

**FACILITY DESIGN PLAN**  
FOR  
**SANFORD JACKRABBIT ATHLETIC COMPLEX – WRESTLING PRACTICE ADDITION**  
**PHASE 2 of the STANLEY J MARSHALL CENTER ADDITIONS & RENOVATION**  
SOUTH DAKOTA STATE UNIVERSITY  
DATE: March 24, 2021

SDSU requests approval of this Facility Design Plan for design and construction of an addition to the Sanford Jackrabbit Athletic Center. The project was approved by the South Dakota Legislature at the 2021 session (SB 28). This is the second phase of the multiple phase project to provide new practice facilities and to renovate the Stanley J Marshall Center. The Preliminary Facility Statement (PFS) was approved at the May 2016 Board of Regents meeting. The Revised Facility Program Plan (FPP) was approved at the December 2020 Board of Regents meeting.

**a. ARCHITECTURAL, MECHANICAL, AND ELECTRICAL SCHEMATIC DESIGN**

Attached are floor plans illustrating the architectural design of the project. Features of the architectural, mechanical, and electrical design are described below.

**Architectural & Structural:**

The addition will be constructed in a similar manner to the Sanford Jackrabbit Athletic Complex. The building will be a concrete slab-on-grade facility with a structural steel rigid frame, steel bar joist secondary framing, and steel deck roof. The exterior skin of the building will include a glazed curtain wall on the west side and insulated metal panels to match the existing building on the remaining exposed walls. The existing south and west walls of the Sanford Jackrabbit Athletic Complex will become two of the interior walls of the wrestling practice addition.

The south edge of the addition will be 2 stories high and include a mezzanine level. The primary space inside the addition will be the mat practice area and will include 4 collegiate sized practice mats. This portion of the addition will match the height of the existing strength and conditioning area of the Sanford Jackrabbit Athletic Complex. Spaces under the mezzanine on the first floor will include team locker room, entry & vestibule, shower & restroom facilities, strength and conditioning space, mechanical space, and a custodial room. The mezzanine level will include team lounge and study areas, mechanical space, and coaches offices. The mezzanine level will overlook the mat practice area.

Concrete footings will make up the foundation of the building. Helical piers may be used where the rigid frame columns are in close proximity to building columns and footings of the Sanford Jackrabbit Athletic Facility. The grade of the site will be adjusted so the floor level of the addition matches the adjacent building. The floor will be concrete slab on grade. A structural steel long span rigid frame will cover the mat practice area. The structural steel frame, secondary steel bar joists, and concrete deck will support the mezzanine. The roof structure will be steel bar joists spanning the rigid frame, topped with a steel deck and single ply roofing system. Due to its proximity to the Dana J Dykhouse stadium, the south wall will have a masonry core to provide the 2 hour fire resistance required. The remainder of the exterior

walls will be steel frame. The exterior skin will be preinsulated metal panels or aluminum curtain wall and window systems.

Interior walls will be gypsum board over steel studs. Finishes will vary according to the room function. Offices, study areas, and team rooms will be carpeted. The mat area will be concrete, but covered by wrestling mats. The showers will be finished in ceramic tile. The locker room will be indoor/outdoor carpet. Most support spaces will be unfinished concrete. All walls will be painted.

#### Mechanical:

Heating and Cooling - Heating and cooling for the addition will be provided with a modular high efficiency air to water heat recovery chiller that will produce both chilled water and heating water for the building. This device is also capable of heat recovery such that when the unit is producing chilled water it is capable of using normally wasted heat to simultaneously produce heated water for domestic building needs. Supplemental high efficiency natural gas boilers will also be installed to provide heated water when the loads exceed the capacity of the high efficiency system. Distribution pumps will be provided for both the heating and chilled water systems. Hydronic equipment such as boilers, pumps, and associated accessories will be located in the mechanical room on the first floor. The heat recovery chiller will be located in a mechanical room in Sanford Jackrabbit Athletic Complex.

