FLORIDA ATLANTIC UNIVERSITY

COST CONTAINMENT GUIDELINES

MAY 2003

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OBJECTIVES

These Cost Containment Guidelines have been prepared to assist Architects and Engineers in the requirements for quality facilities. These guidelines will evolve annually and should be distributed by the University's Facilities Planning Office and the University's Physical Plant Office to all Architect/Engineers and Construction Managers under contract. Objectives of the guidelines are to:

1. To facilitate communication between the Owner and the Architect/Engineer.

2. To enhance the design quality, value and building longevity.

3. To assist the Architect/Engineer in completion of the Architect/Engineer's assignments in a timely, cost efficient and technically proficient way.

4. To establish a level of building quality consistent with University System interest in long term ownership.

5. To promote consistent quality and durability from project to project.

6. To reduce unnecessary building maintenance and repair problems through quality and design control, as well as Owner input.

7. To set performance standards for the university, the Architect/Engineer, the Construction Manager and the Contractor.

8. To maintain flexibility in space and systems design to accommodate future functional changes.

9. To allow predictable maintenance and operating activities to be done efficiently and effectively.

10. Assist the Construction Manager, when one is under contract.

HOW TO USE
FAU COST CONTAINMENT GUIDELINES

This set of Guidelines is not intended to place undue creative restrictions upon the Architect/Engineer. The intent is to raise issues and considerations that might otherwise be overlooked, and to convey to the Architect/Engineer the knowledge and experience gathered by the Owner in the course of owning and operating university buildings. The Guidelines should not be followed blindly. The Architect/Engineer is encouraged to recommend alternatives to the Owner when the Architect/Engineer feels that a better alternative solution is available for individual items. The Architect/Engineer is also encouraged to help keep these Guidelines current by bringing to the Owner's attention innovations in technology, materials, and construction systems.

The Owner does not intend for the standards to conflict with current building, handicapped, and life safety codes, and has attempted to avoid creating such conflicts. If a conflict is discovered in the course of using the standards, it is the Architect/Engineer's responsibility to immediately bring this conflict to the Owner's attention along with recommendations for resolving the conflict.

The checklist format organizes and streamlines the use of the Guidelines and the review process. Where these Guidelines provide information for the benefit of the Contractor, the Architect/Engineer shall pass the instructions along to the Contractor through the bidding documents. By checking a **"YES"** box the Architect/Engineer acknowledges to the Owner that requirements of a particular item has been met. When checking a **"NO"** box, the Architect/Engineer shall provide appropriate written justification for overriding the item, and proposals for alternatives or revisions can be the basis for periodically updating these Guidelines. This will assure future Architect/Engineers that the Guidelines are up to date, respond to changing technology, and provide proven cost-effective, as well as, state-of-the-art construction processes and products. **Only those pages with a "NO" comment response, need to be submitted. The "Estimate Summary and Budget Comparison" form, Exhibit 6, from the FAU Professional Services Guide dated April 2003, has also been revised to allow for a consultant to sign and submit this form indicating compliance with the FAU Cost Containment Guidelines, in lieu of submitting a fully completed FAU Cost Containment Guideline document.**

These standards are intended as guidelines for the design of all new and renovated facilities, and to enhance the coordination effort between the Architect/Engineer and the Owner. Though not intended to limit the creative judgment of the Architect/Engineer, any proposed variations from these guidelines must be thoroughly discussed with and approved by the Owner before incorporation in the project.

These Guidelines are intended to ensure that university facilities will be developed with high aesthetic and quality standards. A detailed interpretation of acceptable standards for a number of typical design elements including signage, lighting, parking, landscaping, utilities, site planning and construction is set forth herein. These standards establish minimum criteria to ensure proper and appropriate development of each new facility, renovation or site improvement to the university.

Although the Owner may permit certain exceptions to these standards, the Owner does not intend to grant exceptions to the design standards that violate the Florida Building Code, the Life Safety Code, and other pertinent codes.

Regulations are revised periodically and care should be taken to verify compliance with other applicable governmental standards. Approval by the Owner does not constitute approval by other governmental/regulatory agencies. The Board of Trustees is the code enforcing agency for building codes. Their approval is interpreted as state approved. Other state approving agencies include the State Fire Marshal, Department of Health, and Department of Environmental Regulation.

All references to Codes shall mean the latest editions adopted through legislation for use in State owned/leased buildings.

These standards are not intended to be a complete specification for any section addressed. Compliance shall in no way constitute a waiver of the Architect/Engineer's liability.

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GENERAL COMMENTS

The following general comments address major policies currently mandated for utilization in the design and construction of all university facilities.

DO:

1. Adhere to the specific requirements of the Agreement and Professional Service Guidelines for each submittal.

2. Ensure that Project site is coordinated with Master Plan criteria.

3. Ensure that all proposed and expanded services and distribution systems and infrastructure are coordinated with the University's Utilities Master Plan.

4. Ensure that Geotechnical Engineer's analysis and site investigation data is evaluated by structural engineer and coordinated with the structural engineer's design criteria.

5. Comply with Flood Plain Management criteria.

6. Determine the impact that the proposed facility has on the current drainage system and plan accordingly.

7. Follow State Requirements for Educational Facilities, 1999, Volume I, for space requirements and ask for written interpretation for unique spaces not shown.

8. Endeavor to incorporate a design concept which will facilitate possible future changes, expansion, or renovation.

9. Comply with applicable codes, regulations and orders as listed in the Florida Atlantic University Professional Services Guide Dated April 2003 (FAUPSG).

10. Comply with fire safety requirements including required plan review by the State Fire Marshal's Office and establish early reviews with the State Fire Marshal during preliminary design phases.

11. Comply with requirements for the physically disabled and follow the ADA Requirements, and Fair Housing Act where required.

12. Coordinate with the University’s Physical Plant Department and the University’s Environmental Health and Safety Department where toxic/hazardous materials are involved in a project, and incorporate Environmental Health and Safety specific requirements in Specifications.

13. Prepare Energy Life Cycle Cost Analysis in accordance with FAU Professional Services Guidelines dated April 2003.

14. Provide low maintenance and no maintenance materials and equipment both interior and exterior.

15. Coordinate between Architectural, Structural, Plumbing, Mechanical and Electrical sections concerning compliance and consistency with applicable codes.

16. Coordinate with Physical Plant and other Users through the University Facilities Planning Project Manager all items that must be compatible with existing maintenance procedures and systems, e.g., plumbing and electrical fixtures and accessories, hardware and keying, data communications, alarm and energy systems. FAU to issue Guide Specifications for special system/data requirements.

17. Address parking by including parking requirements as part of facility design and cost as well as restoration of displaced and disrupted parking.

18. Include adequate parking facilities and access for service vehicles, in addition to the loading docks.

19. Provide at least one loading zone to accommodate frequent moving of portable equipment to and from the building and to allow maintenance vans and personnel to have ready access to the building, if no service drive and dock are in the program.

20. Require tests to catch ponding problems at roofs, parking lots, plazas, entries, sidewalks and other such areas before the relevant subcontractors have left the job.

21. Ensure that guarantees and warranties of existing systems or components, e.g., roofing, are not voided by design of new work.

