Southern Oregon University

Student Recreation Center and McNeal Pavilion Renovation

Ashland, Oregon

Schematic Design
Revised Narratives

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ARCHITECTURE DESIGN

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Table of Contents

1.0 Introduction

1.1 Project Background

After nearly 60 years of service to Southern Oregon University, the McNeal Pavilion is the focus of a major renovation, reconstruction and modernization plan to replace deteriorating structures and renovate select existing structures bringing the building up to current life safety, ADA and energy code standards. The project encompasses renovation of existing along with new construction to provide new state-of-the-art spaces supporting SOU's successful academic, athletic and recreation programs. Concurrent with the McNeal Pavilion project is the addition of a new Student Recreation Center (SRC). The SRC will be constructed of primarily new construction and select renovated areas including the Auxiliary Gym and portions of the existing Racquetball building. The SRC will be connected to, but operate independently of, the building's athletic competition functions.

This project is funded by two separate funding sources; one for the McNeal Pavilion Renovation encompassing all improvements related to athletics and academics, the other is a student-fee funded Student Recreation Center, which includes improved Outdoor Program spaces. Construction costs will be separated between these two funding sources. Building systems operational costs, to the extent possible, are designed separately to allow cost tracking for the separately funded building areas.

McNeal Pavilion

Currently McNeal Pavilion houses the competition gymnasium for Raiders' events including basketball, volleyball and wrestling games and matches. Additional support spaces for football, athletic training, laundry and storage, and spectator amenities comprise the remaining athletic spaces in the building. The main competition gym also hosts local events including graduations, auctions, and other campus and community non-sport events.
McNeal Pavilion also supports academic program spaces for the Department of Health and Physical Education (HPEL), and Outdoor Adventure Program (OAP). The academic programs currently share spaces with student recreation programs. The goal of this project is to provide dedicated academic classrooms, offices, exercise and academic support areas while recognizing that some shared use with Student Recreation Center spaces will benefit both programs.
McNeal Pavilion contains an existing six-lane competition pool constructed in 1964. The pool and pool building will be demolished to allow construction of new program areas in its place.

Student Recreation Center

The Student Recreation Center is a student fee funded project consisting of new construction and renovated areas. Recreation center spaces include a 2-court gym with suspended 2-lane running track, a single-court multi-activity gym, two group exercise rooms, a large open cardio/weights and plyometric area, administration offices, locker rooms and support spaces.

The Outdoor Program is part of the SRC and provides outdoor recreational opportunities to SOU's students through student-led trips and an extensive rental equipment program. The program continues to increase participation and requires improved and additional space to

continue to effectively operate and expand outdoor opportunities. Outdoor Program also manages the indoor climbing wall. Outdoor Programs and the Outdoor Adventure Leadership academic program share program equipment.

1.2 Project Description

Located on north campus, McNeal Pavilion and SRC is sited south of Raider Stadium and north of Webster Street. Stadium Street bounds the site on the east; an existing campus parking lot is located just to the west of the existing building. The building has two main entries, one located on the west side for athletics and game day public entry, another on the south side serving as the main entrance to the SRC and academic wind. The SRC entry faces recently constructed residence halls located south of Webster St. The site slopes from south to north. The proposed building will be three stories in height. The lower level consists of partial basement on the north side and a full story in height on the south side, a main level and an upper level. The main entry to the SRC and Academic areas is located on the south side off Webster Street pedestrian mall. A new entry on the west side will serve Athletic programs and events.

Existing McNeal Pavilion gross square footage is approximately 113,000 GSF comprised of the original 1956 building and subsequent additions taking place in 1964, 1976 and 1991. The proposed renovated and new construction combined building consists of approximately 128,800 GSF of enclosed usable space. Balconies off of the upper level Athletic Office Suite and Fitness area add approximately 3,000 additional gross square feet.

The 1956 structure, 1964 pool and pool building, and 1991 office and restroom buildings will be demolished to make way for new construction with improved programming. The Dance Building and Auxiliary Gym, both constructed in 1964, will be renovated to enhance existing as well as new uses. Existing construction connecting the Dance Building and Auxiliary Gym will be demolished to improved seismic structure and improve circulation in the building.

The existing 1976 concrete tilt-up Racquetball Building will be renovated, including seismic and gravity load upgrades and interior renovations to accommodate storage and support uses inside the former racquetball courts. Athletic offices will be of new construction built on top of the Racquetball Building roof creating a second floor to the structure.

Finish floors of the 1964 building differ by three to five feet, resulting in areas of ramped interior corridors to meet the various levels.

The existing Dance, Auxiliary/MAC Gym and Racquetball buildings will require seismic and gravity loading structural upgrades. Existing walls to remain exposed to the exterior will be structurally upgraded with the intent to save-in-place as much of the existing structure as possible. All renovated areas must be brought up to current energy codes.

Existing walls shared with new taller construction will be replaced with new precast walls and cast-in-place foundations to meet seismic and lateral code requirements. For the Dance Building, the west wall and foundation will be replaced with new concrete walls. The

remaining north, south and east walls will be reinforced with exterior metal framing clad with metal panels. The roof will be reinforced with the intent to leave existing roof framing in place and reinforce with additional members. Dance Building interior uses will stay the same, with the intent to complete minimal interior renovation to meet life safety and accessibililty requirements.

The intent is to save as much of the existing Auxiliary Gym as possible or as feasible given the current design. The Auxiliary Gym is enveloped on three sides with new two story construction. The existing gym roof is lower than new the roofs and will therefore receive considerable snow drift loading. Due to the drift loading and taller shared walls, current thinking is to remove the north, west and south walls and foundations, replacing the walls with precast walls and cast-in-place foundations. The roof will be replaced to accommodate the added drift loads, using new steel trusses. The new roof and wall/foundation systems will support new RTU's for the Auxiliary Gym and academic wing. The existing east wall can be reinforced in placed and saved. Since the Auxiliary Gym contains existing locker rooms at the lower level, the existing gym floor structure will be saved and shored while new construction is built around it. Renovations to the existing locker rooms will include reinforcing existing walls and retaining locker rooms uses to convert the existing locker rooms to track and field team use. New metal lockers will be provided along with upgrades to the existing wet areas to meet minimum code and accessibility requirements.

Refer to the structural narrative for additional information on renovations and new construction.

LEED Gold minimum certification is required. Sustainable features include roof mounted solar panels and energy recovery systems.

McNeal Pavilion will include the following proposed new and renovated construction:

<u>Athletics Spaces</u>

- Competition Gym with top-loaded concourse seating, approximately 1,400 seats
- Public Rest Rooms, Concession and Storage
- Athletic Offices and Meeting Rooms
- Wrestling practice gym
- Locker Rooms for the following sports:
    - Football
    - Men's and Women's Basketball,
    - Women's Volleyball
    - Men's Wrestling,

    - Men's and Women's Soccer
    - Men's and Women's Track and Field (in renovated area)
    - Women's Wrestling
- Two Private/Flex Locker Rooms for Officials or Staff Use
- Laundry and Equipment Issue
- Athletic Treatment and Taping
- Storage
- Team Room
- Ticket Office

Academic Spaces

- Physiology Lab
- Three Classrooms, (2) with 45 student capacity, (1) with 75 student capacity
- Dance/Multi-Purpose Room divisible with a divider curtain (renovated)
- Auxiliary/MAC Gym. (renovated) The gym will be shared with SRC through a rental agreement.
- Faculty Offices and Conference Room
- Emergency Command Center Storage Room
- Public Rest Rooms
- Dedicated Storage

Student Recreation Center

- 2-court recreation gym with 2-lane suspended running track
- Shared Auxiliary/MAC gym (renovated). See Academics above.
- Men's and Women's Locker Rooms
- One Private Gender Neutral Locker Room
- Two Group Exercise Rooms
- Open Cardio/Weights/Plyo/Stretching area

- Administrative Offices
- Storage
- Laundry – Shared with Outdoor Program
- Intramurals & Club Storage (renovated area)
- Dedicated Storage (renovated area)

Outdoor Program

- Climbing Gym
- Lounge/Trip Planning Room
- Bike Tune/Instruction Area
- Check-in Desk and Offices
- Laundry
- Small Item Storage – Main Level
- Large Item Storage – Lower Level

General Building Program

- General Campus Storage
- Mechanical, Electrical and IT Rooms

Interior Building Imagery

Both McNeal Pavilion and the Student Recreation Center will employ high-volume spaces meant to maximize the use of daylighting where appropriate. Upon entering visitors will be greeted with open, welcoming lobby and wide circulation spaces. Visual connectivity between McNeal Pavilion and Student Recreation Center is encouraged and will be incorporated to the extent possible.

Interior materials will be selected for aesthetics and durability. Colors will focus on a modern tonal palette complimented with natural wood and interesting architectural feature elements.

The Student Recreation Center itself will feature open exercise and gymnasium areas meant to enhance student interaction. Large gathering areas and soft-seating lounge spaces are located throughout the building to encourage social aspects of the Center and

create a comfortable place to exercise, relax, or study. Second floor fitness areas feature expansive windows with views to Webster Street, helping to enliven and promote Webster as a campus circulation spine. Group Exercise Rooms are also located at the second level, as is an indoor running track.

Outdoor Programs will be greatly enhanced with a new Climbing Gym featuring tall wall, bouldering area, and teaching ledge. A large, open lounge and trip planning area is located adjacent to the entry and OP check-in desk. A large Bike/Ski Tuning Classroom will be located in the lower level Racquetball building. Storage and support spaces complete both the main floor and lower level Outdoor Program elements.

Academic areas are located convenient to shared uses such as the Outdoor Program area, renovated Dance Building and renovated Auxiliary Gym. The southeast corner of the building is devoted to three new larger, improved classrooms on the main level and a new upper level office suite dedicated to academic staff. The offices and classrooms will enjoy expansive windows and views to Webster Street and east to Stadium Street. The largest classroom seats about 75 students and features tiered floor configuration. All classrooms will be outfitted to SOU's smart classrooms standards including fixed podium with technology controls, smart boards and sound systems.

The Competition Gym is located directly off of the new west athletic entry. Spectators will enter the main doors and immediately see the gymnasium directly below. The main circulation areas will be open to the gym and include social seating along bar-height tables lining the concourse. A ticket booth, concessions and rest rooms support the Gym.

Athletics offices are located to the south and consist of new construction built on top of the existing racquetball building. Offices and meeting rooms have direct views into the gymnasium to the south as well as views north to Raider Stadium. Locker rooms and other lower-level support functions are accessed by a stair and elevator located at the northwest corner of the concourse. Locker rooms share one large wet area containing showers, lavatories, toilets and urinals.

Exterior Building Imagery

McNeal Pavilion and new Student Recreation Center serve a vital function to the campus community by providing recreation and student life opportunities. Similar to Hannon library, the McNeal-Recreation Center building serves a unique function on campus. As such the building's architecture should tie to more to the language of Hannon Library and differentiate itself from the adjacent residence and dining halls. Borrowing materials and colors from Hannon Library follows the Material and Character information included in the Design Guidelines of the 2009 Campus Master Plan Update. A strong tie between the two projects will help link north campus to south campus and encourage a consistency of architectural styles on both sides of Siskiyou Boulevard.

Primary exterior wall materials proposed include red brick masonry, medium grey and charcoal aluminum composite metal wall and fascia panels, silver colored concrete elastomeric coatings, and grey and silver aluminum storefront window framing systems. Window frames support clear glazing with opaque white spandrel glass employed at floor level changes. Vertical elements of grey metal panel splice window elements to create visual interest on the primary elevations. Red vertical elements matching SOU's color scheme define the main west and south entries as well as accent other building window walls creating visual interest.

Large building masses comprising the main competition gym and recreation gym are softened by stepped roof forms adjacent to the main public way. These flat roof lower forms bring the building down to a pedestrian scale as it meets Webster Street on the south and the existing campus parking lot and pedestrian plaza on the west.

Existing buildings comprise much of the east side of the building and will be renovated to match new construction. Building elements of grey metal wall panel will visually tie the east side walls with the west and south primary faces.

The north elevation features a tall charcoal grey metal clad tower marquee element, prominently featuring SOU's red and white logo, visible from Raider Stadium. Windows from the second floor athletic office suite face Raider Stadium and allow added transparency to what is essentially the lack side of the building. High clerestory windows in the Rec Gym will bring in natural daylight to the space.

Wall-mounted aluminum dimensional building name lettering is proposed for both the McNeal Pavilion west side main entrance and south side Student Recreation Center entrances.

2.0 Design Narratives

2.1 Site Improvements and Access

Vehicle Access, Parking and Services

On-half of the existing asphalt parking lot west of McNeal Pavilion will be available for contractor use during construction. No new parking is proposed. Electric vehicle charging stations will be added to approximately (4) spaces in the existing parking lot. New site improvements in the west parking lot will be limited to grading and site paving necessary to improve drainage, fire and emergency vehicle access.

Proposed fire and emergency vehicle access to the building will be provided on four sides of the building. Emergency vehicles will access the north side on the east of Stadium St. A fire-truck turning hammerhead is accommodated on the north side to allow exiting after an emergency. At the lower service/fire access area, screening walls will enclose a generator and waste material collection containers. Screen walls will also protect Outdoor Program exterior vehicle storage area. A wash area is provided for Outdoor Program use adjacent to the vehicle storage area. Back-of-house operational, training and loading areas have access to exterior doors located on the north side of the main building and at various locations in the existing racquetball building. Athletes will have use of lower level doors on the north side, allowing athletes direct access to Raider Stadium via a new gate located in the existing fence. A paved walk and site stair is provided at the new gate.

Service loading occurs through the storage area of the racquetball building allowing access to the Competition Gym floor via 8' wide overhead coiling and double man doors. Laundry deliveries and equipment have exterior door access on the lower west side of the building.

A new diesel emergency generator and its enclosure will be located at the east side of the site near the screened Outdoor Program equipment yard.

Building services and back-of-house staff may also access lower level functions of McNeal at the east side through card-access controlled doors. The main custodial room is located in the renovated Racquetball Building.

No significant changes will occur at the Webster Street pedestrian walk/ fire lane. Outdoor Programs small-items loading and wash yard will be located at the southwest corner of the building, screened by an eight-foot masonry wall and gates. Temporary loading for Outdoor Programs will occur in the new drop-off/loading area in the parking lot west of the building.

Existing vegetation and trees will be retained to the extent feasible for site design, desirability and environmental qualities.

Pedestrian Access

The project will enhance pedestrian routes around the building and improve connectivity to existing pedestrian paths. McNeal Pavilion pedestrian access to the Competition Gym is from the west. The west athletics entry will feature a large plaza and landscape features creating a signature front door for athletics and provide spectator access to the competition

gym. The existing utility service tunnel will be extended under the plaza and designed to accommodate future connection to a proposed biomass plant to the northwest.

Students using both the SRC and academics wing will enter the building at the main south SRC/Academics entry. This entry also serves as the primary entry for Outdoor Program. The south entry will be complemented by an inviting landscaped seating area. Bicycle parking will be provided to meet minimum LEED requirements. Shared bicycle parking areas will be investigated to maximize use of existing bicycle storage areas applicable to the McNeal-SRC project. An outdoor classroom is planned in the southeast corner of the site consisting of shaded area and landscape forms accommodating social and teaching gather spaces.

2.2 Landscape

Tree and shrub areas shall be planted with species similar to those used at North Campus Village, and shall be irrigated with an automatic sprinkler system utilizing low water use nozzles. Irrigation water will be provided from the T.I.D. non-potable irrigation supply.

Lawn areas will be hydroseeded with a fescue seed mix, and irrigated with an automatic sprinkler system utilizing low water use nozzles. Irrigation water will be provided from the T.I.D. non-potable irrigation supply.

2.2 Civil

Site Overview

The McNeal Pavilion building and associated site improvements will occupy approximately 3.2 acres on the SOU Campus. Although a large majority of the existing structure will be removed and the renovated building will be expanded, the overall building footprint will only increase a relatively small amount from its existing condition. The project will tie into the existing parking area to the west, the recently completed site improvements to the south, Stadium Street to the east, and Raider Field to the north. At this time, a new access road will also be constructed at the northeast corner of the building. Below we have provided a summary of the site utility, grading, and drainage conditions for the new project.

Water/Fire

Research indicates there is an existing 6” domestic water service currently piped directly from Webster Street to the existing boiler room through a 4” meter. We believe the service lateral is located on the east side of the existing underground tunnel system. The City of Ashland Water Department may require the replacement of the existing 4” meter due to age and this as well as the required meter size should be evaluated as the project progresses. This point of connection should remain at its current location.

Based on the available information during our research and field observations, it appears there is an existing fire riser in the boiler room with very limited coverage. We are assuming that the new expanded building will be sprinkled/require a fire service and have shown one possible location on the attached “Utility Exhibit”. This service would require a Double

Check Detector Assembly (DCDA), fire department connection, and possibly a new fire hydrant nearby. There is an existing public 6" mainline within Webster and Stadium Streets and a public 12" mainline within Wightman Street. Depending on the fire service size and required flow/pressure, the service may be required to tee off the 12" mainline within Wightman Street.

Ladder truck access has been requested near the west plaza area which would likely require the existing underground tunnel system to be reinforced to accommodate the heavy truck load.

Sanitary Sewer

As-built maps and the survey information illustrate the existing McNeal Pavilion sewer system at the northwest side of the building. This 12" sewer service appears to serve all of the existing building. From this location, it is assumed that the service drains north to collect the Raider Stadium grandstands, then turns northwest to discharge into the existing 12" public main within Wightman Street. Modification to the lateral system may occur to accommodate the new building, but the ultimate point of connection should remain. The condition of the existing service should be determined prior to its reuse.

Storm Sewer

As-built maps and the survey information illustrate an existing public 24" mainline that passes around the east end of McNeal Pavilion, flows beneath Raider Field, collecting Iowa Street, and continues to the north. An existing storm lateral system serves both the north and south sides of McNeal Pavilion, draining east into the existing 24" line. Modification and upgrading of the lateral systems will need to occur to accommodate the new building, but the ultimate point(s) of connection should remain.

Stormwater detention and pre-treatment requirements will be determined at the time of a pre-design meeting with the City of Ashland. Both are assumed to be required with a building expansion since additional impervious area will be added. We have shown one possible location for a detention/treatment swale on the north side of the building. See site civil plan for additional information.

