SOUTH DAKOTA BOARD OF REGENTS

Budget and Finance

AGENDA ITEM: 8 – C
DATE: June 26-27, 2019

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SUBJECT
NSU Regional Sports Complex Facility Design Plan

CONTROLLING STATUTE, RULE, OR POLICY
SDCL 5-14-1 Classification of Capital Improvements
SDCL 5-14-2 Supervision by Bureau of Administration of Capital Improvement Projects
   – Payment of Appropriated Funds
SDCL 5-14-3 Preparation of Plans and Specifications for Capital Improvements – State
   Building Committees – Approval by Board or Commission in Charge of
   Institution
BOR Policy 6:4 Capital Improvements
BOR Policy 6:6 Maintenance and Repair

BACKGROUND/DISCUSSION
Northern State University requests approval of this Facility Design Plan for the
construction of a Regional Sports Complex with a projected cost of $33 million. The Board
approved NSU’s Preliminary Facility Statement for the new Complex in October 2017, and
approved NSU’s Facility Program Plan in December 2018. The project received approval
from the South Dakota Legislature during the 2019 session in HB1037.

The construction manager for the project is the team of McCown Gordon Construction and
Quest Construction with consultation provided by Kansas Turf. The information and
drawings included in this Facility Design Plan are provided by CO-OP Architecture with
consultant information from DLR Group, Helms & Associates, Mettler Sichmeller
Engineering, and Confluence. The Construction Manager will present the Guaranteed
Maximum Price to the building committee for their approval in August of 2019.

The Regional Sports Complex is the third and final project of the Educational Impact
Campaign. The first project of the campaign, the Athletic and Recreation Fields, was
completed in November 2018. The second project of the campaign, the new South Dakota
School for the Blind and Visually Impaired, is currently under construction and is
scheduled to be completed in November 2019.

(Continued)

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DRAFT MOTION 20190626_8-C:
I move to approve the Facility Design Plan for NSU’s Regional Sports Complex at $33M
to be funded with private donations guaranteed by the NSU Foundation.
Facility Description
The new Regional Sports Complex will be located immediately south of the Barnett Center on the former site of the South Dakota School for the Blind and Visually Impaired. The facility will include a new football stadium with a seating capacity of 3,569 and a perimeter berm to accommodate overflow seating. Included in the multi-level grandstand are various bench and chair-back seating types, a primary concourse, restrooms, concessions, suites, press rooms, coaches’ boxes, A/V rooms, storage, ticketing, and other amenities. A softball field will be adjacent to the football facility and provide seating for 254, dugouts, bullpens, press/suite room, and has a restroom/concession facility that can be shared with the football stadium. Both the football and softball playing fields are synthetic turf and will accommodate practice and games as well as other education and entertainment needs for the university and surrounding communities.

Parking will be available immediately west of the complex to accommodate tailgating. Additional on-campus parking will be available in nearby university parking lots. All parking areas will be used throughout the year by students and to accommodate guests attending other campus events.

A two-story addition to the south side of the Barnett Center and on the north end of the new football stadium will include space for new football locker rooms on the lower level with various amenities such as laundry, equipment storage, restrooms, and facility storage. A multi-purpose event space and club room will look out over the new football field from the second level of this Barnett Center addition. The event space will provide a superior game day experience and it will also be used year-round for a variety of campus and community events and activities.

The new football stadium structure is currently designed using steel and concrete with steel stud infill walls. The primary exterior building materials include cast concrete, block, and metal panel. Significant storefront glazing will be used at the suites, press and event/club space. The north south configuration and all of the facility is designed to meet NCAA playing requirements. The ability to combine this new facility with the existing Barnett Center – particularly the event space, locker rooms, restrooms, and ticketing booths – creates a cohesive sports complex that is convenient, cost effective and maximizes the space available.

