

Guide for Architects and Engineers

Eastern Illinois University

Charleston, Illinois

Facilities Planning and Management

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I. INTRODUCTION

1. REVISIONS

1. The terms Building Standards, Campus Standards, and A/E Guide refer to the same document. The Building Standards are periodically reviewed & updated by the Design & Construction division of Facilities Planning & Management. Design professionals should confirm with the FPM Project Manager that they have the most current issue before commencing any project.
2. Revision date of this guide shall be located in the footer area, identifying the month, day, and year the guide was revised and issued.
3. Revisions since the last issuance of the guide shall be identified by *italics*.

2. PURPOSE

1. This manual is intended to provide an overview and to serve as a guide to architects, engineers and other consultants providing professional services for all new construction, remodeling, rehabilitation and maintenance projects at Eastern Illinois University. The term's architect, engineer, or A/E as used in this document all refer to the design professional contracted with EIU for a specific project.
2. The contents of this manual will acquaint all firms with certain basic requirements that will pertain to all projects. It is recognized that some modifications may be necessary to satisfy the conditions of certain projects. If deviations are necessary, please contact Facilities Planning and Management in writing for clarification and/or modification. Direct the inquiry to the assigned project manager.
3. These standards are not intended to cover all details of planning, design, specifications and construction. They are not to be used in lieu of A/E Specifications and do not relieve the A/E of responsibility for all aspects of project design as set forth in the Professional Service Agreement.

3. OBJECTIVES

1. The design and construction of all projects for the Eastern Illinois University will normally be guided by the following objectives:
 1. Fulfilling the needs of the user department.
 2. Design excellence.
 3. Compliance with University Campus Planning Policies.
 4. Economic balance, commensurate with available funds and design objectives, between initial construction cost, building permanence and operation-maintenance costs.
 5. Compliance with applicable codes and laws, including those pertaining to disabled and the requirements of participating government agencies.

4. FORMAT

1. The *specification sections of this* document have been organized following the CSI format, *Section Number and Title only* . Since the Building Standards provide instructions and design criteria as well as specification guidelines, an additional section, “Planning Requirements,” is included.

5. UNIVERSAL APPLICATION

1. The Architect/Engineer and University personnel engaged in the planning and design process should be as conversant with the provisions and instructions of the Planning Requirements sections, Divisions 0 and Division 1, as with the specifics of Divisions 2 through 16. These general requirements apply, when modified appropriately, to all University construction projects.

6. RELATED DOCUMENTS

1. Design professionals should be familiar with FPM Goals and Objectives and CAD Guidelines for Architects and Engineers. They are available on the web at <http://www.eiu.edu/fpm>. *If the Guide cannot be located, contact Facilities Planning and Management, Eastern Illinois University, Charleston, IL. 61920, phone (217) 581-3520.*

7. DEVIATIONS OR VARIANCES

1. Proposals for deviations or variances from these Building Standards must be submitted in writing to the University’s assigned Project Manager. The Project Manager shall see that

approval (or rejection) is obtained from the appropriate University offices or departments.

8. CONFLICTS AND ERRORS

1. Conflicts, errors, and recommended changes or additions should be reported to the University assigned Project Manager. If the conflict or error is not in conjunction with a particular project it should be reported to the Manager of Design & Construction, Facilities Planning and Management, for appropriate action.

9. AVAILABILITY

1. The Guide for Architects and Engineers may be found on the Internet at the following web site: *<http://www.eiu.edu/fpm>*. *If the Guide cannot be located, contact Facilities Planning and Management, Eastern Illinois University, Charleston, IL. 61920, phone (217) 581-3520.*

II. ADMINISTRATION

Eastern Illinois University, chartered in 1895 is a public corporation with a campus located in Charleston, Illinois. Within the limits of authority fixed by the State Constitution and other applicable laws, the **Board of Trustees of Eastern Illinois University** exercises jurisdiction on all matters except for those which it has delegated authority to the President, other officers, or bodies of Eastern Illinois University. The President of Eastern Illinois University is the chief executive officer and is responsible for the enforcement of the rules and regulations of the University.

1. ORGANIZATIONAL UNITS OF THE UNIVERSITY

The following paragraphs identify the basic responsibilities of each administrative unit involved in the planning and construction of all capital improvement projects. More specific and detailed responsibilities may be assigned if the need arises.

1. FACILITIES PLANNING AND MANAGEMENT

Facilities Planning and Management is responsible for the coordination of the development of all capital improvement program statements and participation in the review of the A/E's recommendations for the University's program requirements. The Director reports to the Vice President for Business Affairs.

1. DESIGN AND CONSTRUCTION DIVISION

The Design and Construction Division is responsible for the coordination and management of all construction on the campus. This division serves as the liaison between the design teams and all campus units. The Manager reports to the Director of Facilities Planning and Management.

2. OPERATION AND MAINTENANCE DIVISION

The Operation and Maintenance Division is responsible for the day to day operation of all completed capital improvement projects on campus. These responsibilities include the operation of all plumbing systems, electrical systems, interior finishes, cleaning, and maintaining landscaping and site amenities. O&M will review proposed plans and specifications relative to satisfying the University's long-term needs for flexibility, building systems performance, and life cycle cost effectiveness. The Manager reports to the Director of Facilities Planning and Management.

2. ACADEMIC OR ADMINISTRATIVE DEPARTMENT

The users of capital improvement projects authorized for the University are the academic and administrative departments, offices, schools, colleges, and auxiliary support units (hereinafter referred to as departments). In association with the fulfillment of the University's vision of instruction, research, and public service; each capital improvement project is designed to serve, compliment, and enhance the objectives of the department. Departmental representatives participate in the interview process for A/E's as well as the subsequent planning activities relating to defining the specifics of the program requirements for the A/E's employed for the project.

3. ENVIRONMENTAL HEALTH AND SAFETY OFFICE

The Environmental Health and Safety Office provides advice and consultation in matters relating to the health and safety for faculty, staff, and students. The office participates in the review of design and construction documents. The Safety Officer reports to the Vice President for Business Affairs.

4. SUPPORT SERVICES

The Support Services Division is responsible for, among others, cleaning of building, property management, and space management. Support Services will review proposed plans and specifications relative to ease of cleaning floors, walls, and ceilings, along with adequate storage space for cleaning supplies and equipment. The Associate Director of Support Services reports to the Director of Facilities Planning and Management.

5. TELECOMMUNICATIONS

The Office of Telecommunications operates and maintains all telecommunications facilities on the campus. The office is responsible for the development and maintenance of standards for project telecommunications equipment and wiring, the review of the proposed installation of the in-building telecommunications distribution facilities for all capital improvement projects, and the appropriate extensions of the campus telecommunications distribution network serving such facilities. The office participates in the review of design and construction documents.

6. INFORMATION TECHNOLOGY SERVICES

The office of Information Technology Services operates and maintains all computer networks on campus. The office is responsible for the development and maintenance of standards for project networks and the appropriate extensions of the campus computer distribution network serving such facilities. The office participates in the review of design and construction documents.

7. MEDIA SERVICES

The office of Media Services is responsible for the technical maintenance, engineering practices, and operational aspects of the sound systems, production intercom systems, RF TV distribution systems, multi-media systems and portable audiovisual equipment on campus. The office provides information on electrical needs for the portable and installed equipment and systems. The office participates in the review of design and construction documents. The Department Head reports to the Dean of the Library.

8. PRESIDENT / BOARD OF TRUSTEES

The **President** and/or **Board of Trustees of Eastern Illinois University** have approval authority for all construction projects to include A/E selection, design approval, and construction contracts.

2. CAPITAL DEVELOPMENT BOARD (CDB)

Many of the capital improvement projects authorized for the University are financed by Capital Development Board bond funds. Accordingly, Public Act 77-1995 (the Capital Development Board Act) which created the Capital Development Board, defines its power and duties in connection with such appropriations.

1. DUTIES OF THE CAPITAL DEVELOPMENT BOARD

The responsibilities of the Capital Development Board, as it pertains to a typical capital improvement project, are as follows:

- 1.** Section 4.01 - To build or otherwise provide hospital, housing, penitentiary, administrative, recreational, educational, laboratory, parking, environmental equipment, and other capital improvements for use by the State of Illinois.
- 2.** Section 4.02 - To conduct continuous studies into the costs of building or otherwise providing the facilities described in Section 4.01.

3. Section 4.03 - To conduct research on improvements in choice and use of materials and in construction methods for reducing construction, operating, and maintenance costs of the facilities described in Section 4.01.

2. RELATIONSHIP OF THE CAPITAL DEVELOPMENT BOARD WITH THE STATE UNIVERSITIES

Section 12 of the enabling legislation provides that “nothing in this Act shall be construed to include the power to abrogate those powers vested in the Board of Trustees of the University of Illinois, (and other college and junior college boards), hereinafter referred to as ‘Governing Boards’. In the exercise of the powers conferred by law upon the Board and in the exercise of the powers vested in such Governing Boards, it is hereby provided that (a) the Board and any such Governing Board may contract with each other and other parties as to the design and construction of any project to be constructed for or upon the property of such Governing Board or any institution under its jurisdiction; (b) in connection with any such project, compliance with the provisions of the Illinois Purchasing Act by either the Board or such Governing Board shall be deemed to be compliance by the other; (c) funds appropriated to any such Governing Board may be expended for any project constructed by the Board for such Governing Board; (d) in connection with any such project the A/E’s retained for the project and the plans and specifications for the project must be approved by both the Governing Board and the Board before undertaking either design or construction of the project, as the case may be.”

3. LIAISON BETWEEN EIU AND CDB

Facilities Planning and Management and/or its delegates are responsible for providing the liaison between University (campus) units and the Capital Development Board.

3. UNIT INTERACTION ON CAPITAL IMPROVEMENTS

The above mentioned organizational units interact to administer, review, and/or influence capital improvement projects at the various stages of programming, design, and construction. Exhibits II-1 and II-2 at the end of this section illustrate the general responsibilities of each unit.

4. WORKING RELATIONSHIP

1. GENERAL

Throughout this Manual wherever the term Architect is used in referring to a professional engaged by the University for a particular project, the term shall be equally applicable to an Engineer or other specialized consultant similarly retained by the University. The AGREEMENT BETWEEN OWNER AND ARCHITECT established the basic terms and conditions which exist between the Owner and the A/E.

2. OWNER'S REPRESENTATIVE

The Owner is the Board of Trustees of Eastern Illinois University, but for all operational procedures, the A/E will work with the appropriate University office that is designated in the Agreement Between Owner and Architect as the Owner's Representative. For most projects, the Owner's Representative will be the Director, Facilities Planning and Management or his designated representative. All communications from the A/E to the University shall be directed to the Owner's Representative or his designee.

3. A/E's REPRESENTATIVE

The A/E shall designate one principal of the firm as the A/E's Representative, who will represent his office throughout all phases of the Project, and to whom all communications pertaining to the Project shall be addressed. Any change in the A/E's Representative during the life of the "Agreement Between Owner and Architect" shall be made only after the written request by the A/E and written concurrence of the Owner's Representative.

4. ADVISORY COMMITTEE

For most projects, a Planning Committee is formed. This committee is usually chaired by the Using Department's Representative and composed of additional representatives of the using department(s), Facilities Planning and Management, and other administrative offices as appropriate. The A/E will meet with a sub-committee, typically the Facilities Planning and Management delegates, at appropriate times, during the planning phases of the Project in order to confirm that the design is developing in accord with the requirements of the university.

UNIT INTERACTION MATRIX
CDB FINANCED PROJECTS

| <u>PARTICIPATING OFFICES OR GROUPS</u> A - Approval Authority X - Administrative Responsibility O - Participation | A/E Selection | Program Statement | Design Review and Approval | Contract Document Review | Bidding | Contract Award | Construction Phase | Interiors Design |
|---|---------------|-------------------|----------------------------|--------------------------|---------|----------------|--------------------|------------------|
| Capital Development Board Administration | O | - | X | X | X | X | X | X |
| FP&M - Planning and Construction | X | X | X | X | O | X | X | X |
| FP&M - Operation and Maintenance | - | O | O | - | - | - | - | O |
| QBS Committee | O | - | - | - | - | - | - | - |
| Executive Committee | A | A | A | A | - | A | - | A |
| Academic/Administrative Advisory Committee | - | O | O | O | - | - | - | - |
| Movable Equipment Committee | - | - | - | - | - | - | - | O |
| Environmental Health & Safety Office | - | O | O | O | - | - | O | O |
| Telecommunications | - | O | O | - | - | - | - | - |
| Computer Services | - | O | O | - | - | - | - | - |
| President/Board of Trustees | A | - | - | - | - | - | - | - |
| Capital Development Board/Board of Directors | A | - | - | - | - | A | - | - |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Capital Development Board-financed projects are administered by the Capital Development Board’s project managers. Facilities Planning & Management - Design and Construction’s administrative duties primarily involve the coordination of the University’s interests in the project.

Construction projects financed by the Capital development Board are normally coordinated for the University by Facilities Planning & Management - Design and Construction Division. When coordination responsibility for a specific project has been delegated to another unit by the FP&M - Planning and Construction Division, then its duties become identical to those shown for FP&M - Planning and Construction.

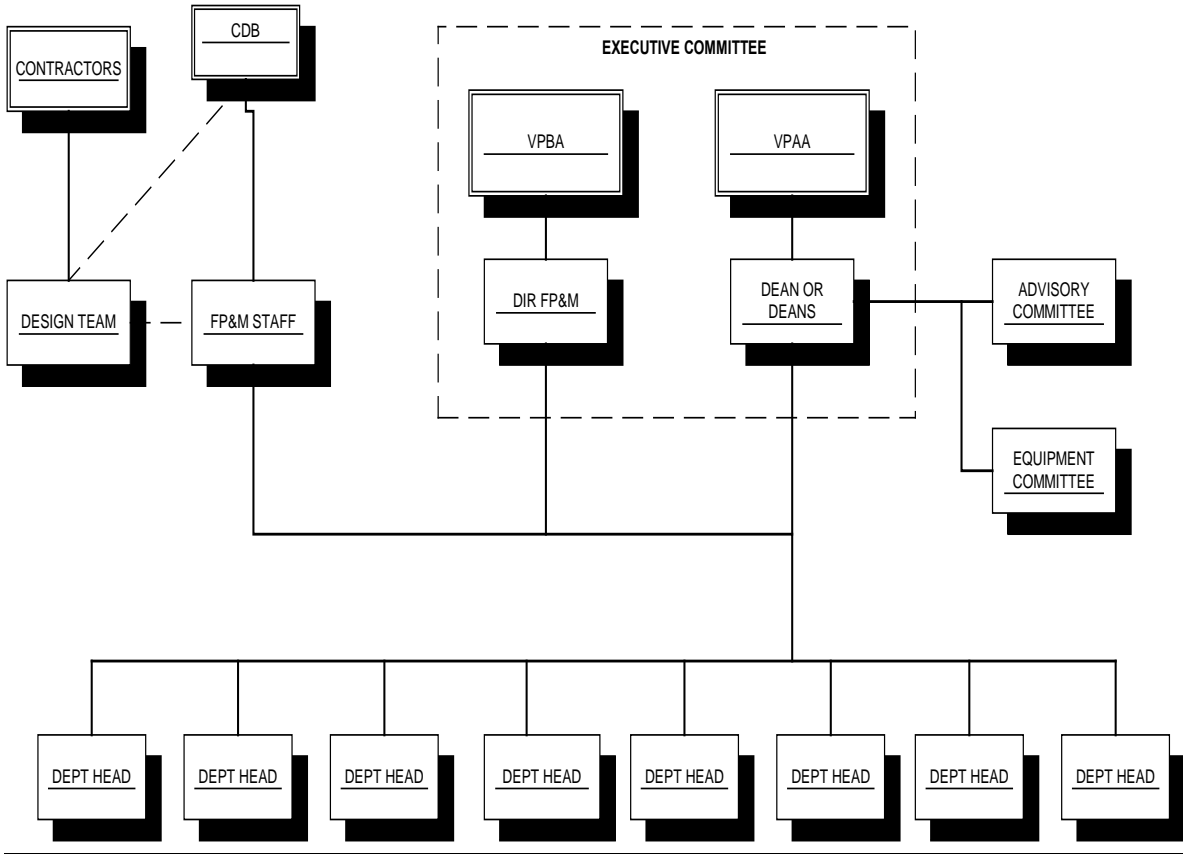
UNIT INTERACTION MATRIX

UNIVERSITY FINANCED PROJECTS

| <p><u>PARTICIPATING OFFICES OR GROUPS</u></p> <p>A - Approval Authority X - Administrative Responsibility O - Participation</p> | A/E Selection | Program Statement | Design Review and Approval | Contract Document Review | Bidding | Contract Award | Construction Phase | Interiors Design |
|--|---------------|-------------------|----------------------------|--------------------------|---------|----------------|--------------------|------------------|
| FP&M - Planning and Construction | X | X | X | X | X | X | X | X |
| FP&M - Operation and Maintenance | - | O | O | - | - | - | - | - |
| QBS Committee | O | - | - | - | - | - | - | - |
| Executive Committee | A | A | A | A | - | A | - | A |
| Academic/Administrative Department | O | O | O | O | - | - | - | O |
| Environmental Health & Safety Office | - | O | O | O | - | - | O | O |
| Telecommunications | - | O | O | - | - | - | - | - |
| Computer Services | - | O | O | - | - | - | - | - |
| President/Board of Trustees | A | - | - | - | - | A | - | - |
| | | | | | | | | |

Construction projects financed by the University are normally administered by the FP&M - Planning and Construction Division. When administrative and/or coordination responsibility for a specific project has been delegated to another unit by the Facilities Planning & Management office, its duties become identical to those shown for FP&M - Planning and Construction Division.

