REQUEST FOR QUALIFICATIONS AND PROPOSAL

Regarding: Commissioning Services

Date Released: March 4, 2020

Closing Date: March 26, 2020; 2:00pm

Project Name: New School of Business

Project Number: A-013842/B0001655

Agency Location: Wichita State University, Wichita Kansas

Point of Contact: Kim Sowell, Assistant Director of Purchasing
Email: kim.sowell@wichita.edu

Wichita State University, on behalf of the Kansas Board of Regents (KBOR), and the architectural team of Gensler and GastingerWalker&, hereby invites statements of qualifications and a cost proposal (in separate envelope) from firms who wish to be considered to consult with the architectural team for the indicated project. The consultant will be bound to the Kansas Board of Regents- Procedures for Implementation of the State Educational Institution Project Delivery Construction Procurement Act and its statutory authority under KSA 76-7, 125 et seq.

Project Information (Attachments by reference):

1) Exhibit A – Schematic Design Narrative dated January 24, 2020
2) Exhibit B – Draft OPR and BOD
3) Exhibit C – Design Development Floor Plans dated March 2, 2020

Estimated Total Construction Cost: $46,500,000

Estimated Overall Project Area: 128,000 GSF, anticipated to be 3 stories with mechanical penthouse.

Target Project Completion Date: Spring 2022

Project Summary:

Wichita State University is seeking the services of a qualified Commissioning Authority for the new building to house the School of Business. The project is presently in the Design Development Design phase. The present design schedule for the project is to complete Design Development April 8, 2020, and Construction Documents August 14, 2020.

The design of the project is by the team of Gensler and GastingerWalker& with engineering consultant W.L. Cassell & Associates. The Commissioning Authority will report to the Owner’s representative, Emily Patterson, Executive Director of Facilities Planning, Office of the Vice President for Finance and Administration, email: Emily.patterson@wichita.edu.
SCOPE OF WORK
The Owner has elected to use the Commissioning Process as an element in their quality process during the design and construction of this facility. The primary role of the Commissioning Authority (CA) is to ensure that the Owner’s project requirements developed during the planning phase are achieved through the design, construction, and operation of the facility. The project is currently in Design Development phase.

The Owner has elected to construct this facility in accordance with the U.S. Green Building Council (USGBC) guidelines as defined in the LEED v4 reference guide. The design intent of the project is to meet the Fundamental level of certification. The commissioning process will require the commissioning agent to provide all documentation required by the USGBC to support these two elements of LEED v4; the project will be submitted to USGBC for Silver certification.

The commissioning process defined below exceeds the requirements of LEED v4 EA Prerequisite #1 and EA credit #3, because the nature of this sophisticated project dictates systems need to be commissioned that are not required by the LEED process. Additionally, some tasks defined below exceed the specific requirements of LEED, but the nature of the complexity of this project requires the defined level of commissioning.

The following is a summary of the commissioning process that the Owner intends to have implemented on this project. For this proposal the following process will be assumed.

1. COMMISSIONING PROCESS
   A. Commissioning Process during Design
   - Review the Owner’s Project Requirements (OPR) for compliance with the requirements set forth in the LEED v4 reference guide, EAp1. The OPR is in development during the Design Development Phase of the project and is attached as an exhibit.
   - Verify the Basis of Design (BoD) in regard to the Owner’s Project Requirements. The draft Basis of Design documentation is attached as an exhibit for reference.
   - Attend 2 meetings with the project team during the design phase. These meetings may be in Kansas City or Wichita.
   - Perform a commissionability review of the drawings and specifications for constructability, serviceability, and maintainability. A review will be required at the 100% DD stage and at the 95% CD stage.
   - Perform plan review for compliance with the OPR and BoD at the mid construction document phase as required by v4 EAp1.
   - Develop full commissioning specifications based on Owner’s requirements. Coordinate and integrate into the project specifications prepared by the project architect and engineers. The commissioning specification shall include a detailed description of the responsibilities of all the parties, details of the commissioning process, reporting and documentation requirements including formats, deficiency resolution, pre-functional checklist requirements, functional testing requirements, test and balancing requirements, training, O&Ms, record document requirements and retesting responsibilities.
   - The specification should include a “definitions” section that will clearly defines what will constitute “engineered system acceptance” within the commissioning process. Formal acceptance may require demonstration of conformance with OPR performance criteria, successful completion of Functional Performance Test, or both.
CA is to develop a preliminary construction phase Commissioning Plan, including:

- A project specific description of equipment to be commissioned.
- A description of the roles of the Cx team and responsibilities, including the Owner, A/E, Contractors, and CA
- A description of the commissioning process.
- Provide sample prototypical Pre-Functional Checklists (PFCs) for each piece of equipment in the Commissioning Scope.
- Provide sample prototypical Functional Performance Tests (FPTs) that define acceptable results of the tests to be performed.
- Provide a list of all tests necessary to demonstrate compliance with performance criteria identified by the Owner within the OPR document or elsewhere. Examples may include:
  - Occupied space temperatures maintained within ranges mandated by University Energy Policy, or other, as established by the OPR.
  - Maximum occupied space background noise levels maintained below levels prescribed within the OPR.
  - Maximum and minimum obtainable lighting levels conform to criteria prescribed within the OPR.
- Sample matrices for training requirements, submission requirements for O&Ms and warranties, etc.
- CA to develop a “post-startup data trending plan”. This plan should be created during the late design phase and reviewed during the M/E/P review sessions. The plan should include:
  - A listing of all mechanical system control points to be monitored over the trending cycle, including documenting all Wichita State University-Facilities Services FS preferences for controls system abbreviations.
  - Recommended polling frequency.
  - An explanation of how the data results will be used to document system performance.
  - A description of how the data results will be used to define “acceptance” of the mechanical systems that are commissioned/trended.
  - Recommendations for long term trending that the University may choose to use for post-acceptance system management.

B. Commissioning Process During Construction and Acceptance Phases

- Revise as necessary the commissioning plan developed during design, including scope and schedule.
- Prepare project specific Pre-Functional Checklists (PFCs) for each piece of equipment in the Commissioning Scope and include in the commissioning plan.
- Prepare project specific Functional Performance Tests (FPTs) that define acceptable results of the tests to be performed and include in the commissioning plan.
- Plan and conduct a pre-construction commissioning meeting within 60 days of contract award.
- Coordinate and direct the commissioning activities in conjunction with the contractor and/or construction manager in a logical, sequential and efficient manner using consistent protocols, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise. Meetings will be held as necessary to coordinate the process.
- Coordinate the commissioning tasks with the General Contractor (GC) to ensure that commissioning activities are being scheduled into their master schedule.
• Review contractor submittals applicable to systems being commissioned for compliance with commissioning needs and as required by LEED concurrent with the A/E reviews. Reviews must be timely and not impact the construction schedule of the contractor.
• Review start-up procedure forms prior to start-up.
• Witness start-up of the following systems:
  • Air cooled Chillers
  • Boilers
  • Emergency generator
  • All equipment equipped with VFDs or ECM’s
  • Smoke Evacuation systems
  • Air distribution systems
• All equipment that is furnished with microprocessor control will be specified to include manufacturer’s onsite startup. The CA shall incorporate manufacturer’s equipment-specific commissioning and startup documentation into the project commissioning documentation. Examples may include air cooled chiller and energy recovery ventilation microprocessor controls.
• Review start-up documentation after equipment has been started.
• Review all construction team meeting minutes for revisions/substitutions relating to the Owner’s project requirements. Attend selected job-site construction team meetings and conduct commissioning meetings as necessary to coordinate the commissioning process with the project team.
• Perform site visits monthly starting with the placement of equipment to be commissioned. Increase the frequency as necessary as equipment rough-in begins and the project progresses to the equipment start-up and functional testing phases.
• The CA shall execute pre-functional checklists by documenting installation of equipment and systems as they are installed. The purpose of this process will be to document installation is per the contact documents as the work is installed, piped, ducted, etc. and not wait until all installation is complete. Performing only one review after installation is complete will not be adequate.
• Direct the execution of the functional performance test procedures (FPTs) by the responsible subcontractors. Test individual pieces of equipment, systems and system integration with other systems. Prepare a testing schedule in conjunction with the construction team. Document test results and recommend system for acceptance.
• Review testing, adjusting and balancing (TAB) execution plan.
• Implement the Construction phase of “post-startup data trending plan”.
• Perform calibration testing of all utility metering systems, including electrical, water, natural, and chilled water BTU consumption. Provide documentation of the accuracy of reported utility usage.
• Maintain a master issues log and separate testing record. Provide to the Owner written progress reports and test results with recommended actions.
• Verify the training of the Owner’s operating personnel.
• Review testing, adjusting and balancing (TAB) execution plan.
• Implement the Construction phase of “post-startup data trending plan”.
• Perform calibration testing of all utility metering systems, including electrical, water, natural, and chilled water BTU consumption. Provide documentation of the accuracy of reported utility usage.
• Maintain a master issues log and separate testing record. Provide to the Owner written progress reports and test results with recommended actions.
• Verify the training of the Owner’s operating personnel.
• Review testing, adjusting and balancing (TAB) final report
• Verify air and water test and balance report by providing 24 man-hours for spot checking report with T&B subcontractor.
• Compile and maintain a commissioning record.
• Review the preparation of the O&M manuals.
• Provide a final commissioning report.

C. Commissioning During the Occupancy and Operation Phases
• Implement the Occupancy phase of "post-startup data trending plan".
• Provide three seasonal tests, peak summer, mild spring or fall in October or April and peak winter. Coordinate this required seasonal testing with the owner and contractor. Follow-up on deficiencies until corrected and provide the final testing documentation for the commissioning record and O&M manuals.
• Return to the site at 10 months into the 12-month warranty period and review with facility staff the current building operation and the condition of the outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have with operating the building as originally intended.
• Assist facility staff in developing reports and documents and requests for services to remedy outstanding problems. Accomplish a Lessons Learned meeting with the Owner, contractors, designers, operators, and occupants one year after occupancy.

2. THE COMMISSIONING AUTHORITY IS NOT RESPONSIBLE FOR:
The CA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CA may assist with problem-solving or resolving non-conformance or deficiencies, but ultimately that responsibility resides with the Architect and General Contractor.

3. SYSTEMS AND ASSEMBLIES TO BE COMMISSIONED
The following systems are to be commissioned:
• All equipment of the heating, ventilating and air conditioning systems including, but not limited to:
  • Building automation systems, including linkages to remote monitoring and control sites
  • Chilled water system including chillers, chemical treatment systems, pumps, piping, and associated equipment
  • Hot Water Boilers, chemical treatment systems, pumps, piping and associated equipment.
  • Air Handling Units
  • Exhaust and other specialty fans
  • Terminal units
  • Ductwork and piping
  • Unit heaters and unit ventilators
  • VRF and DX Split Systems
  • Refrigeration systems
  • Chemical water treatment systems
  • Equipment vibration control
• Domestic booster pump
• Domestic hot water systems including water heaters and pumps
• Emergency power from the generators thru all distribution panel boards rated 800A and larger
• Uninterruptible power supply (UPS) systems.
• Normal power distribution systems from the main switchgear thru all distribution panel boards rated 800A and larger
• Lighting control systems.
• Communication and paging systems.
• Life safety systems (fire alarm, fire protection). This includes the fire and jockey pump and dry or pre-action systems. It also includes the operation of all integrated systems for all prototypical fire sequences, examples being AHU shutdown, smoke evacuation sequence, elevator recall, security interface, door hardware interface, kitchen systems such as natural gas shutdown, shunt trip of electrical devices, kitchen exhaust fan control and range hood interface, etc.)
• Operation of all mechanical and plumbing equipment listed in this RFP during utility power failure, the transition to emergency power, and the transition back to utility power after the utility is restored.
• All systems serving atrium space

4. DESIRED QUALIFICATIONS
It is desired that the person designated as the Commissioning Authority satisfy the following requirements:
A. Have acted as the principal Commissioning Authority for at least three similar projects. Similar in construction size and defined commissioning scope (tasks and list of equipment and systems).
B. Have been a dedicated fulltime commissioning authority for the last 5 years
C. Experienced in the quality process.
D. The Commissioning team members shall have extensive experience in: (1) the operation and troubleshooting of HVAC systems, (2) direct digital control (DDC) systems, (3) lighting control systems, (4) testing, adjusting, and balancing (TAB) of HVAC systems, and (5) voice/data networking systems. Extensive (minimum of five years) field experience is required for this type work and systems.
E. Knowledgeable in building operation and maintenance and O&M training.
F. Knowledgeable in test and balance of both air and water systems.
G. Experienced in energy-efficient equipment design and control strategy optimization.
H. Direct experience in monitoring and analyzing system operation using energy management control system trending and stand-alone data logging equipment.
I. Excellent in verbal and written communication skills. Highly organized and able to work with both management and trade contractors.
J. The commissioning authority must be a Professional Engineer in the State of Kansas, with other Engineers as appropriate that are also registered Engineers. Project managers, lead field Engineers, and field support staff may be non-Engineers who have had technical training, past field experience and skill in Commissioning, especially in the areas of TAB, HVAC operations, DDC systems, networking, and electrical system operations. The required expertise for this project must be part of the skill and experience set of the firm making the proposal.
K. A commissioning authority must have earned a commissioning certification from ACG or BCA.
L. The Commissioning firm will demonstrate depth of experienced personnel and capability to sustain loss of assigned personnel without compromising quality and timeliness of performance.
5. INSTRUCTIONS TO PROPOSERS

A proposer must propose to execute all phases of the commissioning in a single proposal. The proposal must be signed by an officer of your firm with the authority to commit the firm.

A. RESPONSES ARE DUE March 24, 2020; 2:00 p.m.
B. Submit three (3) bound copies and one (1) .pdf file on a usb drive of your written technical qualifications. Organize your technical proposal following the submission requirements below. Provide numbered tabs corresponding to each of the sections below, with your response behind each tab.
C. Submit fee proposal in a separate sealed envelope with the qualifications.
D. Provide a summary description of your firm’s commissioning experience within the past five years.
E. Provide a detailed project organizational chart indicating names of dedicated project staff and their specific duties and responsibilities. Provide an organizational chart of your firm.
F. List the key individual who will be the Commissioning Authority for this contract and describe his/her relevant qualifications and experience. This information is required in addition to any detailed resumes the proposer submits. The contract will require that this individual be committed to the project for its duration.
G. Provide your approach to working with the design team, School of Business and WSU Facilities Planning (FP) and Facilities Services (FS) staff.
H. Provide project and professional references and experience for three to five commissioning projects for which the proposer was the principal Commissioning Authority in the last three years. Include a description of the project, identify when the proposer came into the project, and describe the involvement of each individual on the proposer’s team in the projects. For each project, attach a sheet that includes the name and telephone number of the Owner’s project manager, construction manager, facility administrator of the building, the mechanical designer, the controls contractor site project manager, the mechanical contractor and the electrical contractor.
I. Project approach
   1) Describe your proposed approach to managing the project expertly and efficiently, including your team participation.
   2) Describe how your designated Commissioning Agent(s) (and commissioning team) will interface with and support the owner’s personnel, the Project Manager, Design Professional, and Construction Manager. Describe your reporting strategy to inform project team of the status of the commissioning process.
J. As an attachment, provide the following work products that members of the proposer’s team wrote:
   1) Commissioning plan that was executed
   2) Commissioning specifications
   3) An actual Functional Test Procedure that was executed
K. Provide a lump sum total fee to accomplish the work and an hourly rate for each team member. The Owner will negotiate with the selected proposer.
L. Questions relating to the RFQ/P must be submitted in writing, faxed, or e-mailed to:
   Kim Sowell
   Assistant Director of Purchasing
   Office of Purchasing
   1845 Fairmount St.
   Wichita, Kansas  67260-0012
   Email: kim.sowell@wichita.edu
The deadline for submission of questions relating to the Request for Qualifications and Proposal is March 10, 2020 by close of business 5:00 pm CST. A copy of all questions and answers will be sent to all proposing firms as an Addendum.

6. ADDITIONAL CONDITIONS

Wichita State University reserves the right to extend the deadline for submittals.

Award, if made, shall be to the responsible offer or whose proposal is determined in writing to be the most advantageous for Wichita State University and the School of Business, taking into account all of the evaluation factors set forth in this RFP. No other factors or criteria shall be used in the evaluation. Wichita State University reserves the right to reject any and all proposals submitted in response to this RFP.

Confidentiality of Documents: Upon receipt of a proposal by Wichita State University, the proposal shall become the property of Wichita State University without compensation to the submitting Firm.

Submittal Evaluation and Shortlist: The Negotiating Committee will have the option to select the successful firm from this submission or shall prepare a short list for further interview to clarify information provided. Those firms shall be invited to interview before key members of Wichita State University and the Architectural team, at which time firms will be ranked in order of preference for final negotiations.

AIA Contract Documents: Interested Firms should note that the AIA contract documents posted for this project have been amended by Wichita State University, and the architectural team and their consultants will be required to accept these terms and provisions.

Clarifications: Failure to notify the Point-of-Contact of any conflicts or ambiguities in the RFQ/RFP may result in items being resolved in the best interest of the University. Any modification to this RFQ/RFP as a result of relevant questions submitted in writing shall be made by written addendum and shall be sent to each proposing firm by email requesting confirmation of receipt. Only written interpretations are binding.

7. SELECTION SCHEDULE

The firm that will perform as CA for this Project will be selected in accordance with the following timetable:

1. Issue Request for Proposals on 3/4/2020
2. Last Day to Submit RFQ/P Questions on 3/10/2020
3. Questions answered by Addendum on 3/13/2020
4. Submission of Proposal on 3/26/2020

Submittal of Qualifications:
Qualifications and Proposals shall be received promptly by 2:00pm, Central Standard Time on March 26, 2020. Firm’s proposal shall be included in securely sealed envelopes or other containers.
Firms shall address and deliver submittals to:

Attention: Kim Sowell
Assistant Director of Purchasing
Office of Purchasing
1845 Fairmount St.
Morrison Hall, Campus Box 21
Wichita, Kansas 67260

Please ensure RFQ/RFP number (A-013842/B0001655) is on the outside of the envelope or container.

Submittals received by Wichita State University prior to the closing date and time shall be kept secured and sealed until closing. WSU shall not be responsible for the premature opening of a proposal or for the rejection of a proposal that was not received prior to the closing date because it was not properly identified on the outside of the envelope or container. Late proposals will be retained unopened in the file and not receive consideration.

Submittals delivered via a delivery service, i.e. USPS Mail, UPS, FedEx, etc. will be received and time stamped by the Office of Purchasing. Any submission not time-stamped and submitted prior to closing date and time will be considered late and will not be considered, regardless of the means of delivery or extenuating circumstances.

