Sioux Falls Arena

"Report on Seven Year Capital Improvements"

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Executive Summary Statement

The Arena has many functional deficiencies. It lacks adequate support and storage spaces. The plumbing and ventilation system requires significant improvements. The size and shape of the building, as well as the seating and sightlines can not be changed without major costs. The Arena is functionally inadequate for the current needs of the City. In the short term, cosmetic and technology improvements to the interior may help continue fan interest for the teams and events held there. Beyond the seven-year timeframe of this report, it is unlikely the Arena can successfully continue to compete with other event centers in our region. The Arena structure and building envelope are sound and can still be a valuable asset for the City. The building can be adapted for functions associated with the Convention Center that currently require additional space. The Arena has served the City well for over 45 years and is now aged to the point of requiring major costs for improvements if it is to continue to serve the community as a multipurpose event and sports center.

It is our opinion, planning should be started soon for a new event center that can better serve the City. A modern event center will need to be a multipurpose venue to serve the City and Region. It is expected to take five to seven years from the start of planning through design, construction and occupancy for a new event center. During the planning, design and construction of any new event center the Arena will still need to function in its current capacity. If a new event center is built and if the Arena will be used for a different function within the next seven years, we recommend only doing basic improvements needed to maintain fan interest and serve the user group needs for that time period.

Scope of Report

Miller Sellers Heroux Architects (MSHA), and our engineering consultants, have been retained by the City of Sioux Falls to provide a building analysis of the Sioux Falls Arena. This building analysis report is intended to provide an independent review of the building, to anticipate and recommend major repairs and improvements over the next seven years. This report will also be used by the City to help forecast future capital improvements for the City's yearly budget process. The dates and costs for each recommendation are based on current building conditions and user needs. To allow for more timely and economical public improvements, engineering and capital improvement recommendations may be phased, or prioritized, differently by the City. Changes in the use or function of the Arena were not requested by the City and are not included as part of this report. Therefore, all suggested improvements are intended to accommodate the continued use of the Arena at its current level for the next seven years.

Facility Overview

The Sioux Falls Arena was built in 1961. The Arena has a brick exterior in a hexagonal shape with a curved metal roof and flat roof connections to the Convention Center and the Sheraton Hotel. At the time of its construction, the Arena was a relatively plain structure with a unique,

functional floor plan and little extra space or amenities. There have been continued improvements to the Arena over the years to allow for new functions, sporting events, the attachment of the Convention Center and hotel, code and life-safety improvements, and to provide ADA accessibility.

The basic floor plan has remained mostly unchanged, with the exception of two additions on the northeast for hockey storage (see Figures 34 and 35), and on the northwest for the mechanical system for the ice plant. The main level contains the main entry and exit concourses, locker rooms, toilet rooms, storage rooms, mechanical equipment and concessions. The upper mezzanine level contains toilet rooms, concession areas, storage rooms, and large concourses leading to the exit stairs.

The Arena has two main levels of spectator seating: retractable platform seating on the main level, and fixed wood stadium seating on the upper mezzanine level. There are VIP seating areas on each end at different levels. A third press box is located on the south end of the building. A catwalk system above the main floor is used to service the center scoreboard and other Arena events. The Arena's seating capacity is 6,300 for basketball, 4,700 for football and hockey, and 6,500 to 7,000 for large concerts.

The original building is now 46 years old. The Arena was designed as a basketball center for a community with a considerably smaller demographic base. The Arena is a structurally sound building that has been modified over the years to serve as a multi-function event center with varying degrees of success depending on the event. The last major improvement was in 1998, when a $1.7 million addition and renovation was added for a hockey rink, the mechanical equipment to produce ice and additional storage.

The original building was not designed to accommodate current sporting events such as hockey and indoor football. The sight lines are poor for both hockey and football because the dasher boards restrict vision along the boards on the side nearest the seating. (See Figures 22 and 24) In modern arenas, the seating is raised above the boards for better vision from the upper levels. The Arena does not have sufficient storage space to accommodate all of the moveable chairs, platforms and sport equipment required for the many event functions. Some storage is now held in vans in the parking lot.

The locker rooms are undersized and lack the most basic amenities. The locker rooms were sized to accommodate four teams of twelve to fifteen basketball players and their equipment. Current football and hockey teams have more players and larger equipment needs. One team requires two existing locker rooms to adequately house the team. Taping and team medical treatments have to be screened from the public concourse by curtains – not very private. The Arena does not have the room for team meetings in single isolated rooms. Team meetings are now held by crowding into one of the locker rooms. There is currently no room for coaches' offices, conference rooms, video room treatment rooms, trainers' areas, team doctors' office, skate sharpening, team equipment repair and storage, or weight room.

The officials have only one small room for dressing and preparing for the events. When there is a split crew, one of the sexes must use the Convention Center lockers if they are available.

There are no ground level media rooms for press and interviews. There are no rooms for halftime performers, mascots, cheerleaders, props or sets. The lobby is small and not sized to bring in special promotions. The size, shape, storage and seating for the Arena can not change significantly without extraordinary costs. Because of the surrounding buildings there is little room for additions without major changes to the roads and parking lots in the rear of the building.

Most of the existing plumbing is galvanized pipes that are corroded and have reduced capacity. This piping occurs both above and below grade and is difficult to access for replacement. The existing ventilation system does not adequately exhaust gases from auto and truck shows and fireworks. Ventilation in the locker's is inadequate. Lockers and offices in the Arena are not air-conditioned.