22. Follow the Roofing System Guidelines for Florida Atlantic University.

23. Ensure that exterior flashing details are designed and detailed in a workable and time proven fashion.

24. Provide acoustical privacy from space-to-space; partitions to underside of structure above and/or acoustic blankets above ceiling each side of partition, carpeting, solid core doors, sound seals around doors, etc.

25. Provide floor drains in all toilet-rooms, janitor rooms, and mechanical rooms.

26. Provide access and working clearances for valves, plumbing, electrical and HVAC equipment.

27. Provide lightning protection on all buildings.

28. Furnish visual blind systems which exclude light in exterior classrooms.

29. Use vending rooms in lieu of hall space.

30. Include FAU Close-Out Procedure Requirements in Contract Documents.

31. Provide Post-Occupancy Services as required.

32. Make all contact through the University Facilities Planning Project Manager as the "single point of contact" and coordinator for all University Departments and Offices.

33. Special attention must be paid to the location and design of parking structures, conformity to the Master Plan, ingress and egress, traffic control, vehicular and pedestrian circulation, utilities and services, safety and security systems, code conformance, provisions for the handicapped, signage, lighting, and protection. Special attention must also be paid to the selection of the structural system and materials, the design and location of control and expansion joints, sealants, treatment of parking surface, finishes, and underside of structure, slopes (minimum of 1/4" per foot), location and design of drains, gutters, waterproofing systems and membranes to avoid water penetration and material deterioration, and maintenance and operation programs.

DON'T:

1. Don't be pressured into certifying Substantial Completion when the Project is not truly substantially complete or the State Fire Marshal hasn't approved the Work.

2. Don't use exterior wall assemblies using metal studs.

3. Don't use exterior wall assemblies that have not been tested for 20 years such as EIFS (Exterior Insulated Finish Systems).

4. Don't rely on sealants to prevent water infiltration.

5. Don't locate glass in areas that are inaccessible.

6. Don't use galvanized metal for flashing.

7. Don't penetrate the roof membrane without Owner's written approval.

8. Don't provide rooftop A/C units or exposed ductwork.

9. Don't locate light fixtures without considering how they will be serviced.

10. Don't use products containing asbestos.

11. Don't use lead based paint

DIVISION 1 - GENERAL CONDITIONS

01010 - General Requirements

.01 **Conditions of the Contract including the General and Special Conditions of the contract provide the basis for structuring the responsibilities for all contractual parties. Bidding Documents include the invitation to bid and various instructions for the bidders, as well as proposal forms and requests for submittal of certificates confirming the Contractors compliance with Contract Documents. Has the Architect/Engineer confirmed that no changes have been made to the General or Special Conditions without written approval from the Owner? (Specific drawing sheet #/specification page # _____.)** | | |

.02 **The Owner may be providing insurance on the project through the Owner Provided Insurance Program. Has the consultant checked with the universities to determine which insurance coverages are to be provided, and which of the Owner's supplements to the Project Manual should be included? (Specific drawing sheet #/specification page # _____.)** | | |

.03 **Has a general description of all elements of the project, including exterior work and any other related work, been provided? This description, though brief, should be complete enough to indicate the full scope of work in each contract so that prospective bidders can decide whether or not they wish to bid on the project. The use for which the project is being built should be explained. Some parts of this description can be copied from the Building Program. (Specific drawing sheet #/specification page # _____.)** | | |

Work on Other Projects

.04 **Is other work, outside the scope of contracts for this project, being performed simultaneously with the work on this project. If so, is there an explanation of how contractors must cooperate with outside contractors and with the University in order to avoid interference with each other's work? (Specific drawing sheet #/specification page # _____.)** | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Items Furnished by the Owner

.05 Is the Owner furnishing items to be installed by the Contractor; are the items listed indicating the work required? Do not give detailed installation instructions; save details for the applicable section of the specifications.
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Future Work

.06 Is specific guidance for a project given with provisions for future work such as an addition, installations of special equipment, or other such task and are provisions made for fire safety, circulation, and accessibility? Are requirements of this contract described that are critical to future work such as structural provision, utilities, areas of the site to be kept clear, or site preparation? Are areas of work identified such as piping, ductwork and conduit that may be extended in future work without necessitating a system shutdown later?
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

Scheduling the Work

.07 Are all job conditions which will affect phasing and scheduling of the work described? Particular attention must be given to scheduling remodeling work in buildings which will remain in operation during remodeling. Examples of some problems encountered are:
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.07-1 Providing and Maintaining Means of Ingress and Egress: Do temporary entrances and exits meet code requirements?
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.07-2 Maintaining Security: Are areas being operated by the user secured from the construction area?
(Specific drawing sheet #/specification page #_____) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.07-3 **Use of Docking Facilities: Are these facilities being shared between the user and the Contractor? (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

.07-4 **Storing of Construction Materials: Are adequate areas being provided for delivery (if not, will schedules will be affected)? (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

.07-5 **Scheduling for Moves by the User: If remodeled spaces must be ready for use by certain dates, are the spaces and dates identified?** ☐ ☐ ☐

.07-6 **Maintaining Services: Are requirements for maintaining services detailed in the section entitled TEMPORARY FACILITIES AND CONTROLS? (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

.07-7 **Dust Control and Noise Control: Are temporary partitions required for control of dust and noise shown on the drawings? (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

.07-8 **Are construction of TEMPORARY FACILITIES AND CONTROLS being provided? (Specific drawing sheet #/specification page #_____).** ☐ ☐ ☐

01030 - Alternates

Purpose of Alternates

A limited number of alternates may be used as a means of Ensuring base bids within the available construction funds. The Architect/Engineer shall consult the Owner regarding priority of alternates. Only additive alternates shall be used. Proposals should be clearly defined, listed in priority of need and held to not more than 7% of construction cost. Have alternates been discussed with the University Facilities Planning Project Manager? See FAU Project Manual Dated 2003 – Bid Projects Only). (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

01045 - Cutting and Patching

.01 **Is cutting and patching identified in detail? This includes incidental cutting, fitting, and patching required to complete the work or to make several parts fit together properly. (Specific drawing sheet #/specification page #_____ .)** ☐ ☐ ☐

.02 **Is there a safety procedure in place for "Hot Work" areas such as in areas where volatile gases and fuels are in use (for example medical, laboratory, and garage spaces)? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

.03 **Is there a safety procedure in place for maintaining critical services, such as medical gases, before shutting off supplies for welding and cutting? (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

01090 - Codes and Standards

Are the approved codes of the Florida Building Code, with all revisions including all related specialty codes, referenced therein identified? Statewide codes include National Fire Protection Association (Life Safety Code), American National Standard Safety Code *(including handicapped requirements)*, Department of Education Criteria Codes, Sheet Metal and Air Conditioning National Association, and other specific codes relating to the conformance of materials within the structure and legislation affecting the compliance and applicability of the construction with local, state and national laws. Barrier free design will be implemented to permit accessibility for the physically disabled. The Florida Accessibility Requirements and the ADA requirements will be followed. Fair Housing Act Requirements will be followed when required. Refer to FAU Professional Services Guide Dated April 2003 for additional Codes, Standards and requirements. (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

01100 - Permits & Approvals

.01 **Has it been specified that an FAU Building Permit must be applied for and issued prior to commencing construction.** ☐ ☐ ☐