Proposal Disclosures: At the time of closing, only the names of those who submitted proposals shall be made public information. No price information will be released. Interested vendors or their representatives may be present at the announcement at the following location:

Wichita State University
Office of Purchasing
1845 Fairmount
Morrison Hall, Room 021
Wichita, KS 67260

Bid results will not be given to individuals over the telephone.

Copies of individual proposals may be obtained under the Kansas Open Records Act, K.S.A. 45-215 et seq. and Wichita State University Policy and Procedures Manual, Section 20.01 by calling 316-978-6791 (Email to kora@wichita.edu) to request an estimate of the cost to reproduce the documents and remitting that amount with a written request. A vendor may make an appointment by calling the above number to view the proposal file. Upon receipt of the funds, the documents will be mailed. Information in proposal files shall not be released until a contract has been executed or all proposals have been rejected.
The parties agree that the following provisions are hereby incorporated into the agreement to which it is attached and made a part thereof:

1. **Terms Herein Controlling Provisions:** It is expressly agreed that the terms of each and every provision in this attachment shall prevail and control over the terms of any other conflicting provision in any other document relating to and a part of the agreement in which this attachment is incorporated. Any terms that conflict or could be interpreted to conflict with this attachment are nullified.

2. **Kansas Law and Venue:** The agreement shall be subject to, governed by, and construed according to the laws of the State of Kansas, and jurisdiction and venue of any suit in connection with the agreement shall reside only in courts located in Sedgwick County, Kansas.

3. **Termination Due To Lack Of Funding Appropriation:** If sufficient funds are not appropriated to continue the function performed in this agreement and for the payment of the charges hereunder, the University may terminate this agreement at the end of its current fiscal year. The University agrees to give written notice of termination to contractor at least 30 days prior to the end of its current fiscal year, and shall give such notice for a greater period prior to the end of such fiscal year as may be provided in this contract, except that such notice shall not be required prior to 90 days before the end of such fiscal year. Contractor shall have the right, at the end of such fiscal year, to take possession of any equipment provided under any contract for which it has not been paid. The University will pay to the contractor all regular contractual payments incurred through the end of such fiscal year, plus contractual charges incidental to the return of any such equipment. Upon termination of the agreement by the University, title to any such equipment shall revert to Contractor at the end of the University's current fiscal year. The termination of the contract pursuant to this paragraph shall not cause any penalty to be charged to the agency or the contractor.

4. **Disclaimer of Liability:** No provision of this contract will be given effect that attempts to require the State of Kansas or the University to defend, hold harmless, or indemnify any contractor or third party for any acts or omissions. The liability of the State of Kansas and the University shall be limited under the Kansas Tort Claims Act (K.S.A. 75-6101 et seq.).

5. **Anti-Discrimination Clause:** Contractor agrees: (a) to comply with the Kansas Act Against Discrimination (K.S.A. 44-1001 et seq.) and the Kansas Age Discrimination in Employment Act (K.S.A. 44-1111 et seq.) and the applicable provisions of the Americans With Disabilities Act (42 U.S.C. 12101 et seq.) (ADA), and Kansas Executive Order No. 19-02, and to not discriminate against any person because of race, color, gender, sexual orientation, gender identity or expression, religion, national origin, ancestry, age, military or veteran status, disability status, marital or family status, genetic information, or political affiliation that is unrelated to the person’s ability to reasonably perform the duties of a particular job or position; (b) to include in all solicitations or advertisements for employees, the phrase “equal opportunity employer”; (c) to comply with the reporting requirements set out at K.S.A. 44-1031 and K.S.A. 44-1116; (d) to include those provisions in every subcontract or purchase order so that they are binding upon any subcontractor or vendor; (e) that a failure to comply with the reporting requirements of (c) above or if the contractor is found guilty of any violation of such acts by the Kansas Human Rights Commission, such violation shall constitute a breach of contract and the agreement may be cancelled, terminated or suspended, in whole or in part, by the contracting state agency or the Kansas Department of Administration; (f) if it is determined that the Contractor has violated applicable provisions of ADA, such violation shall constitute a breach of contract and the agreement may be cancelled, terminated or suspended, in whole or in part, by the University or the Kansas Department of Administration.

Contractor agrees to comply with all applicable state and federal anti-discrimination laws.

The provisions of this paragraph number 5 (with the exception of those provisions relating to the ADA) are not applicable to a Contractor who employs fewer than four employees during the term of such contract or whose contracts with the contracting state agency cumulatively total $5,000 or less during the fiscal year of such agency.

6. **Acceptance:** The agreement shall not be considered accepted, approved or otherwise effective until the statutorily required approvals and certifications have been given, including, but not limited to the signature of an authorized representative of the University, as defined in University policy.

7. **Arbitration, Damages and Warranties:** Notwithstanding any language to the contrary, no interpretation of this contract shall find that the State or the University have agreed to binding arbitration, or the payment of damages or penalties. Further, the University does not agree to pay attorney fees, costs, or late payment charges beyond those available under the Kansas Prompt Payment Act (K.S.A. 75-6403), and no provision will be given effect that attempts to exclude, modify, disclaim or otherwise attempt to limit any damages available to the University at law, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

8. **Representative’s Authority To Contract:** By signing this contract, the representative of Contractor thereby represents that such person is duly authorized by Contractor to execute this contract on behalf of Contractor and that Contractor agrees to be bound by the provisions thereof.

9. **Responsibility for Taxes:** The State of Kansas and the University shall not be responsible for, nor indemnify a Contractor for, any federal, state or local taxes which may be imposed or levied upon the subject matter of this contract.

10. **Insurance:** The University shall not be required to purchase any insurance against loss or damage to property or any other subject matter relating to this contract, nor shall this contract require it to establish a "self-insurance" fund to protect against any such loss or damage. Subject to the provisions of the Kansas Tort Claims Act (K.S.A. 75-6101 et seq.), Contractor shall bear the risk of any loss or damage to any property in which Contractor holds title.

11. **Information:** No provision of this contract shall be construed as limiting the State of Kansas Legislative Division of Post Audit from having access to information pursuant to K.S.A. 46-1101 et seq.

12. **Confidentiality:** As a state agency, the University’s contracts are generally public records. Accordingly, no provision of this contract shall restrict the University’s ability to produce this contract and/or any corresponding documents in response to a lawful request or from otherwise complying with the Kansas Open Records Act (K.S.A. 45-215 et seq.)

13. **The Eleventh Amendment:** The Eleventh Amendment is an inherent and incumbent protection with the State of Kansas and need not be reserved, but prudence requires the State and the University to reiterate that nothing related to this contract shall be deemed a waiver of the Eleventh Amendment.
14. **Campaign Contributions / Lobbying:** Funds provided through a grant award or contract shall not be given or received in exchange for the making of a campaign contribution. No part of the funds provided through this contract shall be used to influence or attempt to influence an officer or employee of the University or any State of Kansas agency or a member of the Legislature regarding any pending legislation or the awarding, extension, continuation, renewal, amendment or modification of any government contract, grant, loan, or cooperative agreement.

15. **Privacy of Student Records.** Contractor understands that the University is subject to the Family Educational Rights and Privacy Act (20 U.S.C. § 1232g) (FERPA) and agrees to handle any student education records it receives pursuant to the contract in a manner that enables the University to be compliant with FERPA and its regulations. Contractor agrees to protect the privacy of student data and educational records in a commercially reasonable manner and shall not transmit, share, or disclose any data about a student without the student’s written consent, except to other University officials who seek the information within the context of his/her professionally assigned responsibilities and used within the context of official University business. Contractor shall promptly report to the University any request for or improper disclosure of University’s student educational records.

16. **Export Control.** Contractor agree to comply with all U.S. Laws relating to the transfer, export, or re-export of technology and technical data, as defined in the export controls under the International Traffic in Arms Regulations (ITAR) 22 Code of Federal Regulations Parts 120-130 or the Export Administration Regulations (EAR) 15 Code of Federal Regulations Parts 730-774. The release of information to any employee or other person, who is not a U.S. Citizen or permanent resident, as well as to corporations or to any other entity, organization, or group that is not incorporated or otherwise organized to do business in the United States may require advanced written authorization from the appropriate U.S. agency. Contractor shall notify University in writing prior to disclosure of any technical data or other items subject to EAR or ITAR and identify the export controlled items at issue and the applicable categories and subcategories of the United States Munitions List and/or Export Control Classification Number(s). University reserves the right to decline to accept any items or information controlled under ITAR or EAR.

17. **Certification.** Contractor certifies that to the best of its knowledge neither it nor any of their principals are presently debarred, suspended, proposed for debarment, the subject of an indictment involving the criminal statutes enumerated in 22 Code of Federal Regulations §120.27, or otherwise declared ineligible for the award of contracts by any Federal agency. Contractor shall provide immediate written notice to the University if at any time it learns that this certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

18. **Facility Access.** To the extent Contractor is required to be on the University’s premises in the performance of any contract, Contractor and its representatives will adhere to the University’s reasonable safety and security policies and procedures, and will use commercially reasonable efforts not to interfere with the University’s regular operations. Contractor further agrees to, upon request, include the University as an additional insured on its general liability insurance policy on a primary and non-contributory basis and provide the University with a certificate of insurance.

19. **Electronic Signature.** The parties agree that the contract may be signed with electronic signatures. If an electronic signature is used, the parties agree that it is the legally binding equivalent to the signing party’s handwritten signature. Whenever either party executes an electronic signature on the contract, it has the same validity and meaning as a handwritten signature. The parties agree that neither party will, at any time in the future, repudiate the meaning of an electronic signature or claim that an electronic signature is not legally binding.
Exhibit A:

Schematic Design Narrative for Woolsey Hall Barton School of Business
24 January 2020

DESIGN GUIDELINES

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Project Description

1. A new 125,000 SF building for Wichita State University. The new building will have an auditorium with seating for 300 (divisible to two 150 seat classrooms), a trading lab with ticker tape and Bloomberg terminals, classroom, offices and other spaces. The main lobby is a spacious, naturally lit space that will open into a central atrium of the building. The building will have a plaza for students to gather around the building along with a small roof terrace.

Section B - Location

1. The project is located in Wichita, Kansas on the campus of Wichita State University.

Section C - Scope of Work

1. The complete construction of: 3 story school composed of approximately 130,000 gross square feet, with a large clerestory lit central atrium. There is no below grade basement level.

2. The Contract Documents will be prepared by the Owner’s Architect of Record, and its consultants, who are identified as follows:

   A. Gensler (Design Architect), 11 E. Madison, Chicago, IL 60602.
   B. GastingerWalker& (Architect of Record), 817 Wyandotte, Kansas City, MO 64105
   C. W.L Cassell & Associates, Inc (MEP and Fire Protection Engineers), 1600 Baltimore, Kansas City, MO 64111
D. MKEC (Civil Engineers), 411 N. Webb Rd, Wichita, KS 67206
E. Bob D. Campbell & Co., Inc (Structural Engineers), 4338 Belleview, Kansas City, MO 64111
F. MKEC (Landscape Consultant), 411 N. Webb Rd, Wichita, KS 67206
G. Branch Pattern (AV Consultant), 7400 College Boulevard, Suite 150, Overland Park, KS 66210

3. Passenger Vehicular Access and parking at the site: Access around the site for automobiles is provided from Perimeter Dr.

4. Loading Dock Access: Vehicular access for deliveries, by car or truck, is provided from the service drive accessed from Perimeter Dr.

5. Pedestrian Access: Pedestrian access is provided from each direction with an existing large pedestrian pathway running north/south on east side of site.

Section D - Applicable Codes and Regulations

1. The project will be permitted by the Office of Facilities and Property Management and Kansas State Fire Marshal’s Office and will be required to comply with the following codes and regulations:

C. Mechanical Code: 2018 – International Mechanical Code (IMC)
F. Accessibility: 2010 ADAAG, ANSI 117.1 2009
I. Kansas State boiler Code

Section E - Testing and Quality Control Recommendations

1. Owner Testing: Separate independent testing and inspection laboratories retained by the Owner to verify the adequacy of the Contractor’s quality control are recommended for testing and inspection in conjunction with the following areas. The Contractor will be required to assist and facilitate the Owner’s testing and inspection laboratories.

A. Section 02300 Earthwork
B. Section 02455 Driven Piles
C. Section 03300 Cast-In-Place Concrete
D. Section 04810 Unit Masonry Assemblies (for reinforced masonry)
E. Section 05120 Structural Steel
F. Section 05310 Steel Deck
G. Section 07811 Sprayed Fire Resistive Materials
H. Section 07841 Through Penetration Firestop Systems
2. Contractor Coordination: The Contractor will be responsible for quality control of the entire project with specific requirements to be provided in connection with testing and inspection of the following:

   A. Section 02200 Earthwork
   B. Section 02455 Driven Piles
   C. Air and Water Balancing and Commissioning: tbd.

Section F - Site Development

1. General
   A. Refer to geotechnical report for specific requirements.

2. Paving and Site Lighting: Cutting and patching of adjacent streets including curb, gutter and aprons shall be as required referencing Wichita State University and City of Wichita standards.

   A. Site Lighting: Overhead lighting provided and installed to WSU standards.
   B. New School of Business Service Drive, VIP and ADA Parking: A new 26’ wide service drive will be constructed along the west or north portion of the building from Perimeter Drive to the parking lot at the west side of site to accommodate delivery services, trash, 75 parking stalls, 4 ADA stalls with one as van accessible, and 2 service vehicle stalls. The new service drive will be 8" concrete pavement on 6” AB-1 on compacted subgrade.

3. Site Utilities / Civil
   A. Refer to attached Civil narrative for site grading, storm water management, and utilities. This narrative also includes design requirements for site paving, site lighting and landscaping.

Section G - Structural Systems

1. Live Loading Design Criteria:
   A. Roof (minimum) 30 psf
   B. Penthouse: 150 psf
   C. Office: 80 psf
      + Partition Load 20 psf
   D. Lobbies, Stairs, First Floor Corridors 100 psf
   E. Corridors above first floor 100 psf
   F. Mechanical Rooms 125 psf
   G. High-Density File Areas 150 psf
   H. Loading Dock: 250 psf
   I. Design live loads are reduced based on tributary area as permitted by the building code.

2. Foundations: Drilled piers bearing on and socketed in competent rock.

3. Floor Framing System:
   A. Typical floor framing consists of 6½” concrete slab atop 3” deep composite metal decking with steel wide flange beams and girders.
4. Concrete Strengths:
   A. 4,000 psi NW – Drilled shafts.
   B. 4,000 psi NW – Basement walls, grade beams, foundation walls
   C. 4,000 psi NW – Slab-on-grade
   D. 4,000 psi NW – Metal deck slabs
   E. 4,500 psi NW – Exterior Flatwork

5. Foundations: Building Structure shall be founded on competent rock as identified in the Geotechnical Report. Reinforced concrete piers not less than 30” diameter shall be drilled into the bedrock not less than recommended depth at each column location. Allow for additional pier locations supporting exterior grade beam at approximately 15'-0”o.c. between columns above and beyond the column locations.

6. Superstructure:
   A. **Typical:** Steel columns

7. Moisture control: Floor slabs and other concrete surfaces to receive direct-applied finish materials that includes a Concure admixture for moisture control.

**Section H - Exterior Enclosure**

1. Building
   A. Exterior Walls, Brick Masonry (where shown on plans):
      1) Building: From outside toward the interior as follows:
         a 4” nominal face brick
         b 1” airspace with full-height drainage mat (Cav Clear or sim)
         c 2” Rigid insulation
         d Weather barrier applied to CMU or sheathing. Weather barrier is vapor permeable. Fluid applied system. Include transitional membrane where wall system meets roof system or other system. Transitional membrane and any accessory sealants or mastics to comply with sealant division 07900 adhesion and compatibility testing.
         e CMU: vertically and horizontally reinforced, concrete masonry unit back-up, using stainless steel anchors and accessories, and epoxy-coated rebar. Grout shall be self-consolidating. Thickness of CMU as required by engineering (8” or 12”).
         f Structural Studs: Cold framed heavy gauge framing with mineral fiber insulation.
         g All control and movement joints in the exterior stone cladding system will be sealed with a single line of one, or two, part silicone sealant; non-staining. Continuous horizontal joint at approximately underside of second floor slab to accommodate slab edge deflections. Vertical control joints at each column centerline, plus 10 additional joint locations to be determined.
         h Framing, gyp bd and finishes.

   B. Curtain Wall and Storefront Systems (Storefront at all areas except west and east entries):
      1) All framing will be fabricated from thermally broken aluminum extrusions.
      2) The finish for all interior exposed faces of the aluminum framing will be a two (2) coat non-micaflake fluorocarbon resinous coating; the finish for all exterior facets of the aluminum framing will be a 2 coat baked enamel or powder coat finish.
3) Typical insulating glass units will be 1” thick and be composed of a ¼” thick tinted glass outboard light with a low emissivity coated second surface, a ½” hermetically sealed argon-filled gap, and a ¼” thick clear inboard light, heat treated. Inboard and outboard lites to be fully tempered where required to meet safety-glass requirements. Where fully tempered lites are above occupiable surfaces, heat-soak such tempered lites.
   a. Where indicated on drawings, include custom ceramic frit pattern on #3 surface.

4) All units shall be reinforced, if necessary, based on Contractor’s Engineering, with structural steel inserts, fully galvanized and coated to prevent galvanic corrosion. Depths of aluminum curtainwall framing members are shown for design intent only. If necessary, include deeper mullions to accommodate the necessary steel reinforcing.

5) All curtain wall framing will be attached to the building’s structural frame, typically.

6) Spandrel Units: Same as typical insulated glass units. Insulated metal panel to be held 1” to back of glass.

C. Translucent Panel Wall Systems:
   1) All framing will be fabricated from thermally broken aluminum extrusions.
   2) The finish for all interior exposed faces of the aluminum framing will be a two (2) coat non-micaflake fluorocarbon resinous coating; the finish for all exterior facets of the aluminum framing will be a 2 coat baked enamel or powder coat finish.
   3) Typical insulated Translucent Panel will be two (2) layers of polycarbonate/Pentaglas panels separated by a 3” air space.
   4) All panel wall framing will be attached to the building’s structural frame, typically.
   5) Basis of Design is UniQuad Translucent wall system by Kingspan.

D. Louvers: extruded aluminum type with integral flashings, finished to match metal wall panels.

E. Door Entrances: Custom fabricated, ultra narrow stile stainless steel balanced swing doors, retaining clear, monolithic or laminated safety glass and glazing materials with custom stainless steel pulls. Swing doors shall be supplemented with overhead concealed door operators to overcome stack pressures. Stainless steel finish to be NAAAMM #4 satin directional polish.