Cost and Funding
The estimated cost of the project and available funds guaranteed by the Foundation is $33,000,000. This is the third and final project to be funded with private gifts and grants generated through the Educational Impact Campaign (EIC). The EIC also provided $6 million for the NSU Athletic and Recreation Fields and $14,347,916 for the new School for the Blind and Visually Impaired. Construction will not begin until the full amount of pledges to fund the project is in place.
Estimated Project Costs

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<td><strong>Total Project Cost</strong></td>
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IMPACT AND RECOMMENDATIONS
The outdoor complex and practice fields were the first phase of the planning related to the Educational Impact Campaign; the replacement of the School for the Blind and Visually Impaired building was the second piece. Approval of the Regional Sports Complex Facility Design Plan completes the projects and the planning related to the fundraising campaign.

Approval of the facility included the expectation that the operating costs and the maintenance and repair be funded from net operating revenues. The revenue and expense financial projections and actual performance for the facility will be provided to the Board annually. There is no cost to the State beyond utilities to support the operations. Given that the facility is funded with private dollars and operating revenues are projected to cover the necessary costs, approval of the final design plan is recommended.

The facilities will be major improvements to the NSU campus that should boost recruitment and the overall student and athlete experience. The Aberdeen community will also benefit from a first-class facility with appropriate amenities by attracting more fans and enhancing the overall game-day events and experience.

ATTACHMENTS
Attachment I – NSU Regional Sports Complex Facility Design Plan
Attachment II – NSU Regional Sports Complex Facility Site Map
Northern State University
Regional Sports Complex
Facility Design Plan

Northern State University requests approval of the Facility Design Plan for the construction of the NSU Regional Sports Complex with a projected cost of $33 million. The Preliminary Facility Statement was approved by the Board of Regents in October 2017 and the Facility Program Plan was approved in December of 2018. The project received approval from the South Dakota Legislature during the 2019 session in HB1037.

The Construction Manager for the project is the team of McCownGordon Construction and Quest Construction with consultation provided by Kansas Turf. The information and drawings included in this Facility Design Plan are provided by CO-OP Architecture with consultant information from DLR Group, Helms & Associates, Mettler Sichmeller Engineering, and Confluence. The Construction Manager will present the Guaranteed Maximum Price to the Building Committee for their approval in August of 2019.

A. Architectural, Mechanical and Electrical Schematic Design

The new Regional Sports Complex will be located immediately south of the Barnett Center on the current site of the South Dakota School for the Blind and Visually Impaired. The facility will include a new football stadium with a seating capacity of 3,569 and a perimeter berm to accommodate overflow seating. Included in the multi-level grandstand are various bench and chair-back seating types, a primary concourse, restrooms, concessions, suites, press rooms, coaches’ boxes, A/V rooms, storage, ticketing, and other amenities. A softball field will be adjacent to the football facility and provide seating for 254, dugouts, bullpens, press/suite room, and has a restroom/concession facility that can be shared with the football stadium. Both the football and softball playing fields are synthetic turf and will accommodate practice and games as well as other education and entertainment needs for the university and surrounding community.

Parking will be available immediately west of the complex to accommodate tailgating. Additional on-campus parking will be available in nearby University parking lots. All parking areas will be used throughout the year by students and to accommodate guests attending other campus events.

A two-story addition to the south side of the Barnett Center and on the north end of the new football stadium will include space for new football locker rooms on the lower level with various amenities such as laundry, equipment storage, restrooms, and facility storage. A multi-purpose event space and club room will look out over the new football field from the second level of this Barnett Center addition. The event space will provide a superior game day experience and it will also be used year-round for a variety of campus and community events and activities.

The new football stadium structure is currently designed using steel and concrete with steel stud infill walls. The primary exterior building materials include cast concrete, block, and...
metal panel. Significant storefront glazing will be used at the suites, press and event/club space. The north south configuration and all of the facility is designed to meet NCAA playing requirements. The ability to combine this new facility with the existing Barnett Center – particularly the event space and locker rooms, restrooms, and ticketing booths, creates a cohesive sports complex that is convenient, cost effective and maximizes the space available.

