

Facility Condition Assessment

Draft Report

May 14, 2024



PROJECT TEAM

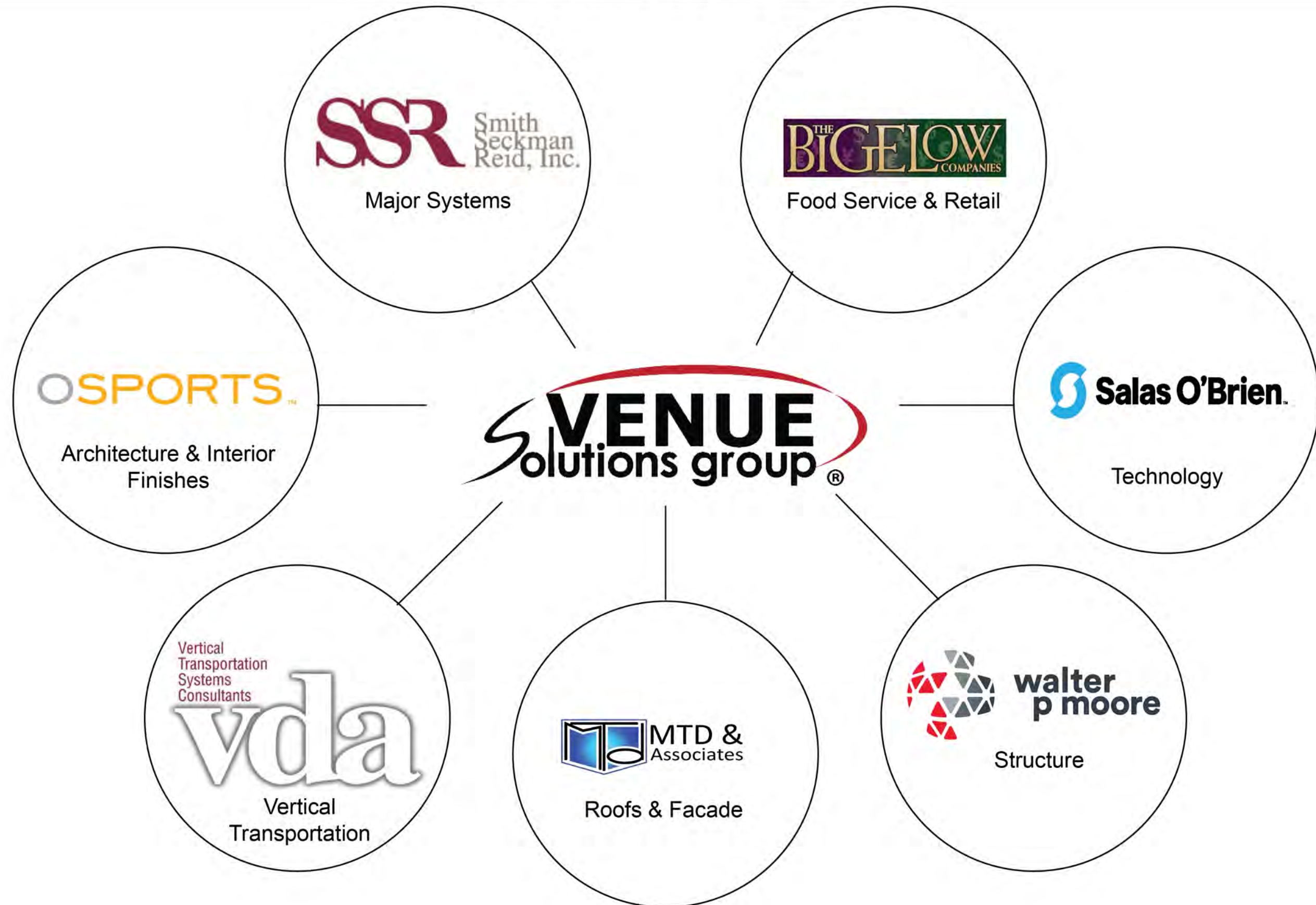


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Facility Condition Assessment Moda Center & Garden Garage

Overview & Executive Summary

Overview

Venue Solutions Group was engaged by the City of Portland to provide a comprehensive facility condition assessment of the Moda Center and attached Garden Garage that benchmarks their current condition. As part of this assessment, VSG, in partnership with their consultant team, has developed a 20-year capital expense plan to assist the client in establishing priorities for major repairs and systems replacements.

As in-home technology has improved, it has become more of a challenge to keep fans and patrons engaged. As a result, more attention and planning are required in keeping sports and entertainment venues contemporary and attractive for their customer bases.

Venue Solutions Group was formed in 2011 by three former senior facility operators who recognized that many public assembly facilities did not have the support of large, contract management firms or professional sports organizations. Managing with best practices, planning for the future, and honestly assessing one's environment and operating success can be challenging in the least, and especially so with today's limited resources. In 2011, as the in-house operational consultants for the world's largest sports architectural firm, the future partners of VSG uncovered a market beyond those needing only architectural services. We discovered that many of our clients desired help in opening new buildings, understanding renovation potential, developing long term capital investment plans, developing policies and procedures, and properly training front of house staff.

VSG has recently performed comprehensive assessments of FedExForum (home to the Memphis Grizzlies NBA team), Gainbridge Fieldhouse (home of the Indiana Pacers NBA team), Spectrum Center (home of the Charlotte Hornets NBA team), Kaseya Center (home of the Miami Heat NBA team), Bridgestone Arena (home of the Nashville Predators NHL team), Kia Center (home of the Orlando Magic NBA team), Oriole Park

at Camden Yards (home of the Baltimore Orioles MLB team) and American Family Field (home to the Milwaukee Brewers MLB team). VSG was also the operational consultant to the owner of the Hollywood Park and Entertainment District, a 300-acre mixed use site located in Inglewood, California (which includes So Fi Stadium, the home of the NFL's Los Angeles Rams and Los Angeles Chargers). VSG assisted the Golden State Warriors as operational advisors on the lead up to the opening of the Chase Center in San Francisco, California.

The consultant team assembled by VSG are national firms with specific expertise in the design and operations of large sports and entertainment venues with major professional sports teams as operators or tenants.

OSPORTS, a nationally recognized sports facility designer, was engaged to perform the architectural review, focusing on the condition of the public spaces, team and event production areas, seating, and premium spaces.

Smith Seckman Reid, Inc. (SSR), a MEP & technology design firm with expertise in arenas and stadiums, performed the review of the mechanical, electrical, plumbing and fire protection systems and at the same time, provided strategies for more efficient major system operations.

Walter P Moore, a nationally recognized structural engineering firm, performed a visual structural review that focused on load bearing walls, fireproofing, steel structures, and exterior sidewalks.

Salas O'Brien reviewed the entertainment systems extensively to include the bowl video displays, sound systems, security, and broadcasting infrastructure.

MTD and Associates assessed the condition of the roof, its water diversion systems, and the exterior façade.

The food service equipment review was performed by Bigelow Consulting, a nationally recognized food and beverage

consultant, to include the concession stand, kitchen and pantry equipment along with fixed retail spaces.

VDA, Inc. reviewed the condition and performance of the elevators and escalators.

VSG and the consultant team performed the on-site review on March 18 and 19, 2024. The review consisted of a visual inspection of equipment and spaces, along with interviews with staff and a documents review. It should be noted that the Moda Center staff were available at all times during the on-site review to answer questions from the assessment team. The assistance and organization of the venue staff contributed significantly to the depth of the report.

It is the opinion of VSG and its consultant team that the Moda Center and the attached Garden Garage are being well maintained by Rip City Management. Investment in the daily upkeep of the arena will continue to accelerate during its fourth decade of operations and the operating costs will continue to get larger as the building ages.

Facility Description

The 19,000+ seat Moda Center is home to the NBA's Portland Trail Blazers and originally cost \$267M to build. The venue opened in 1995 replacing the 12,900 seat capacity Veterans Memorial Coliseum as the Trail Blazers home court. The coliseum continues to operate as a complement to the Moda Center on the Rose Quarter campus, hosting smaller concerts and the Portland Winterhawks Western Hockey League team. The Moda Center has seven levels and a variety of premium seating to include 70 suites, club spaces and Blazer Boxes accessed at the upper concourse. The arena has hosted a variety of national events to include the 2024 NCAA Women's Regional Basketball Tournament, 2005 U.S Figure Skating Championships and multiple years of the men's NCAA 1st & 2nd Rounds Basketball Tournament.

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Why Perform a Facility Condition Assessment

Public assembly venues are typically among the largest investments made by communities. Skyrocketing costs of these investments make extending the life of the facility, its systems and equipment more critical than ever. With the evolution of video and wireless connectivity technology and competition with the in-home experience, keeping facilities relevant for local, regional, and national events is becoming more challenging. Re-investing in the current facility to extend its life past what was considered the typical life span of 30 years may make more financial sense as a community investment. Incremental re-investment over the life of the facility to extend its usefulness from 30 years or beyond is significantly less expensive than building new. One of the steps to determine if long-term re-investment is appropriate is having a comprehensive facility condition assessment performed to determine the state of the facility's physical structure, systems, and infrastructure.

A facility condition assessment can assist the owner and operator in determining if its current operating policies and procedures align with evolving industry "best practices". "Best practices" can encompass not just how a facility operates but how the staff acquires their knowledge, professional development opportunities, establishing written operating policies and procedures, and training programs. It's one thing to know the condition of a system or piece of equipment, but it is equally as important to know why the current condition exists.

Executive Summary

Architecture & Interiors

Moda Center as a 30 year old facility is in good condition for its age. It would be difficult to say there are any failing architectural aspects of the facility, as the building has generally been well maintained for the duration of its lifespan. The exterior façade has clean modernistic lines comprised primarily of precast concrete panels, glass, stainless steel, linear louvers, and prefinished soffit panels at the roof line. The building

architectural features lend itself to dramatic nighttime lighting concepts.

The building operators have maximized the event level to handle a wide variety of events and maximizes its operational use by having clean and organized storage areas. We learned they have a need for producer or family rooms for certain events, and also have the need for a fourth locker room for NCAA basketball tournaments. The building operators have been creative in creating flexible space by putting the lockers on wheels and rolling them out when the fourth locker room is not required. For a facility approaching 30 years of age, there is minimal wall cracking at any level and there is minimal to no signs of ceiling stains above the 100 Level concourse. Within the event level there are select areas of ceiling stains and damage due to the large volumes of above-ceiling building service and concession piping.

Though the facility appears to be maintained well throughout its use, the building is showing signs of aging in several areas. Areas including legacy, public, and premium spaces that could be repurposed to spark more excitement within the venue. New social nodes in the generous 100 Level should be explored, and the team shore should be transformed into more of a destination location.

The parking garage needs a refresh to its appearance to enhance the arrival experience to the venue. Uniformly illuminated drive aisles, improved wayfinding graphics, and staining the concrete white or light gray would improve customer experience. This improvement would also enhance pedestrian safety and move fans to the arena in an improved fashion.

Within the last year the retractable seating system has been replaced. The next step in bowl modernization is replacement of the fixed seating. Maintenance of the fixed seats is an ongoing item as springs, armrests, and hinges need constant attention to maintain clear egress when fans are not seated.

Public restrooms are uniformly distributed throughout the facility. The restrooms are in need of modernization of fixtures and

finishes. This will also allow an opportunity to address any minor accessibility issues that may exist with the spaces.

Mechanical, Electrical, Plumbing & Fire Protection

The mechanical systems serving the Moda Center have been well maintained since the building opened in 1995. Several pieces of the original mechanical equipment have been replaced over the years; however, the general age of the equipment is approximately 30 years old. Regular preventative maintenance has contributed to the long life of the mechanical equipment, but much of the equipment is nearing the end of life and should be replaced soon.

The chilled water system functions at the intended capacity using all three chillers, but the two large chillers are at the end of their useful life. The chilled water pumps are in good condition considering their age and do not appear to be damaged or performing poorly. The cooling towers were replaced around 2019 and appear to be in great working condition. Continued preventative maintenance will help ensure this equipment exceeds its useful life.

The facility is equipped with a second condenser water loop that serves a combination of water source heat pumps and food service equipment. The pumps serving this system should be planned for replacement soon, but the cooling tower and plate and frame exchanger are in great condition.

The arena was originally designed with a full professional grade ice plant; however, due to ice system performance issues the hockey team relocated their home games to the coliseum. The system has been effectively mothballed and an entirely new ice plant and ice floor would be required to re-start ice making capabilities.

The hot water system utilizes three gas-fired boilers, with the smaller boiler being used during periods of low load. The boilers have been replaced within the last ten years and are in good condition, but the associated hot water pumps should be

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planned for replacement near the same time as the chilled water pumps.

For their age, the bowl air handling units and support air handling units are in good condition and are routinely maintained. The lifespan of an air handling unit is generally 25 years, so these units should begin to be replaced starting in the next five years. The new air handling units should be equipped with VFDs and airflow measurement stations.

The building automation system was upgraded in 2022 with a Siemens system. This system is a major improvement from the previous one, but there are still improvements that can be made for energy optimization. By monitoring and trending data, the mechanical systems in the building can be scheduled to run in a more efficient manner.

Electrical

Overall, the electrical equipment in the arena and parking garage is in good condition. While the some of the equipment has been replaced, much of the equipment is original. Facility staff have been taking action to extend the life of major equipment through regular preventative maintenance and visual inspections. The primary power service from the utility is more than adequate for the building load and has capacity for future renovation and moderate expansion. An agreement is in place with the utility provider, PP&L, for upstream dual redundant services. However, per the agreement, PP&L staff are required to perform a manual switch over to the secondary feed upon failure of the primary feed.

Power monitoring is currently provided at the main switchgear and some switchboards. The original unit mounted switchboard meters appear to still be functional, but new digital GE power leader meters were installed on the main switchgear. A thorough audit of the power distribution system should be conducted as part of any planned renovations. It should include metering at each substation over a 30-day period to determine maximum demand loads.

Emergency power for the arena is provided by one 1,500KW, 480Y/277V, diesel engine, CAT interior generator. The generator and transfer switch are original and are operating with no known issues. Emergency power for the parking garage is provided by a separate generator.

Many of the light fixtures are original, but most fixtures in areas of high traffic have either been re-lamped with LED or replaced with entirely new fixtures. Most of the light fixtures are in good working order and provide adequate lighting levels, but certain spaces will need additional lighting. Facility staff is doing well to maintain and replace fixtures as needed.

While certain player/coaches areas have been renovated, much of the lighting control system is original and consists of GE contactors for on/off control of the concourses and other areas. Local controls throughout the arena are primarily Lutron devices. There is an overall network lighting controls system that is original that can remotely open and close the GE contactors, therefore each area has local on/off with the more premium spaces utilizing localized 0-10V dimmer switches. It is recommended to upgrade to a more modern network lighting control system for the entire arena during any planned renovation to increase flexibility, allow for programmed scene settings, and meet the current energy codes.

The original sports fixtures have been upgraded to a GigaTera LED sports lighting system with separate lighting controls software and has no reports of any issues.

The show, broadcast, and portable power for the facility consists of original and new equipment that is in fair condition. Capacity is adequate for most events, but many portable devices are damaged or are missing protective covers.

Most of the fire alarm devices are original but a new Desigo fire alarm management system was installed within the past two years. This new system is sensitive to power surges and consistently causes false trouble messages which is likely the result of insufficient upstream surge protection. This system

also ties into the food service ANSUL hood systems throughout the arena.

Plumbing and Fire Protection

The plumbing and fire protection systems have been well maintained and are in relatively good, working condition given the age of the arena. Most of the major plumbing equipment, such as the booster pump skid and the hot water boilers, has been replaced within the last ten years. Facility maintenance staff had only minor issues with plumbing systems at the time of assessment.

The fire protection system is served by a city water main that is pressurized further by a fire pump. Conditioned spaces are served by wet sprinkler systems. Exteriors spaces and other areas subject to freezing are served by dry sprinkler systems or anti-freeze systems. Trail Blazer broadcasting is served by a pre-action deluge sprinkler system. Overall, the condition of the sprinkler piping is good and the maintenance staff has replaced piping in various areas as leaks have developed, which is common for a system of this age.

Structure

The assessment consisted of a walkthrough visual review to identify structural, waterproofing, and other miscellaneous items in need of repair.

The primary arena structure is currently exhibiting signs of isolated concrete and steel deterioration and is in generally fair condition overall with isolated waterproofing elements in poor condition. Structural concerns that will require repair included corrosion of roof MEP equipment support framing, corrosion of metal screens at MEP locations, and minor cracking and isolated spalling of the concrete decks. The protective coating on interior catwalk steel elements was typically observed to be in good condition and is not immediately in need of replacement. Isolated fasteners at a catwalk connection were observed to be corroded and may require replacement in the medium term.

Much of the seating bowl waterproofing elements are in generally fair to poor condition. Multiple locations of trafficable joint sealants had adhesively failed and were depressed relative to the adjacent concrete deck and in need of replacement in the near term. Other non-trafficable joint sealants including cove sealants and joint sealants applied along vertical surfaces were nearing the end of their service life and should be replaced in the medium term. Traffic coating at plaza annex areas throughout were nearing the end of their service life and will need to be recoated in the medium term.

The primary façade system comprising the building exterior is precast concrete and granite panels and was typically found to be in fair condition overall. There was an isolated instance of a spalled granite panel at street level which will need to be removed and replaced. Precast concrete panels bounded the perimeter of the upper concourse and were found to be in fair condition overall with no observed movement or related distress.

The Garden Garage is currently exhibiting signs of isolated concrete and steel deterioration and is in generally fair condition overall with isolated waterproofing elements in poor condition. Structural concerns that will require repair include delaminating grout pockets and isolated instances of concrete spalling. Various steel elements throughout the garage will also require recoating in the medium term.

Much of the waterproofing elements are in generally fair to poor condition. Joint sealants at the parking structure perimeter and construction joints were commonly missing and the expansion joint that bisects the parking structure needs replacement. Pipe penetrations through the slab were frequently unsealed, creating avenues of water intrusion.

Additional miscellaneous items in need of remediation include missing vehicle barriers around staircases, isolated cracking at CMU walls, a helicopter pad, deficient pedestrian barriers, and faded parking striping.

Technology

The Moda Center has continually added audio and video (AV) technology to the bowl to enhance the fan experience over the years; however, new rooms need to be built to house LED equipment, scoring, and video production. These rooms should be fully enclosed and include dedicated cooling with electronic access control.

Overall, the current arena speaker system is meeting expectations, but it has reached end of life. Life expectancy for electronics, specifically amplifiers and digital signal processors, is roughly 8-10 years. Upon replacement, selection of a more modern system will bring advances in speaker and amplifier technology resulting in increased clarity and low-end impact. The current mixing console system has also reached end of life. Advances in signal processing capability and expanded feature sets of new consoles will allow more overall flexibility and creativity for the operators.

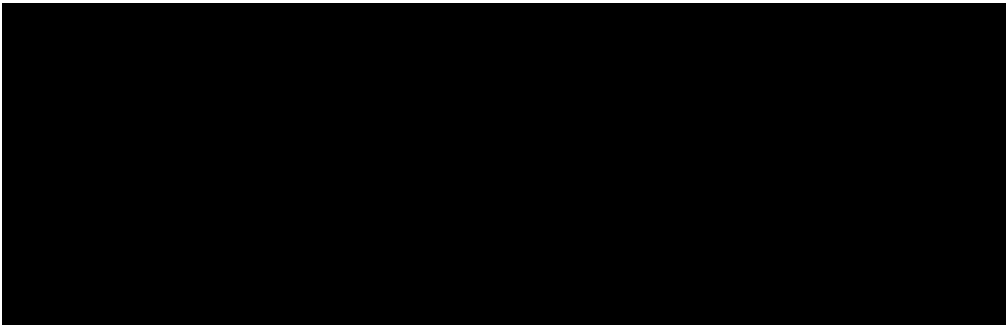
The arena contains many LED surfaces and displays that have been added at different times over the years. The bulk of the LED displays are either past or nearing the end of their useful life. Plans should be made to replace/upgrade these displays in the next year or two. The newest displays (vomitories and tunnels) can remain in place until 2027-28 before replacement is needed. However, it is recommended to try and get all displays from a single provider to ease maintenance, service, and provide whole system discount pricing.

The existing broadcast cabling has been slowly enhanced to meet needs through the years, but a complete overhaul is recommended. SMPTE, triax, single mode fiber, and analog audio tie lines should be the baseline for cabling to all camera positions to meet NBA standards. Cable housings should be upgraded to include permanent labeling and a single enclosure for each location.

The video production suite services both the in-house videoboard production as well as the Trail Blazers’ broadcast. The equipment and infrastructure are mostly a shared resource. Overall, the current production systems are meeting expectations, but they have reached end of life. Life expectancy for electronics is roughly 8-10 years with the last significant upgrade to the system in 2010. The space has become overcrowded, disjointed, and ineffective as more systems and operator stations have been added to accommodate advances. A complete overhaul of systems, space and workflow is recommended to allow more overall flexibility and creativity and efficiencies for the operators and venue.

The ancillary audio and video systems throughout the arena are basic and outdated. Most systems operate as an island and cannot be centrally controlled. Modernization of the AV systems will improve fan experience (especially for pre and post-game) and for non-game events. Upgraded audio systems and the addition of large format video displays will increase fan engagement on game day and utilization of the clubs and lounges outside of game day.

The building was constructed with data systems in mind as the telecommunications rooms are spacious and have been well maintained. The facility team has implemented updates to the telecommunications cabling system, both backbone and horizontal, to stay current with data infrastructure trends. It is apparent that they keep documented records, and the team is aware of cabling paths and terminations throughout the building. Additional backbone and wireless access point cabling should be added over time to increase bandwidth.



Roofs & Façade

The arena has a total of 16 separate roof areas, on seven various levels. The roofs have a total area of approximately 232,730 square feet. There are three generic types of roof covering systems in use on the building. Sixteen roof areas are conventional low-slope roofs with thermoplastic (TPO or PVC) single-ply membrane roof covering systems. There are two steep-sloped “mansards” that utilize flush-seam metal panels that could be considered either roofing or wall panels. The existing TPO/PVC single-ply membrane roof covering systems have been in place for two years, and generally are in good condition. The system is reportedly covered under the contractor’s 20-year warranty of workmanship and materials that should remain effective until 2042.

The exterior envelope utilizes varying types of materials and finishes, including precast concrete panels; EIFS (Exterior Insulated Finish System); polished flat-slab cut stone veneer; embossed stainless steel panels and trim; and several various configurations of pre-manufactured, pre-finished metal panels (small louvered panels, larger louvered panels, ribbed panel soffits, flush-seam panels, and cylindrical cladding panels on exterior columns). Fenestration for the building includes anodized aluminum-framed double-glazed storefront doors; stainless steel-framed double-glazed storefront doors; steel fire-rated doors with embossed steel exterior cladding; and painted steel fire-rated doors. Windows/glazing systems include aluminum-framed double-glazed fixed (non-operable) windows; aluminum-framed double-glazed storefront systems; and aluminum-framed double-glazed curtain-wall systems.

Based upon visual observations, and considering the current age of the facility, the majority of exterior envelope components appear to be in relatively fair-to-good condition, and it appears that the quality of the workmanship, materials, and quality control at original construction was above average.

Vertical Transportation

The Moda Center and the attached Garden Garage are served by four escalators and nine elevators. All the equipment at the Moda Center was manufactured and installed by Montgomery Elevator Company at the time of the arena’s original construction in 1995. Montgomery was purchased by Kone Elevator company around the year 2000 and many of the current components are obsolete and are difficult to obtain.

All the equipment installed is known to be of good quality, heavy-duty design and found to be in good overall condition. Indications are that this equipment has been properly maintained since the time of its initial installation. The current level of preventative maintenance was found to be above average.

We discovered some maintenance deficiency items during our examination. A detailed listing of all these items are included further on in this report. A copy of the maintenance deficiencies should be forwarded to the incumbent service provider with a directive to correct all items in a timely manner.

Based on our experience and industry expectations of similar equipment installed in like facilities, we feel that if proper maintenance practices are continued, the escalator and elevator systems should continue to serve the venue’s needs in an acceptable capacity for the short-term future before any major upgrades would become necessary.

The four escalators do not have the more modern safety devices but are code compliant for the code in effect at the time of installation. We verified a major component of the system, the control boards, are currently available locally which factors into our recommendation of replacement in the next four to seven years.

All elevators have Montgomery Ultron controls. The control boards for the elevators are no longer supported by the manufacturer or third-party companies. We recommend modernization of all the elevators within the next three years.

Several (relatively minor) items of code requirements were noted and have been included for consideration within the recommendations section of the vertical transportation section.

Mandated full load Category 5 (CAT5) testing procedures of the elevators appear to be current with all required test tags found to be in place. However, the Category 1 (CAT1) testing was found to be past due at the time of our review.

Food Service & Retail

For a venue that is entering its 29th year of operation, the food, beverage, and merchandise equipment has been well maintained, replaced, and updated so that the arena is current in its offerings comparable with newer venues. This is evidenced by the proactive equipment purchasing policies of the current arena owner. The foodservice outlets are attractively designed with bold signage that reflects both the offerings but also highlights the sponsorships of brands within the venue.

The foodservice operation also features several Amazon “Just Walk Out” marketplaces, utilizing AI, which is the newest technology available to public assembly facilities.

The Moda Center offers a wide range of concession menu choices as well as premium clubs, individual and party suites, and private and public bar outlets.

Levy Restaurants, the current concessionaire, is the third operator of the food and beverage services, and now their sister company, Rank + Rally, also operates the merchandise at the arena.

The merchandise sales outlets do not have the same footprint as some newer arenas, particularly when comparing the main store on the 100 Level. It is approximately 2,000 square feet, which is half the size of more modern arena team stores. The other locations around the concourses are small but not dissimilar from other NBA venues’ satellite locations.

Capital Expense Matrix

The 20-year capital expense matrix is a tool to be utilized by the facility owner and operator for planning and prioritizing capital improvements. The information we have been provided by manufacturers and current facility users is based on “best practices” for similar sized arenas. The matrix is intended to be a “living” document, whereby it is continually updated as changes occur in costs, priorities and in the consumer price index, or CPI.

In the attached capital plan, we have assigned an 3.5% CPI in years 2025 through 2044. As there is much unknown on how future world events will impact our economy, we recommend that the capital plan be updated annually. Within the capital plan we have included unit and per square foot costs along with additional cost percentages to account for demolition, installation, design services, general conditions, contractor profit and insurance. Not every upgrade or equipment replacement will require a general contractor or permitting.

Since VSG has no control over construction costs or contractor prices, any equipment or infrastructure cost estimates are made based on VSG and our consultants’ experience and judgment. VSG cannot and does not warrant or guarantee that future contractors’ proposals, bids or costs will not vary from our estimates. Before undertaking a project involving items in the capital expense matrix, we recommend a full vetting and identification of all costs prior to an allocation of or request for funding.

In the capital improvements matrix provided with the report, VSG has prioritized each capital item based on the following methodology:

High Priority - items that should be addressed immediately to maintain serviceability due to end of life or obsolescence and if the associated item’s replacement is needed to maintain the safety of the facility.

Medium Priority - items that should be addressed in the near term to mitigate further deterioration of the item and ensure the overall serviceability is maintained.

Low Priority - items that should be addressed once the high and medium priority items have been repaired or replaced to sustain the overall serviceability for the long-term.

ARCHITECTURE & INTERIORS

Our architectural assessment started by evaluating why facilities from previous generations focused almost exclusively on one-dimensional event delivery. Spectators came to an event, sat in their designated seat, enjoyed services, and went on their way. We now all but expect and desire a physical engagement to the event floor. Tailored food delivery to individuals and groups, unencumbered access to multiple facility zones, and the integration of technological advancements are all relevant to each market.

As we explored options and recommendations, our team evaluated why certain “upgrades” should be considered as priority items, and why other upgrades could be staggered. This illustrative presentation would be based primarily on the pros and cons of an upgrade as well as the benefits of their outcomes, both to the owner, staff, players, and guests.

The foundation of our architectural facility evaluation planning merged pragmatic technical upgrades with forward-thinking initiatives, architectural integrations, both physical and spatial, across the entire venue. Successful venues draw spectators to events regardless of win-loss records. They assist in delivering an emotional connection and facilitating per-cap spending.

Today’s venues must also be planned to accommodate events and expectations that have yet to be developed, anticipating the change that is inevitable. This is particularly paramount to incorporate into your thinking because the facilities that suffer economic stagnation are often those that lack the vision and flexibility required to re-invent themselves as needed within an accommodating infrastructure. In other words, we plan for what we know is coming, but we also plan for what we can’t yet foresee.

Lastly, and equally as important, is the general public’s expectations because public spaces and venues are radically different than previous generations. Access to cutting-edge technology, personalized viewing experiences, organized wayfinding, tailored food service, and a variety of immersive

experiences are just a few of the elements that now dictate fan loyalty from an attendance and monetary spending perspective.

Exterior Features

The arena is primarily clad with precast concrete panels that start approximately four feet above the granite wainscoting. There is a combination of flat panels interwoven with ribbon bands of geometrically patterned precast panels. Bands of continuous louvers are integrated into the precast banding. Prefinished metal wall panels, soffits, and parapets finish off the upper portion of the facility. The building has significant projected soffits of varying dimensions adding to the overall shape of the arena. The mostly precast concrete panel building is aging with little to no signs of distress or staining. However, the strong overhangs on the building leave large portions of the exterior protected from rain and these protected areas are showing the accumulation of naturally occurring windborne dirt.



Dirt accumulation on metals and precast panels



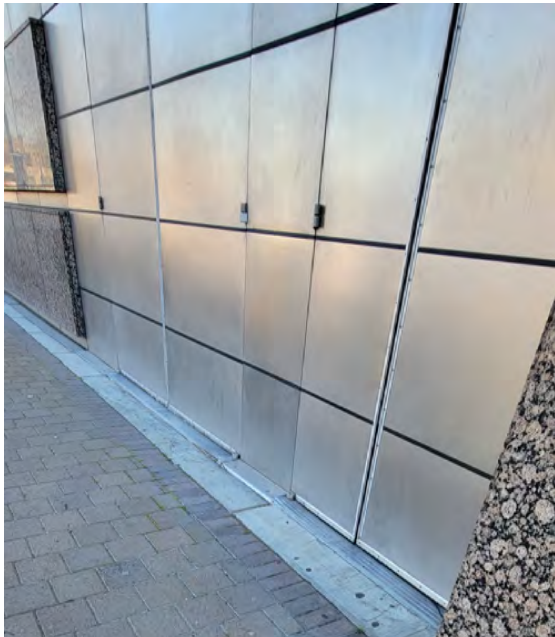
Dirt accumulation on precast panels



Dirt accumulation on precast panels



Metal column wrap baked on finish is oxidizing allowing handprints to easily mark finish appearance



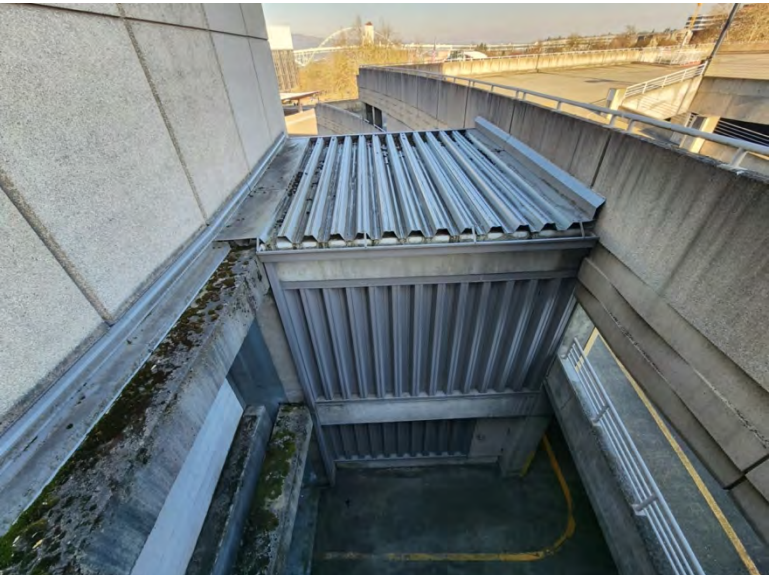
Stainless steel door skins showing accumulation of dirt



Dirt accumulation on precast and metal panels



Organic growth on walls



Expansion joint cover in need of repair or replacement

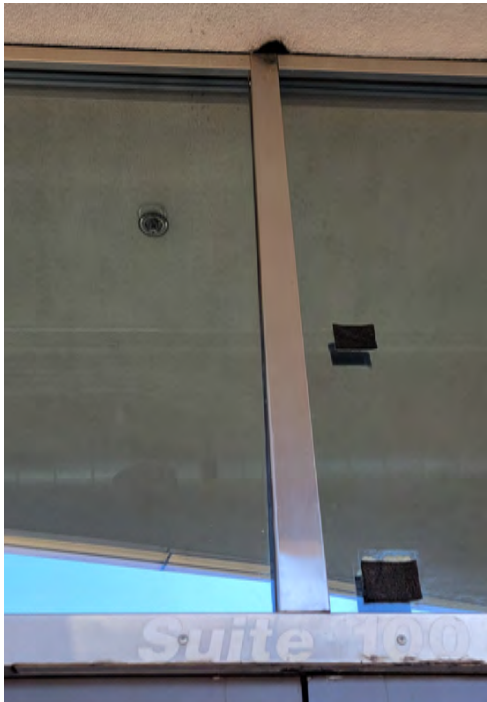
Curtainwall systems allowing natural light into the arena are located around the perimeter in conjunction with the four entrances and exits. Primary entrance doors and punched windows are clad in smooth polished stainless steel. Adjacent to the curtainwall system, and in alignment with the geometric precast panels, are embossed stainless steel panels that also match the perimeter hollow-metal egress and building access doors.

EIFS soffits above 100 level entrances are comprised of flat stucco finished panels. Lining the outer edge of the entrance soffits are boxed linear fluorescent light fixtures. The finish on the linear fixtures is weathered and they are beyond their useful life.

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EIFS soffit damage



Electrical short damage to exterior soffit

There appears to have been an electrical short that damaged the interior and exterior sides of the interior wall. This area is located just to the North of the circular entrance.

Electronic ribbon signage boards are located in the soffits of the 100 level entrances and are past their useful life.

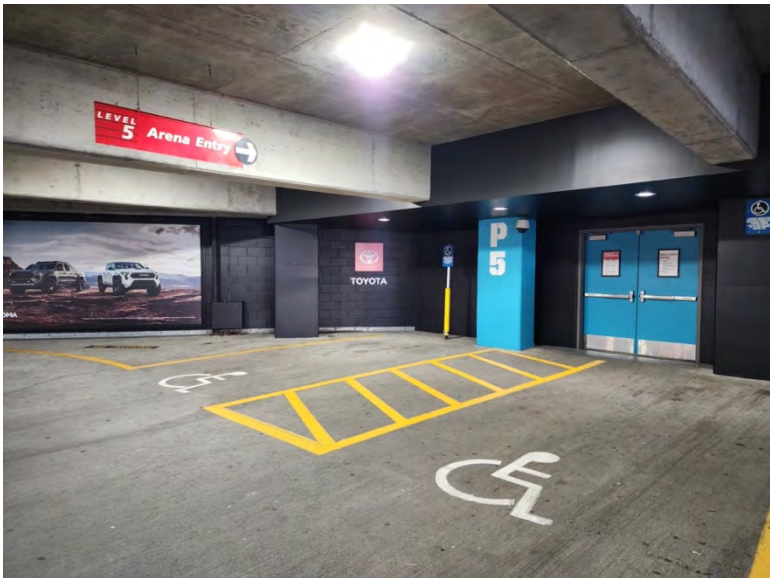


Electronic ribbon panel and linear fluorescent box fixture

The team store needs to be a destination, not just for retail shopping, but for an experience and events to attract visitors. It is recommended that improvements to the site wayfinding signage should be implemented to guide visitors to the team store.

Parking Garage

The precast concrete on the garage is not aging as well as the arena as the structure is showing signs of streaking and staining. The staining is present on vertical panels with stronger build-up below horizontal ledges of precast openings. Presumably, environmental fallout (airborne dust) is collecting, and with no exposure to rain to fully wash away the dirt, the upper portions of the panels are showing streaks. The chain link fencing along the at-grade openings is stretched and deformed in several locations. Cast-in-place concrete walls are collecting organic materials, additionally moss is accumulating on the top of the knee-wall. The full height fence with vinyl slat infill along the northeast corner is deformed and no longer has clean flat aesthetics. Precast panel and mechanical screening support steel is showing sign of corrosion and should be addressed before corrosion-related staining reaches the precast panels. Wayfinding signage graphics could be improved, particularly the size and boldness of the font. Signage could be improved to locate the elevators. Improved signage, pavement graphics, and a revisit of the accessible parking stalls should be studied.



ADA stalls restricting visibility for user entry/exit

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Light fixture imparting glare on wayfinding signage



Wayfinding signage hidden with structural members



Painting darker areas of garage white would increase perception of safety in garage and improve parking experience

Interior

The Moda Center and the attached Garden Garage parking structure to the North of the arena are part of the larger Rose Quarter Complex. The arena is connected to the annex/box office by a large plaza that connects these two buildings to the surrounding street grid.

There are nine major arena levels designated by numbers 201-209 on the original construction drawings. These are referenced in this report for consistent location. The levels and their functions are as follows:

- 201 - Service Level (including Event Level and loading docks)
- 202 - 100 Level (Main Concourse and lower seating bowl access)
- 203 - Club Level (Lower seating access Premium spaces)
- 204 - Suite Level (Suite access)
- 205 - 300 Level (Upper Concourse/ Upper Seating Bowl access)

- 206 - Mechanical (Mechanical equipment level)
- 207 - Level 7 (Press, Production, Upper Bowl egress)
- 208 - Future Skybox Level
- 209 - Catwalk Level

Above the Event Level, there are two concourses, the 100 Level and the 300 Level, which are open to the ticket-buying public during events. The 100 Level concourse provides access to the lower bowl (including the 200 Level seats); while the 300 Level concourse provides access to the upper bowl. A third concourse, the 200 Level, provides access to premium level bars and services including the Rose Garden banquet facility, and several outdoor terraces. A fourth concourse, the Suite Level, provides access to the skyboxes and is restricted to patrons who have suite admission. All concourses provide a variety of concession stands.