F. Parking and Loading Dock Door Entrances: Double hollow metal doors.

G. Aluminum Panels: Custom fabricated solid 1/8” (0.125”) thick aluminum face-sheet panels with stiffeners and heli-arc welded corners, finish to match curtain wall and storefront framing. 1” panel thickness at edges to meet glazing pocket. 4” deep once out of the glazing pocket. 0.60 back face aluminum. Insulate with factory foamed in place polyisocyanurate or closed cell polyurethane. Aluminum panels to be dry glazed into aluminum framing system.


I. Exterior Wall Interior Side Finish: Steel studs supporting gypsum wallboard, ready to receive joint treatments and other finishes.

J. Window Treatment: All exterior punched windows, curtain walls and storefronts will be provided with powered roller shades in concealed shade pockets except offices to be manual operation. Shades at atrium to be integrated with lighting control system.

2. Walls Below Grade: Reinforced concrete walls with positive side hybrid bentonite panel (CETCO Ultraceal or equivalent) waterproofing and vertical drainage mat, in accordance with the soils consultants final report. Extend from grade down to toe of footing.
3. Roofing Systems:
   A. Terraces: Precast Concrete pavers (2.0” min thickness, 24” x 24” module) applied over plastic setting pedestals and rigid insulation on TPO membrane roofing system. Terraces shall be supplemented with continuous stainless steel flashing and counterflashing around perimeters and penetrations.
   B. Flat Roofs: TPO membrane roofing and rigid insulation.

Section I - Interior Finishes

1. Building
   A. Typical Floors:
      1) Entrance Vestibule
         a) Floors: Walkoff carpet tiles recessed flush with adjacent floors.
         b) Walls: Combination of two coat fluropolymer coated composite metal panels and two coat fluropolymer coated aluminum framed glass storefront; polished concrete base.
         c) Ceilings: Prefinished perforated aluminum panels with acoustical insulation.
         d) Lighting: Integrated linear LED lighting within the aluminum ceiling panels.
   B. Main Lobby/Atrium:
      1) Floors: Polished concrete, color and mix to be determined by the architect.
      2) Walls: Impact resistant gypsum board.
      3) Ceilings: Suspended, acoustical plaster ceiling: Recessed LED down lighting, and wallwashers.
   C. Loading Dock:
      1) Floors: concrete; broom finished concrete at exterior ramp and access area.
      2) Walls: Painted impact resistant gypsum wallboard with corner guards.
      3) Ceiling: Exposed
      4) Lighting: Chain hung LED lighting.
   D. Service Corridors:
      1) Floors: Sealed concrete.
      2) Walls: Painted impact resistant gypsum wallboard with corner guards.
      3) Ceiling: 2'-0" x 2'-0" Acoustical ceiling tile with 15/16” exposed “T” grid system.
      4) Lighting: Recess mounted 2'-0" x 2'-0" lensed LED.
   E. Building Service Areas (Main Electric Room, Pump Room, Data Rooms, Mechanical Room:
      1) Floors: sealed concrete, painted.
      2) Walls: Painted moisture resistant gypsum wallboard.
      3) Ceiling: Exposed structure.
      4) Lighting: Surface mounted strip LED.
   F. Janitor’s Closets:
      1) Floors: sealed concrete.
      2) Walls: Painted moisture resistant gypsum board with resilient base and protective FRP material to 4'-0” AFF.
      3) Ceiling: Exposed structure.
      4) Lighting: Surface mounted strip LED.
      5) Accessories: Brushed stainless steel mop rack and shelf.
G. Stairwells:
1) Stairs: Concrete filled, painted steel pan stairs.
2) Walls: Painted gypsum board with resilient base at landings.
3) Soffits: Exposed steel stair framing, painted.
4) Railing: Steel tube.
5) Lighting: LED lighting.

H. Restrooms:
1) Floors: Large format porcelain tile with epoxy grout throughout new restrooms at $7 sq. ft.
2) Walls: Ceramic wall tile on all wall surfaces with epoxy grout at $7 sq. ft. in first floor restrooms. Ceramic wall tile on wet wall only in all other restrooms with epoxy paint.
3) Ceilings: Washable acoustic ceiling tile systems; white, glass fiber, 24”x24” at $2 sq. ft
4) Lighting: Recessed LED down lighting, and cove light along wet wall.
5) Countertops: 3cm solid surface countertops with sink apron.

I. Atrium Stair:
1) Railing: Vertical Metal Pickets with wood hand rail.
2) Treads and Risers: Wood treads with steel perforated risers.
3) Plinth: Solid wood plank flooring.

J. Auditorium and Pre-function:
1) Floors: Polished concrete, color and mix to be determined by the architect. Linear LED Lights located at stairs. Pre-function also to include recessed carpet tiles for seating areas.
2) Walls: Acoustical wood veneer panels on all walls.
3) Ceilings: Acoustically absorptive specialty ceiling at $40 sq. ft.
4) Lighting: Recessed LED down lighting, and wall washers. Decorative lighting in Pre-function.
5) Accessories: Two 4’H x 20’W glass marker boards at the front of the Auditorium.

K. Cafe and Cafe Support:
1) Floors: Polished concrete, color and mix to be determined by the architect in café.
   a) Café Support: Epoxy flooring.
2) Walls: Ceramic wall tile on back wall of café at $7 sq. ft.
   a) Café Support: Protective FRP material to 6’-0” AFF Painted moisture resistant gypsum wallboard.
3) Ceilings: Gypsum board ceiling with low, VOC, flat finish in café.
   a) Washable acoustic ceiling tile systems; white, glass fiber, 24”x24” at $2 sq. ft., at Café Support.
4) Lighting: Recessed LED down lighting, and decorative pendants above café bar.
5) Millwork: Countertops to be 3cm quartz countertops with high pressure laminate base cabinets. Front of counter to receive ceramic tile at $7 sq. ft.
   a) Café Support to receive stainless steel countertops prep tables and casework.

L. Classrooms:
1) Floors: Carpet tile flooring at $35 a yard.
2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish. Acoustical wall panels 4’H band.
3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
4) Lighting: Recessed LED linear lighting.
5) Millwork: 3cm solid surface counter tops and high-pressure laminate base cabinets.
6) Accessories: One wall to receive 4’H glass marker board the length of the wall.

M. Study Rooms, Interview Rooms and Bright Futures:
1) Floors: Carpet tile flooring at $35 a yard.
2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish. One wall to receive acoustical wall panels floor to ceiling.
3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
4) Lighting: Recessed LED linear lighting.
5) Accessories: One wall to receive 4’H glass marker board the length of the wall.

N. Phone Rooms:
1) Floors: Carpet tile flooring at $35 a yard.
2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish. One wall to receive acoustical wall panels above countertop.
3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
4) Lighting: Linear LED cove light with down lighting recessed LED.
5) Millwork: High pressure laminate countertop. (Refer to plans)

O. Multipurpose Room:
1) Floors: Carpet tile flooring at $35 a yard.
2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
3) Ceilings: 40% to receive specialty ceiling for $40 sq. ft. 60% to receive acoustical ceiling tile, white, glass fiber, 24”x72” tegular edged, with 9/16” Grid.
4) Lighting: Recessed LED down lighting, and decorative lighting.

P. Catering Support and Furniture Storage for Multipurpose:
1) Floors: Sealed concrete.
2) Walls: Protective FRP material to 6’-0” AFF Painted moisture resistant gypsum wallboard.
3) Ceiling: Exposed structure.
   a) Catering Support: Washable acoustic ceiling tile systems; white, glass fiber, 24”x24” at $2 sq. ft.,
4) Lighting: Ceiling hung linear LED Lights.
5) Millwork: Catering Support to receive stainless steel countertops prep tables.

Q. Academic Department, Centers, and Student Success Office Suites
1) Floors: Carpet tile flooring at $35 a yard.
2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
4) Millwork: High pressure laminate countertops and case work for copy/ print, workrooms and work counters. (Refer to plans)
   a) Reception Desks: Countertops to be 3cm quartz countertops with high pressure laminate base.
   b) Recruiters Lounge, Graduate Student Lounge, Student Leadership Room and coffee bars to receive 3cm quartz countertops with high pressure laminate base cabinets.
5) Lighting: Recessed LED linear lighting.
6) Accessories: Offices to receive one glass marker board.
R. Dean’s Kitchen and Faculty Lounge:
   1) Floors: Polished concrete, color and mix to be determined by the architect
   2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
      Ceramic wall tile backsplash behind counters at $7 sq. ft.
   3) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
   4) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
   5) Millwork: Countertops 3cm quartz countertops with high pressure laminate base and upper cabinets.
   6) Lighting: Recessed LED linear lighting. Decorative pendants in Faculty Lounge above island.

S. Small, Medium and Large Conference Rooms:
   1) Floors: Carpet tile flooring at $35 a yard.
   2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
   3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
   4) Millwork: High pressure laminate countertops and casework in large conference rooms. (Refer to plans)
   5) Lighting: Recessed LED down lighting.

T. Executive Conference Rooms:
   1) Floors: Carpet tile flooring at $40 a yard.
   2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
      Presentation wall to be book match wood veneer. Wallpaper above casework.
   3) Ceilings: Painted gypsum wall board around perimeter and acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid in tray ceiling.
   4) Millwork: 3cm quartz countertops with wood veneer base cabinets. (Refer to plans)
   5) Lighting: Recessed LED linear lighting with a decorative pendant above conference table.

U. College Support (Dean’s Suite):
   1) Floors: Carpet tile flooring at $35 a yard.
   2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
      a) Dean’s Board Room: Presentation wall to be book match wood veneer.
   3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
      a) Dean’s Board Room: Painted gypsum wall board around perimeter and acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid in tray ceiling.
   4) Millwork: High pressure laminate countertops and casework for workrooms and work counters.
      (Refer to plans)
      a) Reception Desks: Countertops to be 3cm quartz countertops veneer base cabinets base.
      b) Dean’s Board Room: 3cm quartz countertops with wood veneer base cabinets.
   5) Lighting: Recessed LED linear lighting.
      a) Dean’s Board Room: Recessed LED linear lighting with a decorative pendant above boardroom table.
   6) Accessories: Offices to receive one glass marker board.

V. Mother’s Room:
   1) Floors: Resilient tile flooring at $6 a sq. ft.
   2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
   3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
   4) Millwork: 3cm solid surface countertops with high pressure laminate countertop. (Refer to plans)
W. Simulation Lab:
   1) Floors: Carpet tile flooring at $35 a yard.
   2) Walls: Painted gypsum wall board with two coats of selected color, low VOC, eggshell finish.
   3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.

X. Recording Studio:
   1) Floors: Carpet tile flooring at $35 a yard.
   2) Walls: Painted gypsum wall board with a STC rating of 65 with two coats of selected color, low VOC, eggshell finish. One wall to receive acoustical wall panels floor to ceiling.
   3) Ceilings: Acoustical ceiling tile, white, glass fiber, 24”x24” tegular edged, with 9/16” Grid.
   4) Lighting: Recessed LED linear lighting.

Section J - Conveying Systems

1. Passenger Elevators:
   A. Two, automatically programmed gearless traction elevators serving all levels of the building. Two service/passenger elevations 5,000# 200fpm.
   B. Passenger elevator doors are 3’6”, single speed center opening. Etched stainless steel door and transom, No. 4 finish, with ceiling height, limestone clad, hollow metal frames at the ground level, painted metal at the typical floor elevator lobbies.
   C. Passenger elevator floors will have resilient flooring. The interior cabs will be a standard manufacturer design. Ceilings will be coffered and contain indirect soffit lighting. Doors will be etched stainless steel, No. 4 finish.

Section K - Mechanical

1. General
   A. All systems shall be designed to meet the Wichita State University and the State of Kansas design guidelines and regulations.
   B. Mechanical systems shall be designed to the most current adopted Mechanical and Energy codes at the beginning of design.

2. Chilled Water Systems
   A. Chilled water for cooling the building will be provided by new air-cooled chillers with free cooling capability. The estimated chilled water plant load will be around 450 tons.
   B. Chilled water plant basis of design:
      1) 2 - 225 ton York/JCI YVFA or equal high efficiency air cooled chillers with variable speed screw compressors and indoor mounted plate and frame heat exchangers.
      2) 3 – 410 gpm (50% load and 1 backup) Bell & Gossett, Armstrong or equal end suction, back pullout centrifugal glycol water pumps with variable frequency drive (VFD) control for soft start and balancing.
      3) 3 – 340 gpm (50% load each and 1 backup) Bell & Gossett, Armstrong or equal end suction, back pullout variable speed centrifugal chilled water pumps with variable frequency drive (VFD) control.
4) A 16° chilled water temperature differential (1.5 gpm/ton) will be utilized to minimize pumping energy and associated piping sizes.
5) Glycol water mains will be routed from the chiller to the indoor heat exchangers.
6) Chilled water mains will be routed from the chiller heat exchangers to the air handling units, DOAS units and fan coil units.

C. Chilled water specialties shall not be limited to:
1) Glycol fill pump assembly for the primary side of the heat exchangers
2) Air/dirt separator in the suction piping to the glycol water pumps.
3) Air/dirt separator in the suction piping to the chilled water pumps.
4) Bladder type expansion tanks for the glycol water loop and the chilled water loop.
5) Auto quick and auto fill assembly for make-up water.
6) Stainless steel fitted suction diffusers and cushion check valves for pump accessories.
7) Pot chemical feeder for the chilled water loop.
8) Magnetic flow meter to measure flow in conjunction with temperature sensors to monitor building tonnage and ton-hours.
9) Piping shall be Schedule 40 with threaded fittings for piping 2” and smaller and welded, flanged or grooved fittings for larger piping. Copper piping with brazed fittings may be used for piping 2” and smaller.

3. Heating Systems

A. Heating water plant basis of design:
1) 4 – 1670 MBH net AHRI output (33% load each and 1 backup) Lochinvar Crest, Aerco or equal, high efficiency, condensing fire tube boilers. The boilers will be furnished with BACnet MSTP cards and be sequenced by the Building Management System (BMS).
2) Each boiler will be fitted with a Grundfos or equal, in-line, variable speed primary circulating pump with integral VFD controlled by the its associated boiler control panel.
3) Sheet metal combustion air will be ducted directly from each boiler to the exterior wall or roof with intake caps.
1) AL29-4C boiler flues will be individually vented up through the exterior wall or roof.
2) 3 – 125 gpm (50% load and 1 backup) Bell & Gossett, Armstrong or equal end suction, back pullout variable speed centrifugal chilled water pumps with variable frequency drive (VFD) control.
3) A 40° (min.) heating water temperature differential will be utilized to ensure condensing at the boilers and to minimize pumping energy and associated piping sizes.

B. Building heating will be provided by the heating water system to serve air handling units, VAV boxes, unit heaters and finned tube radiation.

C. Heating water specialties will not be limited to:
1) Air/dirt separator in the suction piping to the heating water pumps.
2) Bladder type expansion tank.
3) Auto quick and auto fill assembly for make-up water with.
4) Stainless steel fitted suction diffusers and ctriple duty valves for pump accessories.
5) Pot chemical feeder.
6) Magnetic flow meter to measure flow in conjunction with temperature sensors to monitor building heating BTUH and BTU usage.
7) Piping shall be Schedule 40 with threaded fittings for piping 2” and smaller and welded, flanged or grooved fittings for larger piping. Copper piping with brazed fittings may be used for piping 2” and smaller.

4. Air Conditioning Systems
   A. Design Conditions
      1) Outdoor design conditions
         a) Summer 100°F db, 78°F wb
         b) Winter -10°F db
      2) General indoor design conditions
         a) Summer 75°F db, 55%RH
         b) Winter 70°F db, 30%RH

   B. We propose the current direction for air conditioning systems is to provide four (3) large VAV cooling only air handling units to provide conditioning to the spaces within the tower. These will be located in roof penthouses. We propose two (2) units for the North Building for the east and west halved and 1 unit for the South Building. These units will be supplemented with two (3) large VAV dedicated outdoor air handling units with total energy recovery to provide ASHRAE 62.1 required ventilation rates to the occupied spaces and necessary building pressurization. These units can be co-located with each of the building AHU’s. A separate VAV unit will be provided to serve the auditorium and its support spaces as the auditorium will likely operate outside of normal classroom hours and will require tighter sound and environmental conditions than the rest of the building. This unit should be located close to the auditorium but not adjacent to it due to noise and vibration concerns. It appears that the best location would be to locate this unit at the west end of the Level 1 Mechanical/Loading Room. All units will be blow-thru configuration with 2” min. thick double wall insulated housings with perforated inner lining in the fan sections. Access doors will be provided between each component and interior LED lighting in each section. Stainless steel drain pains will be provided at each cooling coil, energy recovery wheel and humidifier section.

   C. VAV Units – North Building units estimated 36,500 cfm each for South Building unit at 53,000 cfm
      1) Economizer section
      2) MERV 8 pre-filters and MERV 13 final filers in side access housing.
      3) 12 bladed airfoil, direct drive, fan array plenum fans with EC motors and 100% airflow capability if one fan drops out.
      4) Steam humidifier section, if required.
      5) Chilled water coil with intermediate drain pans and stainless steel frames.
      6) Airfoil mixed flow inline return/exhaust fans.
      7) Duct mounted attenuators will be used if required to maintain acceptable noise levels.
      8) Variable frequency drive (VFD) for return/exhaust fan control.
      9) Single duct VAV boxes with 100% shut off for interior spaces.
     10) Single duct VAV boxes with hot water reheat coils for exterior exposures.

   D. DOAS Units – 1 for each of the VAV AHU systems above.
      1) MERV 8 pre-filters and MERV 13 final filers in side access housing.
      2) 12 bladed airfoil, direct drive, fan array plenum supply fans with EC motors and 100% airflow capability if one fan drops out.
      3) Total energy recovery wheel with VFD control, purge and MERV 8 filters on inlet side of exhaust airstream.
     4) Morning warmup and wheel bypass damper.
     5) Hot water preheat coil with antifreeze pump.
6) Chilled water coil with intermediate drain pans and stainless steel frames.
7) Hot water reheat coil.
8) 12 bladed airfoil, direct drive, fan array plenum supply fans with EC motors and 100% airflow capability if one fan drops out.
9) Single duct VAV boxes with CO2 space sensor control for high occupancy and variable occupancy spaces.
10) Single duct VAV volume boxes for low and steady occupancy spaces connected to occupancy sensors.