A LEED exemption has been granted for this project based on South Dakota Codified Law 5-14-34(1) which allows the Office of the State Engineer to grant a waiver if the building will have minimal human occupancy. The building design meets criteria 1 of Administrative Rule 10:09:03:01 Terms and conditions for granting waivers which states that high performance building standard certification may be waived if “twenty or fewer persons will permanently occupy the building in a 24 hour period.” Although the project has received this exemption from LEED certification, energy efficient materials and systems will still be incorporated into the facility design.

**Barnett Center Addition – Mechanical/Electrical/Plumbing Systems**

**HVAC SYSTEM:**

Air Handling Units (AHU’s) will provide the morning warmup heat, all cooling, and all ventilation requirements of the facility by supplying air to variable air volume boxes (VAV’s) with hot water reheat coils. The AHU’s shall utilize hot water heat during the heating season or refrigeration DX cooling during the cooling season (an exterior ground mounted air cooled condensing unit to sit on the west side) and shall incorporate a supply fan section with Variable Frequency Device (VFD), an air blender, full economizer (free outside air cooling during hot water heating season) from a stationary intake louver, and a separate return fan section with VFD providing full relief through a stationary relief louver. Demand controlled ventilation will monitor the space carbon dioxide levels and adjust the outside fresh air damper to maintain proper fresh air levels for the occupancy at the time, thus providing energy savings during the occupancy periods lower than peak design.

**Individual Zone Control**

Each individual temperature control zones would have a VAV box located above accessible ceilings. If a zone calls for cooling the VAV box damper opens up and allows the 55-62 degree air to enter the zone from the air handler satisfying its cooling requirements. If the zone is calling for heat, the VAV box damper opens up to its heating position and the reheat coil is used to heat the air to satisfy the zone’s heating requirements. When there is no call for heating or cooling, the VAV provides for proper ventilation air.

Supplemental cabinet unit heaters will be utilized to offset infiltration in high traffic locations with exterior doors (for example vestibules). Supplemental radiation heat will be utilized to serve areas needing additional heat such as spaces with lots of glass to the exterior or restrooms with exterior wall exposure.
**Hot Water Hydronic Heating System**
The hydronic piping will consist of an insulated, two-pipe hydronic hot water heating loop that will use circulating pumps to circulate heating water to AHU’s, VAV’s, CUH’s, and low profile finned tube radiation.

**Heat Injection**
Heat will be injected into the hot water heating loop as needed by using a new steam to heating water heat exchanger located in the mechanical room of the new addition. Tie-in’s will be made to the existing low pressure steam supply & low pressure steam condensate return piping in the southwest corner of the Existing Barnett Center/Wach’s Arena and be extended into the new addition mechanical room. A steam condensate receiving tank system will be required in the new mechanical room of the new addition to lift the steam condensate to the proposed tie-in location.

**Ventilation Systems**
Separate power roof ventilators or inline exhaust fans will be utilized to provide exhaust in restrooms, locker room, and storage areas. Proper separation from new intakes & existing intakes of existing Barnett Center/Wach’s Arena AHU’s will be necessary.

**Temperature Controls**
The temperature control system shall be an extension of one of the existing control systems. All equipment shall be controlled and monitored by the existing color graphic operator’s workstation for owner’s designated personnel to change schedules and setpoints.

**PLUMBING SYSTEMS:**
The plumbing system shall consist of the following:

**Plumbing Fixtures**
Wall hung photo-eye operated flush valve toilets will be provided. Metering faucets will be utilized for public lavatories. Tiled showers are planned for locker room areas.

Exterior hydrants will be located at optimal locations.

**Domestic Water Piping & Insulation**
A tie-in will be made to the existing domestic water meter fit riser in the northwest corner of the existing Barnett Center and a separate domestic cold water feed be extended into serve new addition. All mains & branch piping will be Type “L” copper consistent to the existing Barnett Center.

