APPENDIX G

UNIVERSITY OF MAINE SYSTEM DESIGN CRITERIA

1.0 Introduction. The word Designer, as hereinafter used, shall mean Architect or Engineer.

The Designer shall adhere to the following design criteria as appropriate:

1.1 The Designer shall adhere to all federal, state and local laws, codes and statutes relative to building design and construction. The University does not intend to list all pertinent laws, codes and statutes, but will outline below some relevant to design of University facilities along with other University design and construction requirements.

1.2 Accessibility. The entire design shall comply with Federal Section 504 Requirements of The Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA), and the Maine Human Rights Act. The design of the project shall comply with the currently adopted ANSI Standard A117.1 and ADA Accessibility Guidelines for Buildings and Facilities. Under current State Law, the Designer must submit a certification of compliance with the State Accessibility Law prior to the project being advertised.

Specific issues Designer should consider:

.1 One main entrance door on the exterior door set shall have power-assisted door opener activated by a push-plate wall switch.

.2 Power door opener shall be of a type which is activated only on demand; it must not be the type that assists users without having to push the wall plate.

.3 For the inner exterior door set, either all closers shall be set at or below the ADA push force maximum or one interior vestibule door will be equipped with a power-assisted opener in the same manner as a main entrance door. In this case, separate push plate circuits and switches shall be used for the exterior door and the inner vestibule door or the doors shall be equipped with a time delay sequencing the exterior and interior door actuators.

.4 Decision to have a power door on the inner vestibule door set will be provided to the Designer by the Project Manager.

.5 Provide all specified door and related hardware to conform to current requirements of the Americans with Disabilities Act (ADA). This includes being certain that no twist locking mechanisms are specified, such as on the insides of any room doors. An example of an acceptable locking mechanism for doors is Schlage XL11-800, or its most recent successor.

.6 All room locks or latch sets shall have lever operators or be a panic hardware type. The level operator on doors to hazardous areas such as mechanical rooms, electrical switch rooms, loading platforms, or other similar type locations shall have tactile warning on lever operator even though door may be permanently locked.

.7 Each multi-stall toilet room shall have one stall which complies with Figure 30(a) in ANSI A117.1 for size, fixture layout and grab bar location. No toilet partition latch shall require a twist motion to operate.

.8 All doors using closers must provide side clearance on the push side of at least 12".

.9 All multi-story buildings shall contain an elevator meeting accessibility standards. The elevator cab shall contain a hands-free telephone. Telephone must connect to a location which is monitored on a 24-hour basis. The elevator car shall also contain an emergency light and an emergency alarm, each of which must be powered by not only normal building power but also an emergency power source which is automatically available upon failure of normal power to the elevator cab.

.10 All stairs must have accessible handrails on both sides that run out at top and bottom, as well as all required "guards."

.11 Where platform lifts are to be installed, ensure conformance with Maine rules regarding two-way communication devices.

Plans must be reviewed to assure coordination between architectural, mechanical and electrical plans to assure requirements of different portions of the total project design do not compromise the accessibility design. Where conflicts are identified, the design must be adjusted to assure full compliance with ANSI A117.1 or the ADA Accessibility Guidelines, whichever is most stringent.

1.3 Carbon Monoxide in Residential Facilities. Designer must comply with requirements outlined in Maine Law H.P. 1286 – L.D.1744 regarding installation of CO monitors in new construction of residential facilities.

2.0 Entrance & Exit Design. Design must consider the following and be discussed with the Project Manager:

.1 Effect of wind on doors.
.2 Need for hold-open stops.
.3 Type of floor required. (e.g. water control, dirt control, surface traction, etc.)
.4 Handicapped access requirement.
.5 Draft control inside building.
.6 Full-depth frost footing below entry slabs, in part to prevent heaving that could interfere with door operation.
.7 Knox Box to be located near main entrance as coordinated through the Project Manager.
.8 Contract Documents must clearly delineate responsibility for wiring of exterior door openers and operating switches.

3.0 Blasting. Specify that General Contractor shall establish a process to identify and plan for blasting, including controls to prevent ancillary damage. Blasting plan must be submitted to Project Manager and no blasting shall occur prior to written approval from the Project Manager.

All blasting shall be specified using the following MasterFormat numbers as appropriate:

31 39 00 Rock Blasting
31 39 13 Trench Rock Blasting
31 39 16 Open Rock Blasting

4.0 Waste Management. The Owner is committed to a resource management strategy which reduces to a minimum the production of waste material while reusing, recycling or composting as much as possible of the remaining materials. Design should strive to identify opportunities to reduce, reuse or recycle waste from renovations or new construction. In an effort to promote environmental sustainability, the Owner requests the inclusion of specifications that encourage the recycling and reuse of materials associated with construction and demolition.