E. Auditorium Unit – estimated 10,000 cfm.
1) VAV multi-zone unit.
2) 2” thick housing walls.
3) Economizer section.
4) Air blenders.
5) MERV 8 pre-filters and MERV 13 final filters in side access housing.
6) Hot water preheat coil with antifreeze pump.
7) 12 bladed airfoil, direct drive, fan array plenum supply fans with EC motors and 100% airflow capability if one fan drops out.
8) Steam humidifier section for wood and other finishes, if required.
9) Chilled water coil with intermediate drain pans and stainless steel frames.
10) Hot water heating coil.
11) Zone damper section.
12) Airfoil mixed flow inline return/exhaust fan.
13) Variable frequency drive (VFD) for return/exhaust fan control.
14) Duct silencers as required.

F. Humidifiers, where required, will utilize DriSteem “Vaporstream”, or equal, electric resistance steam generators with AHU mounted stainless steel RapidSorb, or equal, steam dispersion assemblies with horizontal headers and vertical tubes.

G. Another option for air distribution from the VAV units and associated DOAS units is to follow what we designed for the University of Kansas – Capitol Federal Hall School of Business. We utilized a double duct system which utilized dual duct boxes with one inlet for supply air from the AHU for conditioning the associated space and the other inlet for ventilation air supplied by the DOAS unit to provide required ventilation air to the space. Since ventilation air is supplied to the box, the conditioning air damper can fully close. The ventilation air damper will be controlled by CO2 sensor(s) in high occupancy or highly variable occupancies and by occupancy sensors in offices or more steady occupancy spaces. The advantage of this system is that there would only be one duct main serving the zone and one set of diffusers in that zone instead of one duct main and associated diffusers for the conditioning system and one duct main and associated diffusers for the ventilation system.

H. Hot water finned tube radiation will be provided at exterior exposures with large areas of glass, especially tall glass.

I. Hot water cabinet unit heaters will be used at building entrances and enclosed stairwells.

J. Units heaters will be installed in mechanical rooms and other unfinished rooms where heating is required.
K. Split system or VRF fan coil units will be utilized at 24 hr high cooling load spaces such as main IT closets, elevator equipment rooms and main electrical rooms with transformers and other heat producing equipment. Smaller IT closets and machine room-less elevators will be conditioned with localized exhaust.

5. Exhaust Systems
   A. Toilet and other general exhaust will be utilized by the DOAS energy recovery units.
   B. Janitor’s closets, high capacity copy rooms and other spaces where chemicals will be used will be exhausted by dedicated exhaust systems per LEED requirements.
   C. Atrium smoke control exhaust is estimated to be 150,000 cfm and will be exhausted via multiple UL 705 rated 50,000 cfm mixed flow exhaust fans located on the roof of the atrium. Make up air will come from automated door and glass openings at the lower level of the atrium.

6. Duct Systems
   A. Ductwork will be G90 galvanized rectangular and spiral round/oval ductwork and will be constructed to the appropriate specified SMACNA pressurization classes.

7. Insulation
   A. Duct Insulation
      1) All supply and outside air ductwork and plenums shall be insulated. Exhaust ductwork and plenums downstream of the DOAS energy recovery wheels shall be insulated. All insulation shall meet ASHRAE 90.1-2016 as a min.
      2) Ductwork shall not be lined except return air boots. The supply and return ductwork for the auditorium AHU will be lined if required for noise control.
   B. Piping & Equipment Insulation
      1) All chilled water, heating water, steam and condensate drain piping and equipment shall be insulated per ASHRAE 90.1-2016 as a min.

Section L - Plumbing

1. General
   A. All systems shall be designed to meet the Wichita State University and the State of Kansas design guidelines and regulations.
   B. Plumbing systems shall be designed to the most current adopted Plumbing and Energy codes at the beginning of design
   C. Plumbing equipment selection will be coordinated with the approved bidders list.

2. Water Service
   A. A min. 8” combination fire/water service will be extended to serve the building.
   B. A 4” min. water service with a 4” min. reduced pressure principal (RPZ) backflow preventer will be installed on the water service entrance to the building.
   C. A triplex vertical turbine booster pump system with variable flow (VFD) control will be provided for pressure boost.
D. Bladder type expansion tank will be provided.

E. Cold water service will be distributed to water softeners, domestic water heaters, mechanical and plumbing equipment, plumbing fixtures, wall hydrants and hose bibbs.

F. Backflow preventers will be provided at equipment connections, coffee makers and ice makers where required.

3. Water Softeners
   A. Culligan, WaterRite, or equal progressive flow water softener system will be provided to serve hot water systems or both hot and cold water systems if required. It is anticipated that soft water will be required for hot water systems at a minimum.

4. Domestic Hot Water
   A. Domestic water will be provided by AO Smith Cyclone Mxi, State, or equal, gas fired, condensing water heaters with Armstrong “The Brain” or equal electronic mixing valves. 140° F hot water loop will be provided with point of use mixing valves to reduce the hot water temperature to 105° F where required. Parallel circulating pumps and domestic hot water circulating piping will be provided to maintain hot water in the hot water loops. Another option would be to utilize Intellihot i or iQ series or equal hybrid instantaneous, condensing water heaters.

5. Water Distribution Piping
   A. Distribution piping will be Type “L” hard drawing copper piping with soldered or brazed wrought copper fittings. Stainless steel main piping may be used if economically feasible.

   B. Field pulled tees will not be acceptable.

   C. Water hammer arrestors will be provided at plumbing fixtures or groups of fixtures to protect from hydraulic shock.

6. Sanitary, Waste and Vent System
   A. A 6” min. waste service will be required and will be extended 5 feet from the building.

   B. Floor drains will be provided at mechanical and plumbing equipment, in public restrooms, showers and other areas where water drainage is required. All floor drains will be provided with Proset of equal trap guards to prevent against backflow and sewer gas leakage.

   C. Below grade piping will be Schedule 40 PVC DWV piping unless served by waste over 140° F. That piping shall be cast iron hub & spigot piping.

   D. Piping above grade will be cast iron hubless piping with heavy duty stainless steel couplings.

   E. Sump pumps will be provided in elevator pits (grease minder pumps for hydraulic elevators) where required and discharge piping will be galvanized steel with screwed fittings until connected to waste mains.

7. Storm Water System
   A. A 15” min. storm water service will be required and will be extended at one or multiple locations 5 feet from the building.
B. Cast iron roof drains and emergency roof drains will be installed at low points of roofing.

C. Below grade piping will be Schedule 40 PVC DWV.

D. Piping above grade will be cast iron hubless piping with heavy duty stainless steel couplings.

8. Plumbing Fixtures
   A. Water closets shall be vitreous china elongated bowl, siphon jet, 1.28 GPF wall mounted fixture with heavy duty carriers. Flushometers shall be sensor type with turbine water powered or solar powered. Certain fixtures shall be mounted at ADA height where noted on the drawings.

   B. Urinals shall be vitreous china, 0.125 GPF (pint), wall hung type. Flushometers shall be sensor type with turbine water powered or solar powered. Certain fixtures shall be mounted at ADA height where noted on the drawings.

   C. Public lavatories shall be either integral solid surface, vitreous china drop in or under mount or stainless steel as directed by the Architect. Faucets shall be sensor type with water turbine powered or solar powered with 10 second time out. Where noted as ADA fixtures with exposed supply and waste piping ADA compliant insulation kits shall be supplied. Private lavatories may be same as above or wall hung and may be supplied with manual wrist blade faucets.

   D. Sinks will be drop in or under mount stainless steel type with gooseneck faucets and wrist blade handles. ADA sinks will have appropriate waste outlet location, sound deadening and insulation kits.

   E. Drinking fountains will be stainless steel bi-level ADA wall mount or recessed with integral cooler(s) and bottle fillers.

   F. Janitor’s sinks will be 24’x24”x12” min. terrazzo with stainless steel cap and backsplash with service sink faucet with pail hook and vacuum breaker.

   G. Wall hydrants shall be recessed non-freeze type with integral vacuum breaker and nickel bronze finish.

   H. Hose bibbs shall be provided in all mechanical rooms and public restrooms.

9. Piping & Equipment Insulation
   A. All cold water, domestic hot water and hot circulating piping, waste piping from drinking fountains and condensate drain discharge to waste risers or mains and horizontal downspout shall be insulated per ASHRAE 90.1-2016 as a min.

Section M - Fire Protection

1. General
   A. All systems shall be designed to meet the State of Kansas design guidelines and regulations.

   B. Fire Protection systems shall be designed to the most current adopted NFPA 13 regulations.

   C. Fire protection equipment selection will be coordinated with the approved bidders list.
2. Fire Service  
   A. Fire service shall be obtained from the 8” min. combination fire/water service mentioned above.  
   B. An 8” min. double check detector backflow preventer will be provided on the fire service entrance to the building.  
   C. A “Storz” or Siamese connection will be provided for fire department connection at location as directed by the Fire Marshall.

3. Fire Pump  
   A. An electric driven fire pump with jockey pump and pump controller with integral emergency transfer switch will be provided required to provide min. NFPA required flow and pressure for the fire sprinkler piping.  
   B. A pump bypass with flow meter/test assembly will be provided.

4. Standpipes  
   A. A manual wet standpipe system will be utilized with standpipe pressure and flow provided by the Fire Department pumper trucks.  
   B. Standpipes will be installed in each main stair tower and elsewhere as required.  
   C. Isolation valves with tamper switches shall be provided at the base of each standpipe.  
   D. Fire valve connections will be provided at the intermediate stair landings.  
   E. Roof manifolds will be provided as required.  
   F. Piping 2” and smaller will be Schedule 40 steel with screwed fittings. Piping 2-1/2” and larger will be standard weight with either screwed, roll grooved or welded fittings.

5. Sprinkler System  
   A. The entire building will be protected with a quick response wet sprinkler system per NFPA 13 requirements.  
   B. Sprinkler zone piping will be connected to the standpipe risers with valve tamper and flow switches.  
   C. Piping 2” and smaller will be Schedule 40 steel with screwed fittings. Piping 2-1/2” and larger will be standard weight with either screwed, roll grooved or welded fittings.  
   D. Sprinklers  
      1) Lay-in accessible ceilings: Semi-recessed with satin chrome finish centered in 2x2 section of ceiling tiles. Concealed with white cover plates in areas as directed by Architect.  
      2) Hard or inaccessible finished ceilings: Concealed with cover plate color as directed by Architect. Locations shall be coordinated with light fixtures and other ceiling components as directed by Architect.  
      3) Exposed: Rough bronze upright  
      4) Wall mounted: Concealed with cover plate color as directed by Architect.  
      5) Special Applications: Extended coverage.
Section N - Building Automation Control System (Temperature Controls)

1. Control Systems
   A. Building Automation Control System (BACS) will be Johnson Controls or Sandifer Engineering and Controls web based BACnet open protocol DDC controls and will connect to and be fully integrated with the existing campus systems servers.

   B. Chillers, booster pump systems, emergency engine generator, electrical switchgear and other equipment with packaged controls or monitoring shall be provided with BACnet IP cards for direct communication with the BACS.

   C. Control valves shall pressure independent electronic valves unless noted otherwise.

   D. Airflow stations shall be provided at air handling units to provide fan tracking and to monitor outside air rates.

   E. Low leakage airfoil bladed electronic control dampers will be used for all outside air and exhaust air dampers.

   F. VAV & dual duct boxes will be pressure independent and will utilize packaged modular controls consisting of stand alone/networked DDC controller and damper operator.

   G. Flow meters will be provided on the domestic water service, mechanical systems make-up water, irrigation systems, chilled water and heating water systems to monitor quantity and energy usage.

Section O - Electrical

1. Overview
   A. The electrical systems will be designed to provide adequate power, lighting and communication systems for the occupancy and use of the facility.

   B. An electrical coordination study will be required.

2. Basic Electrical Materials
   A. Interior raceway systems will generally consist of metal boxes interconnected with Electric Metallic Tubing (EMT.) PVC Schedule 40 will be used for underground installations. Rigid galvanized steel (RGS) conduit will be used for exposed exterior work where subject to damage or where installed in tunnels. The minimum conduit size for power wiring will be 3/4”.

   B. Conductors will be copper. Insulation will be THHN or THWN rated for 75°C; however, design will be based on 60°C or 75°C ratings as required by the NEC. Four wire feeders where neutral is considered a current carrying conductor will have an additional 80% derating. A maximum of six current-carrying conductors, using code designated derating factors, will be installed in any raceway. All conductors including neutrals and grounding conductors will be color coded.

   C. Wiring devices will be specification grade, 20 ampere, minimum, color as selected. Device plates will be stainless steel in office and service areas and smooth finish plastic to match the color of device in special areas. Back-to-back installation of devices will not be allowed.

3. Electrical Service
A. A new concrete encased duct bank will be planned for the primary medium voltage electrical system. The new duct bank will be configured as needed to maintain, extend or modify as needed for any campus medium voltage loops. Manholes and pad mounted switches will be provided as coordinated with campus planning, the electrical utility company and the civil engineer.

B. The building transformer is utility company provided and owned. It is anticipated the transformer will be 2,000 kVA with a medium voltage primary, 480 V, three phase, four wire secondary liquid filled, exterior, pad-mounted transformer. The transformer will be fed from utility company circuits as coordinated with the University. Anticipated loads are listed below.

<table>
<thead>
<tr>
<th>Use</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Electrical Loads, 5 W/ft²</td>
<td>650 kW</td>
</tr>
<tr>
<td>2) Mechanical Loads</td>
<td>1,040 kW</td>
</tr>
<tr>
<td>3) Total</td>
<td>1,690 kW</td>
</tr>
</tbody>
</table>

C. The 460 volt switchgear will have a drawout main breaker with full-feature electronic trip and ground fault protection. A microprocessor based metering package will be provided for kWH, kW, kVAR, ampere and voltage readouts.

D. Switchgear busing will be copper braced for 100,000 AIC. A fully rated horizontal bus will be provided for all sections. Branch overcurrent devices will be drawout circuit breakers with full feature electronic trip. All components will be fully rated for the available AIC.

4. Emergency Power

A. Emergency power will be supplied by one diesel fueled engine generator located in an exterior sound attenuated enclosure. The engine generator will be complete with subbase fuel tank, radiator, and critical grade silencer. Fuel storage will provide 24 hours of runtime at 100% rated load. A remote annunciator will be provided, and the generator will be connected to the building automation system. An on-site load bank test shall be performed. Fuel for all testing of the generator shall be provided. Tank shall be turned over to the University full.

B. The required emergency engine generator equipment will be rated at 400 kW, 480Y/277 V, three phase, four wire. Fuel storage will be 1,000 gallons. The generator will be connected as a separately derived system.

C. Code required emergency loads including exit lighting and life safety systems will be served from a dedicated life safety branch of the emergency power system. This branch will include a dedicated automatic transfer switch and the necessary distribution equipment.

D. Separate transfer switches and distribution equipment will be provided to serve elevators, atrium smoke evacuation fans, standby security and communication systems, and the fire pump.

E. All transfer switches will be monitored by the BMS system.

F. Transfer switches will have maintenance bypass capabilities.

G. All elevators will be connected to the emergency electrical system. However, the generator will be sized to only allow one elevator to operate at one time in an emergency situation.

H. The main switchboards for the emergency system shall be provided with TVSS.

5. Grounding

A. The utility service transformer secondary will not be grounded at the transformer and no ground wire will be run to the building electrical service with the secondary conductors. The transformer case will be bonded per the serving Utility Company standards. The building electrical service will be grounded at the building, and the neutral-to-ground bond will be made at the service entrance switchgear.
B. The electrical power distribution system will be provided with a “single-point ground system”. The ground bus at the main service equipment will be connected to the water service, a concrete encased electrode, a deep driven ground rod, and building steel if present.

C. An electrical grounding riser will be provided, with a grounding busbar located in each electrical room.

D. A grounding counterpoise will be provided.

E. All transformers will have the neutral of the derived system bonded to an electrical grounding riser, building steel, the nearest metal water pipe, and the transformer case. An insulated ground conductor will run back to supply equipment in same raceway as the phase conductors.

F. An insulated equipment grounding conductor will be installed with feeders and branch circuits. Metal raceways, equipment enclosures, receptacles and light fixtures will be bonded to the equipment grounding system.

6. Power Distribution

A. Distribution panelboards or switchboards will be provided to serve mechanical equipment and other concentrated loads. Lighting panelboards will be provided as required to serve other building loads. HVAC equipment, elevators, and Owner equipment will be supplied with 480 or 208 volt, 3 phase power or as needed. Lighting will be served from 277 volt branch circuits.

B. Distribution panels and switchboards will be circuit breaker or fusible type as needed. Components will be fully rated to provide the required AIC rating. Electrical equipment bussing will be copper.

C. Lighting panels will be commercial type with bolt-on circuit breakers. Busing will be copper. Components will be fully rated to provide the required AIC rating. Each panel will have a hinged door with a master keyed flush tumbler latch. Half size breakers and load centers will not be used. Lighting panel overcurrent protection will be limited to 225 amperes. A minimum of one 20 ampere 120 volt circuit will be provided for each 150 square feet of building area for general power requirements.

D. Transformers will be provided to convert 480 volt power to 208Y/120 volts for lighting, receptacle and equipment needs. Transformers will be K-factor (K=13) dry type rated for 115°C rise. Windings will be copper. Transformers rated 30 kVA or smaller may be wall or floor mounted. Transformers rated 45 kVA or greater will be floor mounted. Transformers will be located to keep maximum feeder length from the transformer to the 120 volt panels from exceeding 10 feet. Transformers will be sized to provide a minimum of 5 watts per square foot of building area.

E. Neutral conductors serving branch circuit panelboards will be sized for 200% of the branch panel feeder ampacity rating.

F. Disconnect switches will be heavy duty type. Exterior switches will be weatherproof. Disconnect switches for packaged HVAC equipment will be fusible.

G. Surge Protection Devices will be provided at the main service entrance and at select branch panels throughout the building which serve computers, sensitive electronic equipment, and LED lighting.

H. Conduit and wire will be provided for power distribution runs. Feeders will have copper conductors.

I. Fire rated pathways will be included for services to fire service access elevators.

J. Electrical distribution equipment will be named according to the University’s preferred naming convention.

7. Wiring Methods

A. Feeders will consist of conductors installed in raceways. Conduit fill will not exceed 40% based on the dimensions of THHN.

B. Each branch circuit will be run with a dedicated neutral conductor. No multi-wire branch circuits will be used.
8. **Wiring Devices**

   A. Provision for connection to furniture in classrooms and auditorium will be provided. Power and USB outlets will be furnished as part of furniture.

   B. Multi-service floor boxes containing power, data, and A/V connections will be provided at all classroom podiums and conference room tables.

   C. Floor boxes with receptacles and some with data connections will be provided in open areas, computer tables, and collaboration tables.

9. **Lighting**

   A. **Fixture Types**

      1) General lighting throughout the building will consist of recessed direct or direct/indirect, or suspended direct/indirect LED source fixtures.