Acoustics

A unique feature to the Moda Center is known as the "acoustical cloud". The acoustical cloud is a set of 160 rotating acoustic panels suspended from the Moda Center ceiling intended to recreate the roar of noise that made the old Memorial Coliseum one of the loudest buildings in the NBA. Each panel is shaped like an airplane wing with one side of each panel reflecting sound, while the other side absorbs sound. With panel controls located at the catwalk level, the panels can be rotated, raised, or lowered to the acoustical requirements of the event.

Facility Condition Assessment
Moda Center & Garden Garage



A unique feature to the Moda Center known as the "acoustical cloud"

Public Toilet Rooms

A review of existing public toilet rooms reveals that they have been distributed and accessed from concourses at various levels of the arena. The level of finishes within the toilet rooms is consistent with similar type facilities to where club level restrooms have more premium floor/wall tile, ceilings, vanity

counters compared to, for example, sealed concrete floors, painted walls, and sinks in general admission restrooms. Our observations indicate the club level restrooms have been updated at some point, but the general admission restrooms appear to be the original installation and should be updated. The luxury suites each have individual toilet rooms which are not consistent with the design of more recently built sports arenas where separate restrooms are programmed and designed for multiple suites.



Toilet room partition material showing ghosting of prior graffiti cleaning

The following are existing toilet counts and ratios based on review of existing documents. The toilet fixture ratios for each level are based on the fixture counts and seating capacities at each level with a 50/50 split of men and women.

<u>Event level*</u>	
WC for women:	314 occ / 24 fixtures = 13 per fixture
Sinks for women:	314 occ / 10 fixtures = 31 per fixture
WC+U for men:	314 occ / 22 fixtures = 14 per fixture
Sinks for men:	314 occ /10 fixtures = 31 per fixture

*Based on 628 occupants (occ), courtside basketball only; concerts will result in higher ratios based on event floor capacities

<u>100 Level</u>	
WC for women:	4063 occ / 88 fixtures = 46 occ per fixture
Sinks for women:	4063 occ / 30 fixtures = 135 occ per fixture
WC+U for men:	4063 occ / 88 fixtures = 46 occ per fixture
Sinks for men:	4063 occ / 28 fixtures = 145 occ per fixture

<u>Club Level</u>	
WC for women:	897 occ / 41 fixtures = 21 occ per fixture
Sinks for women:	897 occ / 17 fixtures = 52 occ per fixture
WC+U for men:	897 occ / 47 fixtures = 19 occ per fixture
Sinks for men:	897 occ / 17 fixtures = 52 occ per fixture

<u>300 Level</u>	
WC for women:	3822 occ / 76 fixtures = 50 occ per fixture
Sinks for women:	3822 occ / 34 fixtures = 112 occ per fixture
WC+U for men:	3822 occ / 84 fixtures = 46 occ per fixture
Sinks for men:	3822 occ / 24 fixtures = 159 occ per fixture

In order to reduce queueing times, we typically recommend the ratios of 40 occupants per fixture or below on water closet/urinal fixture counts for professional basketball arenas, especially at the 100 Level. Also, we believe there may be less than typical (or desirable) number of family/unisex restrooms currently existing, notably at Club Level and 300 Level. The Event Level could also be challenging with the number of existing public restrooms for concerts when seats also occupy the event floor.

A master plan exercise should be considered to address the fixture count ratios.

Service Level

Operationally, the event level support spaces are used efficiently, and in some cases the spaces serve dual purposes depending on the event requirements.

The media/work rooms are functional but could use a paint refresh and new carpet.



Water stain observed on ceiling tile in media workroom

The locker room hallway is painted CMU with LVT flooring. The signage graphics blend into the wall color scheme making wayfinding somewhat unclear. The LVT shows signs of wear, as wheel indentations in the tile are pronounced. The acrylic wall graphics have locations with chipped edges.



Corridor outside team locker room are in fair to good condition

There are five locker rooms in the arena. The Trail Blazers’ player spaces (locker room and showers) are on par with other NBA team spaces. The Trail Blazers’ weight room is tight for the amount of equipment used in today’s training programs. There are three other locker rooms with an additional room that can be set-up for a NCAA tournament locker room (Locker Room D) when required. Locker Room A is used for NBA visitors and has showers, sports medicine, and coaches’ offices. Locker Rooms A-D are adequately functioning, but the finishes and millwork are worn and should be considered for a refresh. When Locker Room D is not being used as a Locker Room, it is used as a family room and/or promoter lounge.

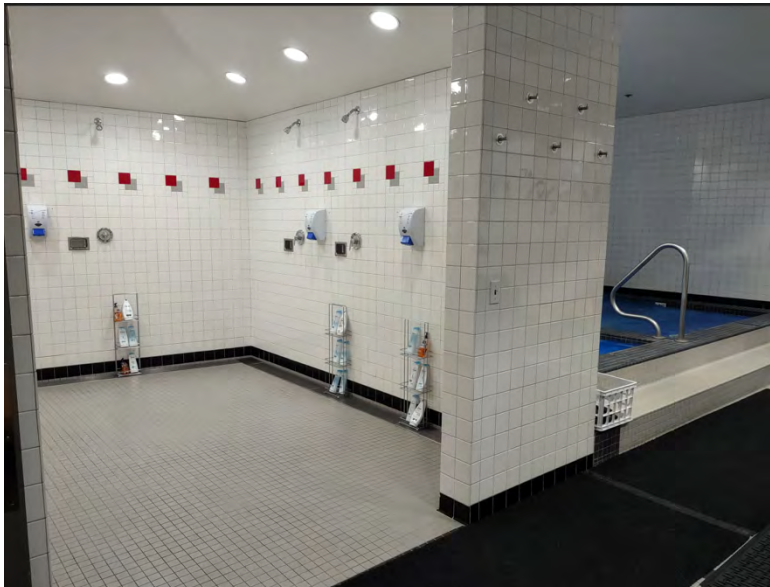


Team locker room has updated architectural finishes



Team toilet rooms and showers are in good condition

Facility Condition Assessment
Moda Center & Garden Garage



Team toilet rooms and showers are in good condition



Weight room is in good condition



Lockers are original installation in Locker Rooms B and C, and show signs of wear and tear



Hydrotherapy area is in fair to good condition



Auxiliary locker room architectural finishes on floor, walls, and ceilings show signs of wear and tear



Video coaching room has updated architectural finishes

Facility Condition Assessment
Moda Center & Garden Garage

The laundry room, including the four washers, are in good condition. The laundry room is used to store the lockers that are necessary to convert Locker Room D to NCAA tournament standards. To ease this room reconfiguration, operations has mounted wheels on the lockers making them mobile. When locker Room D requires lockers, the wheeled lockers are rolled in from storage.

Operationally the support spaces are used efficiently and in some cases the spaces serve dual purpose depending on the event.

The Trail Blazers' family room is located just outside the players locker room access path to the court. The family room is partitioned with modular wall panels. The partial height wall panels leave the family room open to the service level corridor and Baseline Lounge.

There are six star rooms (dressing rooms); a few rooms have newer finishes, and a few need a finish refresh. Star Room F is in the worst condition and needs more work than the other dressing rooms.



Star dressing rooms have older finishes on floor, walls & ceilings show signs of wear and tear



Door threshold at star room is worn out and needs repair/replacement to avoid potential tripping hazards

The Oro Fino Bar, a high-end premium space, is accessible to VIP patrons and was completed in 2019.

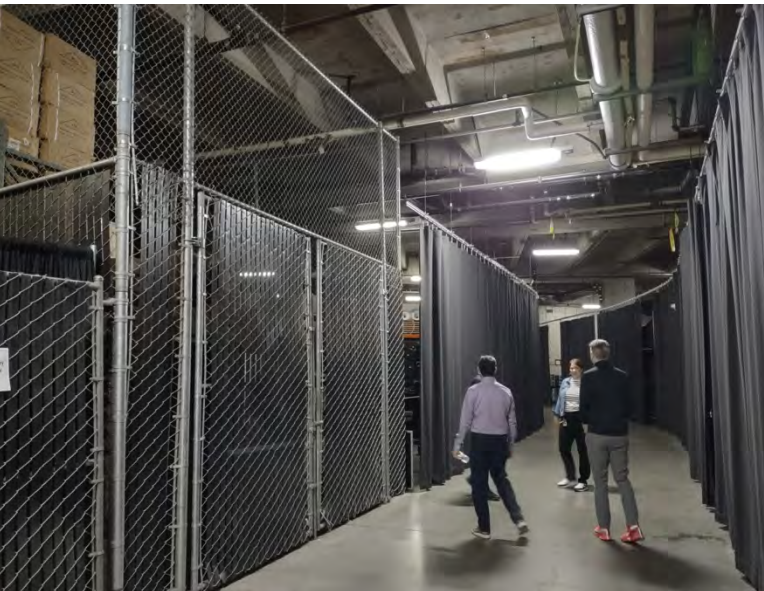


Oro Fino Bar/Lounge at Event Level



Bar/lounge at Event Level in fair to good condition

The arena's event level storage areas are clean and are well organized resulting in efficiently using the available space.



Event storage in fair to good condition

Facility Condition Assessment
Moda Center & Garden Garage

On the opposite side of the VIP entrance are the staff locker rooms.



Staff locker room in fair to good condition

The staff locker rooms are large, and the metal lockers are in good condition. The restrooms and showers within the locker rooms are clean but need a refresh of finishes. The ratio of male to female lockers are disproportionate. This should be revisited to see if today’s labor ratios are more balanced. If so, the locker room configuration should be redesigned, perhaps in conjunction with the shared entrance configuration.

Visiting press is a very minimal, plain space and is need of a refresh.

The loading dock has six bays and one ramp to access the event level. There are two dock levelers and four edge of dock levelers. All of the dock equipment, signage, lights, and bumpers should be considered for replacement.



Entry into Courtside Club



Courtside Club interiors appear in fair to good condition



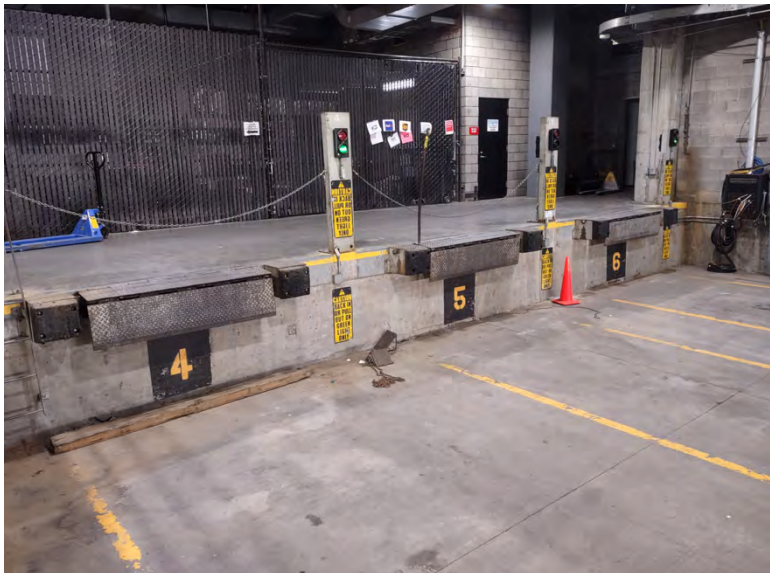
Entry into Courtside Club



Floor transition at entry to Courtside Club needs repair/replacement to avoid potential tripping hazards or any accessibility issues



The loading dock is in fair to good condition, showing signs of normal wear and tear

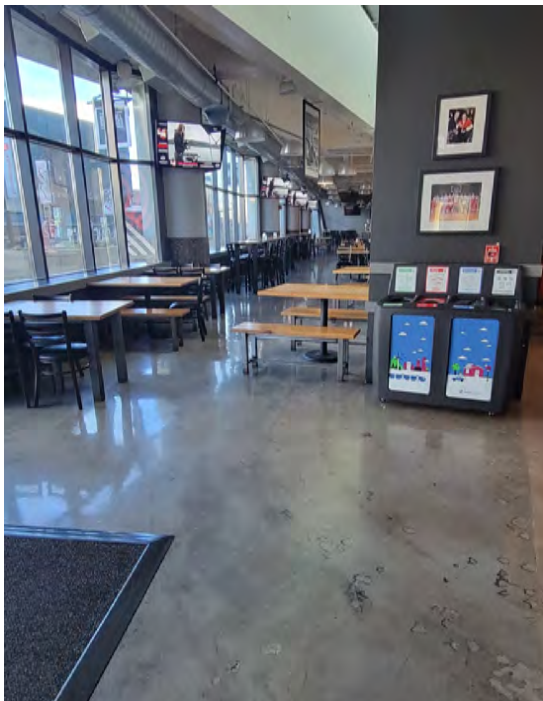


There are no trench drains observed at the base of loading dock apron

Under standard industry design and construction practice, trench drains are typically installed at dock aprons.

100 Level (Main Concourse)

The 100 Level concourse is primarily polished concrete with smaller areas of materials specific to a retail space, bar, or entrance. The polished concrete is easy to maintain and, if damaged by material handling, blending by additional polishing can make the repair merge into the adjacent areas. As the facility reinvents itself for the future, additional finish materials should be considered. The cleaning methods used, along with the lack of cove base, is leaving staining along the wall to floor interface. Periodic attention should be given to the wall and floor boundary, especially in the restrooms.



Polished concrete finish with surface chipping/delamination

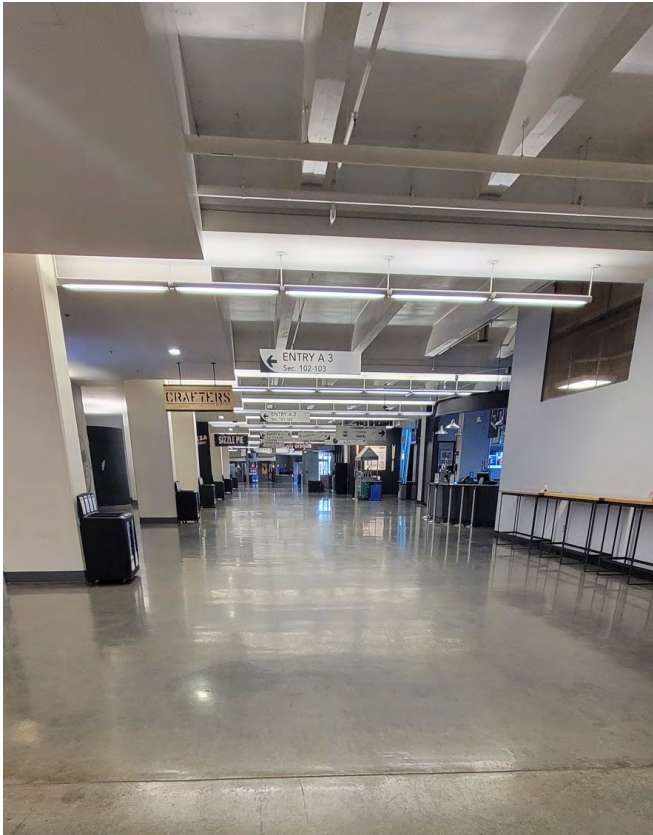


Polished concrete finish staining adjacent to walls



Polished concrete finish staining adjacent to walls

Wayfinding signage in the concourse is light in color and tends to blend with the white ceilings and overhead structure. Easy to read graphical wayfinding should be considered to help move patrons to their destination.



Concourse signage is difficult to read at distance and new wayfinding signage should be designed with a story to define pathways

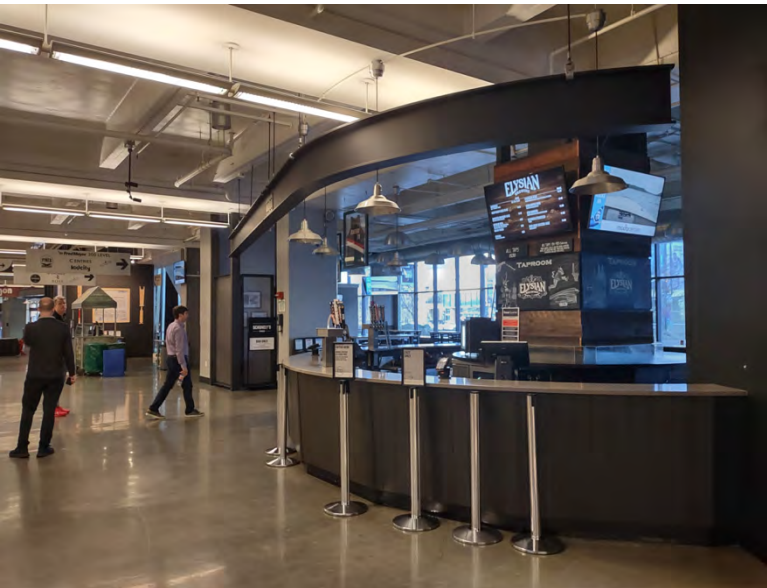


Polished concrete finish staining adjacent to walls

Magnetometers and x-ray equipment at the entrances have power cords taped to the floor. This is a bit understandable as 1995 arenas were not designed with in-floor power at the entrances. To clean up the floor and to eliminate the possibility of tripping on cords taped to the floor, new in-floor power should be considered in a renovation.



Concession front at 100 Level with menu boards easy to read from distance



Concourse bar front at 100 Level in good condition

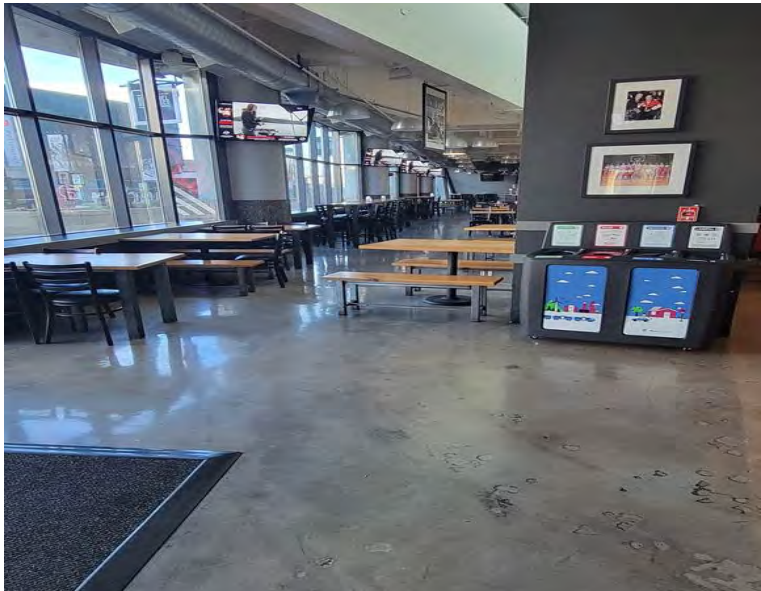
Facility Condition Assessment
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Club Level

The Club Level is directly above the 100 Level concourse provides access to the 200 level seats in the bowl. The club patrons also have direct access to several concessions such as The Speck, The Sphere, and The Rose Garden banquet room. The flooring at the Club Level is a combination of carpet tiles and large format tile. The overall condition of the level is in fair to good condition but with finishes that are somewhat dated.



Concourse at Club Level tile flooring in fair condition



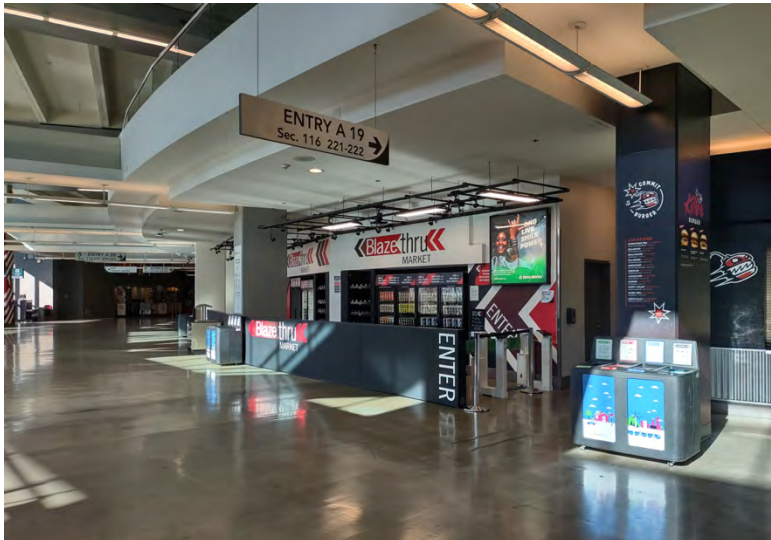
Main concourse bar is approximately 11,700 sq. ft.



Grab-and-Go stand at 100 Level is a new addition to the food and beverage offerings



Concourse at 100 Level at sales area in great condition



Concourse at 100 Level floor, walls and ceilings are in fair to good condition



Lounge at club level carpet shows signs of wear and tear



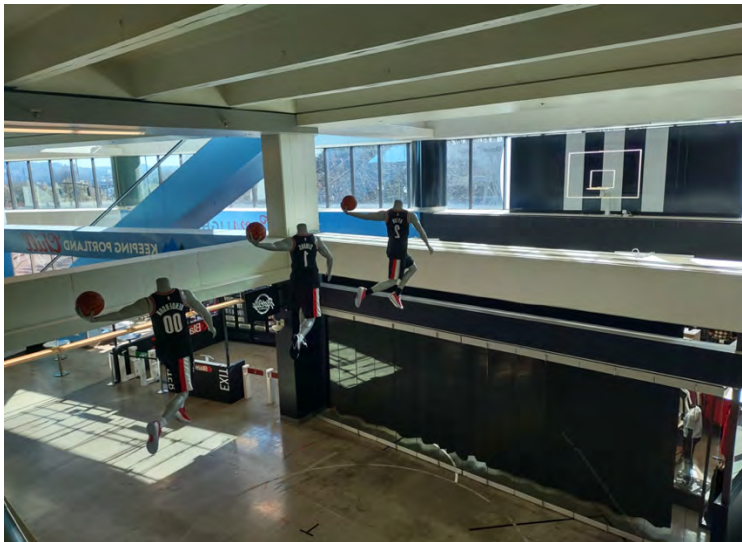
Lounge at Club level



Club Lounge



Bar at Club Level



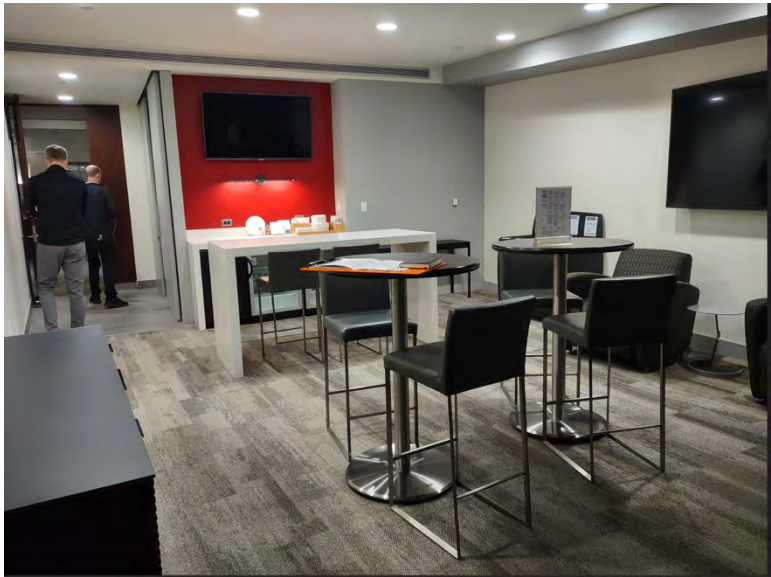
Club level overlooking team store



Club Level tile chipping and flooring wear



Club Lounge



Updated luxury suite finishes in good condition

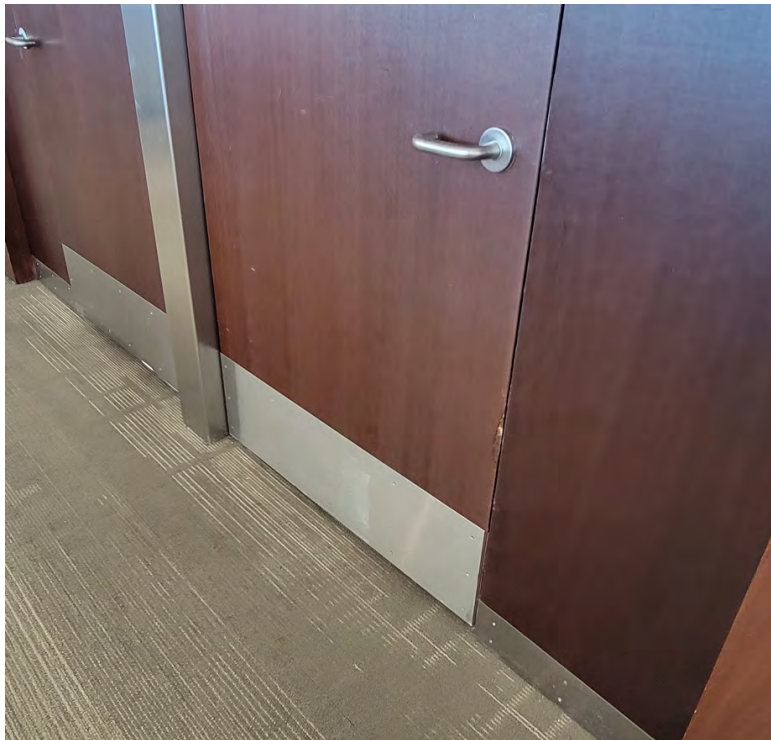


Suite corridor carpet shows sign of wear and tear

Suite Level

The Suite Level is divided into a combination of suite concepts. 50 suites are of original size and configuration. The Legacy Suite and Studio 365 are a combination of two suites. The Pacific Office Automation Party Suite is a combination of four suites. The Studio Suites are a combination of six suites transformed to a large dining area and opera style seats for 24 groups of four.

The flooring at the Suite Level is a combination of carpet tiles and large format tile. The individual suites vary from recently transformed finishes to nearly original materials and finishes.



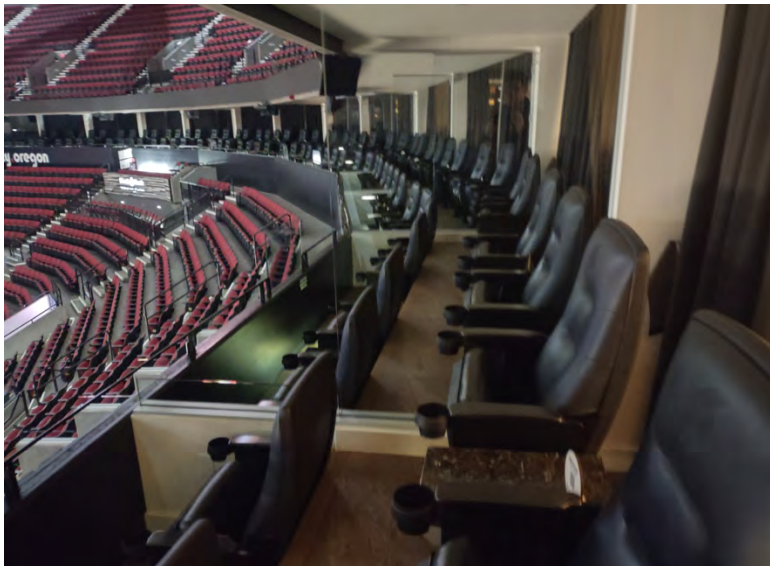
Wear at suite door



Luxury suite finishes in good condition



Suite Level lounge



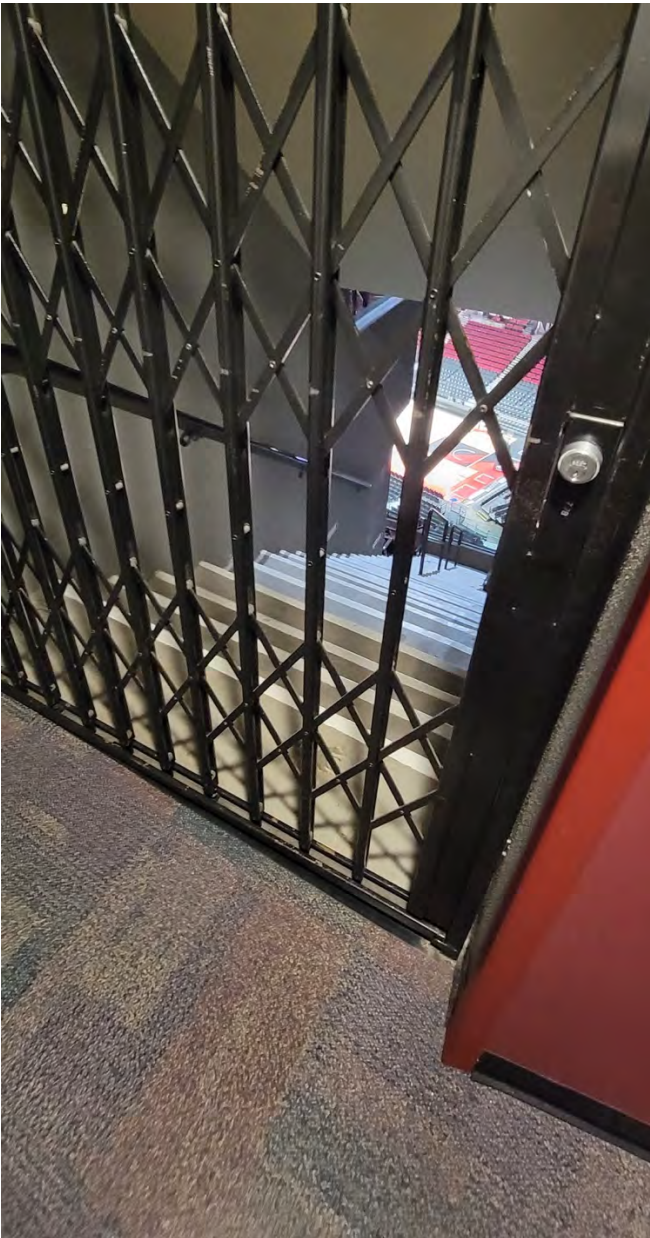
Suite seating in good condition

300 Level (Upper Concourse)

The 300 Level concourse is primarily polished concrete with smaller areas of materials specific to a retail space, bar, or entrance. As the facility reinvents itself for the future, additional finish materials should be considered. The cleaning methods used, along with the lack of cove base, is leaving staining along the wall to floor interface. Periodic attention should be given to the wall to floor boundary, especially in the restrooms.

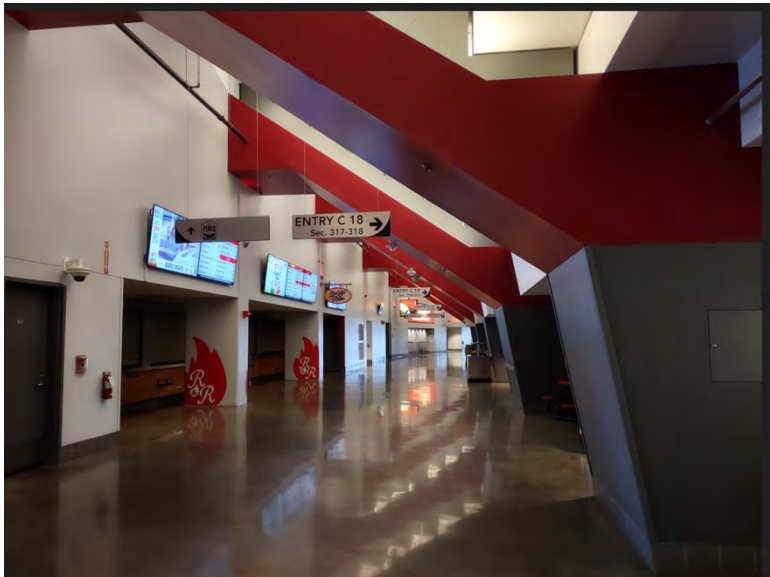
Wayfinding signage in the concourse is light in color and tends to blend with the white ceilings and overhead structure. Easy to read graphical wayfinding should be considered to help move visitors to their destination.

The upper bowl has a couple of locations where there is a door or gate at the upper extents of an aisle. These conditions should be reviewed to ensure there is not a “dead-end corridor” created by a locked door or gate and a clear egress path should be ensured and identified.



Potential restricted path of egress

Facility Condition Assessment
Moda Center & Garden Garage



300 Level concourse finishes are in good condition



300 Level concourse architectural finishes are in good condition



Level 300 restrooms appear to have original finishes



Bar at 300 Level concourse



300 Level toilet rooms have original finishes



300 Level toilet rooms have original finishes with wall tile and base show signs of wear and tear

Seating Bowl

Visually, the seating bowl design provides for an intimate bowl without extensive cantilevers or overhangs thus creating a monolithic bowl design. The parabolic design of seating bowl rake is visually evident which is usually an indicator of proper sight lines design for fixed seating areas.

The seating bowl consists of courtside seating, 100 Level, Club Level, 200 Level, and 300 Level seating with one level of suite seating tucked in between Club Level seating and 300 Level seating. The total capacity of the seating bowl is roughly 18,000 fixed seats with approximately 1,024 suites seats resulting in total seating capacity of slightly over 19,000 seats for basketball configuration.

There are substantial quantities of telescopic seating platforms and demountable seating at courtside and 100 Level seating that allow for expansion of the event level floor making the arena multi-purpose and flexible for conducting various events such as, but not limited to concerts, floor shows, etc.



Undercarriage for new telescopic seating platforms



Demountable and telescopic seating

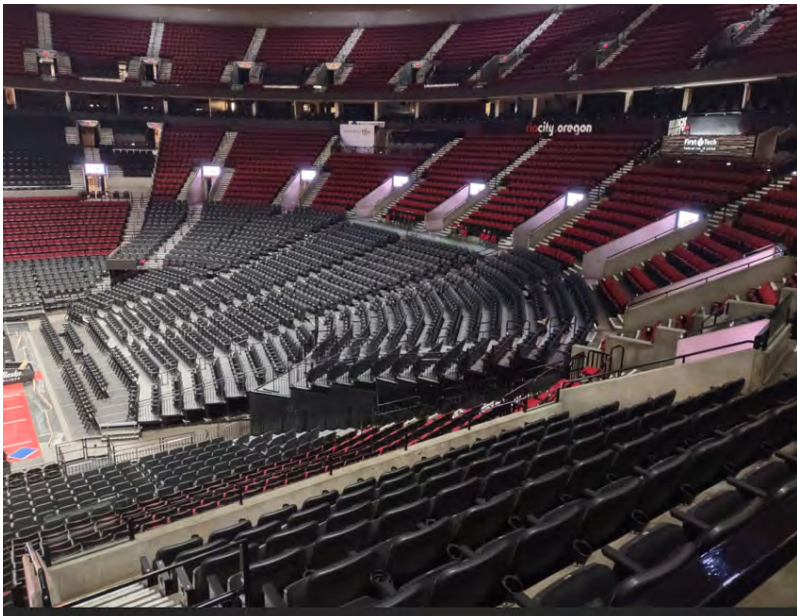
During our walk-thru, the basketball court seating configuration was set up, limiting our review to this layout. However, it is our understanding that telescopic seating platforms were recently replaced and have the ability for various multi-purpose configurations.

The padded arena fixed seating appears to be the original installation and should be targeted for replacement within the next five years.

The precast concrete seating treads and risers should be targeted for cleaning and new sealer application with sequenced fixed seats replacement schedule. At the same time, joint sealants in the bowl should be replaced as there are a significant amount of joint sealant failures. Several areas had depressed joint sealants that are suspected to have resulted from a high heel or similar pin-point depression.

The seating bowl rails are generally in fair to good condition with some repairs and touch-ups that will be needed as part of the arena maintenance program.

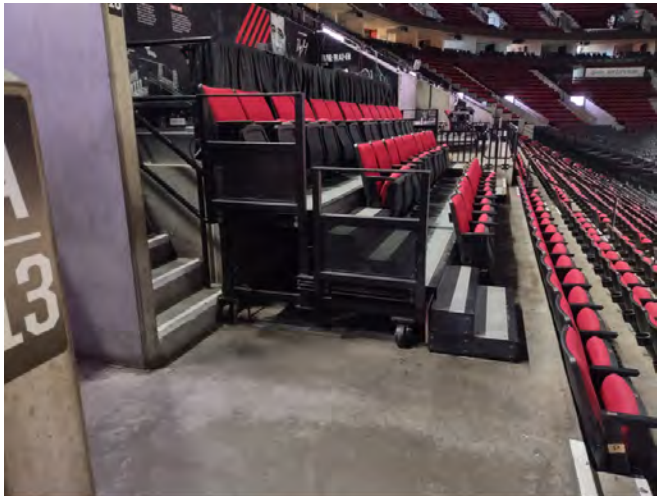
There are accessible seating platforms scattered throughout the bowl at different locations and various levels. We observed several accessible seating platforms that are infilled with fixed seating platforms. We recommend a more thorough review of existing accessible seating to ensure the current configurations meet all requirements, but more specifically horizontal/vertical dispersions and sightlines for wheelchairs in accordance with current applicable building codes and applicable accessibility standards for accessible design.