5.0 Sustainability & Energy Conservation. Board of Trustees policy requires that the University design and construct facilities in a manner that encourages environmental responsibility and promotes sustainable development on campus properties and in local communities (http://www.maine.edu/about-the-system/board-of-trustees/policy-manual/section1002/).

.1 By Board of Trustee policy and Governor's Executive Order, the selected design firm will be required to design to green standards compliant with Executive Order 27 FY11/12 when applicable and cost-effective. The Architect will use LEED standards whenever possible and will keep an accurate accounting of each area of energy conservation concern, with annotation indicating how LEED standards are used or why they were not included.

For more information, go to http://www.usgbc.org.

.2 New construction or substantial renovation must conform to ASHRAE Standard 62-2001 and ASHRAE Standard 90.1-2001 or current accepted version under any of the compliance methods specified in the standards. For the purpose of this section, "substantial renovation" means any renovation for which the cost exceeds 50% of the building's current value prior to renovation; see Title 10 MRSA 1415-D

Mandatory Standards for Commercial Construction, as amended. In addition, design should have an energy-use target that exceeds ASHRAE 90 by at least 20%; see Title 5 MRSA 1764 Life-Cycle Costs, as amended.

.3 The Architect shall prepare a Life Cycle Analysis as required by Title 5 MRSA 1762 No Facility Constructed Without Life-Cycle Costs, as amended, which states (in part):

"No public improvement constructed or substantially renovated in whole or in part with public funds or using public loan guarantees, with an area in excess of 5,000 square feet, may be constructed without having secured from the designer a proper evaluation of life-cycle costs, as computed by a qualified architect or engineer. The requirements of this section with respect to substantial renovation shall pertain only to that portion of the building being renovated. Construction shall proceed only upon disclosing, for the design chosen, the life-cycle costs…and the capitalization of the initial construction costs of the facility or building. The life-cycle costs shall be a primary consideration in the selection of the design…"

Any life-cycle costs must include:

- The reasonably expected energy costs over the life of the building, as determined by the Architect, that are required to maintain illumination, power, temperature, humidity and ventilation, and all other energy-consuming equipment in a facility;
- The reasonable energy-related costs of probable maintenance, including labor and materials, and operation of the building, replacement costs over the expected life of the facility, and any other ownership cost issues identified by the University; and,
- A comparison of energy-related and economic-related design alternatives. The University may direct the Architect to select, include and develop life-cycle costs for any viable alternatives that should be considered.
- The Life Cycle Analysis must be coordinated with appropriate LEED criteria. The Final report shall include an executive summary highlighting the analysis. The Architect shall submit during preliminary design phase a preliminary life cycle cost analysis to be reviewed with the University.

.4 Maine law (Title 5 MRSA 1762-A Water Conservation in State Facilities, as amended,) requires all University facilities to be constructed with water conserving fixtures. All designs shall incorporate fixtures meeting Maine law, unless a lower flow rate is required by the University and communicated in writing.

.5 Maine law (Title 5 MRSA 1769) requires all University owned exterior lighting fixtures having an output greater than 1,800 lumens to be full cut-off type which allow no direct light emission above a horizontal plane through the luminaries' lowest light-emitting point.

6.0 Utility Lines. In general, the Owner owns and maintains all above and below ground utility lines on University campuses. Any connections made by a Contractor to utility lines must receive prior approval. All connections shall be inspected to meet all applicable standards, and approved by the Owner upon completion and prior to backfilling. Design documents must identify responsibility for all required connections to site utilities.

6.1 Water Meters. Water meters are required in all buildings. Water meters shall be the same size as the distribution main on all sizes up to and including 2". Larger mains shall be served by multiple 2" meters or larger single units as determined by the Owner.

6.2 Electricity. Electric meters are required in all University buildings. Meters should have a multiplier of 1, 10 or 100. Where secondary metering is provided by local utility, metering requirements will be in accord with utility requirement.

Where primary service exists on campus, the Owner normally will provide the primary service to the transformer vault or transformer pad mount including the installation of necessary transformers and primary switching. The Designer shall specify in the transformer vault, or at the transformer pad mount, ground rods and necessary ground cable for the grounding of the primary power. Secondary power for buildings will normally be 120/208 or 277/480 volt 3 phase, 4 wire.

Designer shall ensure design documents state at what date and time the Owner will provide electrical service during the construction project.