TYPICAL PROJECT ORGANIZATIONAL CHART



III. PLANNING REQUIREMENTS

SECTION 1 - CRITERIA FOR PROFESSIONAL SERVICES

GENERAL

1. The following outlines, in general terms, the professional services that the A/E is to provide at each phase of the project. In addition to the provisions listed below, specific requirements are included in the technical sections, Divisions 2 - 16.
2. A formal presentation of the design documents will be required at the end of each design phase (Schematic, Design Development, & Construction Documents). A REDICHECK checklist, or other approved plan check system shall be submitted to FP&M at each design phase presentation.
 1. Construction Documents shall be formally presented as determined during the design fee negotiations. Typical submittals are done for 50%, 75%, & 95% completion of the documents. The number of submittals will depend upon the complexity of the project.
 1. 95% documents shall be complete and ready to be released for bids. Minor corrections may be requested prior to release.
 2. Include on the cover sheets of the specifications and the drawings the EIU project number. Place the project number in the lower right hand corner of the drawing sheets. This number will be provided by FPM at the beginning of the project.
 2. All construction documents shall be bound into sets, in a systematic method. The method of binding is up to the A/E. Prong fasteners and brass wing fasteners are not desired by FPM.
3. Capital Development Board (CDB) Projects shall be submitted according to CDB's requirements.
4. In addition to the items listed, the A/E agreement should be reviewed for provisions that supplement or supersede those included herein.
5. A/E shall conduct all meeting, unless otherwise notified. A/E shall record minutes of all meetings and distribute to Project Manager and A/E Team. A/E shall provide weekly reports and submit to Project Manager

throughout the project beginning with the Program Scope through the construction closeout. Example of the Weekly Report form is found at the end of Section III.

6. All correspondence, reports, and project submittals from A/E shall include the EIU Project Number.
7. It shall be the A/E's responsibility to confirm the most recent revision of these Guidelines.
8. It shall be the A/E's responsibility to confirm the most recent revision of the front end documents referenced in Section I of this Guide.

DESIGN PHASE

1. PROGRAM STATEMENT

1. A specific Program Statement will govern each project. The Program will be prepared by the University or by the A/E when so directed in the Professional Service Agreement. In general, the Program Statement will include the following:
 1. Academic objective.
 2. Statistical data, including User population.
 3. Space and facility requirements, including itemized room listing, inter-relationships, and environmental requirements.
 4. Relationship to campus plan and adjacent physical elements.
 5. Site development requirements.
 6. Appearance requirements.
 7. Phase development, when applicable.
 8. Special requirements.
 9. Overall time schedule.
 10. Overall cost of construction.

2. PROGRAM ANALYSIS

1. The A/E will review the Program Statement provided by the owner to verify the project scope and budget. Items to be reviewed are:
 1. Project description covering the building, site and related features.
 2. Functional relationship study to illustrate important relationship and internal and external circulation.
 3. Area analysis listing each function with net assignable square footage summarized by major categories and totaled.

4. Projection of gross building area.
 5. Environmental requirements.
 6. Special conditions.
 7. A list of all codes, regulations and standards which may be applicable together with a list of review agencies.
 8. List of fixed equipment (movable equipment furnished by the University).
 9. Existing utilities in the area of the work to be performed.
 10. Project budget and schedule.
2. Review of existing plans or copies of existing building plans can be done at the Design & Construction Division of Facilities Planning & Management Office. When warranted, off-site copy of original drawings may be arranged.

3. SCHEMATIC DESIGN

1. Purpose: To develop plans, building systems and related documents, which will satisfy the requirements set forth in the Program Statement.
2. Requirements:
 1. Code analysis, including EPA and IHPA requirements.
 2. Proposed site development.
 3. Floor plans with room names.
 4. Elevations of principal facades.
 5. Preliminary structural foundation and framing systems.
 6. Preliminary HVAC systems including one line diagrams.
 7. Building systems narrative describing principal features of the building envelope, structural, mechanical and electrical system which illustrates, together with the drawings, the interrelationship of the systems. Provide a discussion outlining the basis of the design recommendations and supporting calculations.
 8. Utility selection and available capacity confirmed by EIU for provided utilities.
 9. Rendering or model (as set forth in A/E agreement).
 10. Outline specification utilizing CSI format.
 11. Life safety plans showing travel distances fire separation and fire protection provisions. Include an exit analysis for the intended uses.
 12. Revised project budget in sufficient detail to identify all cost centers. A quantity take-off estimate is preferred. Provide an estimate of alternates that may be considered.
 13. Revised project schedule.

14. REDICHECK checklist.

3. Submittal: A formal presentation of the schematic design will be presented to FP&M and the academic and/or administrative units involved in the project.

4. DESIGN DEVELOPMENT DOCUMENTS

1. Purpose: To develop the approved Schematic Design into a complete set of Design Development Documents.
 1. Site plan with proposed site development.
 2. Floor plans with numbers as approved by FP&M and NASF (program & actual).
 3. Transverse and longitudinal sections.
 4. Typical wall section(s).
 5. Furniture and equipment plans.
 6. Finish Schedules.
 7. All design loads included on structural plans.
 8. HVAC loads, equipment sized and utilities added to HVAC system drawings.
 9. Preliminary lighting and power layouts and proposed fixture cuts.
 10. Sketches of proposed distribution systems, complete with anticipated load calculations.
 11. Rendering or model (as set forth in A/E agreement).
 12. Outline specification utilizing CSI format.
 13. Life safety plans showing travel distances fire separation and fire protection provisions. Include an exit analysis for the intended uses.
 14. If the building will be occupied during renovation work describe the life safety features and temporary facilities that will be in place during the construction period.
 15. Revised project budget in sufficient detail to identify all cost centers. A quantity take-off estimate is preferred. Provide an estimate of alternates that may be considered.
 16. Revised project schedule.
 17. REDICHECK checklist.
2. Submittal: A formal presentation of the design development will be presented to FP&M and the academic and/or administrative units involved in the project.

5. CONSTRUCTION DOCUMENTS

1. Purpose: To develop the approved Design Development Documents into a complete set of plans and Project Manual for bidding.
 2. Requirements: Intermediate Review (50%) or as determined by the Project Manager.
 1. An “in progress” set of plans and complete draft of the Project Manual covering the work for all divisions to be bid.
 2. Plans & Specifications for all alternates to be bid.
 3. A detailed cost estimate for all work including alternates. A quantity take-off estimate may be required
 4. Complete set of all calculations for:
 1. Structural
 2. Mechanical
 3. Electrical
 1. Load calculations.
 2. Primary to secondary coordination curves for the entire building distribution system.
 3. Emergency power source, if required
 4. Secure all approvals from regulatory agencies.
 5. Revised project schedule.
 5. REDICHECK checklist.
3. Requirements: 95% Review or as determined by the Project Manager. 95% Review documents shall mean the plans and specifications are 100% complete and are being submitted to FPM for final review and approval before release to contractors for bidding purposes. At this submittal, minor revisions may be required before approval to release for bids.
 1. A complete set of plans and Project Manual covering the work for all divisions to be bid and including complete “front end” documents and Division 1.
 2. List of alternates to be bid.
 3. An updated cost estimate in complete detail for base bids and alternates.
 4. Statement that all review questions have been resolved and/or identification of outstanding issues.
 5. Complete set of final load calculations for:
 1. Structural
 2. Mechanical
 3. Electrical

1. Final load and breakdown tabulation for each panel showing connected loads.
 2. Final load and breakdown tabulation for each distribution panel and/or main distribution showing connected loads
 3. Emergency Power.
6. In accordance with the A/E agreement, prepare or assist the University in preparation of a power curtailment analysis, and/or EPA, IHPA (or other) required applications.
 7. REDICHECK checklist.

6. DESIGN REVIEWS

1. Purpose: To insure that University requirements as set forth in the Program Statement and related directives are understood and provided in the design documents.
2. Procedures:
 1. A formal presentation will be made by the A/E at the end of each of the above stages (intermediate & 95% complete for Construction Documents). The University staff will review the submissions following the presentation and will provide written comments within (14) days or as determined by the Project Manager.
 2. A review meeting will be scheduled with all interested parties present. Agreed changes, corrections and additions will be made by the A/E. The University may require a re-submission.
 3. On certain projects, additional intermediate reviews may be scheduled. The review process may be compressed or phases combined when the occasion warrants, however, the procedure will remain essentially the same.
 4. Both the A/E and University administrative units will be expected to allocate sufficient time for each review to avoid omissions and backtracking.

7. BIDDING PHASE

1. Requirements:
 1. Arrange for reproduction and distribution of the bidding documents.
 2. University shall place Advertisements for Bids on the State Procurement web page.

3. Prepare addenda for University review and distribute to all bidders.
4. Conduct the pre-bid conference and prepare minutes for University Project Manager.
5. Assist the University in the Bid Opening.
6. Evaluate all bid proposals and prepare a recommendation for award or such other action as may be appropriate.
7. Provide project manager with 3 sets of final bid documents (two (2) half size sets and one (1) full size set).

8. CONSTRUCTION PHASE

1. Project Administration:

1. Coordinate all University / Contractor communication.
2. Conduct, with the University, the pre-construction conference to explain procedures, including pay requests and contractor's and supplier's submissions. Prepare minutes for the University Project Manager.
3. Review shop drawings and equipment manufacturer's submissions for conformance with design intent. Review submissions as appropriate with users and other University personnel to insure conformance with the program requirements.
4. Prepare color and material selection charts for review with the University.
5. Prepare change orders and supporting documentation.
6. Conduct monthly meetings for review of pay applications.
7. Monitor project progress and prepare weekly status reports.

2. On - Site Observation

1. Provide on-site observation in accordance with the A/E agreement.
2. Maintain a log of all on-site observations and copy project manager.

3. Close Out Phase

1. Certify the completion of all contracts.
2. Assemble all guarantees, warranties and bonds.
3. Confirm that all extra materials are on hand and properly stored.
4. Assure that adequate instruction in proper operation and maintenance of systems is provided by the contractor or supplier.

5. Compile a “punch list” of all items remaining to be done as noted during the inspection of the work.
6. Prepare a “Substantial Completion” Certificate.
7. Issue a certificate of final acceptance upon completion of all “punch list” items.
8. Obtain all releases, waivers of lien and contractor’s final affidavit
9. Provide “Record Construction Drawings” based on information furnished by the Contractors.
10. Provide Operations & Maintenance Manuals.
11. Review & approve maintenance manual submitted by the contractor.
12. Review contractors system operating reports.

9. WARRANTY PHASE

1. Provide warranty phase services in accordance with Professional Services Agreement.

END OF SECTION

PROGRESS REPORT

EIU Project: Info furnished by EIU

EIU WO. # : Info furnished by EIU

EIU Project:
Manager: Info furnished by EIU

Date:

Prepared by:

-
1. GENERAL
 1. Overview of Project status
 2. Work Completed
 3. Upcoming milestones
 2. REQUIRED ACTION BY A/E
 3. REQUIRED ACTION BY EIU
 4. REQUIRED ACTION BY OTHERS
 5. SCHEDULED MEETINGS

Reports should be emailed to Project Manager each Wednesday before noon during the entire design and construction process. Reports may be faxed to Facilities Planning & Management (217) 581-5716. (Email is the preferred method of delivery.)

SECTION 2 - PROCEDURES FOR DRAWING REQUIREMENTS

GENERAL

1. The following outlines specific drawing requirements that the A/E is to provide. It is not intended to be a complete and inclusive list of drawings. In addition, see the requirements in Divisions 2-16 and the Standard Drawings incorporated therein for specific requirements.
2. Title/General
 1. Project Name-EIU Project Number-Date
 2. Eastern Illinois University, Charleston, Illinois
 3. Campus Map with project location
 4. List of Drawings
 5. Abbreviations
 6. Materials and Symbols Legend
 7. Approvals
 8. A/E - Names/Addresses/Telephone No./Fax No.
 9. Registration Stamp and Signature
3. It is required that plan drawings for all divisions be developed on a computer-aided drafting system compatible with the current AutoCAD version at the University. Reference separate University CADD Standards.
4. Half-Size reproductions:
 1. Lettering should not be less than 1/8" high on full size drawings unless demonstrated legibility when reproduced at half size.
 2. Hatching and other patterns should be selected to reproduce clearly at half-size.

SITE

1. Survey: A survey of the building site may be provided by the University or A/E may be asked to provide as reimbursable expense. Information regarding existing and proposed utilities should be obtained from the University's Utilities Division.
2. Site Plan: All existing and new structures, foundations, walks, ramps, curb cuts, paving materials, drives, streets, parking lots, fences, underground and overhead utilities and related structures, landscaping on and adjacent to the building site and site furnishings should be accurately shown on the site plan. Location and datum elevation of the nearest official benchmark should also be shown.

3. Existing and new contours and elevations should be shown.
4. If the same drawing is used for the work of all contractors, the division of work must be clearly indicated on the drawing.
5. Location of new buildings should be clearly established from known points.
6. Limit of contractor's work area, construction fencing, vehicle access to the site, and test boring data should be shown on the site plan.
7. Mechanical
 1. Show proposed alignment of underground utilities, drainage structures, mechanical equipment, fire hydrants and related work.
8. Electrical (including Telecommunications)
 1. Service entry and routing.
 2. Transformer location.
 3. Exterior lighting, circuiting and details.
 4. Emergency telephones.
 5. Emergency generators

ARCHITECTURAL

1. Floor plans - not less than 1/8" = 1'-0".
2. University room numbering system shown on plans.
3. Reflected ceiling plans to illustrate coordination of general, mechanical and electrical systems - not less than 1/8" = 1'-0".
4. Roof plans illustrating pitch, drainage, mechanical & electrical equipment and other features.
5. Overall sections to illustrate coordination of general, mechanical and electrical systems.
6. Typical room plans and/or elevations - not less than 1/4" = 1'-0".
7. Equipment layout plans for laboratories and other special purpose facilities - not less than 1/4" = 1'-0".
8. Life Safety plan illustrating:
 1. Exit Corridors
 2. Fire Resistive Ratings
 3. Travel Distances
 4. Fire Suppression System
 5. Fire Alarm/Smoke Detectors
 6. Exit Lighting
 7. Life-safety Control System
 8. Areas of Rescue Assistance

STRUCTURAL

1. Foundation plans - not less than 1/8" = 1'-0".
2. Floor plans - not less than 1/8" = 1'-0".
3. Roof plans - not less than 1/8" = 1'-0".
4. Design loads and code references for all conditions.
5. Design characteristics for all structural materials.
6. Foundation (footing, pier, caisson, grade beam) schedule and loads.
7. Column, beam, girder and truss schedules and loads.

MECHANICAL

1. Plans, elevations and sections to illustrate complete layout of mechanical systems and coordination with architectural, structural and electrical systems - not less than 1/8" = 1'-0".
2. Plans, elevations and sections of Mechanical Equipment Rooms showing all equipment, ducts, piping, temperature control equipment, location of access and service points.
3. Roof plan showing all roof mounted mechanical equipment and services.
4. Life safety plan (see Architectural-8 above).
5. Schedules of mechanical equipment capacities.

ELECTRICAL

1. Floor plans (reflected ceiling), not less than 1/8" = 1'-0", of lighting layout showing circuiting, switches, branch circuit panels, exit fixtures, emergency fixtures, wall fixtures, speakers (if any) in ceiling, fire alarm detectors, fire alarm break-glass stations, branch circuit wiring, and routing of all conduits that are to be installed in or above ceiling construction. Coordinate with architectural, structural and mechanical work.
2. In addition, show in a light form, all ceiling air diffusers for coordination of diffusers and fixtures.
3. Floor plans, not less than 1/8" = 1'-0", of power and circuiting showing:
 1. Convenience outlets.
 2. Special outlets.
 3. Branch circuit panels, distribution panels.
 4. Service entry, etc.
 5. Motor outlets, starters.

6. Motor control wiring, remote control station locations.
 7. Under floor duct.
 8. Feeder conduits and routing.
 9. All branch circuit wiring and routing of conduits to be installed in or below floor construction.
 10. Voice and Data circuits
4. Roof plan showing
 1. Lightning protection.
 2. All motors and equipment.
 5. Schematic diagrams showing
 1. Electrical distribution (one-line diagram).
 2. Fire alarm system / riser diagram.
 3. Public address system.
 4. Voice / Data
 5. Any special systems required by a particular project.
 6. Control wiring for all motors complete with control devices, etc.
 6. Large scale plans and details:
 1. 1/4" = 1'-0" scale plans or larger.
 2. Typical rooms (plans and/or elevations) showing dimensions of devices, fixtures, etc.
 3. Mechanical and electrical equipment rooms.
 4. Details of special supports, rough-ins, etc., that are required for clarification.
 5. Life safety plan (see Architectural-8 above).
 6. Panel schedules.
 7. Telecommunication requirements are listed in Section 16800.
 8. Media Services requirements are listed in Section 16800.

END OF SECTION

SECTION 3 - PROCEDURES FOR SPECIFICATION REQUIREMENTS

GENERAL

1. Provide complete description of all items. Manufacturers must be approved by FP&M.
2. Divisions 2 - 16 are provided as a standard guide to the A/E in the preparation of the project specifications. Specific requirements shall be followed unless prior authorization for deviation is received. See Introduction, Deviations or Variances.
3. Follow CSI format.
4. The University currently has proprietary specifications for the following:
 1. Best Lock Premium Series cores.
 2. Andover campus energy management system.
 3. Spirax-Sarco or Armstrong Condensate return pumps
 4. Simplex fire alarm system
 5. Sloan or Zurn flushvalves
 6. Holophane pedestrian site lighting

END OF SECTION

SECTION 4 - PROCEDURES FOR REMODELING, AND RENOVATION

GENERAL

1. The Procedures, Codes, and Planning Requirements sections shall apply to remodeling, and renovation projects including re-roofing.
2. The work to be undertaken shall be clearly defined as to scope and budget in concert with the designated FP&M staff during Program Analysis, if not previously detailed.
3. Where there are changes in use to be made, all aspects of code requirements including life-safety, accessibility, environmental, structural loading, mechanical and electrical considerations shall be examined and recommendations made to insure conformance with codes and accepted practice. See Procedures, Codes and Planning Requirements, Section 5 - Codes, Regulations and Standards.
4. Where re-roofing is to be undertaken, the roof drainage system and roof structural capacity shall be examined and recommendations made to insure conformance with codes and accepted practice.

END OF SECTION

SECTION 5 - CODES, REGULATIONS AND STANDARDS

GENERAL

1. The codes, regulations and standards represent the quality and safety that should be provided.
2. These data should not be considered as a complete or comprehensive listing and should be elaborated upon by the Architect or Engineer to secure a completed project of the quality indicated.
3. Construction work for the Eastern Illinois University campus shall comply with the applicable requirements of any Federal, State of Illinois, or EIU statute, code, law, regulation or guide.
4. The list below provides a general summary of applicable regulations and standards. Specific provisions are included in the Technical sections as appropriate. The current edition of these documents shall apply unless noted otherwise in the technical sections or listed in the current codes and standards section below.