Seating bowl looking north

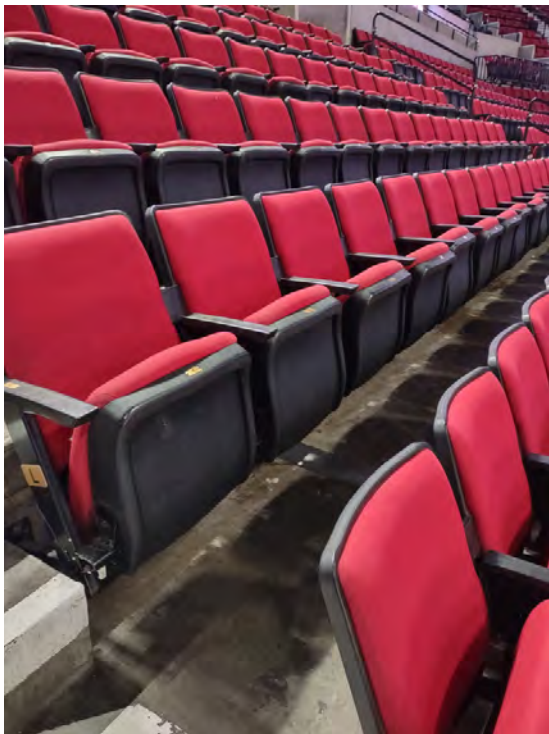
Facility Condition Assessment
Moda Center & Garden Garage

More specifically, the applicable codes require tread depths shall have dimensional uniformity. The tolerance between adjacent treads shall not exceed 3/16". The existing tread dimensions exceed this tolerance and substantially vary in depth along aisle steps.



Infill seating on accessible platform near

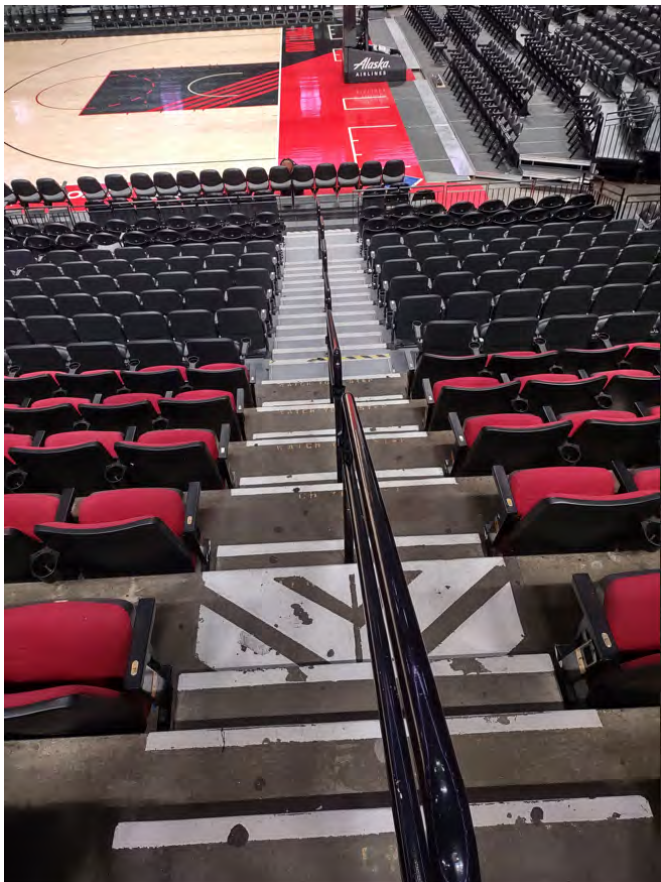
In Section 111 the aisle steps do not appear to be code compliant as a one could step off 2nd step which is more than 8" maximum allowed by code.



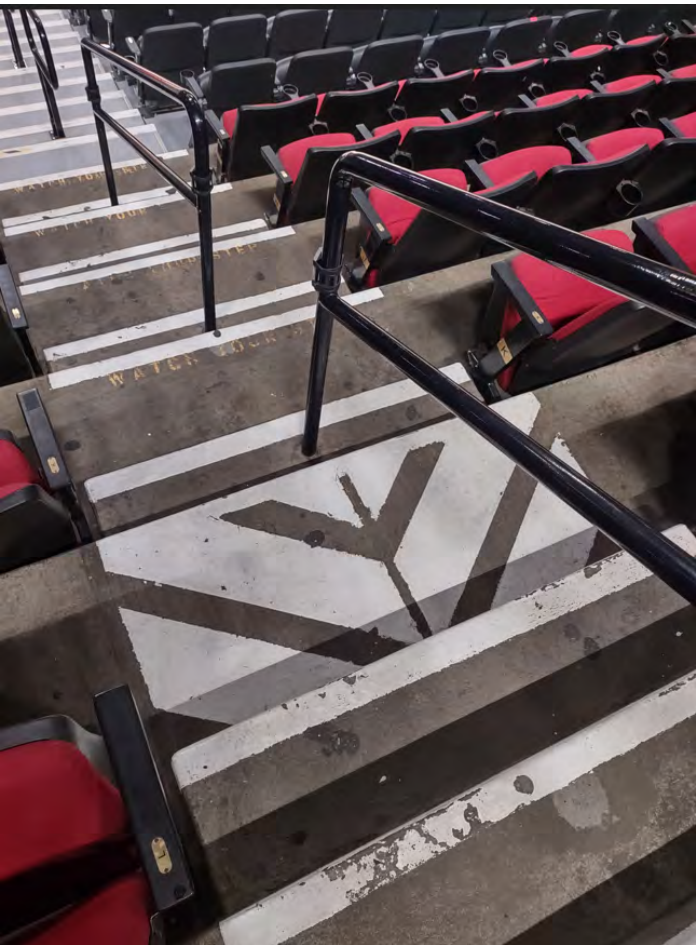
Lower deck padded seats appear to be the original installation and show signs of wear and tear



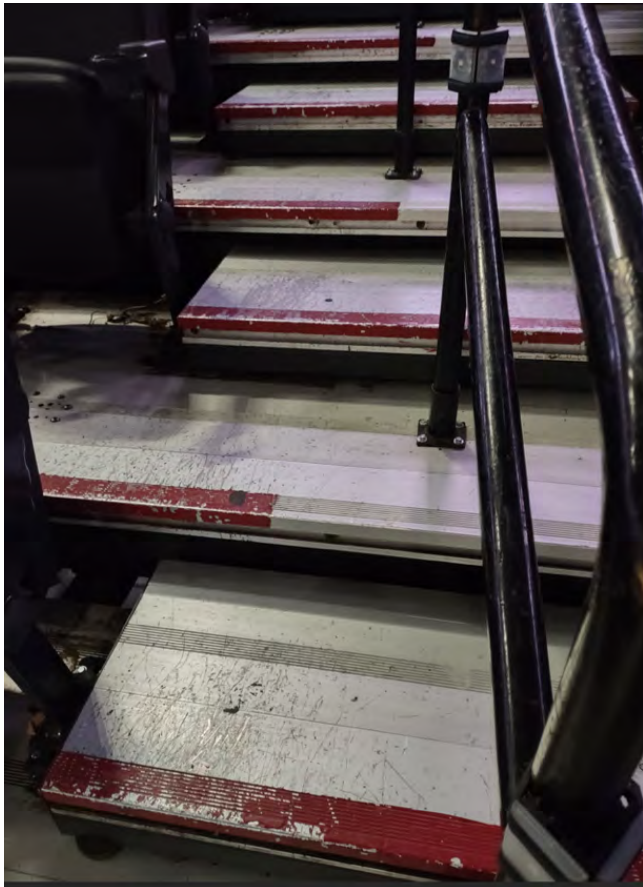
Stains on padded seating at lower deck



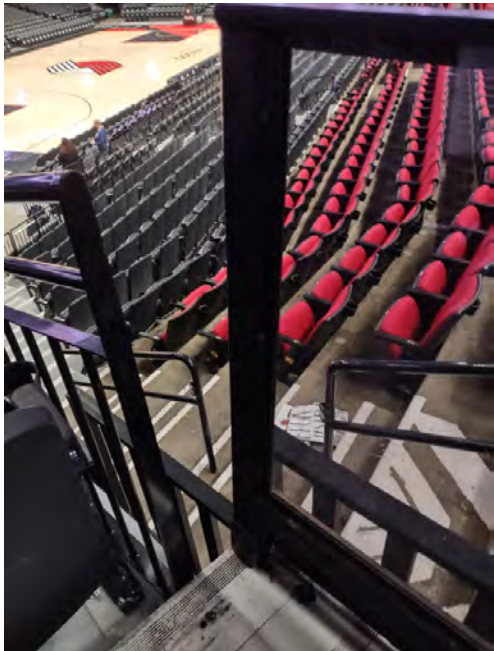
Typical configuration of aisle steps on lower deck indicates potential safety issues



Contrasting marking stripes have worn out at seating aisles and should be replaced as required by code



The aluminum seating treads show signs of substantial wear and tear at Section 116



At Section 116 the gap in guardrail exceeds allowable 4-inch sphere required by code



At Section 116 the gap between concrete and aluminum aisle step; this condition could become potential tripping hazard



Aluminum closure plate at seating tread held in place with duct tape; this condition could become potential tripping hazard



Aluminum closure plate at seating tread held in place with duct tape; this condition could become potential tripping hazard

RECOMMENDATIONS

Exterior

Curtainwall and Storefront System

- Thresholds at building perimeter doors should be replaced after the adjacent concrete is restored.
- New thresholds should be set in sealant.
- Clean and restore to remove years of airborne dirt accumulation.
- Develop a maintenance practice to wash the building particularly under the expansive overhang where the panels are not exposed to rain.

Exterior Precast Panels

- Clean and restore to remove years of airborne dirt accumulation.
- Seal panels with a breathable sealer to minimize accumulation in the future.
- Develop a maintenance practice to wash the building particularly under the expansive overhang where the panels are not exposed to rain.

Exterior Metal Façade Cladding (Soffits, Eyebrow and Louvers)

- Clean and restore to remove years of airborne dirt accumulation.
- Develop a maintenance practice to wash the building particularly under the expansive overhang where the panels are not exposed to rain.

Exterior Embossed Stainless Metals (Doors and Accent Banding)

- Clean and restore to remove years of airborne dirt accumulation.
- Develop a maintenance practice to wash the building particularly under the expansive overhang where the panels are not exposed to rain.

EIFS Soffits

- Repair damaged EIFS soffits.
- Coordinate soffit repairs with replacement or removal of obsolete electronic ribbon signage.
- Clean EIFS soffits and prep for new elastomeric coating.
- Apply new elastomeric coating to EIFS surfaces.

Granite Wainscotting

- Repair damaged granite wainscotting

Exterior Guardrails and Handrails

- Tubular handrails and guardrails should be cleaned and repainted.
- Support post bases should be fully grouted at drilled cores. If the grout does not have positive pitch, sealant can be applied to bases. Periodic observation of grouted and sealed handrail/guardrail bases should be part of routine maintenance programs.

Expansion Joint

- Replace expansion joint assemble between the parking garage and arena.
- Replace expansion joint on the annex plaza between.

Exterior Stairs and Ramps

- Repair concrete landings for exterior stairs and ramps. Repairs should include:
 - Remove and replace damaged concrete.
 - Apply corrosion inhibitors to exposed reinforcing.
- Replace all joint sealants at the stairs and railings.
- Patch concrete wall corners at ramp landings to doors.

Exterior Fences and Gates

- Fencing along the at grade opening to the garage should be replaced.
- Screening fence in the garage should be replaced.

Team Store Wayfinding

- Provide stronger wayfinding signage for team store to be a destination, not just for event retail shopping, but for an experience and destination to attract patrons.

Garden Garage

Garage Wayfinding and Safety

- Wayfinding signage in the garage, although attractive from a graphics standpoint, is difficult to read at a glance. The signage fonts are narrower than recommend by parking associations and should be enlarged.
- Lights are often directly in front of signs creating glare and should be redirected downward.
- Signs are often up in the structure making sign difficult to read until driver's view is clear of structural members so additional signage is needed to eliminate signage blind spots.
- Increase signage approaching pedestrian and vehicular crossing points.
- Clean concrete and apply breathable white paint to increase the overall parking experience and improve safety. This can be implemented in phases. Initial phase would be to address dark areas, entrances, arena access, locations where pedestrians cross vehicular traffic.

Service Level

Loading Dock

- Replace two dock Levelers
- Replace four edge of deck levelers
- Replace dock lighting
- Replace dock signage and accessories

Media /Work Rooms

- Replace paint and carpet

Facility Condition Assessment Moda Center & Garden Garage

Locker Room Hallway

- Signage graphics blend into the wall color scheme making wayfinding not as clear as it could be. Consider signage color change or different wall color.
- Replace LVT flooring showing signs of wheel indentations.
- Repair/Replace wall graphics with chipped edges.

Locker Room A-D

- New wall coating
- New flooring
- New lockers (on wheels for Room D)
- New ceilings

Laundry Room

- Laundry room equipment looks to be in good condition. The equipment will need to be replaced at least once over the next 20 years.

Trail Blazer's Family room

- The family room is partitioned with modular wall panels. The partial height wall panels leave the family room open to the service level corridor and Baseline Lounge. This use is a bit more than temporary. Verify space conforms to code requirements.
- Study if the event level needs can operate with this room being permanent with fixed walls, providing greater privacy for families.

Star Rooms

- Refresh Star Room F near term
- Refresh remainder of star rooms, long term

Courtside Club

- Courtside Club premium space that needs to be re-visioned with focus on flexibility of use.

VIP entrance / Staff Entrance

- With the modern-day demand for premium spaces, the shared staff and VIP entrance should be studied.

Staff Locker Rooms

- The restrooms and showers within the locker rooms are clean but need a refresh.
- The ratio of male to female lockers are disproportionate. This should be revisited to see if today's labor ratios are more balanced.
- Staff locker room configuration could be redesigned, perhaps in conjunction with the shared entrance configuration.

Visiting Press

- Need of a refresh

100 Level (Main Concourse)

100 Level Concourse Polished Concrete

- The cleaning methods used, along with the lack of cove base, is promoting staining along the wall to floor interface.

Wayfinding signage

- Concourse wayfinding signage is light in color and tends to blend with the white ceilings and overhead structure. Easy to read graphical wayfinding should be considered, helping move visitors to their destination.
- Provide in-floor electrical receptacles for entrance door security equipment to eliminate taping power cords to the floor.

Club Level

The Club Level

- There are several low dropped ceilings within the club concourse. A study should be performed to validate ceilings are in compliance with current codes.
- The space is well used, and the finishes are starting to show wear. From scratched and dented millwork to chipped floor tile this space needs a modern transformation.
- In time the concessions and bars will need refreshing.

- Balance of the Club Level flooring will need to be replaced soon.
- Suite doors see a large volume of service carts that in time wear the doors. Doors will need to be replaced once over the next 20 years.

Suite Level

The Suite Level

- The Legacy Suite, Studio 365, Studio Suites, and the Pacific Office Automation Party Suite are a few years old. The balance of the suites should be on a cycle of refreshing seating, millwork, ceilings, flooring, and wall coatings.
- Balance of the Suite Level flooring will need replaced of the course of the period of the capital replacement time horizon.
- Suite doors see a large volume of service carts that in time wear the doors. Doors will need to be replaced once over the period of the capital replacement time horizon.

300 Level (Upper Concourse)

300 Level Concourse Polished Concrete

- The cleaning methods used, along with the lack of cove base, is promoting staining along the wall to floor interface.

300 Level Wayfinding signage

- Concourse wayfinding signage is light in color and tends to blend with the white ceilings and overhead structure. Easy to read graphical wayfinding should be considered, helping move visitors to their destination.

Upper Bowl Egress

- Upper bowl has a couple of locations where there is a door or gate at the upper extents of an aisle. These conditions should be reviewed to ensure there is not a dead-end egress path created by a locked door or gate. Code investigation of the aisle leading to the locked gate

and/or door should be performed to determine if physical change need to be mad at the last row of seating.

Upper Bowl Top Row

- Upper row has a few conditions that should be studied. Verify if top row as currently used requires a railing.
- If back row is used for egress, drink rails are an obstruction.
- Standing zone has low clearance head knocker conditions.

All Levels

Seating Bowl (all Levels)

- Replace seating within five years
- Prep and paint all leading edges of aisles, steps
- Clean and seal precast
- Replace joint sealants
- Remove and replace metal joint sealant cover plates
- Replace expansion Joints
- Paint and touch up railings
- Complete an accessibility assessment on seating requirements as part of the seating replacement for the bowl.

Restrooms (All Areas)

- Except for a select few locations, restrooms finishes need a complete refresh to be comparable with more modern venues. Team restrooms, newer suites are examples where restrooms have been modernized.

MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION

Mechanical

The two primary goals for this assessment are to identify equipment that is in need of replacement or that will be within the next 20 years and second, to identify potential system upgrades and emerging technologies that would provide a benefit in utility savings, maintenance, guest comfort and indoor air quality.

Estimates of equipment life are based on both the ASHRAE 2019 Handbook – HVAC Applications and the ASHRAE Owning and Operating Cost Database. Specifically, data from the ASHRAE Handbook is from the Akalin 1978 study and, where available, from the 2005 Abramson data. The database is an ongoing project and represents more up-to-date information, although the dataset in some cases is too small to be considered useful. Information is presented in the report as a range between the three, while in the capital expenditure table either the mean of the range or the best value from experience has been used. Access to the database is available at: <http://xp20.ashrae.org/publicdatabase/>. We reference ASHRAE Standard 62.1 – Ventilation for Acceptable Air Quality and ASHRAE Standard 90.1 – Energy Standard for Buildings except Low Rise Residential Buildings.

Chilled Water System

The main chiller plant located within the arena consists of three water-cooled centrifugal chillers. According to maintenance staff, all three chillers are needed to handle a peak building load during the summer months. Two of the chillers (CH-1 and CH-2) are constant speed and sized for 765-Tons each. Both of the large machines are manufactured by McQuay.



Chiller 1

The small chiller, CH-3, is sized for 380 tons and is equipped with a VFD and manufactured by Daikin. All three chillers utilize R-134a as the refrigerant. The small chiller is staged on during periods of low load in the building and can modulate capacity until one of the large machines is staged on. Chillers 1 and 2 appear to be original. Per the facility's capital improvement projects list, there have been several repairs completed on these pieces of equipment. Also, per the facility documentation, Chiller 3 was completely replaced in 2015.



Chiller 3

Chilled water is used in the arena to provide cooling for the bowl and support air handling units. The chiller plant is designed for 43F supply water temperature and the return water temperature fluctuates between 55F-57F depending on building load.

The chilled water system has a primary/secondary variable flow distribution. Both the primary chilled water pumps and the secondary water pumps are original but have had motor replacements over the years. The three primary chilled water pumps are constant-speed vertical inline pumps sized at 1,530 GPM, 60 ft. of head for the large chillers and 760 GPM, 60 ft. of head for the small chiller. The larger pumps are 40 HP each, and the smaller pump is 20 HP.

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The larger pumps are 50 HP each, and the smaller pump is 30 HP. These pumps are also manufactured by Armstrong.



Chilled water primary pumps

The two secondary chilled water pumps responsible for distributing the chilled water to the facility are vertical in-line pumps sized at 1,910 GPM and 130 ft. of head. These 100 HP pumps are equipped with VFDs and are in relatively good condition considering the amount of time they have been in use.

The pumps are manifolded together and piped in a parallel configuration, therefore if one pump fails, the chilled water system can still operate.



Chilled water secondary pumps



Secondary chilled water pump VFDs

Heat rejection for the chillers is handled by three condenser water pumps located in the boiler plant which sits on the level directly above the chiller plant. The pumps are constant-speed vertical inline pumps sized at 2,300 GPM, 60 ft. of head for the large chillers and 1,140 GPM, 60 ft. of head for the small chiller.



Condenser water pumps



Chilled water system cooling tower

Heat rejection for the chillers is through three single-cell, cross flow cooling towers located in an area on the low roof above the boiler plant. Each of the towers are manufactured by BAC. According to the facility's records, all three cooling towers were replaced between 2017 and 2018 and all three appeared to be in great condition. Each of the cooling tower fans are equipped with VFDs.



Cooling tower VFDs

All three of the cooling towers are equipped with basin sweepers and have heat trace wiring on the exterior piping leaving the cold-water basin. The cooling tower makeup water and chemical treatment systems are in overall good condition.

Overall, the chilled and condenser water systems have been well maintained over the years. The arena has a service contract with HMS Chiller to perform quarterly and annual preventative maintenance.

The median useful life span of a chiller is between 18 and 23 years. Chiller 1 and 2 have outlived their useful life by a

significant amount, and Chiller 3 should outlive its useful life with continued maintenance and proper upkeep.

The median useful life of the cooling towers is between 17.5 and 20 years and should be expected to last at least that long with routine preventative maintenance.

The useful life of chilled water pumps is 20 years if maintained properly. The maintenance staff did not have any major concerns with the chilled water or condenser water pumps. These pumps are regularly inspected and have not needed any major service.

Heat Recovery Water System

The arena is equipped with a second condenser water loop that is detached from the chilled water system and is designed to serve as a heat recovery or heat rejection loop. This heat recovery loop provides 80 F degree water throughout the facility to serve a combination of water source heat pumps and different pieces of food service equipment. Because each of these unitary devices can add or subtract heat from the heat recovery loop, energy is able to be recovered and transferred between the different areas of the building.

Two condenser water pumps are responsible for distributing the heat recovery water throughout the facility. The system is designed such that one pump can handle the building load, and the second pump is on stand-by. These pumps are vertical in-line pumps sized at 1,500 GPM and 120 ft. of head. These pumps have 60 HP motors, and the primary pump is equipped with a VFD.



Heat recovery water distribution pumps

In order to reject waste heat from the heat recovery loop, there is a single cell BAC cooling tower located in the same roof area as the building chilled water towers. This cooling tower is sized for 1,885 GPM of flow and has a 60 HP fan motor. While on site, the cooling tower appeared to be in good condition and of a similar age to the cooling towers serving the chilled water system. The cooling tower fan motor is equipped with a VFD.

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Heat recovery cooling tower

To decouple the open loop system of the cooling tower from the closed heat recovery loop throughout the building, the arena has an 11,266 MBH plate and frame heat exchanger installed. This heat exchanger is manufactured by Alfa Laval and was replaced in 2018. The heat exchanger appeared to be in good condition.



Heat recovery heat exchanger

Two additional condenser water pumps between the cooling tower and the heat exchanger are designed such that one pump can handle the total flow, and the second pump is on stand-by. These pumps are vertical in-line pumps sized at 1,500 GPM and 60 ft. of head. These pumps have 40 HP motors which appear to be original, and the primary pump is equipped with a VFD.



Heat recovery condenser water pumps

The heat recovery water systems have been well maintained over the years. The median useful life of the cooling towers is between 17.5 and 20 years.

The useful life of condenser water pumps is 20 years if maintained properly. The maintenance staff did not have any major concerns with the condenser water pumps. These pumps are regularly inspected and have not needed any major service.

Ice Plant

The arena was originally designed with a full professional grade ice plant which was primarily used for the Western Hockey League franchise that played their home games in the building. However, once the hockey team relocated their home games to the coliseum due to the ice plant’s performance issues, the plant

was mothballed. In 2017-2018 the ammonia absorption tank and piping to the ice plant cooling tower was removed.

Due to the cost associated with the full demolition and removal of remaining pieces of equipment associated with the ice plant, both the ice plant compressor skid and cooling tower on the roof have been abandoned in place. Replacement of the ice plant and a new ice floor will likely be required to maintain a quality ice sheet.

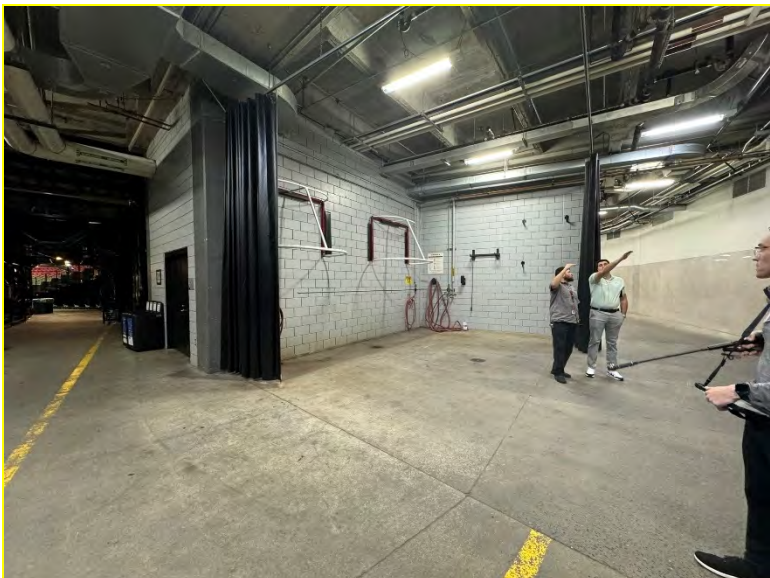


Abandoned ice chiller



Abandoned ice system cooling tower

Additionally, down on the service level of the building, other remnants of the ice plant still exist. The overhead pipe routing for the brine fluid that would circulate between the ice chillers and the event floor is still in place. The location where the ice resurfacing machines were stored has been abandoned and now serves as an extension to the service level corridor.



Abandoned ice resurfacing machine area



Abandoned ice floor brine piping

Hot Water System

The hot water system consists of three gas fired hot water boilers. Boiler 1 and Boiler 2 are each sized for a capacity of 6,800 MBh, whereas Boiler 3 is smaller and only sized for a capacity of 2,400 MBh. All three boilers utilize forced draft fans for combustion exhaust. According to the maintenance staff, the two larger boilers were replaced in 2015 as part of an upgrade project, and Boiler 3 is slightly older and was replaced in 2013.



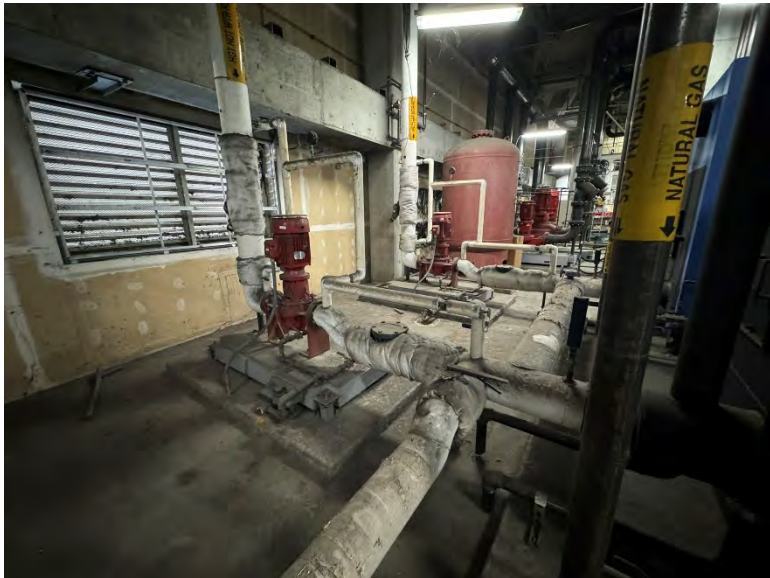
Boilers B-1 and B-2



Boiler B-3

Hot water is used to provide heating for the bowl and support air handling units, unit heaters, VAV box reheat, heating coils, and fin tube heaters. The boiler plant is designed for 200F supply water temperature and the return water temperature is approximately 170F depending on the building load.

The hot water system has a primary/secondary variable flow distribution. Both the primary hot water pumps and the secondary water pumps are original but have had motor replacements over the years. The three primary hot water pumps are constant-speed vertical inline pumps sized at 455 GPM, 50 ft. of head for the large boilers and 160 GPM, 50 ft. of head for the small boiler. The larger pumps are 10 HP each, and the smaller pump is 5 HP.



Heating hot water primary pumps

Hot water distribution throughout the facility is handled by two vertical in-line pumps sized at 550 GPM and 130 ft. of head. These 30 HP pumps are in relatively good condition considering the amount of time they have been in use and are equipped with modern VFDs. The pumps are manifolded together and piped in a parallel configuration, therefore if one pump fails, the hot water system can still operate.



Heating hot water secondary pumps

The median useful life span of a gas-fired heating hot water boiler is between 18 and 22 years. The median useful life of the hot water pumps is 20 years. The maintenance team did not voice any concerns about the function of the boilers or the hot water pumps.

Bowl Air Handling Units

The arena bowl is conditioned by eight air handling units located on the mechanical level. There are two air handlers per quadrant that are responsible for serving that area of the facility. The bowl units are each sized for 47,000 CFM, totaling 376,000 CFM supplied to the seating bowl area. A single bowl unit is equipped with one return/relief fan, a preheat coil, a cooling coil, MERV 14 filters, and a supply fan. Both supply and return fans for each bowl unit are equipped with a variable frequency drive.

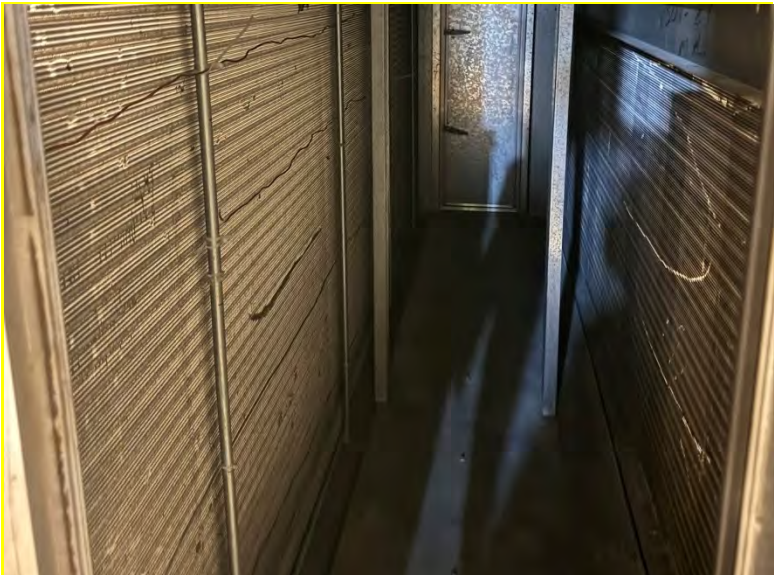


Bowl AHU supply fan



AHU fan VFD

The bowl units, all manufactured by Carrier, are original and in good condition considering their age. According to the facility staff, the filters are changed on a regular basis based on equipment run time. Upon inspection of the units, the coil sections were clean with little damage, and the drain pans were free of any build up or rusting. There were no known issues reported at the time of the assessment.



Bowl AHU coil section

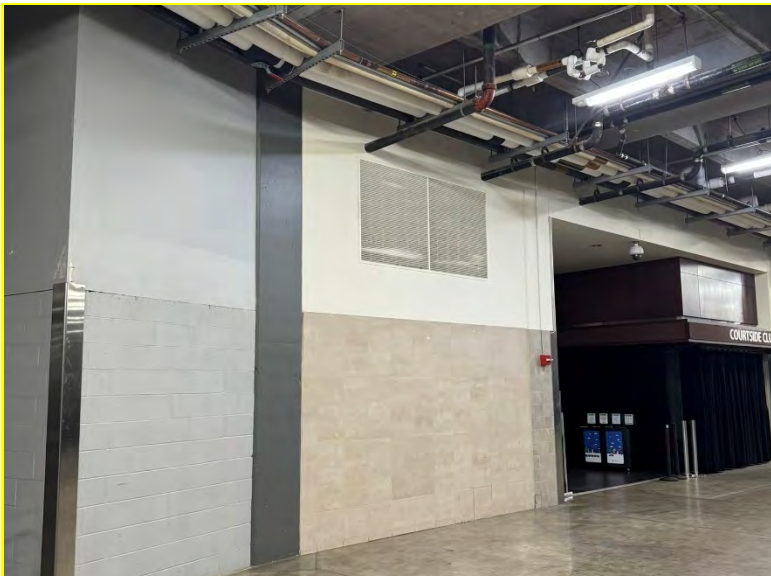
Outside air enters the bowl units through louvers on the exterior wall, mixing with the return air from the arena then passes through filters and the hydronic coils and is distributed to the arena.

The arena supply air is distributed by a continuous ring of sheet metal ductwork that each of the eight bowl supply fans tie into. There are large sidewall diffusers on the ductwork to supply the air down into the arena.

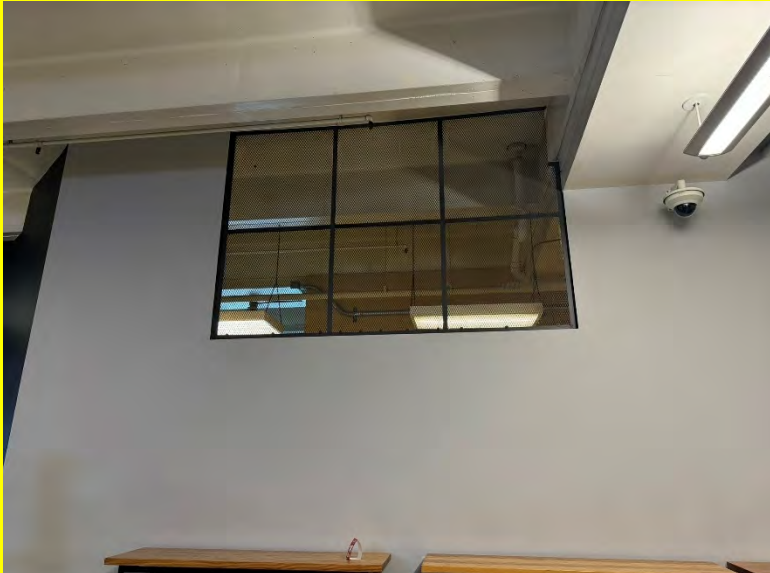


Arena air supply ductwork

Air is returned to these central rooms from grilles located low in the arena that pull air into a shaft to be brought back up to the mechanical level and either mixed with the outside air or relieved through louvers.



Bowl return air louvers



Bowl return transfer opening

The components of the arena air handlings rooms appear to be in good condition and functioning properly. The equipment in these rooms is original but have been regularly maintained over the years allowing for a longer runtime. The average life span for a built-up bowl air handler is around 15-20 years. Hydronic coils are expected to last about 15 years, and fans will reach their end of life around year 25. All this equipment has outlived its useful life.

Support Air Handling Units

Additional areas are served by 14 hydronic air handling units located in mechanical rooms around the arena. The support units are all manufactured by Carrier and are all original except for AHU-1-12 which has been added in the last 10 years to serve the courtside club space. Over the years, there have been several parts replaced inside the support units. Each unit has a preheat coil and a cooling coil. Some of the support units were equipped with variable frequency drives as part of the original design, however, there was a capital improvement project in 2020 that added additional VFDs to the fans that previously had none. The only air handling units that do not have VFDs are AHU-1-2, AHU-1-3, and AHU-1-4.



Support air handling unit

Several of the support air handling units have ducted return, however, there are a few where the return air is ducted back to the mechanical room and then the units have an open end that allows the fans to pull its own return air back into the unit.



Support AHU open return

The maintenance team did not express any major mechanical issues with any of the air handling units around the arena. They are serviced for preventative maintenance similar to the other mechanical equipment. The average life span for a chilled water air handler is around 20-25 years. Hydronic coils are expected to last about 20 years, and fans will reach their end of life around year 25. These units are all past their 25-year mark but are in good condition due to the good maintenance efforts.

Heat Pumps

There are approximately 130 water source heat pump systems serving specific areas in the arena such as lobbies, suites, concessions, catering, and elevators. These heat pumps range in size from 430 CFM up to 5,000 CFM. Each of these units is connected to the heat recovery loop in the building.

Every heat pump is equipped with a fan, coil section, filters, and a compressor section. The maintenance team did not have any major issues with the heat pumps and there have been several replacements over the years as either components or entire units have failed.



Heat pump

Fans

Supply, exhaust, smoke/relief, and other types of fans are located inside the arena in various mechanical spaces to assist in the flow of air in and out of the facility. Overall, the fans were all in good condition and were functioning to full capacity.



General exhaust fan

Kitchen exhaust hoods that are connected to grease exhaust fans are not controlled by the building automation system (BAS), but rather locally controlled in each concession stand.

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Throughout the facility, there are approximately 52 fly fans installed. Some of the locations installed include concourse restroom areas.



Air curtain at restroom

Typically, the useful life of an exhaust/supply fan can be up to 25 years. Since the majority of these fans are original and in fair condition considering their age, preventative maintenance can help to ensure the fans continue to function. Fans that are belt driven should be monitored for failures and belts should be replaced as needed. If an entire fan fails and needs to be replaced, a direct drive replacement should be selected for its lower maintenance requirements and less chance of failure.

Smoke Management System

The arena smoke management system is designed to provide proper protection for three distinct zones within the building: the arena bowl, the concourses, and the event level marshalling area.

The smoke control systems are controlled by the fire management system. The system includes automatic activation for the concourse and marshalling areas upon activation of fire alarm devices including waterflow switches and smoke

There are two large exhaust fans dedicated to parking garage ventilation for the Garden Garage. These fans operate in conjunction with gas sensors in the garage to ramp up the exhaust airflow rate. Each of these fans appeared to be original.



Garden garage ventilation fan

There is a dedicated exhaust fan to serve the generator fuel storage room in order to exhaust any accumulating fumes.



Ventilation fans in fuel storage room



General exhaust fan

There are ventilation fans throughout the building located in electrical rooms, as many of the electrical rooms are not conditioned. Some of the electrical rooms were noticeable warmer than adjacent spaces even with the ventilation fans pulling the air from the room. Most of the ventilation fans are original with a portion of them being replaced as they have failed.



Ventilation fans in main electrical room

detection which are zoned to match the smoke zone boundaries. In addition, the system includes capabilities for manual activation from the fire control center. The arena bowl system is manually activated from the building control center or from the fire control center.

The arena bowl air handling units are designed so that they may either exhaust air through the return shaft from any level or supply outside air through the return shaft to any level. The openings on the shafts at each level are equipped with automatic dampers. This allows each unit to provide 40,000 CFM of smoke exhaust or make-up air on a quadrant-by-quadrant basis. Activation of a sprinkler flow alarm or smoke detector at any zone will activate smoke exhaust for that level. All automatic smoke control operations can be overridden by the fire department.