Ventilation - Ventilation for the addition will be provided by (2) air handling units and (1) dehumidification unit located in the mechanical room on the second floor, and (1) air to air energy recovery ventilator located in the existing second floor mechanical room in the existing HPF building to the west of the addition. One of the air handling units will serve the large mat area, while the other air handling unit will serve all the other spaces ancillary to the mat area (such as offices, lounges, lockers, etc). The air handling units in the addition will be provided with chilled and heating water coils. Finally, a dehumidification unit will be provided for the mat area, to dehumidify the space whenever outside air and mechanical cooling alone cannot dry out the space below maximum relative humidity. Supply and return ductwork will be routed from each air handling unit into the spaces they serve.

Plumbing - A new water service for the addition will be provided in the first-floor mechanical room and be connected to existing site utilities just the south of the addition. A water softener will also be provided to soften all water to the building. Finally, domestic hot water will be generated through a double wall heat exchanger connected to the building heating loop. This will allow water heating to be done in the summer with recovered heat from the heat recovery chiller. A hot water recirculation system will also be installed with recirculation pump and accessories. Domestic hot, hot water recirculation, and cold-water piping will be extended to plumbing fixtures in the building. All plumbing equipment will be located in the mechanical room on first floor. New sanitary sewer for plumbing fixtures will be connected to the existing sewer main routed under the new addition. A new dedicated sewer service will not be required for the addition. Natural gas for the new boilers will be extended from the existing gas meter on the adjacent HPF building to the west, with a larger meter likely required to carry the additional load.

Fire Protection - A new water service for the addition will be provided in the first-floor mechanical room and be connected to existing site utilities just the south of the addition. Sprinkler risers with all accessories will be provided for the addition as well as a fire department connection located on the exterior of the addition. A fire sprinkler system will be installed throughout the new addition.

Temperature Controls - All new heating/cooling, ventilation, and plumbing equipment will be controlled and monitored with a new direct digital control building automation system. This system will be connected to the existing campus building automation system.

Site Electrical Service & Distribution - The SJAC electrical services will be extended to provide power distribution out of the wrestling addition mechanical room for lighting and power to the space. Additional panelboards and transformers will be added as required for the power needs of the space and the new mechanical equipment. The electrical service is a 480Y/277-volt system for the mechanical equipment and larger loads with step down transformers for 120/208v loads as required.

Site Lighting - The building will have exterior wall light fixtures lighting up the perimeter and adjacent sidewalk. The building perimeter and sidewalks will maintain lighting levels per South Dakota State University's standards that aid in Campus security.

Normal Electrical Distribution – Switchboards will include 480Y/277-volt switchboards to serve mechanical equipment loads, new pumps, lighting and other miscellaneous equipment in mechanical rooms. 208Y/120-volt step-down transformers and panelboards will be provided as required to serve receptacles, and small equipment loads throughout the building as needed. Panelboards will be UL-labeled, copper bus, bolt-on breaker type with separate ground bus. Locations must be approved by owner and must be flexible for users. All panels to be locked and in secured spaces.

Emergency System: Emergency egress lighting, exit lighting, fire alarm, etc. will be provided as required by Code. The fire alarm system will be an extension of SJAC addressable voice evacuation system. Devices, pull stations, audio/visual horns/speakers, visual strobe lights, sprinkler system flow switches, and other devices as required will be compatible with the existing system. This will allow emergency notification through the fire alarm system. A connection to the BAS system will be provided.

Lighting - Lighting will be designed with user input to provide the best lighting types and sources to suit the needs of the space. Occupancy sensors will be utilized to provide energy conservation and comply with IECC and per ASHRAE 90. All exterior lighting on the building will be LED type with full cut-off fixtures. Lighting will not be installed over areas without frequent access. All light fixtures will have a high efficiency rating. LED lighting will be used throughout the addition.

Special systems - Cable TV will be provided to the facility. Access control will be provided at all public entry points, compatible with for owner "Blackboard" system. Video Surveillance cameras will be provided at all public entry points and connected to the University safety and security system. Sound and P/A system will be provided as coordinated with the owner. Network cabling will be provided for owner-furnished wireless access points. Telecommunications and User Network Data Lines will be provided to connect to the University data network for student and coaches access.