DEFINITIONS AND ABBREVIATIONS

1. DEFINITIONS

1. **Regulations** - Rules or statutory requirements of government agencies (Eastern Illinois University, State of Illinois or Federal Government).
2. **Codes** - Sets of rules and guidelines for design, prepared by a designated governmental and /or professional group, which are intended to protect the public safety and welfare.
3. **Standards** - Requirements set by authorities, custom or general consent and established as accepted criteria.

2. ABBREVIATIONS

| | | |
|------|-------|--|
| ACI | | American Concrete Institute |
| ADA | | Americans with Disabilities Act |
| AGA | | American Gas Association |
| AGCI | | Associated General Contractors in Illinois |
| AISC | | American Institute of Steel Construction |

| | |
|-------------|---|
| ANSI | American National Standards Institute |
| ASHRAE | American Society of Heating, Refrigeration and Air-Conditioning Engineers |
| ASHRAE 90.1 | American Society of Heating, Refrigeration and Air-Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| AWWA | American Water Works Association |
| BICSI | Telecommunication Distribution Methods Manual |
| BOCA | Building Officials & Code Administrators |
| BOT | Board of Trustees |
| CDB | Capital Development Board |
| CPSC | Consumer Product Safety Commission |
| EIU | Eastern Illinois University |
| FED | Federal Agencies |
| FM | Factory Mutual Engineering Corp. |
| IAC | Illinois Accessibility Code |
| IAGO | Illinois Attorney General's Office |
| IBC | <i>International Building Code</i> |
| IBHE | Illinois Board of Higher Education |
| IDOL | Illinois Department of Labor |
| IDOT | Illinois Department of Transportation |
| IDPH | Illinois Department of Public Health |
| IDRE | Illinois Department of Registration & Education |
| IEPA | Illinois Environmental Protection Agency |
| IHPA | Illinois Historic Preservation Act |
| ISPE | Illinois Society of Professional Engineers |
| JULIE | Joint Utility Location Information for Excavators |
| NEC | National Electric Code |
| NFPA | National Fire Protection Association |

| | |
|------------------|---|
| OSFM | Office of State Fire Marshal |
| OSHA | Occupational Safety & Health Act |
| SMACNA | Sheet Metal & Air Conditioning Contractors National Association |
| SOS | Secretary of State |
| UFAS | Uniform Federal Accessibility Standards |
| UL | Underwriters Laboratories, Inc. |

COORDINATION

1. The A/E is responsible for investigating and determining which codes are applicable at the project site, and for designing and specifying accordingly. A/E may submit written requests to the University, with full documentation, requesting deviations from the codes, or the substitutions of more stringent codes. Do not proceed with design or specifications based on deviations or other codes until written authorization is received.
2. The A/E shall submit a list of all applicable codes, regulations and standards for a particular project during the program analysis (see III - 1 - 2).
3. The A/E may reference other codes or standards throughout the specifications when deemed appropriate for proper compliance with regulatory requirements.

CURRENT CODES AND STANDARDS

The following are current codes or standards that are applicable for all campus projects:

1. *International Building Code (ICC) 2003*
2. *Illinois Plumbing Code –Latest edition*
3. *National Electric Code (NFPA – 70) – Latest Edition*
4. *2006 Life Safety Code (NFPA – 101) (As of 08/27/07)*
5. *Illinois Accessibility Code (IAC) (4/24/97)*
6. *Americans with Disabilities Act (ADA)*
7. *Illinois Energy Conservation Code – Public Act 93-0190*
8. *2003 IEBC for Old Main, Pemberton Hall, and McAfee Gym only (9/13/07)*
9. *Elevator Safety Code as adopted by the State of Illinois effective 02/03/2012*

It is the policy of Eastern Illinois University to require that the more stringent code requirement be met when multiple codes differ.

END OF SECTION

SECTION 6 - GENERAL PLANNING REQUIREMENTS

GENERAL

The general planning requirements supplement the Program Statement. The A/E should review each item to insure that the criteria are followed where applicable.

In addition to the general planning requirements listed below, the A/E should review Divisions 2 - 16 for specific requirements.

1. FACILITIES FOR PERSONS WITH DISABILITIES

1. American With Disabilities Act, Title II. (Title III may also be applicable in some circumstances.
2. "Illinois Accessibility Code", in accord with the Environmental Barriers Act.

2. ENVIRONMENTAL HEALTH AND SAFETY

All University buildings shall be designed with full consideration for the safety of the occupants and users. The following are University requirements that require emphasis and in some cases may be in addition to those required by Code. These requirements are administered by the University Office of Environmental Health and Safety, and Facilities Planning & Management.

1. **APPROVALS:** It is the Architect's responsibility to secure the approval of bidding documents from appropriate authorities. Copies of the approving letters shall be furnished to Facilities Planning & Management.
2. **CORRIDORS:** Corridors used as a means of access to exits and used for discharge from exits shall provide a clearance of at least 6 feet in width. Room doors swinging into corridors shall be recessed.
3. **FIRE PROTECTION:** Applicable NFPA standards shall be followed in all project designs. In addition to NFPA, the University has a contractual agreement with the City of Charleston for fire protection. As such, designers are required to work with the Chief of the Charleston Fire Department or City of Charleston Fire Inspector to coordinate design aspects to insure an expedient fire attack. Consideration must be give to:

1. Fire truck entry and truck turning radii.
 2. Water flow capabilities (each project should have a water supply test conducted.)
 3. Location of Post Indicator Valves and fire department stand pipe connections.
 4. Location of fire alarm annunciator panel(s).
 5. Knox box location
4. FENCING: All construction sites shall be fully fenced to prohibit access by the general public and non-authorized University employees. Fencing shall be self-supporting, movable, and top of fence shall be a minimum of six foot above grade. The use of “snow fence” or “ribbon” is not acceptable.
5. TERMITE PROTECTION: All projects that require an addition to a building or a new building shall have termite protection included in the specifications. This treatment shall be consistent with the current standard of practice for this work and shall be in conformity with all EPA, Federal, State and Local Codes.

3. ASBESTOS REMOVAL

1. Most University buildings and tunnels constructed before 1970 contain asbestos materials in some form or another. The most typical of these are pipe insulation, acoustical control materials, and floor tile & mastic. If the removal project is large enough to require the bidding process, the Owner may contract with a consultant for preparation of contract documents. These services may be separate and distinct from the Architect’s services.
2. The use of asbestos or any product containing asbestos banned by the Environmental Protection Agency and Department of Labor’s Occupational Safety and Health Administration is absolutely prohibited from any project. Any contractor installing any product with asbestos shall bear full responsibility and liability for any penalties, damages, suits or loss and shall pay for any and all costs of removal and replacement and also all legal costs if they are involved. Any product specified that unknowingly contains asbestos shall be brought to the attention of the architect in writing prior to its purchase and shall not be used on any project.
3. Notify FP&M when suspected asbestos containing materials are discovered during construction so that appropriate action can be taken. No workmen or other activity should be allowed in the area containing suspected material until it has been removed or certified as not having friable asbestos.

4. ENERGY CONSERVATION

1. Energy conservation is a major factor in the design of buildings for the University. Energy saving possibilities may be achieved through control of building orientation, configuration, fenestration, insulation, and design of mechanical and electrical systems that operate economically. Use ASHRAE Standard 90 as the basis of design. Illinois Energy Conservation Code shall also apply.
2. See Division 15 and 16 for specific energy conservation, management and control requirements.
3. Solar orientation of a project should be taken into account as an energy conservation measure insofar as other functional site and master plan considerations allow.
4. Design of the enclosure envelope shall take into account the conservation of energy in the configuration and volume of the enclosure.
5. The amount of fenestration should be confined to the area required for light and ventilation, and consistent with the Procedures, Codes, and Planning Requirements. Insulating glass or other energy conserving options should be provided.

5. RECYCLING OF CONSTRUCTION & DEMOLITION MATERIALS

1. All contractors doing work on Campus should be made aware of the EIU recycling program before beginning work. Construction materials that are eligible for recycling are paper, cardboard, plastic, metal, concrete, concrete block, and aluminum. Consult the *Project Manager* for additional information concerning recycling.

END OF SECTION

SECTION 7 - SITE DESIGN PLANNING REQUIREMENTS

MASTER PLAN

Site planning needs to reflect the University's master plan as it relates to the long range campus planning. The University's master plan as approved by the Board of Trustees may be found at www.eiu.edu/~mstrplan/.

The present campus has an urban feel with a typical city street grid encroaching into the edge of campus. The buildings range from late 19th century stone structures to stone and brick structures built in the 1960's. Other "gems" from the 1930's and 1940's are McAfee Gym and Booth Library.

GENERAL CRITERIA

1. Planting

1. The campus has several large tree specimens that should be preserved when constructing projects near them. The University Grounds Department should be consulted when projects are near these specimens.
2. Planting beds should be used sparingly. Specimen selections must be reviewed by the Grounds Department. Planting at building edges should consider the scale of the area involved. Consideration for the use of large mowers should be given to planting bed size and location.
3. Consider security when selecting plant materials. Large dense materials should be avoided in areas where they could create hiding places.

2. Roads and Walks

1. Pedestrian movement should be emphasized when designing circulation on campus. Conflicts between pedestrians and vehicles or bicycles should favor pedestrian right-of-way.
2. All sidewalks 8 feet or wider should have a crowned cross-section. Walks should be *6" thick, fiber reinforced and shall be scored* appropriately.
3. Generally all walks should be designated for pedestrian or, where appropriate designed for emergency vehicle traffic.

4. Parking lots are preferred to be 60 feet wide face-to-face of curbs with 24 foot drives and perpendicular parking. Preferred parking space width is 9 foot. Asphalt lots should pitch a minimum of $\frac{1}{4}$ inch per foot and concrete lots should pitch a minimum of $\frac{1}{8}$ inch per foot.
5. Disabled parking is designated on a campus wide basis. Typically, lots that are closer to the center of campus activity will require a larger percentage of disabled parking than remote lots.

3. ART IN ARCHITECTURE PROGRAM

1. The campus participates in the Art in Architecture program on CDB projects. Considerations for maintenance of the Art should be given when developing the program. The artist should describe the amount and type of maintenance that should be anticipated for the particular art piece.

4. SIGNAGE

1. Uniform campus signage *shall be coordinated through the Project Manager.*

5. LIGHTING

1. See Section 16500 – Lighting for light fixtures.

END OF SECTION

SECTION 8 - BUILDING ARCHITECTURAL DESIGN PLANNING REQUIREMENTS

GENERAL DESIGN

A sound, functional plan is the single most important factor in obtaining an acceptable solution to the requirements of the Building Program. This can best be achieved through a careful study of the space relationships and a thorough understanding of the needs of the users as expressed in the Building Program and in subsequent meetings and discussions held between the Architect and the Planning Committee. It must also be recognized that changing curricula and modifications of space are frequent occurrences in University operation. Flexibility should be a consideration in any plan to accommodate anticipated as well as unanticipated changes and future growth. Exterior design of the building is expected to be compatible with neighboring buildings and with the campus as a whole. Exterior materials as well as the building form will be examined very carefully at every step of the process to ensure compliance with the requirements of the project and University standards. It is neither the policy nor the intent of the University to limit the creative individuality of the Architect in design or selection of materials. The guidelines and requirements presented in this Manual are based upon University experience with materials and construction methods and details which have resulted in the fewest problems in operation and maintenance, and in the best service and life of materials and equipment. Uniformity in the use of materials and equipment throughout the campus limits the range of cleaning and maintenance products and reduces the variety of parts and materials which must be stocked for repairs and replacements as well as providing a continuity of aesthetic and functional user-experiences. New materials and products and new methods of construction, when proven sound, may justify changes to these standards. Proposals for such new used shall be approved by the Owner's representative prior to presenting them to the entire Planning Committee and incorporating them into the documents. Energy conservation must be given special consideration in the design of new or remodeled University buildings.

BUILDING PROGRAM

1. For each Project the University will usually provide the Architect with a written Building Program. The typical Building Program will include the following:
 1. A statement of approval by academic and administrative personnel involved with the project.

2. A statement of the nature and function of the end user of the facility, background information regarding development of the project to date, and identification of the site.
3. A statement of general design considerations pertinent to the project.
4. An estimated Project Cost. The Architect should be especially concerned with the amount identified as Construction Cost. The heading "Construction Cost" normally includes all built-in or fixed equipment for the Project. It is the responsibility of the Architect to design within that estimated cost or immediately advise the Owner's Representative that this cannot be accomplished.
5. The Building Program may incorporate a tentative time schedule indicating when various phases of the work are expected to be completed. This schedule is based on a critical occupancy date(s) which in turn relate to other planned programs and the University academic calendar. A revised time schedule may be developed after discussions between the Architect and the Owner's Representative.
6. A tabulation of net areas required for assignable spaces. Net areas given in the Program shall be maintained in the Architect's design as closely as possible. Any significant deviation from the areas given or functional relationships shown in the program could result in rejection of the schematic design unless previously approved by the Owner's Representative.
7. A set of specific space requirements for each of the individual spaces including where appropriate: diagrams of the essential functional relationships between the different spaces, room finishes, and room furnishings.

DESIGN COMPONENTS

1. ENTRANCES:

1. Entrances shall be planned with vestibules when possible and doors shall meet ADA requirements. Each building shall have at least one entrance with doors large enough for moving equipment in and out of the building. Provide access to facilitate removal of mechanical equipment.
 1. Where possible, design doorways so that doors are recessed some distance from face of wall to provide protection from

wind and shelter for doors, or provide overhead protection. Provide vision panels in high frequency use doors.

2. Side lights must clearly differentiate between doors and fixed panels.
3. Door opening pressure and entry door design must comply with State and Federal accessibility standards.
4. All primary entrances must be equipped with automatic door operators (some building may have more than one primary entrance). Automatic door operator push buttons shall be mounted 42" above finish grade or finish floor. Install operators at interior and exterior of entrance doors. Operators must also operate on a frequency matching existing operators on campus.

2. NON-PROGRAMMED SPACE REQUIREMENTS

1. CORRIDORS

Attention should be given to adequate corridor widths for the loads generated by the particular occupancy of each part of the Project. Provide drinking fountains and other public facilities such as benches to serve the building occupants. Similar analysis shall be made for determination of number and size of elevators and number and size of public toilets.

2. PUBLIC TOILETS

Provide adequate facilities to accommodate building occupants including physically disabled. Quantity of fixtures shall be based on the Illinois Plumbing Code. Preferred width of pipe space behind toilets is 36" clear and readily accessible. Include lighting and separate 120 volt duplex receptacle in each pipe space. Deviation from this shall be approved by FP&M.

3. MAIL

Discuss with the Owner's Representative the nature of mail facilities for each individual building.

4. CUSTODIAL

Custodian facilities will vary according to size, type, and use of the building. The number of rooms, size and location should be considered during preparation of schematic design documents and needs should be determined in consultation with the Operation and Maintenance section of FP&M. All custodian room doors shall be 36 inches wide. Provide adequate ventilation.

1. MAIN CUSTODIAL ROOM

1. The preferred location for the main custodial room is on the ground level close to a service entrance and delivery area or elevator.
2. The minimum size of the main custodial closet should be 120 SF. Adequate space for storage of custodial equipment, special crew equipment, emergency equipment, lockers and space for the custodians to eat their lunch shall be provided.
3. Provide sufficient locker space to accommodate all custodians for the building, based on one custodian for each 20,000 SF of floor area to be cleaned.
4. Provide a curb-type utility floor sink, hose bibs, hot and cold water, ½" cold water with shut-off located 12" above faucet assembly for future EIU connection to chemical station, 36"x 42" bulletin board and shelves to accommodate a 30 day supply of cleaning items (soap, towels, etc.).
5. In larger facilities it may be desirable to separate locker rooms and equipment/supply rooms.

2. SATELLITE CUSTODIAL SPACE

1. Satellite custodial closets should be located on all other floors. The preferred location of these closets would be near restroom areas. Major buildings may require more than one satellite closet per floor - consult with FP&M.
2. The size will be determined by the size of the building served. Minimum size shall be 50 SF. Narrow room layouts are not acceptable.
3. The room should have light, receptacle, ventilation, service sink and door with lock.

4. Custodial closets should not share any other function (i.e.: telecommunications boards, pipes chases, cleanouts, electrical equipment, etc.)

5. **WASTE DISPOSAL AND RECYCLING**

The University is mandated to recycle at least 40% of its waste stream. This requires careful consideration of volumes, pick-up schedules, equipment sizes, etc. Review waste and recycling requirements with FP&M. Wastepaper disposal is an almost continuous operation. Waste pick-up is on a daily or more frequent basis to each building, using packer type trucks into which containers are emptied. Building custodians take waste from individual spaces to the “local” containers. Biological wastes, chemical wastes and radioactive materials require special consideration and their requirements will be analyzed and programmed in specific building where they occur.

6. **MAINTENANCE AREA**

Provide a secure work area for building maintenance personnel of 100 square feet with workbench and space for tools. This space may be in a mechanical room if sound levels permit.

Provide a storage space equivalent to 1% of the total gross square footage of the building or 100 square feet (whichever is greater) for storage of maintenance items for the building such as spare floor tiles, etc.

7. **UTILITY CLOSETS**

Locate telecommunications equipment and electrical branch circuit panel boards in separate utility closet dedicated to there purpose when possible. Provide proper clearance around equipment.

8. **CONVEYING SYSTEMS**

1. **ELEVATORS**

The State of Illinois has passed legislation pertaining to elevator installation, upgrading, maintenance, and servicing. The Design Professional shall become familiar with the requirements of this law and shall assist EIU in obtaining all required permits to construct, upgrade, and occupy any elevator unit that is a part of this project.

1. All buildings with more than one floor must have an elevator to provide accessibility.
2. Where a new building is being constructed, the Contractor shall utilize the elevator at the Contractor's risk. The Contractor shall extend the Owner's basic warranty for the duration of the construction contract and shall return the unit to the Owner's use in an as-new condition.
3. The elevator installation shall comply with ASME A17.1 latest edition.

2. DUMBWAITERS AND TRAYVEYORS

1. The A/E should consider the accessibility of all mechanical parts in the design of any dumbwaiter or trayveyor.
2. Trayveyors should be designed such that it will not harbor insects or rodents and can be easily cleaned.
3. Dumbwaiters should be designed for not more than 500 pounds.