.01-1 **Examples of permits and agencies which may apply to work at FAU follow. AE shall verify that all required permits and approvals have been specified. See Appendix 4 -Additional Permit Application for additional permit information relating to the AE's and CM/GC's work.** ☐ ☐ ☐

.01-2 **Has it been specified that an FAU Excavation Permit shall be obtained before digging, trenching, cutting, pile driving, etc.? Contractor requests permit in writing from University Facilities Planning Project Manager. "Supervisors in charge of work" line on the Excavation Permit is to be signed by the contractor's supervisor in charge of the work during digging.** ☐ ☐ ☐

.01-3 **Has it been specified the State Fire Marshal-stamped approved construction documents shall be on-site prior to the start of construction?** ☐ ☐ ☐

01110 -- Project Survey Form:

Has the University Office of Space Utilization and Analysis Project Survey Form been completed by the architect and submitted to Facilities Planning? See Appendix 5 – FAU Project Survey Definition for the form and Instructions on how to complete it. ☐ ☐ ☐

01300 - Submittals

The Owner is very specific about the selection of materials and equipment included in a new building. It is the responsibility of the Architect/Engineer to request and receive approval of a submittal if it is other than specified in these guidelines. Are all materials and equipment included as specified in these guidelines?
(Specific drawing sheet #/specification page #_____ .) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

01310 - Progress Schedules

Have the specifications required the Contractor to prepare a network analysis system using the Critical Path Method, as outlined in the Associated General Contractors of America (AGC) publication "The use of CPM in Construction - A Manual for General Contractors" (An alternate type of schedule will be considered based on the project complexity and size.) (Specific drawing sheet #/specification page # _____.)

01400 - Quality Control

.01 Quality control shall be of major importance in each University construction project. Are requirements for compliance (rather than simply referencing standards) included? Has the Architect/Engineer provided an up-to-date copy of his/her respective firm's in-house quality control manual? (Specific drawing sheet #/specification page #_____.)

.02 Do products or workmanship specified by association, trade, or federal standards, comply with requirements of the standard (except when more rigid requirements are specified or required by applicable codes)? (Beware that dating of specified standards may be at variance with applicable building codes which may have referenced standards with established dates.) (Specific drawing sheet #/specification page #_____).

.03 Are any areas specified that require evidence and examples of required expertise from the contractor in conjunction with specified items, such as, system components, design element or special treatment? (Specific drawing sheet #/specification page #_____ .)

01500 - Construction Facilities and Temporary Controls

.01 Has the Architect/Engineer specified that the Contractor adequately protect the Work, adjacent property, the public, and the Owner's property from injury or loss arising in

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

connection with the construction contract? In addition has the A/E specified that the Contractor shall be responsible for any damage or injury due to the Contractor's act or neglect? Adequate barricades, night lights and flashers must be used to protect the public.
(Specific drawing sheet #/specification page #_____) | | | |

Utilities

.02 **Has the Architect/Engineer specified modifications regarding payment for water, fuel, chilled water and power consumed? Contractor's utilities are required for the progress of the work. Specifications shall be written to stress this point. The general contractor shall make arrangements with the University's Physical Plant Department for installation of temporary lines (through the University Facilities Planning Project Manager).**
(Specific drawing sheet #/specification page #_____ .) | | | |

.03 **Has the Architect/Engineer provided information to avoid damage to existing underground lines? Drawings indicating the approximate location of all known lines will be furnished by the Owner. Bidders may examine these drawings and the successful bidder will be supplied a single copy at no cost.**
(Specific drawing sheet #/specification page # _____.) | | | |

.04 **Do the specifications indicate that no excavation, including drilling, exploratory work, fence posts, etc., will be permitted until the drawings of existing lines are reviewed in the field by University representatives, Contractors, Subcontractors, Architect/Engineer, and the Owner's representatives? (Any damage to these known lines during construction will be repaired immediately in a manner acceptable to the Owner and the appropriate utility company at no cost to the Owner.)**
(Specific drawing sheet #/specification page #_____ .) | | | |

Utility Company Installations

.05 **Have plans for reviewing temporary lines running through University property been identified in the specifications? (To be done in conference with the Owner Representative.)**
(Specific drawing sheet #/specification page #_____ .) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Connections to Existing Utilities

.06 **If connections to University utilities are permitted, do the specifications contain instructions to the Contractor to make requests for utilities service through the University Facilities Planning Project Manager? Contractor shall make all necessary arrangements for the service, including the point of tie-in, times permitted for utility work, shutdown scheduling, traffic control, amount of lead time notification, etc., with the University's Physical Plant Department (through the University Facilities Planning Project Manager). The Architect/Engineer shall obtain drawings of existing utilities and shall consult University personnel regarding services available and points of connections to services. All services shall be metered through meters furnished by the Contractor, and the Owner shall be reimbursed for utilities. (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

07 **Costs for providing temporary services shall be borne by the Contractor. Do the specifications clearly identify the Contractor's responsibility for the installation of service lines and payment for services, whether services are furnished by the utility company or by the University? Billing for utilities will be made by the University in accordance with the current Rate Schedule of the University. Advance arrangements must be made with the University's Physical Plant Department before the Contractor begins work at the site (through the University Facilities Planning Project Manager). (Specific drawing sheet #/specification page #_____ .)** ☐ ☐ ☐

07-1 **Has it been specified that the Contractor shall pay for water, chilled water, steam, fuel for heat, electric power, and any other utility consumed? (Specific drawing sheet #/specification page #____ .)** ☐ ☐ ☐

.07-2 **Has it been specified that the Contractor shall install and maintain water supply lines and make changes in lines as necessitated by conditions at the site. (Specific drawing sheet #/specification page #_____ .)** ☐ ☐ ☐

.07-3 **Has it been specified that the Contractor shall install and maintain HVAC and electrical systems and make changes as required? (Specific drawing sheet #/specification page #_____)** ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Duration of Services

.08 Do the specifications clearly identify Contractor's responsibility for providing continuous utility services until date of Substantial Completion, or Beneficial Occupancy, (whichever comes first) including operation of permanent equipment and services?
(Specific drawing sheet #/specification page # _____.) | | | |

Temporary Heating, Cooling and Ventilation

.09 Does the specification specify that the Contractor must provide, at the Contractor's expense, all heating and cooling necessary to protect the work from dampness and cold, as well as, to dry out the building, especially prior to millwork doors, paint and acoustical tile installation?
(Specific drawing sheet #/specification page #_____ .) | | | |

Temporary Water

.10 Water necessary for construction, drinking, and testing of plumbing and mechanical systems may be obtained from the University's Physical Plant Department through the University Facilities Planning Project Manager. The connection point must be verified by the Physical Plant Department. The line size must be adequate for all demands. Does the Architect/Engineer specify that the Contractor make necessary connections and install a meter, and that the Contractor be responsible for installation of all pipe from the meter, and removal of temporary lines upon job completion? All costs, including use and connection fees, shall be paid by the Contractor at current rates. All temporary water lines will have backflow preventers.
(Specific drawing sheet #/specification page # _____.) | | | |

Temporary Sanitary Facilities

.11 Do the specifications call for the Contractor to provide and maintain in a neat and sanitary condition such accommodations for the use of the Contractor's employees as may be necessary to comply with the regulations of the State Board of Health and the county and municipality where the project is located? The point of tie-in to sewage systems, if utilized, shall be designated

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

by the University' Facilities Planning Project Manager; otherwise, the Contractor shall provide adequate chemical portable sanitary facilities for Contractor's forces. Chemical toilets will not be emptied in the University sewage system. Pit toilets are prohibited. (Specific drawing sheet #/specification page # _____.)