Natural Gas

There are currently two gas meters serving the McNeal Pavilion, one each on the north and south walls of the boiler room. The common service lateral is fed from an existing mainline within Webster Street. From our recent experience adjusting the Avista Utilities mainline on the SOU Student Housing project, we believe it is a 4" welded steel gas pipe. This point of connection should remain for the upgraded facility.

One possible conflict that may occur is at the southeast corner of the expanded building. At this location, the building footprint encroaches slightly into the existing public utility easement that runs along Webster Street. Although the easement is only being used for the gas main at this time, we will need to coordinate with Avista utilities to verify its accurate location and separation requirements from the building wall.

Data-Communications

Existing telephone service appears to be served overhead from Wightman Street. The existing service follows the same path of entry as power, along the south side of the maintenance yard. The telephone service will need to be routed underground and we will review the final connection point with Century Link and the design team.

An existing fiber optic line runs along the north side of the McNeal Pavilion approximately 15'-20' from the north edge of the building that will need to be protected during construction. At this point, it appears the only disturbance that will occur along the line will be at the service area on the northwest corner of the building. We will work hard to accommodate it at its current location if at all possible; however we may need to re-route the existing fiber line.

We assume all other data-communication services or school interconnected facilities utilize the existing underground tunnel system. The existing underground tunnel system enters in the SW corner of the existing boiler room. It has been noted that the tunnel system may need to be expanded and/or modified to account for the future co-generation facility to the northwest.

Site Grading

The McNeal Pavilion site has approximately 20' of vertical grade change between the southwest and norththeast corner of the development area. With the recently constructed improvements on the south side of the building, the upper level finish floor elevation is somewhat fixed to match up with this area. There is 16' of elevation change between the upper level and lower level finish floor elevations that will help to transition the grades across the site. In addition, the existing dance studio and auxiliary gym that will remain may have a slightly higher finish floor elevation which will need to be accommodated into the building design.

At the west side of the building, the existing grade falls quickly from south to north. With the new west plaza area needing to be held at a consistent grade, ramps will need to be constructed from the parking area to the west.

Along the east side of the building, Stadium Street also falls quickly from south to north. Building access will need to be accommodated with a proper stair transition between the finish floor and existing sidewalk elevations.

Conclusion

In summary, the proposed redevelopment site appears to be adequately served by all major utilities without requiring the need for additional mainline utility extensions or disturbance to surrounding areas. Existing site utilities will be re-evaluated after the completion of the schematic design phase, once the service loads have been identified. Based on our experience within this immediate area, we project that underground TV inspection/investigation (sanitary sewer, storm sewer) and destructive locates/potholing (water, gas, datacom) will be required to verify the condition of the existing infrastructure.

Although challenging, we should be able to accommodate the existing grade conditions with the proposed structure and schematic site layout. It will be important to accommodate ADA access along the stadium paths and west side of the building and we will work with the design team and SOU to come up with creative solutions to the elevation changes.

2.3 Architectural

Building Program Elements

The following design narrative describes the general building components proposed for the project program areas. Refer to the Building Program Spreadsheet in Section 3.0 for additional information on all included program spaces and assigned square footage.

Athletics

Athletics spaces are concentrated on the main and lower levels of the facility. Spectators and athletic staff and student will enter the building through at the main west entry to the competition gym. Doors open to a general concourse running north-south length of the gym, providing access to the main gym top-loaded seating and spectator amenities including a ticket booth with exterior and interior transaction windows, a fixed concession stand with two points-of-sale, concession storage and public rest rooms.

Athletic offices are accessed from this same entry, with the main athletic office entry located on the north side of the gymnasium above the existing racquetball courts. Stair and elevator access is provided to the suite, which is approximately five feet above the main concourse level. Athletic offices feature a reception/waiting area, administrative area, dedicated meeting rooms, private offices, break/work room and storage. Meeting rooms and offices have views to Raider Stadium and into the competition gym floor and north gymnasium concourse.

Spectators access their seats via the main west concourse and via permanent stairs leading from the main concourse and north concourse to the gym floor. ADA visitors have elevator and stair access to ADA seats on the gym floor via a northwest stair and elevator. Public access is limited on the lower level by card access only readers.

Spectators access the gym via two concourses leading to both a top-loaded seat section at the west and a floor-loaded seating area at the east. Additional bleacher floor seating on the south side of the gym is also available. The gym seats approximately 1,400 for basketball. West side seating consists of retractable seat-back bleachers and non-seatback bleachers on 30” wide platforms. East side seating consists of be retractable 30” wide bleachers also with seat backs. Bleachers retract to allow a two-court practice configuration running east-west. Flooring will be a resilient wood basketball floor with striping for basketball and volleyball. Gym storage is located in the adjacent racquetball building.

Scoreboards purchased three years ago will be the reused in the new gymnasium. The sound system will be replaced with a newer sound system capable of supporting the larger gym space.

ADA wheelchair and companion locations are interspersed on the concourse and gym floor levels in compliance with ADA regulations. ADA floor patrons can access the gym floor via the concourse elevator and stair. Single hole rest rooms are provide at the gym floor level for ADA patrons. Other patrons are asked to use the rest rooms on the main concourse. Rest rooms at the main concourse are located just inside the main doors and at the west side. Assistive listening devices are available.

All athletic locker rooms and support spaces are located on the lower level. Athletic spaces can be accessed through the main west lobby stair and elevator. Locker rooms are grouped by gender to allow access to a large dedicated shower, toilet and lavatory areas shared by teams. Each locker room is sized to comfortably accommodate the number of student athletes for each sport. Locker rooms have convenient access to equipment and laundry areas and treatment and taping which are all located on the lower level. Track and field locker rooms will have separate shower, toilet and lavatories for each locker room, with these lockers potentially serving as visitor's locker rooms in the off season. A single dedicated Visitor Locker is located in the existing Dance Building lower level locker room.

Staff, officials, and coaches can use two Flex Locker Rooms also located at the lower level. The Flex lockers can also function as private lockers for athletes when needed.

The Wrestling Gym features 3,250 square feet and includes area for mat storage. Double doors lead from the wrestling gym and into the main corridor gym doors.

The Laundry/Equipment room and Sports Medicine treatment and taping areas have direct exterior access on the north side of the building. Equipment and Laundry facilities are located in the renovated racquetball building and consist of three washers and four gas dryers, all commercial grade equipment. Equipment check-in and storage is directly connected to the Laundry. Four-foot wide doors to the Equipment Issue and Laundry accommodate rolling carts and equipment installation and removal. Secure wire-mesh partition equipment storage cubicles are provided for sport teams.

Treatment and taping consists of a large open area with approximately eight treatment tables and eight taping tables. An ice/water area is provided, along with three walled private offices and separate Hydrotherapy area for future in-ground therapy tubs.

Storage rooms and existing locker rooms are located under the Auxiliary/MAC gym. The locker rooms will be used by the Track and Field teams and will be minimally refurbished to meet current building codes and ADA requirements.

Academics

The building renovation and new construction will greatly improve SOU's Health and Physical Education and Outdoor Adventure Leadership program spaces. Students and staff will enter the academic wing at the main south entry, passing in front of the SRC control desk. Access to the east academic side will be uncontrolled, allowing academics to freely access academic spaces. A large entry lounge will accommodate both academics and SRC users, creating an inviting social area with TVs, carpeted inserts at soft furniture locations off the main entrance. Public rest rooms are provided just off the main entry lounge.

Three dedicated smart classrooms are planned, two with 35-student capacity, and one tiered 75 person classroom. Moveable tables and chair seating is planned for the smaller classrooms, while fixed tables and moveable chairs will be in the large tiered classroom. Finishes in classrooms will be painted drywall, carpet tile and acoustical tile ceilings.

A large 6-desk Physiology Lab is located next to a Team Building Room on the lower level. The two spaces have an operable partition dividing them, allowing the spaces to be

combined into a single larger classroom or Team Building Room when needed. The Lab will accommodate two treadmills, two stationary bikes and scales. Built-in lockable millwork and countertops are located in the space and include a small wash sink and storage. Sports' Medicine's adjacent Hydrotherapy area will contain the existing hydrostatic weighing tank used by academics.

Staff offices are located on the second floor south side of the building, with windows providing natural light to the outer offices and borrowed lights providing daylight to interior spaces. The suite features a reception and waiting area, administrative office space, eight dedicated staff offices, work/break room, conference room, and storage. Finishes in the space will be painted drywall, carpet tile and resilient goods flooring and acoustical tile ceilings.

Activity spaces in the academic wing are located near the offices. The existing Auxiliary/MAC gym will be renovated and serve shared uses with Academics leasing space in the gym from the Student Recreation Center. The Auxiliary Gym has dedicated storage and will feature durable interior finishes suitable for a wide variety of activities from soccer to inline skating and basketball. The existing Dance building will be renovated structurally with interior uses to remain the same, the intent is to save in place as much of the existing building and features as possible. The Dance Room will incorporate smart classroom technology to serve classroom type uses as well as exercise/dance uses. The Dance room will have a sprung resilient dance floor, mirrors and sound system. The existing balcony on the north side of the Dance room will be renovated. Storage uses in the Dance room will remain in the existing closets.

Student Recreation Center

The Student Recreation Center is access on the south side off of the Webster St. pedestrian paths. A landscaped outdoor gathering area off of Webster St. welcomes building visitors to the main entry doors. The main lobby features a large, daylit space with south-facing windows. Custom-millwork creates the Control Desk featuring three computer workstations and storage for small equipment check-out, towel drop and storage. The Control Desk has open viewing to front lounge areas, the academic wing entry and the interior entry to Outdoor Program. Tree turnstiles monitor traffic entering the SRC, while a series of three gate allow exiting through the lobby in full view of the control desk.

Main level SRC uses include a two-court Recreation Gym and storage, single court shared use Auxiliary/MAC Gym and storage, two Group Exercise Rooms with shared storage, men's and women's locker rooms, private locker rooms, administrative offices and the Outdoor Program suite.

The main recreation gym will feature two courts with basketball and volleyball striping and built-in retractable basketball hoops, volleyball inserts and safety padding. Scoreboards will be provided for each court. Wood basketball flooring will cover the entire space. A motorized divider curtain will be located between the courts. Views into the Recreation Gym from circulation areas will create a very open atmosphere. A two-lane suspended running track with rolled rubber flooring runs along the perimeter of the gym, 16' above the gymnasium floor.

Academics and Recreation will share the renovated Auxiliary/MAC gym. Activities in this gym will range from yoga to heavy-use sports of soccer and inline skating. As such the gym will feature very durable finishes and an interlocking grid flooring such as Sport Court. A dropped ceiling in the space will be impact resistant and require little maintenance. New fixed basketball hoops will be provided, as well as volleyball inserts and new safety padding. A new scoreboard is planned. The sound system will be individually controlled in the space.

Group Exercise Rooms are located on the second floor and will feature wood resilient flooring Room 1, rubber athletic flooring in Room 2. Mirrored walls will be included in both spaces and a ballet barre included in Group Exercise Room 1. Ceiling will be primarily suspended acoustical ceiling tile with gypsum board accents. Each room will have individual sound control and multi-level lighting. An adjacent shared storage room is sized to accommodate equipment for various activities including steps, balance balls, mats, hand weights and bands. Small exercise equipment for spin classes can also be accommodated in the space.

Recreation locker rooms will feature dry locker areas with single and two-tier lockers, 40 locker footprints are provided in each locker room. Showers, toilet and lavatories in the wet area are designed for maximum privacy. Locker entries are blocked with a view baffle from the public corridor. Finishes in the locker rooms include porcelain mosaic tile floors for slip resistance, porcelain tile and epoxy painted walls, hard lid ceilings, phenolic plastic lockers and benches, and quartz countertops. Toilet accessories will be stainless steel or owner-provided plastic vendor provided dispensers.

Administrative offices are located right of the main entry and feature a waiting/gathering area, administrative staff workstation, five dedicated offices, break/work room/student work area, conference room, and a shared Laundry.

Upper Level recreation spaces include an open cardio/weight/ plyometrics area, two-lane running track, Group Exercise rooms, rest rooms and support areas. Access to the upper level recreation space is via the main stair case and elevator located just behind the lower level Control Desk. The space is a light-filled open area with views to the south Webster St. pedestrian area. A Fitness Desk is located proximate to the Free Weight area. The desk has good views into both the cardio and weight room areas for monitoring safety. Large spaces open-to-below will enhance the openness of the facility.

Cardio equipment will be located on the west side of the space, overlooking the Climbing Gym below. Cardio units will have individual TVs and sound capability. Cardio theater TV's will supplement those on the equipment. Weight equipment will be located on the east side of space with a Plyometrics area and Selectorized equipment nearby.

A two-lane running track is open to the Recreation Gym below. A timing clock will be provided for the track. Daylight and views to the north are provided.

Mirrored walls are provided in the weight, cardio and plyometrics areas. Water stations with equipment wipe-down supplies and water bottle fillers are provided at convenient locations throughout the upper level.

Interior materials will be rubber athletic flooring or interlocking tiles suitable for weight room and cardio area use. Heavy weights may be supplemented by surface platform systems.

Two private rest rooms are located at this level for convenience.

Outdoor Program

Outdoor Program spaces are located to the west upon entering the main SRC lobby. A wide, open entry to Outdoor Program invites participants to the space, whereby staff located at a built-in millwork check-in Desk greet visitors. The desk is connected to administrative workstations and a private office for management staff. A large trip planning area is located just past the Check-In desk. The Trip Planning area overlooks the new 1,100 sf Climbing Gym and functions as a social gathering area for the Climbing Gym and OP trips. Laundry facilities are also located at the main level, shared with Recreation. OP small equipment storage is located off of the offices and trip planning room. A screened outdoor wash yard is adjacent to the small storage area. The outdoor wash yard is located on the southwest corner of the building and features a masonry privacy wall. The wash bay includes hose bibbs and a grated trench drainage basin. Hanging drying racks and equipment storage racks can be located in the walled area. Gates will close the walled area off from the main pedestrian areas.

Large equipment storage is located on lower level and has exterior access to a second outdoor equipment wash area.

The Climbing Gym will feature a custom wall sculpted to look like natural rock. High walls will be 40' high and feature a teaching ledge at approximately 16' off the gym floor. Bouldering areas will be incorporated into the wall design. Floor surfacing will be rolled rubber over foam padding. The design of the climbing wall will be managed through a design-build process with SOU and the selected provider working closely with the owner and design team to design the wall and wall features.

Large equipment (kayaks, canoes, etc) will be stored in an Outdoor Program Storage space located in the Racquetball building. Storage is accessed via a new overhead door opening to the north service drive accessed off Stadium St. A walled trailer parking area is also located on the north side for equipment and trailer storage.

General Building Areas

An extension to the campus steam tunnel services will enter the building on the west side. The tunnel elevation will be below above the lower level finish floor elevation requiring a short ladder to access the tunnel from the main Mechanical Room. Domestic water will also enter the building at the west side. Walls will be painted and concrete floors sealed. Refer to the Mechanical narrative for systems information.

Custodial services feature a main Custodial Room at the lower level, with support custodial spaces on the main and upper levels. Custodial rooms will feature a mop sink, mop rack, floor drain and rubber flooring for slip resistance.

Storage is located in a portion of the lower level Auxiliary Gym.

The Main Electrical room is located at the west side of the building, lower level, near the anticipated main transformer and primary feed. The room will be fire rated per code

requirements. MDF, IDF, and secondary electrical rooms are located throughout the building to accommodate systems. Refer to the Electrical Narrative for systems information.

4,500# hydraulic elevators are proposed at the two elevator locations. Cabs are capable of carrying a wheeled stretcher and large equipment such as treadmills and floor machines. Cab finishes will be stainless steel panels and ceilings with stainless steel rails and bumpers. Surfaces will be protected with portable, heavy-duty wall blankets when used for service. Oil sensing pumps will be used to detect hydraulic oil in the sump pit. Security camera located in the ceiling.

Exterior Materials

Exterior imagery at the main front entry is characterized by building forms employing flat cantilevered roofs supported by anodized glass storefront framing systems, blond brick masonry and insulated metal rainscreen-system wall panel systems. Glazing will be campus standard clear Low-E insulted units with mullion extensions and/or aluminum louvered shades provided for added shading. Glazing on the west elevations will be shaded with aluminum sunshades as necessary to reduce glare and heat gain. Colored metal column covers located at the main west Athletics entry and main south Academics and Student Recreation entries will employ SOU red to announce entry locations and provide a signature look to the new facility.

Large volumes including the Competition Gym, Recreation Gym and Auxiliary Gym and north elevations will have more economical, yet durable and aesthetically pleasing elastomeric finishes matching many of SOU's newer buildings.

Roofs shall be single ply TPO membrane systems over continuous insulation. Existing built-up roofs on the Dance Building and Auxiliary/MAC Gym will be replaced with single ply TPO systems to the extent possible given existing flat roofs and adjacent new construction. Roof access is provided at the upper level floor though the north stair tower. Access to adjacent roof areas will be via roof ladders. Roof top mounted HVAC units will be screened by building walls where available and by aluminum mechanical screens where exposed to view.

Refer to the Exterior Elevations and Outline Specifications for additional information.

Interior Materials

Refer to the Interior Materials pictorial outline included in the Outline Specifications portion of the booklet for proposed finishes in the major program areas.

Building Code Review

Building:	Southern Oregon University McNeal Pavilion Addition & New Student Recreation Center
Location:	Ashland, Oregon
Proposed Types of Construction:	Bldg 1 (west): Type IIB Athletics/Competition Gym Bldg 2 (middle): Type IIA Recreation Center. 1-hr rated primary structural frame, interior and exterior bearing walls and floor construction, roof construction less than 20 feet above finish floor. 1-hour rated cementitious fireproofing on primary structural steel members Bldg 3 (east): Type VB Existing Dance and Auxiliary Gym buildings plus connecting new building structure 2-hour fire wall separates each building.

