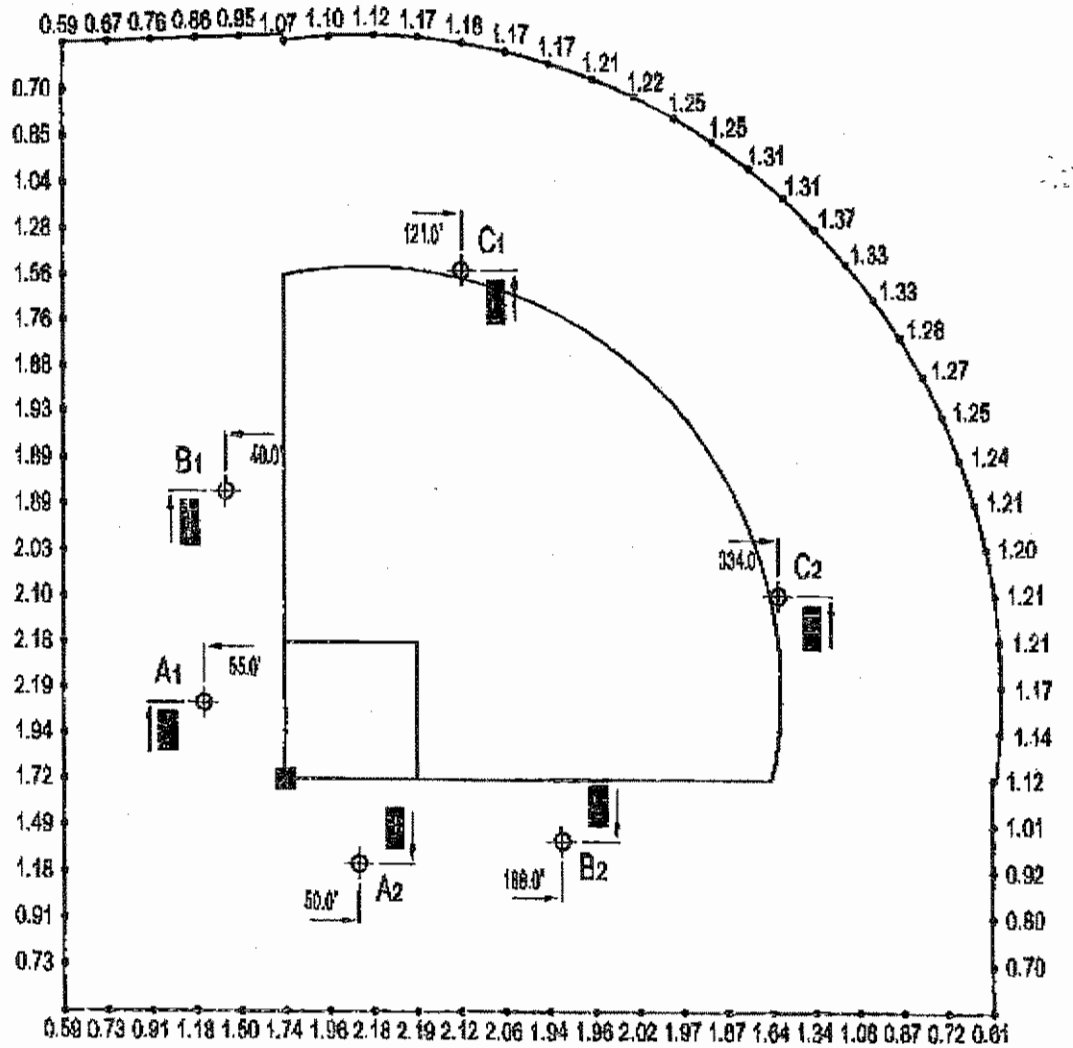
0 60 120

EQUIPMENT LISTING						
[illegible] unit	Pole location	Mounting height	Pole size	Elev.	Tilt. Angle	Glare Angle
2	A1-A2	70'	70'	0'	8	12.8
2	B1-B2	80'	80'	0'	19	30.4
2	C1-C2	70'	70'	0'	17	27.2

Project Name, City, State

330'/360'/330', 90' Basepath

Fixture Type: [illegible] MZ
Lamp Type: 1500W MZ
Lumens: 155000
File # / Date: BB140-1 / 24-May-2001
Prepared By: N/A



Notes

Pole location dimensions are relative to 0,0 reference point

MUSCO
GUARANTEED PERFORMANCE

INITIAL SPILL LIGHT
MAXIMUM FOOTCANDLES

Target Points:	78
Average:	1.34
Maximum:	2.19
Minimum:	0.59
Avg/Min:	2.267
Max/Min:	3.708