All mains & branch piping above grade shall be insulated with fiberglass and a sealed vapor barrier.

**Domestic Hot Water System**
Natural gas fired, high efficiency domestic hot water heaters located in the new addition mechanical room will heat domestic water to 140F and distribute 120F water to the domestic hot water system with a thermostatic mixing valve. A domestic hot water recirculation system will be used to ensure that the building occupants don’t have to wait for hot water.
Another option being explored is to provide domestic hot water by utilizing steam from the central heating plan with a domestic hot water heat exchanger and possible domestic hot water storage tank. This option would eliminate the need for the two dedicated natural gas fired domestic hot water heaters.

Sanitary Waste/Venting
All sanitary waste and venting shall be PVC piping.

For all new plumbing vents through the roof, proper separation will be required to all new fresh air intakes & also the existing fresh air intakes of existing Barnett Center/Wach’s Arena AHU’s.

Natural Gas Piping for Natural Gas-Fired Domestic Hot Water Heaters
A tie-in will be made to the existing natural gas meter fit in the northwest corner of the Barnett Center.

All natural gas piping shall be schedule 40 black pipe with isolation valves and pressure reducing valves as necessary.

Cooling Condensate Drainage
All condensate drain piping from the AHU’s & fan coils and shall be Type “L” Copper.

Storm Drainage
All storm drainage shall be PVC piping encased in insulation. Primary & overflow roof drains to be provided for all flat roof areas piped down to below grade to the city storm sewer.

FIRE SPRINKLER SYSTEM:
A complete fire sprinkler system will be installed meeting NFPA, local codes, & the fire marshal’s requirements. An extension of the existing fire sprinkler system is planned.

LIGHTING SYSTEM:
Interior Building Lighting
In areas with acoustical ceiling tiles, economical LED flat panels and recessed can lighting will be utilized. In open/exposed areas linear hanging or pendant fixtures will be utilized. All lighting will be LED.

Life Safety
Exit and emergency lighting will be placed according to life safety codes.

Controls
NSU maintenance prefers minimal occupancy sensors so dimmers and/or standard switching will mostly be utilized unless an occupancy sensor makes sense based on the location. No lighting control panel will be added.

Exterior Lighting
No parking lot lighting will be added. Building lighting will be minimal/as needed.
**SPECIAL SYSTEMS:**

*Fire Alarm:* A fire alarm will be added onto the existing system in the Barnett Center.

*Sound System, A/V System:* The system itself is provided and installed by NSU. Rough-in provisions will be made for these systems. Rough-ins consist of conduits, boxes, and data openings as coordinated with the owner’s A/V representative.

*Door Access and Camera System:* The system itself is provided and installed by NSU. However, rough-in provisions will be made. Rough-ins consist of conduits, boxes, and CAT6 cable (or other) as coordinated with the owner’s IT representative.

**DATA CABLING:**

The data system will be installed by a BICSI certified installer. CAT6 cabling will be used throughout the addition. No new data room is anticipated for the addition and all cabling will be run to existing data closets. Horizontal cabling will be in Electrical Metal Tubing (EMT) raceway where exposed, free-air above accessible ceilings.

**POWER SYSTEM:**

The existing Barnett Center 480V system has capacity to add another panel to serve the loads in the addition. A step-down transformer will be added along with a distribution panel to provide the addition with 120/208V.

All electrical devices (switches, outlets) will be commercial grade. All wiring will be in accordance with the National Electrical Code and the South Dakota State Electrical Commission Wiring Bulletin.