9. ACOUSTICS

1. Equipment operating in mechanical rooms shall meet the noise level requirements of OSHA.
2. The location and design of instructional areas should consider interior and exterior noise sources.
3. When appropriate, the A/E should recommend the services of an acoustical consultant.

END OF SECTION

SECTION 9 - STRUCTURAL PLANNING REQUIREMENTS

GENERAL

1. Design Loads should be based on INTERNATIONAL Building Code - 2003, however, the A/E should review all actual loading conditions and recommend modifications as appropriate.
2. Design loads shall take into account long term flexibility and the potential for changing uses. Minimum live load requirements shall be 100 - 125 psf and any deviations should receive prior approval from the University.
3. List all design loads on the structural drawings.
4. Seismic requirements:
 1. Indicate earthquake design data on structural drawings
 2. $S0.2 = 35$ and $S1 = 14$ (*Interperlated*) Using IBC Table 1615(1) and 1615(2)

END OF SECTION

SECTION 10 - MECHANICAL PLANNING REQUIREMENTS

GENERAL

1. The University is committed to the principle of energy conservation and will review proposed mechanical systems and design for means of reducing operating costs as well as initial cost. The A/E must work closely with FP&M to design new buildings and remodel existing building that are energy efficient. Compliance with ASHRAE Standard, as modified by EIU Building Standards, is the minimum requirement. If it is determined during a scheduled submittal review that the maximum allowable energy load will exceed the ASHRAE standards, a conference with FP&M will be required to determine the course of action. Redesign of problematic portions of the building will be required to meet the energy and maintenance requirements. Life cycle costs shall be used to determine the selection of the HVAC equipment.
2. Mechanical rooms containing refrigeration equipment shall be designed in accordance with ASHRAE.
3. See Division 15 and Procedures, Codes, and Planning Requirements, Section 13 for specific requirements.

END OF SECTION

SECTION 11 - ELECTRICAL PLANNING REQUIREMENTS

GENERAL

1. The electrical design shall conform to the requirements of this manual, which includes the Codes, and Planning Requirements and Division 16, along with all references relating to energy conservation and life cycle cost analysis. The final design results should be based upon utilizing and applying the best professional judgment to obtain the most acceptable solution within the construction budget.

END OF SECTION

SECTION III-13 - CAMPUS UTILITIES PLANNING REQUIREMENTS

GENERAL

1. Pull cooling load off the existing chilled water loop.
2. Heating will be accomplished with hot water unless conditions dictate otherwise.
3. Major building subsystems will be independently metered for water, electrical, and steam. Metering communications via Ethernet TCP/IP is required.
4. Thermal load will be served from steam provided by the existing steam distribution system.
5. Electrical gear will be 15KV primary voltage.
6. Water distribution will be ductile iron.
7. All buried infrastructure shall have tracer wires.
8. All new utilities infrastructure installed shall have major components (i.e. isolation valves, manholes, valve vaults, switch vaults, transformers, disconnects, etc.) located with GPS standard coordinates and shown on as-built drawings.

END OF SECTION

SECTION 14 - CAMPUS UTILITY AND BUILDING SYSTEM OUTAGES

DESIGN

Contractors must arrange for and pay for all temporary utilities required for execution of the work unless specifically directed otherwise. Specifications shall be written to stress this point. The University operates most utilities throughout the campus. Peripheral campus buildings may have service connections directly from the public utilities. The A/E will determine the type and scope of each utility needed during construction document phase and, after discussion with FP&M, provide specific direction to the contractors in the project specifications regarding the arrangement for such utilities.

1. Utility company installations: Plans for running temporary lines through University property shall be reviewed by the A/E in concert with the University *Facilities Planning & Management*.
2. Connections to existing utilities: If connections to University utilities are permitted, the A/E shall obtain drawings of existing utilities and shall consult the University Project Manager and Utilities Superintendent regarding services available and points of connections to services. The specifications shall contain instructions to the contractors to make requests for these services through the A/E.
3. Cost: Costs for providing temporary services shall be included in the contractors bid. Specifications shall clearly identify each contractor's responsibility for the installation of service, whether services are furnished by the utility company or by the University.

CONSTRUCTION

1. The contractor should advise the University Project Coordinator when there is a need for an outage.
2. When requesting the outage, the contractor should include, as a minimum, the following:
 1. Project contact person including telephone;
 2. Type of outage and specific systems affected;
 3. Buildings or specific areas within buildings affected;
 4. Date and time of outage request;
 5. Length of outage;
 6. Specific reason for outage.

3. The Project Manager *and* Project Coordinator will evaluate the request and determine: magnitude of shutdown required; timing; and impact on the continuing operations of campus departments. The contractor will then be advised of the schedule for the requested outage. It should be noted that some outages may be required to be conducted during evenings, weekends, and campus holiday periods.
4. A means to locate the newly installed utilities shall be provided by the corresponding project. Tracer wire (8 gauge copper) shall be installed and extended into the corresponding building for all water, storm, sewer, and other direct buried utilities as appropriate.

SCHEDULING

1. Outages for building systems and campus utilities shall be scheduled at least five working days in advance, at the convenience of the continuing operations of the Campus.
2. When an available date and time are acceptable to the project, it will be formally scheduled by the Project Coordinator.
3. The Project Manager and Project Coordinator are responsible for contacting numerous members of the campus community when scheduling outages. Therefore, once an outage is scheduled, meeting the established schedule is of critical importance.

EXECUTION

1. The project's contractor shall agree to start work promptly as scheduled.
2. In the event that the contractor's required material or labor is not available, or other significant problems arise at the scheduled starting time, the *Project* Manager reserves the right to cancel the outage.

EXISTING UTILITIES

1. Any damage caused by the Contractor to existing marked utilities shall be replaced by the Contractor at no expense to the University. This includes any damaged sitework, sidewalks and drives.
2. Underground Utilities

1. Contractor shall call the Project Coordinator to arrange utility locates.
2. The University shall provide personnel and equipment to locate and mark existing University owned and operated utilities. Locates are available Monday through Friday 7:00 AM - 3:00 PM except during University holidays. Locates shall be scheduled 72 hours in advance.
3. Marking shall be accomplished by color coding in accordance with the Uniform Color Code of the American Public Works Association. Locates shall be marked as follows:

| Utility | Flags Ground | Painting |
|----------------|---------------------------|-----------------------|
| Electric | red w/ white lettering | red |
| Telephone | orange w/ white lettering | orange with white |
| Nat. Gas | yellow w/ black lettering | yellow |
| Steam | yellow w/ blue lettering | yellow with blue |
| Dom. water | blue w/ white lettering | blue |
| chilled water | blue w/ red lettering | blue w/ red |
| San sewer | green w/ black lettering | black w/ green |
| Storm sewer | green w/ white lettering | white w/ green center |

4. Contractor shall assign one person to work with the University locator.
5. The accuracy of the locates shall be plus or minus three feet in plan view. Depth of buried lines shall vary. Contractor shall be responsible for all construction in the area of existing utilities.
6. Contractor shall be responsible for locating the following utilities not owned by EIU by calling J.U.L.I.E.

- (1) Telephone - Illinois Consolidated Telephone Co.
- (2) Cable TV - TCI of Illinois
- (3) Natural Gas - Ameren CIPS
- (4) Water - Charleston Water Company
- (5) Electrical - Ameren CIPS

3. Existing Utilities and Structures

1. The contractor shall exercise care to protect underground pipelines, tunnels, and duct banks from heavy vehicular traffic. Heavy wooden mats shall be used where required.

2. The contractor's attention is directed to the extensive network of existing underground pipelines, tunnels, manholes, and electric conduit. It shall be the contractor's responsibility to become acquainted with the extent and location of these underground structures and to protect them against damage from his operations.
3. Excavation adjacent to underground structures shall be done with care, and then only after first determining the exact location of them. Where new excavation is below the support line of existing structures, sheeting or other approved procedure shall be utilized.
4. Any exterior work which will require underground digging five or more feet below the ground elevation will require shoring in order to avoid possible cave-ins. The contractor will be required to follow all OSHA requirements for proper shoring.
5. The contractor shall verify the locations of existing utilities before starting trench cutting operations. Excavation shall be performed by hand digging around utilities to locate and prevent rupture or breaking of lines. Cost of repairing any damages to existing marked utilities shall be paid by the contractor without expense to the University. The University reserves the right to repair any existing utility damaged by the contractor at the contractor's expense.
6. Existing utilities which are shown on the drawings or field located and are damaged by the contractor shall be repaired or replaced, at the University's sole option, entirely at the cost of the contractor. Where damage necessitates a utility outage, the contractor shall work continuously on a 24-hour, around the clock basis until the damaged utility is placed into service again. All costs to be the responsibility of the contractor.
7. If existing utilities are encountered during construction which are not shown on plans, and which have not been field located prior to encountering same, contractor shall immediately stop work in that area and notify Owner's representative. Owner's representative will make a determination as to the nature of utility and direct contractor as to what action is to be taken.
8. No valve, switch or other control of any existing utility system shall be operated for any purpose by the contractor without prior approval of the University. The University's lockout-tagout procedure must be followed.

9. Contractor shall document on as-built drawings the location and invert elevations of encountered utilities and every 50 feet of new utility installations. Measurements shall be taken in plan from permanent structures such as exterior building walls. Final acceptance of contract shall be contingent upon as-built approval from the Owner's representative.

END OF SECTION

IV. DIVISION 0 - BIDDING AND CONTRACT PROVISIONS

Division 0 is not bound with the Building Standards. A portion of Division 0 for EIU projects can be found at **Facilities Planning and Management Website**. The Illinois Capital Development Board will issue division 0 for CDB projects.

The following EIU Division 0 can be found at *www.eiu.edu/fpm/*.

| | |
|--------|---|
| 00020* | Advertisement for Bid – Include project description and start/completion dates. |
| 00100* | Instructions to Bidders |
| 00300* | Bid Form – Include start/completion dates |
| 00700 | General Conditions |
| 00800 | Supplemental Conditions |
| 00825* | Prevailing Wage Rates Vendor Disclosure of Financial Interest |

Documents with an asterisk (*) are contained within the Purchasing Bid Documents. To obtain these documents, go to Facilities Planning & Management web site (www.eiu.edu/fpm/) and select “Design & Construction”, at mid-page under “Construction Contracts”.

All front-end documents should be reviewed prior to each submittal for updates made to the documents. Verify the revision dates on all documents to insure that they agree with the latest provided on the web site.

END OF SECTION

V. DIVISION 1 - GENERAL REQUIREMENTS

EIU does not have Division 1 sections for projects. *The A/E shall develop Division 1 sections as a part of their standard specification document.* The Illinois Capital Development Board will issue division 1 requirements for CDB projects.

Division 1 sections shall include but shall not be limited to:

Project Summary

Project Coordination

Project Meetings

Construction Schedule

Submittal Procedures

Quality Requirements

Temporary Facilities and Controls

Product Requirements

Cutting and Patching

Close-Out Procedures

END OF SECTION

VI. INTRODUCTION TO TECHNICAL SECTIONS

DIVISIONS 2 thru 16

The following technical sections are arranged according to the CSI format. The technical sections are intended to guide the A/E in meeting University requirements. The A/E shall incorporate the requirements of technical sections when preparing contract documents. It is not intended that any of the technical requirements be a substitute for project specifications.

The A/E shall review with the EIU Project Manager conflicts within University standards and conflicts between these standards / requirements and operative codes and regulations. The conflicts shall be reconciled and the A/E shall record the resolution as part of the ongoing documentation of the project.

The technical sections are provided in two forms:

1. Building Standards are written in narrative form to identify University requirements and cautions or guidance to the A/E.
2. Guide Specifications are written in the CSI format for specification headings and in narrative form to identify particular University requirements that may be different from or more stringent than normal practice, and/or include proprietary materials.

END OF SECTION

SECTION 02930 – SEEDING AND SODDING

The work shall include:

1. All seeding, sodding and lawn restoration that is directly related to this project, unless otherwise indicated by Project Manager.
2. All lawn areas damaged by construction activity in and around the site and on Campus directly related to the project shall be restored to the original condition, or better, at the conclusion of the project.
3. All streets, both Campus and City, shall be cleaned on a regular basis to minimize tracking mud, dirt, and dust through out the Campus and City.
4. Sod shall be top quality, 12 – 18 month old Bluegrass consisting of a minimum of three varieties of Bluegrass evenly blended.
5. Seed shall be a mixture of 70% Kentucky Blue grass and 30% Perennial Rye grass. Seeding is preferred to sodding.
6. Mulch shall be straw of wheat, rye, or oats spread evenly over the seed to retain moisture. Hay shall not be permitted.
7. Water to establish plant materials will be furnished by EIU. Contractor shall furnish all hoses, meters, back-flow preventers and any other connections necessary to carry out watering needs.
8. Only vehicles and equipment necessary to perform the work will be allowed on lawn areas.
9. Fertilize immediately prior to sodding operation or immediately after the *seeding* operation.
10. Seeding work should be done between April 1st and April 30th or August 15th and October 15th when temperatures are mild and establishment can be completed.
11. Include maintenance of sod for at least 30 days following completion of installation. Repeat sodding operations until a satisfactory uniform stand of grass is obtained as determined by the A/E.
12. Water seeding operation with sprinklers whenever soil surface is dry. Continue proper watering schedule until the project is accepted.

13. Repeat seeding operations until a satisfactory uniform stand of grass is obtained as determined by the A/E. Correct any damage resulting from erosion, washouts, or other causes.
14. Maintain sidewalks and other paved areas to be free of debris and material resulting from planting and maintenance work.

END OF SECTION

SECTION 02950 - TREES, SHRUBS AND GROUND COVER

1. *When the project includes any landscaping in addition to seeding, the following guide shall be included in the specifications. All communications between the architect and/or contractor and EIU shall be done through the Project Manager. If necessary, the PM will make arrangements to consult with the EIU Grounds Department. When the project scope includes all tree planting, replacement, pruning, and protection, it shall be coordinated with the Project Manager.*

The following shall be included in the specifications:

Campus Tree Care Policies:

Planting: Tree plantings will be approved by the Grounds' Department's arborist and unless contracted out via a project, will be performed by the arborist and tree crew. Species selection will be at the discretion of the arborist, taking into consideration current inventory and the desire to diversify species as needed. Most trees will be at least 2.5" in diameter, with the exception being bare root stock plantings. When utilizing a contractor, trees will be inspected by the arborist upon arrival to the job site and E.I.U. reserves the right to refuse any plant material due to damage, small size, insect/disease problems or any other visible problem that would jeopardize the vigor of the tree. E.I.U. also reserves the right to reject a planting due to improper techniques at the time of installation. Specifications for planting of trees and shrubs have been developed by the Superintendent of Grounds and the Grounds' Department's arborist. They are as follows:

Exterior Plants

1.0 General

The Eastern Illinois University campus is a living classroom for the students and the public, therefore the care of trees and plants is a high priority on campus.

Contractor to provide: topsoil for plant installation; trees and plants; mulch, fertilizer, landscape accessories, soil amendments; and replacement warranty.

Contractor shall furnish the Owner with a warranty against defective materials and workmanship for a period of one year growing season.

1. *Replacement of all plant materials found dead or not in a healthy growing condition at no expense to the University.*
2. *Replacements will be plant materials of same size and species with a new warranty commencing on date of replacement.*

2.0 Products

Plant names indicated shall comply with “Standardized Plant Names” as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade. Provide stock true to botanical name and legibly tagged.

Comply with sizing and grading standards of the latest edition of “American Standard for Nursery Stock ANSI 760.1-1980.” A plant shall be dimensioned as it stands in its natural position. All tree diameters will be at “breast” height.

The quality and size of plants shall comply with standard of American Association of Nurserymen: normal growth habit, free from disease, insect infestation or damage or weeds.

Arrange the delivery in sufficient quantities and time to maintain the approved construction schedule as amended.

Move plant materials in solid root balls, wrapped in burlap or grown in containers.

Deliver plant materials immediately prior to placement. Keep plant materials moist.

Species and sizes of trees and plants shall be as identified in the Plant Material Schedule on the drawings, grown in climatic conditions similar to those in climatic conditions work. Include labels on each plant with correct botanical name, size and nursery source. Peat moss or compost shall be shredded, loose, brown fibrous vegetable material, free of lumps, roots, inorganic material or acidic materials minimum of 85% organic material measured by oven dry weight; 4 – 5 pH range; moisture content 30%.

Water shall be clean, fresh, and free of substances or matter which would inhibit vigorous growth of plants. Water may be available from the University depending on the location. Availability and location to be determined at site visit.

Mulching material shall be fine grade shredded Hardwood Bark, dry and free from weeds and foreign matter detrimental to plant life. Large chunks of bark or wood, hay, chopped cornstalks, or litter are not acceptable.

Wrapping materials shall be tree wrap paper, brown, crinkled bituminous impregnated crepe paper four inches wide.

Support stakes shall be painted steel T posts that are five foot minimum length. Three stakes per tree.

Cables and wires shall be non-corrosive, of sufficient strength to withstand pressure and resultant movement of plant life, but not less than 14 gauge.

Plant protectors shall be rubber sleeves over cable to protect plant stems, trunks and branches.

3.0 Execution

A. Delivery, Storage and Handling

1. All plants shall be sound, healthy specimens of plants, representative of their species with well formed tops and good, healthy root systems.
 - a. Plants shall be free from injurious pests, pest damage, disease, broken branches, objectionable disfigurements, etc.
 - b. Plants shall be nursery grown.
 - c. Plants which have unsymmetrical heads, sparse branch structure, damaged roots balls, are of wrong species, have evidence of insects or insect damage, disease, or weeds or are undersized may be rejected by the University.
 - d. No waiver or responsibility for defective work shall be claimed or allowed due to failure to report unfavorable conditions affecting the work.
 - e. No plant shall be so bound with rope or wire at any time as to damage the bark, break branches or destroy its natural shape.

B. Preparation

1. Verify with University's Project Manager and Superintendent of Grounds that topsoil is ready to receive the work.
2. Prepare topsoil to receive plant materials.

B. Installation

1. Plant installation shall include all provision and placement of plants, digging, soil preparation and all other operations in accordance with specifications and Drawings.
2. Plants marked "B & B" shall be balled and burlapped with ball diameters as specified in the "American Standard for Nursery Stock ANSI 760.1-1980".

No plant will be accepted when the ball has been cracked or broken in moving or during the process of planting or when the burlap and ropes have been removed.

All balled and burlapped plants that cannot be planted immediately on delivery shall be set on the ground with the balls well covered with soil or other acceptable mulch material and shall be kept moist until planted.