Number of Luminaires:	88
* KW Consumption:	140.80
**Average Tilt Factor:	0.968
***Recoverable Light Loss Factors: X	1.000
Total Light Loss Factor(LLF)	0.968

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:
Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location

SCALE IN FEET

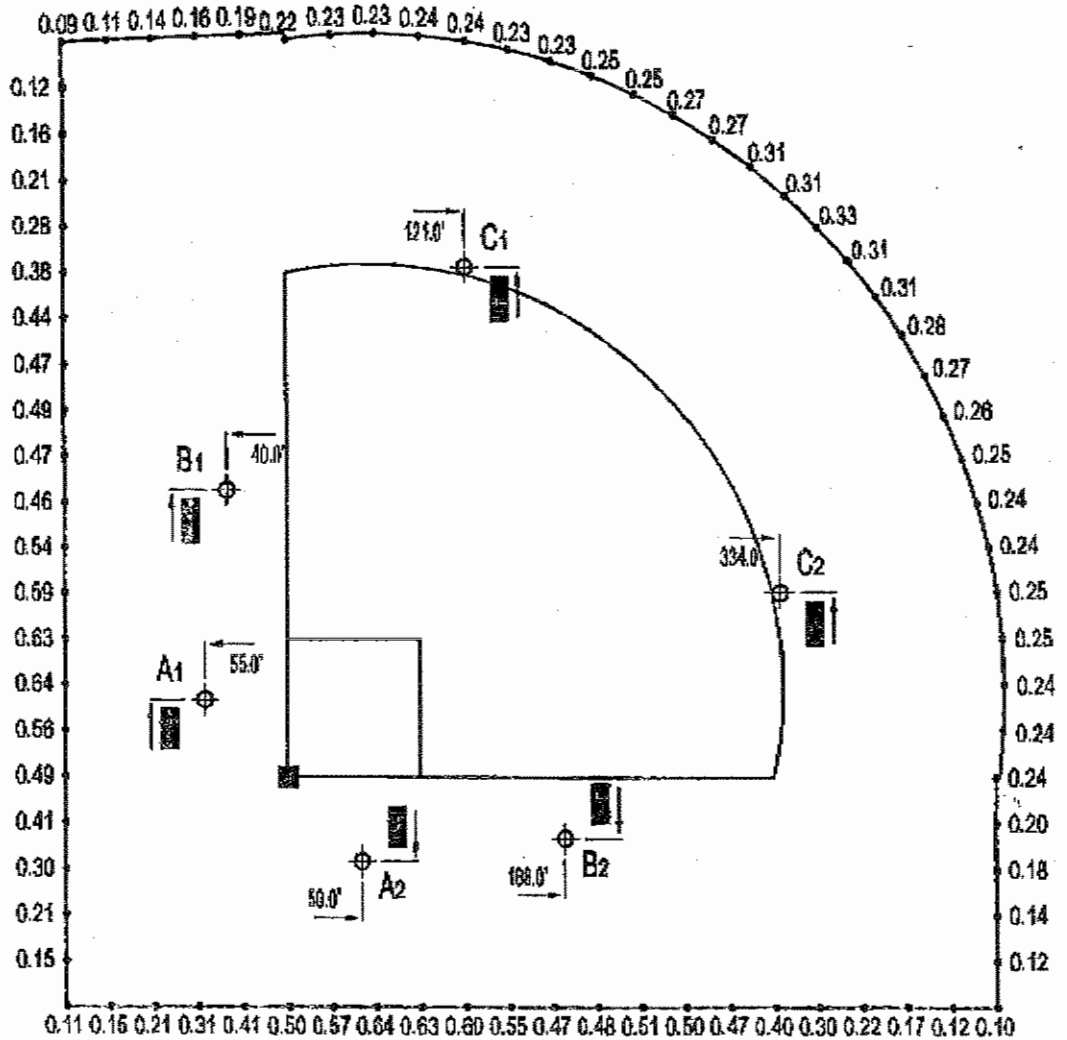
0 120 240

EQUIPMENT LISTING						
[illegible] Unit	Pole Location	Mounting Height	Pole Size	Elev.	Fixt. Unit	Kilowa Unit
2	A1-A2	70'	70'	0'	8	12.8
2	B1-B2	80'	80'	0'	10	16.4
2	C1-C2	70'	70'	0'	17	27.2

Project Name, City, State

330'/360'/330', 90' Basepath

Fixture Type: LV-8 MZ
Lamp Type: 1500W MZ
Lumens: 155000
File # / Date: BB140-1 / 24-May-2001
Prepared By: N/A