**Football & Softball Stadiums – Mechanical/Electrical/Plumbing Systems**

**HVAC SYSTEM:**

Air Handling Unit(s) (AHU’s) will provide the morning warmup heat, all cooling, and all ventilation requirements of the facility by supplying air to variable air volume boxes (VAV’s) with hot water reheat coils. The AHU’s shall utilize hot water heat during the heating season or chilled water cooling during the cooling season (air cooled chiller to ground mounted in a shared enclosure with transformer/gas meter fit, etc.) and shall incorporate a supply fan section with VFD, an air blender, full economizer (free outside air cooling during hot water heating season) from a stationary intake louver, and a separate return fan section with VFD providing full relief through a stationary relief louver. Demand controlled ventilation will monitor the space carbon dioxide levels and adjust the outside fresh air damper to maintain proper fresh air levels for the occupancy at the time, thus providing energy savings during the occupancy periods lower than peak design.

*Individual Zone Control*

Each individual zone will have a VAV box located above the accessible ceilings. If a zone calls for cooling the VAV box damper opens up and allows the 55-62 degree air to enter the zone from the air handler satisfying its cooling requirements. If the zone is calling for heat, the VAV box damper opens up to its heating position and the reheat coil is used to heat the air to satisfy the
zone’s heating requirements. When there is no call for heating or cooling, the VAV provides for proper ventilation air.

Common areas such as corridors, vestibules, mechanical, etc. would have two-pipe fan coil units. Supplemental cabinet unit heaters will be utilized to offset infiltration in high traffic locations with exterior doors for example vestibules, stairwells. Supplemental radiation heat will be utilized to serve restrooms with exterior wall exposure or areas needing additional heat such as spaces with lots of glass to the exterior.

**Hydronic System**

The hydronic piping systems will consist of insulated two-pipe hydronic water system (circulating heating water supply & return in the heating season, or chilled water supply & return in the cooling season; with automatic changeover from heating to cooling and vice versa at a certain outside air temperature (adjustable)). The hydronic loop piping will consist of an insulated, two-pipe hydronic loop that will use circulating pumps to circulate water to AHU’s, VAV’s, CUH’s, and low profile finned tube radiation.

**Heat Injection**

If the outside air temperature falls below the setpoint, the two-pipe hydronic system will be switched over to heating (hot water heat). Heating will be enabled and heat will be injected into the heating water supply & return piping system using high efficiency, natural gas fired boilers. Heating water will not be available when the air temperature is above a set temperature (adjustable) and the system has been switched to chilled water.

**Heat Rejection**

If the outside air temperature rises above the setpoint, the two-pipe hydronic system will be switched over to cooling (chilled water). Heat will be rejected from the AHU’s and fan coils into the chilled water supply & return piping system using a ground mounted air-cooled chiller. Cooling chilled water will not be available when the air temperature drops below a set temperature (adjustable) and will be provided by the economizer of the AHU’s.

**Ventilation Systems**

Separate power roof ventilators or inline exhaust fans will be utilized to provide exhaust in restrooms, locker rooms, and storage areas. Proper separation from fresh air intakes will be necessary.

**Temperature Control System**

The temperature control system shall be an extension of either of the existing control systems. All equipment shall be controlled and monitored by the existing color graphic operator’s workstation for owner’s designated personnel to change schedules and setpoints.

**Softball Stadium (Suite/Press Area, FB Stadium Shared Concessions/Restrooms)**

**Suite/Press Area**

This area will include a sidewall packaged vertical unit with electric heat to meet the heating, cooling, and ventilation requirements for the space. These units will each require a small closet to
house the unit and each have a single louver to the exterior thus requiring no exterior or roof mounted condensing units.

Concessions
This area will include a sidewall packaged vertical unit with electric heat to meet the heating, cooling, and ventilation requirements for the space. This unit will require a small separate closet to house the unit with a single louver to the exterior thus requiring no exterior or roof mounted condensing unit.

Restrooms Area
This area will include a sidewall packaged vertical unit with electric heat to meet the heating, cooling, and ventilation requirements for the space. This unit will require a small separate closet to house the unit with a single louver to the exterior thus requiring no exterior or roof mounted condensing unit. The ventilation system will utilize an energy recovery ventilator that will supply semi-conditioned outside air to the sidewall packaged vertical unit. The energy recovery unit will transfer energy from the exhaust air stream to the outside air, then distributing it within the building.