      2) Approximately 50% of lighting will be LED source fixtures with electronic dimming drivers. Typical dimming level will be 10%.

      3) Down lights for general purpose use will be LED source recessed fixtures with low brightness reflector.

      4) Environmental lighting such as wall-washing, wall-grazing, and indirect wall-mounted fixtures will be LED source fixtures with electronic dimming drivers.

      5) Cove-lighting fixtures will be linear fixtures with LED sources, or flexible LED strip fixtures.

      6) Accent and display lighting will consist of aimable, directional, recessed or surface- or track-mounted fixtures for LED sources.

      7) Auditorium lighting will be LED source fixtures dimmable to 1% and controllable by architectural dimming system.

      8) Lighting for storage spaces and utility spaces with finished ceilings will be 2x2 recessed integral LED source fixtures.

      9) Lighting for support spaces such as utility rooms with unfinished ceilings, basement, and mechanical/electrical spaces will be surface mounted or suspended LED fixtures.

   D. Exit lights will be LED type. Egress lighting will be provided by selected fixtures connected to the life safety emergency generator system.

   E. Exterior lighting for egress paths will be integral LED source fixtures mounted on the building.

   F. Exterior site lighting will be LED source fixtures in accordance with campus standards.

   G. Exterior ground-mounted lighting will be LED source fixtures.

B. **General illumination levels for major areas are given as maintained average illuminance on a horizontal plane 2’ 6” above the floor, and will be as follows. Lighting calculations will be submitted for owner approval.**

   1) Classrooms 40 fc
   2) Offices 30 fc
   3) Corridors 10 fc
   4) Entrances-Day 10 fc
   5) Entrances-Night 5 fc
   6) Storage Areas 10 fc
   7) Café-General 10 fc
   8) Restrooms 5 fc
9) Mechanical/Electrical Rooms 20 fc
10) Electrical & Janitor's Closets 10 fc

C. Task illumination levels will be met by either the installed lighting at static areas or task lights provided with systems furniture, or by lighting zones/scenes. Lighting calculations will be submitted for owner approval.

1) Reading/Study/Work Desk 50 fc
2) Copy/Print 30 fc
3) Classroom Whiteboards 30 fc (on vertical surface)
4) Food Preparation 50 fc
5) Classroom-A/V Viewing 5 fc
6) Classroom-Learning/Teaching w/ Screens 15 fc

D. Lighting Controls

1) A building lighting control system will offer a single point of control of general building areas and circulation spaces via a graphical interface. Centralized control will not extend to all enclosed areas.

2) Local basic control systems will consist of switches and occupancy sensors.

3) Local enhanced control systems will be programmable and capable of controlling fixture responses to inputs such as daylight and occupancy sensors, and manual control devices.

4) Occupancy sensors will be used in all enclosed spaces excluding mechanical/electrical rooms, and may be installed in circulation spaces where appropriate. Control responses to certain occupancy sensor, such as automatic-on, automatic-off, and delay settings will be programmable from a local control system.

5) Zones of control will be assigned as appropriate for space use. Control system will be capable of overlaying control schemes for each zone depending on use and will allow for an automatic return to default scheme after each use. Schemes include time-of-day light level adjustment, dimming response to available daylight, recall of preset scenes, and custom user control. User control in enclosed, occupied spaces will at a minimum consist of the ability to switch zones of fixtures in the room or switch fixtures to multiple levels.

6) Control in multi-user spaces will include personal control of task lighting.

7) Installed task lighting will be provided with automatic shutoff.

8) Architectural dimming system supporting dimming to 1% or less will be provided in the Auditorium.

9) Rooms requiring advanced multi-scene control (classrooms, Global Trading, conference rooms, learning labs, and special use areas as appropriate) will be provided with a graphical control panel capable of interfacing with other audio/visual/technology systems and will support programming and recall of preset scenes as well as custom user control.

10) Rooms requiring simple single-zone or multi-zone control will be provided with manual switches and automatic shutoff devices.

11) Rooms requiring enhanced single-zone or simple multi-zone control will be provided with a programmable multi-button control station that supports scene recall and custom user control of scenes and dimming.

12) Where necessary, required egress lighting will be controlled along with non-emergency lighting through the use of emergency shunt relays/dimming controllers or through a control system listed for use in emergency circuits.

13) Lighting zones in circulation spaces will be controlled by lighting contactors or dimming/switching relay modules as appropriate. Contactors/relay modules will be controlled by the building lighting control system.

14) In circulation areas emergency fixture will be left on for night light purposes.
10. Fire Alarm

A. The fire alarm system will be designed and installed to meet WSU Fire Safety Specifications.
B. Main FACP or network node shall be a NOTIFIER Model NFS-320, NFS2-640 or NFS2-3030 Fire Alarm panel as applicable to accommodate the number of attached devices and shall contain a microprocessor based Central Processing Unit (CPU) and power supply in an economical space saving single board design. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system-controlled devices.
C. The addressable fire alarm system will be complete with addressable control relays.
D. Addressable manual stations will be provided at each exit from the building and no more than 200’ from any part of the building. Smoke detectors will be provided for elevator capture, HVAC system control, atrium exhaust systems, and other areas required by Code.
E. Audible/visible evacuation signals will be visible in the evacuation path. Signals will be located in accordance with NFPA required spacings. Visible signals will also be installed in classrooms, toilets, common use areas, and rooms larger than 2000 square feet.
F. Audible evacuation signals will be speakers with a pre-recorded voice evacuation message provided by the fire alarm system amplifier. Separate tones will be provided for fire evacuation and for weather related evacuation or mass notification messaging. Visible signals will be strobes meeting ADA requirements. Small rooms will be equipped with mini strobes. Signals will be combined audible/visible assemblies unless otherwise indicated.
G. HVAC systems will be provided with duct detectors as required by Code. Relays will be provided to shut down each air handling unit in response to an alarm generated by its associated detector.
H. Fire sprinkler systems will be monitored for flow and valve position.
I. All fire alarm wiring will be installed in raceways.

11. Lightning Protection

A. A complete concealed lightning protection system will be provided. The system will have a master label approval. Down conductors will be run in raceways concealed in the building structure. Detailed installation drawings will be provided by the system supplier.

Section P - Telecommunications

1. Overview

A. The Telecommunications System design will provide infrastructure for Data, Voice, and CATV information transport service to and within the building. Cabling will also be provided to Security Card Reader and Surveillance Camera locations. Materials and Installation shall comply with WSU Information Technology Services’ Recommended Requirements for Installation Contractor document.

2. Contractor Qualifications

A. Telecommunications Contractor shall be Panduit Partner Certified in good standing for minimum five (5) years, and shall provide copy of Panduit Company certificate with bid.
B. Telecommunications Contractor shall have BICSI Installer Level 2 on staff and assigned to be Lead Technician full-time on this project. Provide copy of BICSI Installer Level 2 certificate with bid.
3. **Telecommunications Materials**
   A. Per WSU Information Technology Services’ Recommended Requirements for Installation Contractor document, and as detailed throughout this Schematic Design Narrative.
   B. All cabling shall be plenum rated, with the exception of cabling within in-grade and below-grade conduits which shall be OSP/wet rated.

4. **Telecommunications Service**
   A. Telecommunications (Data, Voice and CATV) service will be delivered to the building via two (2) redundant Corning fiber optic 24-strand single-mode cables with diverse pathways into the building, for distance-learning compatible redundancy. The cables will route from location(s) to be determined.
      1) Each cable pathway to the building will consist of two (2) new 4” conduits, with Maxcell 3-cell 4” fabric mesh innerduct installed through each conduit.

5. **Telecommunications Spaces**
   A. The Equipment Room and Entrance Facility (ER and EF) will be combined in one room on Level 1, hereinafter referred to as Equipment Room (ER). Building service cables will terminate in the ER, as well as work area outlet cables from the adjacent area.
   B. Telecommunications Rooms (TRs) will be located such that work area outlets are served by either a TR or the ER with a maximum cable length of 295-feet, including vertical elevation changes and service slack storage of cables.
      1) One (1) TR will be provided on Level 1, in addition to the ER.
      2) Two (2) TRs each will be provided on Levels 2 and 3.
   C. Panduit Netframe # R2P6S Equipment racks will be provided per WSU Standards.
      1) Five (5) racks will be provided in ER.
      2) Three (3) racks will be provided in each TR.
      3) Provide between adjacent racks, and at end of outer racks, Panduit vertical manager # PR2VD10.
      4) Provide between patch panels, and above top-most patch panel and below bottom-most patch panel, Panduit horizontal manager # NCMHF2.
      5) Provide 1U Tripp Lite # RS-1215-RA power strip on each equipment rack.
   D. Rack-mount UPS will be provided, Vertiv # GXT5-1500LVRT2U 1500VA, each with # IS-UNITY-DP Intellislot
      1) Provide One (1) of each in TRs.
      2) Provide Three (3) of each in ER.
   E. CommScope ladder runway will be provided horizontally for overhead cable support, and vertically for support along walls, within Telecommunications Spaces. Runway widths shall be 18” and 12” as required.
   F. STI EZ-Path Firestop Sleeves shall be provided for vertical and horizontal cable penetrations into Telecommunications Spaces.
      1) Five (5) horizontal 4” EZ-Path sleeves in ER
2) Three (3) horizontal 4” EZ-Path sleeves in each TR
3) Two (2) vertical thru floor slab EZ-Path sleeves in each TR on Levels 2 and 3.

6. Telecommunications Backbone

A. The Data backbone will consist of one (1) Corning 24-strand single-mode fiber optic cable from the ER to each TR, terminated in rack-mount Corning enclosures with fusion-spliced Corning LC pigtails.
B. The Analog Voice backbone will be one (1) 25-pair Category 3 cable from the ER to each TR, terminated on rack-mount 110-blocks.
C. CATV backbone will consist of one (1) CommScope RG11 quad shield coaxial cable from the ER to each TR and terminated via compression F-type connectors. CATV amplifiers, splitters, taps, and line equalizers will be provided as necessary.

7. Telecommunications Grounding

A. A Telecommunications Main Grounding Busbar (TMGB) will be provided in the ER, and will be bonded as required per WSU and J-STD-607 standards.
B. A Telecommunications Grounding Busbar (TGB) will be provided in each TR, and will be bonded as required per WSU and J-STD-607 standards.
C. A Telecommunications Grounding Backbone shall be provided, consisting of # 3/0 AWG Copper insulated conductor in conduit from TMGB to each TGB.

8. Horizontal Cabling System

A. Category 6A cable and connectivity hardware will be utilized for all Data, VoIP, and Analog Voice outlet connections.
B. The standard work area outlet (faceplate) will receive two (2) Category 6A cables and jacks.
C. Standard outlets shall receive a 4-11/16” square backbox, 2-5/8” minimum depth, with 1” conduit stubbed up and bushed above accessible ceiling with sweeping 90-degree bend for cable exit parallel to ceiling.
D. Data outlets will be provided and terminated in floor boxes and poke-thru devices as required.
E. Data outlets will be provided in the following areas:
   1) All flexible spaces
   2) Interview rooms
   3) Private student studies
   4) Open student studies
   5) Lounges
   6) Food Service
   7) Storage rooms
F. Data/VoIP outlets will be provided in the following areas:
   1) Private faculty / staff offices
   2) Shared faculty / staff offices
   3) Staff / student workstations
G. Data/VoIP and Analog Voice outlets will be provided in the following areas:
   1) Conference Rooms (including table top access to Data, and ceiling-mount Data for projector)
   2) Reception / Waiting areas
   3) Resource Rooms
H. WiFi Access Point (AP) outlet locations will be estimated by W.L. Cassell and confirmed / adjusted by WSU as required. Each AP outlet will receive (2) Category 6A cables, jacks, and CommScope Cat 6A...
CCA-CAT6A-PLENUM ceiling connectors terminated above accessible ceilings in metal backbox and stainless steel faceplate.

I. Power, conduit, media converters, and 2-strand fiber optic cable shall be delivered to light poles in courtyard areas adjacent to building for connection to WiFi APs.

J. CommScope Category 6A cables will terminate on Panduit patch panels utilizing Panduit Cat 6A Mini-Com module jacks, rack-mounted in TRs and in ER. Cables will home-run from outlets to the nearest TR or ER on the same floor as the outlets, unless otherwise noted on the drawings.

K. CommScope Category 6A patch cords shall be provided for outlets (except at WiFi APs) and for patch panel ports.

L. TV outlets will receive one (1) CommScope RG6 quad-shield coaxial cable and compression F-type connector, and one (1) Category 6A cable and jack. RG6 cables will home-run from the nearest TR or ER in similar fashion to Category 6A cables.

M. Wire Basket type Cable tray will be provided above accessible corridor ceilings to route cables from TRs and ER to outlet areas. Tray shall be 4” deep in widths of 18” and 12”.

N. Cables will be supported via j-hooks above accessible ceilings, where they route from cable trays to conduit stub-ups above work area outlets and where there are no more than fifty (50) cables routing together. J-hooks shall be sized to allow for minimum 25% spare capacity.

O. STI EZ-Path sleeves shall be provided where cable pathways cross fire and/or smoke rated walls.

9. Security
   A. Two Category 6A cables and outlets shall be provided to each card reader and surveillance camera location.
   B. Card reader and camera locations to be determined with input from WSU.

END OF DESIGN GUIDELINES
Owner’s Project Requirements (OPR)

The Owner’s Project Requirements (OPR) is a written document that details the ideas, concepts, and criteria that are determined by the Owner to be important to the success of the project.

The OPR is required for LEED certification of the project, but also serves broader purposes:

This OPR includes a description of the Owner’s goals and functional requirements for the project, and the Owner’s expectations on how the project will be used and operated.

1. Provides the design team with information necessary to develop the Basis of Design (BOD) during program verification and schematic design, which serves as a “road map” for development of the design and construction documents.

2. Provides the commissioning (Cx) team with tangible benchmarks to measure success & quality and confirm that the building and systems constructed align with the University’s expectations and requirements.

3. Serves, along with the BOD and contractor deliverables such as “as-built” documents, as the foundation for the Systems Manual outlined below.

OPR TABLE OF CONTENTS:

1. INTRODUCTION
2. PROJECT NARRATIVE
3. PROJECT GUIDELINES
4. PROGRAMMING
5. ARCHITECTURAL DESIGN & PERFORMANCE
6. ENGINEERED SYSTEMS DESIGN & PERFORMANCE
7. ENVIRONMENTAL & SUSTAINABILITY
8. COMMISSIONING
9. FACILITIES MANAGEMENT
1. INTRODUCTION

1.1 OWNER STAKEHOLDERS
The Owner is the Wichita State University Core Client Group. Primary users and stakeholders include the W. Frank Barton School of Business Steering Committee and Industry Advisory Group. The entity responsible for project management and delivery is WSU Facilities Planning. The organization responsible for operation and maintenance of the facility is WSU Facilities Planning.

Core Client Group
Jay Golden – Wichita State University, President
Richard Muma – Wichita State University, Provost
Emily Patterson – Wichita State University, Executive Director of Facilities Planning
Larisa Genin – Wichita State University, Dean of the W. Frank Barton School of Business
Elizabeth King – Wichita State University Foundation, President & CEO
Keith Pickus – Wichita State University Foundation, Vice President

1.2 OPR PROCESS AND TRACKING
The Owner will develop a draft version of this document and update it through program verification and schematic design, or until the Cx consultant is selected. The Cx consultant will then assume responsibility for completing and editing the OPR throughout design, construction, and the post-occupancy period of one year following Substantial Completion of construction. As decisions are made during the life of the project, this document shall be updated to reflect the current requirements of the University.

2. PROJECT NARRATIVE

2.1 PROJECT DESCRIPTION
Woolsey Hall is to be a new 128,000 SF building for Wichita State University. The new building will have an auditorium with seating for 300 (divisible to two 150 seat classrooms), a trading lab with ticker tape and Bloomberg terminals, classroom, offices and other spaces. The main lobby is a spacious, naturally lit space that will open into a central atrium of the building. The building will have a plaza for students to gather around the building along with a small roof terrace.

2.2 PROJECT LOCATION
The site for the project is east of Mid Campus Drive (south of the YMCA/Student Wellness Facility and north of the Food Truck Plaza/pond) The location provides a strong connection between the existing academic building locations and the partnership building to the east.

2.3 PROJECT TEAM
Design Architect: Gensler
11 E. Madison, Chicago, IL 60602.
Architect of Record: GastingerWalker&
817 Wyandotte, Kansas City, MO 64105
MEP and Fire Protection Engineers: W.L Cassell & Associates, Inc
1600 Baltimore, Kansas City, MO 64111
Civil Engineers: MKEC
411 N. Webb Rd, Wichita, KS 67206
3. PROJECT GUIDELINES

3.1 OVERALL PROJECT GOALS

3.2 PROJECT BUDGET & SCHEDULE

3.2.a Preliminary Project Budget: The building program was originally created in 2014 and was revised in 2018 to be in line with a total project cost of $50 million. The total project cost includes construction, site development, FF&E, information technology, audio visual equipment, door security, moving costs, professional fees, WSU Foundation costs, State of Kansas OFPM fee, and contingency.

3.2.b The preliminary budget updated in 2018 includes the key line items:
- Building Cost: $35,343,000
- Fixed Equipment: $706,860
- Site Development: $1,767,150
- Total Construction: $37,817,010
- Site Acquisition: $0
- Fixtures, Furniture & Equipment: $1,767,150
- IT Costs: $600,000
- AV: $2,750,000
- Security: $587,500
- Installation/Moving Costs: $150,000
- Professional Fees: $2,120,580
- Contingency: $2,474,010
- Foundation Costs: $1,500,000
- State OFPM Fee: $234,147

3.3 DONOR REQUIREMENTS

3.4 PROJECT SCHEDULE

October 14, 2019 Project kickoff + Visioning session
October 28-29, 2019 Stakeholder Visioning Sessions + Programming Meetings
November 4-5, 2019 Vision Synthesis Presentation
4. PROGRAMMING

4.1 PROJECT-SPECIFIC DESIGN GOALS

4.1.a The Woolsey Hall building needs to tell the story of the W. Frank Barton School of Business. This must be a student-oriented building, with a vibrant, open, welcoming, and celebratory environment that showcases the accomplishments of current and former students while supporting the academic experience, counseling & mentoring, team-oriented discussion, individual study, informal interaction, and events.

4.1.b A successful exterior appearance for this facility should complement the “family” of construction materials that is currently used on the Wichita State University campus while imparting the “new” image for the functions that will occupy the building.

4.1.c An important part of the current and future business and Wichita State University dialogue needs to include social, economic, and environmental sustainability. The building should be a productive environment for today’s environmentally-literate students, faculty, and staff while creating an opportunity to incorporate a sustainable philosophy into curriculum and culture. The new facility should present an academic and business model for lowered operating costs and increased operating efficiencies while improving the health, well-being, and productivity of students, faculty, and visitors in the building.