Fuel Storage Systems

The arena has a room dedicated to the generator fuel storage tank that is adjacent to the generator space.

Within the room there is a 5 ft diameter by 7 ft long storage tank that is original. The tank is equipped with a single pump to flow the fluid out of the tank to supply to the generator. The facility staff reported no known issues with the system.



Fuel storage tank



Pump in fuel storage room

VAV Boxes and Unitary Heaters

There are approximately 21 variable air volume boxes (VAV) with hot water reheat and 25 hot water reheat coils serving various areas of the building. These devices are controlled by local thermostats installed in the spaces served and provide individual zone temperature control.

There are small sections of fin tube radiant heaters installed in two of the club spaces and in the Annex. These devices are connected to the heating hot water loop of the building.



Fin tubed heater

The arena also has a handful of standalone electric unit heaters in the remote areas of the parking garage to provide space temperature control in the colder months.

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Operations and Maintenance

When there is not an event, the arena bowl handling units operate at minimum capacity, and the support units operate if necessary. Depending on the cooling load needed to operate during event or non-event times, the building chillers stage on and off and modulate in capacity. During low load operation, only the small 380 ton chiller is needed.

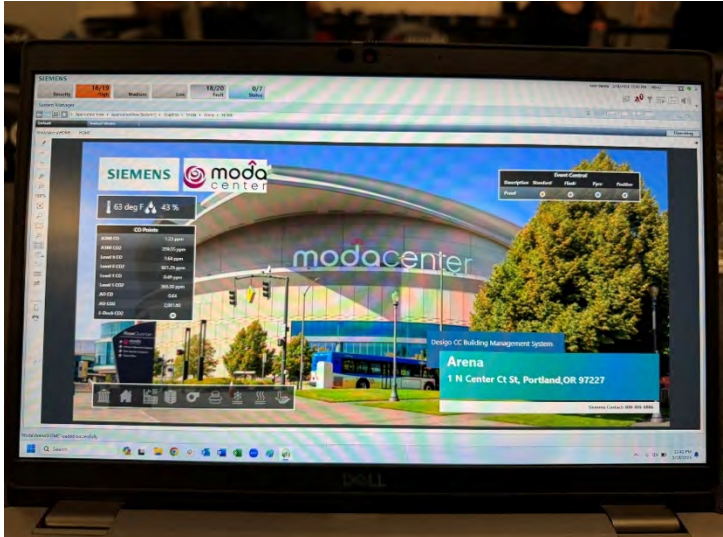
The maintenance staff at the arena performs day to day work to keep the mechanical systems operational. There are six engineering staff responsible for handling the maintenance and upkeep all MEP systems.

Since the building opened in 1995, there have been renovations to the mechanical systems. Small renovations are performed by the arena maintenance teams, but larger project work has been performed by mechanical contractors.

Overall, mechanical rooms were clean, but some were being used for additional storage. This can cause clearance issues, as well as maintenance issues if there were to ever be an emergency, and the unit was not able to be reached.



Obstructed air handling unit



Building automation system interface

Most of the mechanical equipment is tied into the BAS and all controls in the building are modern direct digital control (DDC) style. There are no pneumatic actuators in the building.



Building automation system control panel



Electric unit heater

The majority of this equipment is original and in good condition considering its age. Replacements have been performed over the years on an as needed basis.

Building Automation System (BAS)

In 2022, the building automation system was completely upgraded with a Siemens system that is a cloud based system that can be accessed anywhere using the operator’s laptop or mobile device. The facility team appears to have very few issues with the new system. The user interface is easy to navigate and appears to be fully functional.

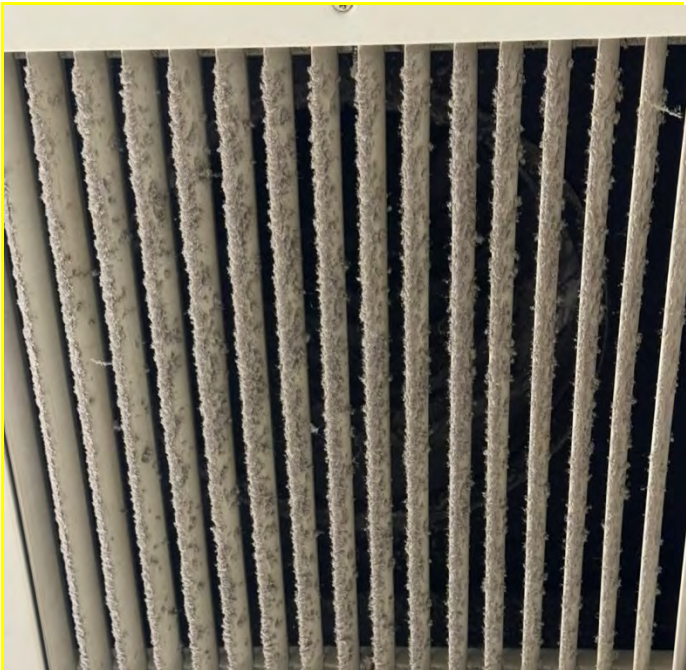
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Currently, some of these rooms have ventilation fans that appear to be near the end of their life cycle. Hydronic or DX fan coil units can be added in order to offset the heating load presented by the electrical equipment, especially in the main electrical room. While on site the warmest spaces were the IT and electrical rooms accessed from the catwalk.



Catwalk level IT closet

It was observed that the arena’s diffusers and grilles are likely original, and many diffusers have noticeable paint peeling, grease, and dirt build up, and should be cleaned and replaced if necessary.



Dirty exhaust grille

In one of the larger premium areas on suite level, there was a missing diffuser.



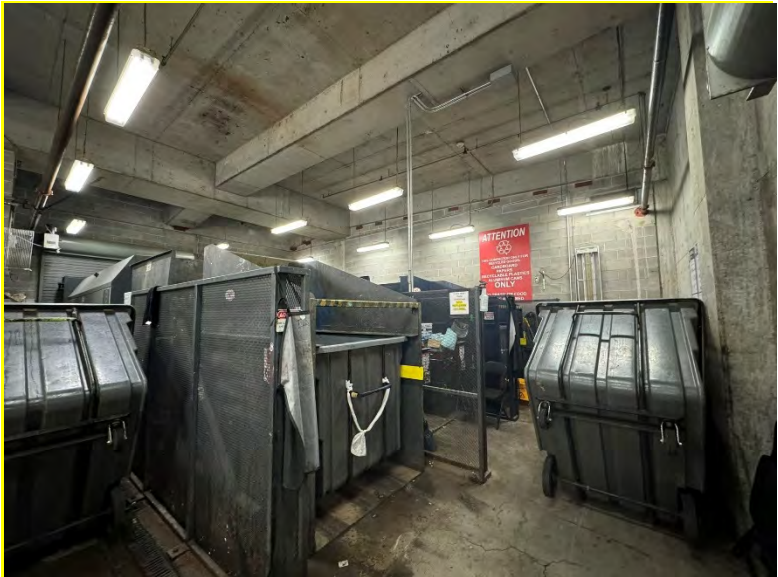
Missing diffuser

For each of the cooling towers, there are no access platforms provided, so in order to access the cooling tower basins, the operator has to either bring a ladder or step on the pipe. For all locations the pipe insulation was showing signs of damage which can effect the thermal performance of the system.



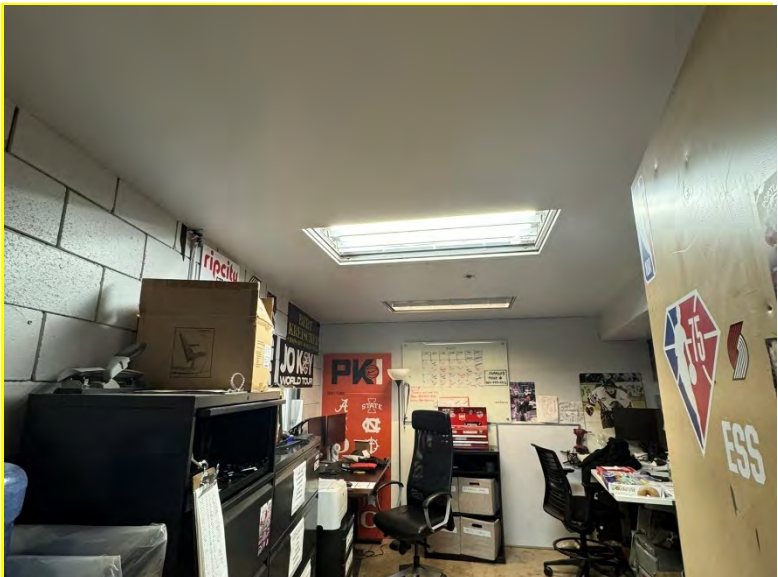
Cooling tower access

The main trash/recycling room on the service level is not currently conditioned. In similar sports facilities it is typical for these spaces to be provided with a dedicated fan coil to condition the space during the summer months and to help reduce the negative impact of harsh odors.



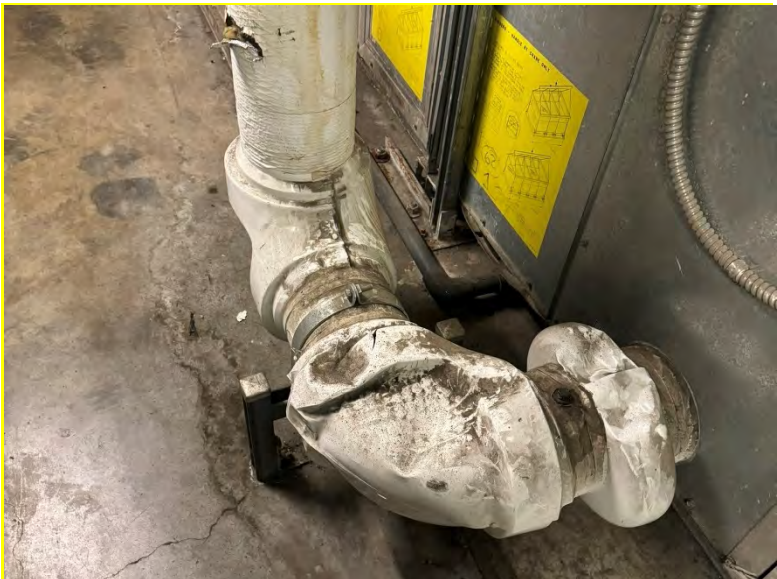
Unconditioned trash/recycling room

While on site, we observed an office space that appears to originally have been a storage space. This office was set up with two workstations and there was no form of space conditioning or ventilation air supply being delivered to the room.



Unconditioned office

We observed several locations of damaged insulation on both piping and ductwork.



Crushed pipe insulation



Damaged pipe insulation

Electrical

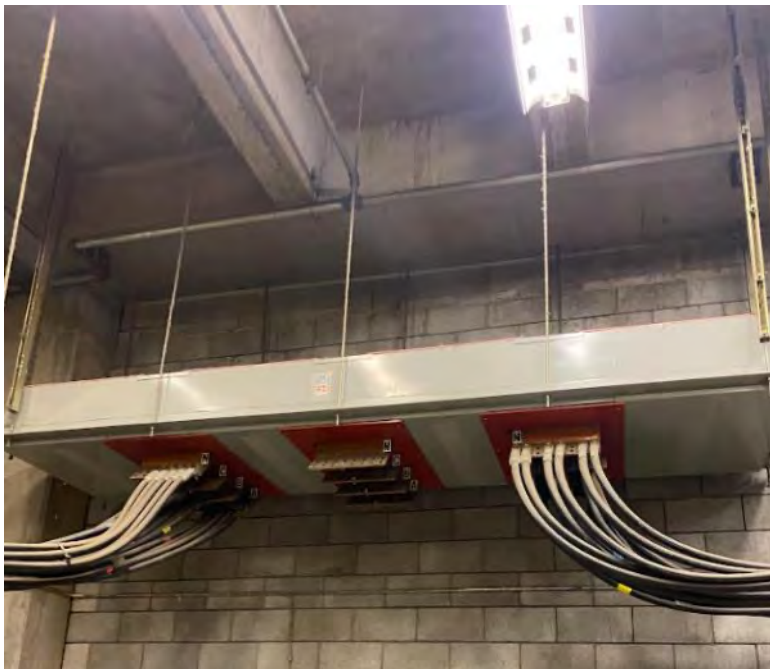
Utility Power Distribution

The electrical utility distribution, manufactured by G&W Electric, has a dedicated vault with two 2,500kW, 12470/480V, 3ph utility transformers that feed into the main electrical room via a collector bus. This equipment was observed to be in good condition and is original to the construction of the arena. Utility power is fed from one 12.47kV, 3ph feed from Pacific Power without the capability to transfer to a secondary utility feed in the event of the main utility failure.



Utility transformer

While there is a secondary feed, the arena has a medium level of redundancy upon loss of utility power since utility personnel are required to manually throw over to the secondary feed.



Collector bus in utility vault

Normal Power Distribution

Normal power to the arena is distributed via four top-fed, 480/277V, 3ph main switchgear lineups, manufactured by General Electric (GE), that serve the entire arena. These switchgear lineups are located in the main electrical room on the event level. This gear was observed to be in good condition with the sizes as follows:

- AMSA
 - o 4,000A MCB, 480/277V, 3ph
 - Feeds stage sound and lighting
- AMSB
 - o 4,000A MCB, 480/277V, 3ph
 - Feeds West riser room
 - Feeds food service and fire alarm

- AMSC
 - o 4,000A MCB, 480/277V, 3ph
 - Feeds East and South riser rooms
- AMSD
 - o 4,000A MCB, 480/277V, 3ph
 - Feeds Chillers 1, 2, and 3
 - Feeds North riser room

While there have been minimal upgrades or major modifications to the switchgear, no spare breakers were noted on site which could result in long downtimes due to difficulty in procuring replacement breakers. New digital GE power leader meters are installed in each piece of switchgear that are not currently tied into the building automation system (BAS). Connection to the BAS would allow for tracking the usage and peak demands across the arena which can assist with future renovation capacity evaluations.

Bus duct is utilized in all four north, south, east, and west riser electrical rooms for concessions, general power, and emergency power. No issues were noted during the walkthrough, but debris and water intrusion over the years, along with new penetrations made in existing electrical rooms, could eventually cause the bus duct to fail and result in a loss of power to a large portion of the arena if not corrected.

Stacked electrical closets in sectors A, B, and C, as well as remote closets throughout, distribute power throughout the arena. Many of these rooms have space for future equipment, but several rooms appear to be used substantially for storage, which violates NEC required clearances in most cases. Carts, spare parts, and storage items were observed in electrical closets. In particular, the northeast electrical room that leads into the show power room, had storage items completely surrounding large electrical equipment. All of these items provide hazards and impede clearances in electrical spaces and should be removed immediately.



Main electrical room



GE power leader digital meter



Bus duct riser



Storage violating NEC clearances

New electrical equipment for retractable bowl seating was installed in 2023 and includes a 250A, 480/277V, 3ph panel in each quadrant of the arena. While this equipment is in good working condition, it has been reported that the motors have bent the metal seat framing causing damage to the seating structure.



Typical retractable seating panel

The motor control centers (MCC's) are original and are in fair condition. As equipment continues to be replaced these boards will be replaced by standalone starters VFDs.



Typical motor control center

Facility staff stated the maintenance contract for the majority of electrical equipment to be through Christianson Electric but is now mostly through GE. There was no record of infrared scanning at the time of the assessment. We recommend performing infrared scanning every three years on all major equipment in order to identify any damaged or failing electrical devices. Arc flash labels were located on all equipment and were last performed in July of 2023. An updated study should be performed again after any major renovation is complete to ensure accurate safety labels on all electrical equipment.

While some branch panels have been replaced during renovations and additions, most of the electrical equipment is original. Breakers for the original panels are no longer manufactured, but contractors have been able to find warranted, certified refurbished parts to continue operation as needed.



Typical arc flash label

Panel schedules for most of the equipment was not accurate or missing a directory entirely. Other than new panels, the schedules do not reflect what is installed and are not updated based on new loads added to existing panels.

It was observed in several locations junction boxes or pull box covers were missing, exposing live conductors, which creates a safety hazard for anyone working on or near this equipment. Missing covers should be replaced to contain conductors after any work is performed in that area.



Example of exposed junction box

Emergency Power Distribution

The arena's emergency and standby loads are fed by one 1,500kW/1875kVA, 480/277V, 3ph, 4w, CAT diesel generator serving emergency loads. The generator serves four automatic transfer switches (ATS):

- AATS-1 – 800A, 4-pole
 - o Lighting and Fire Alarm
- AATS-2 – 2,500A, 3-pole
 - o Fans and Elevators
- AATS-3 – 400A, 4-pole
 - o Food Service
- AATS-4 – 400A, 3-pole (Fire Pump Controller – by Division 23)
 - o Fire Pump



1,500kW generator

The generator is fed by a remote fuel tank located in an adjacent room with the capacity for an estimated eight hour run time at full load. The generator and fuel tank are both original and have no reported issues.



Diesel fuel tank

The attached parking garage has a standalone generator that was reported to be in good condition with no known issues but was not accessible at the time of our visit.

AATS-1, 2, and 3 are located within the same room as the emergency generator while AATS-4 is located in the fire pump room at the south side of the arena. The generator maintenance contract is through Peterson CAT and is scheduled for monthly visits. It appears that load bank provisions have been added to the largest ATS (AATS-2, 2,500A) which is beneficial for testing the true performance of the generator. Recent tests include load bank testing, a full diesel fuel replacement, and battery testing. It should be verified that the load bank testing is taking place with records provided to staff for record tracking.



AATS-2 with load bank connections



AATS-4 for fire pump

Much of the equipment in the emergency electrical room has debris and residue from liquid. While no damage has been reported as a result of this, it is recommended to clean, torque, and tighten equipment and lugs to ensure adequate operation and connections.



Liquid residue on motor control centers (MCC)

There is no centralized uninterrupt power supplies (UPS) in the facility but there are rack mounted UPS's manufactured by APS in the IT spaces and fire command room that provide an uninterrupted transition between utility and generator power. Additional UPS's appear to have been included as more critical equipment has been added since opening.

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The clubs and renovated suites contain unique LED decorative fixtures that are difficult to replace due to long lead times and the various manufacturers. It is likely that the fixture drivers are the main point of failure for these types of fixtures.



Club light fixtures

Pole lights on the catwalk level are among some of the fixtures that have been re-lamped with LEDs. LED flood lights were added to the low roof to illuminate the plaza area below for additional security which has proven effective and should be considered elsewhere.



Rack UPS's serving server room

Lighting and Lighting Controls

Original lighting in the arena consists of non-LED fluorescent, incandescent, or halogen fixtures. However, the electrical staff have systematically changed fluorescent lamps to LED in certain high use areas such as concourses, vomitories, and player/coaches areas. Most fluorescent tube fixtures have been replaced with LED tubes as the original fixtures burn out. The fixtures in the parking garage have also been recently replaced with high output LED fixtures with field selectable color temperatures. Issues with the existing interior lighting include broken lenses, non-operational ballasts, and aging fixtures that have irregular color temperatures.



Aged fixtures in kitchen



Burned out wall mounted fixture

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Catwalk lighting

Exterior pedestrian pole lights are accompanied by decorative string lighting that illuminates the plaza areas along the outside of the arena and were observed to be in good condition. Lighting for the exterior eyebrow is located on the low roof and has color changing capabilities for any desired façade aesthetic. While these RGB fixtures were added in 2014, they are very dirty due to the exposure to the elements.



Exterior pedestrian light poles



Low roof RGB fixture with dirty lens

Small 120V fixtures are currently installed in exterior garden beds but experience a lot of vandalism. It was noted that a plan is in place to remove all of these fixtures and replace them with more durable fixtures in order to eliminate the maintenance and cost required to upkeep the fixtures.



Vandalized garden bed fixture

The lighting control system is mostly original and in need of replacement. The controls are very limited and only include GE contactors to sweep lighting on/off. All dimming is localized 0-10V Lutron wall dimmers, with the exception of the club level where there were ETC UNIOSN dimmer racks installed to control a select portion of the general lighting on club level. Local dimming is very limited to locations such as suites, clubs, player areas, and broadcast areas. SAMJIN Smart LED control touchpads have been added to select player areas with the ability to adjust brightness, color temperature, sensor settings, and on/off control.



SAMJIN smart LED system in player area

The command center on the event level and the production studio on the 7th floor contain a wall mounted control station where certain areas of the arena can be manually activated or deactivated.



Local control switches and dimmers



Wall mounted lighting control station



Typical lighting contactor cabinet

While no issues were noted, the entire system has become out of date and obsolete making it difficult to find replacement parts as components begin to fail. The arena does have a networked lighting control platform, WinControl, that is accessed on the 7th floor in the production studio and is original. This system can remotely open and close contactors for specific areas of the arena but lacks the capabilities of a more modern networked lighting control system. Occupancy sensors are installed on service level fixtures and most exterior fixtures are controlled via a photocell, but additional occupancy, timeclock, daylighting, and site controls will be required for any major renovation to meet new energy code requirements for ASHRAE 90.1 or IECC.

Facility Condition Assessment
Moda Center & Garden Garage

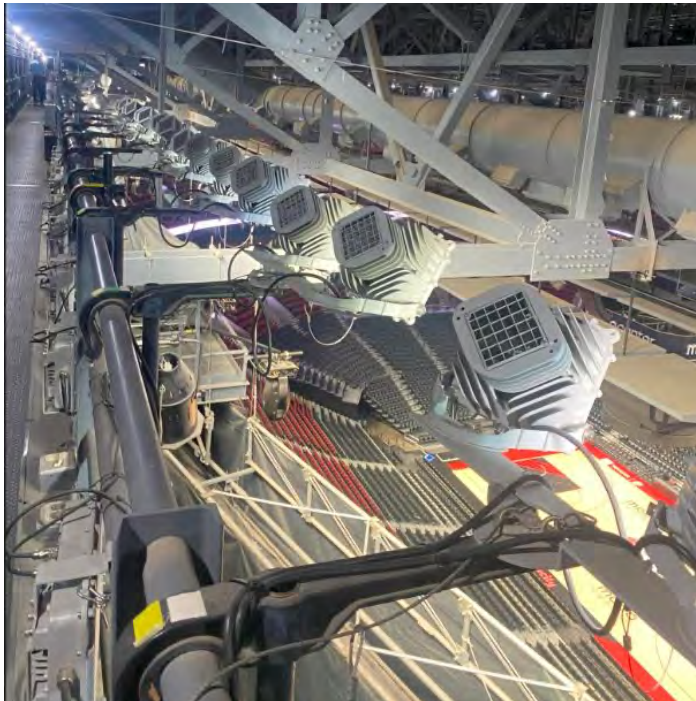


Lighting control software

Sports Lighting

The bowl sports lighting was upgraded in 2017 to GigaTera SFM400 LED fixtures and is controlled via GigaTeras own GESS lighting control software. While the sports lighting is controlled via a separate platform from the rest of the networked areas, it can be accessed on the same desktop located in the production studio on the 7th floor. The sports lighting is currently in great condition with GigaTera technical support in place for any driver replacement needs.

Additionally, several Speedotron fixtures accompany the GigaTera fixtures on the catwalk and are powered by 2,400W power supplies. These large, external power supplies provide the power necessary to pulse power to these fixtures to achieve strobe effects for special events/concerts.



Sports lighting fixtures



Speedotron fixtures

Show/Temp Power

Currently the show power on site is in good working condition and adequate for the current needs of the arena for most events. Show power connections are currently as follows:

Event Level Northwest Room

- Two 400A, 208V, 3ph stage lighting disconnects with CAM-loks
- Two 200A, 208V, 3ph stage lighting disconnects with CAM-loks
- Two 200A, 208V, 3ph stage sound disconnects with CAM-loks

Event Level Northeast Room

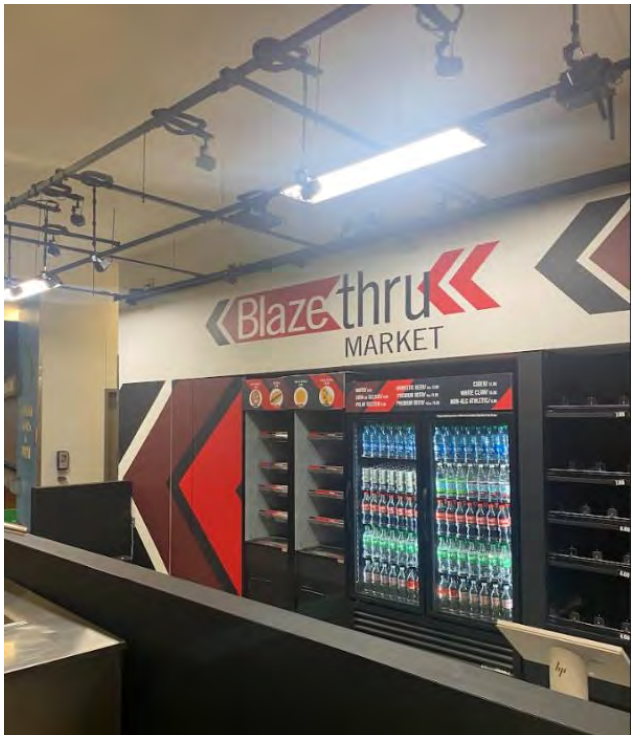
- Two 400A, 208V, 3ph stage lighting disconnects with CAM-loks
- Two 200A, 208V, 3ph stage lighting disconnects with CAM-loks
- Two 200A, 208V, 3ph stage sound disconnects with CAM-loks



Northwest show power room

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The main and upper concourse levels have power distributed throughout for food service. Dedicated panels and receptacles have been added over the years to accommodate the increased number of portable concessions, including the 2023 addition of several Blaze Thru Grab-N-Go markets. Facility staff noted that there is adequate power throughout for concessions, but many of the poke-thru devices are original and damaged.



New Grab-N-Go Market on concourse



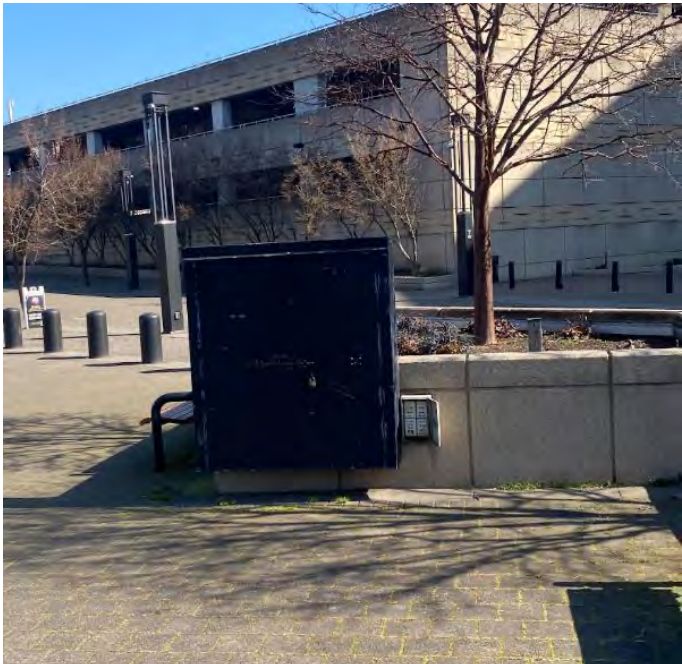
Damaged poke-thru receptacle on concourse

While there is adequate power for temporary connections throughout the exterior plaza and garden areas, many of the weatherproof devices have been damaged or are missing their protective covers.



Missing weatherproof receptacle cover

The plaza contains an outdoor performance space along with a NEMA 3R rating cabinet containing temporary points of connection. While there was no access to the inside of this cabinet, facility staff has not needed additional power.



Exterior show power NEMA 3R cabinet

Broadcast Power

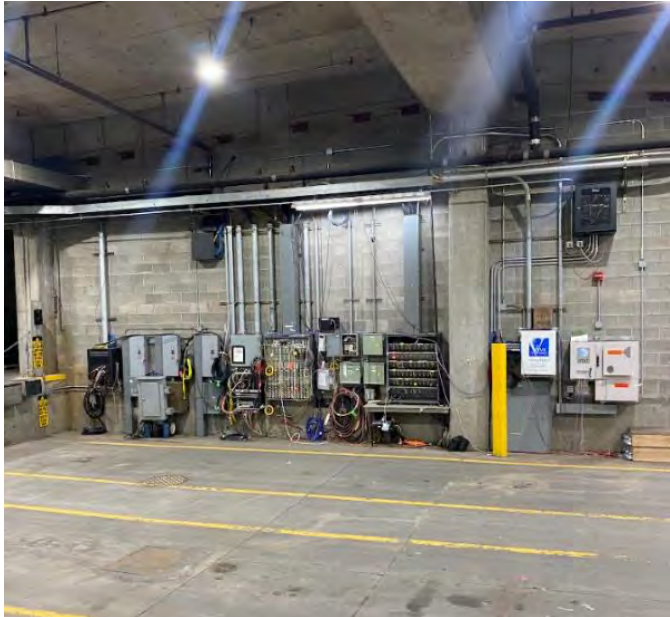
The truck dock power consists of three 208/120V, 3ph disconnects with CAM-loks with two additional 200A, 208V, 3ph disconnects added for additional broadcast power needs. Facility staff did not note any issues or additional power needs for this area.

Facility Condition Assessment
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Fire Alarm

The fire alarm system was upgraded within the past two years to a Desigo system manufactured by Siemens. The fire alarm devices throughout the arena are mostly original. The new Siemens cabinet is located in the fire command area on the event level and is in great condition. The Desigo building management system (BMS) is also located in the fire command room and had three trouble messages during the time of the assessment. Facility staff noted that frequent false trouble messages occur due to the systems sensitivity to utility power surges.

The food service ANSUL systems were noted to be properly tying into the fire alarm system and were last serviced by Johnson Controls in February of 2024.



Truck dock broadcast connections



Additional 200A truck dock disconnects



Siemens fire alarm cabinet with trouble message



Typical ANSUL pull station

Lightning Protection

The lightning protection system was not able to be accessed at the time of our visit, but staff noted that there are no currently known issues.

Plumbing

Domestic Water

The arena domestic water is served by a Grundfos quadraplex variable speed booster pump located in the water entry room on the southeastern side of the event level. The booster pump is not original with the original pump replaced in 2016. The booster pump is served by an 8" water line from the city with a single 8" reduced pressure backflow preventer located inside the same room. The reduced pressure backflow preventer appears to be in good working condition. There were no known issues with the backflow preventer or booster pump skid at the time of assessment.

Domestic hot water for most of the arena is produced by gas fired hot water boilers located on the club level. Hot water storage tanks are also present to provide adequate hot water during periods of high demand. Hot water is returned via parallel in-line recirculation pumps in the same area. Hot water is tempered by a master mixing valve as well as point of use mixing valves at public and emergency fixtures to mitigate the risk of scalding.

Domestic hot water for level 7 is served by heat pump water heaters on level 6. The owner's apartment on level 8 has its own electric tank type water heater.

The domestic booster pump and hot water boilers are connected to the building automation system allowing for remote monitoring and control.



Quadraplex domestic water booster pump skid

The arena's domestic cold water is served by a Grundfos Hydro MPC-E 4 CRE 32-2 variable speed packaged booster pump skid. Each of the four pumps are 10 HP, sized for 180 ft. of head and a flow rate of 158.5 gpm. The entire skid has a maximum flow rate of 845 gpm. Variable speed motors allow for more efficient distribution during low flow periods.



170 gallon hydropneumatic tank in fire pump room

Hydropneumatic tanks are designed to maintain on-demand pressurized water without the continuous use of a pump.



8" backflow preventer at water entry

Facility Condition Assessment Moda Center & Garden Garage



Typical point of use tempering valve in the ceiling of event level serving fixtures above



Domestic hot water boilers on club level

Domestic hot water is primarily produced by two Ace Heater Atlas A100 hot water boilers.

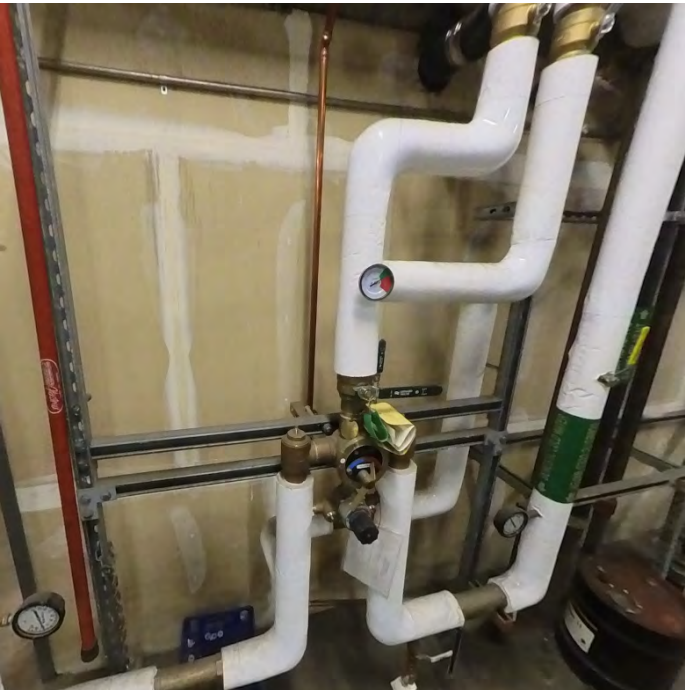


1 of 2 natural gas meters serving the domestic hot water boilers



Domestic hot water storage tanks on club level

Two Hanson Mfg. 1,500-gallon vertical hot water storage tanks provide a buffer for periods of high hot water demand. The storage tanks are original.



Master mixing valve on club level

Plumbing Fixtures

Plumbing fixtures throughout the facility are in good, working condition. In the wake of the Covid pandemic, most of the manual style faucets and flush valves were transitioned to automatic, touchless faucets and flush valves.

Plumbing Fixtures			
Fixture Type	Quantity	Manufacturer	Flush Valve / Faucet Manufacturer
Toilets	490	Kohler	Toto
Urinals	174	Kohler	Toto
Sinks	272	Kohler / American Standard	Toto / Elkay
Showers (Individual)	18	Tile	Symmons
Showers (Communal)	5	Tile	Symmons



Typical public lavatories on event, 100, and 300 levels



Typical public urinal on event, 100, and 300 levels



Typical toilet in star rooms on the event level



Typical shower at star rooms on the event level

Most of the showers, both individual and communal, are beginning to show their age. Several fixtures in star rooms had audible water hammer when we operated the shower valves.



Typical restroom on suite level

Most of the suites restrooms have recently been renovated, including the plumbing fixtures.

Sanitary and Storm Water System

The sanitary system for the arena drains all sanitary waste via gravity piping and discharges to the city sewer system, except for the event level waste, which is routed to two ejector pits. Grease waste from the kitchens discharge through point of use grease interceptors before entering the city sewer system.

The facility maintenance staff mentioned that the cast iron waste piping has been replaced in several areas as leaks have developed.

Storm water for the arena is served by roof drains and a piped gravity system to discharge storm water from the roof to the city storm system. Subsurface drainage is collected and routed to sumps below grade.

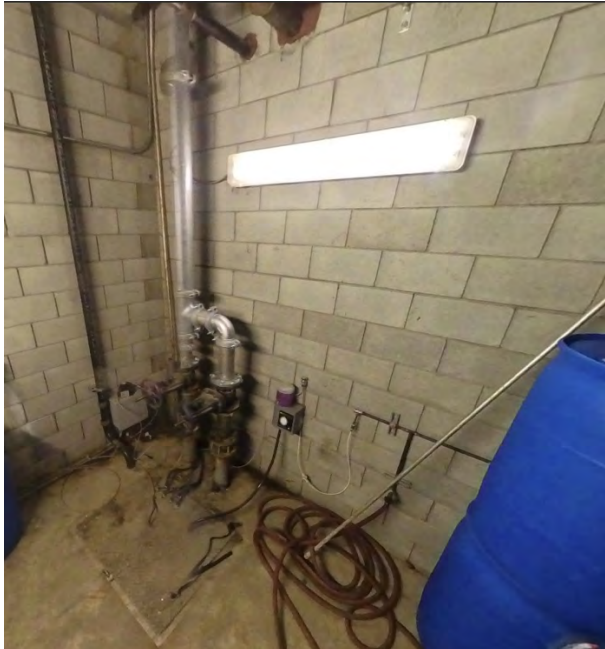
Area drainage is provided in the parking garage. Storm water is discharged to the city system via gravity piping on the upper levels and via submersible pump pits on the lower levels.



Ejector pit 1 on event level

Piping has recently been replaced. The original duplex ejector pumps have also been replaced within the last 10 years.

The pit in the SE portion of the arena had a very noticeable sewer smell.



Ejector pit 2 on event level

This pit in the SW portion of the arena did not have a noticeable sewer smell.



Vents and roof drains on level 7 intermediate roof

Roof drains appeared clean and functional on the intermediate roof. The main roof was not easily accessible at the time of assessment.