All plants shall be handled so that the roots are adequately protected at all times.

All plants shall be properly protected by a tarpaulin or other suitable covering during shipment.

C. Planting Details

1. Prior to installations Contractor shall stake tree planting locations that have been authorized by the University's Superintendent of Grounds. Layout of plant material needs Owner approval prior to installation.
2. All balled and burlapped shade trees, shrubs and ornamental trees shall be planted in excavated holes.
 - a. Pits for plants shall be dug prior to moving plants to the pit location.
 - b. Sides shall be vertical with a diameter of three times greater than the root ball or container diameter.
 - c. Plant pits shall be filled with topsoil and compacted to accommodate for settling.
 - d. The ball shall be covered to approximately 3/4 of its depth with the planting soil mixture and thoroughly watered in place.
 - e. All twine or rope shall be cut from the trunk and the burlap folded away from the top of the ball.
 - f. The remaining 1/4 fill shall be dry soil and settled in place.

3. Enough planting mixture shall be used to bring the surface, when settled, to the required grade.
 - a. The grading of the tree and shrub pits shall form a saucer at least four inches in depth and the diameter of the planting pit.
 - b. The saucer shall be filled with mulch, as specified, to a depth of three inches.
4. All deciduous trees shall be wrapped at the discretion of Superintendent of Grounds
 - a. Wrappings shall start at the base of the tree and extend up the entire trunk to the height of the first branches.
 - b. Each turn shall overlap the preceding wrap by two inches.
 - c. Each wrap shall be taped at the top and bottom
5. When noted on the drawings, a continuous mulch bed of three inches thickness shall be installed under shrubs. Finish grade of shrub bed areas shall be adjusted prior to planting to an elevation which is three inches below existing curbs, walks and adjacent lawns.

D. Maintenance

1. Maintain plant life immediately after placement until plants are well established and exhibit a vigorous growing condition.
2. Continue maintenance until all plant installation is complete and accepted; and for one month following that date.
3. Maintenance shall include:
 - a. Cultivation and weeding of plant beds and tree pits.
 - b. Irrigation sufficient to saturate root system.
 - c. Trimming and pruning, including removal of clippings and dead or broken branches; and treatment of pruned areas or other wounds.
 - d. Maintain wrapping, guys and stakes. Adjust guy accessories when and as required.
 - e. Addition of shredded bark mulch as required.
 - f. Provide adequate protection to prevent plant materials from damage until final acceptance.

Landscaping:

Depending upon scope of project or time restrictions, landscape designs may be provided via in-house or per landscape architect/contractor. Eastern Illinois University Grounds' Department reserves the right to review all landscape design plans when an outside contractor is utilized, and to make suggestions, refuse species and request substitutions as needed in order to address maintenance or species issues. When utilizing an outside contractor, the arborist will be at the site upon delivery of plant material and E.I.U. reserves the right to refuse any plant that does not meet specifications, is damaged, or has signs of disease, insects, or poor cultural traits. Specifications for soil preparation in regards to seeding, installation of sod, or plant beds have been developed by the Grounds' Department. They are as follows:

Planting

1.0 General

A. *It is understood that landscaping is an integral part of overall exterior development and aesthetics of a facility and it is expected that the project architect will develop a conceptual landscaping scheme. The stockpiling of debris free topsoil (including turf) on campus on each construction project is required. Reserve excavated earth on campus when requested.*

Topsoil preparation - Provide a Combination 3-1-2 fertilizer at 3# nitrogen/1000sq.ft for areas to be sodded and a Combination 2-3-2 fertilizer at 5# nitrogen/1000 sq.ft for areas to be seeded.

2.0 Products

Imported Topsoil shall be natural, fertile, agricultural soil typical of locality, capable of sustaining vigorous plant growth from well drained site free of flooding, not in frozen or muddy condition, not less than six percent organic matter and PH value between 5.4 and 7.0. Free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, noxious weeds and foreign matter. Use topsoil excavated from site only when it conforms to these specifications.

All fertilizers shall be granular, non-burning product composed of not less than 50% organic slow acting, guaranteed analysis professional turf fertilizer.

Contractor shall apply necessary fertilizer with combination of 2-3-2 at a rate of five pounds nitrogen per 1,000 square feet of seeded area.

Contractor shall apply the necessary fertilizer with combination of 3-1-2 at a rate of three pounds per 1,000 square feet of sodded area.

Contractor shall apply fertilizer by mechanical means with proper calibration of spreading machine and spread evenly over area scheduled to be seeded or sodded.

Water shall be clean, fresh, and free of substances or matter which would inhibit vigorous growth of grass.

3.0 Execution

- A. *Carefully inspect all prior work and existing conditions. Notify the University's Grounds Superintendent immediately of all conditions that would impair proper execution of the work. Failure to notify before start of work constitutes acceptance of existing conditions.*

4.0 Preparation of Sub grade

A. Soil Preparation

1. *Contractor shall eliminate uneven and depressed areas. Remove any debris, roots, branches, stones and gravel in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products.*

2. Contractor shall scarify sub grade to a depth of 12 inches where topsoil is scheduled. Scarify all areas where equipment has compacted subsoil.

3. The University's Superintendent of Grounds must approve all scarified areas prior to the application of topsoil.

Topsoil

1. Contractor shall provide topsoil level to grade and place in areas where seeding or sodding is scheduled.

2. Contractor shall install topsoil during favorable weather conditions. Topsoil and installation area must be dry.

3. Topsoil shall be placed over all backfilled trenches, excavations and disturbed areas that are not scheduled for paving.

4. Topsoil shall be placed to a depth of 12 inches where possible.

Finish Grading

1. Contractor shall mechanically cultivate to a minimum 4" (four inch) depth and fine grade topsoil eliminating rough, uneven or depressed areas. Maintain levels, profiles and contours of sub grade. All vegetation shall be removed.

Finished grade shall provide positive drainage away from buildings at all times and shall prevent pooling or puddling of water at any/all locations.

Finished grade top or topsoil tolerance shall be plus or minus one inch.

Finished grade to be level, firm and sufficient to prevent areas from settling when irrigation is applied.

d. Cultivate mechanically inaccessible areas by hand. Rake until surface is smooth.

e. Grade to perimeter contours to allow for proper drainage.

2. Contractor shall remove stones, roots, grass, weeds, debris, and foreign materials while grading. Do not bury foreign material.

Additional Requirements:

2. The following references shall be consulted as a part of developing these specifications:

3. “American Standard for Nursery Stock”, American Association of Nurserymen, Inc.
4. “Tree and Shrub Transplanting Manual”, International Society of Arboriculture.
5. “Standard Plant Names”. Horticulture Nomenclature.
6. All plants shall conform to the measurements specified in the plant list and shall conform to the “American Standards for Nursery Stock”. Plants larger than specified may be used if approved in writing by EIU Superintendent of Grounds.
7. Use the following chart to establish a schedule for installing plant materials:
 1. Deciduous Trees and Shrubs – October 15th to December 15th or March 15th to May 15th.
 2. Evergreen Trees – September 15th to December 15th or March 15th to May 15th.
 3. Evergreen Shrubs – October 15th to December 15th or March 15th to May 15th.
 4. Groundcovers – September 15th to November 1st or March 15th to June 15th.
8. If special conditions exist which may warrant a variance in the above planting dates, a written request must be submitted to the FP&M project manager. The Project Manager will confer with the Superintendent of Grounds to determine if the request will be granted.
9. The following is EIU’s Approved Tree List:

Large Trees (over 40 feet)

| | |
|-------------------------|--|
| Bald Cypress | Taxodium distichum |
| Beech, European | Fagus sylvatic var. ‘Asplenifolia’, ‘Atropunicea’, |
| ‘Pendula’, | ‘Tricolor’ |
| Coffeetree, Kentucky | Gymnocladus dioicus |
| Dawn Redwood | Metasequoia glyptostroboides |
| Ginko (Maidenhair tree) | Ginkgo biloba (Male only) |
| Hackberry | Celtis occidentalis ‘Prairie Pride’ |
| Magnolia, Cucumbertree | Magnolia acuminata |
| Maple, Freeman hybrid | Acer x freemanii |
| Maple, Sugar (Hard) | Acer saccharum |
| Oak Chinkapin | Quercus muhlenbergii |

| | |
|------------------|-------------------------|
| Oak, Bur | Quercus macrocarpa |
| Oak, Swamp White | Quercus bicolor |
| Tuliptree | Liriodendron tulipifera |
| Zelkova | Zelkova serrata |

Large to Intermediate Trees (Narrow-Upright)

| | |
|--------------------------------------|--|
| Beech, European | Fagus sylvatica ‘Darwyk’ |
| Ginkgo, (Maidenhair tree) Sentry’ | Ginkgo biloba fastigiata (Male only) ‘Princeton, |
| Hornbeam, European | Carpinus betulus fastigiata |
| Maple, Norway (columnar) | Acer platanoides columnare |

Intermediate-Sized Trees (25-40 ft)

| | |
|--------------------|--------------------------|
| Catalpa | Catalpa speciosa |
| Elm, Lacebark | Ulmus parvifolia |
| Hornbeam, American | Carpinus caroliniana |
| Hornbeam, European | Carpinus betulus |
| Katsura Tree | Cercidiphyllum japonicum |
| Maple, Hedge | Acer campestre |
| Sour Gum | Nyssa sylvatica |
| Yellowwood | Cladrastis kentukea |

10. It shall be the responsibility of the contractor to protect all trees within the construction zone(s). Protective fence shall be installed surrounding the tree at the drip line to prevent compaction of root-bound soil beneath the tree and to keep construction equipment and materials away from the base of the tree. This fence shall be maintained at all times.
11. In the event that it becomes necessary to have traffic or material storage within the drip line(s), consult with EIU’s Project Manager prior to encroaching within the zone. If deemed permissible, it will be the contractor’s responsibility to provide surface protection of the root system within the drip line by placing plywood covered with soil to lessen compaction in these areas. Tree protection boards shall also be installed around the base of the tree(s) to protect the trunk from damage. Details are available through Facilities Planning and Management.
12. During construction, only vehicles and equipment necessary to perform the work will be allowed on lawn areas.
13. Trees within a construction site that are to remain shall be fenced to their drip line with a six-foot high chain link fence. Maintain fence in good repair during the construction period.

14. Remove all sod from areas being prepared for planting of trees or shrub groupings.
15. Stake and label plant locations and obtain approval from FP&M before excavation is begun. Insure that utility location has been completed before requesting approval.
16. Maintenance shall begin immediately after each plant is planted and shall continue until acceptance.
17. Maintain sidewalks and other paved areas to be free of debris and material resulting from planting and maintenance work.

END OF SECTION

DIVISION 3 - CONCRETE

The basic references for this work shall include:

1. ACI Manual of Concrete Practice.
2. Applicable ASTM documents.
3. Standard Specifications for Roads & Bridge Construction and supplements, Illinois Department of Transportation.

The specifications shall indicate:

1. Concrete not exposed to weather shall be not less than 3000 PSI minimum compressive strength at 28 days, and shall be in accordance with ASTM C-94.
2. All concrete exposed to the weather shall be not less than 3500 PSI minimum compressive strength at 28 days.
3. All exterior concrete shall have air-entrained cement (4% to 6%). No exceptions.
4. Fibrous reinforcement shall be used in all concrete exterior walks, paving, and slabs. Fibrous reinforcement shall be added at the rate of 1.5 pounds per cubic yard, minimum.
5. Pitch floors to drains when they are provided as a part of this work. Indicate floor drain elevations on drawings.
6. Slope floor at all exterior openings to allow any water infiltration to drain to the exterior.
7. Floor slabs that will not receive other floor finishes should be hardened with a liquid floor hardener.
8. All walks shall be installed a minimum of 6" thick and 8' wide unless otherwise indicated on the drawings. Coordinate walk locations and sizes with the Project Manager prior to finalizing on the drawings. All walks shall have a stiff broom finish. Provide pre-molded expansion joints at a maximum of 40' in all walks. Pin new walks to existing walks *building foundations* to prevent differential settlement.
9. Cross slope shall meet ADAAG and IAC design standards. All curb ramps shall be red concrete and comply with ADAAG and IAC. Coordinate accessibility issues with the Project Manager.

END OF SECTION

DIVISION 4 - MASONRY

REFERENCES

The following references shall be part the contract documents:

1. Secretary of the Interior's Standards for Historic Preservation Projects.
2. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
3. Indiana Limestone Institute of America - "Repairing Damage to Indiana Limestone, A Basic Guide".
4. Brick Institute of America (BIA) Technical Notes.
5. Appropriate ASTM documents.

The following masonry items shall be incorporated into the specifications as the project requires:

1. Face Brick shall conform to ASTM C216, Grade SW, Type FBS.
2. Brick selection for new projects must be discussed and approved by Facilities Planning & Management.
3. Brick selection for additions should match existing as close as possible and must be approved by Facilities Planning & Management.
4. All limestone should be Indiana limestone meeting the characteristics of ANSI A93.
5. All stone anchors shall be nonferrous or stainless steel. All through-wall flashing shall be fabric membrane or non-corrosive metal.
6. Provide masonry control joints at recommended spacing.
7. Provide through wall flashing under copings and under members with exposed top joints.
8. Insure that ends of flashing above lintels are dammed to direct water to the wall exterior.
9. Detail special bond and coursing patterns.

10. Protect existing paving, walks, landscaping and shrubbery below the work areas.
11. *Match existing mortar joints.* Do not specify raked mortar joints. Concave joints are preferred.
12. Do not use long lengths of shelf angles. Compute expansion of shelf angles with 60 degree temperature differential and 1/2" minimum clearance between adjacent members. Insure that mortar does not enter clearance space.
13. Insure that the joint between masonry and the underside of any shelf angles or steel lintels is filled with compressible material and caulked to prevent transmission of concentrated loads to a small area of masonry.
14. Specify galvanized steel for lintels and shelf angles.
15. *On existing buildings, match existing mortar color.*

END OF SECTION

DIVISION 5 - METALS

The following shall be referenced as a part of the project specifications:

1. Standard Specifications for Design, Fabrication and Erection of Structural Steel for Building of the American Institute of Steel Construction (AISC) and Code of Standard Practice of the AISC.
2. Planning Requirements - Section 5 of Planning Requirements of this Document – Codes, Regulations and Standards
3. Planning Requirements - Section 9 of Planning Requirements of this Document – Structural Planning Requirements

The following items shall be incorporated in the contract documents as the project dictates:

1. All structural and ornamental metals shall be appropriately primed.
2. All metal form decking shall be galvanized or appropriately primed to suit the conditions of use.
3. Design and fabricate metal deck in accordance with the criteria in the Steel Deck Institute (SDI) “Design Manual for Composite Decks, Form Decks and Roof Decks”.
4. Design and fabricate metal joists in accordance with the criteria in the Steel Joist Institute specifications.
5. Require shelf angles for masonry veneer to meet at building corners so that brick is fully supported.
6. All welds performed on high pressure piping, including those on steam and chilled water piping shall be performed by a certified welder.

END OF SECTION

DIVISION 6 - WOOD & PLASTIC

The following documents shall be referenced as a part of the contract documents as the project dictates:

1. Secretary of Interior's Standards for Historic Preservation Projects.
2. Illinois Historic Preservation Agency.
3. American Wood Preservers Association (AWPA)
4. The following items shall be included in the contract documents as required:
5. Exterior millwork should include low maintenance materials when appropriate.
6. The use of exterior millwork should be limited to replacement or restoration work.
7. All doors shall be 7'-0" in height, solid core unless specifically approved by EIU's project manager.

END OF SECTION

SECTION 07100 - WATERPROOFING

Waterproofing shall be included in projects that have below grade levels and in locations that normally require waterproofing.

In general, it shall be noted on the drawings and/or in the specifications that if required, waterproofing shall be installed per manufacturer's writing recommendations and by someone experienced in the field of application.

On existing construction, if the waterproofing is penetrated in any manner, for any reason, it shall be repaired to the original or better condition, to the satisfaction of the University without additional cost to the University.

Regardless of application, any waterproofing membrane that is damaged, penetrated, or interrupted as a result of this work shall be repaired or replaced with the similar/like material and shall be compatible with the existing waterproofing membrane.

END OF SECTION

SECTION 07232 - ROOFING

The following items shall become a part of the specifications as the project dictates:

1. Built-up Roofing
2. Single-ply Membrane
3. Shingles
4. Slate
5. Tile

Include the following references in the contract documents:

1. OSHA Allowable Fiberglass Levels (for tear off)
2. NCRA Roofing and Waterproofing Manual Fifth Edition.
3. SMACNA Architectural Sheet Metal Manual.

Include the following items as a part of the specifications as the project requires:

1. Asphalt built-up (4-ply glass fiber & gravel surface) and modified bitumen (3 plies including granular surfaced cap sheet) roofs are the preferred systems on EIU facilities.
2. Single-ply roofing systems should be chosen with care. Only those materials that have a proven record of success will be considered by EIU.
3. Mechanically fastened single-ply systems are preferred over ballast type systems due to possible shrinkage problems associated with ballasted system.
4. Tapered insulation of ¼” per foot shall be installed to insure proper roof drainage. Verify that the existing construction is high enough for new tapered thickness.
5. All polyisocyanurate shall be overlaid with ½” High Density fiberboard.
6. Do not specify systems requiring insulation fasteners into concrete decks.
7. Provide roof protection mats or pavers for mechanical equipment access.
8. Minimum specification for shingles should be “25 year warranty shingles in lieu of weights per square. Minimum slope shall be 3:12.

9. Roof areas under cooling towers should have two layers of liquid applied elastomeric. Embed tapered insulation in it. Install 60 mil single ply membrane over insulation and double seal all field laps. Cover with additional loose laid single ply membrane and concrete ballast blocks over insulation. Use liquid rubber as sealant install “pitch pockets” at all pipe penetrations. On new installations, provide a minimum of 3-foot clearance under cooling towers.