#### **b. CHANGES FROM THE FACILITY PROGRAM PLAN**

There have been no substantive changes from the Facility Program Plan. The floor plan of the building has been refined to include proper support spaces and improve the floor plan efficiency.

Program floor areas have been refined and are as follows. The refinements in design have allowed more floor area to be devoted to program spaces. Less floor area is assigned to support space. The total floor area of the addition is 16,085 sf.

• Matt practice area	8,678 sf
• Vestibule/lobby	422 sf
• Coaches lockers	234 sf
• Toilets/Showers	425 sf
• Lockers	705 sf
• Strength & Conditioning	1,237 sf
• Coaches Offices	815 sf
• Team Lounge & Study Area	1,733 sf
• Mechanical, Custodial	971 sf
• <u>Corridors, circulation</u>	<u>255 sf</u>
• Subtotal (net assignable space)	15,475 sf
• <u>Unassigned space</u>	<u>610 sf</u>
• Total (gross area of the proposed addition)	16,085 gsf

**c. IMPACT TO EXISTING BUILDING OR CAMPUS-WIDE HEATING/COOLING/ELECTRICAL SYSTEMS**

This addition will be constructed west of the strength training and conditioning space on the Sanford Jackrabbit Athletic Complex (SJAC). This addition will be bounded by the exterior walls of the SJAC on the north and east sides. No campus utilities will require modification, but selected site utilities will require modification that are located under the addition.

The electrical service to the SJAC will need to be encased in concrete and a pull pit relocated outside the building footprint. The SJAC sanitary sewer service line under the addition may need to be replaced to a material suited to being under an occupied building. The storm sewer piping serving both the SJAC and the stadium will need to be relocated outside the footprint of the addition. All other utilities and services will be extended from the SJAC to this addition.

**d. TOTAL CONSTRUCTION & PROJECT COST ESTIMATES**

The spending authority approved via SB28 was \$3,950,000 which matches the project budget from the Facility Program Plan. It did include a provision for cost inflation to a limit of 25% over the spending authority. The current project cost estimate is \$4,399,162. A breakdown of the project cost estimate is as follows.

**Construction Costs**

New Addition Building Construction	\$ 3,016,217
Site and Utilities Construction	\$ 134,760
General Construction Overhead & Fees	\$ 315,098
Construction contingency (approx.. 7%)	<u>\$ 242,625</u>
Subtotal – Construction Costs	\$ 3,708,700

**Non-construction Costs**

Design & Professional Fees	\$ 376,037
Project Management & OSE Costs	\$ 132,077
Furnishings, Equipment, Signage	\$ 34,000
Owner Contingency (approx. 4%)	<u>\$ 148,348</u>
Subtotal – non-construction Costs	\$ 690,462

Total Estimated Project Costs \$ 4,399,162

The project estimate is currently \$450,000 higher than the estimated cost from last year and the legislatively authorized amount. A distinct reason for the cost increase is recent inflation of metal materials costs. Steel materials, in all forms, have shown increases varying from 40% to 150% in the last 6 months. Project architects estimate that the increase due to material costs inflation is approximately \$325,000. The University has raised funds to the level of estimated project budget. We have identified a series of alternates that we can take advantage of if bids are favorable or if additional reductions need to be made. Alternates 1 and 2 noted below will be taken if affordable at the time of bidding. Alternate 3 will be taken if bids are unfavorable, and additional cost savings are necessary.

The legislative authorized spending authority is \$3,950,000, but it did include the flexibility for up to a 25% increase from inflation, additional funding, etc. The Estimated project cost remains within the current authority.

The following items will be included as alternates to the project.

- Alternate 1 - Corridor link from the Dykhouse Center to the Wrestling Addition \$ 161,970
- Alternate 2 - Roof Patio \$ 49,372
- Alternate 3 - Mat Space Reduction (deduct alternate) (\$ 85,903)

The project schedule is included as an attachment to this Facility Design Plan.