Any electrical outlet that is placed within 6 feet of a water source shall be a GFI-protected outlet. Design requirements are as required under OSHA's Electrical Standard 29 CFR 1910.303(b)(1) as enforced by the Maine Bureau of Labor Standards and the National Electric Code, NFPA 70.

6.3 Heating. Coordinate with the Project Manager to provide heating and fuel storage systems to meet the campus needs. All above ground oil storage system designs must be engineered to ensure secondary containment of the stored materials is available in the event of failure of primary containment system.

.1 At UMaine's Orono campus and USM's Portland campus, most buildings are heated from a central steam heating plant with distribution pressures as follows: UMaine: 50psi Steam. USM-Portland: 15psi Steam.

.2 At USM's Gorham campus, most buildings are heated from a central hot water plant with water circulated at 300 degrees at 300psi.

.3 Other campuses have individual, low pressure building heating systems using either hot water or steam.

.4 Designer shall ensure design documents state at what date and time the Owner will provide heating service during the construction project on campuses with central heating plants.

.5 Where a campus is served by a central energy management system, the design of the heating, ventilation and air-conditioning system shall make provisions for interconnection with this system.

6.4 Gas. Increasingly, University campuses are being connected to gas pipelines, connection to which should be included in the work of the Contractor. However, when gas service will be from a bulk LP tank, the Owner shall determine if there is an existing bulk tank of sufficient size in the vicinity of the proposed building so that another tank is not required or if a new tank is required to serve the new facility and any adjacent buildings. If a new tank is required, it shall be installed and connected as part of the construction contract. Connections to existing tanks may be part of the contract if it is in the best interest of the Owner.

6.5 Temporary Utility Service. Arrangements for any temporary utility service must be coordinated with the Owner. The cost of the installation of the temporary service will be charged to the Contractor, who will be charged for the quantity of the utility used at cost. Temporary service shall meet all applicable standards.

Steam or hot water for temporary heat may be provided to the Contractor at no charge when the permanent construction is completed and if it is in the best interest of the Owner to provide the heat.

7.0 Room Numbering. The assignment of room numbers on construction documents for individual rooms shall be coordinated with the Owner so that Room Numbering is in accord with the University Standard System, as described below. The Designer shall assign room numbers prior to completion of preliminary design and verify the room numbering with the Project Manager prior to numbering of the rooms on the drawings.

UMS FACILITIES ROOM NUMBERING SYSTEM

The following system is established for numbering rooms. This system is a general guide and will not preclude variations for special reasons. The following definitions will aid in the use of the system:

Basement – A floor below grade with no entrance at grade.

Ground Floor – A floor which is below grade on at least one side but has an entrance at grade on at least one side.

First Floor – Normally the main floor of a building. This floor will have entrances at or above grade.

Mezzanine – A partial floor level between two normal floor levels.

All numbers must use a three-digit format and are reserved for each level according to the following schedule:

Basement or Ground Floor	000 – 049
Basement Mezzanine	050 – 099
First Floor	100 – 149
First Floor Mezzanine	150 – 199
Second Floor	200 – 249
Second Floor Mezzanine	250 – 299
Third Floor	300 – 349
Third Floor Mezzanine	350 – 399

The numbering starts on the North or West end of a building with the odd numbers on the west or south side and the even numbers on the east or north side. Where there are interior rooms with corridors on each side of the building, the odd numbers shall follow the west or south corridor and the even numbers the east or north corridor.

Rooms which open onto two levels, such as sloped floor lecture rooms, shall be numbered according to the floor from which the most common entrance would be made.

Rooms which open off another room with no entrance from the corridor will carry the room number from which the entrance is made plus a letter designation.

Numbers may be omitted so that rooms across the corridor from each other can carry numbers nearly in sequence.

Unique unassigned spaces are to be identified in the following manner:

Telecommunications rooms: number plus letter "T," 104T.
Electrical vaults: number plus letter "X," 175X.

Coordinate room numbering so that all plans, panel directories and valve tags show final, appropriate room numbers.

8.0 Historic Preservation. If this agreement involves a structure listed in the National Register of Historic Places or a structure within a designated historic zone, its design and implementation shall be done in compliance with the U.S. Secretary of the Interior's Standards for Rehabilitation as applicable. Plans for such projects shall be made available by the Architect to the Maine Historic Preservation Commission for the Commission's review and comment. Projects to which this section applies may be exempted from the provision only if done so explicitly in writing by the Owner.

9.0 Keying Systems. All locks will be keyed using one of the University GGMK systems. Keying requirements, including electronic entrance controls, will be coordinated by the Project Manager. All permanent building keys should be shipped directly to the University by the hardware supplier.