Temperature Controls
The temperature control system shall be an extension of either of the existing control systems. All equipment shall be controlled and monitored by the existing color graphic operator’s workstation for owner’s designated personnel to change schedules and setpoints.

PLUMBING SYSTEMS:
The plumbing system shall consist of the following:

Plumbing Fixtures
Wall hung photo-eye operated flush valve toilets will be provided. Metering faucets will be utilized for public lavatories. Tiled showers are planned for locker room areas.

Exterior hydrants will be located at optimal locations of all desired floors.

Domestic Water Piping & Insulation
To prevent pitting, scaling, or corrosion below & above ground domestic cold, hot, and recirculating hot water piping & fittings shall be Uponor Pex A with a twenty-five year warranty. The exception will be all piping with in the mechanical room at the water meter fit. All mains & branch piping above grade shall be insulated with fiberglass and a sealed vapor barrier.

Football Stadium
A dedicated domestic cold water service & meter fit is planned for the new facility.

Softball Stadium (Suite/Press Area, Shared Concessions/Restrooms)
A dedicated domestic cold water service & meter fit is planned for the shared concessions/restroom facility. No plumbing is planned for the suite/press area at this time.
Domestic Hot Water System

Football Stadium
Two natural gas fired, high efficiency domestic hot water heaters located in the new mechanical room will heat domestic water to 140°F and distribute 120°F water to the domestic hot water system with a thermostatic mixing valve. A domestic hot water recirculation system will be used to ensure that the building occupants don’t have to wait for hot water.

Softball Stadium (Suite/Press Area, FB Stadium Shared Concessions/Restrooms)
One new high efficiency domestic hot water heater located in a mechanical room will heat domestic water to 140°F and distribute 120°F water to the domestic hot water system with a thermostatic mixing valve. No plumbing is planned for the suite/press area at this time.

Sanitary Waste/Venting
All sanitary waste and venting shall be PVC piping.

For all new plumbing vents through the roof, proper separation will be required to all new fresh air intakes & also the existing fresh air intakes of existing Barnett Center/Wach’s Arena AHU’s.

Natural Gas Piping
All natural gas piping shall be schedule 40 black pipe with isolation valves and pressure reducing valves as necessary.

Football Stadium
A new natural gas service & meter fit will provide natural gas necessary to serve high efficiency hot water boilers, infrared radiant heaters, and domestic hot water heaters.

Softball Stadium (Suite/Press Area, Shared Concessions/Restrooms)
No natural gas is planned for the softball stadium (suite/press area, football stadium shared concessions/restrooms) at this time.

Cooling Condensate Drainage
All condensate drain piping from the AHU’s and fan coils shall be Type “L” Copper.

Storm Drainage
All storm drainage shall be PVC piping encased in insulation. Primary and overflow roof drains to be provided for all flat roof areas piped down to below grade to the city storm sewer.

FIRE SPRINKLER SYSTEMS:

Football Stadium
A complete fire sprinkler system will be installed meeting NFPA, local codes, and the fire marshal’s requirements.

Softball Stadium (Suite/Press Area, Shared Concessions/Restrooms)
No fire sprinkler system is planned for these facilities.
**LIGHTING SYSTEM:**

*Interior Building Lighting*
In areas with acoustical ceiling tiles, economical LED flat panels and can lighting will be utilized. In open/exposed areas linear hanging or pendant fixtures will need to be used. There will be some architectural and accent lighting as the plan develops. All lighting will be LED fixtures.

Exit and emergency lighting will be placed according to life safety codes.

As needed dimmers, occupancy, vacancy, or daylight sensors will be utilized. The possibility exists to use a lighting control panel depending on the usage of the space.

*Exterior Lighting*
Nighttime friendly LED fixtures will be utilized to help mitigate light pollution. Building & parking lot lighting will be controlled through the campus Johnson Controls system and any security lighting shall be operated by photocell control, on at dusk, off at dawn.