Temporary Fire Protection

.12 Do the specifications call for temporary, as well as permanent, fire protection facilities including fire hydrants? During construction, fire hydrants shall be installed within the specified distance of a building according to the occupancy classification to meet the NFPA requirements that pertain thereto. (See DIVISION 15, Section 15400, Plumbing; Fire Safety Systems).
(Specific drawing sheet #/specification page # _____.)

Hoists and Elevators

.13 Do the specifications call for new elevators to be used for transportation of materials or Contractor's workers?
(Specific drawing sheet #/specification page #_____.)

.14 Do the specifications call for the existing elevators to be used during construction. Has permission been obtained from the University Facilities Planning Project Manager? Refer to Division 14 for conditions governing this use.
(Specific drawing sheet #/specification page #_____).

Barriers and Enclosures

.15 Do the specifications call for the Contractor to provide rigid barricades (especially for open trenches and excavations,) shielding, and/or warning signs including audible warning devices for the sight impaired, to protect all University employees, students, and the general public from hazards outside the required construction site fence? This includes but is not limited to: open trenches, falling objects, and the lighting and posting of warning signs about physical hazards during darkness to comply with all OSHA requirements.
(Specific drawing sheet #/specification page # _____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Construction Fence

.16 Is the construction fence location shown on drawings with the following specifications?
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.16-1 A six-foot high fence with gates shall be erected around the project site.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.16-2 A heavy woven steel wire fence on steel posts (where appearance is a consideration, a privacy type fence might be required).
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.16-3 Has any reference to barbed wire on any part of the fence been deleted?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.16-4 "No trespassing" signs to meet OSHA requirements shall be specified.
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.16-5 The Owner should be held harmless if improper or inadequate fencing is installed by the Contractor and injury or damage results.
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

01540 - Security

.01 Do the specifications require that no persons, other than employees of the Contractor, Architect/Engineer, University Facilities Planning Department and Physical Plant Department, enter the construction work site without specific prior approval of one of those parties? Warning signs may be posted to assist in the enforcement of this requirement.
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 **Do the specifications call for the Contractor and its employees, while working on the premises, to comply with the Safety Orders issued by OSHA, the University's Director of Environmental Health and Safety and any other safety, health or environmental regulations of the State of Florida having jurisdictional authority? (Specific drawing sheet #/specification page #_____)** ☐ ☐ ☐

Ladders and Roof Access

.03 **Do the specifications call for ladders, ramps, guard rails, stair rails, stair runways and protection of floor, roof and wall openings in accordance with "CONSTRUCTION SAFETY ORDERS OF OSHA?" (Specific drawing sheet #/specification page #_____)** ☐ ☐ ☐

Building Security

.04 **Do the specifications call for one exterior door of any enclosed structure to be provided with a lockset with a University security cylinder during construction? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Fence Gates

.05 **Do the specifications call for the Contractor to keep gates locked at all times except during working hours? (Specific drawing sheet #/specification page # _____)** ☐ ☐ ☐

.06 **Do the specifications call for the Contractor to furnish the University Facilities Planning Project Manager two keys for each lock or two masters for all gate locks? These keys will be turned over to the University Police Department for emergency access to the construction site. (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

01541 - Safety

.01 **For some projects, the Owner may implement an Owner Provided Insurance Program (OPIP). Have the guidelines in Section 01010 Division 1 - General Requirements been referenced? (Specific drawing sheet #/specification page # ____.)** ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 **Do the specifications call for the Contractor to be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Safety of Persons and Property

.03 **The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:**
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.03-1 **All University faculty, staff, students.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03-2 **All other persons who may be affected thereby.**
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.03-3 **All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any Subcontractors or Sub-subcontractors.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03-4 **Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.04 **Do the specifications require the Contractor to give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of the Owner or other public authority bearing on the safety of persons or property or their protection from damage, injury or loss?**
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.05 **Has it been specified that the Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection? This will include posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.**
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.06 When the use or storage of explosives or other hazardous materials on campus is necessary for the execution of the Work, has it been specified that the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel? Notification of such activities shall be provided to the University Facilities Planning Project Manager and the University Environmental Health and Safety Department prior to their being brought and/or used on campus.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.07 Has it been specified that the Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents? This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the University Environmental Health and Safety Department and the University Facilities Planning Project Manager.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.08 Has it been specified that the Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety?
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Emergencies

.09 Has it been specified that in any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss? Notification of such occurrences must be made to the University Police Department as soon as practical.
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

01550 - Access Roads and Parking Areas

This section shall be addressed specifically in the bid documents. Have specific requirements for temporary access roads and parking areas for the Contractor been specified? This section shall be used for all bid documents. Include reference to University's Traffic and Parking rules.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

01560 - Temporary Controls

Noise and Dust Control

.01 **In occupied buildings, has the Architect/Engineer indicated areas for which noise and dust control must be provided and specified methods of control? If details of installations are involved, specify these in the applicable sections of the technical specifications. The Contractor shall be required to install barriers indicated by the Architect/Engineer and shall provide other dust control barriers as required by construction operations. (Specific drawing sheet #/specification page #_____)** ☐ ☐ ☐

Drainage

.02 **Has it been specified that the Contractor shall be required to provide temporary drainage trenches, drains, sumps, pumps, or other items required to afford satisfactory working conditions for the execution, completion, and protection of the Work? Water shall be diverted to or shall be pumped into existing sewage systems and shall not be allowed to run onto ground surface area unless otherwise authorized. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Storm Water Run-Off

.03 **Does the temporary drainage plan include the pumping of tunnels, elevator pits, and other structures which collect storm water and waste water run-off from construction operation? (Specific drawing sheet #/specification page # _____.)** ☐ ☐ ☐

Clean-up Enforcement

.04 **Do the specifications contain provisions that the Contractor must remove mud and spillage from public and University streets without delay? Failure to clean streets promptly could result in streets being cleaned by the Owner at the Contractor's expense. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05 **Has it been specified that all catch basins and storm drain lines in the vicinity of the site shall be protected at all times from the entry of mortar, concrete spoil, and other construction debris? The residue from the cleaning of concrete trucks, wheelbarrows, concrete buggies, etc., must be prevented from entering the drainage system. If cleaning is done, it must be contained and the Contractor must remove the residue from the campus with other construction refuse.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Repairs of Damages to Facilities

.06 **Do the specifications contain provisions that damage to roads or other facilities on the grounds resulting from Contractor's hauling, storage of materials, or other activities in connection with the Work, shall be repaired or replaced, at no expense to the Owner? Repairs or replacements shall be made to the Owner's satisfaction. Clean-up of areas shall occur on a weekly basis. Contractor shall not overload vehicles with material causing spillage and possible future damage.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