Report Format

The format for this report outlines major repairs and improvements to the exterior and interior, with each section sub-titled by topic. Each repair or improvement topic has four sub-sections: "Overview" contains a brief description of the issue. "Specific" includes more detailed information. This is followed by "Recommendations". And finally, "Costs" section is an estimated dollar amount for the work which includes estimated engineering costs over the suggested time period. All estimates are based on materials and labor rates for 2007 in the Sioux Falls market. City staff will provide the needed data for future costs.

Interviews with Staff and Users

The MSHA design team interviewed the Director of Operations, Mr. Terry Torkildson, and Russ DeCurtins and staff from SMG, the management company for the Sioux Falls Arena. These interviews helped us to understand their needs, what they deal with on a daily basis, and to provide a complete list of all anticipated repairs and major improvements needed. Our design team reviewed the drawings for the Arena as well as all the equipment information available. We toured the Arena many times to establish the accuracy of the information provided and observe the conditions first hand.

Our design team also met with major users to determine if the Arena is meeting their needs. We met with Mike Heineman and Jeremy DeCurtins from the Sioux Falls Skyforce National Basketball Association Development League; Colin Steen from the Sioux Falls Storm of the United Indoor Football League, and Gary Weckwerth from the Sioux Falls Stampede of the United States Hockey League.

It became evident that each of the Arena user groups felt the building under-serves their needs in some significant ways. These groups continue to use the facility because there are no other better options available in the City. The reasons listed on the following page do not necessarily address the management and maintenance concerns of the Arena, but they do highlight the inadequacies of the building design and its inability to be improved significantly to meet user needs.

Building improvements desired by the user groups:

- *Improve sight lines for events – hockey and indoor football*
- *Provide more storage space for team equipment*
- *Provide larger locker rooms with training and team meeting spaces*
- *Provide better ventilation to exhaust smoke and carbon dioxide and monoxide*
- *Provide additional officials' dressing rooms*
- *Provide a media room or press area on the main floor*
- *Provide high tech scoreboards with video advertising*
- *Provide improved sound system and controls*
- *Provide adequate ventilation and humidification control in the locker rooms*
- *Provide concessions that offer better quality and selection of food and beverages*
- *Provide a lighting system that resets quickly when turned off*
- *Provide a larger lobby space for special events and promotions*
- *Improve the overall appearance and cleanliness of this older facility.*

MSHA also met with Ron Bell, the Chief Building Codes Examiner, from the City of Sioux Falls to review building code and accessibility issues for the building. The design team examined and researched each of the areas listed as recommended improvements and maintenance. Local venders, equipment suppliers and contractors were interviewed to determine costs required for each of the improvements.

Section 2

Exterior:

Roofing:

Overview:

There have been continuing problems with the curved roof because ice and snow build up on the metal roof during the winter. During melting, the weight of the ice and snow suddenly releases its grip on the roof surface, and the curved roof acts as a slide. The ice and snow crashes onto the flat roof below causing damage to the flat roof membrane. (See Figures 4, 5, and 6) Roof pavers have been broken and damaged. The ballasted roof membrane has pulled loose from the flashing and leaks. (See Figure 7)

Specifics:

Plastic snow and ice guards were directly adhered to the metal roof with the intent of holding the ice and snow in place to allow it to melt slowly and prevent slides. Precast concrete pavers were placed below the metal roof on the flat roof membrane to provide additional protection from falling ice.

Many of the snow and ice guards are still in place on the highest part of the curved roof. As the curved roof becomes steeper, all of the plastic snow guards have been torn off by sliding snow and ice.

Many of the concrete pavers placed on the flat roof as protection are now cracked and broken from the falling ice and snow. The concrete pavers did protect the EPDM membrane from puncture by the falling ice and snow, but contributed to a different problem. The ballasted EPDM roof membrane for the flat roof is extended up under the curved roof panels and flashing. The falling ice and snow impacts the concrete pavers with enough force to push both the pavers and EPDM membrane away from the metal roof which rips the membrane away from under the flashing as well. This has caused several leaks.

Recommendations:

The metal roof panels are still in good condition. Some patching and flashing has occurred over the years and is a continuing maintenance requirement. The metal roof panel system should be inspected and maintained yearly, but it should not require major repairs or replacement for the seven years covered by this report.

It is clear that the snow and ice guards adhered to the metal panels did not work. An option that we do not recommend is the installation of metal snow bars clamped to the standing seams. To effectively hold the ice and snow in place would require a large number of show bars at a vertical spacing of six feet for each metal panel. This would require a large amount of labor plus the cost of the snow bars. These bars would be very visible and would change the image of the Arena roof. Aside from the visual appearance of these metal bars

on the roof there is a greater danger that the snow bars might also be torn loose by sliding ice and snow. The impact force on these snow bars would likely tear the metal roof panel completely off. If this was to happen the entire roof would probably need to be replaced. We don't believe it is worth the cost or the risk to prevent the ice and snow from sliding down to the low roof if there is another way to prevent damage.

The alternative to holding the ice and snow in place is to allow it to slide and control the damage at the low roof. We recommend replacing the EPDM membrane on the lower roof with an impact roof system to handle the sliding ice and snow. The new roof system would consist of a layer of 1/4" Dens-Deck above the insulation. Dens-Deck has embedded glass mats front and back with a silicone-treated core for superior impact strength and moisture resistance. Over the densdeck install a fully adhered, or mechanically fastened, 80 mil TPO polymer base and a polyester-reinforced fabric center scrim and a tough thermoplastic polyolefin compounded top ply roof system. The impact zone at the bottom of the curve should add a TPO walking mat system welded to the TPO membrane to take the impact and allow foot traffic to maintenance areas. The TPO membrane is a white color so it will improve solar reflectance and heat transference to the interior. With removal of the existing concrete pavers and stone ballast system we anticipate no structural concerns for the new roof system. We further recommend additional work at the roof cap intersection with the roof panels to create a secure metal lock joint in lieu of relying on sealant in the joints for water protection. We recommend this improvement be done as early as possible.