When project calls for re-roofing, include the following:

1. Arrange with Project Manager for any test cuts that may be required.
2. If a new roof system is adopted, check roof deck and framing system design load capacity.
3. If roof is over a metal deck inspect it for condition. Replace any rusted metal decking. If area is less than 2 square feet, cover with 14 gauge galvanized steel sheet metal screwed to deck, 6” o.c.
4. Check roof drain locations and sizes. For new drains, use no drain size less than 4” diameter.
5. Tapered insulation of at least 1/8” per foot slope shall be installed if deck is level. Verify that existing construction is high enough for new tapered insulation thickness.
6. Verify that levels for fiberglass are acceptable when “tear-off” is involved.
7. Include in specifications a list of materials, which are in use in the hoods & other systems that have roof exhausts. The Project Manager will provide the list.
8. Regardless of application, any waterproofing membrane that is damaged, penetrated, or interrupted as a result of this work shall be repaired or replaced with the similar/like material and shall be compatible with the existing waterproofing membrane.

END OF SECTION

SECTION 08200 – DOORS & WINDOWS

In general, include the following in the contract documents:

1. All wood doors installed on Campus shall be solid core, (fire rating as required for the particular use of the door).
2. All non-rated and 20 min. rated wood doors shall have either particleboard or wood stave cores.
3. All new doors shall typically be 3'-0" wide, 7'-0" tall, and 1 ¾" thick; however, each door shall be reviewed for its particular application.
4. Aluminum Doors shall be similar to Kawneer 350 Heavy Wall – 2" thick with Kynar kick shields on both sides shall be used.
5. Aluminum Windows shall be store-front materials and shall be of the highest quality commercial products, meeting industry commercial standards.
6. All caulking shall meet or exceed industry standards for sealant on window applications.
7. Weather-tight barriers like sub sills, sill pans, end dams, and water reflectors shall be installed to prevent any water infiltration to the interior of the wall and rooms.
8. Before applying exterior sealant materials, clean all aluminum clad surfaces coming into contact with caulk/sealant with products specifically designed/intended to increase adhesion of the caulk/sealant.

END OF SECTION

SECTION 08700 - HARDWARE

WORK INCLUDED

The work in this section shall include commercial door hardware, electrified door hardware, and mounting heights to comply with ADAAG and IAC.

The following references shall become part of the specifications:

1. ADA Accessibility Guidelines (ADAAG)
2. Illinois Accessibility Code (IAC)
3. NFPA 101

The following shall become part of the contract documents:

1. All locksets shall be heavy duty commercial grade.
2. Cylindrical locksets equal to Best #93K w/ #14 Lever & "D" Rose are preferred unless matching existing conditions.
3. All locksets shall accept Best Lock Corporation cores. EIU will provide a sole source request letter for Best Lock cores.
4. Require Best Premium 7 pin, *WG keyway*, uncombined cores and two key blanks per core to be delivered to EIU key shop for installation by EIU after building acceptance. Indicate that the Project Manager is to be notified when the cores are to be delivered to EIU.
5. Include Best Lock Corporation, Corbin Russwin Architectural Hardware, Sargent, and Yale Security Inc in specifications.
6. Include the following for exit devices:
7. Rim lock devices on exit doors are preferred, vertical rods may be specified with prior FPM approval.
8. Provide keyed, removable mullions at all pairs of doors, both interior and exterior.
9. Provide cylinder (Best core) dog down device for all non-rated doors.
10. Include Von Duprin 99 series or 33 series in specifications. Equivalent Sargent and Best exit devices are acceptable.
11. Closers concealed in floor should not be used for exterior doors. They are discouraged in any location.

12. Include LCN, Norton Door Controls, and Corbin & Russwin Architectural Hardware in specifications (Norton 1600 preferred).
13. Provide electric magnetic hold opens only when allowed by code and where agreed by Facilities Planning & Management.
14. Provide stainless steel kickplates on doors subject to high frequency use. Generally, these include doors to stairs, toilet rooms, storage or receiving rooms.
15. Every primary building entrance shall include a power door operator that includes interior and exterior wall or frame mounted switches. Operator shall also include a radio-controlled transmitter and receiver with frequency to match existing campus frequency. Demonstrated interactivity with other campus transmitters must be provided.
16. Include Norton 6600 POR-RFI Series in specifications. Equivalent operators as manufactured by Horton are acceptable.
17. When required, HES electric strikes are preferred.
18. It shall be the A/E's responsibility to insure that the electronic door controls interface with the fire alarm system, smoke evacuation, and the power door operation for accessibility. This shall be indicted in all areas of the specifications – Door Hardware and Mechanical/Electrical - to insure coordination between the different hardware components.
19. Pneumatic operation is not permitted unless no other solution is available. Battery powered wall switches are not permitted. "Push-N-Go" feature on operators are not permitted.
20. *All door openings provided with power assist systems shall include a door activator switch similar to Ingress'R as manufactured by Wikk Industries, Inc. Switch is 36" tall, 6" wide, and 1 1/2" deep.*

END OF SECTION

SECTION 09510 - ACOUSTICAL CEILINGS

1. In general, all acoustical tile ceilings installed on Campus shall be 2x2 suspended acoustical tile system, utilizing 7/8" grid and 5/8" fissured tiles.
2. This does not preclude the use of ceilings other than suspended acoustical tile. A/E shall consult with the Project Manager and determine the ceiling type to be included in the design of the project.

END OF SECTION

SECTION 09680 - CARPET

1. University preference for carpet is level loop, solution dyed, direct glue.
2. All adhesives should be low VOC type.
3. All carpet should be class I.
4. All carpet should have a rating of less than 3.0 kv static generation unless other specific needs are identified in a project.

END OF SECTION

SECTION 09900 - PAINTING

1. Application of all finish systems shall comply with the manufacturer's recommendations.
2. All substrate materials shall be properly cured as recommended by the finish manufacturer's recommendations.
3. Require proper cure times for masonry, plaster and drywall construction before receiving finishes.
4. *Exterior* Concrete, Stucco, and Masonry (Other than Concrete Masonry Units) should receive Acrylic Masonry Primer and 2 coats of Low Lustre Latex House Paint.
5. *Exterior* Concrete Masonry Units should a Latex Block Filler and 2 coats of Low Lustre Latex House Paint.
6. *Exterior* Ferrous Metals should receive 2 coats of Alkyd Metal Enamel over a rust-inhibitive Alkyd Primer.
7. Exterior metal doors should receive *alkyd metal* primer and 2 coats *industrial enamel*.
8. *Interior and exterior* metal windows should be primed with an *alkyd metal* primer, second coat should be Polyamide Epoxy primer, 2 coats of *industrial enamel*.
9. Exterior wood trim should receive an Alkyd Exterior Primer, 2nd coat should be Super Spec Latex Exterior Primer, Top coat should be Latex House and Trim.
10. *Interior* Concrete and Masonry (other than Concrete Masonry Units) should receive a Latex Enamel undercoater and Primer/Sealer and 2 coats of Latex or Alkyd finish.
11. *Interior* Concrete Masonry Units should receive Latex Block Filler and 2 coats of Latex or Alkyd finish.
12. Natural-Finished Woodwork should receive 3 clear coats of Alkyd-Based, self-sealing, Satin-Urethane Finish over stain. Use filler coat on open grain woods.
13. Gypsum Board should receive a Latex Primer & Underbody and 2 coats of Latex or Alkyd Satin finish.

14. Plaster walls and ceilings should receive *latex sealer/undercoater* and 2 coats of *latex Satin Finish*.
15. Public or high traffic areas should receive 2 coats of *exterior latex satin house and trim latex sealer/undercoater* for gypsum board or over a block filler for masonry.
16. *Interior Ferrous Metals* should receive two coats of satin, Alkyd-Enamel Finish over an Alkyd Enamel undercoat and a primer. May be factory primed.
17. Painted concrete floors should be acid etched then receive an oil grease emulsifier as neutralize wash before receiving a coat of *Armorseal Primer/sealer* and 2 coats of *Armorseal self-leveling paint*.
18. Do not paint flexible connections between ventilating fans and ducts.
19. Do not paint valve stems or other close fitting mechanical and moving parts.
20. Painting of ceiling and walls of mechanical equipment rooms may be omitted (discuss with FP&M Project Manager).
21. Provide adequate ventilation, particularly when painting in buildings which remains User-occupied.
22. *When applying latex paint over an oil based paint, prime with Superbond first.*

END OF SECTION

SECTION 10800 - TOILET ACCESSORIES

The work under this section shall include but shall not be limited to furnishing and installation of the following items:

1. Grab Bars
2. Toilet, Shower, Washroom Accessories
3. Mounting heights to comply with ADAAG and IAC.

Include the following references in the contract documents:

1. ADA Accessibility Guidelines (ADAAG)
2. Illinois Accessibility Code (IAC)

The following products shall be incorporated in the project unless otherwise noted by the Project Manager:

1. Grab Bars – Stainless steel with concealed anchors. Sizes to comply with ADAAG and IAC
2. Sanitary Napkin Disposal – Surface mounted, stainless steel, keyed same as Sanitary Napkin Dispensers. Locate in each toilet compartment in women washroom.
3. Toilet Paper Holder – Royce Ringer #TP-3, stainless steel. **Furnished by EIU and installed by Contractor.**
4. Soap Dispensers – Sani-Fresh Universal white tip. White Color, 800 mm capacity. **Furnished by EIU and installed by Contractor.**
5. Paper Towel Dispensers – Fort Howard Machine #563-53. 8”x 850’ towel capacity, crank type, Brown & Tan color. **Furnished by EIU and installed by Contractor.** *Coordinate installation with Project Manager.*
6. Sanitary Napkin Dispensers – Semi-recessed stainless steel, convertible coin mechanism for 10 or 25 cents. Keyed to match existing campus wide keys.
7. Waste Receptacles – Semi-recessed stainless steel, minimum 18 gallon capacity. Container shall lock into frame. Mount unit to comply with ADAAG and IAC.
8. Electric Hand Dryers – No touch, electronic operation and automatic shut-off. 208/240 volt.

9. Mirrors – Stainless steel framed glass-mirror units. Vandal resistant mounting. Top of mirrors shall be at least 76” AFF when the bottom of mirrors are installed to meet ADAAG requirements.

Manufacturers:

1. Bobrick Washroom Equipment, Inc
2. American Specialties, Inc.
3. Bradley Corporation.

EIU does not provide recessed toilet accessories, but only those listed above. *Those items provided by EIU may or may not be those listed above, but those that are currently being used by the University.*

Recessed or semi-recessed waste containers identified in Item #7 is not a standard but is a design option. Discuss the use with the Project Manager.

END OF SECTION

SECTION 11130 - Media Services

The following items shall be included as a part of the project unless otherwise indicated by the Project Manager:

1. Projection Screens
2. Audio Systems
3. Lighting controls, floor boxes, and accessories.

1. Projection Screens

When determining a size and type of projection screen for a particular application, use Milliken M.K. Jr. "Angles of View", Vol. 1 Da-Lite Screen Company. *See Section 11132.*

2. Audio Systems

When turning a rough design into a functional system, use Giddings, Philip 1990 reference manual "Audio Systems Design and Installation", Focal Press. *See Section 11135*

3. Standard Classroom and computer Laboratory Lighting and Light controls.

Standard classroom and computer laboratories shall have three switches for the control of the fluorescent light fixtures. These switches shall be connected as follows:

- Switch 1 - Fluorescent lights low level over seating.
- Switch 2 – Fluorescent light high level over seating.
- Switch 3 – Fluorescent light row near chalkboard/projection screen.

4. Auditorium Lighting and Light Controls

1. Auditoriums shall have the fluorescent light fixtures controlled by low voltage relays. The lights shall be zoned as follows:

- Zone 1 – Fluorescent lights low level over seating area
- Zone 2 – Fluorescent lights high level over seating area
- Zone 3 – Fluorescent light row near chalkboard/projection screen
- Zone 4 – Reserved

2. At each entry door, a single switch shall control Zone 1. A bank of switches at the front on the room shall control all zones.
3. Acceptable relays are available from these manufacturers: Pass Seymour/Legrand, GE, Horton Controls.
4. Along with the fluorescent light fixtures, dimming incandescent fixtures shall be installed. These fixtures must be able to provide a uniform 10 foot candles of illumination at the writing surface of the seating area(s). The University will provide a computer-controlled dimmer to be connected by the Electrical Contractor to the incandescent fixtures. The lights shall be zoned as follows:

Zone 5 – Incandescent lights over seating area.

Zone 6 – Incandescent lights over chalkboard/projection screen area.

Zone 7 – Incandescent lights for aisle (where applicable).

Zone 8 – Reserved.

5. Wall sconce lighting is encouraged, where applicable, and when provided is to be connected to the University provided computer-controlled light dimmer.

5. Floor Boxes for Multimedia Systems

1. Floor boxes in multimedia systems must have panel space to accommodate six (6) connectors and one (1) electrical panel. The floor box shall have:

1 quan. - Duplex receptacle 120 VAC 20 Ampere on a dedicated circuit.

1 quan. – Lan connection.

1 quan. – Empty 1 ½” conduit to the computer/video projector.

1 quan. – Empty ¾” conduit to each speaker.

2. The only know floor box meeting these requirements is the ACE Backstage™ “Full Pocket”.

6. Wall Boxes for Multimedia Systems

1. Wall boxes in a multimedia system must have panel space to accommodate six (6) connectors and one (1) electrical panel. The wall box shall have:

1 quan. - Duplex receptacle 120 VAC 20 Ampere on a dedicated circuit.

1 quan. – Lan connection.

1 quan. – Empty 1 ½” conduit to the computer/video projector.

1 quan. – Empty ¾” conduit to each speaker.

2. The only known wall box meeting these requirements is the Wiremold™ “WallSource Multiple Service Box”.

END OF SECTION

SECTION 11132 – Projection Screens

The following items shall be included as a part of the project unless otherwise indicated by the Project Manager:

1. *When determining a size and type of projection screen for a particular application, use Milliken M.K. Jr. “Angles of View”, Vol. 1, Da-Lite Co.*
2. *Conduct pre-installation meeting to verify project requirements and manufacturer’s instructions.*
3. *Motorized projection screens require common work electrical power for conduits and wiring.*
4. *All manual screens should be no larger than 10’ wide.*
5. *The screen surface shall be seamless Matte White.*
6. *The location of the projection screens and equipment are critical. Verify placement of all components with Project Manager and A/E prior to installation.*
7. *Contractor shall be responsible for providing required blocking for mounting the projection screens.*
8. *Install projection screens in locations and per arrangements shown on the drawings.*
9. *Projection screens and associated components shall be secured in accordance with the manufacturer’s recommendations and as specified in the project documents.*
10. *Coordinate layout and installation of projection screens with the other work in ceilings and walls, including light fixtures, HVAC equipment and finishes.*
11. *Install in accordance with manufacturer’s printed instructions. No deviation from these instructions will be permitted.*
12. *Protect all projection screens at all times before and after installation until such time as the project is turned over to the owner. Keep screens in a dry, ventilated area, at temperatures less than 80 degrees.*
13. *Acceptable Manufacturers:*
 - a. *Da-Lite*
 - b. *Draper*
 - c. *Or an approved equal*

END OF SECTION

SECTION 11135 – Audio-Visual Equipment

The following items shall be included as a part of the project unless otherwise indicated by the Project Manager:

1. *All permanently installed audio-visual equipment and systems require common work with electrical power, conduits and wiring.*
2. *Contact Project Manager for additional details covering electrical power requirements. Location of audio-visual equipment is critical.*
3. *Conduct a pre-installation meeting to verify project requirements and manufacturer's instructions.*
4. *Verify placement of all components with Project Manager and A/E prior to installation.*

END OF SECTION

SECTION 15060 - PIPE AND PIPE FITTINGS

1. PIPING

1. Provide seamless steel piping for all piping 2-1/2 in. and larger. Piping 2 in. and smaller shall have butt weld seams.
2. 0-150 psi steam, 2-1/2 in. pipe and greater shall be schedule 40 steel pipe with welded fittings. Steam supply lines 2 in. and smaller shall be schedule 80 black steel pipe with cast-iron screwed fittings. All flanged fittings shall be provided with spiral wound metal gaskets equal to FLEXATOLIC steam gaskets.
3. Steam condensate lines shall be schedule 80 steel pipe with matching fittings.
4. Air conditioning condensate drainage lines shall be type "L" copper piping. Minimum size shall be 1-1/2" or larger as required for proper condensate drainage. Drain lines shall be trapped with sufficient trap seal depth to prevent air leakage from or into the air side of the system and to prevent flooding of condensate pans. Traps shall be constructed with unions and cleanouts on both sides of the trap to allow for field cleaning and drainage. Locate traps in accessible areas to allow field service.
5. Domestic water piping shall be copper piping type "L" above slab; type "K" below slab. Caution should be taken to avoid a multimaterial system, e.g. do not use both copper and ferrous piping in the same distribution system. Underground site piping shall be ductile iron with mechanical or slip joints.
6. All underground piping shall be installed with a tracer wire so that it maybe located in the future.
7. Chilled water and heating hot water piping for interior applications above grade shall be copper or schedule 40 steel for sizes 3" and smaller. Schedule 40 welded steel piping shall be used in the larger sizes. For direct buried chilled water piping, use welded schedule 40 steel pipe with a preinsulated jacket (contact EIU for specific details).
8. Refrigerant piping: Copper type "ACR".
9. Natural gas piping: Schedule 40 black steel pipe above grade and shall be painted in exterior locations. *Underground shall be polyethylene with fusion welded joints were the pipe goes to above grade it shall be steel with the proper coating.*
10. Compressed air or vacuum piping: Copper type L pipe.

11. Condenser water piping: Schedule 40 black steel pipe.
12. Internal building sanitary and storm piping: standard weight cast iron soil and fittings of like material. Joints shall be no-hub (aboveground) and bell and spigot (below ground). No-hub is not permitted for underground use. Plastic based (Schedule 40 or SDR 35) or concrete based piping shall be used for mains external to the building.
13. All sprinkler piping shall be schedule 40 steel pipe.
14. *All piping through floors shall be sleeved. The sleeve shall extend 2" above the floor and shall be sealed.*

2. UNIONS

Do not use dielectric unions in closed-loop piping systems. Use a brass or bronze valve adapter, fitting or union between copper and iron instead of a dielectric union. Dielectric unions shall be used on open loop systems.

3. AIR VENTS

1. Automatic air vents with isolation valves shall be installed at the high point on all overhead down-feed mains. The discharge drain shall be extended to a suitable floor drain. Spiral Therm spiral top vent is preferred.
2. An air chamber with manual vent shall be provided at high points on lines above finished ceilings and in areas where a safe and suitable drain point is not readily available.
3. Manual air vents shall be provided at all equipment connections or other points required to remove air from the systems.
4. All manual drains and vents shall be provided with plugs.

