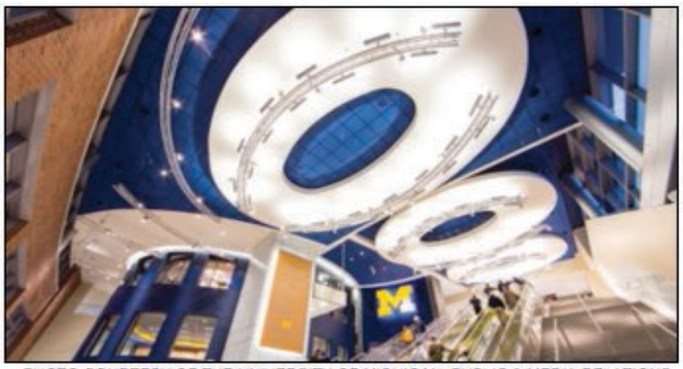
RECREATION MANAGEMENT
IDEAS AND SOLUTIONS FOR RECREATION, SPORTS AND FITNESS FACILITIES

Design Corner

Design Team Coordination

The Benefits of MEP & Architectural Coordination in Designing Athletic Facilities

By David A. Conrad



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Whether the athletic facility you're designing is new or renovated, they all have one thing in common. They are a place to gather with friends and family to watch and enjoy your favorite team or sporting event. Today, large, successful athletic facilities at the collegiate and professional level are being designed with a "wow" factor in mind and the intention to draw large spectator crowds, which require even more room for comfort. In order to accommodate these facilities, the building infrastructure must be carefully sized and coordinated with the architecture to provide the user with a memorable and sometimes magical experience.

Successful coordination in designing building systems for a new or renovated athletic facility can be a serious challenge for engineers and architects. Large building services combined with high-priced spaces and special architectural features require meticulous coordination and often a fair amount of elbow grease and creativity in order to create a comfortable and aesthetically pleasing venue.

Peter Basso Associates recently completed the MEP-engineering and lighting design for the 12,700-capacity University of Michigan, Crisler Arena expansion. An arena of its size could be divided into three main spaces: general purpose, finished spaces, and arena space. The general purpose typically includes mechanical and electrical rooms, toilet rooms and maintenance spaces, whereas finished spaces may include suites, alumni clubs and offices. The arena space itself included a playing area and spectator seating. For the purpose of this article, we will solely focus on the coordination of general purpose and finished spaces, examining equipment location, accessibility requirements, allocated above-ceiling space, ductwork and pipe pathways.

The first step in the coordination process for any design engineer is to gain a thorough understanding of the building type, the function of the building and the type of atmosphere that is desired. Before the expansion, the temperature inside Crisler Arena fluctuated from cold to frigid; it was poorly lit and largely uninviting—a stark contrast to the excitement and enthusiasm of its cheering crowds and championship-bound athletes.

One of the goals for the design team was to reinvigorate spaces both inside and outside the facility using vibrant team colors, attracting spectators and supporters to the excitement of the arena.

An added challenge was the building's circular configuration. The design team was tasked with creating a new main entrance—lacking in the original design—that would grab the attention of the spectators and bystanders, but keep the aesthetics of the existing arena intact. As part of the project kickoff, the architects provided 3-D renderings that illustrated exterior design concepts as well as the interior finishes that met the owner's needs.

After reviewing the renderings and meeting with the owner, the team developed an understanding of the types of spaces that were required, new concepts for pedestrian circulation, and discussed new architectural features that would be incorporated. The design engineers then met with the building operators to gain a sense of building functionality, usage and time of occupancy. For example, would it be operational 24/7, 365 days of the year, or would the building be "dark" part of the year?

During this meeting the maintenance staff indicated what types of systems were preferred and what type of special systems would be needed in order for them to complete their daily operations. The design engineers were able to make system recommendations that would meet the maintenance staff's needs, stay under budget, be energy efficient and satisfy the architectural partners. After meeting with the design team and owner, the mechanical and electrical systems were selected and the design phase commenced. Upon system determination, the local codes, city ordinances and university standards were identified. The building was then broken down into different classifications, such as general purpose, finished spaces and arena spaces.

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The general purpose areas consisted of the main mechanical and electrical spaces: critical spaces to the backbone of the building's infrastructure. In selecting the location of these rooms, a few items were taken into consideration: The first was the type of structure in and around each room; the second was the proximity to the exterior, utilities being provided and the accessibility to the room. Since the preferred location of these rooms was along the exterior where the structure tended to be the largest, pathways for ductwork, piping and electrical conduits were identified and coordinated within the boundaries of the existing structure and adjacent spaces so that no additional floor space would be required. However, keeping the surrounding floor spaces from being decreased due to infrastructure proved to be yet another challenge.

The owner noted that no matter how big or how small a room at the arena, to the university, it served a valuable purpose that could not be compromised. Once the rooms were established along the exterior of the building, the utilities from the site were coordinated with the civil engineer and utility providers. The equipment inside the mechanical and electrical rooms was located, and service clearances and pathways for replacement were incorporated into the floor plans. For large equipment that could not be replaced with manpower, such as a chiller, a structural hoist was provided to assist in their removal. The location of the hoist was closely coordinated with the structure and maintenance personnel.

The finished spaces around the arena presented a different challenge for the design team—particularly the club area where alumni and donors could converse before, during and after a basketball game. This space included seating, a gathering area and a kitchen. The space was designed with high-end finishes, requiring the mechanical-electrical systems and equipment to blend in aesthetically.

An understanding of how the space would be used was critical to the coordination of the design team. For example, light switches, receptacles and thermostats had to be located so they would not interfere with custom wall coverings. Each device had to be located and coordinated appropriately to avoid interference during installation. The ceiling space above the club area was crowded with mechanical and electrical services; some fed the club while others passed through to adjacent spaces. Coordinating the orientation of the services was also critical to avoid any interference. The design engineers took a close look at each structural member, conduit, light fixture and depth, ductwork, piping and hanger configuration. This detailed approach helped to establish the desired ceiling height but also provided the accessibility for the maintenance staff.

The biggest challenge for design engineers in large sporting venues, like University of Michigan's Crisler Arena, is not the complexity of the mechanical-electrical systems, but the detailed coordination required between the different disciplines. Each discipline brings a different design solution to the table, and they must all be understood in order for the project to be successful. By understanding the different design solutions and how they relate to the building's operation, the design engineer can provide an efficient, fully coordinated system that will meet the needs of the end user for decades to come.

ABOUT THE AUTHOR

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