Costs:

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 30,000						
Construction Costs	$350,000						

Priority: 1

Exterior:

Exterior Walls and Doors:

Overview:

The exterior walls and doors were examined to determine their present condition and very few problems were discovered.

Specifics:

The exterior walls of the Arena are in very good condition and are well maintained. The last major exterior renovation was completed in 2001 and included brick replacement, repointing brick and sealants. There are no major exterior shell improvements that need be planned for over the course of the next seven years. Some of the sidewalks and door stoops have cracked concrete, spalled and chipped edges that should be repaired, or replaced. We understand that the management company is responsible for these kinds of minor repairs through the normal maintenance for the building. The closers for the exterior doors are an item that requires constant maintenance and replacements to keep the doors operational. The aluminum entry doors are in good condition and do not appear to require anything more than normal maintenance. (See Figure 18) The hollow metal doors and frames are showing some wear and require painting on a yearly basis. All of the bottom weather seals and some of the kick-plates on the north service doors should be replaced to maintain a good weather tight seal for the building. The face metal for the canopy on the east exit doors and above the back service doors should be painted and maintained yearly. (See Figure 20)

The exterior walls of the Arena according to the drawings received are un-insulated 4" brick and 12" concrete masonry units. That type of wall construction would have an approximate R-value of R-3. If the cores of the concrete blocks were filled with vermiculite (unknown with the drawing information available), it would raise the R-value to approximately R-7. With either option the Arena is poorly insulated and is a high energy user. Modern buildings of this type typically use R-14 to R-24 wall construction. As the price of energy continues to rise, it is an increasingly better value to add higher insulation to the walls and roofs to conserve energy use. The type of construction and design of this building makes it very difficult, if not impossible, to add insulation to improve the energy rating without a significant expense and disruption to the existing functions in the Arena. It is not practical or cost effective to increase the insulation for the Arena during this seven-year improvement period.

Recommendations:

Continue normal maintenance on a regular basis to the exterior. It is expected that no major costs need to be budgeted for doors and walls for the next seven years.

Costs:

Improvement Costs							
Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs							
Construction Costs							

Priority: -

Section 3

Interior:

Rigging:

Overview:

The original building design was geared to provide a large venue for community events, primarily high school and college basketball games. At that time the growth of and demands for differing entertainment possibilities could not have been anticipated. The structural framing for the curved roof, while providing a very economical solution to enclose the space, does not lend itself to safe and convenient rigging operations for special equipment such as sound and lighting that are unique to a particular event. The existing catwalk system is directly above the basketball court in the center of the main floor thereby limiting the area that can be accessed from overhead.

Specifics:

The original structural design did not include provisions for transient loads due to special event equipment such as lights and speakers. Structural studies conducted in the past have provided guidelines with respect to the weight and location of equipment that can be suspended from the structure. These guidelines impose restrictions on such suspended equipment thereby making the rigging for a particular event difficult. Rigging difficulty is further compounded by the fact that a majority of the structural members are oriented such that the rigging lines can only be anchored at or near the top flange of the structural member. Additionally there is no fall arrest system for use by rigging crews.

Recommendations:

We recommend making immediate modifications to the existing framing to provide a means to attach personal safety equipment such as body harnesses, lanyards, etc. The area to be covered by such a system could be limited to the north 1/3 to ½ of the roof between the west arch frame and the east arch frame or an area of approximately 15,000 sq. ft. These modifications will provide a means of "tying off" by rigging crews to each of the castellated beams (spaced at 18'-2" o.c.) within this area as well as to each of the 4 primary arches. These modifications will significantly improve the overall safety of any rigging operation.

The cost to renovate the existing structure in order to increase the total weight of equipment that can be suspended would be cost prohibitive for the benefits gained. We recommend that the existing rigging guidelines continue to be followed.

Costs:

Improvement Costs							
Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 8,000						
Construction Costs	$ 160,000						

Priority: 1

Interior:

Scoreboards:

Overview:

The center scoreboard and the scoreboards on both ends of the Arena continually have maintenance problems. They are an old technology that have no video replay capability and limited flexibility for information display such as advertising and up-to-the-minute statistics and scoring. Individual lights need to be replaced when they burn out. Because of the age of the scoreboards, the availability of parts for the displays and controllers will also be an issue in the near future.

Specifics:

Based on what major professional teams provide in the large markets, spectator experience at sporting events and concerts continues to evolve. A large video screen has the ability to display live video and video replay, real-time stats, in-game information, and full color graphics and animations in 4.4 trillion colors. This new technology gives facilities the opportunity to increase the number of advertisers and overall advertising revenue by offering their advertisers a way to reach their customers in new and innovative ways. Today, the numbers of facilities that have this technology continue to increase. These kinds of video displays are becoming common in all major and minor event centers. If this kind of display board was added to the Arena it would add to the enjoyment for the fans.