01570 - Traffic Regulation

Parking

.01 **Has it been specified that parking at campus is subject to regulations established by the University Security/Parking Services at the particular campus? Temporary fencing and parking and storage areas shall be specified by Architect/Engineer. Employees of the Contractor and subcontractors must secure parking permits from the University and must park cars in areas assigned to them. Parking on streets or in restricted areas is prohibited. At the beginning of the Work, the Contractor shall report to the University the approximate number of parking permits which will be required for all employees, including employees of Subcontractors.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Access to Construction Area

.02 **If existing streets and roads on campus must be used, has a detailed plan of the routes to be used been approved in cooperation with University Facilities Planning Project Manager? (Specific drawing sheet #/specification page #_____)** ☐ ☐ ☐

Planning for Temporary Control

.03 **Has it been specified that the University Security/Parking Services must be notified at least 1 week in advance of any anticipated Work affecting traffic flow? To ensure maintenance of flow and to safeguard all parties involved in planning temporary routing, a field inspection should be made jointly by the Architect/Engineer, the Owner, and Contractor prior to performing any Work which would interrupt normal traffic patterns. Rerouting of traffic shall be planned, as to route and direction, in cooperation with the University Police Department.**
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Contractor's Responsibilities

.04 **Has it been specified that the Contractor's Work requires interruption of traffic, the Contractor shall be required to post signs in all affected areas, in sufficient numbers and with appropriate messages to warn motorists entering the construction zone and to alleviate conflicts and confusion among motorists or pedestrians at intersections, crossings, turns, and other obstructions to normal traffic flow? Temporary signs shall be as shown in the FLORIDA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, Florida Department of Transportation (current edition).**
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.05 **Has it been specified that temporary lanes shall be well marked, and obstructions, barriers, lane changes, or detours shall be indicated by appropriate signage at each point of potential confusion, as well as at each change in direction of a temporary route? The University Police Department shall be notified in advance of the anticipated time of return to normal**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

traffic patterns. Upon completion of construction affecting streets or traffic flow, but before temporary control devices and lane markings are removed, the area shall be restored to receive traffic in the normal pattern. The University Police Department shall be notified of the actual time of completion of restoration. (Specific drawing sheet #/specification page # _____.)

01580 - Project Identification and Signs

.01 Have the requirements for temporary project identification and informational signs required during construction, and removal at completion of Work been specified? Refer to the FAU Professional Service Guide dated 2003. (Specific drawing sheet #/specification page #_____)

Project Identification

.02 The requirement in the General Conditions that a project sign be furnished might be waived if the project is small or is a remodeling project. The University Facilities Planning Project Manager will determine the need for the sign. If a sign is required, the location shall be approved by the Owner and shall be shown on the drawings, together with details of the sign. Has it been specified that the Contractor provide the sign and require a shop drawing showing layout of the text? Submit one print of the shop drawing to the University Project Manager. The Architect/Engineer, accompanied by a representative of the Owner must inspect and approve the finished sign befor erecting at the site. (Specific drawing sheet #/specification page #_____)

01590 - Field Offices and Sheds

.01 Has it been specified that the Contractor shall provide and maintain a clean, weather-tight office at the site suitable for the Contractor's own use, and for use of the Subcontractors? All expenses including the installation cost, and the use of telephone, heat, light, water, and janitor service shall be borne by the Contractor. (Specific drawing sheet #/specification page #_____)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 **Is it been specified that the Contractor's office shall be of size suitable for the use of the Contractor, Subcontractors, and the Architect/Engineer's representative? Office shall be heated, lighted, and provided with doors with locks, and private line telephone service. One lockable space in the office shall be provided for use of the Architect/Engineer's representative; space shall be equipped with plan table, desk, suitable chairs or stools, plan rack, filing cabinet, and telephone. The Contractor or an authorized agent shall be present at the office or shall arrange to be called readily, at all times while the Work is in progress.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

01600 - Materials and Equipment

Salvage on Demolition and Renovation Projects

.01 **On all projects involving demolition and/or renovation, the Architect/ Engineer should review with the University Facilities Planning Project Manager (for inclusion in the bid documents) the possibility of salvage of materials and equipment, either for use in the remodeling project, or by the University's Physical Plant Deparment. The University Facilities Planning Project Manager, upon notification by the Architect/Engineer of salvage not needed in the remodeling, will notify the Architect/Engineer of materials and equipment to be removed by the Owner or to be turned over to the Owner by the Contractor. Non-reusable materials including toxic and/or hazardous waste will be removed from campus by the Contractor. Has the Architect/Engineer specified in the "Project Summary" accompanying the Invitation to Bid and in the contract specifications, that the University reserves the right to remove salvage prior to start of construction, or in certain instances the Contractor is to turn over certain items of salvage to the Owner?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Storage and Protection

.02 **Has it been specified that the Contractor and all Subcontractors shall provide suitable weather-tight storage sheds of sufficient size to hold materials required on the site at one time for storage of materials which might be damaged by the weather? Outdoor storage of materials shall be confined to the areas within the construction fence. Temporary structures shall be painted with**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

one coat of paint; color shall be approved by the University Project Manager. No signs except small identification signs are permitted on sheds. Indoor storage shall be confined to unused spaces in the building; corridors, stairs, and other public spaces shall not be used for storage.
(Specific drawing sheet #/specification page #_____) | | | |

Storage of University Equipment

.03 Has it been specified that after substantial completion, large rooms, at or near grade level, shall be made available to the Owner for the storage of equipment? Details shall be arranged with representatives of the University through the University Facilities Planning Project Manager.
(Specific drawing sheet #/specification page #_____.) | | | |

01650 - Starting of Systems

Have the requirements regarding building system start up, and systems demonstration, described to permit direct reference from individual product specification sections been provided?
(Specific drawing sheet #/specification page # _____. | | | |

01700 - Contract Closeout

.01 Has additional information been provided beyond that contained in the FAU Professional Services Guide dated 2003 regarding, final cleaning, adjusting, project record documents, close out procedures, etc.?
(Specific drawing sheet #/specification page #_____.) | | | |

Final Cleaning

.02 Has the Architect/Engineer reviewed Paragraph 3.15 (Cleaning Up) of the General Conditions to determine whether or not this subject is adequately covered? Some amplification might be required.
(Specific drawing sheet #/specification page # _____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Project Record Documents

.03 **Has it been specified that the Contractor shall maintain on site one set of the following record documents to record actual revisions to the Work:**

- **Contract Drawings**
- **Specifications**
- **Addenda**
- **State Fire Marshal Approved Documents**
- **Change Orders and other Modifications to the contract**
- **Approved Shop Drawings, product data, and samples**

(Specific drawing sheet #/specification page # ____) | | |

.04 **Has it been specified that record documents shall be stored separately from documents used for construction and kept concurrent with construction progress? The Architect/Engineer should monitor and verify progress prior to approval of Contractor's monthly Applications for Payment.**
(Specific drawing sheet #/specification page #_____.) | | |

"Record Drawings" and Specifications

.05 **Has it been specified that the Architect/Engineer requires submission of record drawings reflecting "record set" conditions? The principal purpose of this "record set" is to provide the Owner with a permanent record of actual construction to facilitate trouble-shooting and for use i n future building alterations.**
(Specific drawing sheet #/specification page #_____.) | | |