4. JOINING OF PIPING

1. All steam, condensate, chilled water and condenser water piping 2-1/2 in or larger shall be installed with welded joints. Victaulic type pipe connections are not permitted except on connections to equipment and fire protection systems
 2. Silver solder shall be used to join all copper pipe 3" and larger. *All underground copper pipe joints shall be silver soldered.*
- END OF SECTION

SECTION 15100 - VALVES

1. VALVES

Valves shall be installed within the system to provide the required control service and to allow isolation for inspection, maintenance and repair of each piece of equipment, fixture, each main and branch service loop. Ball valves shall be used in sizes 6" and smaller. Valves 2-1/2" and larger shall have flanged end connections. Each valve shall be installed so that it is easily accessible for operation, visual inspection and preventative maintenance.

2. VALVES IN STEAM LINES (80LBS. TO 150 LBS.)

Forged steel, 300lb., bolted flanged yoke bonnet, outside screw, rising stem; flanged ends with metal spiral wound gaskets. Bodies shall be cast carbon steel. Valves shall be repackable under pressure.

1. Gate Valves: Stem and solid wedges shall be stainless steel. Seat rings shall be stainless steel. Stuffing boxes shall have high temperature packing. Condensation chamber shall be provided immediately below the packing.
2. Globe Valves: Disc shall be stainless steel. The seat shall be stainless steel.
3. Check Valves: Swing disc and seat ring shall be stainless steel.

3. VALVES IN STEAM LINES (0LBS. TO 80LBS.)

1. Gate Valves (2" and smaller): All bronze, threaded, solid disc, union bonnet, rising stem, 150 lbs. repackable under pressure.
2. Gate Valves (2-1/2" and larger): Iron body, bronze seat and disc, bronze stem, solid disc, outside screw, rising stem, 125 lbs., repackable under pressure.
3. Globe Valves (2" and smaller): As specified for gate valves of the small size.
4. Globe Valves (2-1/2" and larger): As specified for gate valves of the same size.
5. Ball Valves (2" and smaller): All bronze, threaded, stainless steel ball and trim, Teflon seats and seals, 125 lbs.
6. Ball Valves (2-1/2" and larger): Iron body, stainless steel ball and trim, Teflon seats and seals, 125 lbs.

7. Check Valves (2" and smaller): All bronze, threaded, swing type, screwed in cap, 125 lbs.
8. Check valves (2-1/2" and larger): Iron body, bronze trimmed, 125 lbs..
9. Install strainer ahead of control valves.

4. VALVES IN WATER LINES

1. *Ball* Valves 3" or larger: Same as gate valves in 0lb. To 80 lbs. steam lines.
2. Check Valves: Same as 0 lb. To 80 lbs. steam lines.
3. Ball Valves: (2-1/2" and smaller): All bronze body with stainless steel trim and full port.

5. BALANCING VALVES

1. Valves (2" and smaller): Use 150 lb., all bronze, renewable composition disc, union bonnet, lockshield stem, repackable under pressure, or 175 lb., threaded brass body, wrench operated ball centric valve suitable for 250 F continuous operating temperature, adjustable stop.
2. Valves (2-1/2" and larger): Same as globe valves in 0lb. To 80 lbs. steam lines; hand wheel shall be tagged with number of turns that valve is open, or 175 lb., flanged iron body, wrench operated ball centric valve suitable for 250 F continuous operating temperature, adjustable stop.

6. VALVES IN STEAM CONDENSATE LINES:

1. Line valves shall be specified for service in steam lines, 80 lbs. to 150 lbs. Class of service shall be based on pressure of steam upsteam of check valve (inlet side of steam trap).
2. Drain valves shall be 3/4" ball valves with a removable plug, as specified for valves in water lines.
3. Spring loaded check valves shall be silent center guide, 250 lb., semi-steel body, bronze trim, 1/16" raised face.
4. Install a strainer ahead of steam traps.

7. VALVES IN CHILLED AND HOT WATER HEATING SYSTEMS

1. Blowdown *ball* valves shall be provided for all strainers, minimum size shall be 2" for strainers 4" and larger. Provide each blowdown valve with a removable plug.
2. Strainers shall be installed upstream of all pumps and control valves.
3. Shut-off valves with ball drain valves shall be provided in branches and risers
4. Lock-shield balancing valves shall be provided at all units and in return risers where required.
5. Automatic vents shall be provided on all convectors and radiators.

8. VALVE TAGS

Each valve in each piping system shall be tagged with a brass, aluminum, or plastic laminate tag. This tag shall indicate the valve number and whether the valve is a steam, hot water, chilled water valve... etc.

9. ACCEPTABLE MANUFACTURES

All valves must made in the USA.

1. Milwaukee Valve
2. Apollo Valve
3. NIBCO

END OF SECTION

SECTION 15150 - THERMOMETERS AND GAUGES

THERMOMETERS, GAUGES AND TEST OUTLETS

1. Thermometers shall be of the industrial type with separable wells. They shall be provided wherever temperature differentials are required for proper operation and servicing of the connected equipment.
2. Pressure gauges shall be provided wherever required for proper operation, servicing or safety of the connected equipment.

GAUGES

1. Gauges shall be 4-1/2" diameter single spring type with recalibration adjustment in the dial face and with ball valve shut-off. Tailor the range to the application. Gauges shall be accessible and readable from the floor level. Install remote sensing gauges as required to conform with this requirement.
2. Magnahelic dial type gauges in systems of more than 5000 cfm shall be installed across all filters. (No inclined manometers.)
3. Provide a steam gauge upstream and down stream for all PRV's and steam control valves over 1" in size.

THERMOMETERS

1. Thermometers shall be red-reading-in-glass type with 9" magnified column, Fahrenheit scale, recalibration feature, adjustable head and brass separable socket. Thermometers shall be accessible and easily read. Install remote head type of thermometer as required.
2. Piped systems and storage tanks: Locate thermometers as required on all systems or tanks where temperature should be identifiable for operation and maintenance.

END OF SECTION

SECTION 15190 - IDENTIFICATION

PIPE IDENTIFICATION

1. All pipes in the piping systems shall be identified, both where exposed in a room and where concealed from view in a chase or above a hung ceiling. Pipe type and flow direction shall be indicated.
2. Stencil legends with proper color coded background or provide color coded banding for proper identification of pipe contents at the following locations:
 1. Behind every access door or panel.
 2. At each valve.
 3. At each riser and/or "T" joint.
 4. At each point of entry or exit where pipe passes through walls, floors or ceilings.
 5. At intervals not exceeding 50'-0" apart on long runs.
 6. Per ANSI standards.

IDENTIFICATION OF CONTROL COMPONENTS

Control Contractor shall identify each instrument in the control panel to designate its function including the field device ID which it controls.

MECHANICAL SYSTEM COLOR IDENTIFICATION

1. Use markers with a yellow color field and black lettering to identify flammable or explosive materials, chemically active, or toxic material, radioactive materials, or materials at extreme temperatures or pressures, including:
 1. Natural gas or propane
 2. Fuel oil
 3. High and low pressure steam
 4. Specialty gases
 5. *Hydronic Hot water*
 6. *Compressed Air*
2. Use markers with a green color field and white lettering to identify liquids or liquid admixtures of inherently low hazard, including:
 1. Cold water
 2. Hot water
 3. Condenser water
 4. Chilled water
 5. Deionized or distilled water

6. Storm & sanitary sewer

3. Use markers with a red color field and white lettering to identify fire quenching materials, including:
 1. Water
 2. CO₂
 3. Foam

VALVE TAGS AND NUMBERING

All valves shall be tagged with 1 1/4 in. diameter, 0.040 in. thick brass or laminated plastic tags with numbers and letters. A complete directory of valves, pump motors, controls, devices, and other equipment, giving use, location, size, and manufacturer's number of each shall be prepared with permanent ink, framed under glass, and hung in the mechanical equipment room where directed by the University. A copy of this list shall also be part of the O&M manual.

In a remodeling project or a project of limited scope, the valves shall be tagged as indicated above.

FLOW INDICATORS

Provide an arrow markers indicating the direction of flow. If flow may be both ways, show double-headed arrows.

END OF SECTION

SECTION 15400 - PLUMBING FIXTURES & SYSTEMS

1. Institutional grade plumbing fixture specifications are based on availability of repair and replacement parts and shall be centered around the listed manufacturers. Accessible units shall comply with State and Federal accessibility guidelines. The State of Illinois Plumbing Code shall apply.
2. Water meters are required on a per building basis. Infrared plumbing fixtures shall be provided with permanent power connections. No self-closing (metering) faucets are allowed.

3. PLUMBING FIXTURES & SYSTEMS

1. WATER CLOSETS

Floor or wall mounted water closets shall be vitreous china. Flush valves shall be Sloan or Zurn. Acceptable manufacturers are:

1. Kohler
2. American Standard
3. Toto
4. *Zurn*

2. URINALS

Urinals shall be vitreous china wall hanging type. Flush valves shall be Sloan, Toto, or Zurn w/ the following acceptable manufacturers.

1. Kohler
2. American Standard
3. Toto
4. *Zurn*

3. LAVATORY

Lavatories shall be vitreous china. Provide 17 guage *brass* chrome plated traps and tailpieces.

Acceptable bowl manufacturers are:

1. Kohler
2. American Standard
3. Crane
4. *Zurn*

4. FAUCETS

Faucets shall be provided with lever handles or infrared sensor with permanent power. 0.5 gpm vandal resistant aerator shall also be provided.

Acceptable faucet manufactures are:

1. Chicago Faucet (not acceptable with infrared feature)
2. T&S Brass
3. Kohler
4. Zurn
5. Sloan (electronic faucets only)

5. MOP BASINS

Mop basins shall be floor level type precast terrazzo mop basin or a wall hung cast iron sink on each floor in the janitor's closet. A ½" CW connection shall be provided with each mop sink and this shall be located 12" above the faucet. This connection shall be used for a future (owner provided) chemical system.

Acceptable faucets manufacturers:

1. Chicago Faucet
2. T&S Brass
3. Kohler
4. Zurn

6. SAFETY SHOWERS AND EYEWASH STATIONS

Safety showers and eyewash stations shall be located in every laboratory adjacent to the exit doorway and shall be clearly identified for that purpose. Coordinate with the EIU safety officer.

7. SHOWER FAUCETS

Acceptable Manufacturers:

1. Symmons
2. Speakman
3. Leonard
4. Zurn

Shower heads shall be 1.5 – 1.75gpm.

8. VENDING AREAS

Provision shall be made for valved and capped hot and cold water, and floor drains if needed.

9. FROST FREE HYDRANTS

Frost free hydrants shall be of the non-freeze integral vacuum breaker type with a lockable cover, and should be arranged around outside of building so that 100 ft. of the hose shall reach all portions of the perimeter. Each frost free hydrant will have its own isolation valve inside the building.

Acceptable Manufacturers:

1. Zurn
2. Wade

3. Woodford

10. ELECTRIC WATER COOLERS

Accessible units: Individually wall mounted type with stainless steel receptors are preferred.

Acceptable manufacturers:

1. Halsey-Taylor
2. Elkay
3. Oasis

11. FLOOR DRAINS

Shall be provided in all mechanical equipment rooms and adjacent to all air handling units.

Acceptable manufacturers:

1. Zurn
2. Wade
3. Josam

12. FLOOR CLEANOUTS

Shall have round top and bronze plug.

Acceptable manufacturers:

1. Zurn
2. Wade
3. Josam

12. GREASE INTERCEPTORS

These units shall be located in accessible exterior locations.

13. STORM AND SANITARY SEWAGE EJECTORS

1. Duplex pumps are required. Only systems, which require the use of these pumps, shall be connected to these pumps. Gravity systems shall be utilized where possible. The pump motors on these units shall be located in a serviceable location. Submersible pumps are not preferred.

2. High water alarms shall be connected to the building automation system for remote monitoring. Provide emergency power supplies to these units where possible.

3. Acceptable manufacturer:

1. Metropolitan pump
2. Aurora pump
3. Weil pump

14. DOMESTIC HOT WATER PIPING

1. Recirculating hot water systems will be required on most systems. This return piping needs to be routed to the faucet outlet as closely as possible. Hot water shall be available during the first cycle of the faucet.
 2. Acceptable manufactures:
 1. Bell & Gossett
 2. Taco
 3. Grundfos
15. THERMOSTATIC MIXING VALVES.
1. Hot water systems shall have a large thermostatic mixing valve at the hot water heater to protect the entire building. Individual mixing valves under the sink are not allowed.
 2. Acceptable manufactures:
 1. Lawler
 2. Leonard
 3. Bradley
16. SUPPLY ANGLE STOPS.
1. Lavatory and sink supply angle stops shall be Wolverine Brass Cat# 53337.

END OF SECTION

SECTION 15520 – STEAM AND CONDENSATE SYSTEMS

BUILDING HEATING AND STEAM DISTRIBUTION SYSTEMS

1. The campus steam pressure is *150* psi. Steam systems shall be provided so unused portions of the system may be isolated during the summer. Divide the steam distribution piping into separate systems as reasonably possible to allow for system isolation and to facilitate metering.
 1. Low pressure steam supply for reheat applications and other heating equipment requiring all-year service. Hot water systems in lieu of steam are preferred for reheat applications with outdoor reset capability.
 2. Low pressure steam supply (5-15 psi.) and return for domestic water heaters.
 3. Low pressure steam 10-15 psi. for steam absorption units. Condensate shall be metered separately in this application.
 4. High pressure steam supply (50 psi (adj.) for steam powered condensate pumps. Individual pressure regulating valves are required to these units.
2. Condensate for all building steam services shall be returned through a steam powered condensate pump(s) with an integral cycle counter. This cycle counter shall be connected to the building automation system.
3. All return systems within the building shall be arranged to flow by gravity (without pockets or lifts) etc., into receivers.
4. Acceptable steam PRV manufactures include; Spence, Fisher, Armstrong, and Leslie.

END OF SECTION

SECTION 15532 - HYDRONIC SYSTEMS

WORK INCLUDES

1. Chemical treatment cleaning of closed loop chilled and hot water systems are very important for proper biological control and for the longevity of these piping systems. EIU *project manager* should be consulted prior to the bidding of the project for coordination of this item. EIU *will* provide these chemicals to the contractor for the proper cleaning of the system. System volume information is needed for proper coordination of this item. The engineer shall review the cleaning process for each project with the EIU project manager before the project is bid.
2. Heating hot water systems which may experience freezing conditions shall be designed with a *non-dyed* propylene glycol freeze protection solution. This situation must be approved by EIU. Glycol is not allowed in the chilled water systems connected to the campus chilled water loop.
3. *The campus chilled water system is a primary-secondary variable speed distribution system.*
4. *All hydronic systems shall be variable speed pumping and pressure independent control valves for control valves over 1”.*
5. *Acceptable manufactures for hydronic pumps:*
 - a. *Aurora*
 - b. *Grundfos*
 - c. *Taco*
 - d. *Bell & Gossett*

END OF SECTION

SECTION 15712 - COOLING TOWERS

GENERAL

1. A crossflow updraft design shall be used in new construction.
2. Condenser water shall be treated with automatic chemical feed systems. EIU will provide the chemical feed system and the contractor shall install.
3. Towers shall not be located in pits or surrounded by close-fitting screens, which impede tower performance. If this does occur, the manufacturer's clearance recommendations shall be followed.
4. Tower systems designed for winter operation shall have an indoor condenser water sump.
5. Where feasible, towers shall be of packaged construction. Wood fill and construction *is not allowed*.
6. Covers shall be provided for all hot water basins.
7. Cooling tower basins: Hot water and cold water tower sump basins shall be stainless steel (Type 304) or fiberglass. Bare or painted galvanized construction shall not be used.
8. The design and positioning of the tower shall avoid the re-entry of drift and to keep it away from building air intakes.
9. Fan Speed Control shall be provided with variable frequency drives.
10. Towers are to be furnished with ladders and handrails in compliance with current OSHA requirements.
11. A frost free hydrant and a 120 V electrical outlet shall be located within *10 ft.* of the tower.
12. *Tower make-up and blow-down shall be metered. The fill connection shall be in the mechanical room by the chiller.*
13. Acceptable Manufacturers:
 1. Baltimore Air Coil
 2. Marley Company
 3. Evapco

END OF SECTION

SECTION 15850 - VENTILATION

1. DESIGN REFERENCES

1. ASHRAE Standard 90.1 and ASHRAE Energy Efficient Building Standards shall be considered.
2. The minimum outdoor air design conditions shall be -10 F heating and 98 F / 75 F DB/WB cooling.
3. Demand based ventilation shall be used in new systems.

2. AIR-CONDITIONING REQUIREMENTS

1. Air quantities, duct sizes and fan capacities should be determined in proper relation to the probable future internal heat gain.
2. All ductwork, except exhaust, shall be insulated. Exterior insulated ductwork applications shall be provided with a durable product rated for exterior use.
3. Space for future cooling coils shall be considered in new heating only units. Supply fan motors should be sized with capacity to operate at necessary higher speeds and higher static pressures when future cooling coils are added.
4. In all cases, care shall be taken so exhaust air will not be introduced back into occupied areas through intake louvers, windows, or other air supply openings. Intake louvers must be so located that leaves, dust, debris, etc. will not be easily taken into the air handling systems.
5. Kitchens, laboratories, etc., where exhaust hoods are required shall have mechanical exhaust fans with capacities capable of moving a volume of air necessary to produce a minimum face velocity of 100 FPM across hood openings. Higher or lower face velocities shall be used where recommended. Fume hood systems shall be designed with a 100 fpm face velocity at the 18" high sash position. Fume hoods shall have stops provided at the 18" position.
6. Exhaust discharges and fans serving fume hoods shall be external to the building. Discharges must be projected vertically with minimum exhaust velocities of 3,000 to 4,000 FPM.

7. *Chilled water coils shall be selected with a high delta T of 16deg to 20 deg. Coil construction shall be P style drainable with .008 fins and tube wall .035 copper.*
8. *Steam coil construction shall be .008 fin size and .049 copper tube wall.*

3. FAN REQUIREMENTS

1. Individual systems larger than 50,000 CFM shall be avoided. Rooftop air handling units are prohibited unless specifically approved by EIU.
 1. Fans serving variable air volume systems shall be provided with variable frequency drives and interfaced with the building automation system. Coordination of the supply and return fans are required. Care shall be taken not to over pressurize the ductwork if a bypass is elected to be provided with the variable frequency drive.
 2. Fans over 3.0 HP shall be provided with a variable frequency drive and interfaced with the building automation system.