The existing scoreboards are of an older design with many individual incandescent lamps that require ongoing replacement and maintenance. The labor to access the boards and change the lights as well as the electrical use could be reduced with new boards. Today's LED (Light Emitting Diode) technology offers a product that requires less maintenance and less power to operate. The lifetime of the product greatly exceeds that of the old incandescent technology. The existing scoreboards show basic information, but do not allow for flexible information display or offer additional advertising or revenue opportunities. The controls are limited and basic. New scoreboards will allow for great flexibility in what can be displayed and how it is displayed and controllers for new technology are based on the Windows operating system and are easy to operate. The new scoreboards could be designed to be reused in a new Event Center when built saving the cost for scoreboards at that time.

Recommendations:

To increase spectator interest and satisfaction and to provide for additional advertising revenue, we recommend installation of new video display boards (see Figure 36) to replace the existing scoreboards at both ends and the center of the Arena. The video displays should be full color matrix scoring displays with shot clocks and hockey goal lights. A new center-hung scoreboard (see Figure 37) to replace the existing center hung scoreboard is recommended at the same time as the end boards so the same digital control systems can be used for all scoreboards. The

system should include a complete display control system and a three-camera front-end production system. We recommend the overall scoreboard size to be approximately 9'-10' high and 50'-55' long with a video display size of approximately 9' x 17'. Areas for scoring and advertising displays should be accommodated in the overall length of the new boards. The new scoreboard should be controlled from a location courtside and/or from a production area in the catwalk area above the floor. A larger production area may be needed for equipment and controls if they are located in the catwalk area. An enlarged catwalk structure is not included in the cost listed for the scoreboard.

Costs:

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 50,000						
Construction Costs	$1,800,000						

Priority: 2

Interior:

Upper Level Seating:

Overview:

The wood and metal stadium seating on both sides of the upper level is original to the building. (See Figures 1 and 2) This style of seating is no longer manufactured, and it is not possible to obtain replacement parts for maintenance of damaged seats.

The second problem is the attachment of the seating to the concrete floor system. The concrete floor system allows spilled liquids to penetrate through the structural floor to the ceiling and lights of the main floor.

Specifics:

The seating on the upper level of the Arena is in reasonably good condition and the seats are comfortable and function well. These seats have performed very well over the life of the Arena. The manufacturer of the original wood and metal seats is no longer in business. There are a small number of manufacturers that make wood and metal "antique" seating in limited quantities for historic sites, but staff has not found manufacturers that make standard parts to fit the existing seats at the Arena. When a seat needs a replacement part, it is taken from dwindling stock of extra seats in storage. In some cases parts are taken from seats still in use in the top row of the Arena. Overall, the Arena management has done very well in maintaining these seats in good condition considering all the use throughout the years. As the Arena increases the number and types of events, the upper level seating will continue to be reduced in number to provide the necessary parts for repair of lower level seats.

The concrete floor is sound, but needs new sealant in the concrete joints, as well as, where the bolts attach the seats to the concrete floor steps.

Recommendations:

We recommend the existing seats remain in place and continue to be maintained with replacement parts for the next seven years. It is expected that a relatively small number of seats in the upper rows will be lost because they will be needed for replacement parts. If the Arena continues to be used in its current capacity beyond seven years, the City will seriously need to consider replacement of all upper level seats. Modern replacement seats typically are made from a molded high-density polyethylene with ergonomically designed seat and backs to provide comfort and support. We include a photograph of this style of seat for reference only (see Figure 3). Replacing these seats will not improve the sight lines for events. Some overall seating capacity may be lost because the new seats will be sized differently to fit the spacing between the aisles, which may need to be widened to comply with current codes. If the aisles are widened, they may also need a handrail in the center to

comply with safety codes. Because of all of these issues, the future use of the building must be carefully determined prior to replacing these seats.

The new seating is currently estimated at approximately $125 per seat plus $25 each for installation. This would also include the sealing of joints and repair of damaged concrete in the stepped floor system. The seating capacity on both sides of the upper level is now shown at 4,393 seats, based on a SMG seating chart. Changes in the width of the seating and aisles will change the number of seats on the upper level.

Costs:

Improvement Costs Year	2009	2010	2011	2012	2013	2014	Future
Engineering Costs							$ 40,000
Construction Costs							$660,000

Priority: 3

Interior:

Retractable Seating on Main Level:

Overview:

The retractable platform seating on both sides of the main level cannot be used for hockey and indoor football. When extended for basketball, the seating rolls on a raised plywood sub-floor to elevate it to court level. (See Figure 8) This plywood sub-floor is wearing which causes warping and problems with the operation of the retractable seating. The platform seats are not divided into individual pull-out sections that can be used without extending other sections. If that were possible it would allow for a more flexible use for events and would make it easier to operate.

Specifics:

There are 556 retractable platform seats installed on each side of the Arena for a total of 1,112 blue shell seats. These platform seats were manufactured by Interkal Seating of Kalamazoo, Michigan and are now fifteen years old.

When these retractable platform seats were installed, neither hockey nor football was played in the Arena. This seating replaced retractable wood bleachers and was designed to extend to the basketball court on the concrete Arena floor. They cannot be pulled out one row at a time. With this seating, access to exits is down to the main level. No provision for exiting to the upper level concourse is allowed.

When hockey and football were added to the Arena events, the platform seating could no longer be used because the fully extended seating extended beyond the dasher boards necessary for these events. Currently, a separate platform system with stacking chairs is used for hockey and football. The platform is raised above the floor to allow better viewing over the dasher boards and still allow access to the main floor for exits. This separate platform and chair seating require additional storage space that is in short supply in the Arena.