4.2 PROGRAMMING FEEDBACK

4.2.a A series of work sessions were held with all of the departments, centers, and support groups to be located in the new building. Approximately 50 faculty, department heads, support staff, and interested parties participated in the work sessions held over four days. A list of recurring themes was developed, including:

- Technology needed throughout the building
- Accessibility concerns addressed
- Better classrooms, both quantity and quality
- Better faculty offices, both quantity and quality
- Business Centers located on the lower floors
- Faculty on the upper floors
- All faculty offices to be at the exterior glass
- Decentralize faculty within the five departments.
- Mix faculty and classroom on the same floor(s)
- Open space on the interior of the building
• Lots of natural light in the building
• Large Multi-Use space for guest lecturers and formal events – anticipated 300-seat tiered lecture theatre
• Space for Student Organizations
• Faculty/staff lounge in the building
• Parking dedicated to visitors for Business Centers
• Some food service “snacks” in the building
• Flexibility for ALL classrooms and throughout the building
• Strong Pedestrian links with other buildings on campus

4.3 OCCUPANCY & USE

4.3.a The anticipated normal hours of operation for Woolsey Hall is 7:00 AM – 10:00 PM, Monday through Friday and 8:00 AM – 2:00 PM on Saturday. “24/7” access is assumed for faculty and staff.

4.3.b The program includes the following capacities:
   (Program may be provided separately at later date)

5. ARCHITECTURAL DESIGN & PERFORMANCE

5.1 BUILDING LOCATION CONSIDERATIONS

5.1.a The building is to be located on the site with the existing pond to remain in place, with a strong relationship to the pond.

5.1.b At its central location, the building is meant to be a hub for the entire campus, not just the school of business

5.2 BUILDING EXTERIOR

5.2.a The exterior appearance of the building should complement the “family” of construction materials that is currently used on the Wichita State University campus while imparting the “new” image for the School of Business.

5.3 BUILDING INTERIOR

5.3.a The building should allow for visually open spaces on all floors.

5.3.b The upper floors of the building allow for student/faculty interaction with wide open corridors and casual seating throughout the building.

5.3.c Flexibility in all of the academic environments is very important for the diversity of teaching styles. Except for tiered classrooms and auditorium all furniture in the classrooms should be freestanding and mobile.

5.4.d Security in an open environment will be very important. All faculty/adjunct offices, academic spaces, and support rooms should have locking doors.

5.4.e Security for the building at exterior doors will follow Wichita State University guidelines.

5.4.f Access to the lower level should be provided as a storm shelter for the occupants of the building.

5.4.g Flexibility for technology throughout the building will be important as academic technology changed during the life of the building.
5.4.h The building should have a minimum of two 5,000-point capacity, elevators with combination passenger/freight service and landings at all levels. The cabs are to be ADA-compliant

5.4.i A service elevator is to be provided to allow access to HVAC equipment, fire pump, and minimal storage.

6. SITE DESIGN

6.1 SITE EXISTING CONDITIONS

6.1.aExisting passenger vehicular access and parking at the site is provided from Perimeter Dr.
6.1.bVehicular access for deliveries, by car or truck, is provided from the service drive accessed from Perimeter Dr.
6.1.cPedestrian access is provided from each direction of the building site, with an existing large pedestrian pathway running north/south on east side of site.

6.2 SITE DESIGN GOALS

6.2.a The site design is to connect west campus to east campus
6.2.b Connection to Food Truck Plaza at the southwest
6.2.c A future concept is consideration of a bridge over the existing pond.
6.2.d It is the intent that the site would not have any vehicular traffic that separates the building from the campus expansion to the east.
6.2.e The Building shall be oriented to enhance the already established N/S pedestrian mall that connects building form 17th Street to Braeburn Square.
6.2.f It is understood that previous stormwater detention projects already completed will accommodate the City of Wichita’s stormwater quality and quantity regulations that that additional detention will not be needed for this facility.
6.2.g It is understood that access to approximately 100 adjacent parking still will be needed for this facility.

6. ENGINEERED SYSTEMS DESIGN & PERFORMANCE

6.1 ENGINEERING CONCEPT GOALS

6.1.a The facility should have integrated vertical and horizontal chase systems for flexibility and adaptability of mechanical, electrical, plumbing, and telecommunications systems.
6.1.b The State of Kansas requirement is for state buildings to be designed to ASHRAE 90.1-2013, beyond the LEED v4 standard.

6.2 STRUCTURAL SYSTEM

6.2.a The structural system is anticipated to be a conventional structural steel system with the preference for cast-in-place for vibration, sound control, and longevity.
6.2.b Floor loading is to be dead load plus 100 pounds per square foot to provide flexibility for repurposing floor space for unknown future needs.
6.2.c Floor construction is anticipated to be composite steel deck with reinforced concrete topping.
6.2.d Roof construction is anticipated to be steel joists on steel beams and steel columns with a steel roof deck.

6.3 CIVIL INFRASTRUCTURE

6.3.a Domestic Water: An existing water loop is available in the perimeter loop road for this Project. An extension of the loop shall be installed around the building to provide adequate fire protection and fire hydrant coverage. Construction of the water loop shall be in accordance with the City of Wichita standards and in compliance with KDHE regulations.

6.3.b Sanitary Sewer: The connection of proposed sewer service shall be constructed in accordance with the City of Wichita standards and specifications for sanitary sewer construction and shall be in compliance with KDHE regulations.

6.3.c Storm sewer: A 15” min. storm water service will be required and will be extended at one or multiple locations 5 feet from the building. A stormwater management plan will be coordinated with LEED goals specific to the LEED Silver strategy for this project.

6.4 PLUMBING SYSTEMS

6.4.a All systems shall be designed to meet the Wichita State University and the State of Kansas design guidelines and regulations.
6.4.b Plumbing systems shall be designed to the most current adopted Plumbing and Energy codes at the beginning of design.
6.4.c Plumbing equipment selection will be coordinated with the approved bidders list.
6.4.d General Plumbing Fixtures: Fixtures shall be commercial-grade, appropriate for use. Flush valves and lavatory faucets in public areas shall be sensor-operated.
6.4.e Water Heating: Water heaters shall be gas-fired, storage-type hot water heaters. Provide both 110 Fahrenheit distribution loop for general hand washing and a 140 degrees Fahrenheit distribution loop for other uses. Both loops shall be recirculated to maintain hot water at the point of use.

6.5 MECHANICAL SYSTEMS (HVAC)

6.5.a The heating, ventilation, and air conditioning (HVAC) systems for the building must be configured for an appropriate amount of flexibility to accommodate changes in activities over time.
6.5.b Central Plant: A central four-pipe (chilled and heating hot water) system is planned. The existing campus Central Plant does not have adequate capacity to serve this new building. The serve the Business School, this facility will utilize a standalone plant housed in this building.
6.5.c Generation of heating and cooling will be local to this building, with the boilers and pumps residing in the lower level of the building. Multiple boilers, chillers, and pumps shall be utilized to provide redundancy in the event of the failure of a single piece of equipment. Both the chilled and heating water systems shall utilize variable-volume pluming with variable-speed drives for energy conservation. Air-cooled chillers located in an adequately
unrestricted and enclosed area on the north of the building will provide cooling capacity.

6.5.d Air-Handling Systems: Indoor central station air-handling units shall be utilized, located in the penthouse of the new building. This location will allow fresh air intake from above grade and reduce the need for areaways or additional duct chases for fresh air. This location will make air-side heat recovery practical. Academic spaces, offices, support areas, etc. shall be provided with their own air handling system to maintain segregation based on usage hours and redundancy needs. Consideration for humidifiers at the central air handlers to minimum 30 percent relative humidity is recommended. Each air system shall be provided with variable-frequency drive and variable air volume (VAV) control. In the office and classroom spaces, single-duct VAV rehear or fan-powered VAV terminate with hot water heat shall be utilized.

6.5.e Central Exhaust System: Shall be utilized for the core restroom spaces and other general exhaust, and shall use a total heat (enthalpy) recovery wheel.

6.6 ELECTRICAL SYSTEMS

6.6.a Primary Electrical Service: This facility will be supported by the existing electrical concrete encased duct bank system that is located within the pedestrian mall to the east. Additional manholes and pad switches will need to be located in coordination with Westar Energy.

6.6.b Building Electrical Distribution: The building will be fed from a pad-mounted utility company transformer. Secondary electrical service from the transformer will be routed underground to a main switchboard located in the lower level. The electrical service will be rated 277/480-volt, 3-phase, 4-wire. The switchboard will feed distribution panels located on each floor.

6.6.c Diesel Generator: The building shall have a diesel generator with a weatherproof, sound attenuated enclosure and subbase fuel tank to provide emergency power for code-required life safety loads via an automatic transfer switch (ATS). The generator shall also provide backup power to the fire pump. The life safety ATS will serve emergency egress lighting, fire alarm system, emergency notification system provided by the Owner, and other life safety loads. The ATS will be located in the lower level in an electrical room separate from the normal power switchboard. Life safety panels will be located on each floor in the same rooms as normal power panels.

6.6.d Fire Pump: The building will have an automatic fire sprinkler system and will require a fire pump. The fire pump shall be serviced from a separate utility service and shall also be fed from the diesel generator. Fire pump feeders shall be routed outside the building or shall be routed in a two-hour fire-rated enclosure.

6.6.e Electrical Rooms: Shall be located on each floor and shall contain normal, life safety, and standby panels and transformers.

6.6.f Site Lighting: Lighting for parking and pedestrian traffic shall match campus standards and be controlled via astronomic time clock and contactors.

6.6.g General Lighting: Shall be provided by LED light fixtures for general lighting shall be considered as an alternate with 0- to 10-volt dimming. The building will require a lighting control system for public spaces to switch lights off after normal hours. Local override switches shall be provided for after normal hours use that will turn lights on in an area for a maximum of two hours. Private offices will utilize dual relay vacancy sensors. Vacancy sensors
require input from the room occupant to initially turn the lights on and will automatically turn the lights off.

6.6.h Exit Signs: Shall be LED with white, cast-aluminum housings and self-diagnostics. Egress lighting shall be connected to the generator via the life safety transfer switch. Egress lighting will be used as nightlights.

6.6.i Firm Alarm: The building will require an NFPA 72 compliant fire alarm system consisting of manual pull stations, smoke detectors for elevator recall, and duct smoke detectors for mechanical air handling units 2,000 cfm or larger. Horns and strobes will provide occupant notification. The fire alarm system will monitor the fire sprinkler system via flow and tamper switches.

6.6.j Lightning Protection: An NFPA-compliant lightning protection shall be provided. A UL Master Label shall be provided for the installed system. A ground loop around the building shall be provided.

6.7 TECHNOLOGY / IT

6.7.a Telecommunications/network infrastructure: The building shall be fed from the existing communication facilities located in the site infrastructure. Redundant pathways are required into the building from the exterior fiber infrastructure. The main telecom room shall be located in the lower level of the building. Secure telecom closets shall be located on each floor. Pathways for backbone cabling shall be provided from the lower level to each floor telecommunication room. A telecommunication grounding system shall be provided and connected to the building electrical system ground.

7. ENVIRONMENTAL AND SUSTAINABILITY

7.1 CAMPUS ENVIRONMENT REQUIREMENTS

7.1.a Wichita State University currently does not have a Sustainable Campus Plan or any campus buildings with performance certifications. WSU would like Woolsey Hall to be the first certified environmentally sustainable project on campus.

7.2 BUILDING SUSTAINABILITY

7.2.a An important part of current and future business models is social, economic, and environmental sustainability being in alignment. The building should be a productive home-base for today’s environmentally-aware students and staff while creating an opportunity to incorporate a sustainable philosophy into curriculum and culture.

7.2.b The new facility needs to present an academic and business model for lowered operational costs and increased operating efficiencies while improving the health, well-being, and productivity of students, faculty, and visitors to the building.

7.3 LEED RATING SYSTEM

7.3.a LEED Goals: Wichita State University has approved the design requirement for Woolsey Hall to seek certification by the U.S. Green Building Council (USGBC) through its Leadership in Energy and Environmental Design
(LEED) process, with the following strategies included in the LEED achievement path:

- High-efficiency mechanical system
- Passive daylighting with electronic dimming system
- Occupancy sensors
- Low-flow plumbing fixtures
- Locally-sourced, renewable, or recycled-content building materials
- Low-VOC and healthy building materials
- Use of exterior shading devised on sun-exposed elevations of the building

7.3.b In reviewing anticipated LEED-related design and construction costs, the following credits will no longer be pursued as part of the LEED strategy:

- A green roof on the Auditorium roof.
- Enhanced Commissioning

7.3.c The project will be certified using the LEED v4 - New Construction rating system, seeking LEED Silver certification.

7.4 WELL BUILDING RATING SYSTEM

7.4.a WELL Building Goals: Wichita State University wants WELL Building Silver tracking (not certification) for the Woolsey Hall building, with the following assumptions about achievement path:

- Water-quality testing
- Mold and radon testing throughout the life of the building
- Healthy food stream practices
- Recycling practices
- Acoustical performance
- Art used throughout the building
- Biophilia throughout the building

8. COMMISSIONING

8.1 COMMISSIONING, INSPECTION, AND QUALITY ASSURANCE

8.1.a The University will engage a Commissioning Agent (CA) independent of the design and construction teams to perform basic commissioning services as part of the Fundamental Commissioning requirements of LEED version 4

8.1.b The Commissioning (CA) consultant will be independent of the design and construction teams, will be selected by the ASD phase, and will be responsible for maintenance of this OPR; peer review of the design and construction documents; development of the project-specific Commissioning specification using the University’s template “non-technical” spec; development of the project-specific Commissioning Plan; construction and acceptance phase commissioning and documentation; development of the facility’s Systems Manual; and post-occupancy commissioning, testing, and documentation.

8.1.c It is anticipated that the following building systems will be commissioned:

- Mechanical and HVAC systems
• Electrical and lighting systems, including emergency (generator) power (if any)
• Domestic hot water systems, including solar (if any)
• Building envelope systems

8.1.d The following items of particular interest to the University shall be addressed and verified by the Cx consultant throughout the term of service:
1. Accuracy of utilities metering and integration of same with the Building Automation System (BAS)
2. Measurement & Verification of energy usage, performance, and efficiency

9. OPERATION & MAINTENANCE

9.1 CONSTRUCTION COMPLETIONS AND TURNOVER

9.1.a Inspection, testing, and commissioning culminates in a declaration of Substantial Completion by WSU. This date establishes both the beginning of the warranty period and commencement of operation and maintenance by WSU. Move-in of occupants and their personal belongings will not take place until all Substantial Completion “punch list” items are completed.

9.1.b The A/E shall develop a project-specific “closeout deliverables matrix” (using the WSU template) to document exactly what is to be required in the specifications for O&M documents, Owner training, attic stock, warranties, and other deliverables at the end of construction.

9.2 OPERATION & MAINTENANCE

9.2.a The entity responsible for maintenance and operation of the building and its systems, beginning on the date of Substantial Completion, is the WSU Facilities Planning Department.

9.2.b In addition to the Cx Plan, field reports, and test reports, the Cx consultant’s primary deliverable is a Systems Manual as required for LEED E/A prerequisite (Fundamental Commissioning). This manual provides the University with a single source of information and instructions for proper operation and maintenance of primary building systems. As opposed to equipment-oriented “O&M manuals,” the Systems Manual is to be systems-oriented to provide operators with easy access to both narrative and technically detailed reference material, descriptions, diagrams, schedules, and other information on stand-alone and, particularly, integrated systems.

9.2.c Like the OPR and BOD, the Systems Manual should be a living document. Unlike the OPR and BOD, though, the Systems Manual should evolve throughout the life of the building – compiled by the Cx from documentation developed by the owner, design team, contractors, and the Cx process itself, then turned over for perpetual use and upkeep by building operators and future consultants and contractors throughout the building's life.

9.3 OWNER TRAINING

9.3.a Onsite training for the Owner – whether operators/maintainers or users/occupants – shall include a description and overview of systems, not just the components and equipment that comprise each system.
9.3.b Training – which is ideally held in conjunction with commissioning – should include general orientation and reviews of the written O&M instructions, relevant health and safety issues or concerns, operation in all possible modes, preventive maintenance, and common troubleshooting problems & solutions.

9.3.c Building systems that WSU staff shall be trained on include:
- HVAC systems
- BAS/controls
- Electrical systems
- Lighting controls
- Security Systems and CCTV
- Fire Alarm system
- Fire Protection system
- Audio/Visual (A/V) systems

9.3.d Most training shall be completed prior to Substantial Completion, and all sessions shall be videotaped and converted to DVD format for the Owner’s use.

**9.4 POST-OCCUPANCY AND WARRANTY**

9.4.a The Cx consultant, CM/GC, and all subcontractors whose systems were commissioned shall meet with the Owner’s O&M staff quarterly during the first year after Substantial Completion to offseason test, optimize, and otherwise troubleshoot all commissioned systems.

9.4.b Also, an onsite meeting will be conducted 10-11 months after Substantial Completion to review performance and quality of the facility with all affected parties – WSU occupants & users, O&M staff, the design team, and the contractor and its subcontractors.
Basis of Design (BOD)

The **Basis of Design** (BOD) is a written document that details the Design Team's concepts, assumptions, calculations, decisions, product selections and operating conditions to meet the Owner's Project Requirements (OPR) and to satisfy applicable codes, standards, and guidelines.

The BOD contains the information necessary to accomplish the OPR including system descriptions, indoor environmental quality criteria, design assumptions.