TOTAL COMBINED BUILDING AREA: 128,800 GSF enclosed, 3,000 additional outdoor balcony areas

APPLICABLE CODES:

2014	Oregon Structural Specialty Code (based on 2012 IBC)
2014	Oregon Mechanical Specialty Code
2014	Oregon Plumbing Specialty Code
2014	Oregon Energy Efficiency Specialty Code
2011	Oregon Electrical Specialty Code
2012	Oregon Fire Code (based on 2012 IFC)
2010	ADAAG
2003	ICC/ANSI A117.1
2007	ASME A17.1 Elevator Code

Proposed Occupancies:

A-3 Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including but not limited to:

Gymnasiums Climbing Wall
Exercise Rooms Recreation Gymnasiums Locker Rooms

A-4 Assembly Uses intended for viewing of indoor sporting events and activities with spectator seating including:
Competition Gymnasium

B Business Group B occupancy includes, among others, the use of a building or structure or a portion thereof for office, professional, or service type actions…
Office suites, Locker Rooms

S-1 Storage Group S-1 Moderate Hazard Storage. Occupancy includes, among others, the use of a building, structure, or portion thereof for storage that is not classified as hazardous occupancy.
General Building Storage *Outdoor Program Storage*

Building 1 - Athletics										
Building Area Modifications:										
Type IIB (2 stories, 9,500sf)										
		Equation 5-2	I_f = (f/p - .25) w/30							
			I_f = (432/719 - 25) 30/30					=		0.35
Total Allowable Area Increase Per Floor		Equation 5-1	$A_a = A_t+(A_t \times I_f) + (A_t \times I_s)$							
			A a =(9,500 + (9,500 x 0.35) + (9,500 x 2))					=		31,825
Equation 5-1:										
Occupancy	Basic Floor Area per floor (IIB)	Frontage Increase Equation 5-2	200% sprinkler increase	Total Allowable Area Increase per floor: Sum of Basic Floor Area, Frontage and Fire Sprinkler Increases					Actual Area GSF	
A-4	9,500	3,325	19,000	31,825					Lower	24,607
									Main	12,557
									Upper	N/A
								TOTAL BUILDING 1 AREA		37,164
Building 2 - Recreation										
Building Area Modifications:										
Type IIA (3 stories, 15,500sf)		Equation 5-2	I_f = (f/p - .25) w/30							
			I_f = (563/1169- 25) 30/30					=		0.23
Total Allowable Area Increase Per Floor		Equation 5-1	$A_a = A_t+(A_t \times I_f) + (A_t \times I_s)$							
			A a =(15,500 + (15,500 x 0.23) + (15,500 x 2))					=		50,065
Equation 5-1:										
Occupancy	Basic Floor Area per floor (IIA)	Frontage Increase Equation 5-2	200% sprinkler increase	Total Allowable Area Increase per floor: Sum of Basic Floor Area, Frontage and Fire Sprinkler Increases					Actual Area GSF	
A-4	15,500	3,565	31,000	50,065					Lower	17,495
									Main	32,992
									Upper	19,817
								TOTAL BUILDING 2 AREA		70,304
Building 3- Academics										
Building Area Modifications:										
Type VB (1 story, 6,000sf)		Equation 5-2	I_f = (f/p - .25) w/30							
			I_f = (264/583 - 25) 30/30					=		0.20
Total Allowable Area Increase Per Floor		Equation 5-1	$A_a = A_t+(A_t \times I_f) + (A_t \times I_s)$							
			A a =(6,000 + (6,000 x 0.20) + (6,000 x 2))					=		19,200
Equation 5-1:										
Occupancy	Basic Floor Area per floor (IIIB)	Frontage Increase Equation 5-2	200% sprinkler increase	Total Allowable Area Increase per floor: Sum of Basic Floor Area, Frontage and Fire Sprinkler Increases					Actual Area GSF	
A-3	6,000	1,217	12,000	19,200					Lower	10,689
									Main	12,739
									Upper	NA
								TOTAL BUILDING 3 AREA		23,428
								TOTAL COMBINED AREA		130,896

2.4 Sustainability and LEED

LEED® CREDIT SUMMARY

LEED certification provides third-party verification that a building was designed and built using strategies aimed at achieving high performance in key areas of human and environmental health: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation in Design. Each category consists of prerequisites and credits. Prerequisites are required strategies that must be implemented to achieve LEED certification. Credits are optional strategies that projects can elect to pursue to gain points toward LEED certification. The LEED rating system has 100 base points plus six Innovation in Design and four Regional Priority points for a total of 110 points. Projects achieve certification if they earn points according to the following levels: Certified: 40-49 points; Silver: 50-59 points; Gold: 60-79 points; Platinum: 80+ points. LEED registration fee will be $900 and paid at the time of registration. The certification fee is based on the project size and paid when the project team is ready to submit the application for review. The project shall register under the LEED Rating System: LEED Building Design + Construction: New Construction and Major Renovation 2009 Version 3. Certification to be achieved: Gold, requiring a minimum of 60 points.

LEED Status Summary	
LEED Target:	Gold
Points Needed:	60
Current Points	
Yes:	65
Probable Yes:	16
Probable No:	17
No:	13

LEED CREDIT REQUIREMENTS FOR CURRENT 'YES' AND 'PROBABLE YES' POINTS

SUSTAINABLE SITES: AT LEAST 18 POINTS TO BE ACHEIVED

SS Prerequisite 1: Construction Activity Pollution Prevention – REQUIRED – NO POINTS

During construction: The General Contractor shall create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan must conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit OR local standards and codes, whichever is more stringent. The plan must describe the measures implemented to accomplish the following objectives:

- To prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- To prevent sedimentation of storm sewers or receiving streams.
- To prevent pollution of the air with dust and particulate matter.

The EPA's construction general permit outlines the provisions necessary to comply with Phase I and Phase II of the National Pollutant Discharge Elimination System (NPDES) program. While the permit only applies to construction sites greater than 1 acre, the requirements are applied to all projects for the purposes of this prerequisite. Information on the EPA construction general permit is available at http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.

SS Credit 1: Site Selection –1 POINT

The project is not located on any of the inappropriate or environmentally sensitive lands defined for this credit.

- Prime farmland as defined by the U.S. Department of Agriculture in the United States Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 (citation 7CFR657.5).
- Previously undeveloped land whose elevation is lower than 5 feet (1.5 meters) above the elevation of the 100-year flood as defined by the Federal Emergency Management Agency (FEMA), an equivalent local regulatory agency, or a professional hydrologist.
- Land specifically identified as habitat for any species on federal or state threatened or endangered lists.
- Land within 100 feet (30 meters) of any wetlands as defined by the U.S. Code of Federal Regulations 40 CFR, Parts 230-233 and Part 22, or a local equivalent definition outside the U.S., and isolated wetlands or areas of special concern identified by state or local rule, OR within setback distances from wetlands

prescribed in state or local regulations, as defined by local or state rule or law, whichever is more stringent.

- Previously undeveloped land that is within 50 feet (15 meters) of a water body, defined as seas, lakes, rivers, streams and tributaries that support or could support aquatic life, recreation or industrial use, consistent with the terminology of the Clean Water Act.

SS Credit 2: Development Density and Community Connectivity –5 POINTS

The project is on a site that meets the criteria for Option 2, Community Connectivity.

Project building is on a site that meets the following criteria:

- Is located on a previously developed site,
- Is within 1/2 mile of a residential area or neighborhood with an average density of 10 units per acre net,
- Is within 1/2 mile of at least 10 basic services, and has as pedestrian access between the building and the services.

SS Credit 3: Brownfield Redevelopment – 1 POINT

The project is being developed on a building/site where asbestos has been found and shall be remediated. Testing should be done in accordance with EPA Reg 40CFR part 763, when applicable. Asbestos consultant shall complete an asbestos assessment (identification and testing) and report explaining the extent of contamination and required action in accordance with EPA 40-CFR-763 (Code of Federal Regulations, Chapter 40, Part 763) and the Asbestos NESHAP (National Emission Standards for Hazardous Air Pollutants) program. The USGBC has permitted asbestos assessments performed in accordance with this regulation as equivalent to a Phase II ESA.

SS Credit 4.2: Alternative Transportation – Bicycle Storage and Changing Rooms – 1 POINT

Secure bicycle racks and/or storage within 200 yards of a building entrance for 5% or more of all building users (measured at peak periods) and shower and changing facilities in the building, or within 200 yards of a building entrance, for 0.5% of full-time equivalent (FTE) occupants are to be provided.

SS Credit 4.3: Alternative Transportation – Low-Emitting and Fuel-Efficient Vehicles – 1 POINT

The project shall pursue Option 2, Alternative fuel.

Alternative-fuel fueling stations are to be provided for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.

SS Credit 4.4: Alternative Transportation – Parking Capacity – 1 POINT

The project shall meet the credit criteria by providing preferred parking for carpools or vanpools. The minimum amount of spaces shall be determined.

SS Credit 5.1: Site Development – Protect or Restore Habitat – 1 POINT

The project shall restore or protect a minimum of 50% of the site (excluding the building footprint) with native or adapted vegetation.
Due to the limited landscape opportunities, there may also be the option to donate offsite land in perpetuity, equal to 60% of the previously developed area (including the building footprint), to a land trust within the same EPA Level III Eco-region identified for the project site. The land trust must adhere to the Land Trust Alliance 'Land Trust Standards and Practices' 2004 Revision.

SS Credit 5.2: Site Development – Maximize Open Space – PROBABLE - 1 POINT

The building footprint and open space shall be designed for Case 2, sites with no local zoning requirements. Land available to designate as vegetated open space adjacent to the building that is equal in the area to the building footprint shall be identified elsewhere on campus.

SS Credit 6.1: Stormwater Design – Quantity Control – 1 POINT

Existing site imperviousness is greater than 50%. The stormwater management plan and site design shall reduce runoff rate and quantify by at least 25% in the volume of stormwater runoff from the 2-year 24-hour design storm.

SS Credit 6.2: Stormwater Design – Quality Control –1 POINT

The stormwater management plan and site design shall reduce impervious cover, promote infiltration and capture and treat the stormwater runoff from 90% of the annual rainfall using acceptable best management practices (BMPs). BMPs used to treat runoff must be capable of removing 80% of the average annual post development total suspended solids (TSS) load based on existing monitoring reports.

SS Credit 7.1: Heat Island Effect – Non-roof – PROBABLE - 1 POINT

The site design shall reduce thermal gradient differences by:

- Use shade from the existing tree canopy or within 5 years of landscape installation. Landscaping (trees) must be in place at the time of occupancy.
- Use shade from structures covered by solar panels that produce energy used to offset some nonrenewable resource use.
- Use shade from architectural devices or structures that have SRI of at least 29.
- Use hardscape materials with an SRI of at least 29.
- Use paving with reflectance of at least 0.3, such as Portland cement concrete paving, which typically has a reflectance of 0.3 to 0.4.

SS Credit 7.2: Heat Island Effect – Roof – 1 POINT

The roofing design shall reduce thermal gradient differences by:

- Using high reflectance and high emissivity roofing for at least 75% of roof area, such as white thermoplastic sheet roofing.
- SRI must be equal to or greater than the values in the table listed in the LEED Reference Guide.

SS Credit 8.0: Light Pollution – PROBABLE - 1 POINT

The project shall comply with one of the two interior lighting options and the requirement for exterior lighting by:

- Reducing input power or have shielding
- For exterior lighting, light areas only as required for safety and comfort.

WATER EFFICIENCY: 7 POINTS TO BE ACHIEVED

WE Prerequisite 1: Water Use Reduction – REQUIRED – NO POINTS

Appropriate high efficiency and/or waterless fixtures shall be specified. Strategies will aggregate use 20% less water than the baseline for the building. Calculations are based on estimated occupant usage and must include only the following fixtures and fixture fittings (as applicable to the project scope): water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves.

WE Credit: Water Efficient Landscaping – 4 POINTS

For Option 1, landscaping that reduces potable water consumption for irrigation by 50% from a calculated midsummer baseline case or using the month with the highest irrigation demand shall be included. Reductions must be attributed to a combination of the following items:

- Plant species, density and microclimate factor
- Irrigation efficiency
- Use of water treated and conveyed by a public agency specifically for non-potable uses

To achieve 4 points, the project shall meet the requirements of Option 1 and use only water treated and conveyed by a public agency specifically for non-potable uses for irrigation.

WE Credit: Water Use Reduction – 35% REDUCTION - 3 POINTS

30% (2 Points); 35% (3 Points); 40% (4 Points)

The project shall use appropriate high efficiency and/or waterless fixtures that in aggregate use less water than the water use baseline calculated for the building (not including irrigation). Calculations are based on estimated occupant usage and must include only the following fixtures and fixture fittings (as applicable to the project scope): water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves.

ENERGY & ATMOSPHERE: AT MINIMUM 17 POINTS TO BE ACHIEVED

EA Prerequisite 1: Fundamental Commissioning of Building Energy Systems – REQUIRED – NO POINTS

Commissioning shall be performed by and under the supervision of an independent commissioning authority as contracted by the Owner. The CxA must report results, findings and recommendations directly to the Owner. The following commissioning process activities must be completed:

- Designate an individual as the commissioning authority (CxA) to lead, review and oversee the completion of the commissioning process activities.

- The owner must document the owner's project requirements. The design team must develop the basis of design. The CxA must review these documents for clarity and completeness. The owner and design team must be responsible for updates to their respective documents.
- Develop and incorporate commissioning requirements into the construction documents.
- Develop and implement a commissioning plan.
- Verify the installation and performance of the systems to be commissioned.
- Complete a summary commissioning report.

Commissioning process activities shall be completed for the following energy-related systems, at a minimum:

- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls.
- Lighting and daylighting controls.
- Domestic hot water systems.
- Renewable energy systems (solar).

EA Prerequisite 2: Minimum Energy Performance - REQUIRED – NO POINTS

For Option 1, whole building energy simulation, the building envelope, HVAC, lighting, etc. shall be designed to meet the criteria.

The baseline building performance rating must be calculated according to the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda) using a computer simulation model for the whole building project. Projects outside the U.S. may use a USGBC approved equivalent standard.

Appendix G of Standard 90.1-2007 requires that the energy analysis done for the building performance rating method include all energy costs associated with the building project. To achieve points using this credit, the proposed design must meet the following criteria:

- Comply with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2007 (with errata but without addenda) or USGBC approved equivalent.
- Inclusion of all the energy costs within and associated with the building project.
- Compare against a baseline building that complies with Appendix G of Standard 90.1-2007 (with errata but without addenda[1]) or USGBC approved equivalent. The default process energy cost is 25% of the total energy cost for the baseline building. If the building's process energy cost is less than 25% of the baseline building energy cost, the LEED submittal must include documentation substantiating that process energy inputs are appropriate.

For the purpose of this analysis, process energy is considered to include, but is not limited to, office and general miscellaneous equipment, computers, elevators and escalators,

kitchen cooking and refrigeration, laundry washing and drying, lighting exempt from the lighting power allowance (e.g., lighting integral to medical equipment) and other (e.g., waterfall pumps).

Regulated (non-process) energy includes lighting (for the interior, parking garage, surface parking, façade, or building grounds, etc. except as noted above), heating, ventilation and air conditioning (HVAC) (for space heating, space cooling, fans, pumps, toilet exhaust, parking garage ventilation, kitchen hood exhaust, etc.), and service water heating for domestic or space heating purposes.

Process loads must be identical for both the baseline building performance rating and the proposed building performance rating. However, project teams may follow the exceptional calculation method (ANSI/ASHRAE/IESNA Standard 90.1-2007 G2.5) or USGBC approved equivalent to document measures that reduce process loads. Documentation of process load energy savings must include a list of the assumptions made for both the base and the proposed design, and theoretical or empirical information supporting these assumptions.

EA Prerequisite 3: Fundamental Refrigerant Management - REQUIRED – NO POINTS

No use of chlorofluorocarbon (CFC)-based refrigerants shall be used in any new base building heating, ventilating, air conditioning and refrigeration (HVAC&R) systems.

EA Credit 1: Optimize Energy Performance – AT LEAST 10 POINTS

For Option 1, whole building energy simulation (1-19 points), the building envelope, HVAC, lighting, etc. shall be designed to meet the criteria for the number of points indicated.

The energy model will demonstrate at least 30% improvement in the proposed building performance rating compared with the baseline building performance rating. The baseline building performance will be calculated according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda) using a computer simulation model for the whole building project. Projects outside the U.S. may use a USGBC approved equivalent standard. See LEED Reference Guide for minimum energy cost savings percentage for each point threshold.

EA Credit 2: On-site Renewable Energy – 3% RENEWABLE ENERGY - AT LEAST 2 POINTS

An on-site solar photovoltaic system shall be designed to offset building energy costs. Project performance will be calculated by expressing the energy produced by the renewable system as a percentage of the building's annual energy cost.

1% (1 point); 3% (2 points); 5% (3 points); 7% (4 points); 9% (5 points); 11% (6 points); 13% (7 points)

EA Credit 3: Enhanced Commissioning – 2 POINTS

A contract shall be in place to implement the following additional commissioning process activities in addition to the requirements of EA Prerequisite 1: Fundamental Commissioning

of Building Energy Systems and in accordance with the LEED Reference Guide for Green Building Design and Construction, 2009 Edition:

- Prior to the start of the construction documents phase, the Owner shall designate an independent commissioning authority (CxA) to lead, review, and oversee the completion of all commissioning process activities. The CxA must report results, findings and recommendations directly to the owner.
- The CxA must conduct, at a minimum, 1 commissioning design review of the owner's project requirements basis of design, and design documents prior to the mid-construction documents phase and back-check the review comments in the subsequent design submission.
- The CxA must review contractor submittals applicable to systems being commissioned for compliance with the owner's project requirements and basis of design. This review must be concurrent with the review of the architect or engineer of record and submitted to the design team and the owner.
- The CxA or other project team members must develop a systems manual that provides future operating staff the information needed to understand and optimally operate the commissioned systems.
- The CxA or other project team members must verify that the requirements for training operating personnel and building occupants have been completed.
- The CxA must be involved in reviewing the operation of the building with operations and maintenance (O&M) staff and occupants within 10 months after substantial completion. A plan for resolving outstanding commissioning-related issues must be included.

EA Credit 5: Measurement & Verification – 1 POINT

For Option 3, Third Party Data Source (1 point), the project shall meet Minimum Performance Requirement 6 through compliance Option 1: Energy and Water Data Release Form. The project must register an account in ENERGY STAR's Portfolio Manager and share the project file with the USGBC master account.