*Exterior Athletic Lighting*
The sports lighting will be a Musco system with LED fixtures (including the option to dim) designed to meet the NCAA Division standards. The primary goals would include:

- **Guaranteed Light Levels:** Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore light levels are guaranteed to not drop below specified target values for a period of 25 years.
- **Environmental Light Control:** It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors. The LED design should provide better control than a good HID design.
- **Life-Cycle Cost:** In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
- **Control and Monitoring:** To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

**SPECIAL SYSTEMS:**

*Fire Alarm:* Because the building is over 6,000 square feet a fire alarm system shall be installed to meet the present code requirements. A fully addressable system will be used. Pathways shall be installed in EMT. The fire alarm system shall be able to communicate back to the campus physical plant with a hard-wired connection.

*Sound System, A/V System:* At a minimum rough-in provisions will be made for these systems.

*Door Access and Camera System:* The system itself is provided and installed by NSU. However, rough-in provisions will be made. Rough-ins consist of conduits, boxes, and CAT6 cable (or other) as coordinated with the owner’s IT representative.
**DATA CABLING:**
The data system will be installed by a BICSI certified installer. CAT6 cabling will be used throughout the building. Panduit network racks with cable management will be utilized. The data and phone systems will be connected to the campus system using fiber optic cable. Horizontal cabling will be in EMT raceway where exposed, free-air above accessible ceilings.

**POWER SYSTEM:**
The existing campus high voltage electrical system will be extended to the new building location. A new high voltage switching section will be added to the existing distribution substation. A transformer will be placed to provide 480/277V three phase power to the main electrical service. 480V will be used for field lighting. A step-down transformer will be added to provide the building with 120/208V.

All electrical devices (switches, outlets) will be commercial grade. All wiring will be in accordance with the National Electrical Code and the South Dakota State Electrical Commission Wiring Bulletin.

**Utilities**
The electric power will be from NSU’s electric distribution system. NSU receives a WAPA allocation and supplemental power is purchased through the State of South Dakota contract with Heartland. Natural gas will be provided by Northwestern Energy along with the steam from NSU’s Central Boiler Plant. Estimated utility costs are $48,000 to $60,000 per year.
Sports Field Design Concept

The football field will be designed and constructed in the same manner as the football and soccer practice fields that were completed in the summer of 2018. The intent is for the new football field surface to perform and play in a manner that is consistent with the football practice field. The proposed softball field will have a similar subgrade preparation but will have shorter turf heights with thatch zone.

Football Field

A. Football Field Turf: Turf will be equal to the new practice fields. Provide a dual fiber synthetic turf with a minimum 52 ounces/SY and 2.25-inch height.
B. Turf Infill: Provide 70% cryogenic crumb rubber at 4-5 lbs. per SF and 30% clean round sand at 3 lbs. per SF.
C. Football Field Section: Two options are being considered. One option includes a minimum of 9” depth of treated compacted sub-grade with 18-inch depth of low volume change (LVC) sand material, with geotextile fabric, and 6-inch depth of clean crushed granite drainage aggregate and sub drain system. The other option includes compacted sub-grade with 10-inch depth of low volume change (LVC) sand material, with geotextile fabric, and 6-inch depth of clean crushed granite drainage aggregate and sub drain system.
D. Football Field Slope: Field will be crowned with a 0.060% cross slopes.
E. Football Field Striping: The NCAA regulation field will have turf colors, center field logo, text, and field striping like the practice field.
F. Drainage: Storm water will be collected below the clean drainage aggregate in an HDPE panel drain system and collected in a 12” dual wall HDPE pipe system for both fields and extended to the existing storm drains in the area.
G. Football Sports Equipment:
   i. Install regulation NCAA adjustable football goals with 30-feet uprights.
   ii. Field goal ball net system (60-feet height by 40-feet wide) with 6” posts behind goals.
   iii. Field grooming equipment.
H. Power/Communications at Field: Provide electrical and communication cable service to the inside of the field walls for power to field equipment along the sidelines.
I. Water at Field: Potable water for players will also be extended water hydrants mounted in the field wall at two locations at approximately the 30-yard lines on both sides.
J. Field Wash-Down: Provide six 1-inch quick couplers in valve boxes in the field equally spaced along the field sidelines to facilitate entire field wash down using 100-feet length hoses.