**SECTION 1:**
PERFORMANCE REQUIREMENTS AND OVERALL DESIGN ASSESSMENT

I. **PRIMARY DESIGN ASSUMPTIONS**
   a. Project Background:
      A new construction 130,000 SF building for Wichita State University. The new building will have an auditorium with seating for 300 (divisible to two 150 seat classrooms), a trading lab with ticker tape and Bloomberg terminals, classroom, offices and other spaces. The main lobby is a spacious, naturally lit space that will open into a central atrium of the building. The building will have a plaza for students to gather around the building along with a small roof terrace
   b. Key items from the Owner Performance Requirements affecting primary design decisions: See Owner’s Program Requirements

II. **STANDARDS AND PROJECT GOALS**
   c. Mechanical Code: 2018 – International Mechanical Code (IMC)
III. ENVELOPE PERFORMANCE REQUIREMENTS + TARGETS:
   a. ASHRAE 90.1-2013, Climate Zone 4, using baseline building performance according to ASHRAE 90.1-2013, Appendix G
      i. Note: The State of Kansas ASHRAE requirements are for 2013, beyond the LEED NC v4 requirements of 2010
      ii. Compliance with mandatory provision of ASHRAE 90.1-2013, inclusive of
   b. 25% total improvement is the energy performance goal per the LEED Silver scorecard path for Woolsey Hall (10 points anticipated).
      i. 5% required improvement compared to baseline building performance rating
   c. EUI Benchmark: 71, per DOE Target Finder
   d. Set Points: WSU Standard = Heating 68F / Cooling 76F
   e. Wall R-Value: R-19
   f. Roof R-Value: R-30
   g. Sensors: Daylight Sensors
   h. Glass: Basis of Design: Solarban 90 (2) Clear
      i. Solar Control: 0.23 SHGC
      ii. Light Transmittance: 51%
      iii. Light-to-solar-gain ratio: LSG 2.22
   i. Shades: Frit, Louver System TBD
   j. PV: None

IV. PRESCRIPTIVE ENVELOPE REQUIREMENTS:
   a. ASHRAE 90.1-2013, Climate Zone 4 (based on thicknesses per ASHRAE models)
   b. Metal Framed Walls / Opaque R-value Requirement = 13.0 cavity, 7.5 continuous insulation (ASHRAE 90.1-2013 Tables 5.5.1-7)
   c. Roofs with insulation entirely above deck / Opaque R-value Requirement = 30 (2015 IECC Table C402.1.3 and ASHRAE 90.1-2013 Tables 5.5.1-7)
   d. Mass Walls / Opaque R-value Requirement = 9.5 (ASHRAE 90.1-2013 Tables 5.5.1-7)

V. LEED CRITERIA:
   a. LEED Goals: Wichita State University has approved the design requirement for Woolsey Hall to seek certification by the U.S. Green Building Council (USGBC) through its Leadership in Energy and Environmental Design (LEED) process, with the following strategies included in the LEED achievement path:
      • High-efficiency mechanical system
      • Passive daylighting with electronic dimming system
      • Occupancy sensors
      • Low-flow plumbing fixtures
      • Locally-sourced, renewable, or recycled-content building materials
      • Low-VOC and healthy building materials
      • Use of exterior shading devised on sun-exposed elevations of the building
   b. In reviewing anticipated LEED-related design and construction costs, the following credits will no longer be pursued as part of the LEED strategy:
      • A green roof on the Auditorium roof.
- Enhanced Commissioning

c. The project will be certified using the LEED v4 - New Construction rating system, seeking **LEED Silver certification**.

VI. **WELL Building Criteria:**
a. WELL Building Goals: Wichita State University wants **WELL Building Silver tracking** (not certification) for the Woolsey Hall building, with the following assumptions about achievement path:
   - Water-quality testing
   - Mold and radon testing throughout the life of the building
   - Healthy food stream practices
   - Recycling practices
   - Acoustical performance
   - Art used throughout the building
   - Biophilia throughout the building

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**SECTION 2:**
PRELIMINARY BASIS OF DESIGN NARRATIVE INFORMATION

I. **BUILDING ENVELOPE:**
   a. Building massing:
      i. The north masonry volume is to house administrative, staff, and faculty office areas, and back of house functions on the first floor. The building envelope is masonry with punched openings
      ii. The south mass of the building is a three-story visually-open classroom bar, with the building envelope is a south-facing ribbon window façade
      iii. Between these two masses is a central atrium with open feature stair connecting all floors, with the building envelope is full glazing inset from the adjacent faces of the building.

   b. Exterior Walls, Brick Masonry:
      i. 4" nominal face brick
      ii. 1" airspace with full-height drainage mat (Cav Clear or sim)
      iii. 2" Rigid insulation
      iv. Weather barrier applied to CMU or sheathing. Weather barrier is vapor permeable. Fluid applied system. Include transitional membrane where wall system meets roof system or other system. Transitional membrane and any accessory sealants or mastics to comply with sealant division 07900 adhesion and compatibility testing.
      v. CMU: vertically and horizontally reinforced, concrete masonry unit back-up, using stainless steel anchors and accessories, and epoxy-coated rebar. Grout shall be self-consolidating. Thickness of CMU as required by engineering (8" or 12").
      vi. Structural Studs: Cold framed heavy gauge framing with mineral fiber insulation.
vii. All control and movement joints in the exterior stone cladding system will be sealed with a single line of one, or two, part silicone sealant; non-staining. Continuous horizontal joint at approximately underside of second floor slab to accommodate slab edge deflections. Vertical control joints at each column centerline, plus 10 additional joint locations to be determined.

viii. Framing, gyp bd and finishes.

c. Typical Curtain Wall Systems:

i. All framing will be fabricated from thermally broken aluminum extrusions.

ii. The finish for all interior exposed faces of the aluminum framing will be a two (2) coat non-micaflake fluorocarbon resinous coating; the finish for all exterior facets of the aluminum framing will be a 2-coat baked enamel or powder coat finish.

iii. Typical insulating glass units will be 1” thick and be composed of a ¼” thick clear glass outboard light with a low emissivity coated second surface, a ½” hermetically sealed argon-filled gap, and a ¼” thick clear inboard light, heat treated. Inboard and outboard lites to be fully tempered where required to meet safety-glass requirements. Where fully tempered lites are above occupiable surfaces, heat-soak such tempered lites.
   1. Where indicated on drawings, include custom ceramic frit pattern on #3 surface.

iv. All units shall be reinforced, if necessary, based on Contractor’s Engineering, with structural steel inserts, fully galvanized and coated to prevent galvanic corrosion. Depths of aluminum curtainwall framing members are shown for design intent only. If necessary, include deeper mullions to accommodate the necessary steel reinforcing.

v. All curtain wall framing will be attached to the building’s structural frame, typically.

vi. Spandrel Units: Same as typical IGU. Insulation will be held 1” from the back side of glass behind a painted aluminum piece of sheet metal.

II. MECHANICAL SYSTEM

a. General guidelines:

   i. All systems shall be designed to meet the Wichita State University and the State of Kansas design guidelines and regulations.

   ii. Mechanical systems shall be designed to the most current adopted Mechanical and Energy codes at the beginning of design

b. Chilled Water Systems

   i. Chilled water:

   ii. School of Business chilled water plant basis of design:

   iii. Condenser Water Specialties shall not be limited to:
      1. Anti-Vibration switches.
      2. Electric basin heaters
      3. Ladder(s) and safety railing.
      4. Stainless steel fitted suction diffusers and triple duty valves for pump accessories.
      5. Chemical treatment system
      6. Piping shall be Schedule 40 steel with grooved fittings. Exterior piping shall be fiberglass.

   c. Heating Systems

   i. Building heating will be provided by a heating water system to serve air unit, VAV box and unit heater coils. The heating water plant will consist of:
1. 2 – 4000 MBH U-tube steam-to-water converters (100% backup)
2. 3 - (50% load and 1 backup) end suction, back pullout variable speed centrifugal pumps with variable frequency drive (VFD) control.
3. A 30° (min.) heating water temperature differential will be utilized to minimize pumping energy and associated piping sizes.

ii. Heating water specialties will not be limited to:
1. Air/dirt separator in the suction piping to the heating water pumps.
2. Bladder type expansion tank.
3. Auto quick and auto fill assembly for make-up water with water meter for monitoring water usage.
4. Stainless steel fitted suction diffusers and triple duty valves for pump accessories.
5. Pot chemical feeder.
6. Magnetic flow meter to measure flow in conjunction with temperature sensors to monitor building heating BTUH and BTU usage.
7. Piping shall be Schedule 40 with threaded fittings for piping 2” and smaller and welded and flanged fittings for larger piping. Copper piping with brazed fittings may be used for piping 2” and smaller.

iii. Air Conditioning Systems
1. Design Conditions:
   a. Outdoor design conditions
      i. Summer 100°F db, 78°F wb
      ii. Winter -10°F db
   b. General indoor design conditions
      i. Summer 75°F db, 55%RH
      ii. Winter 70°F db, 30%RH
2. The current direction for air conditioning systems is to provide four (4) large VAV cooling only air handling units provide conditioning to the spaces within the tower. These can be located either at the in the building or roof penthouse. These units will be supplemented with two (2) large VAV dedicated outdoor air handling units with total energy recovery to provide ASHRAE 62.1 required ventilation rates to the occupied spaces and necessary building pressurization. These units can be co-located with several of the tower AHU’s. A separate VAV unit will be provided to serve the auditorium and its support spaces as the auditorium will likely operate outside of normal classroom hours and will require tighter sound and environmental conditions than the towers. This unit should be located close to the auditorium but not adjacent to it due to noise and vibration concerns. Two displacement ventilation AHU’s are being considered to serve the atrium since it is such a large volume and traditional AHU systems will likely be too large and inefficient to serve that type of space. These units will provide airflow at the floor level of the atrium and therefore the units should be located at the lower level of the building. All units will be blow-thru configuration with 2” min. thick double wall insulated housings with perforated inner lining. Access doors will be provided between each component and interior fluorescent or LED lighting in each section. Stainless steel drain pains will be provided at each cooling coil, energy recovery wheel and humidifier section.
3. Tower VAV Units – estimated 33,000 cfm each.
   a. Economizer section
   b. MERV 8 pre-filters and MERV 13 final filters in side access housing.
   c. 12 bladed airfoil single or fan wall plenum fans.
   d. Chilled water coil with intermediate drain pans and stainless steel frames.
   e. Airfoil mixed flow inline return/exhaust fans.
   f. Variable frequency drives VFD’s for supply and return/exhaust fan control.
   g. Single duct VAV boxes with 100% shut off for interior spaces.
   h. Single duct VAV boxes with hot water reheat coils for exterior exposures.

4. DOAS Units – estimated 15,000 cfm each.
   a. MERV 8 pre-filters and MERV 13 final filters in side access housing.
   b. 12 bladed airfoil single or fan wall plenum fans.
   c. Total energy recovery wheel with VFD control, purge and MERV 8 filters on inlet side of exhaust airstream
   d. Hot water preheat coil
   e. Chilled water coil with intermediate drain pans and stainless steel frames.
   f. Hot water preheat coil
   g. Airfoil mixed flow inline return/exhaust fans.
   h. Variable frequency drives VFD’s for supply and return/exhaust fan control.
   i. Single duct VAV boxes with CO2 space sensor control for high occupancy and variable occupancy spaces.
   j. Single duct constant volume boxes for low and steady occupancy spaces.

5. Atrium Units – estimated 18,750 cfm each.
   a. Economizer section.
   b. Air blenders.
   c. MERV 8 pre-filters and MERV 13 final filters in side access housing.
   d. Hot water preheat coil.
   e. 12 bladed airfoil single or fan wall plenum fans.
   f. Chilled water coil with intermediate drain pans and stainless steel frames. Face and bypass dampers will be located upstream of coil to bypass return air for reheat.
   g. Hot water heating coil.
   h. Airfoil mixed flow inline return/exhaust fans.
   i. Variable frequency drives VFD’s for supply and return/exhaust fan control.
   j. Low velocity displacement ventilation diffusers in floor with fin-tube radiation.

6. Auditorium Unit – estimated 14,000 cfm.
   a. VAV multi-zone unit
   b. 4” thick housing walls up to and including preheat coil section.
   c. Economizer section.
d. Air blenders.
e. MERV 8 pre-filters and MERV 13 final filters in side access housing.
f. Integral face and bypass steam preheat coil.
g. 12 bladed airfoil single or fan wall plenum fans.
h. Steam humidifier section for wood and other finishes if required.
i. Chilled water coil with intermediate drain pans and stainless steel frames.
j. Hot water heating coil.
k. Zone damper section.
l. Airfoil mixed flow inline return/exhaust fans.
m. Variable frequency drives VFD’s for supply and return/exhaust fan control.
n. Duct silencers as required.

7. Hot water finned tube radiation will be provided at exterior exposures with large expansions, especially tall, of glass.
8. Hot water cabinet unit heaters will be used at building entrances and enclosed stairwells.
9. Split system fan coil units will be utilized at 24 hr high cooling load spaces such as main IT closets, elevator equipment rooms and main electrical rooms with transformers and other heat producing equipment. Smaller IT closets and machine room-less elevators will be conditioned with localized exhaust.

iv. Exhaust Systems
   1. Toilet and other general exhaust will be utilized by the DOAS energy recovery units via mixed flow inline exhaust fans.
   2. Janitor’s closets, high capacity copy rooms and other spaces where chemicals will be used will be exhausted by dedicated exhaust systems per LEED requirements.

v. Duct Systems
   1. Ductwork will be G90 galvanized rectangular and spiral round/oval ductwork and will be constructed to the appropriate specified SMACNA pressurization classes.

vi. Insulation
   1. Duct Insulation
      a. All supply and outside air ductwork and plenums shall be insulated. Exhaust ductwork and plenums downstream of the DOAS energy recovery wheels shall be insulated per ASHRAE 90.1-2007 as a min.
      b. Ductwork shall not be lined except return air boots. The supply and return ductwork for the auditorium AHU will be lined if required for noise control.
   2. Piping & Equipment Insulation
      a. All chilled water, heating water, steam and condensate drain piping and equipment shall be insulated per ASHRAE 90.1-2013 as a min.

III. PLUMBING SYSTEM
   a. General
i. All systems shall be designed to meet the Wichita State University and the State of Kansas design guidelines and regulations.
ii. Plumbing systems shall be designed to the most current adopted Plumbing and Energy codes at the beginning of design
iii. Plumbing equipment selection will be coordinated with the approved bidders list.

b. Water Service
   i. A min. 8” combination fire/water service will be extended to serve the building.
   ii. A 4” min. water service with a 4” min. reduced pressure principal (RPZ) backflow preventer will be installed on the water service entrance to the building.
   iii. A triplex vertical turbine booster pump system with variable flow (VFD) control will be provided if required for pressure boost.
   iv. Bladder type expansion tank will be provided.
   v. Cold water service will be distributed to water softeners, domestic water heaters, mechanical and plumbing equipment, plumbing fixtures, wall hydrants and hose bibbs.
   vi. Backflow preventers will be provided at equipment connections, coffee makers and ice makers where required.

c. Water Softeners
   i. Progressive flow water softener system will be provided to serve hot water systems or both hot and cold water systems if required. It is anticipated that soft water will be required for hot water systems at a minimum.

d. Domestic Hot Water
   i. Domestic hot water will be provided by a packaged double wall instantaneous water heater system with Armstrong “The Brain” or equal electronic mixing valves. Circulating pump and domestic hot water circulating piping will be provided to maintain hot water in the piping.

e. Water Distribution Piping
   i. Distribution piping will be Type “L” hard drawing copper piping with soldered or brazed wrought copper fittings. Stainless steel main piping may be used if economically feasible.
   ii. Field pulled tees will not be acceptable.
   iii. Water hammer arrestors will be provided at plumbing fixtures or groups of fixtures to protect from hydraulic shock.

f. Sanitary, Waste and Vent System
   i. A 6” min. waste service will be required and will be extended 5 feet from the building.
   ii. Floor drains will be provided at mechanical and plumbing equipment, in public restrooms, showers and other areas where water drainage is required. All floor drains will be provided with trap guards to prevent against backflow and sewer gas leakage.
   iii. Below grade piping will be cast iron no-hub piping.
   iv. Piping above grade will be cast iron hubless piping with heavy duty stainless steel couplings.
   v. Sump pumps will be provided in elevator pits (grease minder pumps for hydraulic elevators) where required and discharge piping will be galvanized steel with screwed fittings until connected to waste mains.

g. Storm Water System
   i. A 15” min. storm water service will be required and will be extended at one or multiple locations 5 feet from the building.
ii. Cast iron roof drains and emergency roof drains will be installed at low points of roofing.

iii. Below grade piping will be cast iron no-hub piping.

iv. Piping above grade will be cast iron hubless piping with heavy duty stainless steel couplings.

h. Plumbing Fixtures
   i. Water closets shall be vitreous china elongated bowl, siphon jet, 1.28 GPF wall mounted fixture with heavy duty carriers. Flushometers shall be sensor type with turbine water powered or solar powered. Certain fixtures shall be mounted at ADA height where noted on the drawings.

   ii. Urinals shall be vitreous china, 0.125 GPF (pint), wall hung type. Flushometers shall be sensor type with turbine water powered or solar powered. Certain fixtures shall be mounted at ADA height where noted on the drawings.

   iii. Public lavatories shall be either integral solid surface, vitreous china drop in or under mount or stainless steel as directed by the Architect. Faucets shall be sensor type with water turbine powered or solar powered with 10 second time out. Where noted as ADA fixtures with exposed supply and waste piping ADA compliant insulation kits shall be supplied. Private lavatories may be same as above or wall hung and may be supplied with manual wrist blade faucets.

   iv. Sinks will be drop in or under mount stainless steel type with gooseneck faucets and wrist blade handles. ADA sinks will have appropriate waste outlet location, sound deadening and insulation kits.

   v. Drinking fountains will be stainless steel bi-level ADA wall mount or recessed with integral cooler(s).

   vi. Janitor’s sinks will be 24”x24”x12” min. terrazzo with stainless steel cap and backsplash with service sink faucet with pail hook and vacuum breaker.

   vii. Wall hydrants shall be recessed non-freeze type with integral vacuum breaker.

   viii. Hose bibbs shall be provided in all mechanical rooms and public restrooms.

i. Piping & Equipment Insulation
   i. All cold water, domestic hot water and hot circulating piping, waste piping from drinking fountains and condensate drain discharge to waste risers or mains and horizontal downspout shall be insulated per ASHRAE 90.1-2013 as a min.

IV. Fire Protection
   a. General
      i. All systems shall be designed to meet the State of Kansas design guidelines and regulations.

      ii. Fire Protection systems shall be designed to the most current adopted NFPA 13 regulations.

      iii. Fire protection equipment selection will be coordinated with the approved bidders list.

   b. Fire Service
      i. Fire service shall be obtained from the 8” min. combination fire/water service mentioned above.

      ii. An 8” min. double check detector backflow preventer will be provided on the fire service entrance to the building.

      iii. A “Storz” or Siamese connection will be provided for fire department connection at location as directed by the Fire Marshall.

   c. Fire Pump
i. An electric driven fire pump with jockey pump and pump controller with integral emergency transfer switch will be provided if required to provide min. NFPA required 65 psi at the top of the standpipes.

ii. A pump bypass with flow meter/test assembly.

d. Standpipes

i. Standpipes will be installed in each main stair tower and elsewhere as required.

ii. Isolation valves with tamper switches shall be provided at the base of each standpipe.

iii. Fire valve connections will be provided at the intermediate stair landings.

iv. Roof manifolds will be provided as required.

v. Piping 2” and smaller will be Schedule 40 steel with screwed fittings. Piping 2-1/2” and larger will be either standard weight with screwed, roll grooved or welded fittings. Schedule 10 piping with roll grooved or welded fittings are also acceptable for piping 2-1/2” and larger.

e. Sprinkler System

i. The entire building will be protected with a quick response wet sprinkler system per NFPA 13 requirements.

ii. Sprinkler zone piping will be connected to the standpipe risers with valve tamper and flow switches.

iii. Piping 2” and smaller will be Schedule 40 steel with screwed fittings. Piping 2-1/2” and larger will be either standard weight with screwed, roll grooved or welded fittings. Schedule 10 piping with roll grooved or welded fittings are also acceptable for piping 2-1/2” and larger.

iv. Sprinklers

1. Lay-in accessible ceilings: Semi-recessed with satin chrome finish centered in 2x2 section of ceiling tiles. Concealed with white cover plates in areas as directed by Architect.