.06 **Has Subparagraph 3.11.1 of the General Conditions been included? This section requires the Contractor to record all changes to Drawings and specifications as they occur and to deliver them to the Architect/Engineer upon completion of the Work. This information is the Architect/Engineer's principal source of information in revising drawings and specifications. In addition, shop drawings, field notes, change orders, correspondence and the Architect/Engineer's own set of drawings will provide auxiliary information.**
(Specific drawing sheet #/specification page #_____.) | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.07 **Has it been specified by the Architect/Engineer that the Contractor shall furnish the Architect/Engineer's office with a set of final record drawings and specifications prior to Substantial Completion? The Architect/Engineer will update the original tracings, and/or update the CADD diskettes, and then furnish the Owner one set of final record drawings on mylar and one set of final record specifications. If the Architect/Engineer agreement requires Computer Aided Design and Drafting CADD), the Architect/Engineer shall furnish one (1) set each of final records listed above and a copy of the CADD drawings on floppy disk(s) dated so to indicate they are "record set" drawings and specifications. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

.08 **Has it been specified that the following information must be shown on the record drawings:**

.08-1 Identification of addenda items issued during bidding period. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.08-2 Identification of alternates, both accepted and not accepted. (Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.08-3 Numbers of bulletins and change orders which effected changes. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.08-4 All field changes made during construction. The Architect/ Engineer is responsible for the accuracy of information placed on the tracings; making only the changes which might be marked on the Contractor's drawings is not sufficient. (Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.08-5 Date on which corrections were made. (Specific drawing sheet #/specification page #_____) ☐ ☐ ☐

.08-6 Tracings shall be identified with the label "RECORD SET". This identification may be hand lettered or rubber stamped on the tracing. (Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

01730 - Operation and Maintenance Data

.01 This section contains the general requirements for operating and maintenance manuals to be submitted, reviewed and approved well in advance of Owner occupancy. The manuals and other supporting material listed herein must contain accurate "record set" data, drawings, changes, etc. on each operating system to permit the University maintenance personnel to take over maintenance with written instructions sufficient to ensure operations and maintenance in accordance with manufacturer's specifications. It is the responsibility of the Architect/Engineer to incorporate these standards into the specifications or other contract documents, and to secure compliance of the Contractor with the standards, including changes in design and specifications during construction incorporated into "record set" conditions. Has it been clearly specified?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Description of Systems

.02 In the specifications or as a preface to the manuals, has the Architect/Engineer described the design intent of the building systems (HVAC, electrical, fire alarm and miscellaneous) and the principles of their operation in a manner to permit prompt initial understanding of the systems by qualified University maintenance personnel? Do the descriptions include flow-charts, riser diagrams, zone control layouts, and other visual aids showing the components, and their relationship to the entire system?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Manuals of Systems Components to be Specified by Architect/ Engineer

.03 Has the Architect/Engineer specified, as applicable to the particular designed system, the components of information required:

.03-1 Manufacturer's printed installation and operating instructions. This shall be the technical specifications and instructions, not "sales" brochures and promotional matter. Instructions shall include all modes of operation in sufficient

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

detail to be readily understood by University maintenance personnel.
(Specific drawing sheet #/specification page #_____.) | | | |

.03-2 Complete identification in the manuals of the actual equipment installed as described in the manufacturers' instructions, including dimensional drawings, model, type, size, performance parameters such as curves, efficiencies, power requirements, operating ranges, etc.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: In cases of multiple installation of identical equipment, only one manual submitted for the identical equipment is necessary, but model and serial numbers of the several pieces of equipment shall be listed.

.03-3 Names, addresses, telephone numbers, contact person (if known) of Subcontractors and/or Sub-subcontractors, their suppliers, manufacturers' representatives, available service facilities and normal channels of supply.
(Specific drawing sheet #/specification page #_____.) | | | |

.03-4 Technical data related to items provided in construction. Unrelated technical data shall be purged by supplier of manual prior to submission by Contractor to Architect.
(Specific drawing sheet #/specification page #_____.) | | | |

.03-5 Detailed parts list showing manufacturer's parts numbers and such other identification as necessary to facilitate procurement of spare or renewal parts and Owner-Manufacturer communications.
(Specific drawing sheet #/specification page # ____-) | | | |

.03-6 Manufacturers' maintenance instructions including schedules showing proper time intervals for lubrication, adjustment, calibration or checking. Contractor shall consolidate manufacturers' schedules with a single master schedule of required maintenance. This requirement is for the Contractors' as well as the Owner's protection to ensure proper early maintenance during the warranty period.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Submission of Operating and Maintenance Manuals

.04 Has it been specified that the Contractor shall submit to Architect/Engineer, no later than the 75% completion date of the HVAC systems, four (4) sets of manuals (or if deemed prudent, a draft set of manuals) for review? Architect/Engineer shall review and require such changes or additions as necessary to meet these standards and when Architect/Engineer approves the manuals, the Architect/Engineer shall forward a set to the Owner. The Owner will review and comment and will advise the Architect/Engineer, who will then secure the required corrections and transmit three completed sets to the Owner before a Certificate of Substantial Completion is issued.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Operation and Maintenance Data

.05 Have detailed requirements been stipulated in the appropriate sections of the specifications? The following check lists should be modified to suit project requirements: ☐ ☐ ☐

ITEMS WHERE DATE IS REQUIRED

General Construction:

.05-1 Roofing Manufacturers maintenance data.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.05-2 Elevators and hoists as per specifications.
(Specific drawing sheet #/specification page #_____-) ☐ ☐ ☐

Plumbing:

.05-3 Piping systems (printed diagrams, valve tag, etc).
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Heating#, Ventilating, and Air Conditioning:

.05-4 Control systems (printed diagrams, operating instructions, etc).
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Electrical:

.05-5 Communications (point-to-point wiring diagrams and instruction manuals, if installed by the Contractor). (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.05-6 Fire Protection Systems (as per specifications). (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.05-7 Motor control (overload heater charts). (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.05-8 Equipment (operating instructions) (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Final Inspection

.06 Have procedures as outlined in Paragraph 9.10, "Final Completion and Final Payment," in the General Conditions and FAU Professional Services Guide dated 2003, been provided? Has a representative of the University Facilities Planning office been included in the arrangements for joint final inspections? (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Project Turnover Procedures

.07 Do the General Conditions of the contract for construction contain instructions and requirements of the Contractor, Architect/Engineer and Owner for acceptance of the project? The Architect/Engineer is responsible for including in the Specifications the obligations for the Contractor, for an orderly acceptance and turnover. Included in such obligations are: punch lists, "record set" plans and specifications, operating and maintenance manuals, and indoctrination of the University personnel. Include written notification for insurance purposes. (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

01740 - Warranties and Bonds

Affidavits, Bonds and Guarantees

.01 In addition to the standard forms required by the contract documents, the following are required. When statements applying to these products are provided, have the following requirements also been specified?

.01-1 Resilient flooring, carpet and padding (affidavits, bonds & guarantees from manufacturer and installer). (Specific drawing sheet #/specification page #._____.) ☐ ☐ ☐

.01-2 Asbestos and lead free design and materials (affidavits, bonds & guarantees from Architect/Engineer and Contractor). (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-3 Termite Protection (5-year guarantee). (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.01-4 Roofing (20-year warranty bond). (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-5 Membrane waterproofing (5-year maintenance bond). (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-6 Postal specialties (surety bond). (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-7 Caulking and sealants (5-year guarantee). sheet #/specification page #_____.) ☐ ☐ ☐

.01-8 Metal windows (2-year guarantee for windows and 5-year guarantee for weather stripping). (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-9 Wood and laminated plastic faced doors (lifetime guarantee). (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.01-10 Tinted and insulated glass (5-year guarantee). (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.01-11 Chalkboards (20-year guarantee). (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

.01-12 Water chillers and air cooled condensers (5-year guarantee). (Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Note: The above list is not intended to be all-inclusive. The Architect/Engineer shall include other related specified materials and systems as required.