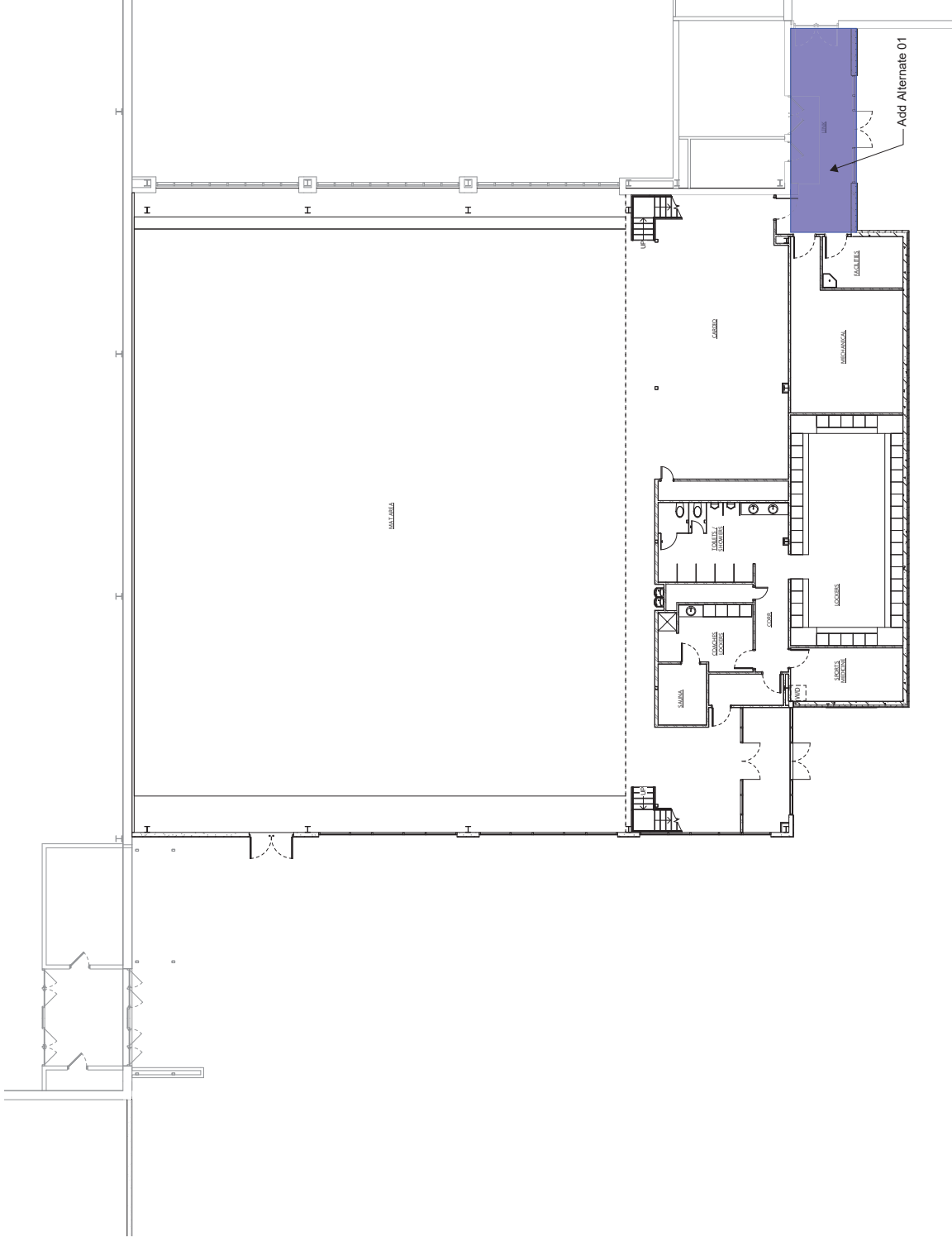
**e. CHANGES FROM COST ESTIMATES FOR OPERATIONAL OR M&R EXPENSES**

Estimates for operational and M&R expenses remain unchanged from the estimates prepared for the Facility Program Plan. Utility consumption costs are estimated at \$24,714 annually. Utility connection costs are included with construction costs.