2. Hard or inaccessible finished ceilings: Concealed with cover plate color as directed by Architect. Locations shall be coordinated with light fixtures and other ceiling components as directed by Architect.

3. Exposed: Rough bronze upright

4. Wall mounted: Concealed with cover plate color as directed by Architect.

5. Special Applications: Extended coverage.

V. Building Automation Control System (Temperature Controls)

a. Control Systems

i. Building Automation Control System (BACS) will be Johnson Controls or Automated Logic web based BACnet open protocol DDC controls and will connect to the existing campus systems servers in the Computer Services Facility.

ii. Chillers, booster pump systems, emergency engine generator, electrical switchgear and other equipment with packaged controls or monitoring shall be provided with BACnet IP cards for direct communication with the BACS.

iii. Control valves shall pressure independent electronic valves unless noted otherwise.

iv. Airflow stations shall be provided at air handling units to provide fan tracking and to monitor outside air rates.

v. Low leakage airfoil bladed electronic control dampers will be used for all outside air and exhaust air dampers.
vi. VAV boxes will be pressure independent and will utilize packaged modular controls consisting of stand alone/networked DDC controller and damper operator.

vii. Flow meters will be provided on the domestic water service, cooling tower make-up water, mechanical systems make-up water, irrigation systems, chilled water, steam and heating water systems to monitor quantity and energy usage.

VI. Electrical

a. Overview
i. The electrical systems will be designed to provide adequate power, lighting and communication systems for the occupancy and use of the facility. Provision on the site medium voltage power distribution system will be made to serve a future planned central cooling plant and garage.

ii. An electrical coordination study will be required.

b. Basic Electrical Materials
i. Interior raceway systems will generally consist of metal boxes interconnected with Electric Metallic Tubing (EMT.) PVC Schedule 40 will be used for underground installations. Rigid galvanized steel (RGS) conduit will be used for exposed exterior work where subject to damage or where installed in tunnels. PVC coated interlocked armored cable will be used for the 15 kV feeders in the tunnel. The minimum conduit size for power wiring will be 3/4”.

ii. Conductors will be copper. Insulation will be THHN or THWN rated for 75°C; however, design will be based on 60°C or 75°C ratings as required by the NEC. Four wire feeders where neutral is considered a current carrying conductor will have an additional 80% derating. A maximum of six current-carrying conductors, using code designated derating factors, will be installed in any raceway. All conductors including neutrals and grounding conductors will be color coded.

iii. Wiring devices will be specification grade, 20 ampere, minimum, color as selected. Device plates will be stainless steel in office and service areas and smooth finish plastic to match the color of device in special areas. Back-to-back installation of devices will not be allowed.

c. Electrical Service
i. The building will be provided with a new 2,500 kVA 12,470 V primary, 480 V, three phase, four wire secondary liquid filled, exterior, pad-mounted transformer with copper windings, live front terminations, drywell fuses, and spare fuses. The transformer will be fed from the new switch provided for the School of Business. Anticipated loads are listed below.

<table>
<thead>
<tr>
<th>Use</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Loads, 5 W/ft²</td>
<td>1000 kW</td>
</tr>
<tr>
<td>Mechanical Loads</td>
<td>1400 kW</td>
</tr>
<tr>
<td>Total</td>
<td>2400 kW</td>
</tr>
</tbody>
</table>

ii. The 460 volt switchgear will have a drawout main breaker with full-feature electronic trip and ground fault protection. A microprocessor based Owner metering package will be provided for kWh, kW, kVAR, ampere and voltage readouts.

iii. Switchgear busing will be copper braced for 100,000 AIC. A fully rated horizontal bus will be provided for all sections. Branch overcurrent devices will be drawout circuit breakers with full feature electronic trip. All components will be fully rated for the available AIC.
d. Emergency Power
   i. Emergency power will be supplied by one diesel fueled engine generator located in an exterior sound attenuated enclosure. The engine generator will be complete with sub base fuel tank, radiator, and critical grade silencer. Fuel storage will provide 24 hours runtime at 100% rated load. A remote annunciator will be provided and generator will be connected the building automation system.
   ii. The required emergency engine generator equipment will be rated at 600 kW, 480Y/277 V, three phase, four wire. Fuel storage will be 1,200 gallons. The generator will be connected as a separately derived system.
   iii. Code required emergency loads including exit lighting and life safety systems will be served from a dedicated life safety branch of the emergency power system. This branch will include a dedicated automatic transfer switch and the necessary distribution equipment.
   iv. Separate transfer switches and distribution equipment will be provided to serve elevators, atrium smoke evacuation fans, standby security and communication systems, and the fire pump.
   v. All transfer switches will be monitored by the BMS system.
   vi. Transfer switches over 400 A will have maintenance bypass capabilities.
   vii. All elevators will be connected to the emergency electrical system.
       However, the generator will be sized to only allow one elevator to operate at one time in an emergency situation.

e. Grounding
   i. The campus utility service transformer secondary will not be grounded at the transformer and no ground wire will be run to the building electrical service with the secondary conductors. The transformer case will be bonded to the tunnel grounding system. Building electrical service will be grounded at the building, and the neutral-to-ground bond will be made at the service entrance switchgear.
   ii. The electrical power distribution system will be provided with a “single-point ground system”. The ground bus at the main service equipment will be connected to the water service, a concrete encased electrode, a deep driven ground rod, and building steel.
   iii. An electrical grounding riser will be provided, with a grounding busbar located in each electrical room.
   iv. A grounding counterpoise will be provided.
   v. All transformers will have the neutral of the derived system bonded to an electrical grounding riser, building steel, the nearest metal water pipe, and the transformer case. An insulated ground conductor will run back to supply equipment in same raceway as the phase conductors.
   vi. An insulated equipment grounding conductor will be installed with feeders and branch circuits. Metal raceways, boxes equipment, receptacles and light fixtures will be bonded to the equipment grounding system.

f. Power Distribution
   i. Distribution panelboards or switchboards will be provided to serve mechanical equipment and other concentrated loads. Lighting panelboards will be provided as required to serve other building loads. HVAC equipment, elevators, and Owner equipment will be supplied with 480 or 208 volt, 3 phase power or as needed. Lighting will be served from 277 volt branch circuits.
ii. Distribution panels and switchboards will be circuit breaker or fusible type as needed. Components will be fully rated to provide the required AIC. Busing will be copper.

iii. Lighting panels will be commercial type with bolt-on circuit breakers. Busing will be copper. Components will be fully rated to provide the required AIC. Each panel will have a hinged door with a master keyed flush tumbler latch. Half size breakers and load centers will not be used. Lighting panel overcurrent protection will be limited to 225 amperes. A minimum of one 20 ampere 120 volt circuit will be provided for each 150 square feet of building area for general power requirements.

iv. A dedicated power panelboard will be provided in each Telecommunications room.

v. Transformers will be provided to convert 480 volt power to 208Y/120 volts for lighting, receptacle and equipment needs. Transformers will be K-factor (K=13) dry type rated for 115°C rise. Windings will be copper. Transformers rated 30 kVA or smaller may be wall or floor mounted. Transformers rated 75 kVA or greater will be floor mounted. Transformers will be located to keep maximum feeder length from the transformer to the 120 volt panels from exceeding 10 feet. Transformers will be sized to provide a minimum of 5 watts per square foot of building area.

vi. Neutral conductors serving branch circuit panelboards will be sized for 200% of the branch panel feeder ampacity rating.

vii. Disconnect switches will be heavy duty type. Exterior switches will be rain-tight. Disconnect switches for packaged HVAC equipment will be fusible.

viii. Surge Protection Devices will be provided at the main service entrance and at branch panels throughout the building, which serve computers, sensitive electronic equipment, and LED lighting.

ix. Conduit and wire will be provided for major power distribution runs. Feeders will have copper conductors.

tax. Electrical distribution equipment will be named according to the University’s preferred naming convention.

g. Wiring Methods

i. Feeders will consist of conductors installed in raceways. Conduit fill will not exceed 40% based on the dimensions of THHN.

ii. Each branch circuit will be run with a dedicated neutral conductor. No multi-wire branch circuits will be used.

h. Wiring Devices

i. Provision for connection to furniture in classrooms and auditorium will be provided. Power and USB outlets will be furnished as part of furniture.

ii. Multi-service floor boxes containing power, data, and A/V connections will be provided at all classroom podiums and conference room tables.

iii. Floor boxes with receptacles and some with data connections will be provided in open areas, computer tables, and collaboration tables.

i. Lighting

i. Fixture Types

a. General lighting throughout the building will consist of recessed direct or direct/indirect, or suspended direct/indirect LED source fixtures.

b. Down lights for general purpose use will be LED source recessed fixtures with low brightness reflector.
c. Environmental lighting such as wall-washing, wall-grazing, and indirect wall-mounted fixtures will be LED source fixtures with electronic dimming drivers.

d. Cove-lighting fixtures will be linear fixtures with LED sources, or flexible LED strip fixtures.

e. Accent and display lighting will consist of aimable, directional, recessed or surface- or track-mounted fixtures for LED sources.

f. Auditorium lighting will be LED source fixtures dimmable to 1% and controllable by architectural dimming system.

g. Lighting for storage spaces and utility spaces with finished ceilings will be 2x2 recessed integral LED source fixtures.

h. Lighting for support spaces such as utility rooms with unfinished ceilings, basement, and mechanical/electrical spaces will be surface mounted or suspended LED fixtures.

ii. Exit lights will be LED type. Egress lighting will be provided by selected fixtures connected to the life safety emergency generator system.

iii. Exterior lighting for egress paths will be integral LED source fixtures mounted on the building.

iv. Exterior site lighting will be LED source fixtures in accordance with campus standards.

v. Ground-mounted or in-grade building lighting will be LED source fixtures.

vi. General illumination levels for major areas are given as maintained average illuminance on a horizontal plane 2’ 6” above the floor, and will be as follows:

<table>
<thead>
<tr>
<th>Area</th>
<th>Illuminance (fc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classrooms</td>
<td>40</td>
</tr>
<tr>
<td>Offices</td>
<td>30</td>
</tr>
<tr>
<td>Corridors</td>
<td>10</td>
</tr>
<tr>
<td>Entrances-Day</td>
<td>10</td>
</tr>
<tr>
<td>Entrances-Night</td>
<td>5</td>
</tr>
<tr>
<td>Storage Areas</td>
<td>10</td>
</tr>
<tr>
<td>Café-General</td>
<td>10</td>
</tr>
<tr>
<td>Restrooms</td>
<td>5</td>
</tr>
<tr>
<td>Mechanical/Electrical Rooms</td>
<td>20</td>
</tr>
<tr>
<td>Electrical &amp; Janitor's Closets</td>
<td>10</td>
</tr>
</tbody>
</table>

Task Illumination Levels will be met by installed lighting at static areas or portable task lights, or by lighting zones/scenes.

<table>
<thead>
<tr>
<th>Area</th>
<th>Illuminance (fc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading/Study/Work Desk</td>
<td>50</td>
</tr>
<tr>
<td>Copy/Print</td>
<td>30</td>
</tr>
<tr>
<td>Classroom Whiteboards</td>
<td>30</td>
</tr>
<tr>
<td>(on vertical surface)</td>
<td></td>
</tr>
<tr>
<td>Food Preparation</td>
<td>50</td>
</tr>
<tr>
<td>Classroom-A/V Viewing</td>
<td>5</td>
</tr>
<tr>
<td>Classroom-Learning/Teaching w/ Screens</td>
<td>15</td>
</tr>
</tbody>
</table>

j. Lighting Controls

i. A building lighting control system will offer a single point of control of general building areas and circulation spaces via a graphical interface. Centralized control will not extend to all enclosed areas.

ii. Local basic control systems will consist of switches and occupancy sensors.

iii. Local enhanced control systems will be programmable and capable of controlling fixture responses to inputs such as daylight and occupancy sensors, and manual control devices.
iv. Occupancy sensors will be used in all enclosed spaces excluding mechanical/electrical rooms, and may be installed in circulation spaces where appropriate. Control responses to occupancy sensor, such as automatic-on, automatic-off, and delay settings will be programmable from a local control system.

v. Zones of control will be assigned as appropriate for space use. Control system will be capable of overlaying control schemes for each zone depending on use, and will allow for an automatic return to default scheme after each use. Schemes include time-of-day light level adjustment, dimming response to available daylight, recall of preset scenes, and custom user control. User control in enclosed, occupied spaces will at a minimum consist of the ability to switch zones of fixtures in the room or switch fixtures to multiple levels.

vi. Control in multi-user spaces will include personal control of task lighting.

vii. Installed task lighting will be provided with automatic shutoff.

viii. Architectural dimming system supporting dimming to 1% or less will be provided in the Auditorium.

ix. Rooms requiring advanced multi-scene control (classrooms, conference rooms, learning labs, and special use areas as appropriate) will be provided with a graphical control panel capable of interfacing with other audio/visual/technology systems and will support programming and recall of preset scenes as well as custom user control.

x. Rooms requiring simple single-zone or multi-zone control will be provided with manual switches and automatic shutoff devices.

xi. Rooms requiring enhanced single-zone or simple multi-zone control will be provided with programmable multi-button control station that supports scene recall and custom user control of scenes and dimming.

xii. Required egress lighting will be controlled along with non-emergency lighting through the use of emergency shunt relays/dimming controllers or through a control system listed for use in emergency circuits.

xiii. Lighting zones in circulation spaces will be controlled by lighting contactors or dimming/switching relay modules as appropriate. Contactors/relay modules will be controlled by the building lighting control system.

V. Telecommunications

a. Overview

i. The Telecommunications System design will provide infrastructure for Data, Voice, and CATV information transport service to and within the building.

b. Telecommunications Materials

c. Telecommunications Service

d. Telecommunications (Data, Voice and CATV) service will be delivered to the building via two (2) redundant fiber optic 24-strand single-mode cables with diverse pathways into the building, for distance-learning compatible redundancy.

i. One of the fiber optic cables will route from .
ii. The second fiber optic cable be routed in a to-be-determined redundant pathway.
iii. Each cable pathway to the building will consist of two (2) new 4” conduits.

e. Telecommunications Spaces
   i. The Equipment Room and Entrance Facility (ER and EF) will be combined in one room, hereinafter referred to as Equipment Room (ER). Building service cables will terminate in the ER, as well as work area outlet cables from the adjacent area.
   
ii. Telecommunications Rooms (TRs) will be located such that work area outlets are served by either a TR or the ER with a maximum cable length of 295-feet, including vertical elevation changes and service slack storage of cables.
   
iii. Equipment racks with vertical and horizontal management panels will be provided per WSU Standards.
   
iv. Wire Basket type Cable Tray will be provided for overhead cable support within Telecommunications Spaces per WSU Standards.
   
v. STI EZ-Path Firestop Sleeves shall be provided for vertical and horizontal cable penetrations into Telecommunications Spaces.

f. Telecommunications Backbone
   i. The Data backbone will consist of one (1) 12-strand 50-micron Type OM3 multimode and one (1) 12-strand single-mode fiber optic cable from the ER to each Telecommunications Room.
   
ii. The Analog Voice backbone will be ........
   
iii. CATV backbone will consist of one (1) RG11 coaxial cable from the ER to each TR. CATV amplifiers, splitters, taps, and line equalizers will be provided as necessary.

g. Telecommunications Grounding
   i. A Telecommunications Main Grounding Busbar (TMGB) will be provided in the ER, and will be bonded as required per WSU and J-STD-607 standards.
   
ii. A Telecommunications Grounding Busbar (TGB) will be provided in each TR, and will be bonded as required per WSU and J-STD-607 standards.

h. Horizontal Cabling System
   i. Category 6A cable and connectivity hardware will be utilized for all Data, VoIP, and Analog Voice outlet connections.
   
ii. The standard work area outlet (faceplate) will receive two (2) Category 6A cables and jacks.
   
iii. Data outlets will be provided in the following areas:
   1. All flexible spaces
   2. Interview rooms
   3. Private student studies
   4. Open student studies
   5. Lounges
   6. Food Service
   7. Storage rooms
   
iv. Data/VoIP outlets will be provided in the following areas:
   1. Private faculty / staff offices
   2. Shared faculty / staff offices
   3. Staff / student workstations

v. Data/VoIP and Analog Voice outlets will be provided in the following areas:
1. Conference Rooms (including table top access to Data, and ceiling-mount Data for projector)
2. Reception / Waiting areas
3. Resource Rooms

vi. WiFi Access Point (AP) outlet locations will be estimated by W.L. Cassell and confirmed / adjusted by WSU as required. WiFi outlets will receive (1) Category 6A cable and jack terminated above accessible ceilings in metal backbox and stainless-steel faceplate. Power, conduit and fiber optic cable shall be delivered to light poles in courtyard areas adjacent to building for connection to WiFi APs.

vii. Category 6A cables will terminate on Category 6A patch panels, rack-mounted in TRs and in ER. Cables will home-run from outlets to the nearest TR or ER on the same floor as the outlets, unless otherwise noted on the drawings.

viii. Category 6A patch cords shall be provided for outlets (except at WiFi APs) and for patch panel ports.

ix. TV outlets will receive one (1) RG6 coaxial cable and connector, and one (1) Category 6A cable and jack. RG6 cables will home-run from the nearest TR or ER in similar fashion to Category 6A cables.

x. Cable tray will be provided above accessible corridor ceilings to route cables from TRs and ER to outlet areas. Cable tray shall be wire basket type.

xi. Cables will be supported via j-hooks above accessible ceilings, where they route from cable trays to conduit stub-ups above work area outlets and where there are no more than fifty (50) cables routing together. J-hooks shall be sized to allow for minimum 25% spare capacity.

xii. STI EZ-Path sleeves shall be provided where cable pathways cross fire and/or smoke rated walls.

i. Security

ii. A Category 6A cable and jack shall be provided to each camera location.

iii. Camera locations to be determined with input from WSU.

SECTION 3:
DESIGN SOLUTIONS