In addition "Extra Stock" requirements shall be reviewed with the University Facilities Planning Project Manager and specified as required (i.e. ceiling tile, paint, etc.)

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 2 – SITE WORK

02010 - Subsurface Exploration

.01 Architect/Engineer Responsibilities
Has the Architect/Engineer furnished a Subsurface Investigation Report as described in the FAU Professional Services Guide? Has the Architect/Engineer provided plans showing required test boring locations and provided a letter to the University Facilities Planning Project Manager or any other information required for the testing laboratory?
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.02 Preparation of Plans for Borings
Has the Architect/Engineer studied plans of existing underground utilities and located borings to avoid these utilities?(The Owner will make available maps showing underground installations.)
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03 Information to be included in Contract Documents
Do the boring locations and sections through borings show all soil conditions?
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.04 Do the specifications contain information to the Contractor acknowledging that the Owner shall in no way be held responsible for the accuracy of the information?
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

02100 - Site Preparation

.01 Structure Removal
Is the structure removal included in the demolition package?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.02 Clearing the Site
Are instructions included in the Construction Documents that indicate debris resulting from stripping and demolition operations shall be removed from University property at

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

frequent intervals so as to prevent this material from accumulating on the site?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03 Grubbing
Removal of trees and shrubs shall include the removal of stumps and roots to the extent that no root greater than three inches in diameter remains within five feet of an underground structure or utility line or under footings or paved areas. Grubbing in open areas shall include removal of stumps and three-inch roots to two feet below finish grade elevations.
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.04 Tree Relocation
Are instructions included in the Construction Documents for relocation of existing trees or other major landscaping and ground coverings?
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.05 Tree Location
Has a survey of existing trees been done to save trees greater than 3" diameter and 10' from the new construction? Have these trees been identified in the landscaping and provisions been made to keep damage and stress from occurring to the trees due to construction activity.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

02120 - Structure Removal

.01 In open areas, foundations of structures shall be removed to a minimum of three feet below finish grade elevation. Where new structures will replace existing structures, indicate extent of foundation removal on the drawings. No existing slabs will remain under fill for new structures. Hazardous material removal shall be conducted prior to structural removal as required by federal, state and local requirements.
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.02 Disposal of existing buildings and structures, trees, dismantled equipment, etc., is the responsibility of the Contractor.
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

02200 - Earthwork

.01 This area should address excavation, filling and grading for the new structure as required to suit site appurtenances. Grading and filling will be performed to lines and grades required by civil engineering. These grade lines will be integrated with the new paving and surfacing as well as landscaped areas. Removal of the unsatisfactory or deleterious materials from the premises will be done as required for the work. Disposal of debris and waste material, temporary protection of work, barricades, rerouting requirement, signage, etc. will also be included. Storm water drainage will be controlled during construction of the project and will also be included.
(Specific drawing sheet #/specification page #____-.) ☐ ☐ ☐

.02 Earthwork includes, but is not necessarily limited to the following:

.02-1 Excavating, filling, backfilling, grading and compaction.
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.02-2 Dewatering of excavations and work areas, as required.
(Specific drawing sheet #/specification page #_____) ☐ ☐ ☐

.02-3 Shoring and bracing, as required.
(Specific drawing sheet #/specification page #_____) ☐ ☐ ☐

.02-4 Disposal of excess and unsuitable excavated materials.
(Specific drawing sheet #/specification page #_____) ☐ ☐ ☐

.02-5 Preparation of sub-grade for building slabs, walks, decks and pavements.
(Specific drawing sheet #/specification page #_____) ☐ ☐ ☐

.02-6 Backfilling of trenches within contract limit lines.
(Specific drawing sheet #/specification page # ____-) ☐ ☐ ☐

.02-7 Excavation and backfill required in conjunction with underground mechanical and electrical utilities, and buried mechanical and electrical appurtenances is included as work of this section. ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

(Specific drawing sheet #/specification page #_____.)

.02-8 "Excavation" consists of removal of all material encountered to subgrade elevations indicated and subsequent disposal of materials removed.
(Specific drawing sheet #/specification page # _____) | | | |

02201 - Earthwork for Buildings

The site for the new building will be stripped and the area around the existing buildings graded to suit the architectural requirements. Excavation and removal of materials from the premises will be done as required for the building and structures. This will include disposal of debris and waste material, foundation drainage, backfill, compaction, shoring, sheathing, temporary protection and barricades. Storm water drainage will be controlled during construction of the project. Fill as required for rough grading elevation. Site preparation for building according to Geotechnical Engineer's recommendations.
(Specific drawing sheet #/specification page #_____.) | | | |

02211 - Rough Grading

Slopes shall not be greater than one vertical to six horizontal in grassed areas. Steeper slopes will be considered in unique circumstances and will be reviewed and approved by the Owner.
(Specific drawing sheet #/specification page # _____) | | | |

02218 - Landscape Grading

.01 Acceptable fill materials shall be in accordance with Geotechnical Engineer's Report and recommendations.
(Specific drawing sheet #/specification page #_____.) | | | |

Topsoil

.02 Existing stockpile topsoil shall be free from sticks, stones, roots, clods and any extraneous material.
(Specific drawing sheet #/specification page # _____) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.03 Imported topsoil shall be a fertile, friable, natural topsoil of loamy character obtained from a well-drained, arable site free from sticks, stones, roots, clods and extraneous matter. Topsoil shall be a black loam, indigenous to general area in which the project is located and shall be suitable for planting and seeding.
(Specific drawing sheet #/specification page #_____) ☐ ☐ ☐

.04 Specify a six-inch depth of topsoil for seeded areas and 12-inch depth for planting areas.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

02222 - Excavating

.01 The excavation and backfilling of trenches, etc., for piping, manholes, pull boxes, etc., in the mechanical trades is considered better placed under those divisions than under this general division but the Architect/Engineer should ensure that the compaction of backfill in trenches is covered and that the soil type is the same and that restoration has occurred.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.02 Under no circumstances shall topsoil and other excavated soils be removed from the campus. If such materials are not required for the project, the Contractor should consult with the University Facilities Planning Project Manager who will advise the Contractor regarding a disposal location.
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

.03 Where topsoil is removed and grading is accomplished on the site, or where the existing ground surface is otherwise disturbed, care shall be taken to prevent soil erosion. If soil is needed, specify that the Contractor will have to obtain it from private sources at the Contractor's expense.
(Specific drawing sheet #/specification page # _____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.04 When necessary to hold large piles of excavated earth on the job site, the Contractor should be required to provide cover or adequate means of water sprinkling to keep the sand particles wet and prevent them from being wind-blown about the campus.
(Specific drawing sheet #/specification page # _____) | | | |