Notes

Pole location dimensions are relative to 0,0 reference point

MUSCO
GUARANTEED PERFORMANCE

INITIAL SPILL LIGHT
HORIZONTAL FOOTCANDLES

Target Points:	78
Average:	0.32
Maximum:	0.64
Minimum:	0.09
Avg/Min:	3.429
Max/Min:	6.902

Number of Luminaires:	80
* KW Consumption:	140.80
**Average Tilt Factor:	0.968
***Recoverable Light Loss Factors: x	1.000
Total Light Loss Factor(LLF)	0.968

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:
Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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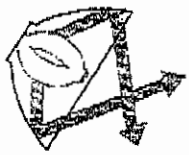
⊕ = Pole Location

SCALE IN FEET
0 120 240

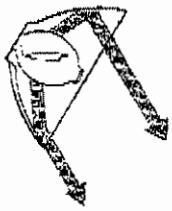
Up to 25% more light on the field – up to 95% less light off the field

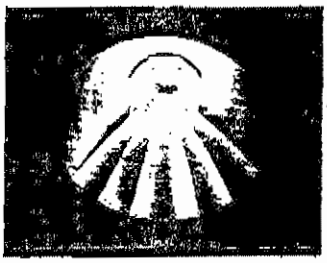
Original SportsCluster®



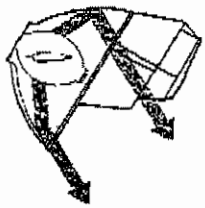
SportsCluster

SportsCluster-2®

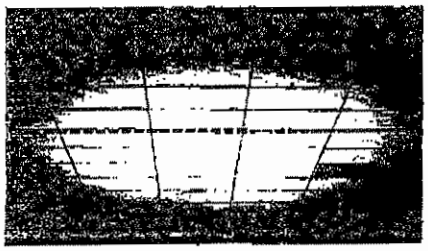


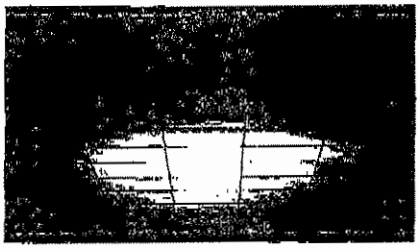


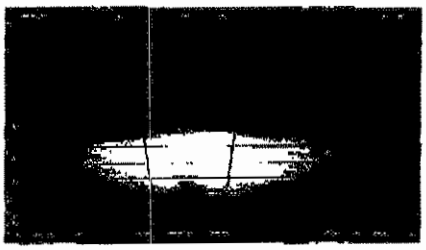
SportsCluster-2® with Level-8™ option



SportsCluster-2: the new generation in sports lighting, harnesses wasted spill light and uses it to improve light levels on the field.



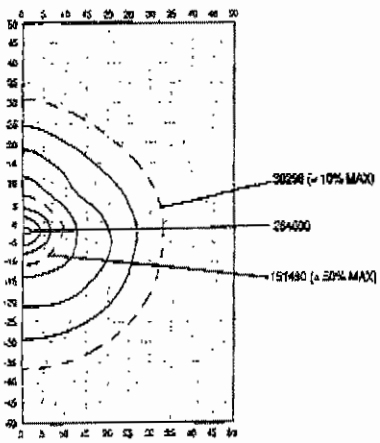




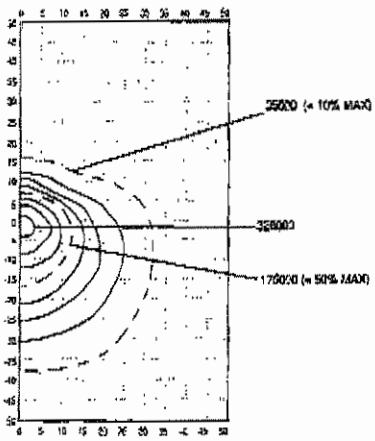
Photos of comparative beams projected on a grid ceiling for reference.

Comparative Isocandela Curves

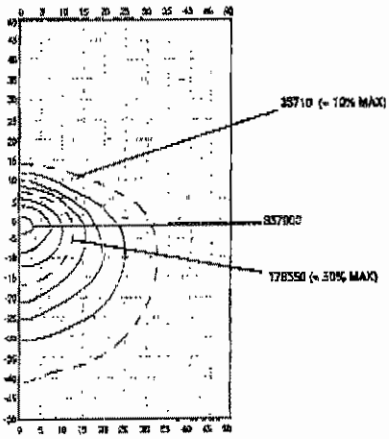
Average of right and left sides



Original SportsCluster
ITL Report #ITL34086
NEMA Type 4



SportsCluster-2
ITL Report #ITL35566
NEMA Type 4



SportsCluster-2 with Level 8
ITL Report #ITL35567
NEMA Type 4