Estimated routine operational and maintenance expenses are \$49,736, excluding initial equipment purchases for custodial equipment. This includes the value of 0.5 FTE custodial employees. Custodial equipment purchases for setting up the facility upon occupancy are estimated at \$24,714 and included within the project budget. These are unchanged from the Facility Program Plan.

Annual funding for maintenance and repair should be approximately 2% of the estimated replacement value of the facility. The estimated cost of annual M&R is estimated at \$65,051. Via approval of the Facility Program Plan and legislative approval, HEFF will be used to as the funding source for maintenance and repair. This is unchanged from the Facility Program Plan

End of Report  
4/5/2021



1 FIRST FLOOR PLAN  
1/8" = 1'-0"

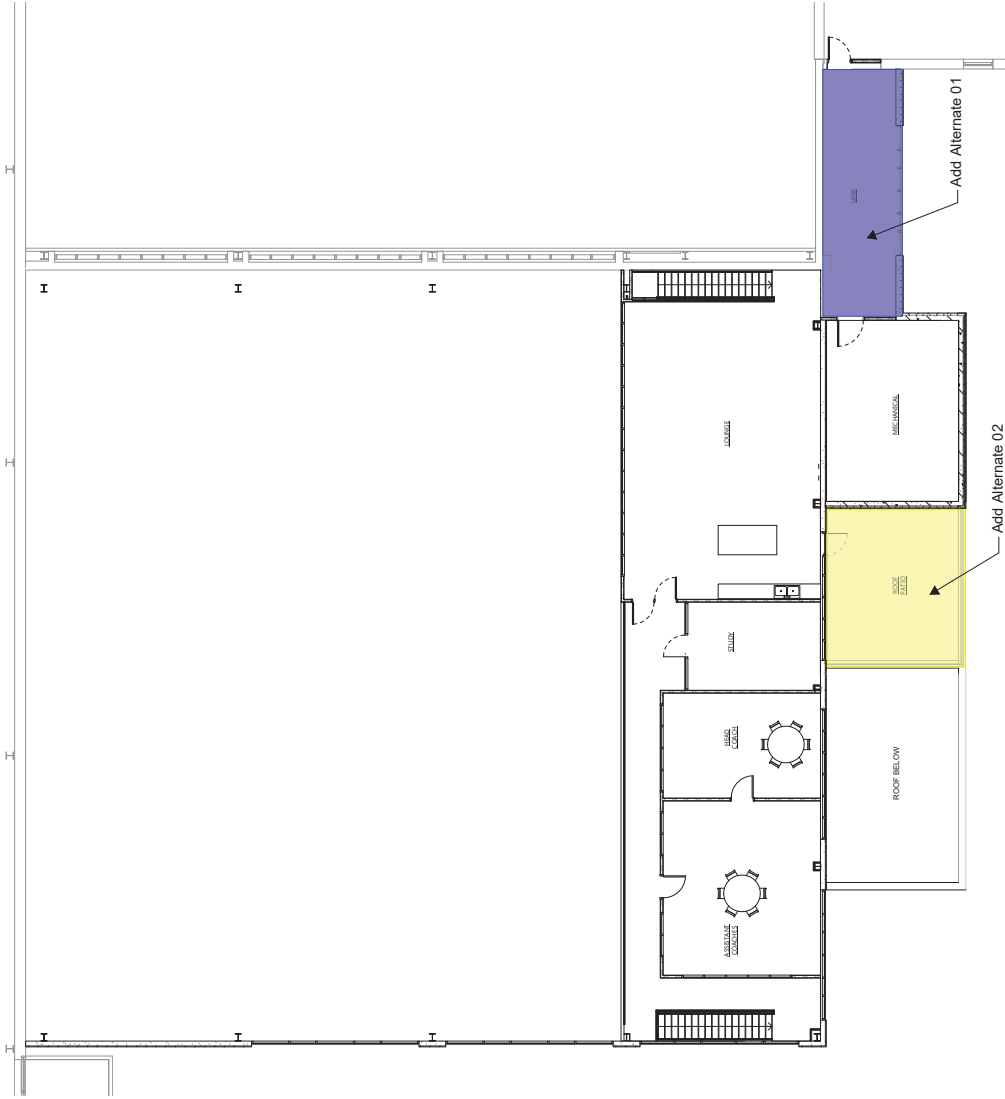


**EAPC**  
ARCHITECTS ENGINEERS

# SDSU WRESTLING CONCEPTS

03/31/2021





1 SECOND FLOOR PLAN  
 1/8" = 1'-0"



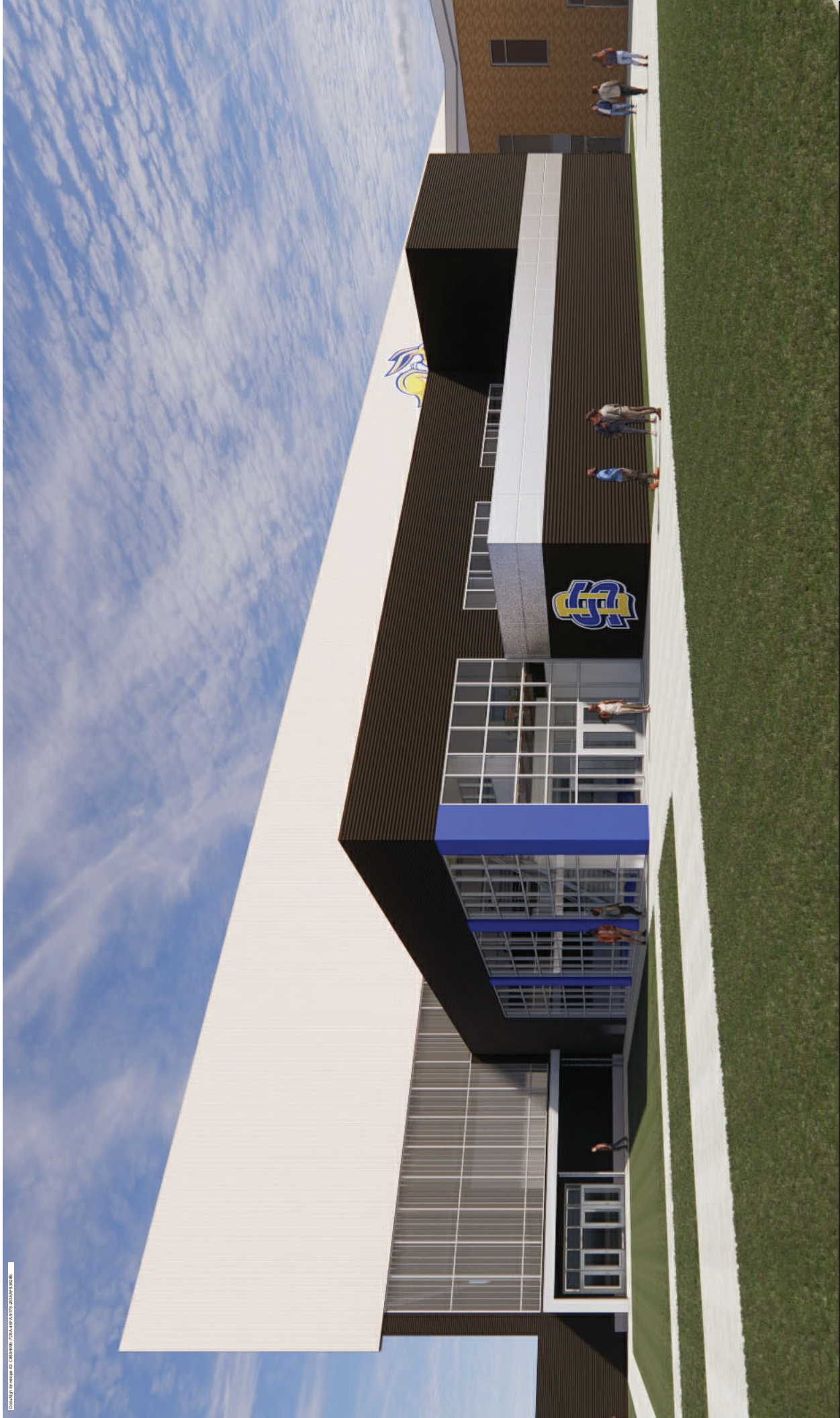