Softball Field

A. Softball Field Turf: Outfield turf to be 1-3/4-inch height with thatch zone at 80 ounces per SY face weight. Infield and warning track turf to be 1-1/2-inch height with thatch zone at 72 ounces per SY face weight.
B. Turf Infill: Install clean round sand and crumb rubber at rates recommended by manufacturer.
C. Field Logos: Provide larger NSU Wolf logo in outfield and smaller NSU logo behind home plate.
D. Softball Field Slope: Infield surface will have conical grades from the pitching mound and sloped at 0.50 percent away from the infield area. The outfield will slope at 0.60 percent from the infield to the outfield fence. Sub-drains will be connected to the site’s storm drain system.

E. Softball Field Section: Provide compacted sub-base per the geotechnical report. Assume a minimum of 9” depth of treated compacted sub-grade with 18-inch depth of low volume change (LVC) sand material, with geotextile fabric, and 6-inch depth of clean crushed granite drainage aggregate and sub drain system.

F. Softball Field Striping: The NCAA regulation field will have turf colors, center field logo, text, and field striping like the practice field.

G. Softball Sports Equipment:
   i. NCAA regulation bases, pitching rubber and home plate.
   ii. Foul poles (30’ height).
   iii. Top rail padding for outfield fence and dugout fencing.
   iv. Aluminum post and netting for batting cages (2-cages).
   v. Dugout benches, bat rack, and equipment storage.

H. Batting cages: Provide two batting cage systems (15-feet by 55-feet) over synthetic turf on the home side.

I. Bullpen: Provide warm-up bullpen for a minimum of two pitching positions over synthetic turf on the home and visitor’s side.

J. Backstop Net System: Provide delegated design system for 35-feet height netted backstop with powder-coated 6-inch posts. Include lower knee wall pad and framing system. Backstop to extend to the dugouts.

K. Fencing: Provide black powder-coated PVC fencing in 4-feet and 6-feet heights per drawings.

L. Power at Field: Provide electrical service to each bullpen, dugout, and batting cage for field equipment power. Verify with electrical for circuits and power requirements.

M. Water at Field: Potable water for players will also be extended water hydrants at each dugout.

Field Wash-Down: Provide four 1-inch quick couplers in valve boxes in the field equally spaced along the field sidelines to facilitate entire field wash down using 100-feet length hoses.

B. Changes from Facility Program Plan

There have been no major changes to the design included in the Facility Program Plan approved in December of 2018.

C. Impact to existing campus-wide heating, cooling and electrical systems

The existing central heating plant will supply heat for the Barnett Center addition and possibly domestic hot water. Boilers in the central heating plant were replaced in 2018 and have the capacity for this increase in demand. The addition will be cooled using the same type of cooling units currently used in the Barnett Center. Both the football stadium and softball stadium will have stand-alone heating and cooling systems. The existing campus electrical loop has the capacity to absorb the increase in demand resulting from this project.
D. Changes from the cost estimates for operational or M&R expenses

There have been no significant changes to estimated operating costs or M&R costs from those provided in the Facility Program Plan.

E. Estimated project costs

The total estimated project cost is $33 million. This is the third and final project to be funded with private gifts and grants generated through the Educational Impact Campaign (EIC). The EIC also provided $6 million for the NSU Athletic and Recreation Fields and $14,347,916 for the new School for the Blind and Visually Impaired.

<table>
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<tr>
<th>Estimated Project Costs</th>
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<td>Construction Costs</td>
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Football Stadium
Concourse Level
Football Stadium
Premium Level