Because basketball and hockey are played during the same winter season, the basketball floor is elevated above the ice sheet. This elevated court level requires a 2” height difference for the basketball court and the main concrete floor. The retractable platform seating needed to be raised to the level of the basketball court. This was done using a plywood platform under the seating. This plywood sub-floor flexes during the movement of extending the retractable seating. The flexing of the sub-floor is causing additional stress, and wearing on the roller mechanisms and motors will likely affect their useful life. The wood platforms also need to be stored when not in use. The Arena has very limited in storage space.

There are also 864 retractable wooden bleachers, (455 on the north and 409 on the south). The bleacher seats were installed in 2000 and manufactured by Kodiak Industries Ltd. Located in Winnipeg, Manitoba. These bleachers are in good shape. There are no problems with their operation because they don't butt up to the dasher boards during hockey or footballs events. Because they are bleacher style seats they do not have back support when they are used.

Recommendations:

This is a difficult problem to resolve. Ideally, the existing retractable seating would be replaced with new retractable platform seating at the correct height which would eliminate the plywood sub-floor. The new seating would allow rows or sections to be extended independently while other rows or sections remain retracted, thus providing the options needed for various events. It would also eliminate the storage required for the platforms used for hockey and football. To function properly as seating for football and hockey the highest seats of the system should be used to view the game while some of the lower seating would remain retracted. The upper seats would stop at an elevated level above the floor because the lower seats are not extended. The exit path from these higher seats ideally would exit to the upper level rather than down to the main level. This exit path is not possible because of code issues. The difficulty of providing a exit path and stairs to the main level could only be done with stairs and would not allow accessible seating or discharge. Unfortunately it is not possible to accomplish the ideal solution. There does not appear to be a workable solution to replace the existing retractable seating with a new flexible seating system that will work for all the events required. The original design of the building and the exit requirements are not compatible with a new seating solution.

We do recommend replacement of the existing 2"x 4" plywood sub-floor with an aluminum system that is specifically built to raise the seats. We believe this would be more durable, easier to store and extend the life of the existing retractable seating beyond the seven-year report period, however, it would be necessary to continue to deal with storage issues. Another less expensive option would be to rebuild and reinforce the exiting plywood sub-floor and provide a smoother top surface. Either solution would help extend the life of the current retractable seating.

Costs:

Improvement Costs							
Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$10,000						
Construction Costs		$90,000					

Priority: 3

Interior:

Upper Level South End Wood Bleachers:

Overview:

The wood bleachers located on the upper level of the south end are ±46 years old and pose a serious safety issue because they are not flush with the wall. This bleacher seating is only used at events such as concerts. The bleachers lack back supports. Fans complain when they must view events without support for their backs.

Specifics:

There are three options to improve this situation.

First, make an inexpensive modification to the existing bleachers by adding a barrier to the open space between the bleacher and the wall. Use local contractors to provide a site-built a solution that would solve the immediate safety concern. However there is an strong concern regarding liability for the City by not providing a factory authorized solution. Back supports cannot be added to this type of bleacher system. We do not recommend this solution.

Second, remove the seats altogether and lose the seating capacity for events. We do not recommend this solution.

Third, replace these wood bleachers with new retractable seating similar to the seating on the lower level. This new system would have the proper guardrails and wall connections. However, this option would lose approximately 32 seats because the spacing for the platform seating is wider than the eighteen inch seat width calculated for the wood bleacher seats. Because of the limited use of these bleachers we recommended replacement be done only if increased ticket sales for the new seats would justify the cost.

Recommendations:

Option #3:
Install new retractable platform seating with approximately 400 shell seats to fix the liability issue.

Costs:

Options #3

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 20,000						
Construction Costs	$200,000						

Priority: 3

Interior:

Arena Management Offices:

Overview:

Move the management offices for the Arena out of the Convention Center and back to the Arena.

Specifics:

The management offices for the Arena are now located in the management offices for the Convention Center. This location works well when the same management team manages both facilities. The City has requested that we look at the feasibility of moving the Arena offices back into the Arena to allow different management locations for each facility.

Recommendations:

If the Arena offices are required to move back into the Arena the square foot area for these offices would need to come from displacing a storage function that occupies that space. This will be difficult because the Arena is already short of storage space. We do not recommend this option and strongly suggest administration remain in the offices designed for it in the Convention Center.

If relocation is required, there are several options for relocating the Arena offices. The first, easiest option is to move to the storage space on the southeast side of the Arena, closest to the front entry, and convert it to office space. This space currently houses the concession offices and equipment storage. The equipment stored in that area would need to be moved out. That equipment could be stored off site or stored in several large trailers in the parking lot north of the Arena. The equipment does need to be accessed for events regularly. The new office space would require air conditioning, mechanical, electrical and communication functions not currently available in this area. The existing office area in the Convention Center is approximately 3,000 square feet for the seven people located there. The new Arena storage space is approximately 2,200 square feet and it will need to accommodate 13 people, the ten people relocated from the current offices and the three concessions people now in this area. Because of the smaller space and the irregular shape of the area the offices will need to be smaller and there would not be room for a conference room or large waiting area. The expected remodeling cost is $70 - $90 per square foot. This is the recommended option if the offices must move into the Arena. The costs shown for this option do not include costs for relocating and storing the equipment currently in the space. Because the Arena is already short of storage space for equipment the only alternative is to store the equipment outside of the Arena building. The equipment needs to be close to the Arena to access for setup. There are already three storage vans in the parking lot with equipment. It may require purchase of several more storage vans to accommodate this equipment. This solution would also increase the labor required for setup and take down of

the equipment. The cost for building renovation would be about $200,000 with engineering fees included. The cost to purchase storage space is unknown. This option is not recommended.