4. VOLUME DAMPERS

1. Volume dampers shall be used to enable proper balancing of exhaust and supply systems. They shall be installed in all branch take-offs from main ducts and in the ductwork before the final diffuser connection. Consult SMACNA standards for proper design.

5. DUCTWORK

1. Welded round stainless steel ductwork 316L shall be used on kitchen exhaust hoods and fume hoods in laboratory settings. Ducted return air systems are preferred. EIU shall specifically approve all plenum return systems that are proposed.

6. DUCTWORK INSULATION

1. Duct wrap insulation is preferred to duct lining insulation. Duct lining insulation is acceptable in areas where it can be used to reduce the noise potential of an air handling system. Unfaced fibrous materials with exposure to the airstream is not acceptable.

7. FILTERS

1. 2" pleated filters are preferred. Filters sizes of 24" x 24" are preferred. Filters shall be readily changeable and their supporting racks shall be of rigid construction.

8. AIR HANDLERS

1. Approved Manufactures:
 1. Trane
 2. Mcquay
 3. York

9. GRILLS AND DIFFUSERS

1. Approved Manufactures:
 1. Price
 2. Titus
 3. Carnes

10. EXHAUST FANS

1. Approved Manufactures:
 1. Greenheck
 2. Cook
 3. Carnes

11. TESTING AND BALANCE

1. Air and water balance testing and reports are required on all new systems and existing systems that have had major changes. EIU will hire an independent balancer to perform this work.

END OF SECTION

SECTION 15950 - TEMPERATURE CONTROL

1. The EIU campus has a central Andover building automation/energy management system. The head end computer and server resides in the **Control Shop**. Most campus buildings have at least one individual Andover building panel that reports to the server. EIU utilizes the campus fiber optic network as a communication link between building panels and the server. Temperature control web pages are available for the A/E to review. The A/E is expected to review these pages to make sure that new systems are operating as designed. EIU PM shall be contacted for access to the off-campus web server.
2. A typical building temperature control system shall consist of a DDC building controller to communicate to the campus "head -end" system. The system will utilize *electrically* actuated terminal devices. *Pneumatic actuation of valves 3" or larger is preferred. Variable Air Volume (VAV) boxes, controls shall be DDC so that minimum and maximum airflows can be monitored as well as other details regarding the operation of this VAV box.*
3. VAV boxes, if provided, shall be provided with hot water or electric reheat coils. Hot water heating systems are preferred with outdoor air reset capability. Air handling units, which are required to condition 100% outdoor air, shall be provided with face and bypass dampers on the heating coil. Individual rooms shall be provided with an individual thermostat. Grouping of rooms to a single VAV box should be limited to 3-4 rooms with similar design characteristics.
4. The engineer shall specify a sequence of operation for the temperature control system. Any modifications to the sequence of operation during the construction of the project shall be included in the final O&M manuals. The engineer should review all required shop drawings, O&M manuals, as-built drawings including a final "points" list of the Andover panel. The "points" list shall indicate all utilized input and output points as well as any spare points that may be available. The engineer shall also review the presentation of the graphics on the web pages as part of the punch list and project substantial completion package. The pressure drop on all control valves shall be reviewed. All system components shall be reviewed to provide for a complete, operational, and maintainable system.
5. All air handling units shall be provided with an economizer control package, e.g. 100% outside air shall be provided to the building space to provide for off season cooling needs. (EIU approval needed if this is not provided.)

6. Preferred manufacturers for control devices shall be Powers, *Belimo*, and Barber-Coleman.
7. Thermostats shall be non-adjustable and report to the Andover system. Each thermostat shall be mounted 48 inches AFF.
8. Include updates to all programming effected by any project so that the system is coordinated with the existing building control functions. Software changes shall be documented in the O&M manuals.
9. Temperature control web pages shall be provided on all new control projects. Refer to Booth Library floor plan AH1 Lv1 for the standard floor plan graphic and Booth Library AH1 for standard air handler graphic.
10. Campus utility metering is important. Chilled water, domestic water, condensate from steam, and electricity are measured on a per building basis in the major campus buildings. Controlotron meters can be found in a number of our buildings. Cycle counters are installed on the steam powered condensate pumps. All of these meters report back into software in order to monitor monthly utility usage on a per building basis.
11. Temperature Control Wiring: All temperature control wiring shall be run in conduit in mechanical rooms and exposed public areas. Other temperature control wiring in concealed spaces shall be run in an organized fashion and supported independently, e.g. not strapped to adjacent systems. The use of bridal rings is suggested. Abandoned temperature control systems, wiring, and pneumatic tubing shall be removed in remodeling projects. *Wire numbers are required on all wiring at each termination point. All numbering to be machine generated. All labels to be heat set permanent markers and match wiring diagrams exactly.*
12. A campus compressed air system does exist in most locations. Some buildings have a temperature control air compressor. If the building's heating system is to operate during power outages, then the air compressor shall be provided with emergency power. All building panels shall be connected to the emergency power system.
13. Pneumatic tubing shall be polyethylene or copper and shall be installed in an organized manner. Copper shall be used in mechanical rooms. Copper control tubing shall be supported by cushioned pipe clamps.
14. Inputs and outputs shall be clearly marked and easily identifiable back to the temperature control shop drawings.

15. Control variables and devices shall be named with a consistent nomenclature as approved by EIU.
16. Routine and preventative maintenance task descriptions and frequencies shall be provided in the O&M manuals.
17. *The designer shall have a meeting with the controls group before designing the controls for a project.*

END OF SECTION

SECTION 16120 – WIRE, CABLE, AND MOTORS

1. BUILDING WIRE

1. All building wiring for secondary distribution, branch circuits and control wiring shall be stranded. All single phase branch circuits 120V and 277V shall have its own neutral wire. Wiring and its insulation shall be per NEC standards. MC cable is not allowed.
2. All wiring in buildings shall be installed in metallic enclosed raceways. No plastic raceways are allowed. No adhesives shall be used to support raceways, mechanical fasteners shall be utilized. For remodeling, some types of low voltage wiring may be installed exposed *using wire mold*; all locations must be approved by EIU.
3. For cables in vertical raceways, appropriate support should be provided to minimize damage to cable insulation.
4. All branch circuit and feeder wiring in a new building shall be in accordance with the established color code. Wiring installed during remodeling shall be in accordance with the color code established when the building was constructed, or in accordance with an established color code.

Color Code for 120/208 volt, 3 phase, 4 wire systems

Phase A- Black

Phase B – Red

Phase C – Blue

Neutral – White or per NEC

Grounding conductor– Green or per NEC

Color Code for 277/480 volt, 3 phase, 4 -wire system

Phase A – Brown

Phase B – Orange

Phase C – Yellow

Neutral – Gray or per NEC

Ground conductor – Green or per NEC

Color Code for 120/240 volt, 3 phase, 4-wire system

Phase A – Black

Phase B – Red

Phase C – Blue

Neutral – White or per NEC

Grounding conductor - Green or per NEC

2. CONDUIT

1. Conduit shall be provided with compression fittings. No set screw or indented fittings are allowed. Minimum conduit size shall be 3/4". Panel

feeders shall be installed in IMC or rigid metal conduit. Underground and below slab conduit shall be sch. 40 PVC and when conduit exits the slab or passes through a foundation wall it shall be rigid metal conduit. *Conduit fill shall not exceed 70% of NEC fill tables.*

2. *All floor penetration shall be sealed water tight.*

3. MOTORS

1. Motors smaller than ½ hp may be single phase 120V. Motors ½ hp and larger shall be three phase and either 208 or 480 V. If a variable frequency drive is installed, the connected motor shall be rated for VFD use.

4. DEVICES

1. All switches and receptacles shall be commercial grade and rated at a 20 amp minimum. Cover plates shall be stainless steel.

5. IDENTIFICATION

1. All panel directories shall be typed. All panels, disconnects, and motor starters shall be labeled. Labels shall reference EIU room numbers rather than construction document numbering. All breakers which power mechanical equipment shall be labeled on the panel directory. *All wiring shall be labeled at splices and final termination points with circuit and panel name. All labels shall be machine generated.*

6. PANEL BOARDS & DISCONNECTS

1. Approved manufactures:
1. Square-D
2. Cutler-Hammer
3. GE

7. VARIABLE FREQUENCY DRIVES

1. *All drives shall have a factory certified start-up. Pump ramp up rate shall be 15s and fan ramp up rate shall be 30s. All VFD's shall be provided with a bypass. The drive shall be wired to provide BAS control when in bypass.*

2. Approved Manufactures:
1. Toshiba
2. Square-D
3. *Allen-Bradley*

END OF SECTION

SECTION 16210 – EMERGENCY POWER GENERATOR SET

1. LOADS REQUIRING EMERGENCY POWER

1. Generator set shall power all code required loads. In addition, systems critical to building operation shall be provided with emergency power. Typical building critical loads include: egress lighting, fire alarm systems, IT closets, food storage equipment, sump pumps, ejector pumps, heating system including pumps and controls; and other appropriate loads.

2. ENGINE/GENERATOR SET

1. Diesel or natural gas powered engine generator sets shall be the required source of emergency power. Verify fuel source with EIU project manager.
2. The generator set shall be provided with integral mounted frame tank if applicable, automatic transfer switch, complete instrumentation, vandal resistant enclosure where applicable, and block and jacket heaters where applicable. Transfer switch shall have a programmable exerciser schedule. Underground diesel fuel storage tanks are not allowed for engine/generator sets. Provide a work platform to provide adequate access for maintenance and inspection. *Generator enclosure shall be whisper quiet.*
3. Acceptable manufacturers are:
 1. Caterpillar
 2. Kohler
 3. Onan
4. Acceptable transfer switch manufacture:
 1. ASCO
5. The complete installation of an engine generator set shall be certified and tested by a factory authorized representative of the generator set manufacturer. This shall include actual witnessed operation of the system under load for a period of two hours.

END OF SECTION

SECTION 16311 – HIGH VOLTAGE ELECTRICAL AND BUILDING SYSTEMS

1. The majority of the campus electrical service is provided in the following manner. Ameren-CIPS, the local utility company, provides *69KV power to a university owned substation located on the east end of campus. From the substation 12470V is fed to two switch yards on campus. There are still 4160V feeds on campus the future plans are to upgrade all feeders to 12470V. Ask the EIU project manager for an up to date campus one-line electrical diagram. These feeders are redundant in nature for the most part presently. The system is arranged in a loop type distribution with some radial feed section still in service. All changes to the system shall have provisions for going to 12470V with a loop feed.* In some areas of campus Ameren-CIPS provides the electrical power directly to the building.
2. A campus electrical master plan has recently been completed. The campus plans are to continue to migrate from 4160 volts to a 12.47 KV looped primary distribution. All new distribution equipment shall be specified as 12.47 KV where that primary voltage exists. For other new distribution, dual primary voltage transformers will be provided to enable switching to 12.47 KV when possible. Consult with EIU project manager on this item.
3. Transformers shall be located inside the building. The electrical rooms shall contain the primary disconnect switch; building transformer; main circuit breaker and secondary switchgear. Space and access are required for removal of switchgear or transformers should they fail in the future. The room shall be adequately ventilated. The electrical room shall only contain electrical equipment.
4. The low voltage distribution in new buildings or additions shall be 3-phase, 4-wire, 120/208 or 277/480 volt systems. Each transformer shall be an energy efficient transformer. If large horsepower motor loads are encountered in the building design for mechanical equipment, a separate 480-volt, 3-phase power system may be economically advisable and shall be considered. Transformers shall be of the dry type.
5. All transformers connected to the campus high voltage service shall be metered. The secondary side of the transformer shall be connected to the campus high voltage electrical monitoring system to measure demand and real time loads. (Consult with EIU on this item.) These meters are connected to the campus network *with a land drop or fiber optic connection.* There is a Square D system and meters on campus presently. Remote access to this system is available.

- F. Provide a one-line diagram of the building distribution system from the incoming high voltage feeder to the last low voltage distribution panel. This drawing is to be framed under glass and securely mounted to the wall in the transformer room.

END OF SECTION

SECTION 16500 - LIGHTING

1. In general, the guidelines of current IES Standards and current ASHRAE Standards 90.1 will prevail.
2. All exit signs must LED and consume two watts or less, unless the building is a historical landmark, then the limit shall be ten watts.
3. All High Density Discharge fixtures must be pulse start metal halide ballasts and bulbs, unless sodium is deemed necessary for consistency.
4. All fluorescent fixtures must be T-5 or 28w T-8 lamps and electronic ballasts. Preference will be given to longer life lamps. Lamp color temperature will be 4100K with a minimum of 80 CRI. 2'x2' or 2'x4' fixtures using bi-pin lamps are preferred. "U" tubes in 2x2 fixtures are not acceptable. Lamp length shall be no longer than 4 ft.
5. All rooms and corridors with a total wattage of at least 200 watts must have lighting controlled by occupancy sensors, timers, or photocells as designed and use dictates. Exceptions will be made on a case-by-case basis and may include rooms such as: lecture halls, auditoriums, fine arts performance areas, gymnasiums, mechanical rooms, etc. Harvesting of ambient lighting is encouraged where exposures allow. The Campus Energy and Sustainability Coordinator shall be involved with these discussions.
6. No incandescent lamps will be allowed unless specific program requirements dictate otherwise. In cases where such dimmers or aesthetic qualities dictate the necessity of such, specific approval shall be required prior to being incorporated into designs. Alternates to incandescent sources must always be offered.
7. All fixture lenses must be made of a non-discoloring material.
8. Application of lighting rather than "spill" from over-lighting in the space is required.
9. Parking lot area lights shall be Medallion 1 with flat lens by Spaulding Lighting dark bronze in color with a square *steel* pole. Parking lots shall have 25' poles and street lighting shall have 35'.
10. Side walk light shall be Holophane GranVille series luminaire mounted on a 12' Wadsworth pole with dark green finish.

11. See section 11130 requirements for standard classroom and computer laboratory lighting, light controls, and floor and wall boxes for media.

END OF SECTION

SECTION 16721 - FIRE ALARM SYSTEMS

1. EIU has a Simplex *True Site* fire alarm system on campus. All new building projects shall utilize a Simplex addressable fire alarm system complete with corresponding graphics installed on the *True Site* computer. Most campus buildings report at a **minimum** building alarm and trouble conditions to 2 central computers; one is located in the electrical shop and the other is at the county 911 facility. Other fire alarm systems such as Pyrotronics, Notifier,...etc. exist in some buildings on campus, and these will need to be modified on remodeling projects.
2. The communication scheme from the respective buildings on campus is via fiberoptics. The communication lines are connected in a token ring arrangement. This means that one building connects to the next building to the next building...etc. to a head end computer. Given this arrangement care must be taken when shutting off a building's fire alarm panel because this will degrade the fire alarm token ring network. Building outages of the Simplex network will need to be of a limited time and be coordinated with the EIU project manager.
3. System description and function: The automatic fire detection and alarm system, if required by code or by EIU, shall consist of the main control panel Simplex *4100ES*, audible-visual alarms, suppression systems supervision, sprinkler flow and tamper switches, supervision of magnetic door holders, necessary smoke and heat detectors, pull stations...etc. The fire alarm system shall provide the capability to shut down the HVAC system, and the elevator systems per code.
4. Fire alarm systems shall be addressable with voice notification. In residence hall applications, the individual rooms shall be provided with a voice notification speaker and *smoke detector with a sounder base*.
5. *Mass notification shall be in all new building-wide fire alarm systems.* This system is operational in several buildings on campus and should continue to be extended as building systems are replaced.
6. Wiring Scheme: A Class A looped wiring system (no "tee-tapping") in a single Class B conduit scheme shall be utilized on addressable systems. The location of the end of line resistors shall be placed in the fire alarm panel.
7. The fire alarm system needs to be designed per NFPA and pertinent ADA standards.

8. The fire alarm panel shall be located in a central public location near the front entrance to the building. Campus police and electricians need to service, maintain, and reset the system.
9. Any supplemental panels (ex. notification appliance circuit panels) shall be located adjacent to the main fire alarm panel. These should not be scattered throughout the facility. All wiring shall be color coded as indicated below. All wiring shall be tagged at all devices, junction boxes, panels, annunciators, and pullboxes. Junction boxes with terminal strips are preferred where appropriate with the connecting wiring labeled.
 1. Strobe circuit – Shielded twisted pair with red cover and white stripe
 2. Speaker circuit – Unshielded twisted pair with red cover and blue stripe
 3. Initiation circuit – Shielded twisted pair <30 pF/ft with red cover and no stripe
- E. The fire alarm system shall be tested in the presence of the design engineer and EIU electricians. Training shall be provided for each new system that is installed. If software revisions are made, EIU shall be provided with an updated copy of the software.
- F. Area of rescue assistance main panels shall be located next to the fire alarm control panel or annunciator panel.

END OF SECTION

SECTION 16800 – SPECIAL SYSTEMS

1. CAMPUS DATA AND VOICE SYSTEMS

1. The campus ITS department should be contacted for systems to be designed in this area. Consolidated Telephone inc. provides phone service to the campus presently. The campus is looking at the possibility of using “VOICE over IP” at some point in the future.
2. Wireless systems are growing in popularity across campus. Consult with the EIU project manager about this item.
3. Spare data connections next to Andover panels shall be provided in the mechanical rooms for purposes of plugging in portable computer equipment.
4. Data and Voice systems shall be installed to BICSI standards. A RCDD shall oversee and sign off on all new installations.

2. CAMERA SYSTEMS

1. These types of systems are growing in popularity across campus. The campus police, electricians and ITS departments have vested interests in these systems. Consistency of the systems is important if order for them to be maintained and to minimize the amount of software needed to operate these systems. There is an existing VICON central campus system on campus. Mike Drake should be consulted on this item. Some of video produced by these systems can be viewed across the campus data network. Issues of bandwidth shall be considered.
2. Consult with the EIU project manager on this item. Media services can also be contacted.

3. CAMPUS CLOCK SYSTEMS

1. There is a new wireless VISIPLEX clock system that has been installed on campus. Please consult with the EIU PM for more details on this system.

4. CAMPUS AUDIOVISUAL SYSTEMS

1. These systems are a necessary component of most modern classrooms at this point in time. Power and data wiring needs shall be coordinated with these systems. John Looby in media services shall be contacted for the layout of these systems in new classrooms.