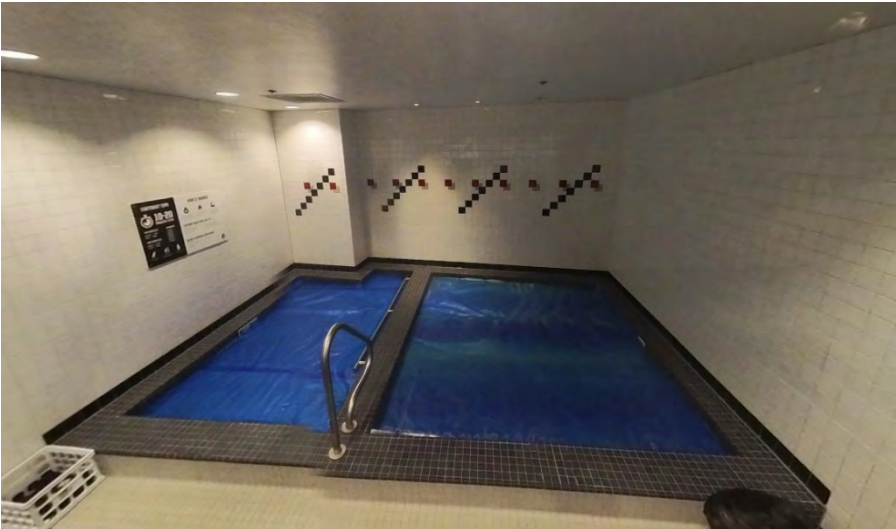
Storm water leader on southeast side of level 7

Miscellaneous

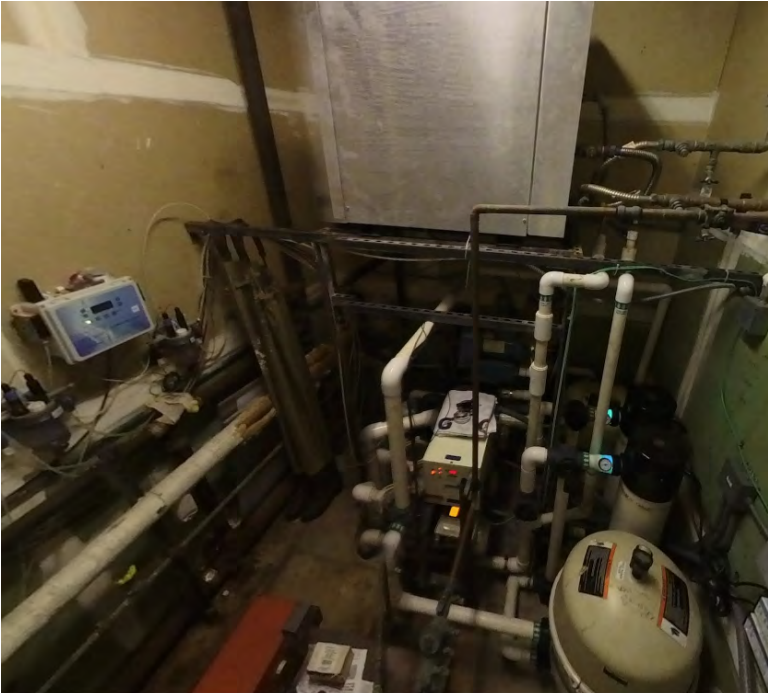


Abandoned ice melt area on event level

Facility maintenance staff mentioned that the ice melt area is no longer used. The water hookups have been used for star laundry during concerts.



Plunge pools in Trail Blazers locker room area



Pool and sauna equipment

Fire Protection

Main Equipment

The arena's fire protection system is served by an 8" inch fire main from the city water system.



2500 GPM Peerless 8AEF17N 150 HP fire pump and jockey pump

The 8" inch fire main is further pressurized by the fire pump. The fire pump has an accompanying jockey pump to maintain pressure during normal conditions. The fire pump has a controller with a transfer switch and backed up by the emergency power system. The jockey pump also has a controller.

Sprinkler System

The fire protection system consists of sprinkler systems and standpipes throughout the facility. Conditioned spaces are served by wet sprinkler systems. Exterior spaces and other areas subject to freezing are served by dry sprinkler systems or anti-freeze systems. Trail Blazers broadcasting areas are served by a pre-action deluge sprinkler system. The main seating bowl is not sprinkled aside from the skyboxes beneath the halo. The air compressor serving the dry sprinkler valve has recently been replaced. Overall, the condition of the sprinkler piping was observed to be reasonably good. The maintenance staff indicated that some of the piping has been replaced in

various areas as leaks have developed, which is most likely do to the age of the system.

The server room in Trail Blazers broadcasting was protected by a clean agent system at one time, but it has since been removed and replaced with a pre-action system.



Dry sprinkler valve serving loading dock



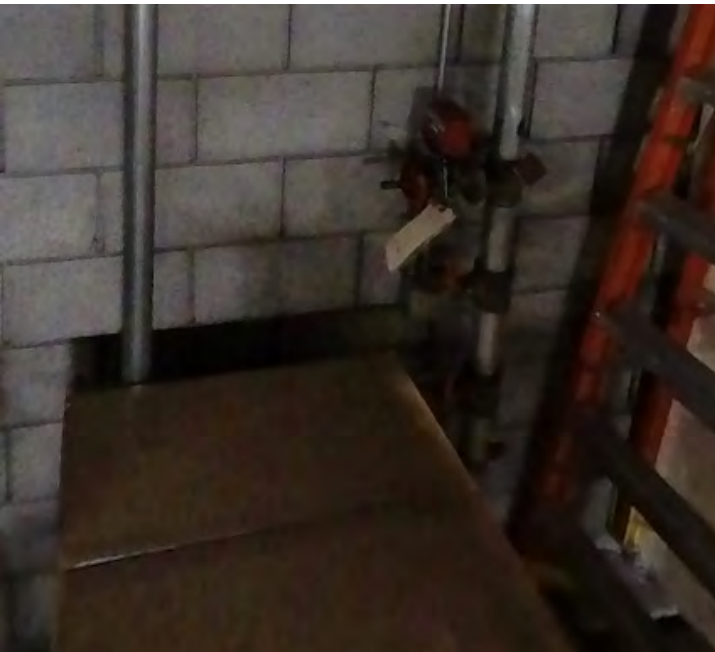
Air compressor serving dry sprinkler valve recently replaced



Pre-action deluge sprinkler valve serving the broadcasting area



Typical wet zone control valve



100 level anti-freeze sprinkler system serving outdoor terraces

Facility Condition Assessment

Moda Center & Garden Garage



Typical fire hose reel on event level

RECOMMENDATIONS

Mechanical - Chilled Water

- The chillers and pumps should all be replaced around the same time in order to have a complete system designed for maximum efficiency and to ease installation efforts.
- Chillers 1 and 2 are the main priority as they are original. When replacing the large chillers, it is recommended to replace them one at a time. Temporary systems can be put in place while the equipment is being replaced. We recommend that this system be replaced in the next five years due to the age of the equipment.
- The new chillers should be provided with VFD motor control and should be high efficiency with a minimum NPLV rating of 0.30 KW/ton and full load rating of 0.58 KW/ton.

- The seals should be replaced on the pumps every three to five years to ensure they will function at full intended capacity.
- For planning purposes, the pumps should be planned for replacement at the same time as the chillers.
- The cooling tower fill media should be replaced in the next two to five years to ensure that the cooling tower is performing at its full capacity.
- The basin of the cooling towers was clean but should be relined in the next five years to continue to stay in good condition.
- The cooling tower as a whole will not need to be replaced for another 12-15 years.

Mechanical – Ice Plant

- Replacement of the ice plant and a new ice floor will likely be required to maintain a quality ice sheet.

Mechanical - Heat Recovery System

- The cooling tower should follow the same maintenance/replacement plan as the cooling tower serving the chilled water system.
- The plate and frame heat exchanger should have its plates cleaned on a regular basis and due to its age should not need to be replaced for another 19 years.
- The pumps serving the heat recovery systems are original and have exceeded their anticipated useful life. Based on the age of the equipment, these pumps should be planned for replacement in the next five years.

Mechanical - Hot Water System

- Preventative maintenance should be a focus to extend the life of the boilers currently handling the load of the arena. The boilers should be able to exceed their projected useful life and do not need to be planned for replacement for another 12-14 years.
- The hot water pumps should be replaced at the same time as the other pumps due to the age of the equipment.

Mechanical - Bowl Air Handling Units

- It is recommended to stage replacement of these units starting in three years, replacing one bowl unit with a custom air handling unit each year. It would be recommended to utilize a panelized knock down type construction for ease of placement and constructability.
- When the facility does replace the bowl units, the focus should be on lower energy costs by reduction of outside air required. One way of doing this is through demand-controlled ventilation. That is, measuring indoor carbon dioxide rates as an indicator of a wide array of contaminants and lowering the outside air into the building accordingly. This is acceptable by code in most jurisdictions and is further allowed by ASHRAE Standard 62.1 and Standard 90.1.

Mechanical - Support Air Handling Units

- Based on their condition, the air handling units should start to be replaced in the next four to seven years. Proper maintenance should be maintained to ensure the coils can function until the full air handling unit is replaced.
- The new air handling systems should implement strategies to reduce operational costs. A good way to lower energy costs is by reduction of outside air required.

Facility Condition Assessment

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Mechanical - Heat Pumps

- Due to the large quantity of units, we recommend replacing the older units first starting in five years. The replacement project should span over several years and should prioritize the units that are either the oldest or that may have demonstrated mechanical issues.

Mechanical - Fans

- It is recommended the fans be replaced starting within five to seven years. Fans that are belt driven should be monitored for failures and belts should be replaced as needed. If an entire fan fails and needs to be replaced, a direct drive replacement should be selected for its lower maintenance requirements and less chance of failure.

Mechanical - Smoke Management System

- We recommend that the system be routinely tested to ensure proper functionality.

Mechanical – Generator Fuel Storage System

- In lieu of replacing the pump prematurely as it still functions, we recommend the facility purchase a spare to have on standby. Therefore, when there is a failure, the equipment downtime is minimized.

Mechanical - VAV Boxes and Unitary Heaters

- These units should be maintained as usual until they are at the end of life.
- Based on the age of the equipment, replacement should be planned to start in six to eight years.

Mechanical - Building Automation System

- To capitalize on energy savings, the data from the building automation system should be trended and used for optimization purposes.
- All equipment should be monitored by the BAS to ensure the building mechanical system is performing coherently.
- The cooking exhaust hoods should be monitored and controlled by the BAS to minimize wasted energy usage.

Mechanical - Operations Miscellaneous Recommendations

- We recommend adding some form of cooling to the electrical rooms around the arena. If the preference is to provide ventilation only, these fans should be replaced with new direct drive inline exhaust fans.
- Many diffusers have noticeable paint peeling, grease, and dirt build up, and should be cleaned and replaced if necessary.
- Grilles, registers, and diffusers should be replaced wherever missing.
- We recommend adding proper service platforms for all cooling towers for ease of access.
- We recommend adding a form of space cooling and ventilation air to the office on service level as fresh air is a code requirement for all occupied spaces in a building.
- The damaged insulation on piping and ductwork should also be replaced to ensure the system is functioning to its full capacity.
- All improvements listed in the report regarding motor replacements should specify premium efficiency motors.

- We highly recommend any work performed be fully commissioned, and that ongoing commissioning (Cx) services be contracted for at least two years thereafter.

Electrical - Utility Power Distribution

- Discuss with PP&L the addition of automatic transfer capability of utility feeds upon loss of power to expedite power restoration and minimize downtime.

Electrical - Normal Power Distribution

- We recommend procuring a minimum of one spare main 4,000A breaker, as well as other large, typical breakers (1,200A, 800A, 400A) to ensure there is no disruption of power due to a breaker failure. These breakers are no longer manufactured, so it may be difficult to find a replacement in a short time frame.
- Clear storage items from all electrical spaces to ensure NEC clearances are maintained.
- Ensure all pull boxes are securely enclosed and not exposing live connections.
- Conduct infrared scanning every three years on all large equipment in order to identify any issues.
- Perform an updated arc flash analysis after major renovations to determine proper working clearances and required PPE with updated signage at each piece of equipment. It is recommended to perform a new arc flash study every five years or after any major renovation.
- It is recommended to replace all original branch panelboards in areas that are being renovated.
- Clean, torque, and tighten bus duct risers every few years to ensure adequate connections. Seal all penetrations around electrical rooms to reduce the chance of water intrusion.

Facility Condition Assessment

Moda Center & Garden Garage

- Commission all electrical equipment meters to ensure they are being correctly fed back to the BAS with accurate load data in order to provide accurate spare capacity for future renovations.
- Verify the motor overload settings for the retractable seating motors located on the event level with the manufacturer.
- Circuit directories for all panelboards should be reviewed annually to ensure any added or removed circuits are accurately documented.

Electrical - Emergency Power Distribution

- Continue to maintain service contract and perform monthly tests on both of the generators (arena and parking garage) using the available building power as load. Force as much load onto generator as practical. Record amps, volts, oil pressure, water temperature, etc. Use NFPA 110 as a guide. Include an annual load bank test of the generator with existing service contract.
- Assess the capacity of the existing generator to determine if spare capacity is available for an additional load once a major renovation occurs.
- Monitor the condition of batteries for the UPS systems in the arena. Coordinate with battery manufacturer on recommended date for full replacements. Consider replacing with Lithium-Ion batteries where possible for longer lifespan and better reliability.
- Continue to maintain and service the existing ATS's to ensure proper operation.

Electrical - Lighting and Lighting Controls

- Replace all non-LED lighting with LED fixtures during a major planned renovation, which will include holistic light fixture replacement in lieu of retrofitting.
- Replace existing lighting control system with a new networked lighting control system that includes arena wide scene control as well as additional controls in club areas to allow for greater flexibility in hosting events independent of games and concerts. This will also include controls that comply with the requirements of ASHRAE 90.1 or IECC.
- Prioritize replacement or cleaning of kitchen fixtures and exterior RGB low roof fixtures.
- Obtain attic stock for unique club and suites fixture drivers or replace the unique fixtures with a common lighting manufacturer in order to reduce lead times.

Electrical - Show/Temp Power

- Replace the floor power devices on interior concourses that can provide reliable temporary power when needed during event days.
- Replace outdoor covers and devices as needed to ensure they maintain the weatherproof rating and avoid nuisance tripping.

Electrical - Broadcast Power

- Consider replacing existing disconnects and CAM-Loks with ESL company switches (or similar) during a major renovation.

Electrical - Fire Alarm

- Consider adding upgraded upstream surge protective devices (SPD) serving the fire alarm system.

Plumbing - Domestic Water

- Continue to perform regular maintenance on major plumbing equipment.
- The hot water storage tanks do not currently pose any issues to facility maintenance staff, but they have outlived the typical useful life. It is recommended to clean and inspect the interior of the storage tanks to further assess their condition.

Plumbing - Plumbing Fixtures

- Routine cleaning of fixtures is recommended to help extend the useful lifespan of fixtures, faucets, and flush valves.
- It is recommended to replace the cartridges in the shower faucets.
- Installing water hammer arrestors on the hot and cold-water piping serving the showers in the star rooms and locker rooms, and anywhere else where there is a quick closing valve, will decrease wear and tear on the system, prolonging its lifespan.

Plumbing - Sanitary and Storm Water System

- Continue regular maintenance on the sewage ejectors and submersible pumps.
- Roof drains should be regularly inspected and cleaned of any debris.

- Epoxy coated cast iron waste piping is recommended, especially for p-traps and piping in food service areas, as the existing piping begins to near the end of its life.

Fire Protection - Main Equipment

- Continue maintenance and testing of the fire pump, jockey pump, and double check valve assembly.
- The fire pump is near the end of its useful life. Replacing the fire pump in the next few years is recommended.

Fire Protection - Sprinkler System

- The sprinkler system appeared to be in good condition. We recommend regularly flushing of the sprinkler system, testing, and exercising valves, and replacing piping as it ages.

STRUCTURE

Arena Structure

In general, the structural assessment consisted of a review of the original construction documents to become familiar with the design concept of the structure (if available). A review of the structural design or a comprehensive check of the drawings was not within the scope of the proposal.

A visual review of the exposed and readily accessible elements of the structure was performed without the use of scaffolds, swing stages, selective demolition, or the removal of existing finishes. Specifically, the scope was restricted to viewing the structure for evidence of structural distress, areas of deterioration and to identify visible potential or suspected structural problem areas. The assessment included a selected review of typical sections, columns, beams, and walls. The visual review documented typical noticeable distress such as cracks, leaks, spalls, scaling, joint deterioration, and other similar adverse conditions.

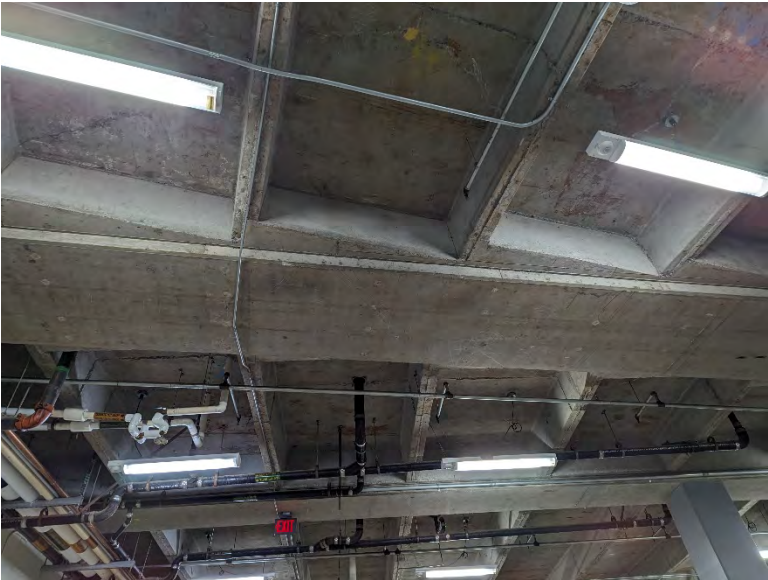
Description of Arena Structure

Structural Description

The arena concourse levels, which include the Main Concourse, Preferred Level, Suite Level, and Upper Concourse, are typically composed of a concrete topping slab over a cast-in-place pan joist system.

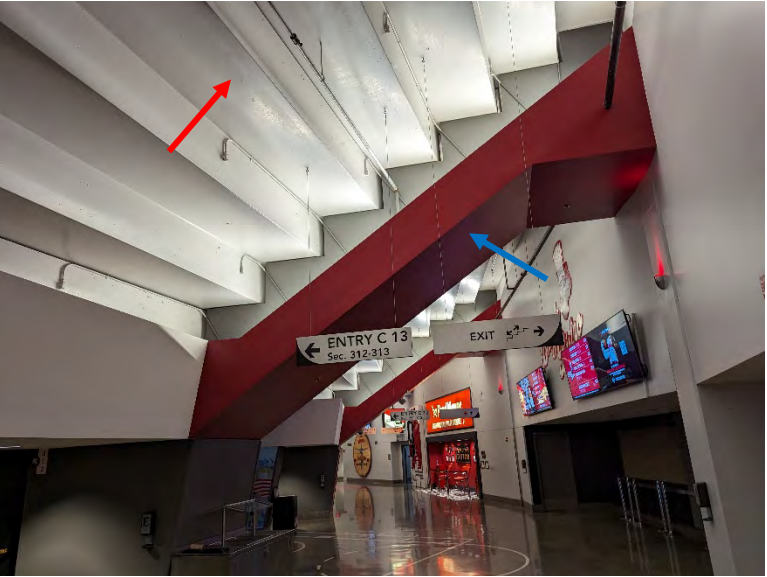


Upper concourse (Section 321) concrete pan joist soffit



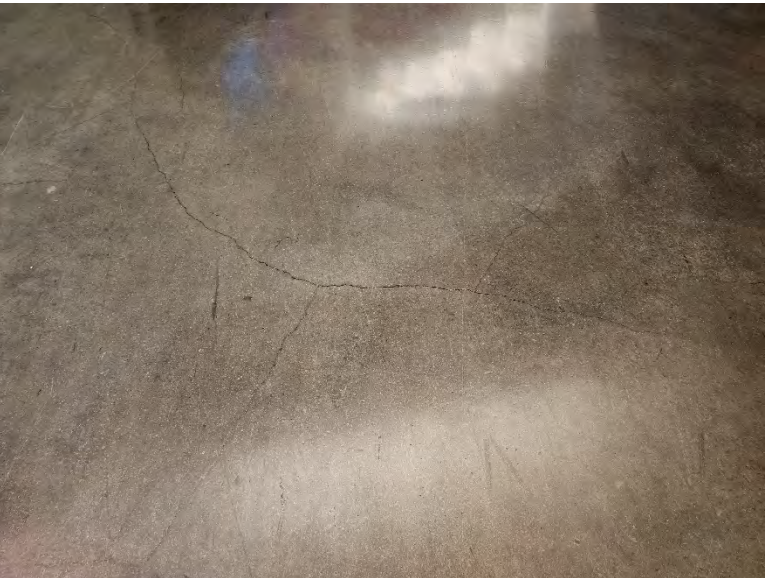
Event floor concrete pan joist soffit

The seating bowl is constructed of precast concrete risers with occasional cast-in-place risers. The concrete risers are supported by concrete rakers.



Upper concourse (Section 312) concrete risers (red arrow) supported by concrete rakers (blue arrow)

The concrete topping slab was typically coated in what appeared to be an epoxy finish coating, which was not original construction, and which coated over previously formed cracks in the topping slab.



Upper concourse (Section 311) topping slab with a clear finish coating over existing cracking

We walked the arena with Moda Center staff and discussed previously performed renovations. No water intrusion locations or structural distress concerns were noted by the Moda Center staff.

Visual Observations

The purpose of this assessment was to determine structural and waterproofing items in need of repair and develop a capital expenditure plan for repairs. Our observations were made without the removal of finishes. No material testing was performed as part of this assessment.

There are several concerns listed below that should be addressed to keep the facility in a serviceable condition.

Seating Bowl

The lower, middle, and upper seating bowl areas are coated with a pedestrian grade coating. Throughout the seating bowl, joint sealants and cove sealants have generally failed at horizontal and vertical substrates. Some of the joint sealants appeared to be urethane joint sealants with a width of greater than 1” wide. This is typically wider than the maximum allowable joint width for urethane joint sealants, so silicone joint sealants should be considered during replacement. However, silicone sealants are not compatible with urethane sealants, and that would have to be considered during the design phase. We recommend replacing sealants at seating bowl in in the next three years.



Seating bowl (Section 322) with locally failed joint sealant at seating row



Seating bowl (Section 326) with locally failed cove joint sealant at stairs



Seating bowl (Section 320) with locally failed joint sealant at seating row



Seating bowl (Section 314) with locally failed joint sealant at stair riser

Typically, treads on area seating (i.e., Sections 110 to 114) had metal protection plates installed over trafficable sections of joint sealants and the condition of the joint sealant could not be verified. We recommend installing metal protection plates over exposed trafficable joint sealants to provide protection to sealants.



Seating bowl (Section 326) with installed metal protection plate over joint sealant

The existing coating was in generally fair condition within the seating bowl. We recommend replacing the traffic coating within five years.

Concourses

Multiple locations throughout the arena concourse levels exhibited cracking of the concrete topping slab. It appears that a sealer-type product had been applied over the slab and cracks. Some of these cracks appeared to be through-thickness cracks that reflected on the slab soffit. However, no evidence of water intrusion through the cracks was observed. No repair is required at this time.



Preferred level (Section 209) concrete topping slab cracking



Upper concourse (Section 310) concrete topping slab cracking measured to be 1/16" wide



Upper concourse (Section 310) concrete topping slab cracking measured to be 1/16" wide



Main concourse (Section 121) concrete pan joist soffit cracking



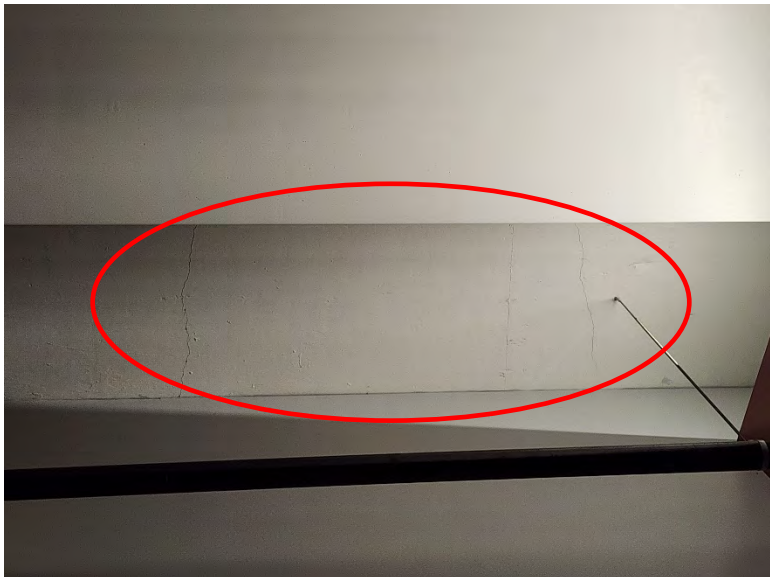
Main concourse (Section 121) concrete pan joist soffit cracking



Main concourse (Section 114) concrete pan joist soffit spalls at previous anchor locations



Upper concourse (Section 303) staining at cast-in-place raker



Upper concourse (Section 314) cast-in-place concrete soffit cracking

Isolated instances of soffit spalling were observed at locations that appeared to be where anchors were previously removed. We recommend cleaning soffit staining throughout the arena concourse and repair and paint over concrete spalls.



Main Concourse (Section 114) concrete pan joist soffit spalls at previous anchor locations

Staining was observed at isolated locations at some concrete rakers. Staining appeared to be a result of leaks from the seating bowl through failed sealants. Replacing sealants in seating bowl should prevent this from occurring.

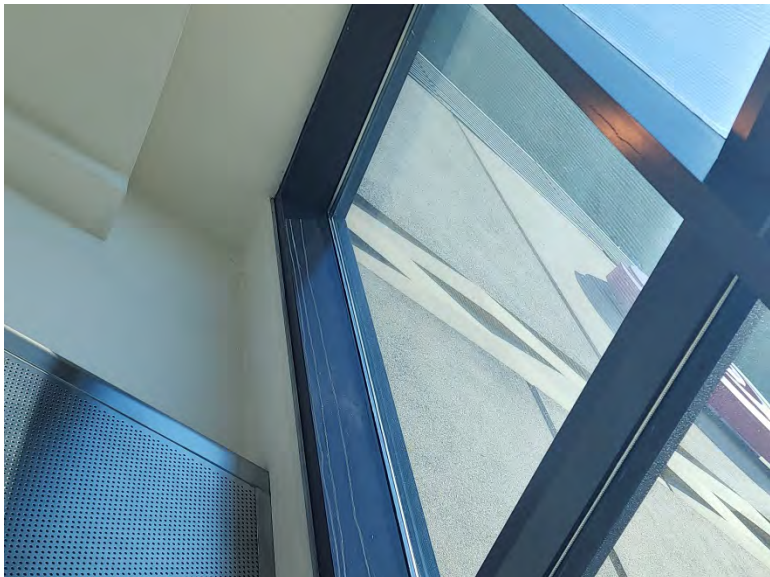


Upper concourse (Section 303) staining at cast-in-place raker

Evidence of water intrusion was observed at a fenestration at the Club Level near section 229. Further assessment is required to determine whether or not water intrusion has occurred at other fenestrations and to determine the cause of the observed water intrusion at the fenestration.



Club Level (Section 229) water Intrusion at fenestration

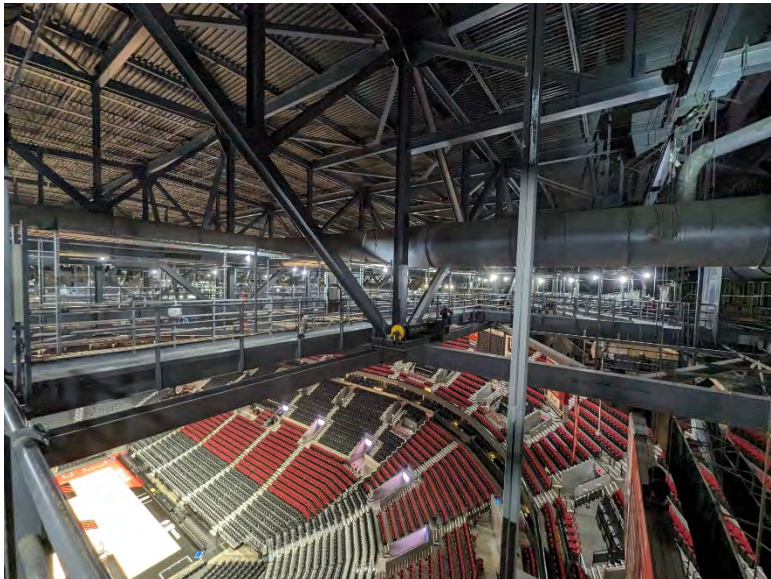


Club Level (Section 229) water intrusion at fenestration

Catwalk

The steel framing and the protective coating on the steel framing at the catwalk appeared to be in generally good condition. At isolated locations we observed sections of the structural steel framing where the coating that had been touched up. There was

an isolated instance of corrosion at a framing connection located along the inner catwalk and gridline R7. We recommend cleaning and coating the corroded steel framing connection and perform periodic recoating as necessary at isolated locations.



Catwalk level steel framing

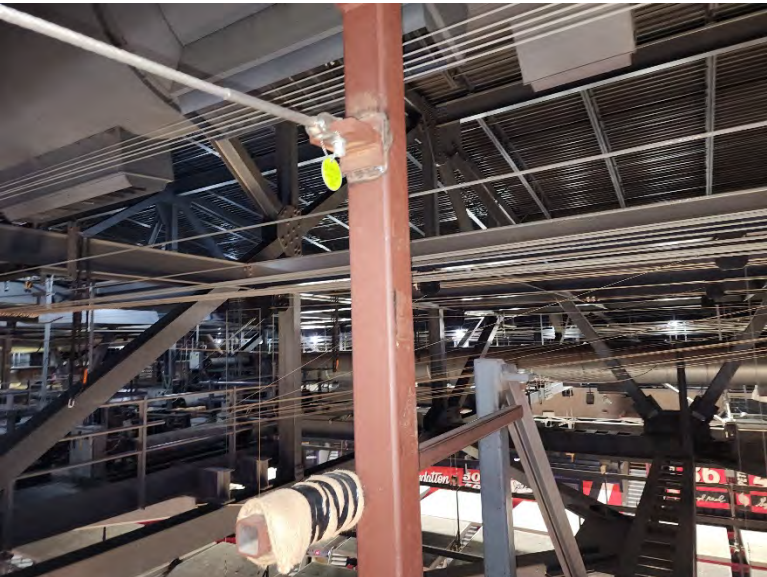


Catwalk level steel framing bolt connection



Catwalk level (Gridline R7) corroded steel framing bolt connection

A post-installed fall protection system was observed throughout the catwalk level and is due for inspection in September 2024.



Catwalk level post installed fall protection system

Facility Condition Assessment
Moda Center & Garden Garage



Catwalk level post installed fall protection system due for inspection in September 2024

Exterior

The arena façade typically consists of precast concrete and granite panels.



Arena façade

A street level granite façade panel at the East elevation was observed to be spalled. We recommend replacing or repairing the spalled granite panel.



Façade (East façade) with spalled granite façade panel



Façade (East Façade) spalled granite façade panel

Steel panels and steel framing elements at a roof mechanical area near gridlines R82-FF were observed to be corroded.

We recommend cleaning and coating corroded steel elements. Steel framing that is found to be exhibiting 10% section loss or greater should be replaced.



Mechanical level (Gridline R82-FF) corroded steel MEP framing beam



Mechanical level (Gridline R82-FF) corroded steel MEP framing beam



Mechanical level (Gridline R82-FF) corroded steel panels



Suite level (Suite 41) plaza annex traffic coating



Club Level (Section 225) obstructed plaza annex floor drain



Mechanical level (Gridline R82-FF) corroded steel panels

Plaza annex areas throughout were coated with a pedestrian grade traffic coating that was typically in fair condition. We recommend recoat traffic coating within five years.



Suite level (Suite 41) plaza annex traffic coating upturn termination

Floor drains at these plaza annex areas were typically obstructed by dirt or debris.

Garden Garage Structure

General Description

Garden Garage structure consists of four above grade levels and three below grade levels. Level P4 is located at street level. The parking structure has a single-helix circulation pattern and is a post-tensioned cast-in-place concrete structure. The post-tensioned slab spans between parallel beams at approximately 20 feet on center due to the radial layout of the garage.



Level P6 post-tensioned slab spanning between beams spaced at approximately 20 feet on center

The footprint of the parking structure reduces in size at the P3 level and then again at the P2 level and P1 level. At the P1 level, there is a tunnel that connects to the Moda Center loading dock.

A combination of concrete parapet walls and post-tensioned steel cables act as vehicle and pedestrian barrier systems at the perimeter of the parking structure. Steel exit stairs are located throughout the parking structure.

A speed bump shaped ring of asphalt at the top floor of the parking structure was indicated to be a physical indicator for parking staff and pilots to know where helicopters were allowed to land on the parking structure.

Visual Observations

In general, the primary structural elements (e.g., cast-in-place concrete post-tensioned slab, cast-in-place beams, cast-in-place columns) did not exhibit significant cracking, spalling, or evidence of active corrosion. Cracking and efflorescence were observed at some post-tensioned slab soffits and may warrant further investigation. Isolated instances of concrete spalling and CMU cracking were observed at the parking structure.

Many typical waterproofing elements were not present throughout the parking structure. Cove sealant was not present at most perimeter cold joints where there was a horizontal to vertical transition, such as where the parking structure slab met a vehicle barrier wall. There is an expansion joint at the middle of the parking structure that was protecting the post-tensioned steel tendons. Pipe penetrations through the concrete slab were inconsistently sealed to prevent water intrusion.

There are several concerns listed below that should be addressed to keep the structure in a serviceable condition.

Structural Items

Isolated grout pockets that protect the post-tensioned tendon anchors at the slab edge were observed to be delaminating. The orientation of the grout pockets suggested that they were protecting temperature and shrinkage tendons. Grout pockets for the primary steel tendons could not be observed due to existing façade finishes. We recommend replacing delaminated or damaged grout pockets in the next year and review condition of the anchors.



Level P5 post-tensioned tendon grout pocket delamination at the slab edge



Level P6 post-tensioned tendon grout pocket delamination at the slab edge

Overhead concrete spalling was observed at a ground level stair soffit. We recommend repairing overhead concrete spalling in the next year. If steel reinforcing bars are found to have experienced 10% section loss or greater, they may need to be replaced.



Level P4 overhead concrete spalling

Cracking and efflorescence were observed at post-tensioned concrete slab soffits throughout the parking structure. Cracking of this nature in a post-tensioned slab is unusual and may indicate an issue with the post-tensioning system. The efflorescence indicates water intrusion through these cracks. Continued water intrusion through a post-tensioned concrete slab may eventually develop into a structural concern if allowed to continue. We recommend routing and sealing cracking from the top side of the slab. Monitor slab cracks for increase in width, which could indicate failure of post tension tendons.



Level P6 soffit cracking and efflorescence

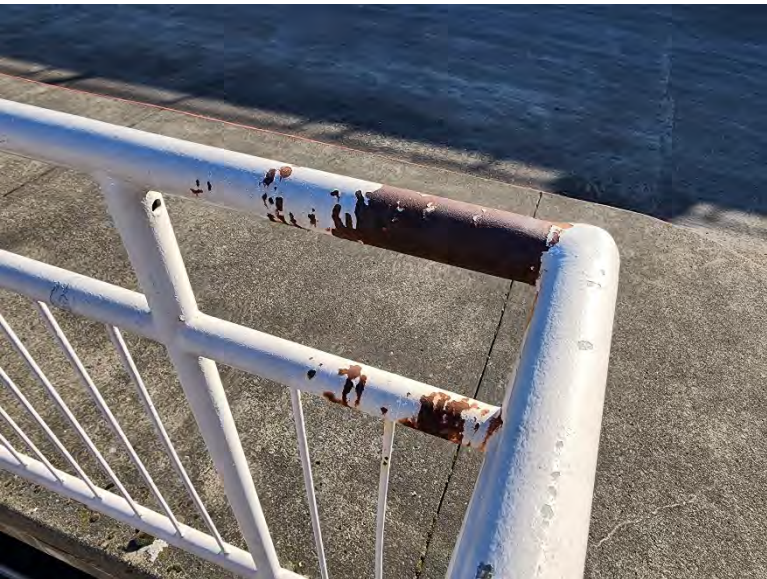
Corrosion was observed at steel elements throughout the parking structure including the precast façade panel connections, bollards, and stair handrails. We recommend cleaning and coating corroded steel elements within the next three years. If steel elements are found to have experienced 10% section loss or greater, they may need to be replaced.



Level P7 corrosion at precast concrete façade panel connection



Level P4 corrosion at steel bollard base



Level P6 corrosion at steel stair handrail

The curbs and floor slab were observed to be cracked, spalled, or delaminated at isolated locations throughout the parking structure. These are typically not structural concerns, but rather potential tripping hazards for pedestrians. We recommend repairing cracked, spalled, or delaminated concrete locations that represent tripping hazards to pedestrians.



Level P4 cracked curb near the stairwell



Level P4 ground level floor cracking

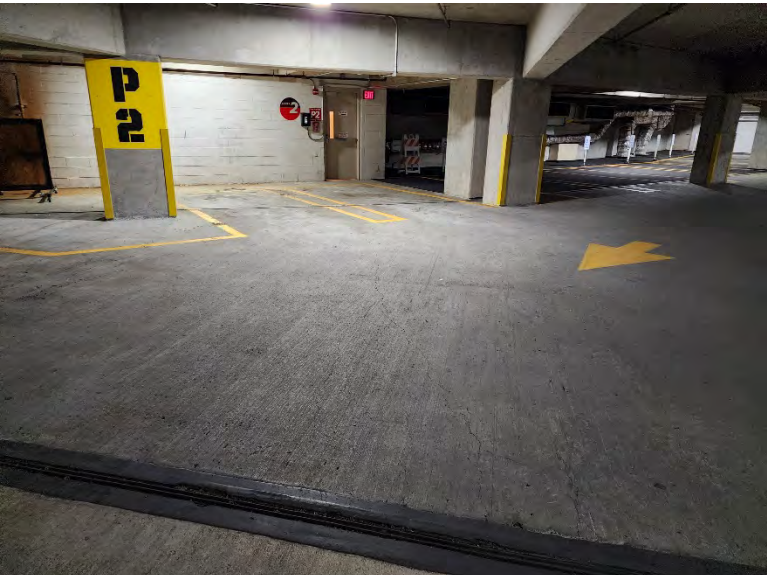


Level P1 spalled floor slab

Floor slab cracking was observed throughout the parking structure, primarily at ground level and below grade levels of the parking structure. There was generally no immediately evident cause for the cracking, but the locations where the cracking was observed suggested that it may be due to differential movement coupled with restraint of the slab. This kind of cracking is typical for a concrete structure and should not be a cause for concern.