If required to house these offices away from their current location we would recommend an addition to the northwest entry. This new addition would require all new construction and would lose approximately 20 existing parking spaces and some green area. The advantage of this location is the Arena offices could have a separate exterior entry accessed from the north parking lot. A direct connection could be made through one of the exterior exit doors in the northwest entry. This is not expected to affect the exit requirements from this set of doors. This new addition is expected to cost $160 - $175 per square foot or about $480,000 - $525,000 for the 3,000 square feet of office space. (See Figure 43)

Costs:

Improvement Costs							
Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 38,000						
Construction Costs	$500,000						

Priority: 2

Interior:

Locker Rooms:

Overview:

The team locker rooms and toilet facilities are very small. Entry doors into the locker rooms, showers and restrooms do not comply with current accessibility requirements.

Specifics:

The Summit League Group has proposed changes to provide each of the four locker rooms with16 large lockers and a team meeting room. This will allow adequate facilities for large regional and national basketball tournaments. The plans for these proposed changes to the Arena are included in this report. (See Figures 38, 39, 40 and 41) However, because of the physical constraints of the Arena the team meeting rooms would expand into the concourse with demountable walls that can be removed when not needed. If this option is accepted, improvements will need to be in place by the fall of 2008.

The existing locker rooms do not comply with accessibility requirements. The doors into the locker rooms do not have the required space on either side of the doors. (See Figure 13) The shower has a four-inch high tile curb separating the shower and drying area. The existing shower room is shared by two locker rooms with no separation between the rooms. (See Figures 11 and 12) Each locker restroom contains one water closet, one urinal and one sink. The area is too small and does not allow for wheelchair turning space. The toilet partitions do not meet accessible requirements. (See Figure 10) Both Title II and III laws require restroom and shower accessibility.

Currently, there is limited space for team dressing, meeting and storage of equipment. There is not a good location for an addition outside of the existing building footprint to add more locker rooms or storage space.

The existing locker rooms have poor ventilation and no air conditioning. Groups using the locker rooms have complained about the heat and humidity. This is a year round problem for all user groups. Some users have resorted to bringing in fans trying to funnel air though PVC pipes to help dry their sports equipment.

Recommendations:

Renovate all four locker rooms to accommodate the required lockers and add new team meeting areas in the concourse. Provide new metal lockers in sufficient numbers to meet the Summit League requirements for their tournament. Make use of all existing lockers that are sized appropriately for team use. Provide a new masonry wall between the connecting showers to create privacy for each locker room. Provide new ventilation fans for the locker rooms and new meeting areas above the existing ceilings. Provide new paint finishes on all

the walls and new carpet on the floors. Create the team meeting area with new permanent soffit and ceiling attached to the concrete structure above and new demountable partitions in the concourse area that can be easily setup and removed, as events require. Provide new existing entry doors to the locker rooms that comply with accessibility standards. Renovate the toilets and shower to be accessible as required by the Federal law. It is recommended that this improvement be ready for use by the fall of 2008.

Costs:

Improvement Costs Year	2008	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 32,000						
Construction Costs	$263,000						

Priority: 1

Interior:

Media, Meeting and Officials Rooms:

Overview:

The Arena does not have a media room in close proximity to the main floor that could be used for event interviews. Currently the Arena has only one small officials' room and no media rooms at the main floor level.

Specifics:

If the Arena is to be competitive attracting major televised events and tournaments, it should have media accommodation similar to other large venues. Newer facilities have media and meeting rooms on the main floor level to accommodate television and the press before and after games.

There is currently only one officials' room with a toilet and shower that accommodates two people at the most. Basketball, hockey and football officials usually come as a team of three and can include both male and female officials. This room also does not comply with accessibility standards.

Team mascots and half-time show performers also desire dressing rooms with restrooms and showers.

When circumstances require additional dressing rooms, the Arena staff currently uses the two locker rooms in the west service corridor of the attached Convention Center. These rooms are somewhat remote from the Arena and are not an ideal solution. These rooms can only be used when they are not occupied for Convention Center events.

Recommendations:

Options are limited for additional rooms in the Arena without taking away storage or Concourse space. We recommend building a second larger, accessible, officials' room adjacent to the existing officials' room. The space needed is taken from the Dasher Storage Room. The existing officials' room would not be required to be changed if this second officials' room is built to be accessible, although both rooms would be preferred. We recommend building a small meeting, or media interview room, at court level by using a portion of the Dasher Storage Room. Building these two additional rooms would add flexibility for a variety of uses. (See Figure 42)

The equipment stored in the existing Dasher Storage Room would need to be accommodated elsewhere in or near the building. We recommend vertical storage racks in all storage rooms to increase storage capacity. The height of the storage rooms makes this an easy and attractive option to increase the storage capacity for the Arena. Heavy-duty

storage shelves may require special design and support spacing to accommodate the many differently sized items stored. Vertical shelving would require a forklift to pick and place the items to be stored, and the Arena already has a forklift that could be used for this purpose. Sprinkler provisions for rack storage would need to be verified.

Costs:

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 25,000						
Construction Costs	$175,000						

Priority: 3

Interior:

Skyboxes and VIP improvements:

Overview:

The Arena does not have private skyboxes on each side of the court as modern facilities do. The Arena's VIP boxes are located on the ends of the court/field/rink at the Mezzanine level. (See Figure 31) They currently do not have access to in-house TV cable to show sporting events.