Construction master keying system should be used during construction. At the time of building acceptance, the Owner will arrange for appropriate action to remove individual lock cylinders from the "construction keying system."

10.0 Facilities for Custodial Services.

.1 Provide a central area for receiving and storing cleaning supplies, ladders and equipment in each facility.

.2 Provide a lockable storage area keyed under building master, in which can be stored spare parts for the building. This area may be one corner of a larger storage room (but not part of a mechanical, electrical or boiler room or a means of egress such as under stairs) with wire security partition around it. Spare parts should include: ceiling tile, resilient floor tile, ceramic tile items, glass, wall fabric, carpet, plus some mechanical and electrical parts such as steam trap elements, fan belts and filters, fuses, etc.

.3 The design shall include enclosed area(s) for collection and storage of recyclable materials and waste as deemed necessary by the Project Manager. The design will address the following:
   a. Space that is both easily accessible and adequate to accommodate storage of materials between pickups by personnel. The space should be dedicated.

b. Convenient internal access for depositing of materials by custodians or building occupants.
c. Convenient external access for pickup of materials by Waste Management/Recycling personnel.
d. Protection of materials from weather.
e. Specific needs prompted by campus Waste Management/Recycling Shop procedures.

.4 Provide for an area for normal accumulation of non-recyclable trash to be hauled away.

.5 Provide a custodial closet on each floor with either a mop receptor or a deep sink.

11.0 IT/Telecommunications. Coordinate with Project Manager to provide telecommunication and IT spaces and service meeting campus needs and standards. Prior to initiating the HVAC design, the Designer must obtain from the Project Manager written instructions for specific HVAC requirements in these spaces. Utilize Communications specification section 27 00 00 as provided in Appendix B.

12.0 Roof Design. Roof surfaces shall slope a minimum of 1/4 inch per foot to drain. Interior drains shall be recessed below adjacent roofing. Interior drain piping shall be insulated to reduce sweating. Unless otherwise directed by the Owner, low slope roofing shall be EPDM and steep roofing shall be heavyweight asphalt shingles or metal.

13.0 Laboratories. Any installations of or modifications to laboratory spaces require special attention to standards that address the potential indoor air quality and hazardous materials normally associated with laboratories. At a minimum, the Owner requires designs to adhere to *ANSI/AIHA Z9.5-2003, Laboratory Ventilation* and *NFPA-45-2002, Standard on Fire Protection for Laboratories Using Chemicals*. Where laboratory fume hood installation, modification or modification of the ventilation systems for a laboratory occurs, Designer shall include acceptance testing in the contract using *ANSI/ASHRAE 110-1995 Method of Testing Performance of Laboratory Fume Hoods* or most current version.

14.0 Subsurface Investigation. The Owner will provide the Designer with necessary boring data, test results and soils reports as soon as possible after receiving a request from the Designer as to type and extent of information required. The Designer should request from the Owner additional soils information if the Designer believes the soils information is insufficient to properly design the facility.

15.0 Lot Lines and Grades. The Owner will establish a base line where necessary to properly locate the building. The Owner will also establish a Bench Mark convenient to the site for use by the Contractor.

16.0 File Sub-Bids/Bid Depository. In most cases, for projects with an estimated cost in excess of $1,000,000, Maine Bid Depository services are to be used. The Owner, through the Project Manager and the Designer, shall decide which sections shall be "File Bid." The Designer shall contact Associated Constructors of Maine to reserve a date for use of the Bid Depository. The date should be no less than five (5) days prior to the scheduled date for submission of base bids.

17.0 Tests. All design tests or controls deemed necessary by the Designer should be discussed with the Project Manager to determine arrangement and payment responsibility within the project. The Designer should provide a checklist of all testing requirements along with a list of parties responsible at the preconstruction meeting.

18.0 Training. All project manuals shall have a requirement that the Contractor provide a training session for University maintenance employees on operation and maintenance of building systems. These training sessions shall provide special emphasis on mechanical, electrical, control, life safety, communications, and owner operated systems.

These training sessions shall also be attended by the design professional responsible for the system design. The length of the training session should be determined by the complexity and extent of the building system with a minimum training session allocation being two hours. The most critical parts of the training session should be videotaped for future use by the University.

19.0 Specific Drawing Requirements.

.1 Structural drawings or floor plans shall show design live load for each floor and roof.

.2 Lighting plans shall show design lighting levels for each room.

.3 Coordinate room numbering with Owner so plans show final, appropriate room numbers.

.4 The Designer shall provide to the Owner at the completion of the work documents as outlined in AIA B201 2017 Article 2.7 Closeout Services.