Level P4 ground level floor cracking measure to be approximately 1/32" wide



Level P2 below grade floor cracking



Level P2 below grade floor cracking

Waterproofing Items

A gutter style expansion joint system was present at levels P5 through P7 and appeared to be located to protect the anchor points of the primary post-tension tendons. There was no report or evidence of water intrusion through these joints. However, it is important that these joints are working properly since water intrusion through the joints can lead to corrosion of the post tension anchors. We recommend replacing the above grade expansion joints with a new expansion joint system within five years.

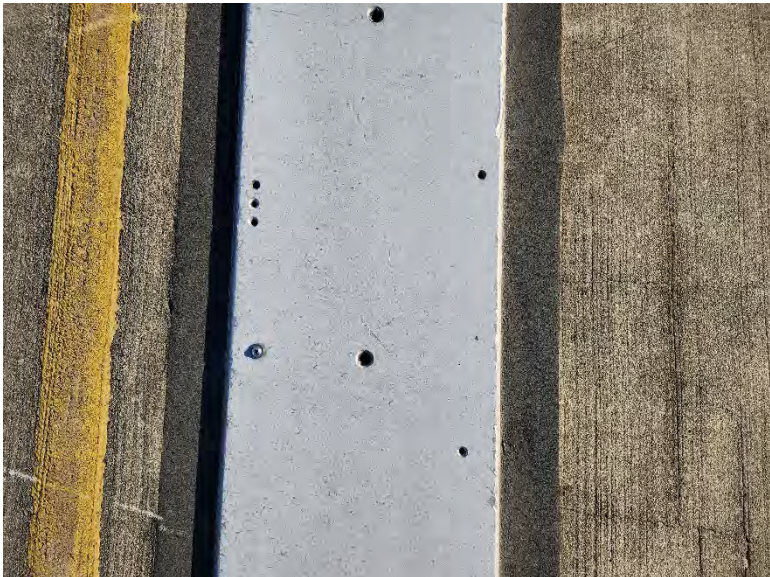


Level P5 underside of expansion joint



Level P2 underside of expansion joint

The expansion joint cover plate was missing anchors at some locations.



Level P7 expansion joint cover plate with missing anchors

We recommend replacing missing anchors at expansion joint covers.

What appeared to be a winged expansion joint was used at below-grade levels to transition between on grade and elevated areas of the floor. The winged headers were damaged at isolated locations throughout the expansion joints. We recommend repairing the below grade expansion joint winged headers and install a metal cover plate to protect the headers within the next two years.



Level P2 compression seal expansion joint with damaged winged headers

Joint sealant was typically not present throughout the parking structure. The construction joints did not have joint sealant installed. Similarly, there was no cove sealant at the curbs or walls at the perimeter of the parking structure. Efflorescence at concrete slab soffits and at perimeter façade panels indicate that water intrusion is occurring at these locations. We recommend installing joint sealant at construction joints and slab perimeters within the next two years.



Level P7 floor slab construction joints



Level P7 perimeter walls and curbs without cove sealant



Level P7 floor slab construction joint without joint sealant



Level P7 perimeter walls and curbs without cove sealant



Level P6 efflorescence at perimeter façade panels below walls and curbs without cove sealant

Pipe penetrations through the slab were unsealed throughout the parking structure. Unsealed pipe penetrations are potential sources of water intrusion into the parking structure, so we recommend sealing pipe penetrations within the next year.



Level P6 unsealed pipe penetration



Level P6 unsealed pipe penetration

Miscellaneous Items

Vehicle barriers were typically not installed around stairwells. Vehicular barriers are typically required where the vertical distance from the floor of a drive lane or parking space to the ground or surface directly below is greater than one foot at the end of drive lanes and parking spots. We recommend installing vehicle barriers around stairwells within the next year.



Level P7 missing stair vehicle barriers

Nonstructural CMU walls were cracked through mortar joints and CMU blocks at the street level stairwell. This may result in instability of the CMU walls, so we recommend replacing cracked CMU blocks and repoint cracked CMU mortar joints within three years.



Level P4 cracked CMU wall



Level P4 cracked CMU wall

A ring of asphalt was located at level P7 of the parking structure. Moda Center staff stated that the ring was to mark where helicopters could land. A cursory review of the existing structural drawings of the garage, dated July 10, 1993 by KPFF Consulting Engineers, does not indicate that this area of the garage was specially designed to support the extra weight of a helicopter. Cracking and efflorescence appeared to be more prominent and frequent below the designated helicopter pad, indicating that landing a helicopter at this location may be overstressing the concrete slab. However, Moda Center staff mentioned that the garage has not been used as a helicopter pad for several years. We recommend removing the asphalt ring and prohibit helicopters from landing on the parking structure or assess whether or not the parking structure has the capacity to support a helicopter.



Level P7 helicopter pad



Level P7 helicopter pad asphalt ring



Level P6 soffit cracking and efflorescence below the helicopter pad

Some parking structure pedestrian barriers were below 42 inches in height required by current code. At some locations, the gap between pretensioned steel cables and concrete parapet walls which were acting in concert as pedestrian barriers had a gap greater than four inches, which is greater than what is allowable by current code. Although not meeting current code requirements, the as-built conditions may be grandfathered in as long as they meet the requirements of the code at the time of construction.

Facility Condition Assessment Moda Center & Garden Garage

RECOMMENDATIONS

Arena Structure

- Repair granite façade panel spall
- Replace cove and joint sealants in seating bowl
- Install joint sealant covers in seating bowl
- Clean and coat corroded steel in catwalk/rigging grid
- Clean and coat corroded structural steel framing for MEP units
- Clean and coat corroded structural steel framing for MEP screen
- Recoat traffic coating in seating bowl and exterior plazas
- Repair spalled overhead concrete in Main concourse
- Clean drains

Garage Structure

- Repair delaminated grout pockets for post tension anchors
- Repair overhead concrete spalls and delaminations
- Repair spalled and delaminated concrete on floor surfaces
- Install vehicular barriers around stairwells
- Assess structural capacity of roof level slab for helipad use if planning to use as helipad
- Seal abandoned slab penetration on roof level
- Clean and coat steel elements
- Replace above-grade expansion joints on Level P7
- Repair expansion joint headers Levels P1-P4
- Install joint and cove sealants on Level P7
- Replace above-grade expansion joints on Levels P2-P6
- Install joint and cove sealants on Level P2-P6
- Restripe garage
- Repair damaged CMU walls
- Remove curb marking helipad location, assuming not used as helipad



Level P5 garage pedestrian barrier less than 42 Inches in height



Level P7 slab penetration trip hazard



Level P5 garage pedestrian barrier gap greater than five Inches

An unused slab penetration at roof level presented a pedestrian trip hazard, so we recommend infilling or covering the slab penetration tripping hazard in the next year.

The parking stall striping was faded at some areas of the parking structure, so we recommend restriping the faded parking stalls in within the next two years.



Level P7 faded parking stall striping

This report is not a warranty or guarantee of the items noted. The extent of our evaluation was limited and cannot guarantee that the condition assessment discovered or disclosed all possible latent conditions. The evaluation required that certain assumptions be made regarding existing conditions and some of these conditions cannot be verified without expending additional sums of money or destroying otherwise adequate or serviceable portions of the facility. In this study, we did not include review of the design, inspection of concealed conditions, or detailed analysis, to verify adequacy of the structure to carry the imposed loads and to check conformance to the applicable codes or for compliance with the Americans with Disability Act (ADA) requirements. The assessment also does not provide specific repair details, construction contract documents, material specifications, details to develop construction cost, or information on means and methods of construction.

TECHNOLOGY

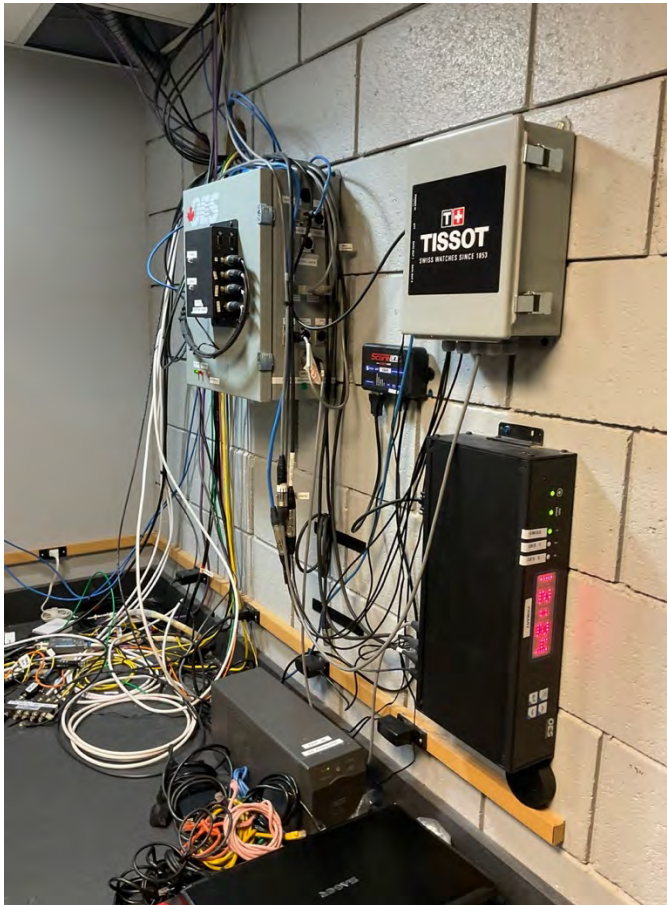
Technology Infrastructure

LED Display Equipment and Scoring System Room

The primary LED processing location is currently housed in two floor standing audio and video (AV) racks located in the old photo processing room. These racks are a significant distance away from the main production area. The room lacks organization and contains a rack with old or non-functioning equipment making movement difficult.



Existing LED processing and scoring system room



Wall mounted scoring system processing and distribution

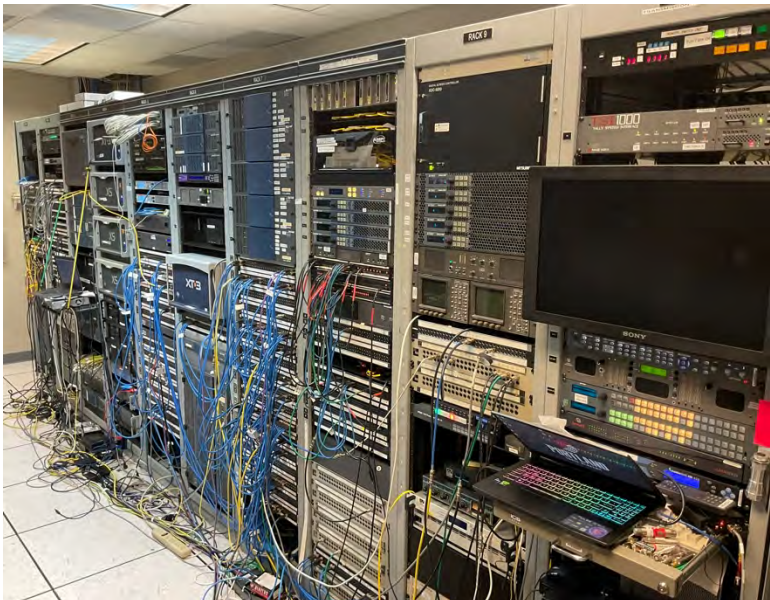
A 10' by 16' dedicated AV room should be built on the event level near the main production suite to house five AV racks. Four racks will house the existing and future LED processing and in-venue video control/monitoring. One rack will house the scoring system controllers and distribution.

The room should include an overhead cable tray, new electrical power, dedicated emergency power, dedicated cooling, dedicated AV pathways, electronic access control, and a security camera at the entry.

Storage, shelving, and organization for spare parts, modules and tools is recommended.

Production Suite – Rack Room

The primary broadcast and in-venue production suite rack room is a shared resource between the Moda Center and the Trail Blazers broadcasting. The rack room houses eighteen racks with all the essential equipment for both the broadcast and in-venue entertainment productions along with NBA required equipment. The room is at capacity and contains equipment that is past its useful age including equipment that is no longer in service.



Production suite rack room viewing row 1 of 2

Much of the core equipment was purchased in 2010 with the high definition (HD) upgrade. The suggested replacement cycle is 10 years for these types of electronic devices. A complete overhaul of existing systems is recommended to meet new technology standards and increase efficient workflows for a better overall fan experience.

Facility Condition Assessment
Moda Center & Garden Garage



Production suite rack room – viewing row 2 of 2

The footprint of the rack room should increase to 36’ by 24’ to accommodate three rows of 12 racks to provide space for all necessary equipment and future expansion.

The room should include overhead cable tray, raised access flooring, increased electrical capacity, dedicated backup UPS and emergency power, dedicated cooling, dedicated AV pathways, electronic access control, and a security camera at the entry.

Production Suite – Control Room (Low Post)

The primary in-venue control room known as “Low Post” contains space and equipment for the videoboard production crew. The room was last updated in 2010 and contains dated production equipment and consoles. The room has space for six crew members.



“Low Post” production control room main bench



PTZ control user station separate from main production control room

Additional space is recommended to accommodate an increased number of user stations and a more efficient layout for production workflows. Room finishes, consoles and lighting should be adjusted to provide the ideal control room setting for operation. Relocating all non-essential equipment into the central rack room to create a quiet and controlled space is recommended.

Bowl Audio

Main Bowl Speaker System

The current bowl speaker system consists of six JBL line arrays. The speakers are powered by a combination of Crown iTech and DCi series amplifiers. The amplifiers are located in equipment racks on the catwalk. Overall, the current bowl audio system is meeting expectations, but it has reached end of life.



Main bowl speaker system



Bowl amp racks

Life expectancy for a modern speaker system is about 8-10 years. This is driven largely by the life of the electronic components in the system in addition to wear and tear on the speaker's drivers. Examples of replacement speaker systems to consider in a renovation should include d&b audiotechnik KSL and L-Acoustics K3. We recommend that the amplifier fans and filters be serviced annually and at the same time check for speaker driver issues.

Audio Network & DSP System

The current digital signal processor for the arena is based around the Biamp Audio hardware platform. Like the bowl amplifiers, life expectancy for the DSP system is in the 8–10 year range for the hardware.

The selection of a DSP platform is largely influenced by the bowl speaker system selected and the other functions (such as control system functionality) desired. The examples include QSC Q-SYS and Symetrix Edge.

Front of House (FOH) Console

The current mixing console configuration employs a Yamaha LS9-32 digital console as the main console in the control booth. Life expectancy on a digital mixing console is around 10 years. We recommend replacing the current console. Examples include the Yamaha D7 and the Allen & Heath Avantis. Annual maintenance on the equipment fans and cleaning of filters should occur annually along with firmware updates.



Audio mixing console

Wireless Microphones

The current wireless microphones are Shure ULXD, and we recommend upgrading to the latest technology, Shure Axient-D. They have improved audio quality, increased RF reception capabilities and are more robust against interference.

Broadcast Cabling & LED Displays

Broadcast Cabling

Improving the quality and access to the broadcast cabling will be a much-needed improvement. Broadcast cabling has been slowly added to as league requirements induced improvement. The original cable (audio, triax, coax) is all in poor condition and is sparingly utilized. Newer SMPTE cable and fiber connections have been added to the panel locations or in some locations in their own new housings.



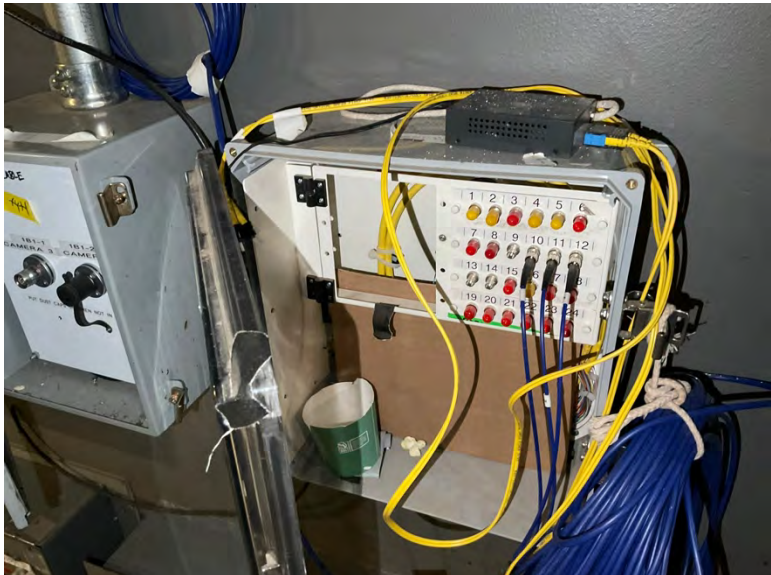
Main camera platform broadcast cable panels



Player tunnel IO panel with temporary labeling

The systems are labeled with temporary labeling and mismatched color coding. The locations themselves are aged and the areas surrounding some junction boxes are poorly maintained.

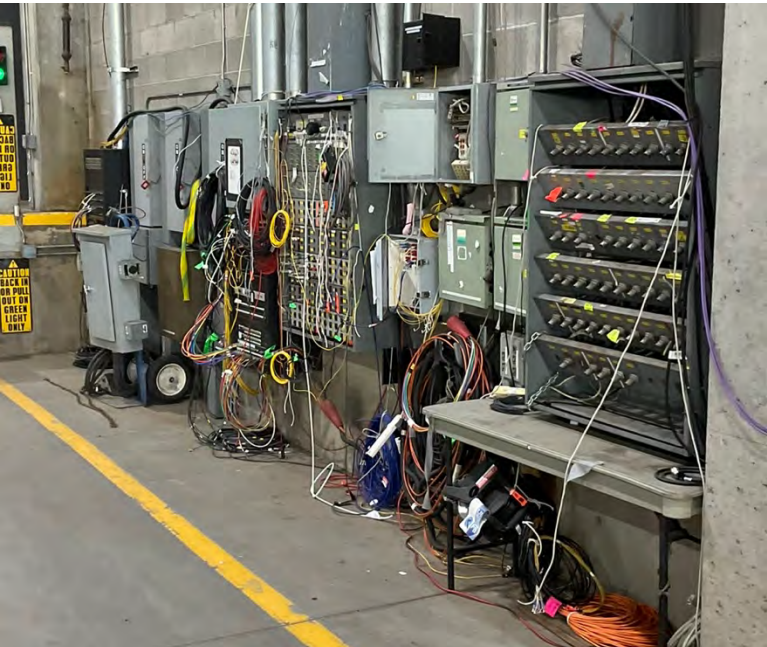
Productions coming to site often utilize their own cable runs due to lack of trust in the existing house cabling system.



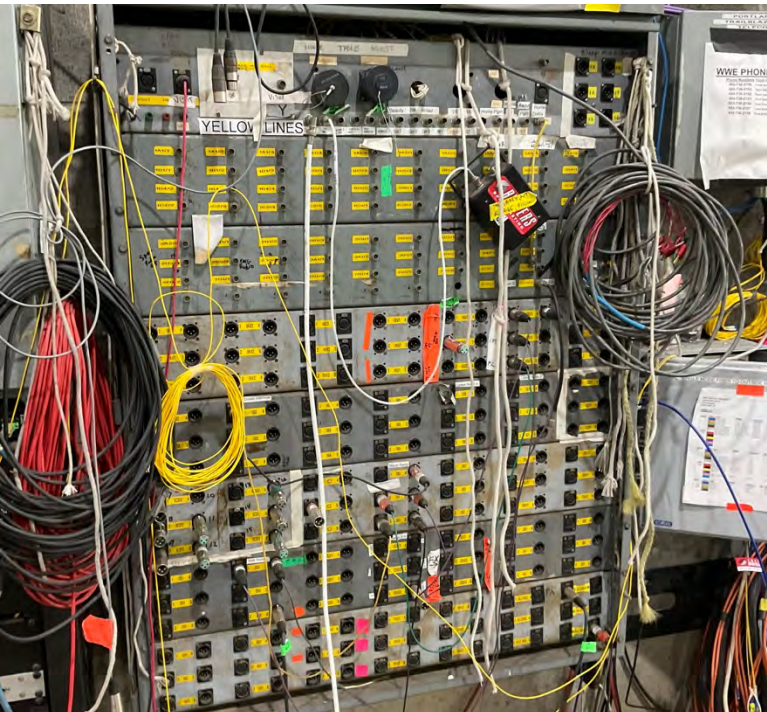
SM fiber and SMPTE triax housing under seating

As mentioned previously, a complete overhaul of the broadcast cabling is recommended. New, purpose-built enclosures with permanent labeling and custom rack mount bulkhead connections provide a more organized and smaller broadcast cabling footprint in most locations.

Moving equipment into a single housing rather than multiples provides easier access and better cable management as well as rack mounting options for any equipment required in those locations.



Broadcast truck dock cabling connections



Broadcast truck dock cabling connections

Facility Condition Assessment
Moda Center & Garden Garage

The truck dock location is under cover and provides ample space for multiple production trucks. The cabling connections and infrastructure are aged and in need of replacement. Cabling additions and expansions over years have sprawled out along an entire wall shared with mobile unit power disconnects.



Broadcast truck dock cabling connections

A 10' by 16', dedicated broadcast equipment room should be built adjacent to the truck dock to house six racks for broadcast cabling. Four racks will house the broadcast cabling terminations. Two additional racks will contain the transmission, scoring, and network equipment /connections.

The room should include an overhead cable tray, new electrical power, dedicated cooling, dedicated AV pathways, electronic access control, and a security camera at the entry.

LED Displays and Systems

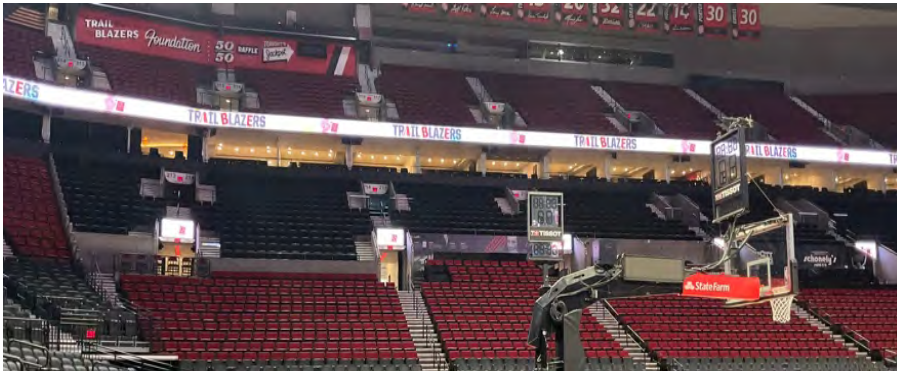
There are five different LED providers and technologies within the arena bowl. LED displays have been added in stages and has created inconsistency between surfaces, the systems that control them and the maintenance of each. It is recommended to begin planning for replacing most of the LED in the arena bowl.

That large center hung display was installed in 2010 making it the oldest surface in the arena. The rings below are also end of life and need immediate replacement. It is recommended that to begin with an immediate replacement schedule for the main center hung display, hoist, and control system.



Arena center hung display

While the display is undersized compared to some NBA video displays, the multi-use functionality of the arena leads to the recommendation of being able to “nest” the display into the high steel to provide rigging clearances as it is currently designed.



360 ribbon board and vomitory LED's

Additional LED in the arena is newer in comparison to the main center hung but still in need of replacement schedule planning. The 360 LED ribbon displays were installed in 2017 and should be nearing replacement in 2025-2027 based on the recommended 8–10-year life cycle of technology.

The vomitory and the player tunnel LED displays are both new and have serviceable years ahead, needing replacement in 2028-2030.



Damage on one of the player tunnel displays



Center hung display hoist

It is recommended to plan for immediate replacement of the center hung display. It is an option to do a complete LED overhaul in the area which could provide cost savings and usher in a single LED provider, making maintenance and service much easier than current conditions. Otherwise, 360 ribbon board replacement is recommended in the next two to three years and vomitory and tunnel LED in the next four to six years.

Ancillary Audio & Video (AV) Systems

Ancillary AV systems include all audio and video outside the seating bowl. This primarily includes the public and premium (clubs, lounge, and suites), and back of house spaces.

Displays and IPTV

Televisions throughout the venue are currently undergoing an upgrade from LG televisions with MATV distribution to Professional Planar displays with Tripleplay IPTV distribution and control.



Updated televisions in suite

AV Network & Headend

Existing AV systems currently operate as independent systems. A dedicated AV network would provide connectivity between all the systems for ease of control and to share streaming audio. The AV network should be housed in AV and data racks and connect over data fiber. The core AV network switches should be installed in the existing main telecom room.

Audio distribution throughout the arena mostly consists of point to point Dante (bowl audio) and analog audio (ancillary AV) throughout the arena. Systems should be updated to include networked Dante distribution (over AV network) and an integrated, IP-based, core system for audio processing and AV control.



Existing lounge on suite level

Clubs and Lounges

Current clubs and lounges are equipped with televisions, speaker systems, wireless microphones, and projection (Skyline Lounge only). These systems are reliant on AV systems that are past their typical life span. Most AV hardware is end of life, so maintenance and support of these systems will be difficult going forward. These systems should be replaced in the next few years.

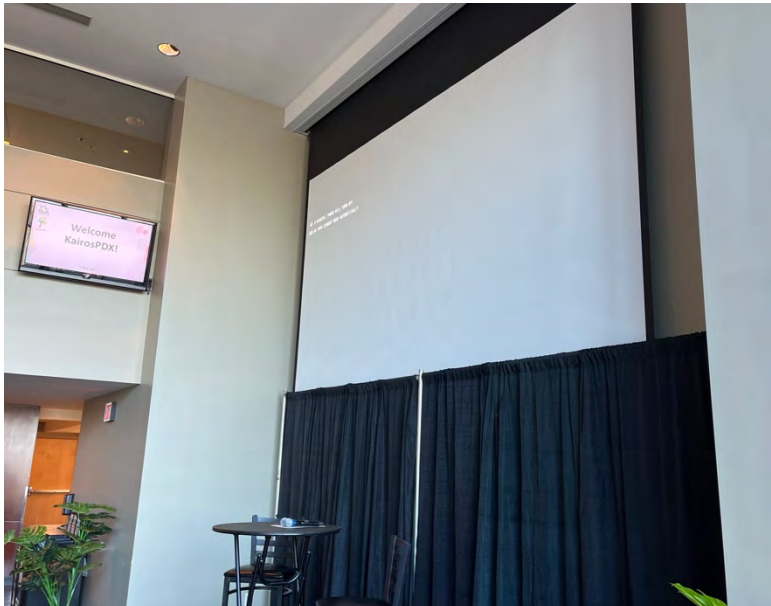
Each club/lounge currently operates as an island and is not integrated into the facility wide control systems. Most spaces do not include AV control system, so users have to access the AV racks (sometimes in another room) to control the audio volumes. New AV control and distribution systems, with wall mounted AV touchscreens, should be implemented in each space. New systems should be integrated into facility wide AV network and headend.



Existing club AV control rack

Speaker systems hardware is past its typical life span and provides minimal audio coverage. New speaker systems should replace the existing speakers with a higher density of speakers and the addition of subwoofers. Upgraded speaker systems will provide better audio coverage and fidelity to better align with standards set by more modern arenas.

Video presentation is currently included in the Rose Room utilizing ceiling mounted video projection system. The system is currently functional and useful for presentations but not for game day. As spaces are updated, a fine-pitch, direct-view LED display should be added to Courtside Club, Oro Fino, and Rose Club (to replace projection) for video presentation and for fan engagement on game day. Video presentation routing should be updated to AVoIP system on the AV network.



Existing video projection screen

Audio and video connectivity in the existing clubs is minimal. As spaces are updated, additional AV connectivity should be integrated into each space. Each location should include two mic/line inputs, two audio tie lines, data tie lines (with shielded Cat6A Cabling), and two fiber tie lines (each with dual single mode cabling). Audio inputs will connect to input on the audio distribution system.

Suites

Suites currently include wall mounted televisions that are controlled with handheld remote, and no speakers are included in suites.

As spaces are updated, overhead speakers should be added to each suite for bowl audio extension, background music, and local TV audio. A wall mounted touchscreen should be added to each suite to control televisions, audio, and lighting. The touchscreen includes a QR code that allows the user to access control on their mobile devices via Wi-Fi.



Existing suite television

The main television in each suite should be enlarged for local presentation and/or insertion of L-Bar graphics (for stats and advertisement).

Concourses and Entries

Concourses currently include basic audio and distributed televisions for game feed, signage, and menu boards. Entries currently include speakers for event policies messaging. Systems are generally functional and meet the owner's current requirements. As spaces are updated speaker systems should be replaced with a high density of overhead speakers for high volume and fidelity.

Back of House

Spaces include visiting and auxiliary team locker rooms, press areas, star dressing, and event level corridors. Audio and video systems in these spaces are minimal and hardware is end of life. Systems need to be replaced and upgraded to meet current

arena standards. Televisions in these spaces have been recently updated.

Visiting and auxiliary team locker rooms, press dining, and media work should include overhead speakers with a wall mounted touchscreen. Audio sources should include bowl audio, background music, and local broadcast audio.

The star dressing rooms should include overhead speakers and subwoofers with a wall mounted touchscreen. Sources should include bowl audio, background music, Bluetooth input, and local broadcast audio.



Star dressing room

The event level corridor should include wall mounted speakers the length of corridor for bowl audio extension and paging.

Telecommunications

Structured Cabling System

The existing backbone and horizontal cabling are well maintained and in excellent condition. The cables are well secured within dedicated pathways and rooms throughout the facility.

The facility team has updated the system as necessary since the building’s inception. Fiber backbone cabling connects all of the venue’s telecom rooms back to the network operations center in the annex office building. Staff keep detailed records of backbone cabling to include strand quantities and termination points.

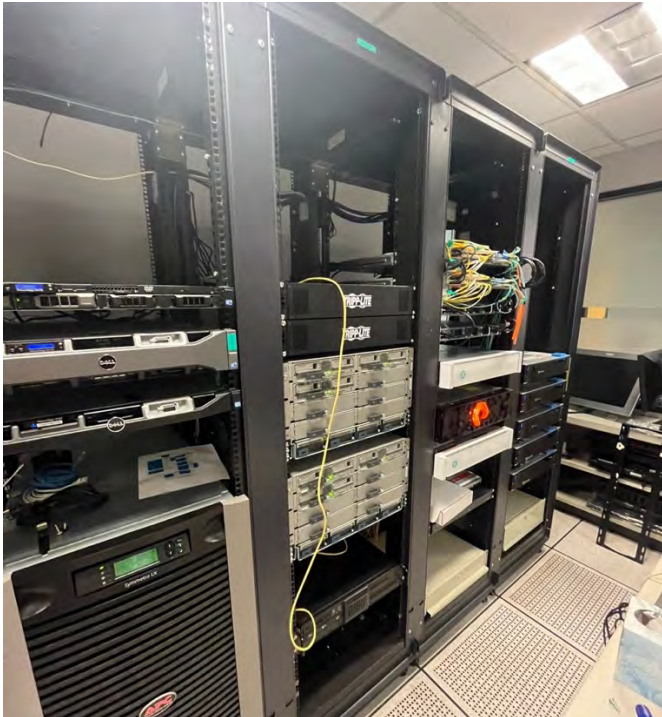
Overtime, fiber cabling strands from network operations center to each telecom room should be increased to allow for higher bandwidth links between switches. The current fiber count of 24 strands should be increased to 48 or 96 strands as needed.



Typical existing telecom room

Cabling to wireless access points (WAP) currently consists of Cat 6 cable. Two Category 6A cables should be run to each WAP location to allow for additional bandwidth.

The network operations center (NOC) within the annex is in good condition. It is a raised floor cable distribution system with local CRAC units. The NOC houses the head end of the security system as well as the central networking equipment. At present, the CRAC unit servicing the room had recently failed and the team was awaiting a replacement unit.



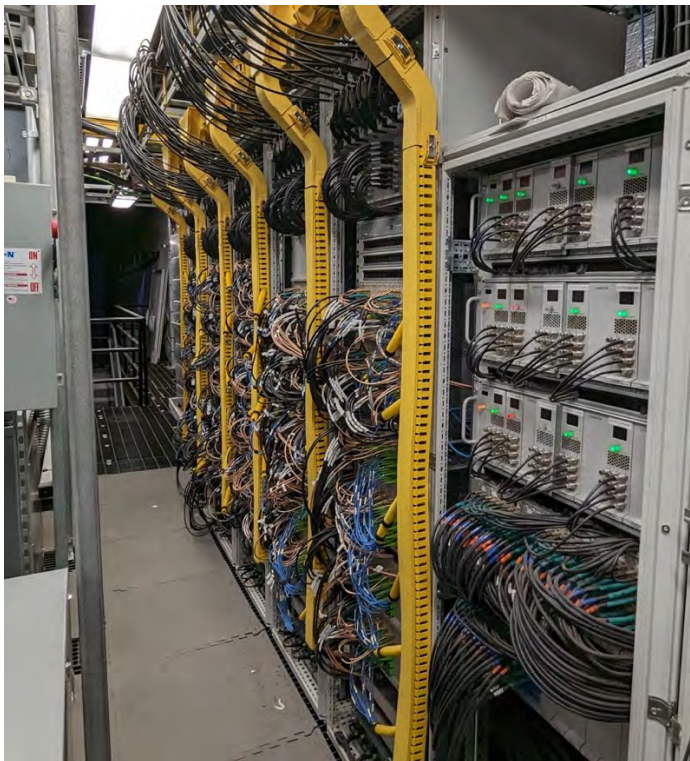
Network operations center

Existing Pathways

The existing horizontal and vertical pathways are well concealed and are sufficient for the installed systems within the venue.

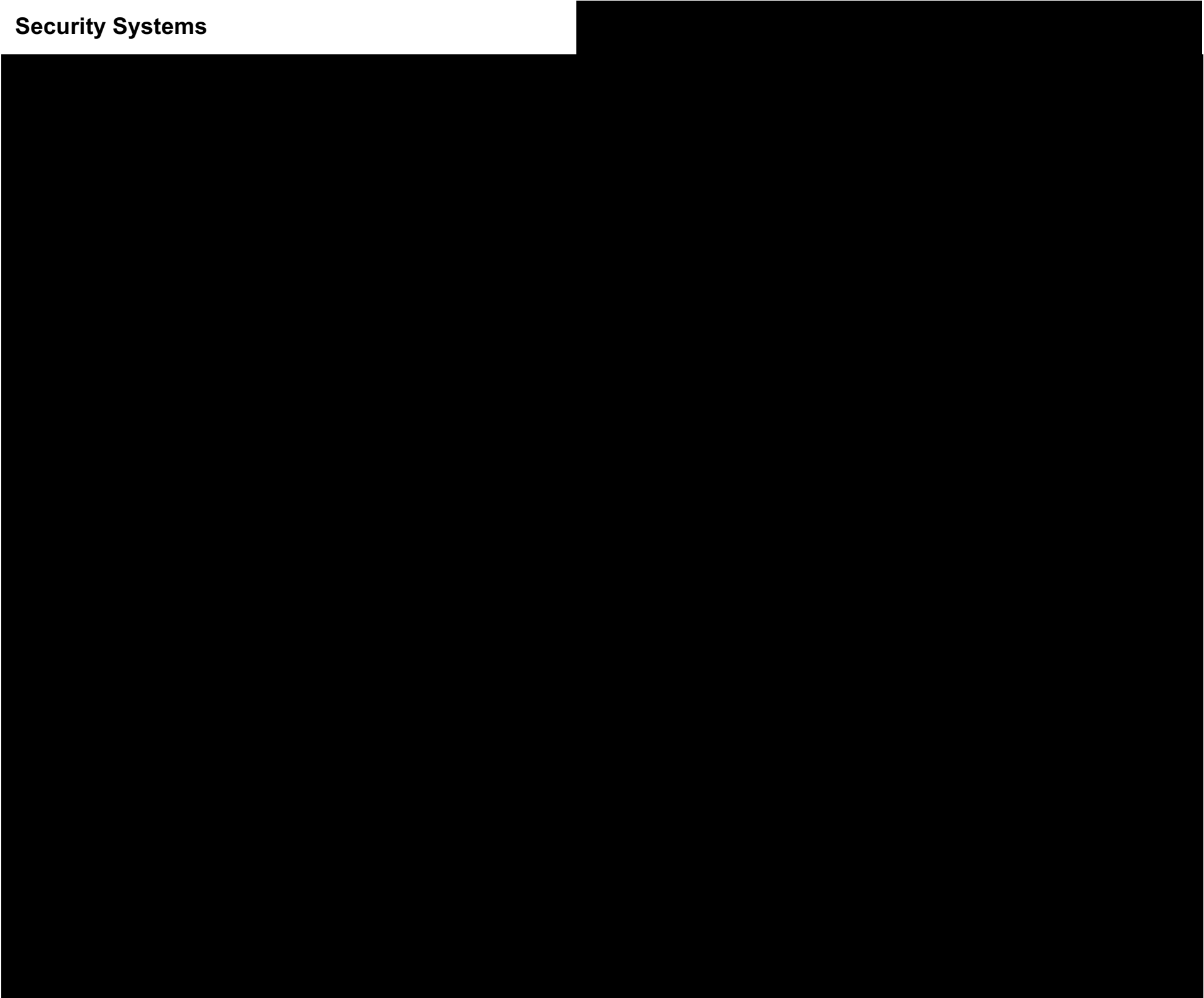
Distributed Antenna Systems (DAS)

The venue includes a distributed antenna system (DAS) that is currently being upgraded to be 5G compatible. It is being planned as a full rip and replace to achieve 5G capabilities. Carriers include AT&T, Verizon, and T-Mobile. There are approximately 1,000 antennas between the venue and the annex building.