Specifics:

Private Skyboxes are now a common amenity in new sporting facilities. Skyboxes are a large revenue producer because of corporate sponsorships. Skyboxes on the side court are not possible at the Arena because of the original design for the seating and sight lines.

The existing VIP boxes on each end of the main floor provide a good, but limited, view of the sporting event. These areas have almost no privacy for business functions. Installation of flat screen televisions could improve the VIP experience by showing the event from a mid-court televised location. Cable would need to be installed in each VIP area. Flat panel televisions would need to be secured to the structure and located to prevent tampering and damage. They could also become an additional source of advertising income for the Arena.

Recommendations:

Install cable and flat screen televisions to each VIP area if costs can be justified.

Costs:

Improvement Costs							
Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs		$10,000					
Construction Costs			$60,000				

Priority: 3

Interior:

Plumbing:

Overview:

Most of the existing plumbing, both above and below floor are galvanized, and are showing their age. Much of the piping is corroded, and some of the piping below the floor is plugged with corrosion and other obstructions. The drainage system is not sufficient in much of the facility. Unisex ADA toilet rooms have been provided in recent updates. (See Figure 28)

Specifics:

Through review of the plumbing system, we have found that there is a mixture of piping materials utilized on the above floor supply and drainage systems. The supply system is comprised of a mixture of galvanized and copper piping. There is some cast iron, PVC and galvanized piping located throughout the facility in the drain/waste/vent system.

Interviews with facility personnel and local contractors have indicated that much of the below floor drainage system is decaying and has been falling apart. Areas where this condition has been encountered have been repaired on an "as occurs" basis. The rather shallow depth of the bedrock below the facility floor also limits the slope which the drainage pipe may be installed.

There are several areas where the original galvanized steel domestic plumbing piping has not yet been replaced with new copper piping. These sections of piping are showing their age and have started decaying. It is common to replace galvanized domestic plumbing piping after a useful life of 30 to 40 years. Much of the galvanized piping is the original piping to the building. The copper that has been installed is in place due in large part to the renovations and spot repairs that have been made over the years.

The existing restroom water closets are mounted to carriers behind the wall and are not adequately attached to the wall/floor for support. Under heavy load, the water closet carrier will flex causing surrounding water closets to rise.

Recommendations:

All existing domestic water plumbing mains which are constructed with galvanized piping material should be replaced with copper. This will require removal of the exiting piping, installing new piping and insulation of the new piping. There will be some locations where walls will need to be opened to gain access to the piping and then patched back in.

All below floor branch waste piping should be replaced on a preventive maintenance basis rather than waiting to repair the ruptures and pipe breaks as they occur on an emergency basis. This will require cutting and patching much of the existing floors as well.

All galvanized above floor waste piping should be replaced on a preventative maintenance basis rather than waiting to repair the ruptures and pipe breaks as they occur on an emergency basis. This will require cutting and patching some of the existing ceilings and walls.

The existing water closet carriers should be replaced with new. The new water closet carriers will be properly supported as per manufacturer's recommendations to prevent the adjacent water closets from moving. This will require the water closet to be removed and water piping will be required to be disconnected. Due to lack of space in the chase, walls may need to be removed and reconstructed. The walls are block and should be examined to verify if they are supporting walls prior to beginning any demolition. Walls could remain in place, but higher labor costs will be the result.

Water closets, lavatories and showers located in the locker rooms do not currently meet the requirements for ADA. Further discussion and costing has been provided in the Interior-Locker Rooms portion of this report Shower rooms should be updated for ADA requirements.

Costs:

Domestic Plumbing Piping

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs						$ 23,000	
Construction Costs						$230,000	

Priority: 3

Sanitary Sewer Piping

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs		$ 42,000					
Construction Costs		$190,000	$195,000				

Priority: 2

Water Closet Carriers

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 14,000						
Construction Costs	$170,000						

Priority: 1

Interior:

Ventilation System:

Overview:

The existing ventilation system does not allow adequate exhaust of gases from auto and truck shows. Ventilation systems will be reviewed for possible modifications to improve on the stagnation issues, as well as trying to get more airflow to the back-of-house and concessions areas. Improvement to the ventilation in the locker rooms should also be considered.

Specifics:

The existing ventilation system consists of four (4) air handling units (AHU's) located on each the east and west sides of the facility for a total of eight (8) AHU's each providing 25,000 CFM of supply air to the seating area. The return air path for this supply airflow is through the concessions areas on second level by means of a plenum style return. The relief air path for this system is through roof mounted fans above the seating area and playing floor. Recent updates have incorporated the fans on a Building Automation System (BAS).

The concession and vending areas on the main floor become stagnant and temperature control is lacking.

Due to the location of return air path, food odors have been allowed to transfer to other spaces.

Recommendations:

The ventilation system capabilities shall be improved to allow for additional fresh air to be introduced based on contaminant levels within the space as well as economizer mode. The building relief shall be interlocked to operate automatically with the new control sequence for the contaminant sensors.

Additional equipment should be added to provide adequate ventilation and improved temperature control to the concession and back of house areas. Additional return paths should be considered to prevent areas of stagnant air and allow a path for return air at the first floor level. Additional ductwork and diffusers will require cutting and patching of existing ceilings along with the potential of adding soffits. Along with additional soffits, some floor cutting may be required. In addition to this added ventilation, we would also recommend that duct-free split systems be added to provide spot cooling to the concessions areas.