EA Credit 6: Green Power – 2 POINTS

The Owner shall engage in at least a 2-year renewable energy contract to provide at least 35% of the building's electricity from renewable sources, as defined by the Center for Resource Solutions' Green-e Energy product certification requirements or an equivalent.

All purchases of green power shall be based on the quantity of energy consumed, not the cost. The annual electricity consumption from the results of EA Credit 1: Optimize Energy Performance shall be used to determine the baseline electricity use.

If the green power is not Green-e Energy certified, equivalence must exist for both major Green-e Energy program criteria: 1) current green power performance standards, and 2) independent, third-party verification that those standards are being met by the green power supplier over time.

MATERIALS & RESOURCES – AT LEAST 6 POINTS ACHIEVED
MR Perquisite 1: Storage and Collection Recyclables – REQUIRED – NO POINTS
An area shall be designated for collection and storage of recyclables for the entire building. Materials must include at a minimum paper, corrugated cardboard, glass, plastics and metals.

MR Credit 2: Construction Waste Management – 75% MINIMUM - 2 POINTS
General contractor shall be required to develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or comingled. Construction procedures and measurement of diverted waste shall be specified. Waste prevention and disposal procedures specific to certain types of work shall be specified.
The minimum percentage debris to be recycled or salvaged is as follows: 50% (1 Point); 75% (2 Points).

MR Credit 4: Recycled Content – 20% MINIMUM - 2 POINTS
For new building materials, products that incorporate recycled content material shall be specified, such that the sum of post-consumer recycled content plus one-half of the post-industrial recycled content shall constitute at least 20% of the total value of all products installed, except mechanical and electrical components.

MR Credit 5: Regional Materials – 20% EXTRACTED, PROCESSED & MANUFACTURED REGIONALLY - 2 POINTS
For new building materials, regionally-sourced products that are extracted, harvested or recovered, as well as manufactured within 500 miles the location of the project shall be specified.

MR Credit 6: Rapidly Renewable Materials – UNDECIDED - 1 POINT
Rapidly renewable building materials and products made from agricultural products that are typically harvested within a 10-year or shorter cycle shall be specified. To achieve the credit, the project must use rapidly renewable building materials and products for 2.5% of the total value of all building materials and products used in the project, based on cost.

MR Credit 7: Certified Wood – UNDECIDED - 1 POINT

Wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria, for wood building components, shall be specified. To achieve the credit, a minimum of 50% (based on cost) of wood-based materials and

products must be FSC certified. Components may include at a minimum, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. Wood products purchased for temporary use on the project (e.g., formwork, bracing, scaffolding, sidewalk protection, and guard rails) may be included in the calculation at the project team's discretion. If any such materials are included, all such materials must be included in the calculation. Furniture may be included if it is included consistently in MR Credits 3. Materials Reuse, through MR Credit 7: Certified Wood.

INDOOR ENVIRONMENTAL QUALITY: A MINIMUM OF 8 POINTS ACHIEVED

EQ Prerequisite 1: Minimum Indoor Environmental Quality – REQUIRED – NO POINTS

The building ventilation shall be designed to meet the minimum requirements of ASHRAE 62.1-2007, or the applicable local code, whichever is more stringent.

EQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control – REQUIRED – NO POINTS

***The Owner shall prohibit smoking in the building, and on the property within** 25 feet (8 meters) of entries, outdoor air intakes and operable windows. Signage shall be included to allow smoking in designated areas, prohibit smoking in designated areas or prohibit smoking on the entire property.*

EQ Prerequisite 3: Outdoor Air Delivery Monitoring – REQUIRED – NO POINTS

Permanent monitoring systems shall ensure that ventilation systems maintain design minimum requirements. Carbon dioxide monitoring and alarm system shall be specified. All monitoring equipment shall be configured to generate an alarm when the airflow values or carbon dioxide (CO_2) levels vary by 10% or more from the design values via either a building automation system alarm to the building operator or a visual or audible alert to the building occupants.

EQ Credit 3.1: Construction IAQ Management Plan – During Construction – 1 POINT

Contractor shall be required to develop and implement an IAQ management plan for the construction and preoccupancy phases of the building as follows:

- During construction, meet or exceed SMACNA IAQ Guidelines
- Protect stored on-site and installed absorptive materials from moisture damage.
- Use filtration media at each return air grille MERV 8 or better and replace immediately prior to occupancy

EQ Credit 3.2: Construction IAQ Management Plan – Before Occupancy – 1 POINT

Contractor shall be required to develop an IAQ management plan, and perform either a full building flush-out or air quality testing prior to occupancy.

EQ Credit 4.1: Low-Emitting Materials: Adhesives & Sealants – 1 POINT
Only products having volatile organic compound (VOC) content not greater than required by SCAQMD Rule No.1168 shall be used on the project. For aerosol adhesives, only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36 shall be specified.

EQ Credit 4.2: Low-Emitting Materials: Paints & Coatings– 1 POINT
Only coatings that comply with the most stringent requirements specified in the following shall be used on the project:

1. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
2. USGBC LEED Rating System, LEED 2009 for New Construction and Major Renovation, for interior wall and ceiling finish (all coats), anti-corrosive paints on interior ferrous metal, clear wood stains and finishes, sanding sealers, other sealers, shellac, and floor coatings.
    a. Architectural Paints and Coatings: Do not exceed VOC content limits established in GreenSeal GS-11.
    b. Anti-Corrosive and Anti-Rust Paints: Do not exceed VOC content limits established in GreenSeal GC-03.
    c. Clear Wood Finishes, Floor Coatings, Stains, Primers and Shellacs: Do not exceed the
    d. VOC content limits established in SCAQMD Rule No. 1113.

EQ Credit 4.3: Low-Emitting Materials: Flooring Systems– 1 POINT
Only flooring products that comply with the following shall be specified and installed on the project:

1. Carpet and Rug Institute Green Label Plus program for carpet and carpet cushion.
2. VOC limit of 50 g/L for carpet adhesive.
3. FloorScore certified hard surface flooring.
4. VOC content limits established in SCAQMD Rule No. 1113 for floor finishes
5. VOC content limits established in SCAQMD Rule 1168 for tile settings adhesives and grout.

EQ Credit 4.4: Low-Emitting Materials: Composite Wood & Agrifiber Products (and adhesives used for laminating them) – 1 POINT
Only products having no added urea-formaldehyde resins in composite wood and agrifiber products shall be specified and installed on the project.

EQ Credit 5: Indoor Chemical and Pollutant Source Control - UNDECIDED– 1 POINT

Undecided point, but may be achieved through: 1) outside air and return air are to be provided with filtration media; 2) independent exhaust shall be provided for rooms where hazardous gases or chemical may be present; 3) at high volume entryways, provide permanent grilles or grates to capture dirt, etc.

EQ Credit 6.1: Controllability of Systems – Lighting– 1 POINT

Individual controls are to be provided for 90% (minimum) of the building occupants to enable adjustments to suit individual task needs and preferences. Lighting system controls are to be provided for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences.

EQ Credit 6.2: Controllability of Systems – Thermal Comfort– 1 POINT

Individual comfort controls are to be provided for 50% (minimum) of the building occupants to enable adjustments to meet individual needs and preferences. Operable windows may be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of a window. Comfort system controls are to be provided for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences.

EQ Credit 7.1: Thermal Comfort – Design– 1 POINT

Thermal comfort meeting the credit criteria is to be provided, with ventilation mechanical means.

For Option 1, ASHRAE standard 55-2004 or non-U.S. equivalent

Meet the requirements of ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy (with errata but without addenda[1]). Demonstrate design compliance in accordance with the Section 6.1.1 documentation. Projects outside the U.S. may use a local equivalent to ASHRAE Standard 55-2004 Thermal Comfort Conditions for Human Occupancy Section 6.1.1.

EQ Credit 8.1: Daylight and Views – Daylight– UNDECIDED- 1 POINT

Daylighting provided may meet the credit criteria through 1 of the 4 options, in at least 75% of spaces.

EQ Credit 8.2: Daylight and Views – Views - UNDECIDED – 1 POINT

Views provided may meet the credit criteria. The area with direct line of sight shall be determined by totaling the regularly occupied floor area:

- In plan view the area is within sight lines drawn from perimeter vision glazing.
- In section view a direct sight line can be drawn from the area to perimeter vision glazing.

It may be possible for the design to achieve a direct line of sight to the outdoor environment via vision glazing between 30 inches and 90 inches (between 0.8 meters and 2.3 meters) above the finish floor for building occupants in 90% of all regularly occupied areas.

INNOVATION AND DESIGN PROCESS – 5 POINTS

Innovation and Design credits can be achieved by 1) demonstrating exemplary performance of specific LEED NC credits (up to 3) and/or 2) by demonstrating an innovative approach/strategy of which can be borrowed from other existing rating systems. Borrowing credits from the LEED EBOM rating system are good candidates because SOU may already have certain policies, programs and operating practices in place that could be easily aligned or adapted. There are a few strategies that have been used by project teams for years that also make sense in a university setting. Project team shall engage with SOU's Sustainability & Recycling Coordinator to explore opportunities to align ID credit strategies with current objectives and practices.

Potential candidates include:

- EBOM MRp1: Sustainable Purchasing Policy
- LI 3115: Green Building Education
- EBOM MRp2: Solid Waste Management Policy
- EBOM EQc3.1: Green Cleaning Policy/Program
- EBOM SSc3: Integrated Pest Management, Erosion Control, and Landscape Management Plan
- Schools IDc3: The School as a Teaching Tool
- EBOM c2.0 MRc6: Additional Toxic Material Reduction – Reduced Mercury in Lamps

2.5 Structural

BACKGROUND

The proposed facility consists of a multi-story structure with floors and roofs located at varying heights throughout. The lower level is a partial basement placed below grade along the southerly half and at grade along the northerly half. The facility will utilize conventional construction techniques. It is our understanding the building will be separated with 2hr walls to create three building fire areas. The Competition Gym "Building 1" will be Type IIB, unprotected non-combustible construction. the Rec Center or middle portion "Building 2" will be Type IIA, protected non-combustible construction, and the existing Dance and Aux Gym will be Type VB, unprotected combustible construction. Building 1 and 2 will be constructed of steel framing with concrete walls, while Building 3 will be a combination of wood/steel framing with masonry and concrete wall construction. Building 3 also includes existing portions of the original construction to be incorporated into the new structural program and retrofit to meet current code.

BUILDING 1 & 2

Competition & Recreation Gymnasium

Roof Structure

The structural roof package at the larger roof spans can be created with steel 3" B-decking that will provide gravity load support for dead, live and snow loading and will serve as the structural diaphragm in the lateral force resisting system. In addition to typical code loads, it our understanding the roof will need to be designed to support mechanical equipment and direct attachment solar panels.

The decking can be supported by long span open web steel joist (OWSJ) framing spaced at 8' o.c. At this time, joist depth range falls within the 54" to 68" range. 60" joists have been selected for this phase. This selection will be refined as the project advances. The OWSJ framing system will be supported on two sides with concrete tilt-up bearing walls. The north and west walls will be constructed of steel frames with special moment frame connections at adjacent lower roof and upper roof levels.

Floor Structures

The structural floor package can be developed with the use of steel WF joists spaced at 4' to 6' o.c. topped with 3" composite steel decking and concrete slab. The large spans over the wrestling room will likely be combination of cantilevered WF beams to support simple span beams in order to reduce the clear span distance and limit deflections for the gym space above. Acoustical consideration for slab thickness and steel deck type will need to be

coordinated with the acoustical consultant to be sure heavy activity above has minimal impacts on the spaces below. Structural design of primary and secondary members will include vibration analysis to insure a level of performance expected from a modern facility.

The suspended running track above will be support off the adjacent concrete perimeter walls and hung from the roof framing above. The floor framing will consist of steel WF girders supporting B-decking with a concrete topping.

Wall and Seismic Lateral Force Resisting Systems

All of the lower level walls will be constructed of 10" to 12" poured-in-place concrete shear walls to create a podium at the main level for support of the superstructure. The taller gymnasium walls above the main level can be created using pre-cast concrete tilt-up wall panels. Anticipated wall thicknesses range between 7¼" & 9 ¼". Pre-cast concrete tilt-up can be site-cast or plant-cast and shipped to the site. The construction method and thickness will be refined as the project advances. The use of concrete tilt-up wall panels will require the engagement of a wall panel designer to prepare the necessary package for the handling, erection, and bracing of the panels until the complete lateral system has been established.

Masonry wall construction has been considered, but due to high eccentric loading conditions from intermittent floor and roof levels, it is our opinion standard masonry construction will not adequately perform without significant reinforcement, special detailing, and high strength masonry units. As a result, we expect the efficiency of masonry construction to be less reliable with respect to performance, problematic with respect to special inspection and construction, and cost prohibitive for this project.

At this time we expect to model the structure to work together as a unit to distribute forces. This will require special attention to vertical and horizontal irregularities to properly connect critical structural elements to create continuity throughout the structure. This approach will allow us to limit seismic isolation joint detailing that can be problematic with respect to finish details between building systems.

Clerestory at Rock Climbing, Lobby, Fitness, Classroom, Meeting and Office Space

Roof Structure

The roof structure in these spaces will be created using structural steel decking over open web steel joists. OWSJ depth will likely fall into the 18" to 24" depth range and can be spaced at 48" o.c. This selection will be refined as the project advances. The OWSJ system will be supported by WF beams supported by strategically located WF columns and concrete bearing walls along the adjacent gymnasiums. Columns in the lobby area will be exposed while columns in most other areas will be concealed within walls. However, there

may be some interior column sizes that do not presently fit interior non-structural wall cavities. These situations will need to be coordinated with the architect before DD advances much farther. This area of the roof will be used to support mechanical equipment. Acoustical consideration for the roof section will need to be coordinated with the acoustical consultant to be sure mechanical unit have minimal impacts on the spaces below.

Floor Structures

The structural floor package can be developed with the use of steel WF joists spaced at 48" o.c. topped with 3" composite steel decking and concrete slab. WF joist will be supported with steel WF girders spaced approximately 18' to 24' o.c. Acoustic and vibration analysis will be important considerations for slab thickness, steel deck type, and structural member sizes.

Steel WF floor girders will be supported by strategically located steel WF columns and concrete bearing walls along the adjacent gymnasiums. Column layout will be aligned with roof framing systems above to efficiently support loads continuously to foundations.

Wall and Seismic Lateral Force Resisting Systems

The wall system that will support the roof/ floor packages and laterally brace the building can be created using steel WF columns, WF perimeter beams, and light gage metal stud infill framing to support finishes and provide support for out-of-plane wind forces. In-plane lateral force resistivity will be accomplished with pre-cast concrete tilt-up wall panels strategically placed throughout the building between openings. It is our understanding that the wall section will consist of exterior veneer and interior furring as required to conceal the tilt-up panels thus allowing us the freedom to locate them for optimal system performance and economy.

Steel special moment frames will be used at the climbing wall clearstory areas where walls do not extend full height. Due to the roof step in the clearstory, steel moment frames will be used in the lobby areas in the transverse direction to support clearstory construction. Columns in this area will be exposed and coordination of the final column layout will be refined as the design advances.

At this time we expect to model the structure to work together as a unit to distribute forces. This will require special attention to vertical and horizontal irregularities to properly connect critical structural elements to create continuity throughout the structure. This approach will allow us to limit seismic isolation joint detailing that can be problematic with respect to finish details between building systems. It should also be noted that with 2hr building separation walls are required to be support on both sides to resist collops during a fire and there limiting the effective use of seismic isolations joint construction. This will require special attention to connection detailing along each side of these walls.

The existing racquetball court building will remain to provide the base for the second level office space above. The structure will be strengthened with steel headers and jambs at new openings and limits of wall demolition. The structural system for the office space above will required ordinary moment frames along the north wall.

BUILDING 3

Existing Auxiliary Gymnasium and Dance Studio

The scope of work for the existing area will include a complete structural rehabilitation of the existing structural system to comply with Life Safety level performance during seismic, wind, and snow code level events. The following outlines the recommendations based on our assessments of the structural deficiencies:

Roof Structure]

The plywood roof diaphragms require added blocking and nailing to improve shear capacity. A reliable diaphragm-to-shear wall and diaphragm-to-collector system must be developed at all diaphragm perimeters.

A primary glue-laminated roof beams will require either replacement or strengthening measures. As the degree of overstress is relatively small over the Dance Studio, we are hopeful that an “inplace” solution can be developed that provide the strength increase for the Dance Studio roof beams. The roof joists that are supported by the main beams appear adequate to support code prescribed loads with exception of the joists that lie within snow drift areas. Additional joists may have to be added to the roof framing system in these areas. The placement of heavy mechanical units on the existing roof framing should be avoided to control structural system upgrades. The roof framing over the Aux Gym is planned to be removed and replaced to provide adequate framing to support the significant snow drift and addition of mechanical units planned for this space.

Wall/ Floor and Seismic Lateral Force Resisting Systems

Large portions of the concrete masonry wall system will have to be removed and replaced with seismically detailed pre-cast tilt-up panel walls to provide a reliable lateral force path to the foundation, support new adjacent structures, and provide a 2 hour fire area separation. This includes the entire west walls of the Dance Studio and Aux Gym, and most of the north and south walls of the Aux Gym (adjacent new structure). The existing concrete footings that support the new concrete panels will be strengthened or replaced.

The remaining masonry walls of the existing Aux Gym and Dance Studio will be reinforced with a steel braced frame system on the outside to avoid disruption of the interior finishes. This frame work will be concealed with the exterior cladding.

A comprehensive seismic detailing program consisting of roof-to-wall connections, beam-to-wall and beam-to-column connections, and other detailing as required to improve structural ductility and successful energy dissipation. This program will have to be implemented throughout the entire facility to develop a structural system that can reliably transfer horizontal force to the ground and can withstand seismic induced shaking without roof and floor diaphragms separating from supporting walls resulting in structural collapse.

FOUNDATIONS

It is our experience the soil conditions in this location are very stable and produce very high soil bearing capacities allowing us to utilize conventional shallow foundation techniques. The geotechnical evaluation and testing data will be consulted in detail to determine accurate design parameters for this project.