DAS system on catwalk level

Security Systems



Production Suite

- Redesign the production suite to provide additional space in the central equipment room for additional racks.
- Increase the size of the videoboard control room to accommodate additional personnel.
- Overhaul equipment, systems, and workflows to current production technologies.

Ancillary Audio & Video (AV) Systems

- Integrate new AV network and AV headend to distribution audio and control AV systems.
- Update and expand AV in clubs and lounge for improved fan engagement and flexibility outside of game day.
- Update and expand AV in the suites to allow for local audio and control.
- Update and expand AV in public spaces for better fan engagement.
- Update and expand AV in back of house spaces to assist with day to day operations.

Telecommunications

- Continue to improve structured cabling system by increasing fiber counts to telecom rooms and increase cabling bandwidth to WAP locations as required.
- Clean out all unused cabling from the existing pathways and telecommunications rooms.
- Remove abandoned equipment from the telecommunications rooms.

Security Systems

RECOMMENDATIONS

Bowl Audio

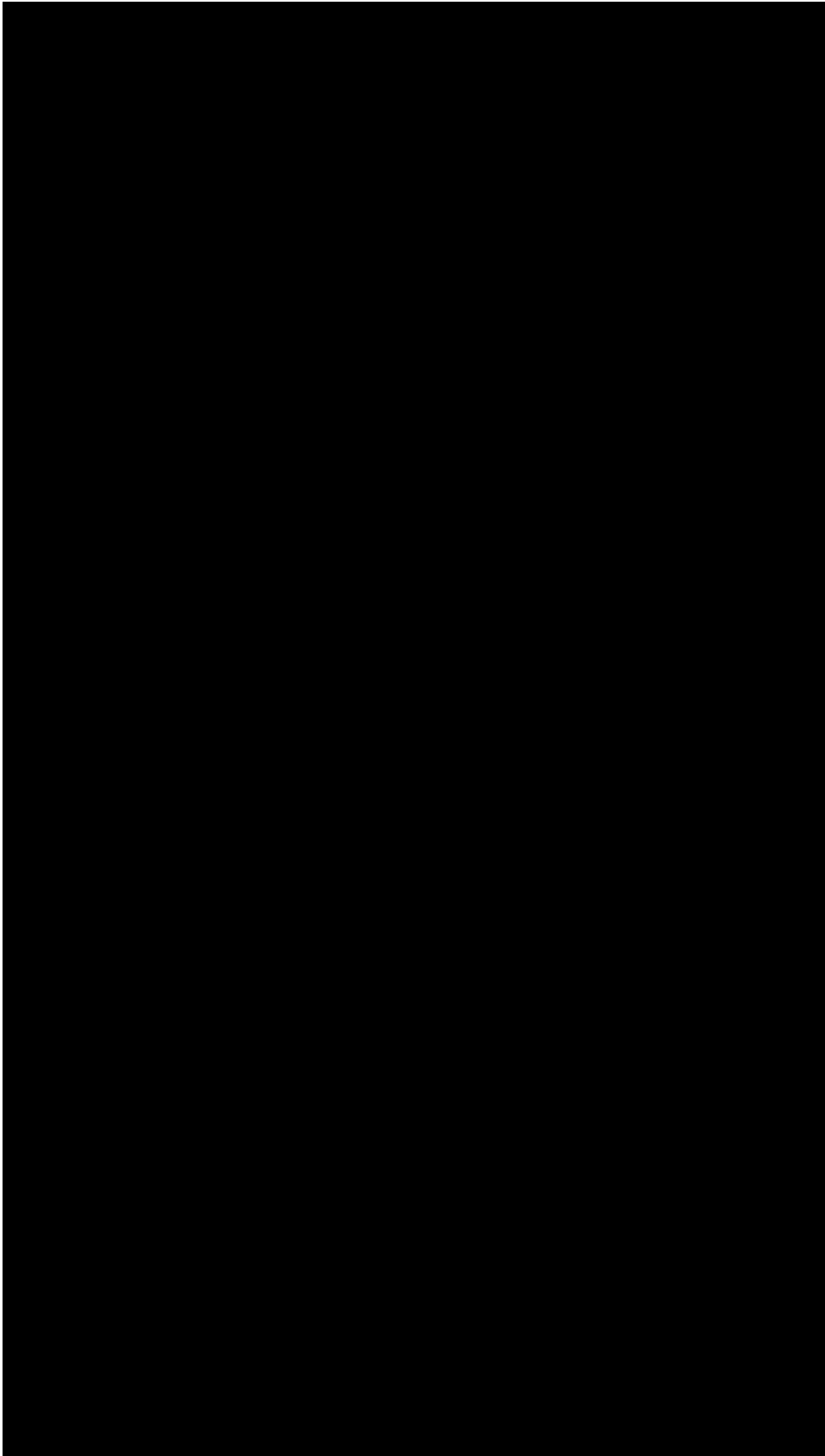
- Replace bowl audio sound system
- Replace existing audio processing and control system
- Provide new front of house equipment

LED Displays

- Replace center hung main and ring displays
- Replace center hung hoist system.
- Replace leased scoring and timing tables
- Replace 360 LED ribbon display
- Replace exterior LED
- Move toward single LED provider for maintenance and service agreement efficiency.
- Relocate LED processing to new AV equipment room adjacent to production suite.

Broadcast Cabling

- Overhaul the broadcast cabling system
- Install new broadcast cable housings with permanent labeling and protective coverings.
- Relocate truck dock cabling infrastructure to new broadcast equipment room adjacent to truck dock.
- Add additional rack space at truck dock to house electronic equipment.

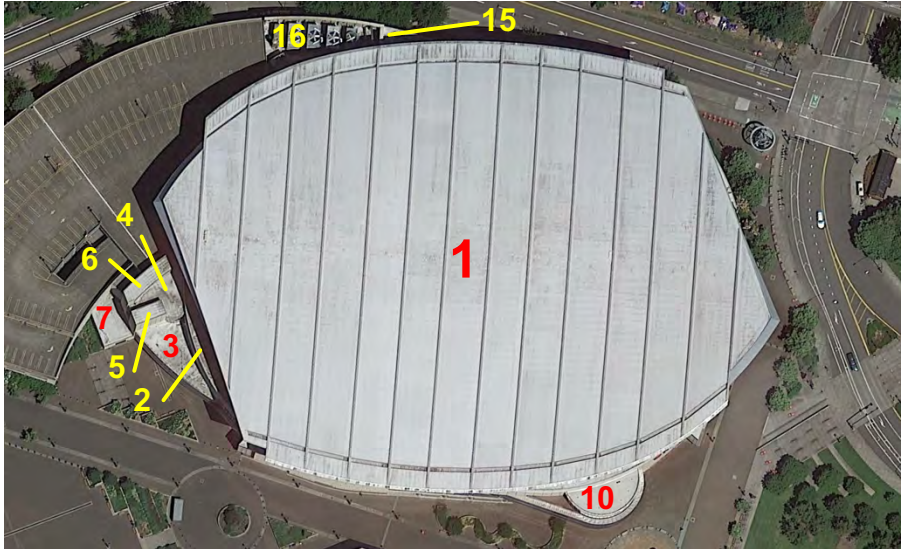


ROOFS & FAÇADE

Roofs

The Moda Center has a total of 16 separate roof areas, at five elevations. Two types of roof covering systems are utilized, on these low-sloped (flat) roof areas. Below is a listing of the roof areas, including type of roof membrane, and the approximate square footage of each.

Roof Area	Roof Covering System Type	Level	Area (SQ. FT.)
1	TPO Single-Ply Membrane	(above bowl)	196,402
2	PVC Single-Ply Membrane	7	21,355
3	TPO Single-Ply Membrane	5	2,142
4	TPO Single-Ply Membrane	6	1,248
5	TPO Single-Ply Membrane	7	404
6	TPO Single-Ply Membrane	7	1,055
7	TPO Single-Ply Membrane	3	1,162
8	TPO Single-Ply Membrane	5	199
9	TPO Single-Ply Membrane	6	300
10	TPO Single-Ply Membrane	6	1,861
11	TPO Single-Ply Membrane	5	153
12	TPO Single-Ply Membrane	6	205
13	TPO Single-Ply Membrane	5	121
14	TPO Single-Ply Membrane	6	193
15	TPO Single-Ply Membrane	6	1,435
16	TPO Single-Ply Membrane	5	4,495
Total Roof Area (Sq. Ft.)			232,730



Aerial view of the arena and roofs

The various roof areas that are visible are identified above. Many roof areas are concealed beneath the overhanging “barrel” roof above the seating bowl (Roof Area 1, in the center).

It is understood that all of the single-ply membrane roof covering systems (Roof Areas 1-16) were replaced in 2022 with new single-ply membrane systems. Roof Areas 1 and 3-16 utilize new TPO single-ply membrane systems, and Roof Area 2 utilizes a PVC single-ply membrane system.

Single-Ply Membrane Roof Covering Systems

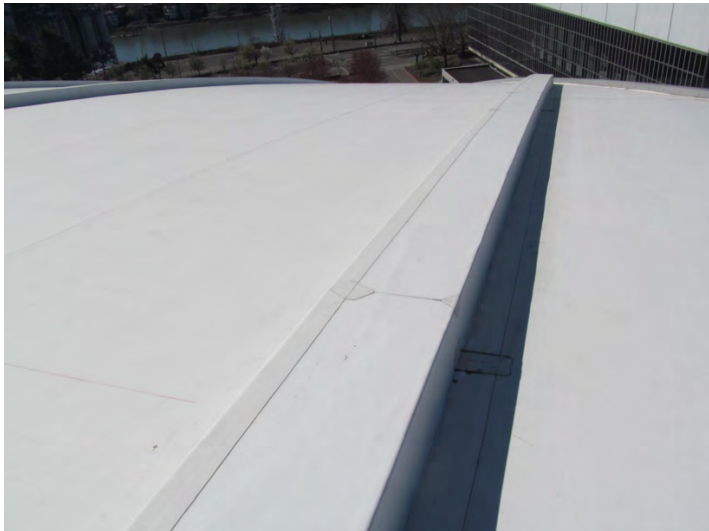
The 16 roof areas with conventional single-ply membrane roof covering systems utilize thermoplastic roofing/flashing membrane systems that use heat to fuse the membrane at overlapping seams. The roofs typically utilize fluted metal structural roof decks, with the exception of Roof Areas 5-6 (above elevator shafts), with cast-in-place concrete structural roof decks. According to information from the roof replacement project, the roof membrane assemblies on all 16 roof areas were removed and replaced in 2022. Based upon information provided by the arena staff, the 2022 roof covering system replacements were performed by CentiMark Corporation, and the new roof membrane materials are branded (or private

labelled) under their name. According to a brief scope of work for the project, provided by Centimark, the 2022 roof covering system replacement project included complete removal of all old roofing/flashing membranes, down to the existing roof insulation assembly (except for complete tear-off down to the concrete roof deck on Roof Areas 5-6); replacement of any moisture-saturated or damaged insulation (in kind); installation of a new roof insulation assembly (adhered to the concrete roof decks) on Roof Areas 5-6; application of a new layer of ½-inch-thick polyisocyanurate roof insulation/cover board (all roof areas except 5-6); and installation of all new thermoplastic roofing/flashing membrane systems.

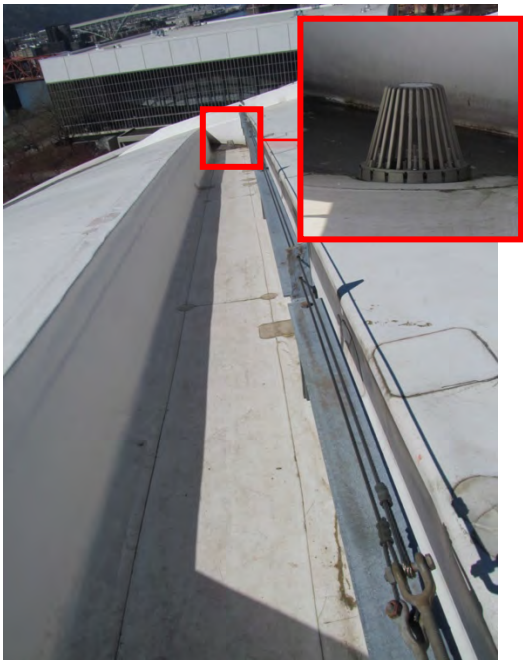
The TPO roof membrane on Roof Areas 5-6 is adhered to the top layer of roof insulation, utilizing adhesive. On all roof areas other than 5-6, the roof membrane assemblies are mechanically fastened, with roof screws and plates (or metal batten strips), along membrane lap seams; the fasteners penetrate through the roof insulation assembly, and into to metal roof deck. The roof membranes utilize 0.060”-thick TPO membrane on all areas except Roof Area 2, that utilizes 0.060”-thick PVC membrane. Both types of membrane are installed in a similar manner, by hot-air-welding seams/connections to make them watertight.

According to the written documentation from CentiMark for the 2022 roof replacement project, some existing sheet metal flashings were removed, cleaned, and reinstalled onto the new roof covering membrane system, and some other metal components were removed and replaced with new sheet metal flashings.

It is understood that CentiMark provided the owner with their 20-year warranty of workmanship and materials, and this warranty should remain in effect until 2042. A copy of the warranty certificate for the roof replacement project has not been provided; therefore, the warranty term and coverages have not been verified.



TPO single-ply membrane roof covering system on Roof Area 1 (main roof above bowl) and “ribs” that transverse the roof are flashed with TPO membrane



TPO membrane-lined built-in gutter/trough for drainage of Roof Area 1; internal roof drains discharge water from the troughs

Water is removed from the roof surfaces by a system of interior roof drains that discharge into the storm drainage system. Secondary drainage is provided primarily via through-wall overflow scuppers and/or overflow drains. Roof Area 1 utilizes a large built-in gutter/trough system near the east and west roof perimeters, and water drains from the troughs into interior roof drains. On Roof Area 1, a system of rigid steel members and steel cables is installed along the roof edges; the steel/cabling system appears to serve two purposes: to provide fall protection for personnel on the roofs, as well as to function as a snow rail system, to prevent heavy snow/ice from clogging or damaging the built-in gutter systems and/or falling over the roof eaves above public access areas at grade.

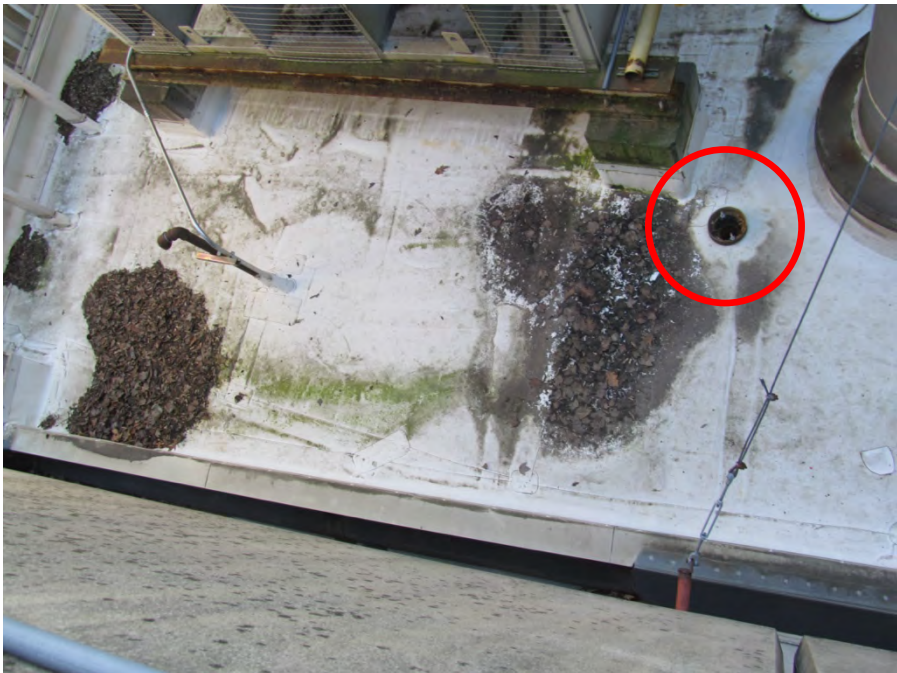
Roof Areas 5-6 drain water via conventional sheet metal gutters and downspouts, that discharge onto a lower roof surface (Roof Area 4).

The general, overall condition of the existing TPO and PVC single-ply membrane roof covering systems is good. Based upon a visual survey of the roofs, the roofing/flushing membranes and associated sheet metal flashings appear to be intact and free of damage. According to the arena staff, only 2-3 small leaks have occurred since the roofs were installed and these items were promptly addressed and repaired by CentiMark; it was reported that none of these leaks have recurred.

Although no significant deficiencies or damage to the existing single-ply membrane roof covering systems was noted during the inspections, there are several minor maintenance/repair items that were noted, and these items are briefly summarized below:

- Dirt, leaves, and loose debris has accumulated on some areas of the roofs, particularly Roof Area 16. These materials may cause staining of the roof membrane and/or clogged roof drains.
- Loose, unused metal materials are stacked on the roof surface on Roof Area 15, that can potentially damage the roof membrane.

- A roof drain on Roof Area 2 is clogged with debris, causing water retention in the area surrounding the drain.
- Roof drain dome strainers are missing from the drains on Roof Areas 8, 9, 11, 12, 14, and 16.
- Wood planks are installed directly atop the roof membrane surface (Roof Area 2), apparently to accommodate foot traffic across a filter blanket and curb; the wood planks bear directly atop the (unprotected) roof membrane surface. The planks also appear to be potentially hazardous for foot traffic.
- Steel frames for rooftop satellite dish antennae are installed on the roof surface and ballasted with concrete blocks. The existing protection padding beneath the frames/CMU are too small and insufficient to properly protect the roof membrane from abrasion/damage.



Leaves and debris accumulated on the roof membrane surface (Roof Area 16) and a nearby roof drain (circled) lacks a dome strainer and is susceptible to clogging by debris

Facility Condition Assessment Moda Center & Garden Garage



Wood plank, provided for foot traffic across a filter blanket, is installed directly on the (unprotected) roof membrane surface

Current Preventive Maintenance Program

During the site inspections, the facility staff was queried about any type of preventive maintenance program in place for the roofs and terraces, and it was reported that there is not currently any existing program for roof maintenance in effect. It was indicated that, if a roof leak or other deficiency is reported, they will contract with a local roofing contractor to locate the cause(s) of the leakage, and make repairs, as necessary.

RECOMMENDATIONS

Single-Ply Membrane Roof Covering Systems

Based upon our visual observations, the existing single-ply membrane roof covering systems generally appear to be in good condition. There was no visible damage to the roofing/flashing membranes or associated sheet metal flashings. The single-ply membrane roof covering systems have been in place for only two years, and this type of system, if properly maintained, typically has a service life of 25-30 years. The full roof replacement is not anticipated to be necessary during the time period covered by the capital expenditure matrix.

Considering a roof warranty certificate for the recent roof replacement was not provided for review, we recommend the owner follow-up with CentiMark to obtain a copy of the warranty certificate. There are also additional items of which the owner should be aware regarding liabilities with the roof systems:

1. Did the roofing installation comply with the local building code, and what code was followed.
2. What method was used to determine wind uplift resistance requirements, and what requirement does the application meet.
3. What is the maximum windspeed covered by the new roofing system warranty.
4. Are there any requirements the building owner must satisfy to keep the roofing warranty in effect.

As previously reported, several minor maintenance/repair items were noted that need attention, in order to maintain the existing roof covering systems in good condition and to prolong the service life of the roof covering systems. Recommendations for these items are briefly summarized below:

- Roof Area 2: It is recommended to remove the existing wood planks from atop the curbed filter blankets, and to install new pre-manufactured metal (steel or aluminum) elevated walkways, with safety railings, across the curbs, and to place

a proper protection course atop the roof membrane beneath the new walkways.

- Roof Area 2: Carefully lift up all existing surface-mounted satellite dish frames and concrete blocks and remove/replace the protection course beneath all such units, to properly protect the roof membrane from abrasion/damage.
- Roof Area 2: Clear and dispose of all debris surrounding the clogged roof drain and thoroughly clean the area of roof.
- Roof Areas 8, 9, 11, 12, 14, and 16: Install and secure new dome strainers onto all roof drains where strainers are missing.
- Roof Area 16: Carefully remove all metal and other materials stacked/stored on the roof surfaces or place proper protection course atop the roof membrane beneath all materials stored on the roof.
- Roof Areas 1-16: Initially, inspect all roof areas, in their entirety, and clean/remove all leaves, trash, and debris from all roof surfaces. Carefully clean any stains from rooftop to restore reflectivity of the roofing/flashing membrane. It is further recommended to perform this task at least annually, and more frequently as needed for lower roof areas where leaves and tree debris commonly accumulate on the roofs.

Preventative Maintenance Program

It is understood that the facility does not have an organized, ongoing preventative maintenance (PM) program, but does make emergency leak repairs as they arise, utilizing a local roofing contractor. PM programs are useful in prolonging the service life of roof covering systems, as well as preventing roof leaks and associated damage before they occur, which combined, can contribute to significant cost savings over the life of the roof system.

It is recommended that PM inspections be performed twice per year, in the spring and late fall. It is also recommended that these inspections be performed by a roofing professional (not by a contractor), and that all recommended roof repairs be

completed by a CentiMark roofing contractor, as is typically required under the existing roof covering system warranty.

Building Façade

The building envelope utilizes several types of designs and materials that include the following:

Exterior Wall Cladding Systems

- Precast concrete panels (throughout much of exterior envelope);
- EIFS (Exterior Insulated Finish System on the entire circumference; Level 7 up to main roof soffit);
- Flat-slab cut stone (presumably granite) panel veneer (near base of exterior perimeters, at/above grade);
- Embossed stainless steel panels, bands, and trim (intermittent use);
- Pre-manufactured, pre-finished metal louvered panels (at grade, west façade);
- Pre-manufactured, pre-finished metal louvered panels (entire circumference between Levels 6-7);
- Pre-manufactured, pre-finished metal ribbed panels (steep-sloped soffits beneath Roof Areas 17-18);
- Pre-manufactured, pre-finished slush-seam metal panels (steep-sloped soffits beneath main roof, fascia and vertical walls beneath main roof, and fascia along the north and south elevation which is being referred to in this report as Mansard panels);
- Pre-manufactured, pre-finished metal panels (cylindrical cladding for exterior columns).

Fenestration includes the following items:

Doors

- Anodized aluminum-framed glass storefront doors (22 doors);
- Stainless-steel-framed glass storefront doors (31 doors);
- Steel fire-rated doors with polished stainless steel exterior cladding (6 doors); and
- Painted steel fire-rated doors (8 doors).

Windows/Glazing Systems

- Aluminum-framed double-pane fixed windows;
- Aluminum-framed double-pane storefront; and
- Aluminum-framed double-pane curtain-wall systems.

Sealant Joints

- Many joints and junctions between similar and dissimilar materials/components of the exterior envelope are made watertight/airtight with elastomeric sealant joints.

The information in this report is based upon visual observations of the existing exterior construction; many such observations are made from a distance (often from grade level or from the roofs). Therefore, detailed descriptions are limited only to areas that are accessible to view or can be viewed from exterior photographs and from accessible areas of the building interior and exterior terraces.

The quantifications of various exterior envelope construction, as well as the cost budget information in the capital expenditure matrix, is based upon our best approximations taken from the three sheets of exterior elevation drawings and two sheets of partial building sections made available to us. While the drawings have provided sufficient information for the roofs and most of the terraces, information for the exterior envelope is extremely limited. There are no door or window schedules, and

most of the detailed text, numerals, and dimensions on the drawings are barely legible.

Exterior Wall-Cladding/Finish Systems

Precast Concrete Panels

The majority of exterior wall cladding on the building utilizes precast concrete cladding panels, which are typically secured to the structural framing with steel weld-clips. The concrete cladding panels consist mostly of plain-surfaced panels, with band courses of “basket-weave” style panels. Joints between panels are caulked with elastomeric sealant.

Based upon visual observations around the building exterior, the existing precast concrete wall cladding panels generally appear to be in good condition. No cracked/damaged panels, or any other deficiencies were noted; however, a few panels near the southeast area of the exterior have some visible staining.

EIFS (Exterior Insulated Finish System)

EIFS is an exterior wall finish system that is applied onto a back-up wall/structure (can be CMU, concrete or a back-up wall system constructed of framing and sheathing). The EIFS system typically consists of a liquid-applied waterproofing layer applied to the back-up wall/sheathing, a drainage course that weeps moisture out along the base of the wall or a continuous metal sill flashing, a layer of rigid insulation board, typically extruded polystyrene, and an exterior coating of cementitious stucco with fiberglass mesh reinforcement.

An EIFS system is utilized as the exterior wall finish system around the entire circumference of the building, spanning from level 7 up to the soffit/underside beneath the main roof above the bowl. EIFS is also utilized for a portion of the exterior wall along the northeast area of the exterior, spanning from level 5 up to the band of metal louvered panels beneath level 6.

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Considering the length of time (29 years) that the EIFS wall finish systems have been in place, they visually appear to be in fair-to-good condition. There are little or no visible signs of cracking, staining, moisture damage, or other deficient conditions. The only noted repair item is an uncovered electrical box in the wall above Roof Area 16, that can allow moisture infiltration into the wall system and interior.

Polished Cut Stone Panel Veneer

Much of the exterior finish along the base of the building at grade (sidewalks, plaza deck, and/or foundation walls/below-grade concrete) utilizes a cut stone slab veneer system. The vertical panels extend from the east entrance, across the south perimeter, and along portions of the west perimeter, terminating at the transition to the parking garage building at the northwest façade of the arena. The stone panels are likely secured to the concrete structure with steel weld clips. Joints between stone panels are caulked with elastomeric sealant.

The cut stone veneer system generally appears to be in fair, serviceable condition, with the exception of a few cracked/damaged panels along the southeast perimeter of the building, where the stone panels extend away from the building façade onto a concrete retaining wall. A piece of one stone panel is missing, leaving an open gap.

It is unknown if these panels are regularly cleaned and sealed. Without regular maintenance, these porous panels can become discolored and show areas of moisture intrusion when it rains. After unsealed panels have been neglected, reversal of moisture intrusion may become difficult to prevent.



A piece of stone veneer is broken from a panel at/below grade, leaving an open gap

Embossed Stainless Steel Flush Panels

The embossed stainless steel flush panels appear to typically be installed intermittently in many areas, apparently for contrast to other finishes, such as band courses and trim (horizontal and vertical) between groups of precast concrete panels or glass curtain-wall assemblies. The stainless-steel panels are also installed in small groupings along grade level in several areas, and several pairs of emergency egress doors are somewhat disguised within arrays of the wall panels, particularly along the south, southeast, and west facades. The panels are also incorporated into the exterior railings on several terrace roofs.

The existing stainless-steel panels generally appear to be in good condition, and no damage or deficiencies were noted, with the exception of minor dents in a band course and in egress door cladding.

Pre-Manufactured Pre-Finished Metal Panels

Several different varieties, configurations, and finishes of pre-manufactured, pre-finished metal panels are utilized in the exterior envelope of the building, at various levels and locations and for varying purposes. Findings and comments for the various panel types/locations/conditions are summarized below:

Small Louvered Panels: The only noted location for these smaller louvered panels is on Level 2 installed along the base of storefronts (at grade) at the west perimeter of the building. The panels generally appear to be in fair-to-good condition, and no damage was noted.

Large Louvered Panels: Larger metal louvered panels are in place along the entire circumference of the arena, spanning from above level 6 up to the parapet on level 7. The louvered panels appear to be placed over a solid back-up wall in most areas; however, there are also a number of openings through the back-up wall, apparently for the purposes of ventilation. The metal panels appear to be in fair condition, as the existing finish on the panels shows some signs of deterioration.

Ribbed Panels: Some areas of steep-sloped soffits on the underside of the main roof (Roof Area 1) are clad with pre-manufactured, prefinished metal ribbed panels, along the east and west perimeters of the roof. These metal panels are face-fastened with sheet metal screws to the underlying framing members. The soffit panels have rectangular ventilation holes with metal mesh screening near the lower perimeter, through spaces between the ribs in many areas. The ribbed panels generally appear to be in fair condition. The finish on the metal appears to be deteriorating in some areas, and the panels also appear to have accumulated significant dirt/dust on the surfaces in some areas, particularly surrounding the ventilation openings.

Flush-Seam Panels: Flush-seam metal panels are utilized for wall-cladding, steep-sloped soffit panels along north and south perimeters of main roof, and fascia panels along perimeters of Roof Area 1. The panels generally appear to be in fair, serviceable condition. Some soiling and/or mossy vegetation growth is visible along areas of fascia panels along the north-facing roof perimeters.

There are also two “mansards”, at the north and south perimeters of the main roof above the bowl that utilize flush-seam panels. These two mansards extend outward at a steep slope beneath the pointed perimeters of the main roof. The mansards also extend up beneath the underside of soffits below the main roof.



What appears to be mossy vegetation growing in seams of the mansard panels on the north elevation

The general, overall condition of the existing mansard panels appears to be fair. Based upon visual observations in areas of the mansard panels that could be safely accessed for viewing, the panels generally appear to be free of physical damage. The paint/finish on the panels has some appearance of minor deterioration, yet there was not any visible rusting/corrosion. There is, however, what appears to be significant growth of mossy vegetation along the seams between metal panels, particularly on the north-facing areas of the mansard. The vegetation and associated roots can potentially cause

abrasion/deterioration of the paint/coating system on the panels, and the vegetation also retains moisture against surfaces of the panels

Metal Panel Column Covers

Pre-finished metal flush panels are utilized for cylindrical covering on structural columns that are constructed to the exterior of the building envelope. The seams in the metal flush panels are caulked with elastomeric sealant. The metal panels and associated paint/finish generally appear to be in good condition.

Fenestration/Glazing

During our inspections, doors and windows that were accessible were observed and photographed from both the interior and exterior of the building. The following is a summary of findings regarding the doors, windows, storefronts, and curtain-wall systems:

Doors

There are numerous arrays of exterior entry doors from the building exterior (including terraces) to the interior, most of which are for public use, and several additional doors that are for intended for emergency egress and/or private/staff use. The public entry doors utilize either anodized aluminum-framed or stainless steel framed doors with double-pane glazing. Emergency egress doors (connected to stairwells and/or interior egress passageways) utilize steel fire-rated doors with embossed stainless steel exterior cladding.

Anodized Aluminum Framed Double-Glazed Storefront Doors

These doors are utilized primarily as public entry doors to the building interior from exterior plazas and terrace roofs. The doors generally appear to be in good condition, and no damage or deficiencies were noted.

Stainless Steel Framed Glass Storefront Doors

These doors are primarily utilized at main public entry areas at the South, North, VIP, and Club Level Entrances. These doors also appear to accommodate the majority of ticketed public entry traffic for games and events. The doors visually appear to be in good condition, and no deficiencies were noted.

Steel Fire Rated Doors with Embossed Stainless Steel Exterior Cladding

The stainless steel-clad doors are connected to three separate emergency egress stairwells and passageways from the interior. The exterior door cladding appears to be designed so as to visually blend the doors into the embossed stainless steel exterior wall cladding surrounding the doors. With the exception of some minor denting of the stainless-steel cladding on two of the doors, no other damage or deficiencies were noted.

Painted Steel Fire Rated Doors

The plain, solid (unglazed) steel fire rated doors are utilized primarily for staff and service entrances, and for access from the building interior to the roofs or from roofs to elevator equipment rooms. The condition of these doors ranges from poor to fair. Although the doors are generally intact and serviceable, the paint is substantially deteriorated on the exterior surfaces of doors that are exposed to the elements, and the exterior steel surfaces are heavily rusted in areas, particularly the elevator equipment room doors (Roof Areas 5 and 6).

Windows/Storefront/Curtain Wall Systems

Based upon visual observations of the windows, storefronts, and curtain wall systems utilized in the building, all are fabricated of extruded aluminum framing, double pane glazing (for thermal efficiency), and typical rubber gasketing. It appears that there are no operable units among the windows, storefronts, and curtain-wall systems.

Aluminum Framed Double Pane Fixed Windows

These are typically smaller windows, utilized in smaller spaces such as offices or hallways. They are also typically installed into openings in precast concrete wall panels. Common elastomeric sealant joints are installed in the wall openings surrounding the window units. The windows that were closely observed generally appear to be in good condition, and no leakage or other deficiencies were noted.

Aluminum Framed Double Pane Storefront

Storefront systems are typically utilized in public access areas, such as entrance lobbies and the main concourse on Level 2, as well as partitions between terraces and interior spaces. Storefront systems typically generally do not span heights in excess of one story. The existing storefronts also generally appear to be in fair-to-good condition. One area was noted at the north entrance to terrace Roof Area 22, with moisture stains/damage around the base of the storefront door. No other leakage or damage was noted on any other storefront systems.



Moisture stains and damage along the base of storefront and entry door near northwest corner of terrace Roof Area 22

Aluminum Framed Double Pane Curtain Wall Systems

Curtain-wall systems are utilized in large, open areas of the building with multi-story vertical spans of exterior walls, such as the “half-round” area on Levels 3-5 (above the South Entrance), a meeting/banquet hall above the North Entrance (Level 3), the north elevator tower, and three emergency egress stairwells. The storefront and curtain wall construction appears to be similar, with the exception that the curtain-wall systems are typically taller, exceeding one story in height. During our inspections, only two small moisture stains were noted on curtain wall systems, with one being in the “half-round” area at Level 3, and the other being in the meeting/banquet room on Level 3. No other deficient conditions were noted.



Areas of glass storefront (marked “S”, and curtainwall (marked “C”) along the west façade of the building

Sealant Joints

Numerous joints between various components of the exterior envelope are often made watertight with the use of elastomeric sealants, and sealant joints are often one of the first points of failure and causes of moisture infiltration. Sealants also typically have a much shorter service life than other roofing and/or exterior envelope materials and require much more frequent

maintenance and replacement than the other materials. Buildings such as this can have thousands of linear feet of sealant joints, and may utilize several types of sealants, depending on the types of materials being joined.

Visual observations of existing sealant joints around the Moda Center (where accessible) revealed that most sealant joints generally appear to be in fair-to-good condition, and that only a few areas with deteriorating sealant joints were noted.

RECOMMENDATIONS

Based upon visual observations of the existing exterior envelope components, and the current age of the facility, it appears that the majority of exterior envelope components are in relatively fair-to-good condition. It also appears that the quality of design, workmanship, materials, and quality control at original construction of the facility was above average, but access to several of the building components was limited. Therefore, the main recommendation is to clean and thoroughly inspect the majority of these areas to determine if additional work is required. In addition, below is a summary of recommendations for the various components of the exterior envelope:

Precast Concrete Panels

- It is recommended to inspect all areas of precast concrete wall cladding panels, and to carefully clean panels as necessary to remove any staining/discoloration from the panels.

EIFS

- It is recommended to inspect all areas of EIFS for cracking, staining, or damage, and make repairs, as necessary. Reapply stucco coatings, as necessary to maintain watertightness of the wall system.

Polished Cut Stone Panel Veneer

- It is recommended to carefully repair any existing cracked/broken stone veneer panels, or to remove and replace such panels with new panels to match the existing stone as closely as possible.

Embossed Stainless Steel Flush Panels

- The existing stainless-steel panels and trim generally appear to be in good condition and may only require minor cleaning in some areas at this time.

Pre-Manufactured Pre-Finished Metal Panels

- It is recommended to carefully clean all areas of metal panels to remove residues from all surfaces. If the paint/finish on any of the metal panels is significantly deteriorated then it is recommended to carefully clean/prepare all such surfaces, and to apply a new paint/coating system on the metal panels.
- It is recommended to carefully clean all surfaces/seams of mansard to remove all vegetation. It is further recommended to regularly monitor for recurrence of the vegetation, and to take necessary actions to remove any new vegetation that occurs. In our opinion, this will help to prolong the finish and service life of the metal roofing panels.

At the time of the inspections, it was noted that the existing double glazed doors, windows, storefronts, and curtain wall systems mostly appear to be in remarkably good condition, considering the age of the building; however, it should be understood that there are components of these systems that can experience failure within 25-35 years, including gasketing and the double pane glazing. It is also highly unlikely that such failures will occur at the same time, as one glazing panel may fail (failure of the seal between the two panes, allowing moisture infiltration/fogging of the glass), while the adjacent panels may

remain serviceable for a number of years. It is also possible for gasketing to fail in some areas and in staggered locations.

Doors

- It is recommended that all doors be frequently inspected for proper operation, for watertightness/airtightness, and for any damage/deterioration to the finish. Inspect all glazing and gasketing in doors, as recommended for other double pane glazing herein.
- It is recommended to clean all existing painted steel exterior doors, to remove all dirt, rust, and loose paint/coatings, and to apply new coats of primer and finish paint over all surfaces of the doors and jambs. If any door/jamb is rusted/damaged beyond repair, then it is recommended to remove and replace the door/jamb.

Windows/Storefront/Curtain Wall Systems

- It is recommended to carefully inspect all double-glazed systems at least twice annually and remove/replace damaged/failing glazing/gasketing components, in kind.

Sealant Joints

- It is important that all sealant joints, project-wide, be thoroughly inspected and monitored for failure, on an annual basis, and that all deficient sealant joints be properly cleared of existing sealants, and installation of new joint backing and sealants, to make watertight.

VERTICAL TRANSPORTATION

The Moda Center and the attached Garden Garage are served by the following vertical transportation units:

- Four escalators (Esc. Nos. 1 - 4)
- Nine traction elevators:
 - o Elevator PE1 (simplex group)
 - o Elevators PE2 & PE3 (duplex group)
 - o Elevator PE5 (simplex group)
 - o Elevator PE6 (simplex group)
 - o Elevators PE7 – PE10 (four-car group in garage)

We identify information for each elevator and escalator by unit profile and relative condition (as applicable), along with the related functionality of the equipment. We provide a rating system of 1 - 5 with 5 being excellent to 1 being extremely poor requiring immediate attention.