**EAPC**  
 ARCHITECTS ENGINEERS

# SDSU WRESTLING CONCEPTS

03/31/2021







**EAPC**  
ARCHITECTS ENGINEERS

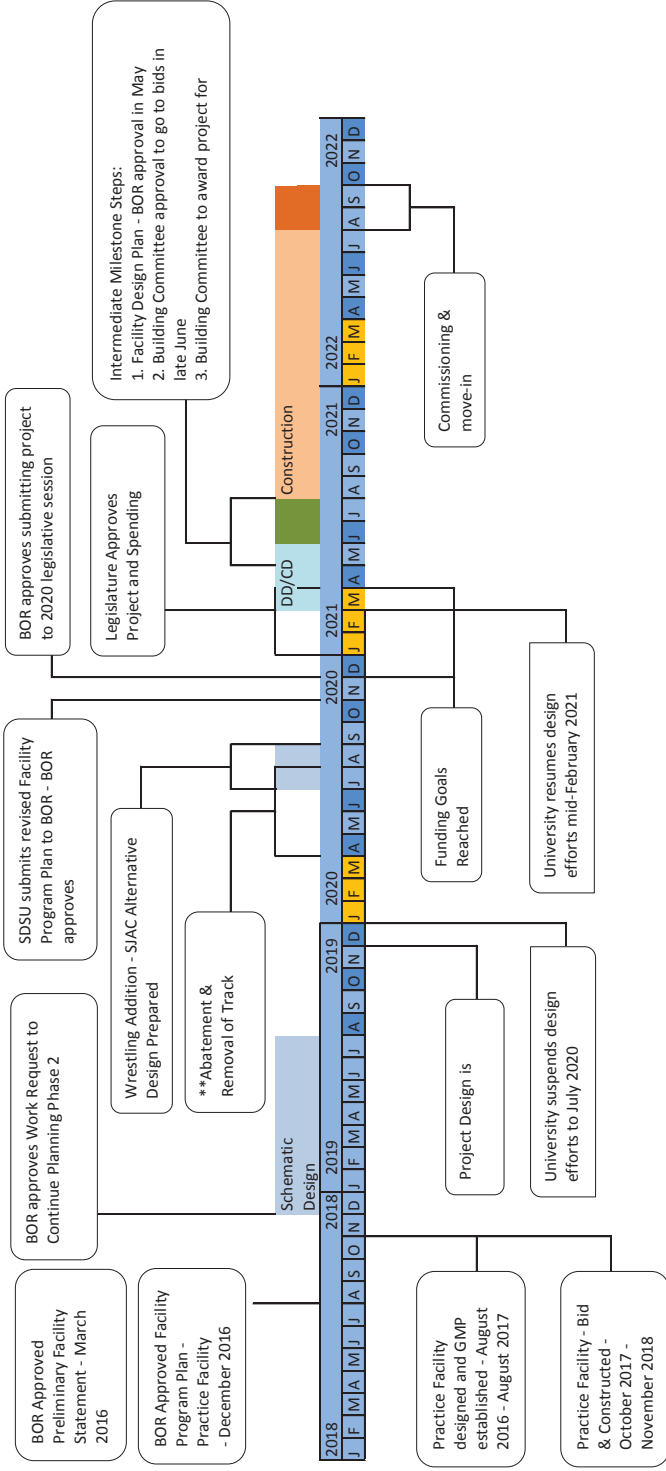
## SDSU WRESTLING CONCEPTS

03/31/2021





**WRESTLING ADDITION TO SIAC**  
**SOUTH DAKOTA STATE UNIVERSITY**  
**UPDATED PROJECTED SCHEDULE (3/24/2021)**



J F M - Months of regularly scheduled business meetings of the BOR (does not include August, planning meeting)  
J F M - Months of South Dakota Legislative Session