Costs:

Contaminant Ventilation

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 6,000						
Construction Costs	$55,000						

Priority: 1

Concourse Ventilation

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 32,000						
Construction Costs	$340,000						

Priority: 1

Interior:

Heating and Air Conditioning System:

Overview:

Heating systems will be reviewed for possible modifications to help improve efficiency and maintenance issues. We will review the sizing and the operation of the facilities two (2) chillers and make recommendations based on capacity and improved efficiency. There has recently been a temperature controls upgrade to the HVAC system.

A single dual-fired boiler located in the Penthouse provides heating hot water to all air-handling unit pre-heat coils. Interviews with facility personnel have indicated the combustion air located on the northwest side allows snow into the building. The blowing snow has caused boiler flameout. A 10,000 gallon oil storage tank is located in the parking lot. The oil is used only when power outages occur.

A standard efficiency, gas-fired boiler serves heating hot water to unit heaters located in the north garage area. The boiler appears to be original and is oversized resulting in short-cycling and decreasing boiler life. Combustion air is dedicated to the space by means of a louver on the exterior wall.

Remote boilers are located in storage rooms to provide heating hot water to hot-water unit heaters, radiation and unit ventilators located throughout the building.

Specifics:

The compressors on the existing chillers have been replaced fairly regularly over the past several years. It is our understanding that the existing chillers are capable of handling the loads which are currently experienced within the facility.

The existing heating system appears to be capable of handling the loads which are currently experienced within the facility.

Recommendations:

It is our understanding that the chillers have been scheduled for replacement in the CIP budget for 2011. We would also recommend that alternate pumping strategies and more energy efficient chiller technology be explored for this replacement. This price reflects replacing the pumps and the chillers with similar units as exist today.

We would not recommend any modifications to the heating system at this time.

Modifications to the existing louver located in the Penthouse should be considered. Due to one boiler dedicated to the pre-heat of all air-handling units a loss of flame will cause

deficiencies in properly heating in the facility. A louver hood should be considered to prevent snow from causing boiler in Penthouse to loose flame.

Costs:

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs			$ 41,000				
Construction Costs			$500,000*				

* CIP Budget was $435,160 for chiller replacement in 2011.

Priority: 1

Interior:

Electrical, Power and Lighting:

Overview:

The electrical system is sized adequately and capacity exists throughout. Equipment replacement is recommended only when major renovations occur. Recommend no changes at this time, simply on a case by case basis.

A new entertainment style lighting system with dimming/dousing and DMX controls is needed.

Other items of interest were: cameras for additional viewing angles, generator for ice plant, and cable TV for VIP areas.

Specifics:

No instant on-off lighting control or individual lighting control. Fixtures need wire guards.

Recommendations:

The entire electrical system should be surveyed. Many modifications have been made over the years and accurate as-built drawings are needed.

Install Iris style units (Wybron – Eclipse II or equal) for 80 lighting units. They would also require (7) power supplies, these units can operate with only one address ea, therefore we can use an Express 48/96 console in the press booth. The other material needed is the cables with XLR connectors on them. This project should have a theatrical dealer that could coordinate the installation and provide the material.

Add cameras for additional viewing angles, generator for ice plant, and cable TV for VIP areas.

Costs:

Electrical Survey – As-built

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$15,000						
Construction Costs							

Priority: 3

Costs: Lighting

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 5,000						
Construction Costs	$250,000						

Priority: 1

Costs:

Miscellaneous

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 15,000						
Construction Costs	$150,000						

Priority: 3

Interior:

Sound System:

Overview:

The existing speaker system for the Arena is inadequate and does not provide good sound articulation for all seating. System is not flexible.

Specifics:

Overall coverage is uneven. Equalization of system is inadequate. Speakers mounted from catwalk in lieu of building structure. Design is too simplistic, not easy to reconfigure for various events. Random noise is being generated in system. SE corner speaker is intentionally disconnected. Speaker zoning is inadequate. No true end zone speakers and zone.

Recommendations:

Replace the system in its entirety. This is one of the things that can help fan satisfaction with the facility. Components shall include: monitor speaker at sound operator, digital sound processing, Equalizer, control system, mount speakers from structure, provide conduits to hide & protect cables for media trucks & end zone entrance, all new cabling & microphones,

Costs:

Improvement Costs Year	2009	2010	2011	2012	2013	2014	2015
Engineering Costs	$ 15,000						
Construction Costs	$275,000						

Priority: 1

Cost Summary Table

Capital Improvement	Cost with Engineers	Projected Completion	Priority
Roofing	$380,000	2009	1
Exterior Walls & Doors	$0		-
Rigging	$168,000	2009	1
Scoreboards	$1,850,000	2009	2
Upper Level Seating	$700,000	2016	3
Retractable Seating	$100,000	2009-2010	3
South End Bleachers	$220,000	2009	3
Arena Management Offices	$538,000	2009	2
Locker Rooms	$295,000	2008	1
Media, Meeting, Officials	$200,000	2009	3
Skyboxes and VIP Improvements	$70,000	2010 - 2011	3
Plumbing - Domestic Water	$253,000	2014	3
Plumbing - Sanitary Sewer	$427,000	2010 -2011	2
Plumbing - Water Closet Carriers	$184,000	2009	1
Ventilation - Containment Vent.	$61,000	2009	1
Ventilation - Concourse Vent.	$372,000	2009	1
HVAC System - Chiller Replacement	$541,000	2011	1
Electrical Survey - As-built	$15,000	2009	3
Lighting	$255,000	2009	1
Electrical Misc.	$165,000	2009	3
Sound System	$290,000	2009	1
TOTAL: *	$7,084,000		

Priority Key:

#1 - High
#2 - Medium
#3 - Low

*All costs are based on 2007 costs