Escalators

All escalators have the original equipment manufacturer (OEM) Montgomery ES-24v microprocessor controllers, handrail speed sensor boards, and missing step boards installed. New starter contactors were installed on all units in 2023 and are energized with 460 volts and protected with a 23-amp breaker. The control boards for the escalators are currently available if replacements are needed.

The escalator direction is changed during events; however, no evident wear on the bull gears was observed when the escalators were reversed. All escalators possess proper barricade protection between the unit and the walls.

All annual inspections were completed September 2023.

Escalator Esc. No. 1 – Overall Rating 4

The unit has glass balustrades with low decking, 40“ steps, steel comb plates, stainless steel skirts and decking. The escalator steps are in good condition and show no evidence of significant wear. The chain sprockets mesh very well with the step chains.

The pit area was clean with GFCI circuits present in the pit and the controller was clean and had no evidence of jumpers.

Escalator Esc. No. 2 – Overall Rating 3

This unit has 24” steps, steel comb plates, stainless steel skirts and decking. The escalator steps are in good condition and show no evidence of significant wear. The chain sprockets are meshing well with the steps.

The pit area was clean with GFCI circuits present in the pit and the controller was clean and no evidence of jumpers.

The step demarcation lighting was not functioning on both upper and lower ends.

Escalator Esc. No. 3 – Overall Rating 4

The unit has glass balustrades with low decking, 40“ steps, steel comb plates, stainless steel skirts and decking. The escalator steps are in good condition and show no evidence of significant wear. The chain sprockets mesh very well with the step chains. This unit is equipped with dual 15 hp motors due to the length of travel of the escalator.

The pit area was clean with GFCI circuits present in the pit and the controller was clean and had no evidence of jumpers.

Escalator Esc. No. 4 – Overall Rating 3

The unit has glass balustrades with low decking, 40“ steps, steel comb plates, stainless steel skirts and decking. The escalator steps are in good condition and show no evidence of significant wear. The chain sprockets mesh well with the step chains. This

unit is equipped with dual 15 hp motors due to the length of travel of the escalator.

The pit area was clean with GFCI circuits present in the pit and the controller was clean and had no evidence of jumpers.

The lower end step demarcation lighting was out on this unit.



Proper protection from wall to unit

Facility Condition Assessment
Moda Center & Garden Garage

Elevators

All elevators have the original equipment manufacturer (OEM) Montgomery equipment with minor upgrades. The Montgomery geared machines utilize Ultron DDC controls, and Magnatek DSD 412 SCR drives to move the elevators throughout the hoistway. The drives in all units were replaced in 2021 and are energized with 480 volts and protected with a 23-amp breaker. All units use MAC door operators and have updated proximity door protection devices.

The Ultron controls are no longer supported by KONE. However, we verified the local office has a limited stock of control boards available.

- Elevators PE1, PE5, and PE6 are simplex units
- Elevators PE2 and PE3 are duplex units
- Elevators PE7 - PE10 are a four-car group in the garage

Elevator PE1

Overall - Rating 4

The passenger elevator utilizes a Montgomery geared machine with Ultron control and SCR drive. The elevator has a load capacity of 5,000 lbs. with a rated speed of 200 fpm. The total travel is approximately 57 feet and uses slide guides with oilers on the main guide rails.

The unit has a total of five landings, serves Floors 1 - 5, and is equipped with a MAC door operator. The hoistway and car doors are two-speed side-opening doors measuring 48" wide x 72" high.

Machine Room – Rating 4

The machine room area was found to be generally clean and in proper order. The required Category 5 (CAT5) safety tests appear to be current. Category 1 (CAT1) tests are overdue (CAT1 – February 2023 and CAT5 - April 2020).



Proper protection from wall to unit



Stainless steel skirts are in good condition and proper step clearance evident on all units



Typical controller in all escalators



Escalator Esc. No. 2 with chains and tracks in good condition as well as the drive chain sprockets

Wiring diagrams necessary for the maintenance and troubleshooting of the car controllers were found to be available and in good overall condition.

The maintenance control program (MCP) is being stored in the machine room which is required by state code. The MCP and fireman's service operation test logs were up to date.



Montgomery geared traction elevator well maintained



Governors are well maintained

Hoistway Equipment - Rating 4

Equipment includes car and hoistway door equipment, elevator car and hoist ropes. Most of the equipment was found to be in good overall condition. The car and hoistway door equipment was clean at the time of our review. Newly replaced door gibs were observed on several hoistway doors.

The car ropes are original, using 5 5/8" ropes manufactured by Bethlehem. The car ropes are near the end of their useful life, and we found one rope was close to being undersized.



Typical hoistway door

Top of Car - Rating 4

The top of the car and related equipment is in good condition and well maintained. It is recommended that barricades be installed to mitigate the fall hazard where opening exceed 12". Pads are used and regularly changed to collect debris from rail oilers on top of the car.



The existing opening between the car and the shaft wall is 26" x 28" wide

Pit Equipment - Rating 4

Pit equipment is good quality and in good condition to include the spring buffers, GFCI circuits and has adequate lighting.



Pit view

The elevator cab is in good condition; ADA requirements are met except for the phone cabinet. A heater is installed in the elevator to keep the space warm during inclement weather.



Elevator cab

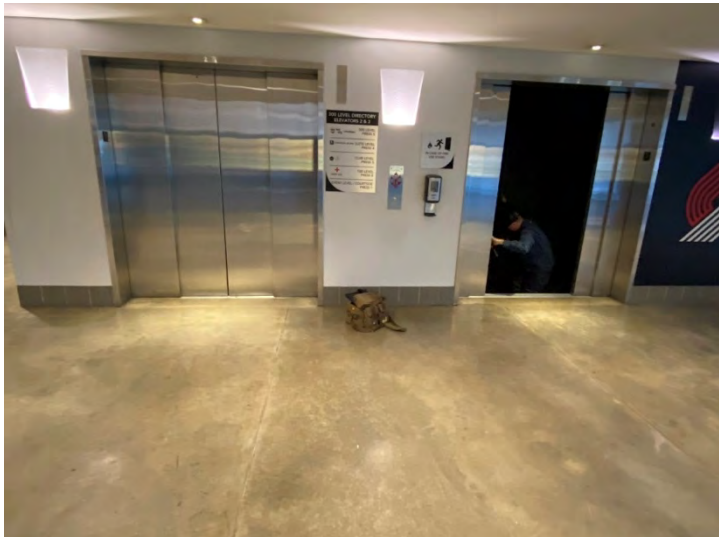
Elevators PE2 and PE3

Overall - Rating 4

The two duplex passenger elevators utilize a Montgomery geared machine with Ultron controls and SCR drive. The elevators have load capacity is 5,000 lbs. with a rated speed of 350 fpm. The elevator has a total travel of approximately 57 feet and uses roller guides on the main guide rails.

The elevators have a total of five landings, serve Floors 1 – 5, and are equipped with a MAC HD door operator. The hoistway and car doors are two-speed center-opening doors measuring 72" wide x 84" high with stainless steel finishes.

Facility Condition Assessment
Moda Center & Garden Garage



Elevators PE2 and PE3 front opening

Machine Room - Rating 4

The machine room area was found to be generally clean and in proper order. The machines are in very good condition for their age. The required Category 5 (CAT5) safety tests appear to be current. Category 1 (CAT1) tests are overdue (Cat 1 – February 2023 and Cat 5 - April 2020).

Wiring diagrams necessary for the maintenance and troubleshooting of the car controllers were found to be available and in good overall condition.

The maintenance control program (MCP) is being stored in the machine room which is required by state code. The MCP and quarterly fireman's service operation was up to date.



Elevator machine room for the Elevators PE2 and PE3 group



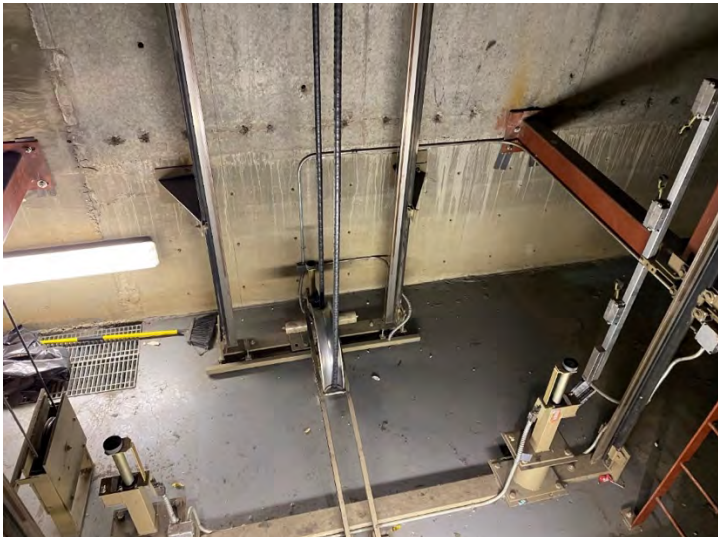
The elevator controller is in good condition

Hoistway Equipment - Rating 4

Equipment includes car and hoistway door equipment, elevator car and hoist ropes. Equipment in the hoistway appears to be of good overall quality and remains in good condition.

Pit Equipment - Rating 4

The pit equipment is good quality and in good condition includes the oil buffers. GFCI circuits are present and adequate lighting is provided. The compensation sheave is clean and well maintained. It is recommended to close off the unused hoistway.



Pit equipment is clean and well serviced



Underside of car is clean, well serviced with buffer tags attached per code

Service Elevator PE5

Overall - Rating 4

The service elevator utilizes a Montgomery geared machine with Ultron controls SCR drive. The elevator has a load capacity of 15,000 lbs. and a rated speed of 150 fpm. The elevator utilizes a 2:1 roping system with a total travel of approximately 57 feet and uses slide guides with oilers on the main guide rails. We discovered during our review new ropes were installed in the first quarter of 2020.

The elevator has a total of five landings, serves Floors 1 - 5, and is equipped with a MAC door operator. The hoistway and car doors are two-speed side-opening doors measuring 48" wide x 96" high with a painted finish.

Machine Room – Rating 4

The required Category 5 (CAT5) safety tests appear to be current. Category 1 (CAT1) tests are overdue (Cat 1 – February 2023 and Cat 5 - April 2020).

Wiring diagrams necessary for the maintenance and troubleshooting of the car controllers were found to be available and in good overall condition.

The maintenance control program (MCP) is being stored in the machine room which is required by state code. The MCP and quarterly fireman's service operation was up to date.



The machine room is clean and well organized

Hoistway Equipment – Rating 4

Equipment includes car and hoistway door equipment, elevator car and hoist ropes. Equipment in the hoistway appears to be of good overall quality and remains in good condition.

Pit Equipment – Rating 4

All pit equipment is in good condition; however, periodic cleaning of the pit is due.



Pit of Elevator PE5 in need of cleaning

Elevator PE6

Overall - Rating 4

The passenger/service elevator utilizes a Montgomery geared machine with Ultron controls SCR drive. The elevator has a load capacity is 6,000 lbs. and a rated speed of 350 fpm. The elevator has a total travel of approximately 107 feet and uses main roller guides.

The elevator has a total of nine landings (there is a 9th floor car button, but floor 9 is inaccessible), serves Floors 1 - 9, and is equipped with a MAC door operator. The hoistway and car doors are two-speed side-opening doors measuring 60" wide x 84" high.

Facility Condition Assessment
Moda Center & Garden Garage



Elevator PE6 car operating panel showing Floor 9 button

Machine Room – Rating 4

The machine room equipment is of good quality and has been well maintained.

The required Category 5 (CAT5) safety tests appear to be current. Category 1 (CAT1) tests are overdue: (Cat 1 – February 2023 and Cat 5 - April 2020). Wiring diagrams necessary for the maintenance and troubleshooting of the car controllers were found to be available and in good overall condition.

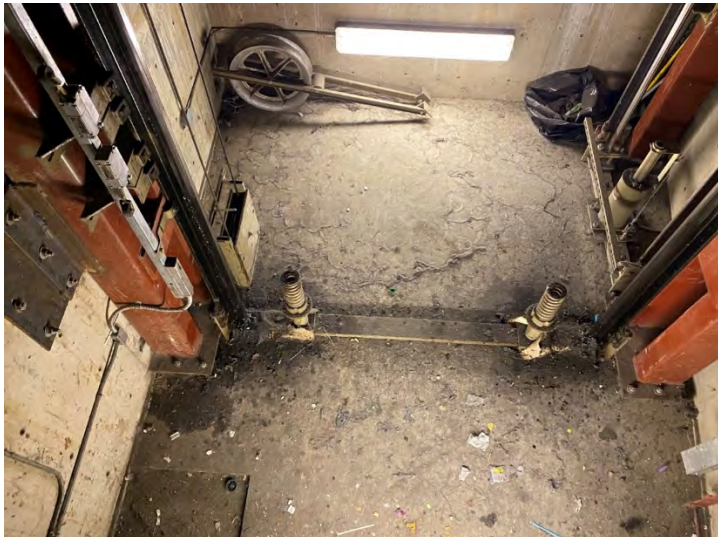
A maintenance control program (MCP) is being stored in the machine room which is required by state code. The quarterly fire service operation is up to date.

Hoistway Equipment – Rating 4

Hoistway and car top equipment remains in good overall condition and is comprised of good quality components.

Pit Equipment – Rating 2

Pit cleaning needs to occur and excess materials removed.



Pit in need of cleaning and remove the excess material

Passenger Elevators PE7, PE 8, PE9, PE10

Overall - Rating 4

The four car passenger elevator group utilizes Montgomery geared machines with Ultron controls and are equipped with SCR drives. They have a load capacity of 5,000 lbs. with a rated speed of 350 fpm. The elevator has a total travel of approximately 57 feet and uses roller guides on the main guide rails.

The elevator has a total of five landings, serves Floors, 1 - 5, and is equipped with a “MAC” HD door operator. The hoistway and car doors are two-speed center-opening doors measuring 72” wide x 84” high with stainless steel finishes.

Machine Room – Rating 4

The required Category 5 safety tests appear to be current. Category 1 tests are overdue (Cat 1 – February 2023 and Cat 5 - April 2020).

Wiring diagrams necessary for the maintenance and troubleshooting of the car controllers were found to be available and in good overall condition. The maintenance control program (MCP) is being stored in the machine room which is required by state code. The MCP and quarterly fireman’s service operation was up to date.

The seismic device serves all elevators. If a seismic event occurs all elevators will be inoperable until the cars are inspected and the switch re-set from the garage machine room.



The machine room is clean and well organized with a seismic switch located in the Garden Garage machine room

Facility Condition Assessment
Moda Center & Garden Garage



One seismic switch for all elevators in the Rose Quarter located in the Garden Garage machine room

Hoistway Equipment – Rating 4

Equipment includes car and hoistway door equipment, elevator car and hoist ropes.

Equipment in the hoistway appears to be of good overall quality and remains in good condition. Hoistway doors are stainless steel 72” wide x 84” high.

All elevators in this group and Elevator PE6 show deterioration of the grommet buffering the rods within the counterweight above the springs. These grommets require replacement.



Disintegrating grommets in the counterweight



Disintegrating grommet material on the top of the counterweight

Pit Equipment – Rating 4

The pit is a walk-in pit. The equipment is of good quality and in good condition. Oil buffers are used in the pit with GFCI circuits available and adequate lighting provided. The compensation sheave is clean and well maintained. It is recommended to close off the unused hoistways.



Pit equipment is clean and well serviced

Car Equipment – Rating 4

The cars have dual car operating panels, two sets of handrails, and integral car position indicators in the car front.



Typical elevator interiors for Elevators PE7 - PE10

Maintenance Deficiency Items

The following items were noted during our examination and should be addressed by the maintenance contractor (Kone Elevator) in a timely manner:

Escalators

- Replace the burnt-out demarcation lighting on Escalators Esc. Nos. 2 and 4. Upgrades to LED demarcation lighting are recommended on all units.

Elevators

Items Common to all elevators

- Complete and annual traction Category 1 testing on time each year. All traction units are presently one month behind. Record the testing in the written Maintenance

Control Programs (MCPs) and store in the proper machine room areas.

Passenger Elevator PE1

- No deficiencies found
- Monitor the car ropes since they are getting close to code replacement

Passenger Elevator PE2

- No deficiencies found

Passenger Elevator PE3

- No deficiencies found

Service Passenger Elevator PE5

- No deficiencies found

Passenger Elevator PE6

- Remove the unnecessary equipment in the pit
- Pit cleaning needed
- Replace the disintegrating grommets in the counterweight frame.

Passenger Elevator PE7 - PE10

- Replace the disintegrating grommets in the counterweight frame.
- Monitor car ropes on Elevators PE7, PE9, and PE 10.

RECOMMENDATIONS

A breakdown of our recommendations for these escalators is as follows:

Immediate

- Issue the maintenance deficiencies section of this report to the current service contractor for their immediate attention with all noted items to be addressed under the terms of the current maintenance agreement in a timely manner.

Escalator Short Term (0 - 5 years)

- Replace the original demarcation lights with LED lighting. Not required if a modernization occurs.

Elevators Short Term (1 - 3 years)

- Note: Elevators PE1, PE2, PE3, PE5, PE6, PE7, PE8, PE9, PE10 have geared traction machines no longer being manufactured. Parts availability will be limited in the near future.
- The elevator controllers remain in good condition currently, but the control boards are no longer supported by the manufacturer or third-party vendors. The long-term requirements for refurbishment/modernization will need to be performed within the next three years.
- It is highly recommended that the owner contacts the local Kone office to purchase additional control boards for emergency use. Once the modernization begins the owner should keep the controller equipment on hand for emergency use in the event of a board failure on one of the other units.

Escalators Long Term (5+ years)

- If the current level of preventative maintenance continues, there should be no need for any major system upgrade work prior to the timeframes previously stated. All escalators should be scheduled for sequential modernization commencing in four years.

Facility Condition Assessment Moda Center & Garden Garage

FOOD SERVICE & RETAIL

We were provided a list of all of the capital improvements made at the Moda Center since 2007. During those 17 years, the owner has spent \$12,635,307 on food, beverage and retail equipment décor and club leasehold fixtures and improvements. This figure does not include annual smallwares or uniform replacements. That 17-year total averages \$743,252 in annual replacement upgrades and new equipment.

Foodservice

Having a special projects/maintenance director on Levy's staff is unique in the arena concessions industry, and based on our observation of the equipment conditions, the results have certainly been positive.

In addition to the in-house personnel, Levy contracts out many of the preventative repair and maintenance functions, including:

- Beer Line Maintenance and Cleaning - Clean Rite
- Equipment Repair - General Parts
- General Repairs - Cool Systems
- Oil Filtration - Filter Fry
- Refrigeration Repair - Acutech
- Ventilator Hood Cleaning - Bare Metal Standard
- Dishwashers - Hobart

The Moda Center is a leader in the industry when it comes to sustainability. Levy works with the building's environmental services team to coordinate food waste composting and recycling of cardboard, cans, and bottles.

The arena was the first venue to use reusable cups for all alcoholic beverages, which come in three sizes: 9, 12, and 20 ounces. Working with the Bold Reuse facility in Portland, customers deposit their used cups in brightly labeled bins on the concourse that are clearly marked for composting, recycling, and re-use. After every event, Bold Reuse picks up the cups and takes them to their plant, where they are washed, sanitized,

inspected for quality assurance, and repackaged to be returned to Levy for reuse.

Interestingly, the Moda Center still relies heavily on their draft beer system. Most sports venues have reduced their draft beer outlets, replacing them with packaged beer (canned) and packaged ready-to-drink cocktails. The reason for this is two-fold: draft beer systems require the pumping of beer from walk-in coolers to the beer faucet at the concession stand or bar, requires pressurized refrigerated lines, which are prone to leaks, equipment failure and over carbonation.



Draft beer walk-in cooler distribution

The beer lines have to be flushed and cleaned every four to six weeks, depending on usage and local codes, and all of that beer in the lines is washed down the drain rather than being sold.

During Covid, concessionaires switched to packaged products to avoid human contact with food and drinks. In addition, concessionaires began installing Grab and Go markets, such as Amazon Just Walk Out Stands, where customers can reach into a glass front cooler and select their own packaged beer or cocktail without pouring a beer.

The results of the marketplace Grab-and-Go's are that customers prefer the beer selection, purchase more products, and are served faster because there is no pouring of beer or soft drinks.

The other benefit of the markets is glass front coolers are much less expensive to purchase and maintain than draft beer systems, and there is no loss of product or waste because there are no beer lines to sanitize between events.

Levy indicated that their customers prefer draft beer and that their maintenance program has kept the draft beer systems running efficiently. We do recommend that those costs be analyzed over the course of a year to determine if draft beer systems should be replaced when they wear out or convert more to packaged products.

Another associated cost of running the draft beer system is the CO₂ and Nitrogen systems. The building originally had a central CO₂ system, which still exists on the loading dock. It appears that this was a CO₂ generator, rather than just storage tanks as used in today's arenas.



Unused central CO2 carbonator

Facility Condition Assessment
Moda Center & Garden Garage



Individual Nitrogen blenders are in each cooler

The CO₂ is then distributed through tubing or copper piping throughout the building to its final sales location. The CO₂ would be used for both draft beer as well as fountain soft drinks. The Nitrogen CO₂ blenders, in the case of the Moda Center, are in the walk-in coolers at the sales locations but could also be at the loading dock if a fully integrated central system was used.

Levy indicated they stopped using the central system due to leaks and mechanical failures. Current central systems are more efficient with stainless steel tanks (6 or 8) to serve an entire arena, rather than this mechanical system currently sitting idle here.

A major advantage of a working central CO₂ system is to eliminate having to deliver individual CO₂ tanks to each sales location. Not only does delivering the tanks require labor, but the tanks can be dangerous if dropped or not secured properly.



50lbs CO₂ tanks

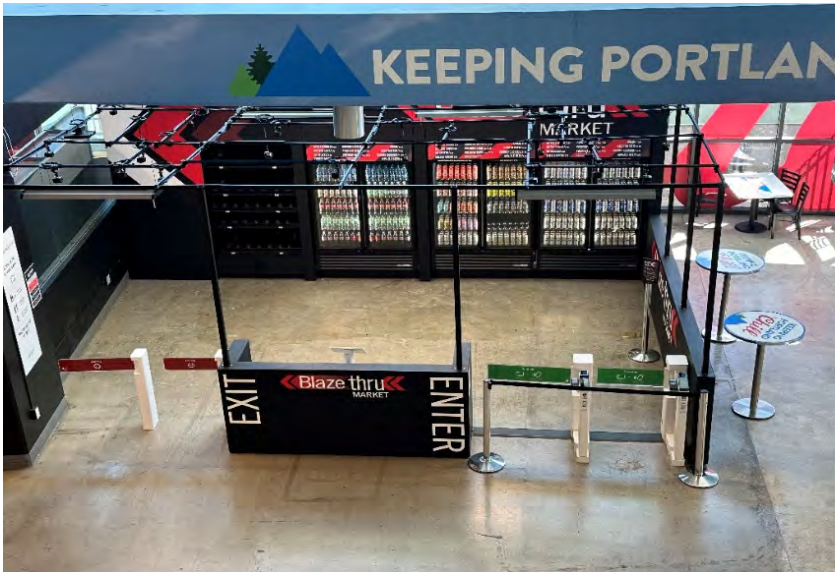
Normally, we recommend eliminating central beer pumping systems. Still, if Moda Center wants to retain theirs, then we definitely recommend replacing the broken CO₂ generator with modern CO₂ tanks that are then filled by a delivery truck at the loading dock as needed by usage. This would require repairing or replacing any leaks in the piping system.

There are a total of five production kitchens and 38 concession stands and bars throughout the arena, plus twenty-five Levy-managed portables. In addition, there are four portables owned and operated by a subcontractor to Levy, Observ.

The current Appetize/Spot On Point-of-Sale system was installed in 2020. Levy and the owner are currently looking at replacing that system in 2025 to improve reliability and function. Levy works with many POS companies but has narrowed the search down to two of the leading companies: Shift-Venue Next and MyVenue. Levy will work with arena management to review bids from each of these major vendors in the concession's POS market.

As part of Levy's concession stands, there are four Amazon Just Walk Out Markets on the main concourse. These were installed in 2023 and have been very successful in speeding transaction time and generating sales. The Amazon stands were created as modular units by Gallery Carts and cost approximately \$200,000 per installation.

The customer enters the turnstile by registering their phone or account at the turnstile. Then, using AI technology with a series of overhead cameras, the system tracks the fan purchases and charges them on their Amazon account without stopping for a cashier transaction upon exiting the turnstile.



Main concourse Amazon Just Walk Out Market

There is one manual grab-and-go stand, without the overhead cameras or automatic billing, on the upper concourse (300 Level). The menu is also limited to packaged beverages and snacks like the Amazon stores. Customers do have self-checkout registers; however, it is a slower transaction process compared to the Amazon stores. Aesthetically, it has not been fully designed to provide the graphics or décor of the Amazon store, and the Walk-in coolers have to be stocked from the front rather than the back as in the Amazon stores.

Assuming the financial return is sufficient, we would recommend converting at least two locations on the 300 level to the full Just-Walk-Out concept to reduce labor costs and transaction times.



Generic product displays



300 Level Grab and Go customer scanning POS

If the financial return is not reasonable, these stands could still benefit from a remodel to provide for a refurbishment of the back room (currently an unused concession stand) to allow for new reach-in coolers that can be replenished from the rear without impeding customer traffic. Additional attractive merchandising

racks for both hot and cold foods can be added to increase sales from these locations.

In 2023, six automatic coffee machines were placed throughout the concourses. We did not get an analysis of whether these machines, which cost approximately \$6,900 each, have provided a reasonable return or if they are just a convenience to be able to offer coffee. Many arenas are using local coffee house subcontractors or sponsor coffee brands to provide coffee and espresso for events.



Coffee vending machines on the concourse

The warehouse coolers and compressors were replaced in 2019 and 2020. Many of the walk-in coolers and freezers throughout the arena have concrete floors, which indicates the slab underneath is insulated, and therefore, an interior metal floor is not required. Levy indicated they have not had any issues of leaks or mold under the walk-ins, which means the insulated slab is effective.

We have noted that some of the coolers, with interior metal floors, are in need of repair due to damage caused by the heavy kegs, denting the walls and opening seams, as well as rusted floors. Damaged walls and floors allow cooling to escape and

can also begin to rot the insulation due to water and beer leakage.



Damaged walls from beer kegs



Rusting interior cooler floors

Facility Condition Assessment
Moda Center & Garden Garage

The one inadequacy of the arena’s equipment noted by Levy is freezer space in the main warehouse. They would like more freezer space to reduce the need for daily deliveries. We have shown an additional freezer in year four in the capital investment plan.

The arena’s eight loading docks are sufficient and do not cause any tie-ups during events for the foodservice department.

The event level south pantry is used for in-seat service, and while not necessarily visible to the public, it has old wood and laminate counters and cabinets that should be upgraded to stainless steel shelving.



Courtside service stand with laminate countertops

The signage throughout the concourses is bright and appealing. The signage clearly indicates the menu theme as well as any branding of sponsors’ products. Blade signage is used so customers can see a brand or concept from a distance down the concourse.



Menu blade signage on concourse



Branded signage



Branded concourse bars

There is a mixture of modern television menu boards, such as the Pizza Stand, and static chalkboard menus that are used in specific stands, like the Low Bar, to match the décor and theme. The Low Bar features popular low priced historic brands or beer.



Digital menu boards



Static chalk menus matching decor

While most equipment was in good working condition, the combi oven, the convection ovens, and the pizza impinger ovens (conveyor style) showed the most wear and tear, and some were inoperable. Levy management did label the broken equipment, so employees did not try to use the ovens, but were waiting for repairs to be performed. We have listed those items for replacement in our equipment spreadsheet.



A bank of older convection ovens



Signage on non-working equipment



Signage on non-working equipment



Combi oven not working

The charbroiler in the Kama’aina stand on the main concourse was in poor condition and should be replaced.

Originally, the arena had Earth Stone wood and gas fired hybrid pizza ovens, however they were not easily used by the employees and Levy recommended converting to the more user-friendly conveyor style ovens. The Earth Stone ovens still are in place if the operator decided to reinstate their use.



Earth stone hybrid pizza oven



Lincoln Impinger conveyor pizza ovens

The fryers also receive heavy use, and some were showing signs of wear. Levy uses a third party, Filter Fry, to clean the fryers and recycle the oil. This company needs to be more diligent in keeping the fryers in optimal condition.



Fryers

Underbar equipment has been well-maintained and in good condition.



Clean and well maintained bartender stations



Clean and well-maintained back bars and counters

Ice machines are distributed throughout the arena in the major concession areas, and with the exception of one in Section E108 are in good working condition. A large central ice maker (Voght) in the commissary was observed to be inoperable. If this ice maker is not needed, it should be removed. If needed for central ice capacity for concessions and portables, then it should be repaired.

The concession stands and portables were clean, in good condition, and appeared to be mechanically well maintained.

Several of the portable concession stands are owned and/or managed by a Levy subcontractor, Observ. We did find a few of their locations were not as clean as the Levy-managed stands, but the majority were attractive and in good condition. This sanitation situation is easily corrected with a nightly inspection report required by the subcontractor.



Observ subcontractor portable cart

Bae’s Chicken Stand, E119, did have a loose floor drain cover that should be repaired to eliminate the tripping hazard.

The suites in the Moda Center were equipped with only a sink and an undercounter refrigerator. All other foodservice equipment is portable smallwares for buffet service. Many venues now are building in more permanent food equipment, such as induction warmers, like the ones used in the arena’s clubs.



Suite sink and undercounter refrigerator

Interestingly, Levy is known for their suite dessert carts, yet there is only one dessert cart used for all of the Moda Center’s suites. Assuming there is demand for this service, more dessert carts should be added.

The arena’s clubs and bars had the highest level of attractive finishes and equipment whether fixed as the bars below or with attractive mobile buffet counters, shown in the next photo.



Attractive club bar



Portable buffet counters

Facility Condition Assessment
Moda Center & Garden Garage



Portable lobby bar for premium level

The Moda Center, like most sports venues, has a used equipment room, which in this case is called the “boneyard.” Even this room is organized neatly on shelves with similar equipment placed next to each other.



Unused equipment in storage area

However, if the equipment is unusable, even for spare parts, it should be sold, if possible, or removed from the building.

Foodservice has its own washers and dryers for uniforms and towels. Many venues have found it more cost-effective to outsource laundry operations.



Foodservice laundry machines

The concession operation is totally cashless, which is typical of venues today. The former cash room has been repurposed for other office functions, and while there is still a safe and currency counters in the room, they are not used and will not be accounted for in the capital plan.

The ceramic tile in the kitchens was observed to be in good condition.



Ceramic tile in kitchens

While most of the concession areas also had well-maintained flooring, whether vinyl or sealed concrete, some areas would benefit from deeper cleaning, such as a power wash. Regularly scheduled professional cleaning of floors at least once every two years is recommended.



Concession flooring requiring power wash

Ceiling tiles should be replaced when they become yellow and dirty. While most of the venue's food service areas are in good condition, this discoloration was noticeable in the court-side kitchen and other heavily used cooking areas.



Kitchen ceiling tiles discolored

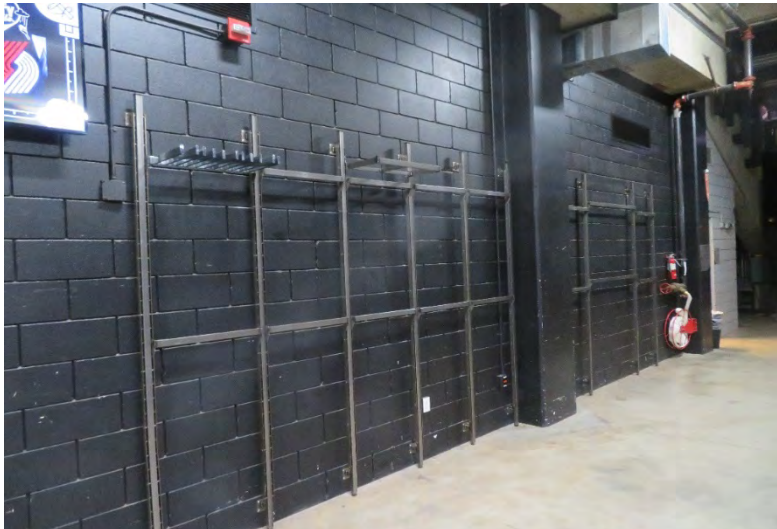
Merchandise

The retail sales areas were renovated in 2017 and again in 2023, often reflecting changes in sponsorship and upgraded display hardware, such as the Opto Systems mobile four-way merchandise racks. The outlets were observed to be attractive.

There is a small warehouse area on the event level for merchandise storage with four industrial racks for pallets, approximately 24' high by 8' in length. Most of Rank + Rally's (R+R) storage for products is next door at the Veteran's Memorial Coliseum, which was not part of our survey scope.

R+R uses 14 Retailcloud POS registers at their merchandise locations. For concerts R+R uses a different POS system, AT Venue, with 41 registers and iPads.

The court-side portable sales location has nine Opto brand racks (4'x8') attached to the wall. Then, during events, back wall metal grids are attached to the racks to provide the backing for the merchandise displays and portable counters and tables may be placed in front of these wall displays.



Wall racks



Back wall grid racks

On the main concourse is the team store that was renovated in 2017 and 2018. It is approximately 2,000 square feet with three walls of displays and a glass front that folds open into the main concourse, where additional portable merchandise racks can be deployed. Team marketing also places three glass display cases in and around the store as well as mannequins of players dunking the ball suspended above, which really draws the customers' attention to the retail outlets.



Main team store



Flying players

There is a small storage room behind the team store for additional stock.

R+R has three heat presses to be able to offer custom jerseys with players' names on them. The A-15 sales location is a series of 20' x 8' racks for wall-hung merchandise.

A-19 is a 520 square foot store with two POS, 15 four-way portable display racks, wall racks, and three walls of cabinetry. There is also a 30' video board mounted high above the stand, which is no longer used now that Adidas is no longer a sponsor.

A-24 is a portable location with six of the Opto racks.

There is one merchandise stand on the club level with two full back bars, wall racks, and table displays.

On the 300 level, there are three retail locations:

- C-14 Kid's City is a fully themed area with displays and games. The merchandise sales area is approximately 175 square feet with a glass front accordion-style wall that folds into the walls when open, featuring back wall racks and three mobile racks of merchandise.
- C-24 is a mirror image of C-14 without the Kid's City décor.
- C-28 sales location has a 6' table in front of two racks on the back wall with products displayed.



Typical upper-level merchandise location

RECOMMENDATIONS

In addition to the regularly scheduled individual equipment replacements shown on the 20-year matrix, the following capital items should be addressed.

- Replace the central CO₂ system. Remove the non-working generator and replace it with stainless steel tanks from a company such as Advanced Co2 Systems or NuCO₂. This will eliminate the hazardous transportation of individual tanks throughout the arena. The current piping within the arena will also have to be checked and repaired if leaks are detected. These systems can also handle the Nitrogen gas needed for beer, as well as CO₂ for soft drinks.
- Draft beer vs packaged beer. In most venues this is an automatic decision by the operator that packaged beer is better due to reduced transaction times at the stands and bars, increased use of Grab and Go markets, increased variety for the customer, elimination of waste from cleaning beer lines and reduced equipment costs by eliminating draft beer systems versus stand-alone glass front refrigerators. However, with Moda Center's sustainability initiative and reusable cups, it may not be appropriate to increase the number of recyclable aluminum cans, which would occur if eliminating draft beer. Therefore, this conversion should be analyzed on a cost-benefit basis.
- Add two additional Amazon Just Walk Out or other suppliers like Zippin AI Marketplaces in the arena, to have that service on the 300 Level.
- Upgrade suite equipment to include induction warmers mounted into the new countertops.
- Add dessert carts for more exposure in the suites.

- Decrease the downtime of inoperable equipment, such as ovens, to improve productivity through replacement or more frequent repairs.
- Replace interior walk-in cooler floors that have been damaged by beer kegs
- Replace or repair walk-in cooler walls and seams that have been damaged by beer kegs
- Power wash the floors at least every other year, if not annually.
- Replace discolored ceiling tiles
- Broken foodservice equipment has little value, normally no more than 10% of its original cost. If the equipment in the storage area (boneyard) can't be repaired or provide parts for other working equipment, it should be sold or removed by a salvage company.
- Compare team store square footage to other NBA arenas and expand the footprint of the store if warranted.

CAPITAL EXPENSE MATRIX RECAP

Moda Center 20 Year Capital Plan

	Years 1-5	Years 6 -10	Years 11-15	Years 16-20	Totals
Architecture & Interiors	\$135,622,642	\$ 996,579	\$ 45,867,826	\$ 110,979,162	\$ 293,466,208
MEP & Fire Protection	\$ 34,706,854	\$ 17,201,173	\$ 4,320,189	\$ 18,529,294	\$ 74,757,511
Structure	\$ 6,211,319	\$ 430,427	\$ 1,013,691	\$ 684,073	\$ 8,339,510
Technology	\$ 30,943,066	\$ 4,685,554	\$ 32,164,599	\$ 7,915,278	\$ 75,708,497
Vertical Transportation	\$ 11,485,955	\$ -	\$ -	\$ -	\$ 11,485,955
Roof & Envelope	\$ -	\$ 272,385	\$ 4,442,863	\$ -	\$ 4,715,248
Food & Beverage and Retail	\$ 4,374,637	\$ 9,498,712	\$ 13,434,795	\$ 9,096,849	\$ 36,404,993
Totals	\$223,344,473	\$ 33,084,829	\$ 101,243,963	\$ 147,204,656	\$ 504,877,921