All foundations for the lower level spaces will consist of a slab-on-grade floor reinforced with deformed bar placed over both isolated spread footings and continuous footings to support superstructure gravity loads and lateral forces. High load spread and continuous footings should be placed deep enough to avoid conflicts with under-slab plumbing and electrical conduit. Recessed floor areas for locker rooms will be coordinated as the design advances. Special attention must be given to mix design, reinforcement detailing, placement methods, placement timing, curing methods, and control joint detailing in order to minimize uncontrolled cracking, curling and surface degradation.

Isolated concrete shear piers and moment frames will be supported by specially reinforced concrete grade-beams to efficiently collect and distribute high uplift forces due to overturning.

Basement level spaces will be separated from grade with poured-in-place concrete retaining walls, restrained at the top. The connection details at the top of wall and construction sequencing are very important design considerations for this type of retaining structural system.

2.6 Mechanical

I. Project Description

A. The project encompasses a total of approximately 135,000 square feet. The building contains 26,000 square feet of renovation including the auxiliary gymnasium, admin areas and dance areas. The new construction will consist of a 16,000 square foot competition gymnasium, an 11,000 square foot recreation gymnasium, several locker rooms, admin areas, classrooms, open fitness, group fitness, athletics treatment,

wrestling gym, a climbing wall and a hall of fame area. This project will be LEED Gold.

II. Design Criteria

A. Temperatures:

1. Summer Outdoor: 96°F db, 66°F wb
2. Summer Indoor:
   a. Aerobics/Group Exercise: 70°F
   b. Fitness Area: 72°F
   c. Gymnasium 72°F
   d. Climbing Wall 70°F
   e. Remainder of Building: 75°F
   f. Note: Where ceiling fans exist, the operational set point may be 5°F higher than the temperatures listed.
3. Winter Outdoor: 25°F
4. Winter Indoor:
   a. Aerobics/Group Exercise: 68°F
   b. Fitness Area: 68°F
   c. Gymnasium 68°F
   d. Climbing Wall 68°F
   e. Remainder of Building: 70°F

B. Humidity:

1. Specific dehumidification steps will be taken to assure a maximum of 60% RH in all spaces.
   a. Base System:
      i. Single Zone rooftop units shall utilize hot gas reheat for humidity control.
      ii. Variable Volume systems shall use a combination of zone level dehumidification control consisting of terminal unit control strategies and unitary dehumidification controls utilizing hot gas reheat for humidity control.
   b. Option M-1:
      i. Single Zone rooftop units shall utilize their associated chilled water and heating water coils for humidity control.
      ii. Variable Volume systems shall use a combination of zone level dehumidification control consisting of terminal unit control strategies and unitary dehumidification controls utilizing their chilled water and heating water coils for humidity control.

C. Outside Air Ventilation:

1. Ventilation rates shall be determined based on local code requirements.
2. Demand controlled ventilation shall be employed to reduce ventilation rates during periods of reduced occupancy. Ventilation rate reduction shall be limited to ensure building pressure relationships are maintained.
3. An energy recovery ventilator shall recover energy from the locker rooms and restroom exhaust to precondition the outside air for RTU-2. See description below.

D. Building Components: Values listed are code minimums. Building components are assumed to meet or exceed these values.

1. Walls:
   a. Mass: U= 0.104
   b. Framed: U = 0.064
2. Roof: U = 0.048
3. Glass:
   a. U = 0.50
   b. SHGC = 0.40

III. Mechanical System Narrative

A. Heating:

1. Source:
   a. Campus steam will be extended to this building. Steam shall be converted to building heating water through two (2) shell-in-tube heat exchangers each sized at 60% of the heating load (2,000 MBH each).
      i. Campus steam at 11 psi – 5" steam main is required.
   b. Steam shall be converted to domestic hot water through two (2) instantaneous heat exchangers. Refer to the plumbing section for sizes.
   c. A condensate return system will return condensate back to the Campus condensate line.
   d. This contract shall include work to 5'-0" outside the building.
   e. Note: Steam will be required 24 hr/day, 7 days per week.
2. Circulation:
   a. Dual heating pumps with variable frequency drives (parallel operation) and brass impellers will circulate heating water to air handling equipment's heating coils and terminal heating devices.
      i. One set of heating water pumps will be provided to service the McNeal building and one set of pumps shall service the SRC (total of 4 main circulation pumps).
3. Heating Devices:
   a. Single Zone Systems: Single zone roof top units shall have heating coils to provide warm air on a call for heat.

b. Variable Air Volume Systems: VAV systems shall have preheat coils in the roof top units with reheat coils located at pinch down VAV terminals and fan terminal units.

4. Distribution:

a. The heating system fluid will consist of 30% propylene glycol for water treatment and freeze protection. Heating water piping shall be either Schedule 40 steel or Type "L" copper, at the contractor's option. Steam piping shall be Schedule 40 for sizes up to 2", Schedule 80 for pipe sizes 2 ½" or larger and Schedule 80 for condensate piping. All heating piping shall be insulated with fiberglass in accordance with local energy code requirements.

i. Distribution to the McNeal and SRC uses of the building will be provided with independent piping systems from their respective circulation pumps.

5. Miscellaneous Heating:

a. Provide hydronic cabinet unit heaters at each stair (4), the lower level entry, the south entry vestibule and the hall of fame entry (2). Provide hydronic unit heaters in Mech/Elec, Fire/Sprinkler Room and Outdoor Program Storage.

B. Heating/Cooling/Air Distribution

1. Base System:

a. Packaged DX cooling energy recovery rooftop unit (single zone variable volume), with heating water coil supply and return fans with VFD, economizer controls, high efficiency cooling system utilizing variable speed or digital scroll compressors for capacity control, hot-gas reheat coil for humidity control, filter rack with MERV-8 pre-filter and MERV-13 final filter, airflow monitoring stations and an energy recovery wheel **(to be approved by SOU FMP)**. Provide unit with a BACnet or Lonmark interface to allow setpoint control and limited sequencing by the temperature controls manufacturer. Tonnages are approximate.

i. RTU-1

a) Areas served: Competition Gymnasium

b) 70 tons

c) 800 MBH Heating Coil

b. Packaged DX cooling rooftop units (single zone variable volume), with heating water coil supply and return fans with VFD, economizer controls, high efficiency cooling system utilizing variable speed or digital scroll compressors for capacity control, hot-gas reheat coil for humidity control, filter rack with MERV-8 pre-filter and MERV-13 final filter and airflow monitoring stations. Provide unit with a BACnet or Lonmark interface to allow setpoint control and limited sequencing by the temperature controls manufacturer. Tonnages are approximate.

i. RTU-5

a) Areas served: SRC Open Fitness

b) 40 tons

c) 350 MBH Heating Coil

ii. RTU-7

a) Areas served: Recreation Gymnasium

b) 40 tons

c) 400 MBH Heating Coil

iii. RTU-7

a) Areas served: Auxiliary Gymnasium

b) 25 tons

c) 250 MBH Heating Coil

iv. Acceptable manufacturers shall be Daikin RPS, Trane Intellipak or equivalent by Aaon.

c. Energy recovery ventilator to serve as the exhaust air system for the locker rooms and the outside air system for RTU-2 (below). Unit shall consist of a heat pipe exchanger, exhaust and outside air fans with VFD and packaged controls. The unit shall be capable of interfacing with the RTU's economizer function to continue exhaust air flow rates while disabling the outside air functions. **Alternate to be approved by SOU FMP – Flate plate heat exchanger in lieu of heat pipe.**

i. ERV-1

a) Areas served: Locker Rooms, Treatment, Restrooms

b) 10,000 CFM

d. Packaged DX cooling rooftop units (variable volume), with heating water coil supply and return fans with VFD, economizer controls, high efficiency cooling system utilizing variable speed or digital scroll compressors for capacity control, filter rack with MERV-8 pre-filter and MERV-13 final filter and airflow monitoring stations. Provide unit with a BACnet or Lonmark interface to allow setpoint control and limited sequencing by the temperature controls manufacturer. Tonnages are approximate.

i. RTU-2

a) Areas served: Athletics, North Admin.

b) 100 tons

c) 1,000 MBH Heating Coil

ii. RTU-3

a) Areas served: Remodeled 1964 Dance, Visitors Locker Rooms, Staff Lockers

b) 30 tons

c) 300 MBH Heating Coil

iii. RTU-4

a) Areas served: McNeal Classrooms and Admin.

b) 40 tons

c) 500 MBH Heating Coil

iv. RTU-6

a) Areas served: SRC (Climbing, Group Fitness, Outdoor Program, Admin, Racquetball Courts)

b) 65 tons

c) 700 MBH Heating Coil

v. Acceptable manufacturers shall be Daikin RPS, Trane Intellipak or equivalent by Aaon.

2. Alternate M-1

a. Heating

i. Same as base design above.

b. Cooling

i. One (1) 400-ton air cooled chiller will provide chilled water for cooling and dehumidification. Chiller shall be variable speed high efficiency type. Acceptable manufacturers are Daikin, Trane, Carrier, and York.

ii. Circulation: Primary variable volume pumps will circulate water throughout the system. Speed will be modulated by variable frequency drives wired to each pump motor to meet the cooling load.

a) One set of chilled water pumps will be provided to service the McNeal building and one set of pumps shall service the SRC (total of 4 main chilled water circulation pumps).

iii. Distribution: The chilled water system fluid will consist of water treated with inhibiters. Piping shall be either Type "L" copper, Schedule 80 PVC or Schedule 40 welded steel **(SOU FMP approval needed for steel)**, depending on pipe size. All chilled water piping shall be insulated with fiberglass piping insulation with a vapor barrier.

a) Distribution to the McNeal and SRC uses of the building will be provided with independent piping systems from their respective circulation pumps.

c. Air Distribution

i. Provide outdoor air handling units with hot water heating coils and chilled water cooling coils, supply and return fans with VFD, economizer controls, filter rack with MERV-8 pre-filter and MERV-13 final filter, double wall foam injected panels and air flow monitoring stations. RTU-1 shall have an energy recovery wheel.

ii. Airflow rates, heating capacity and cooling capacity shall be equivalent to the base system descriptions.

iii. Controls shall be field applied by the temperature controls contractor. See controls sections below.

3. Ductless Split System air conditioning system with indoor evaporator and a remote air cooled condensing unit. Unit shall be controlled from a local factory provided thermostat.
    a. FCU-1 & CU-1
        i. Area Served: IT 1021
        ii. 1.5 tons
    b. FCU-2 & CU-3
        i. Area Served: IT 158
        ii. 3.0 tons
    c. Acceptable manufacturers shall be Daikin, Sanyo and Mitsubishi.
4. General:
    a. Starters shall be provided by the Mechanical Contractor.
    b. Provide fire/smoke dampers at all rated penetrations per local code requirements.
5. Ductwork:
    a. Materials:
        i. Galvanized sheetmetal ductwork shall be used throughout, except as noted.
        ii. All exposed ducts shall be spiral and shall have a Grip-Lock primer to facilitate painting by the GC.
        iii. Diffusers located in excess of 15' AFF shall be of high capacity, long throw drum louver type.
    b. Insulation: All supply ductwork shall have 1" duct liner, including spiral ductwork. Round ductwork downstream of VAV boxes shall be wrapped with 1" insulation without duct liner. Return ductwork shall be unlined.
    c. Sizing:
        i. All low velocity supply, return and exhaust ducts shall be sized at 0.08"/100'.
        ii. Medium pressure ductwork upstream of VAV boxes shall be sized at 0.15"/100' with a maximum of 2,300 fpm.
6. Air Terminal:
    a. Provide approximately 40 single duct VAV terminal units with hydronic heating coils.
    b. Provide approximately 20 parallel flow, fan powered terminal units with hydronic heating coils.
7. Exhaust:
    a. Provide the following exhaust fans:

FAN	FAN TYPE	SERVING

EF-1	Roof Mounted Centrifugal – Down Blast	M RR 930 & W RR 931
EF-2	Ceiling Mounted	Cust. 1019
EF-3	Ceiling Mounted	W RR 1018
EF-4	Ceiling Mounted	M RR 1017
EF-5	Ceiling Mounted	M Change 816
EF-6	Ceiling Mounted	W Change 817
EF-7	Roof Mounted Centrifugal – Down Blast	W Rec. Locker, 926 M Rec. Locker 761, W RR 133 & M RR 117
EF-8	Ceiling Mounted	Classroom RR
EF-9	Ceiling Mounted	Classroom RR
EF-10	Ceiling Mounted	Break 717
EF-11	Inline Centrifugal	M RR 945
EF-12	Inline Centrifugal	W RR 946
EF-13	Ceiling Mounted	Break/Copy 942
EF-14	Ceiling Mounted	Cust. 940
EF-15	Ceiling Mounted	Main Electrical
EF-16	Ceiling Mounted	Elect. 160
EF-17	Roof Mounted Centrifugal – Down Blast	Mechanical 150
EF-18	Roof Mounted Centrifugal – Down Blast	Main Custodial 198
EF-19	Roof Mounted Utility Set	Climbing Wall
TF-1	CEILING	ELEC. 1020

b. Provide the following HVLS fans:

CF-1 through CF-4	12’ HVLS FAN	Competition Gymnasium
CF-5 & CF-6	14’ HVLS FAN	Recreation Gymnasium
CF-7 & CF-8	12’ HVLS FAN	Auxiliary Gymnasium

c. The clothes dryers shall have exhaust ducts extending through the roof. Size per manufacturer's recommendations.

d. A make-up air duct from an exterior louver will transfer unconditioned air into the sealed make-up air plenum located at the rear of the dryers.

e. Provide relief hood with a motorized damper on the elevator shaft.

8. Temperature Controls:

a. General: A direct digital control (DDC) system shall provide the basis of the temperature control system. The system will be computer based and will allow for the mechanical systems to be controlled and monitored from a remote location or from within the building itself. Provide a full graphics package. All mechanical equipment shall interface with and be controlled through the BAS system with the following exceptions:

i. Cabinet Unit Heaters.

ii. Unit Heaters.

iii. Exhaust fans for individual/remote toilet rooms and Janitor closets.

iv. Sewage Ejector/Sump Pumps.

b. Metering:

i. Meters shall be provided on the Main Steam, Condensate, Domestic Cold Water and Chilled Water **(Alternate M-1)** entering the building.. Steam shall have vortex type flow meters with pulse output to the DDC system. All others shall be Mag type flow meters with pulse output to the DDC system.

a) Sub meters shall consist of:

i) Steam entering each domestic hot water heater

ii) Btu meters on the heating water distribution systems serving both the McNeal and SRC systems.

iii) Btu meters on the chilled water distribution systems serving both the McNeal and SRC systems. **(Alternate M-1)**

ii. A control strategy shall be implemented to determine the energy used by the McNeal and SRC portions of the building to separate energy costs.

c. Base System:

i. The base system shall have packaged controls in the air handling equipment that will interface with the DDC system's front end via a BACnet or Lonmark interface.

d. Alternate M-1:

i. The alternate system shall have field applied controls by the temperature controls contractor in each air handling system with a local controllers interfacing back to the DDC system's front end.

C. Plumbing:

1. Domestic Water:

a. Site Utilities:

   i. A 6" fire service to ±5'-0" outside of building will be required. We will evaluate whether we can utilize the existing service. Continuation will be by the civil engineer.

   ii. A 4" water meter and service (280 gpm demand) to ±5'-0" outside of building will be provided for this facility. Continuation will be by the civil engineer. Note this system will not be separated to monitor usage between the Athletic and Student uses due to duplication of piping, if water usage needs to be provided it shall be prorated based on square footage.

   iii. The lawn irrigation service is anticipated to be a separate service with an exterior water meter and reduced pressure backflow preventer by others.

b. Piping:

   i. The domestic cold water, hot water and hot water recirculation, condensate and pool condensate piping above ground in the building shall be Type "L" hard copper with no-lead solder and fittings. Note we will have (2) separate domestic HW and HWC systems, (1) for the Athletic Department and (1) for the Student Recreation Center.

   ii. The cold water service entry shall have a reduced pressure backflow preventer.

c. Water Heater:

   i. The Athletic Department shall have a separate steam-to-domestic hot water heater. The heater will be (1) instantaneous steam/hot water heater at 50 gpm flow at 2,100 MBH output steam. 140°F hot water will be generated and supplied to the laundry. We will provide a thermostatic mixing valve and service the remainder of the athletic portion of the building HW with 120°F hot water. We will add point of use thermostatic mixing valves to provide 110°F hot water for public lavatories to meet code requirements. The water heater will be sized to provide 20 minutes minimum of HW to all showers.

   ii. The Student Recreation Center shall have a separate steam-to-domestic hot water heater. The heater will be (1) instantaneous steam/hot water heater at 26 gpm flow at 1,000 MBH output steam. 140°F hot water will be generated and supplied to the laundry. We will provide a thermostatic mixing valve and service the remainder of the athletic portion of the building HW with 120°F hot water. We will add point of use thermostatic mixing valves to provide 110°F hot water for public lavatories to meet code requirements. The water heater will be sized to provide 20 minutes minimum of HW to all showers.

   iii. Note we will interconnect the (2) systems with valving so that in the event of a heat exchanger failure we could open the valves from the other heat exchanger and limp by for the building HW use.

d. Domestic Water Recirculation Pump:

   i. The domestic hot water will be circulated to provide instantaneous hot water at all fixtures for both the 140°F and the 120°F systems and will

operate continuously in the occupied mode. We will have separate 120°F pumps (1) for the Athletics and (1) for the Student Recreation center. The 140°F pump will be for the Athletic department.

2. Waste and Vent Piping:
    a. Utilities:
        i. An 8" building drain will be provided to ±5'-0" outside of the building. Continuation will be by the civil engineer.
    b. Piping:
        i. Construct below ground waste piping of schedule 40 PVC with solvent welding fittings within ±5'-0" of the building.
        ii. Waste and vent piping above grade in building shall be service weight cast iron with no-hub fittings. All plumbing VTR's shall be located 15' minimum from any outside air intakes.
3. Storm Piping:
    a. Roof drains and overflow roof drain systems shall run totally independent of each other and the roof drainage system will terminate below grade. The overflow roof drainage system will discharge above grade with a downspout nozzle to a splash block. The limit of responsibility shall stop at ±5'-0" outside of building. Material shall be the same as the waste and vent system and minimum 3" size piping at minimum.
4. Gas Piping:
    a. Natural gas piping shall be Schedule 40 black steel. Piping sizes 2" and smaller shall be screwed joints. Piping sizes 2-1/2" and larger shall have welded joints. Gas piping will be routed to the clothes dryers and possible cooking equipment in the concession area.
5. Plumbing Fixtures:
    a. Plumbing fixture quantities are as follows:
        i. Water Closets (75)
        ii. Lavatories (63)
        iii. Urinal (18)
        iv. Sinks (6)
        v. Showers (79)
        vi. Mop service basin (6)
        vii. Electric water coolers (14)
        viii. Clothes washer commercial (4)
        ix. 3 comp. sink concession (1)
        x. Hand sink concession (3)
        xi. Laundry sink (2)
        xii. 2 comp. sink concession (1)

b. Water Closets: Wall hung vitreous china, syphon jet type (1.28 GPF) and operated with a battery operated electronic flush valve.

c. Urinals: Vitreous china, syphon jet type (.125 GPF) with a battery operated electronic flush valve.

d. Lavatories: Vitreous china, under counter mounted or wall hung type. Faucet shall have an electronically operated faucet with a .5 GPM flow restrictor and set at 10 second run time for water saving feature.

e. Sinks: 18-gauge stainless steel self-rimming type. Faucet shall be manually operated with a 1.5 GPM flow restrictor for water saving feature

f. Mop Service Basins: Floor type, molded stone, 24"x24"x10" size.

g. Electric Water Cooler with bottle filler: Stainless steel, ADA compliance with R134A refrigerant.

h. Shower: The enclosure will be recessed concrete and tile sloped to drain. Provide pressure balancing shower valve with 1.5 gpm shower head for water and energy savings. All handicap showers will have a handheld shower and fixed showerhead. Approved manufacturers: Powers, Bradley, Symmons and Leonard.

i. The laundry sink shall be a molded stone freestanding sink.

j. Provide thermostatic mixing valves and 4” floor sink for each hydrotherapy.

6. Insulation:

   a. Domestic cold water will have 1" of fiberglass insulation.

   b. Domestic hot and hot water recirculation will have 1" of fiberglass insulation for up to 1" piping, 1-1/2" fiberglass for piping above 1".

   c. Roof drain and overflow roof drainage will be ½" fiberglass insulation for up to 6" piping, 1" fiberglass for 6" and larger. Provide insulation on all horizontal piping including drain bodies. Indoor condensate piping from air conditioning units and similar equipment shall have ½" of fiberglass insulation.

7. Equipment Access

   a. Provide service access to all equipment, valves, shock absorbers etc.

8. Miscellaneous Plumbing:

   a. Provide exposed, chrome hose bibbs with vacuum breaker in mechanical rooms, janitor’s rooms and at the loading docks.

   b. Provide hose bibbs, stainless steel box type with door in each shower area and lavatory battery for floor wash down.

   c. Provide wall hydrant spaced on the exterior of the building at maximum 150'. Also included wall/roof hydrants on the roof for HVAC unit cleaning.

   d. Provide floor drains as shown on architectural plans and/or as follows:

      i. Showers.

      ii. Shower hallways wet areas within the locker rooms.

      iii. Shower drying area.

iv. Toilet rooms.

v. Mechanical equipment rooms.

vi. Laundry room and trench drain area.

vii. Janitor's rooms.

viii. Training rooms.

e. Provide solenoid type trap primer system for all floor drains.

f. Provide RP backflow preventer on hydronic heating water makeup.

g. Provide domestic water, gas connections to commercial gas dryers and washers at locations as shown on the architectural plans. Washers will discharge into concrete trench with floor drain.

h. Provide a duplex sump pump system for the foundation drainage system.

i. Provide sump pump and oil smart system for elevator pits.

j. Earthquake restraints will be required to meet seismic requirements for all equipment and piping.

k. Provide compressed air piping for the outdoor work area, compressor will be provided by owner. **Alternate:** Provide 5 hp, 460/60/3 phase rotary screw air compressor, 65 db in lieu of owner provided.

IV. Fire Protection

A. Provide a complete sprinkler system for the entire building in conformance with NFPA 13. All heads fused not bulb type and shall be fully recessed, chrome concealed type in finished areas, brass pendant or sidewalls in all exposed ceiling and unfinished areas. **Alternate**: White concealed heads to hide in the white ceiling should be reviewed with the University for acceptance in lieu of tech spec chrome requirement.

B. Provide a new 6" fire service with double check valve assembly. Limit of responsibility shall be 5' outside the building.

C. Piping will be schedule 40/10 black steel piping with threaded or grooved fittings per SOU tech specification. American Tube Dynaflow and Dynathread piping systems will be allowed as long as CRR= 1.0 or better.

D. Earthquake restraints will be required to meet seismic requirements.

E. Smoke detectors at the rooftop units shall interface with the fire alarm system.

It is anticipated that the entry canopy and overhangs will be non-combustible construction and allowed by the local fire

2.7 Electrical - Division 26

Scope:

The electrical work shall consist of supplying equipment and material, tools and transportation, labor and services and miscellaneous items required to provide a complete electrical installation as described herein for McNeal Center.

Codes:

The entire electrical installation shall be made in accordance with the 2009 National Electrical Code (NEC) and all current state codes and any Southern Oregon University codes/standards. The work shall include securing licenses and permits necessary, and includes payment of the requisite charges and fees, and utility company charges.

Work Includes:

1. Power: Electrical service from pad mounted City of Ashlund owned transformer. The transformer will be provided by the local utility company. Primary design will be done by the utility company. The electrical engineer will coordinate the work with the utility company during design. Primary voltage to be 12,470 voltage and secondary voltage to be 277/480V, 3Ph, 4W.
2. Telephone: Service underground from campus telephone service provider. Line will extend from the service pedestal to main telephone terminal in the new main Tele/Data room. All plywood backboards to be provided by General Contractor.
3. Electrical distribution facilities within the building, including the main switchboards, power and lighting feeders, panelboards, step-down transformers, circuit wiring and connections, outlets and wiring devices.
4. Lighting fixtures and lamps. All controls associated with the lighting system.
5. Motor and power consuming equipment connections from switchboard to integrally wired equipment, connection of power wiring for equipment furnished under mechanical section, and feeder facilities for elevator power.
6. Complete and operable emergency systems per applicable building codes.
7. Complete and operable fire alarm system per applicable building codes and coordinated with campus wide fire alarm provider.
8. Grounding system.
9. Adjustment and testing of the electrical work.
10. Rough-in for audio visual system.
11. Provide new Tele/Data network entry in new tele/data room. Tele, data, P.O.S., cable TV, security (rough-in, cabling and termination outlets as coordinated with campus IT department).

Light and Power Systems Characteristic:

1. Electrical power shall be provided at 277/480V, 3Ph, 4W. with (3) SOU metered services for the recreation center, athletics and academics.
2. Power for LED lighting, fluorescent lighting and HID lighting shall be 277/480V, 3Ph, 4W. Feeders to 277/480V lighting panels shall be sized to supply a load of 3 watts per square foot.
3. Power for receptacles shall be 120/208V, 3Ph, 4W. Dry type transformers and 120/208V panels shall be sized to supply a load of 6 watts per square foot.
4. Power for elevators, heating, ventilating, plumbing and air conditioning equipment shall be 480V, 3Ph, 3W.

5. Emergency systems shall consist of a 150 KW 277/480 volt 3 phase emergency generator with light levels to meet life safety code minimum levels. Exit lights shall be LED and meet SOU standards. Provide (2) transfer switches (1) emergency-100A) (1) standby equipment-(200A)

Workmanship:

All electrical equipment and material shall be installed in accordance with code requirements and in a neat workmanlike manner by skilled and competent mechanics in conformance with the standard practices of the electrical industry.

Materials and Equipment:

All materials and equipment shall be new and shall comply with established trade standards and shall be listed as approved by the Underwriters' Laboratories, where inspection standards are listed and in effect. Materials and equipment shall be as follows:

Main Electrical service:

1. The utility transformer will be located to the west of the main electrical room. Underground conduits will connect the main gear inside the main electrical room to the utility transformer outside.
2. Main switchboard shall be free standing with metering capability as requested by SOU's facilities department, main circuit breaker switches with circuit breaker feeder switches. Three mains will feed an academic section, an athletic section and a recreation section. All breakers will be coordinated to provide short circuit current protection for all distribution equipment. Main switchboards shall be 277/480V, 3Ph, 4W, sized to provide power for all current consuming equipment plus 20% spare capacity and space. Switchboard is to be provided with TVSS protection.
    a. Estimated switchboard size:

        McNeal Center 135,000sq/ft @ 15w/sq/ft
        2,025.0KW
        Spare Capacity (20%) 405.0KW
        Subtotal
        2,430.0KW
        Amps @ 480 volt three phase
        2,924.2AMPS
        Switchboard size: 2000 AMP
3. Estimated split is 60% SRC, 40% McNeal.
4. Main disconnects will be located in the main gear.
5. All bussing shall be rectangular cross section copper and shall be braced as required.
6. Sub-feed switches shall be of size as required and shall be equipped with coordinated circuit breakers.
7. Utility will provide City of Ashlund 1500 KVA, 12,470 Volt primary-277/480 Volt wye secondary pad mounted transformer and install per campus standards adjacent to existing 208 volt transformer. Primary to match existing primary configuration on the SOU campus and the splices and cables required to splice into existing primary cable shall meet requirements of university standards. The existing 208 volt transformer that feeds the existing recreation building shall remain on the campus loop but become spare for future biomass building.

Generator and ATS:

1. An estimated 150KW diesel generator will be placed next to the trash enclosure on east side on the north end of the building. The generator will be provided with a day tank.
2. Two automatic transfer switches will be used to transfer emergency load and standby load in the event of a power outage. The transfer switches will be placed in a separate room within the main electrical room.

Panelboards:

1. Panelboards shall be flush or surface mounted equipped with bolt-in branch breakers and hinged door in door lockable doors. Mechanical, lighting and equipment panels are separated on each level.
   A. 277/480V panels shall be General Electric type AE or equal. 120/208 volt panels shall be General Electric type AQ or equal.
   B. Refer to the power plans for estimated panel layout and locations.
   C. Provide sufficient capacity for upper level cardio equipment. Provide a dedicated 120V, 20A circuit for each treadmill. In addition provide a circuit for cardio equipment TV screen, share (1) 120V, 20A circuit for (8) screens.

Dry Type Transformers:

1. Dry type transformers shall be floor, ceiling or wall mounted, type “H” mounted on vibration and sound isolators.
2. Transformers taps shall be two 2-1/2% full capacity below and two 2-1/2% full capacity above normal voltage.
3. Transformers shall be General Electric type “M” or equal.

Wiring Devices:

1. Wiring devices (switches, receptacles, etc.) shall be specification grade, color to match wall finish.
   Switches shall be rated 20A at 277V
2. Standard duplex receptacles shall be 20A. Provide one duplex for every 25sq/ft. of office, conference, and staff areas. Locker rooms shall receive GFI duplex receptacles above counter at vanity and at each grooming station.
3. Low voltage (tele/data) to be provided as guided by SOU standards.
4. Device plates shall be 0.040 metal.

Conduit and Wiring:

1. Feeder conduits run below grade shall be rigid steel, or P.V.C.
2. All wiring shall be copper.
3. Feeder conduits run above grade shall be EMT.
4. Branch circuit conduit shall be EMT or P.V.C.
5. Flexible conduit shall be used for final connections to motors and “lay-in” lighting fixtures. Use “Sealtite” for connections exposed to weather.
6. Outlet boxes shall be pressed steel, minimum of 4" square. Outlets exposed to weather shall be Upper weatherproof “Condulet” type.
7. Secondary feeders shall be copper with 600V type “THHN/THWN” insulation.
8. Branch circuit conductors shall be copper with 600V type “THHN/THWN” insulation.

Lighting: McNeal Center:

1. Lower Level
    - *(McNeal)* Locker Room– Recessed 2'x4', 1'x4' LED troffers and LED recessed downlights to 30 footcandles.
    - *(McNeal)* Wrestling Gym-.Pendant mounted low bay LED sports lighter to 50 footcandles.
    - *(McNeal)* Laundry- 2' x 4' LED recessed troffers to 50 footcandles.
    - *(McNeal)* Lobby and Public Corridors- Recessed LED downlights, recessed 2'x4' troffers, decorative pendants and LED wall sconces to 20 footcandles.
    - *(McNeal)* Offices and Conference Rooms– 2'x4' LED troffers, LED downlights to 30 footcandles.
    - *(McNeal)* Treatment and Tapping Room- 2' x 4' LED recessed troffers to 50 footcandles.
    - *(McNeal)* Hydrotherapy room- Linear LED wet listed strips to 30 footcandles.
    - *(SRC & McNeal)* Restrooms – 1'x 4' LED troffers to 30 footcandles.
    - *(SRC & McNeal)* Electrical, Mechanical Equipment Rooms- 4' LED strips to 30 footcandles.
    - *(SRC & McNeal)* Storage Rooms – 1'x4' LED strips to 20 footcandles.
    - *(SRC)* Rehab- Recessed 2x4 LED troffers to 30 footcandles.
2. Main Level
    - *(SRC & McNeal)* Lobby and Public Corridors– A combination of 2'x4' LED troffers, LED downlights and decorative LED pendants and sconces to 20 footcandles.
    - *(McNeal)* Concessions– 2'x4' LED troffers to 50 footcandles.
    - *(SRC & McNeal)* Office and Conference Rooms– 2' x 4' LED recessed troffers and LED downlights to 30 footcandles.
    - *(SRC)* Laundry– 2'x4' LED troffers to 30 footcandles.
    - *(SRC & McNeal)* Toilets and restrooms– LED recessed downlights and 1'x4' LED troffers to 30 footcandles
    - *(McNeal)* Classrooms and Labs-.2' x 4' LED recessed troffers to 50 footcandles
    - *(SRC)* Climbing Wall– LED highbays for general light and LED spot lights running vertically to produce hot spots. Light level on surface to be 30 footcandles.
    - *(SRC & McNeal)* Storage/Electrical/IT- LED strip lights to 20 footcandles.
    - *(SRC)* Dance/MultiPurpose- LED 2x4 troffers and LED dimmable downlights to 30 footcandles.
3. Upper Level
    - *(McNeal)* Competition Gymnasium- Pendant mounted high bay LED sports lighter to a footcandle level of 135 footcandles with a 1.8 to 1 max. to min. ratio. at 30" AFF
    - *(SRC)* Recreation Gymnasium/Axillary Gym- Pendant mounted high bay LED sports lighter to a footcandle level of 50 footcandles
    - *(SRC)* Fitness- Pendant mounted linear LED fixtures to 50 footcandles
    - *(SRC)* Lobby and Public corridors- Recessed LED high bay downlights and LED wall sconces to 20 footcandles.
    - *(SRC)* Weight Room- Pendant mounted linear LED fixtures to 50 footcandles
    - *(SRC)* Group exercise- Linear LED pendants to 50 footcandles.

4. Site Exterior

- Exterior lighting will be split 60% SRC, 40% McNeal.
- Above exterior doors provide LED wall pack with high/low photocell control.
- Walkways and new plazas adjacent to entries-12'-0" tall LED decorative poles and be approved by SOU. Walkways to average 0.2 footcandles.

5. Refer to the lighting cutsheets included with this narrative for fixture types. These will correspond to the fixtures on the lighting plans.

Lighting Control-McNeal Center

1. Refer to lighting plans for lighting controls. Rooms that do not show a motion sensor will be controlled by a central relay system with low voltage controls at a central location, typically a reception desk.
2. Provide motion sensors, toggle switches, and dimmers in most rooms of the facility. These rooms include offices, storage rooms, group exercise rooms, locker rooms.
3. Provide timer switches in rooms where motion sensors may pose a danger. These rooms include electrical rooms, mechanical rooms and IT rooms.
4. Daylight sensors will be used for fixtures near windows to automatically dim lights when daylight is available.
5. Provide a relay control panel with control of large public spaces. Controls are to be located at the control desk. The relay panel will control exterior lighting by time clock and photosenor, interior lights will be swept off by the timeclock. The following areas are to be controlled via the control panel:
    - Public spaces/corridors, on/off
    - Gymnasiums, Climbing wall and Lobby
        - Provide controls such that 50% of light may be turned off.
    - Second floor open fitness
        - Provide controls such that 50% of light may be turned off.

Mechanical Equipment: McNeal Center

1. Power wiring to all mechanical and elevator equipment shall be provided adequate for loads served. All starters, control wiring and controls will be provided by others regardless of operating voltage. It is assumed that all heating/cooling will be done with electric equipment. All areas shall be cooled. Provide electrical connections to the equipment as described in Mechanical Design Narrative:

Fire Alarm and Communication System:

1. 60% of the fire alarm will be for SRC, 40% will be for McNeal. Provide a complete voice evacuation system consisting of manual pull stations located at control points in the building that will be manned during operating hours. Provide a pre-recorded message system to be heard throughout the building and in each occupied space (i.e. individual offices). Fire alarm shall mute all sound systems upon activation, via fire alarm relays and control modules. Provide ADA strobe or speaker strobes in all areas of egress and bathrooms. Each floor shall be zoned separately, and zones for fan shut down and sprinkler shall be provided. Provide an elevator recall system including smoke and fire detection. Provide fire/smoke damper control system including smoke detection, control modules and 120 volt power. Annunciator showing all zones shall be in placed in the main lobby visible from the main fire department entry. Duct detectors provided by the mechanical contractor shall be tied into the fire alarm system. System will meet the requirements of Local District.

Access Control Systems:

1. Access control will be coordinated with the university. Access control points, and the systems specifications will be coordinated with the universities IT department and their standards. Control panels for the system will be located in the nearest IT rooms.
2. Refer to CAD drawing detail 7 sheet E1.42 for access control rough-in detail.
3. Access control will be provided at all entrances and any interior doors SOU identifies.

Data/Voice Systems:

1. Data and voice will enter into the building from the west. The existing telephone and data fiber will run down the corridor to the main IT room.
2. IT rooms have been located throughout the building for the distribution of data and voice cabling.
3. Cable tray will be located in corridors where large quantities of cable will exist.
4. Backbone cabling will be provided to connect the main IT room to the smaller IT rooms located throughout the facility. Refer to the riser for an estimation on the backbone cabling requirements.
5. Voice and data cable, category 5E, will be placed thought the facility in offices, reception desks, classrooms and son on for the distribution of voice and data. The Universities design guidelines will be used to help determine the locations of these data/voice outlets.

AV Systems:

1. Provide junction boxes and conduits for support of audio visual system being designed by others.
2. A/V control panels will be located in IT rooms located throughout the facility.

2.8 Audio Visual, Video, Scoreboard and Acoustics

Introduction

Overview of Systems – The electronic systems considered in this narrative are related to building, game operations and fan entertainment, recreation and academic facilities. While these system are integrated with the life safety system the life safety or fire alarm systems are not included.

The systems described are based on the present stadium architectural design, current practice at other similar collegiate facilities, University standards where applicable, and communications with Athletics, recreation, and academics staff members. While each system is capable of independent operation, these systems are best considered as parts of an overall whole, rather than independently operating entities as each contributes to the overall experience of building users.

General design

The current trend in new facilities design and construction is to combine most, if not all, low voltage systems on a single, physical data network to transport voice, data (office, operations, building systems, security, point of sale) and AV signals, rather than using physically separate electronics and signal transport systems, as has been the norm for several decades. Combining (or "converging", to use the current industry term) all of this traffic on a single data network can provide operational and technical efficiencies as well as improving operational control and allow systems to share information and signals.

A converged network has special implications for Southern Oregon University as it is based on using University standard data hardware (not part of this design scope), which may be administered by the campus IT department, not Athletics or recreation staff. One benefit of a converged network is in many ways, it is essentially an extension of the overall campus system.

While there will be multiple locations with AV and sound systems throughout the facility, each with separate control, the signal processing and amplification for all the systems will be housing in a centrally located room in the facility.

It is common for the sound systems to interface with the life safety/fire alarm systems to mute the sound systems during an alarm condition. Based on the design direction for the sound systems, we recommend that primary voice evacuation be distributed by, and confined to, the fire alarm system. In all areas, the sound systems will mute during an emergency and these areas would be provided signaling and voice evacuation messages via traditional life safety annunciation devices.

Opinions of probable cost (OPC) of the installed systems are noted throughout this narrative for assistance in developing budget allowances. These opinions are very preliminary, but based on recent projects of similar size and scope and reflect our understanding of the level of technical sophistication desired by the University. These opinions of cost exclude the following:

- AC Power Service
- Conduit pathways for low-voltage cabling and its installation
- Permits, taxes, bonds, and EC/GC markup
- Other exclusions may be noted for individual systems

SOUND AND AV SYSTEMS
MCNEAL PAVILION AUDIO SYSTEMS

The McNeal Pavilion will host a wide variety of events from sporting events to banquet style meeting events and as such the audio system will need to be flexible and configurable for these varying event types. McNeal Pavilion will be supplied with a sound reinforcement system which will provide coverage to the home and visitors sections as well as the court. The system is intended for both music and voice reinforcement.

Input panels located in in floor boxes at center court, and also on the end wall at court level, will accept microphone and line level signals. The inputs are controlled from a lockable wall-

mounted panel on the court level without the need to connect any portable equipment to the system.

For courtside use a portable equipment rack will include a Bluetooth station for source playback from portable devices, a dual channel wireless microphone system, and auxiliary inputs for connection of other playback sources like an MP3 player or CD player. All the source equipment will be located in and controlled from an audio mixer within the portable rack.

A centralized cluster of loudspeakers will provide sound coverage to the bleacher seating and floor area. This cluster will be positioned around the center court area and can be muted in zones. Additional delay speakers may be implemented for the upper portion of the larger bleacher section. Zone mutes and cluster configuration for various events will be selected at the control panel.

The system will be setup through digital system processing to provide for optimum performance for a sporting event. Should the facility be configured for an end-stage event, portable equipment provided by the University may also be used at the stage position and could feed audio signal to the main sound system. During an end-stage type event, a preset will configure the system to mute the court speaker aimed at the stage end and then delay the remaining speakers to best match the audio from the portable system. This delay cannot be exact and the front edge of the stage should be assumed as the zero point in time.

Audio signal processing and amplification will be located in the central AV room and volume, zoning, and preset configurations are controlled from the wall-mounted control panel at the court level.

The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended the system is to revert back to the standard system configuration. This feature is to be implemented through the use of control ports linked to system presets within the digital signal processing system.

Seating Bowl Loudspeaker Design Criteria – The design goals of the seating bowl loudspeaker system include:

- Maximum continuous loudness of not less than 100 dBA. This will allow for announcements to be heard over all but the most intense crowd noise.
- Frequency response of 50 to 12,000 Hz minimum. This will allow for natural sounding speech and good quality musical performance. Additional low frequency (“bass”) capacity can be provided if high bass impact sound quality is required by the University.
- Uniformity of loudness of ±2 dB between 2000 Hz and 4000 Hz. The goal is to have the sound be equally loud throughout the seating areas, avoiding “hot” or “dead” spots.
- Ratio of first/direct arrival sound to reverberant or indirect sound is to be +6 dB. This metric is important as it is a primary determination of speech intelligibility for announcements.

Opinion of Cost – Distributed Sound System $250,000

HEARING ASSISTANCE SYSTEMS

The McNeal Pavilion system is provided to allow hearing impaired patrons and others to hear PA programming in the seating bowl via wireless receivers and headsets. ADA guidelines suggest a quantity of receivers for the seating bowl equal to 4% of capacity with slight reductions to that quantity depending on the total number of seats within a venue. Very few sports facilities purchase that quantity of receivers, based on historical demand. As receivers can be added to the system at any time, a smaller number is initially purchased with the commitment to add more as required.

In addition to the seating bowl, hearing assistance systems are to be provided in recreation gymnasiums and any other locations as directed by the University. The receivers for these areas are expected to be compatible with the seating bowl system and additional receivers over and above those required for the seating bowl are not expected to be part of the base building construction.

Opinion of Cost – Each system $6,000

Concourse Concessions and Lobby

Television sets located in the lobby and concessions area will display game action when the content available. These TVs will also get a cable TV drop from the campus cable TV system. In addition the concessions will be equipped with digital menu boards as directed. These menu boards will be fed signal over the data network. PC computers running content management software and will be provided by the University.

Opinion of Cost – Concessions and Lobby Reference CATV

Ticket Windows

Only window communications will be provided. This is provided with the window purchase and is not part of the AV scope.

Wrestling Gym

The wrestling gym will be supplied with a sound reinforcement system that will provide sound coverage to the gym floor. The loudspeakers will be large-format ceiling speakers distributed throughout the gym.

System input will consist of primarily Bluetooth enabled portable devices provided by the operations and instruction staff. Other devices such as MP3 players or CD players will connect to the system through an auxiliary input within the space. A small wall-mounted rack provides additional microphone and line level inputs if needed.

Audio signal processing and amplification will be located in the central AV room and a simple touch panel will remotely control the audio system source selection, volume, and preset configurations from the local equipment rack. The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended, the system is to revert to the standard configuration.

AV connections will be provided at the rack for HDMI and VGA devices to display video content from laptop computers and other devices on a large format LCD display located within the space to support instruction needing video presentation technology. Control will be

provided using the rack mounted touch button control panel rather than relying on a handheld infrared remote. This remote will provide control of screen up/down, projector on/off and input selection, and volume.

Any other television located within the wrestling gym will be provided with a cable TV drop.

Opinion of Cost – Wrestling Gym $22,500

Note: OPC does not include the televisions.

Athletic Offices

No dedicated AV systems, other than a single TV drop for future TV sets in locations as directed, are included in office areas. Paging needs will be served by the telephone system. TVs will be connected campus cable TV distribution.

Opinion of Cost – Athletic Offices Reference CATV

Note: OPC does not include the televisions.

Athletic Meeting and Conference Rooms

AV connections will be provided for HDMI and VGA devices to display video content from laptop computers and other devices. A large format LCD display with adjacent left/right speakers will be located within each space to support audio associated with video presentations and video conferencing. The TV will also have a cable TV drop. Control will be provided using a simple, permanent button panel rather than relying on a handheld infrared remote. This remote will provide control of the television set on/off, channel and input select, and volume.

Opinion of Cost – Athletic Meeting and Conference Rooms$15,000 (each)

Note: OPC does not include the televisions.

Locker Rooms

AV connections will be provided for laptops and other HDMI or VGA devices to display video from the coaching video system (coaching video system is not included in the project). A large format LCD display with adjacent left/right speakers will be located within the locker room. The TV will also have a cable TV drop. Control will be provided using a simple, permanent button panel rather than relying on a handheld infrared remote. This remote will provide control of the television set on/off, channel and input select, and volume.

Both the men's and women's basketball locker rooms will have a permanent game clock. Other areas with permanent game clocks are the visitor's and volleyball locker rooms.

Opinion of Cost – Locker Rooms $3,500 (each)

Opinion of Cost – Game Clocks $2,000 (each)

Note: OPC does not include the televisions.

Visiting Locker Rooms

No dedicated AV systems, other than TV sets in locations as directed, are included. TVs will be connected to campus cable TV distribution.

Opinion of Cost – Visiting Locker Rooms Reference CATV

Note: OPC does not include the televisions.

Official's Locker Room

No dedicated AV systems, other than TV sets in locations as directed, are included. TVs will be connected to campus cable TV distribution.

Opinion of Cost – Official's Locker Room Reference CATV

Opinion of Cost – Game Clock $2,000 (each)

Note: OPC does not include the televisions.

Aux Locker Rooms

No dedicated AV systems, other than TV sets in locations as directed, are included. TVs will be connected to campus cable TV distribution.

Opinion of Cost – Aux Locker Rooms Reference CATV

Note: OPC does not include the televisions.

Recreation & Academic Reception Lounge Area

Control of the system will be from the control/reception desk at the entrance. System input will consist of primarily Bluetooth enabled portable devices provided by the operations staff. Other devices such as MP3 players or CD players will be able to connect to the system through an auxiliary input at the control station. The lounge area will be provided with distributed loudspeakers flush mounted in the ceiling, or suspended for structure above, to provide low-level background music program and will be zoned separately from the fitness center. Audio signal processing and amplification will be located in the central AV room and a simple touch panel located at the reception desk will control the AV system source selection and volume in the lounge area.

Televisions will be located throughout the space in locations as directed and will be provided with a cable TV drop connected to the campus cable TV distribution.

In addition to these standard televisions, two informational LCD displays will display daily facility schedules and upcoming event information. Separate displays for athletics / recreation center and the academic classrooms will be provided. Source content for these informational displays will be PC computers located at control position. These computers will be provided by the owner, although the interconnect cabling between the computer and the displays will be part of this work.

Opinion of Cost – Recreation & Academic Lounge $25,500

Note: OPC does not include the televisions

Fitness Center

Control of the system will be from the control/reception desk at the recreation center entrance. System input will consist of primarily Bluetooth enabled portable devices provided by the operations staff. Other devices such as MP3 players or CD players will be able to connect to the system through an auxiliary input at the control station. The fitness area will be provided with distributed loudspeakers flush mounted in the ceiling, or suspended for structure above, and zoned for each separate fitness area. Audio signal processing and amplification will be located in the central AV room and a simple touch panel will control the AV system source selection and volume of the various areas throughout the space and will also be located at the control station.

Televisions will be located throughout the space in locations as directed and will be provided with a cable TV drop connected to the campus cable TV distribution. Cardio equipment located within the fitness center will be supplied with a cable TV feed to connect to the equipment's onboard AV features.

Since this area has multiple television audio sources, there will be a device that converts up to 10 channels of audio to WIFI streaming. This allows patrons to select and listen to one of the LCD display's audio content using their own Wi-Fi device and headphones. Free apps are available for Android and Apple devices.

The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended the system is to revert back to the standard system configuration. This feature is to be implemented through the use of control ports linked to system presets within the digital signal processing system.

Opinion of Cost – Fitness Center $40,000

Note: OPC does not include the televisions.

Climbing Gym

System input will consist of primarily Bluetooth enabled portable devices provided by the operations staff. Other devices such as MP3 players or CD players will be able to connect to the system through an auxiliary input within the space. The climbing wall area will be provided with distributed loudspeakers flush mounted in the ceiling or suspended for structure above. Audio signal processing and amplification will be located in the central AV Room and a simple touch panel will control the AV system source selection and volume of the area. The system will mute in case of a fire alarm and remain muted for the duration of the alarm.

A television will be located within the space as directed and will be provided with a cable TV drop connected to the campus cable TV distribution. A local HDMI input allows for input of content from a laptop or similar device with the associated audio being reproduced by the speakers in the TV set.

Opinion of Cost – Climbing Wall $12,500

Note: OPC does not include the televisions.

2-Court Recreation Gymnasium

The gym will host a wide variety of events from intermural, or tournament style, sporting events to banquet-style meeting events and as such the audio system will need to be flexible and configurable for these varying event types. The gymnasium will be supplied with a sound reinforcement system which will provide coverage to both courts and will be divided into two zones that are separated by the curtain between each court.

The system is intended for both music and voice reinforcement. Input panels, located in in floor boxes at center court, and also on the end wall at court level will accept microphone and line level signals. The inputs are controlled from a lockable, wall-mounted, control panel on the court level without the need to connect any portable equipment to the system.

For courtside control a portable equipment rack will include a Bluetooth station for source playback from portable devices, a dual channel wireless microphone system, and auxiliary inputs for connection of other playback sources like an MP3 player or CD player. All the source equipment will be located in and controlled from an audio mixer within the portable rack.

Large-format ceiling loudspeakers distributed throughout will provide sound coverage for the gymnasium floor and can be muted for each court. The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended, the system reverts to the standard configuration.

Audio signal processing and amplification will be located in the central AV room with volume, zoning, and preset configurations are controlled from the wall-mounted panel at court level.

Opinion of Cost – 2-Court Recreation Gymnasium $45,000

Auxiliary / MAC Gymnasium

The gym will host a wide variety of events from sporting events to banquet style meeting events and as such the audio system will need to be flexible and configurable for these varying event types. The gymnasium will be supplied with a sound reinforcement system providing single zone coverage to the court.

The system is intended for both music and voice reinforcement. Input panels located in in floor boxes at center court and also on the end wall at court level will accept microphone and line level signals. The inputs are controlled from a lockable wall-mounted control panel on the court level without the need to connect any portable equipment to the system.

For courtside use a portable equipment rack will include a Bluetooth station for source playback from portable devices, a dual channel wireless microphone system, and auxiliary inputs for connection of other playback sources like an MP3 player or CD player. All the source equipment will be located in and controlled from an audio mixer within the portable rack.

Large-format ceiling loudspeakers distributed throughout will provide sound coverage gymnasium floor area. The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended the system reverts back to the standard configuration.

Audio signal processing and amplification will be located in the central AV room with volume, zoning, and preset configurations are controlled from the wall-mounted panel at the court level.

Opinion of Cost – Auxiliary / MAC Gymnasium $30,000

Group Exercise Rooms

Each group exercise room will be supplied with a sound reinforcement system that will have the capability of providing sound coverage to the exercise floor. The loudspeakers for the system will be a left/right configuration, wall-mounted above the instructor location.

System input will consist of primarily Bluetooth enabled portable devices provided by the operations and instruction staff. Other devices such as MP3 players or CD players will connect to the system through an auxiliary input. A small wall-mounted rack provides additional microphone and line level inputs if needed, along with a wireless headset microphone for use by instructors.

The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended the system is to revert back to the standard system configuration.

AV connections will be provided at the rack for HDMI and VGA devices to display video content from laptop computers and other devices on a large format LCD display located within the space to support instruction needing video presentation technology. Control will be provided using the rack mounted touch button control panel rather than relying on a handheld infrared remote. This panel will provide control of LCD on/off, channel, input selection, and volume.

Any other television located within group exercise will be provided with a cable TV drop.

Opinion of Cost – Group Exercise Room $17,500 (each)

Note: OPC does not include the televisions.

Recreation Center Offices

No dedicated AV systems, other than a single TV drop for future TV sets in locations as directed, are included in office areas. Paging needs will be served by the telephone system. TVs will be connected campus cable TV distribution.

Opinion of Cost – Athletic Offices Reference CATV

Note: OPC does not include the televisions.

Trip Planning Room

AV connections will be provided for HDMI and VGA devices to display video content from laptop computers and other devices. A large format LCD display with adjacent left/right speakers will be located within each space to support audio associated with video presentations and video conferencing. The TV will also have a cable TV drop. Control will be provided using a simple, permanent button panel rather than relying on a handheld infrared remote. This remote will provide control of the television set on/off, channel and input select, and volume.

Opinion of Cost – Trip Planning Room $15,000

Note: OPC does not include the televisions.

Academic Offices

No dedicated AV systems, other than a single TV drop for future TV sets in locations as directed, are included in office areas. Paging needs will be served by the telephone system. TVs will be connected campus cable TV distribution.

Opinion of Cost – Athletic Offices Reference CATV

Note: OPC does not include the televisions.

Academic Conference Rooms

AV connections will be provided for HDMI and VGA devices to display video content from laptop computers and other devices. A large format LCD display with adjacent left/right speakers will be located within each space to support audio associated with video presentations and video conferencing. The TV will also have a cable TV drop. Control will be provided using a simple, permanent button panel rather than relying on a handheld infrared remote. This panel will provide control of the television set on/off, channel, input selection, and volume.

Opinion of Cost – Academic Conference Rooms $15,000

Note: OPC does not include the televisions.

Academic Dance & Multipurpose Room

The academic dance and multipurpose room will be supplied with a sound reinforcement system that will provide sound coverage for the dance floor. The loudspeakers for the dance system will be a left/right configuration wall-mounted above the instructor location.

System input will consist of primarily Bluetooth enabled portable devices provided by the operations and instruction staff. Other devices such as MP3 players or CD players will be able to connect to the system through an auxiliary input within the space. A small wall-mounted rack provides additional microphone and line level inputs if needed, along with a wireless headset microphone for use by instructors.

Audio signal processing and amplification will be located in the central AV room and a simple touch panel will remotely control the audio system source selection, volume, and preset configurations from the local equipment rack. The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended the system is to revert back to the standard system configuration.

Additionally, the Dance room will have a motorized projection screen and installed projector. This projector will be of the LED/Laser type in order to reduce maintenance and operating costs.

AV connections will be provided at the rack for HDMI and VGA devices to display video content from laptop computers and other devices. A 16:10 format motorized projection screen

and projector will be located within space to support instruction needing video presentation technology. Control will be provided using the rack mounted button control panel rather than relying on a handheld infrared remote. This panel will provide control of screen up/down, projector on/off and input select, and volume.

Any television located within the academic dance and multipurpose room will be provided with a cable TV drop. No other inputs will be provided for televisions.

Opinion of Cost – Academic Dance & Multipurpose Room $45,000

Note: OPC does not include the televisions.

Dynamic Exercise Room

The dynamic exercise room will be supplied with a sound reinforcement system that provide sound coverage for the exercise floor. The loudspeakers for the dance system will be a left/right configuration wall-mounted above the instructor location.

System input will consist of primarily Bluetooth enabled portable devices provided by the operations and instruction staff. Other devices such as MP3 players or CD players will be able to connect to the system through an auxiliary input within the space. A small wall-mounted rack provides additional microphone and line level inputs if needed, along with a wireless headset microphone for use by instructors**.**

Audio signal processing and amplification will be located in the central AV room and a simple touch panel will remotely control the audio system source selection, volume, and preset configurations from the local equipment rack. The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended, the system is to revert back to the standard system configuration.

Additionally this space will have a motorized projection screen and installed projector. This projector will be of the LED/Laser type in order to reduce maintenance and operating costs.

AV connections will be provided at the rack for HDMI and VGA devices to display video content from laptop computers and other devices. A 16:10 format motorized projection screen and projector will be located within space to support instruction needing video presentation technology. Control will be provided using the rack mounted button control panel rather than relying on a handheld infrared remote. This panel will provide control of screen up/down, projector on/off and input select, and volume.

Any television located within the dance exercise room will be provided with a cable TV drop. No other inputs will be provided for televisions.

Opinion of Cost – Dynamic Exercise Room $45,000

Note: OPC does not include the televisions.

Phys Lab

The Phys Lab will be supplied with a sound reinforcement system that will have the capability of providing background music throughout the room using ceiling mounted loudspeakers.

System input will consist of primarily Bluetooth enabled portable devices provided by the operations and instruction staff. Other devices such as MP3 players or CD players will be able to connect to the system through an auxiliary input within the space.

Audio signal processing and amplification will be located in the central AV room and a simple touch panel will remotely control the audio system source selection and volume. The system will mute in case of a fire alarm and remain muted for the duration of the alarm. When the alarm condition has ended the system is to revert back to the standard system configuration.

AV connections will be provided for HDMI and VGA devices to display video content from laptop computers and other devices on a large format LCD display located within the space to support instruction needing video presentation technology. Control will be provided using the rack mounted touch screen control panel rather than relying on a handheld infrared remote. This panel will provide control of the television set on/off, channel, input selection, and volume.

Any other television located within group exercise will be provided with a cable TV drop.

Opinion of Cost – Phys Lab $12,500

Note: OPC does not include the televisions.

Classrooms

The classrooms will be supplied with a sound system that will have the capability of providing sound coverage to the seating. The loudspeakers for the system will be a left/right configuration wall-mounted above the instructor location and are intended to support video presentation (or other video content) only.

Audio signal processing and amplification will be located in the central AV room and a simple touch panel will remotely control the audio system.

Classrooms will have a motorized projection screen and installed projector. This projector will be of the LED/Laser type in order to reduce maintenance and operating costs.

AV connections will be provided for HDMI and VGA devices to display video content from laptop computers and other devices. A 16:10 format motorized projection screen and projector will be located within space to support instruction needing video presentation technology. Control will be provided using the wall- mounted button control panel rather than relying on a handheld infrared remote. This panel will provide control of screen up/down, projector on/off and input select, and volume.

Any television located within the classrooms will be provided with a cable TV drop. No other inputs will be provided for televisions.

Opinion of Cost – Classroom $22,500 (each)

Note: OPC does not include the televisions.

Scoreboard/led displays

McNeal Pavilion Scoreboard

The existing scoreboard and matrix displays will be removed for the renovation and reinstall. New electrical distribution, signal cabling, and secondary steel and closeout documentation will be part of this scope. Primary structure, overall enclosure, logos/lettering, etc. are in the overall project structural and metals packages.

Scoreboards include:

- Play clocks at each goal.
- Game clocks in each end zone with exact location to be determined.
- Game clocks in home and visiting basketball and volleyball, and officials locker rooms as directed by the University.
- Game in progress controller inputs will be provided on both sides of the court and other locations if directed by the University.
- Matrix display.

Recreation Scoring & Timing Equipment

New clocks and scoring displays will be installed for each recreation gymnasium court.

- A single fixed digit display for clock and score, possession, etc. will be provided for each court.
- Game in progress controller inputs will be provided on both sides of each court.

Opinion of Cost – Scoring and Timing Equipment

IP addressable, Ticket window monochrome LED displays

These are typically mounted inside the ticket window glazing. AC power and signal to be hard wired within wall cavity, with overall power switch in each area to allow power on/off of all signs in that room. Outdoor brightness LCD digital signage displays can also be used for this function.

Opinion of Cost – Ticket Window Display - Price per EACH window$2,000

Distributed TV System

The program direction for TV signals in the facility will be distributed via a typical RF coax based cable plant. The existing campus based coax system currently used in the facility will be maintained, extended and distributed throughout the renovated facility. This system will serve all of the TV sets installed in McNeal Pavilion, the recreation center, and academic area including offices, locker rooms, concourses, concessions, etc.

The Distributed TV system headend would typically be located with the AV system in a centralized room with any In-house channels for content delivery of In-house or Athletics only channels inserting into the system at this point.

Sources for distributed TV channels include:

- A redistribution of the campus cable television system's signal.
- TV production feeds from the broadcast truck(s).

Television Sets

Televisions are expected to be located throughout the facility. A total of 100 TV sets of various sizes could be anticipated to be installed in a facility of this size. This quantity could increase or decrease based on budget and the desires of the University.

Opinion of Cost

COAX Based RF Distribution System

Coax Based Headend		$100,000
Coax Cable Drop	$600 EACH	
TV, bracket, and Installation	$1,200 EACH	
Opinion for 100 TV Installation (Cable, TV, and Installation)		$180,000
Total		$280,000

acoustics for INTERIOR SPACES

Environmental Noise

Our understanding of the site indicates that it is not impacted by extraordinary environmental noise sources such as low aircraft over flights, train noise and vibration or severe roadway noise. Most noise heard inside the building will be from stadium utilities (air conditioning and circulation) and human activities.

Building Interior Noise Control

The arena events can be very noisy. For this reason, the building mechanical systems should be quiet enough, especially in premium and office areas in addition to the seating bowl to accommodate a full range of activities.

The recommended background noise levels due to mechanical systems are:

- Seating bowl - NC 40 at the closest seat to a supply or return air diffuser/grille.
- NC 35 for suites, office space, broadcast spaces and locker rooms.
- NC 40 for non-premium concourses.

Isolation to other locations in building

There are several noise producing activities in the arena. Care must be taken so that one function or mechanical system does not adversely impact another activity.

Acoustically Sensitive Spaces

Team Areas – The entire perimeter partitions around team areas should be acoustically rated and extend to structure above. This is also true of training rooms and coaches offices.

Meeting and Conference Rooms – Rooms intended to be used only for hospitality, and not presentations should have ACT ceilings. Meeting rooms that have a significant presentation function should have fiberglass ACT and 1" thick acoustical wall panels on 50% of the wall surface area above chair rail height. If the ceiling features gyp board coffers or other features, the areas between the coffers should be ACT.

Classrooms – Rooms that have a significant presentation function should have fiberglass ACT and 1" thick acoustical wall panels on 50% of the wall surface area above chair rail height. If the ceiling features gyp board coffers or other features, the areas between the coffers should be ACT.

Room Acoustics

McNeal Pavilion Acoustics

Modern arenas are multi-use facilities for reasons of economic necessity, even though a professional sports team may be the primary user of the building. It is our understanding that the arena seating bowl acoustical design should be optimized for true multi-purpose use, with superior acoustical treatment. The goal is to provide an environment that supports good speech intelligibility and music quality with little or no impact on crowd noise intensity.

In keeping with the multipurpose mission of the facility, the recommended acoustical treatments are:

- Roof deck treatment should include acoustic-rated, lapendary baffles suspended from roof joists/truss covering 80% of exposed roof deck.
- Vertical walls above the last row of seating completely around the arena and any corners exposed to the bowl are to be treated with a combination of perforated metal acoustical panels or Tectum "finale" to a minimum height of 8 ft. above the tread and backed by 2" thick duct liner board. Treatment should continue from tread height to deck above.•

Recreation Gymnasiums

Ceiling: To limit excessive noise build-up and to promote good speech intelligibility we recommend the ceiling structure consist of an acoustical roof deck. The deck should be minimum 3 in. thick and have minimum rating of NRC 0.70; an acceptable product is Vulcraft's 3NA acoustical roof deck.

Walls: Slotted acoustical CMU should be used on all four walls, located above 8 ft. AFF or 8 ft. above the tops of any seating risers. The slotted block should have a minimum rating of NRC 0.80, similar to the Proudfoot Company's SoundBlox RSC.

Floor: Athletic wood flooring.

Wrestling Gym

Walls: We recommend that Tectum wall panels be included in the wrestling gym from 8 feet above the floor and higher. The panels should be factory-painted and if the panels must be field painted, we recommend following the manufacturer guidelines and use a dry-fall paint to avoid clogging the pores within the panels.

Climbing Gym

Walls: We recommend that Tectum wall panels be included in the climbing gym and be factory-painted. If the panels must be field painted, we recommend following the manufacturer guidelines and use a dry-fall paint to avoid clogging the pores within the panels.

Dance and Group Exercise Rooms

Ceiling: Acoustical ceiling tile in these should be specified with a minimum NRC of 0.70 and should cover approximately 90% of the gross ceiling area, with lighting and mechanical elements occupying the remaining 10% of the ceiling area. An acceptable product for the ACT is Armstrong's Ultima mineral fiber ceiling tile.

Walls: No applied wall treatments are needed.

Floor: Either VCT or carpeting is acceptable.

Conference and Meeting Rooms

Ceiling: A design combination of gypsum board and ACT ceilings in the conference and meeting rooms throughout the building will provide acceptable acoustics during meetings if the ceiling tile is specified with a minimum NRC of 0.70, similar to Armstrong's Ultima ceiling tile. If the conference rooms will often be used for teleconferencing, the hard gypsum board ceiling located above the conference table and microphone system may make speech more difficult to understand for people on the phone. If this is how the room will be used, we recommend including the ACT over the majority of the ceiling area or replacing the gypsum board with a similar-looking acoustical finish, such as a Eurospan stretched fabric system. The acoustic material should be minimum 1 in. thick with minimum NRC 0.70.

Walls: If the conference rooms will primarily be used for teleconferencing, we recommend including 50 sq. ft. of absorptive wall panels on two non-parallel walls. The panels should be minimum 1 in. thick with NRC 0.70 and be specified impact resistant, similar to Kinetics' Hardside High Impact wall panels.

Floor: Either VCT or carpeting is acceptable.

Material Installation Recommendations

Acoustical Roof Deck: Acoustical roof deck should be factory-painted prior to installation to avoid getting paint within the perforations or the acoustical in-fill. Field-painting, if necessary, should carefully follow manufacturer recommendations.

Slotted Acoustical CMU: Caution should be exercised when field-painting acoustical CMU as spray-applied paint can enter the cavity and negatively affect the acoustical properties of the CMU block and interior insulation. Instead, we recommend that paint be rolled or brushed on. Where graphics are to be painted over the acoustical CMU, special mention should be made to ensure careful application.

HVAC Noise Control

HVAC systems are to be designed and balanced to meet the criteria outlined above.

Air Terminals - Air rushing through air terminals (diffusers or grilles, supply or return) can add noise back into a system that is otherwise quiet. Select air terminals that under worst-case field conditions have a manufacturer's noise rating 5 NC points less than the required NC level for the room being served. For example, a private office needing an NC/RC-30 should have diffusers rated at NC-25. This is necessary for two primary reasons: Manufacturers generally report the lab tested noise levels in terms of an NC value caused by the diffuser in a specific room. The room where the diffuser will be installed may not be anything like the room used in the manufacturer's data. Most rooms have multiple diffusers. The noise from each diffuser (supply and return) combines resulting in a louder noise level in the room. Never install volume dampers at diffusers. Keep them far enough upstream that laminar flow (or a smooth velocity profile) is obtained well before the air hits the diffuser. Manufacturers rate their diffusers' noise without obstructions that create turbulent airflow at the blades. As an alternative to dampers, use Terminal Boxes with variable frequency drives.

Air Velocities - To help keep air velocity noise within acceptable limits use the following recommended maximum air velocities (fpm) based on the desired noise level for the room served:

	Velocity at Air Terminal	Initial 10 feet Before Terminal	10 to 20 feet Before Terminal	20 to 30 feet Before Terminal
NC 25 Supply	350	425	550	700
NC 25 Return	425	500	650	800
NC 30 Supply	425	500	700	850
NC 30 Return	500	600	800	950
NC 35 Supply	500	600	800	1000
NC 35 Return	600	700	900	1150

Terminal Boxes - Terminal boxes (mixing boxes, VAV boxes, fan-powered boxes, etc.) have two noise problems to be aware of: the discharge noise (inside the device) that is transmitted down the inside of the ducts, and the radiated noise that comes from the exterior housing of the box itself and travels through the room's finish ceiling. Openings such as ambient air intakes, particularly with fan-powered boxes, may require inlet silencing to reduce radiated noise to an acceptable level. Minimize a box's discharge noise by sizing it to operate in the middle to lower region of its airflow range when at maximum design airflow rate. Place all terminal boxes only in ceiling plenums over non-

critical rooms such as open office areas, corridors, toilets, or storage rooms. This will reduce the effects of their radiated noise on the rooms where they are located. If a terminal box must be placed over a noise sensitive room, select a box with a radiated noise rating 5 NC points less than the NC requirement for the room, and keep at least three feet clear between the bottom of the box and the finish ceiling.

Duct Lining - Fiberglass duct liner board is one of the most cost-effective ways to reduce noise traveling in duct systems. An acoustic benefit from duct liner is usually not seen until the liner's thickness reaches 1 inch. Therefore, ½-inch thick duct liner board should only be used where acoustic concerns are not an issue. Concerns have been raised recently regarding possible harmful health effects due to microbial growth or possibly carcinogenic loose fibers. It is generally felt that properly installed duct liner board in a properly designed HVAC system will not cause any adverse health effects. An overview of the available research in this area and a brief discussion of the pros and cons can be found on page 43.32 of the ASHRAE Handbook 1995 Applications. In light of the concerns over this product, the specifications for it should require strict oversight and compliance with safe installation practices as defined by the manufacturer and SMACNA. Bacteriostatic linings are available which minimize opportunities for microbial growth on duct lining which has become dirty and damp through poor filtration and humidity control practices.

Sound Attenuators - When other attenuation methods are not effective enough, a sound attenuator may be necessary. Generally, attenuators providing the most attenuation are longer and cause a larger drop in system pressure. A number of things should be kept in mind when selecting and locating an attenuator: To achieve an attenuator's rated performance, both the entrance and the exit of the attenuator must have a laminar flow condition. Therefore, locate attenuators at least 5 duct diameters from an elbow (upstream or downstream) or the air-handler. To keep mechanical noise from breaking back into the duct downstream of an attenuator, place attenuators in the mechanical room wall (or abutting next to it if fire codes are an issue). Or, use round duct between the attenuator and the wall.

Air Handlers - The primary source of noise and vibration in air handlers is the fan. However the paths of this noise and vibration are numerous. A large portion of the airborne noise is sent down the supply ducts; some goes back through the return ducts; and the rest is radiated through the unit's walls. Much of the vibration is attenuated by the fan's spring supports. But a sizable amount of vibration is caused by the airborne low-frequency noise incident on the unit's walls. To isolate all the vibration and noise paths: Mount the entire air handling unit on spring isolators rather than just mounting the fan motor assembly on springs. Use open, stable spring mounts with appropriate static deflection, non-skid pads, integral leveling and mounting bolts (such as Mason Industries' SLF). This will isolate both the fan's inherent vibrations and the vibrations caused by the excessive low-frequency noise levels. Suspend connecting piping on spring isolating hangers. If piping must be rigidly suspended from the building, use a flexible pipe connection fitting (such as Mason Industries' Super-Flex connectors). Attach electrical connections using flexible conduit with at least a 90 degree bend.

Return Path - Noise in the return path is often overlooked in a system design. Contrary to popular myth, noise travels equally well with or against the airflow. Therefore, the rules for the supply path also apply to the return path when it is ducted. In a non-ducted return system the following items should be explored: The path from the air handler to

the first noise-sensitive room should be of sufficient length to adequately attenuate the noise from the mechanical room or air chase. If a duct is employed to bring air from a ceiling plenum to the air handler's inlet, then a sound attenuator or duct lining may be employed. Return grilles opening into ceiling plenums with excessive mechanical system noise should have a sheet-metal duct "boot" or "hat" placed over the opening. When floor to roof partitions obstruct the free flow of ceiling plenum air, use transfer ducts such as the ones that follow to avoid allowing sound in one room being heard in the other:

Supply Path - Various aspects of the supply duct path effect noise attenuation. The supply path between the air handler and the first diffuser take-off must be of sufficient length to allow noise attenuation to occur. Duct lining is the most cost-effective attenuation method, but it needs adequate duct length to accomplish its task. Likewise, a sound attenuator also needs an adequate amount of duct to accommodate its length and to provide laminar flow at its entrance and exit. To avoid duct rumble, the duct geometry at the air handler should not turn the air in a direction contrary to the rotation of the fan.

Partition Considerations

All sound rated partitions surrounding or separating noise sensitive rooms or spaces should extend to structure above and have an STC rating of at least 55 (likely higher in some cases). In cases where the need for isolation is less critical, partitions can simply extend above deck. Penetrations in sound rated walls should be avoided and when necessary sealed, as with the top and bottom of the walls. Air transfer grilles must not be installed in sound rated walls.

Moving Partitions

Any rooms with moving partitions should have a factory STC rating of at least 52 and feature integral sound absorptive finishes. This level of performance will be adequate to isolate simultaneous, adjacent events. It will not allow adequate isolation between any events, featuring music, or louder programs such as a motivational sales meeting

END OF SECTION