02223 - Backfilling

Backfilling is required at building perimeter and site structures up to subgrade elevation. Fill under interior and exterior slabs-on-grade or pavement, and fill under landscaped areas shall meet applicable ANSI/ASTM standards.
(Specific drawing sheet#/specification page #_____) | | | |

02225 - Trenching

When excavating and backfilling for the mechanical and electrical trades is covered in this portion of the specifications, make certain that the compaction of back-fill is properly specified and meets applicable ANSI/ASTM standards and the requirements of Section 553.60, F.S., the Trench Safety Act.
(Specific drawing sheet #/specification page # _____) | | | |

02251 - Termite Control

.01 Termite treatment is required for every building. The Subcontractor, for soil poisoning, must furnish a service agreement stating the work performed will be guaranteed for a period of 5 years from the date of substantial completion. In addition the agreement must state that the structure will be inspected yearly for infestation and treatment provided as necessary. The Subcontractor shall offer an optional renewal of the service on the same terms. The type of chemical treatment must be specified, including the amount of application per unit area. The service agreement shall state that in the event of damage during the guarantee period, the Contractor shall make repairs to structurally damaged surfaces to a dollar value based on the size of the building. An independent testing laboratory shall certify that the treatment meets the requirements of the Specifications.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 If treatment is provided prior to substantial completion, the Architect/ Engineer should specify modification of service and guarantee so that the University is not billed prior to acceptance of the building.
(Specific drawing sheet #/specification page #_____. ☐ ☐ ☐

.03 Chemicals and application shall conform to EPA's Federal Insecticide, Fungicide and Rodenticide Acts.
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

02490 - Trees, Plants, and Ground Cover

Trees, plants and ground cover work includes planting, backfill, guying, watering, pruning, as well as, replacements and guarantees.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

02500 - Paving and Surfacing

02513 - Asphaltic Concrete Paving

Provide materials and installation to comply with requirements Of the Florida Department of Transportation and as determined by the civil engineer. Minimum installation shall consist of 1" plant mixed type S-1 asphaltic concrete surface course over 6" compact base over 10" stabilized soil, unless civil engineers determine otherwise.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

02514 - Concrete Paving

.01 Provide Class A concrete with a minimum compressive strength of 3000 psi in 28 days. All products, materials, and execution shall comply with applicable ANSI and ASTM Standards.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Expansion Joints

.02 Provide premolded type ½" thick, full depth of concrete, maximum 30'-0" o.c. and at junctions with vertical surfaces.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.03 **Are expansion joints specified and shown on the drawings? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Control Joints

.04 **Are control joints saw-cut to squared relief, e.g., 6'0" wide sidewalk, 6'0" space between? Do they line up so that new stress points do not occur and cause more cracking of the concrete surface? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Finish

.05 **Are the finishes floated, troweled, and medium broom finished? drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Utility Cuts

.06 **Are utilities cuts required to cross existing paved areas? (Saw-cutting finished surfaces should be used only as a last resort. The University recommends boring as the standard procedure for crossing streets/roads. Concrete walks shall be cut and replaced from joint to joint, doweled to the remaining slab. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Walks

.07 **Are concrete sidewalks required and shown at a minimum of 6 inches thick with 6 x 6 #10 wire mesh reinforcement, and edge thickness increased a minimum of 2 inches? All sidewalks may be subjected to heavy vehicular traffic, additionally, ground freezing should not be discounted. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Pedestrian walks

.08 **Are walks used as vehicular drives shown at a minimum of 6" thick with edges increased to a minimum of 2 additional inches thick and 10'-0" wide, steel reinforced? Secondary sidewalk width should be a minimum of 6 feet, and should**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

match surrounding walk patterns. Care must be taken to prevent slick finishes, and to avoid the possibility of marking or vandalism while the concrete is curing. Expansion joints must be properly designed and indicated on contract drawings. Medium broom finish on all sidewalk Work is required. Do the specifications call for the Contractor to protect concrete from defacement by fencing or providing appropriate personnel to maintain and secure the area until the concrete has properly cured?
(Specific drawing sheet #/specification page #_____.) | | | |

.09 Has the AE provided for golf cart parking? | | | |

.10 Has adequate space been designed at walking intersections to allow golf cart turning? | | | |

02660 - Water Distribution System

Water main materials: ductile iron pressure water pipe and PVC pressure pipe, joints are optional. Provide gate valves at all new branches, fire hydrants, backflow prevention devices and meters. Discuss valve location and installation details such as valve boxes, direct burial, and ground level access to valve operator with the University. Water lines will be disinfected according to AWWA Standard C-601. All pipes will be tested for leakage. Detectable plastic marking tape shall be installed underground above buried utility lines, as required, to facilitate the location of the lines before damage to the lines can occur during required excavation.
(Specific drawing sheet #/specification page #_____.) | | | |

02720 - Storm Drainage System

Are catch basin or inlets precast, or cast-in-place concrete? (Grates and frames are to be cast iron or galvanized steel. Drainage pipe to be concrete, corrugated metal pipe or Helicoidal metal pipe (bituminous coated or aluminum.)
(Specific drawing sheet #/specification page #_____.) | | | |

02730 - Sanitary Sewer System

Are sanitary sewers: vitrified clay pipe with gasketed push joints or PVC pipe with joints as recommended by pipe

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

manufacturer? Are sanitary manholes: precast concrete or cast-in-place concrete? Are cover and frames: cast iron or galvanized steel? Are cleanouts: commercially manufactured wye branches?
(Specific drawing sheet #/specification page #_____.)

02780 - Unit Pavers

.01 Where pavers are used has the following been specified?
Brand: Paver module – U.S. Brick, Inc.
Colors: E-11 Red-Tan-Charcoal.
Pattern: Cobblestone
Thickness: 2 7/8" for standard use
Sizes: 9 ¾" x 6 ¼", border 4" x 8".
Stones per square foot: Large 2.45, Square 3.69.
Texture: Smooth, non-skid surface

02800 - Site Improvements

02811 - Landscape Irrigation

.01 Are all landscaped and sodded areas irrigated? The irrigation system shall be designed so as to eliminate water spray on pedestrian walkways and buildings.
(Specific drawing sheet #/specification page #_____.)

.02 Are sprinkler heads "Rain Bird" products or approved equal specified?
(Specific drawing sheet #/specification page #_____.)

.02-1 For all FAU campuses, except those shared with Broward Community College (BCC), are Sprinkler Heads specified to be "Toro" only? For work on BCC campuses, has the Architect/Engineer verified in writing with BCC the sprinkler Specification?

.03 Are all landscaped areas adequately irrigated based on the following criteria:

.03-1 An automatic sprinkler irrigation system for all landscaped areas. All sprinkler lines shall be self-draining.
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.03-2 An irrigation system designed and operated to prevent or minimize runoff of irrigation water onto roadways, driveways, walks, etc.
(Specific drawing sheet #/specification page #_____.) | | | |

02825 – Fencing

.01 Has permanent (not construction) chain link fence been specified to be green vinyl coated? Where visual blocking is required, has double green slats been specified? If additional visual blocking is required, has green fabric been specified? | | | |

02842 - Bike Racks

Are bike racks of a design similar to Bike Stanchions from The Bike Security Racks Company or The Ribbon Rack by Brandir, and are they acceptable to the University?
(Specific drawing sheet #/specification page #_____.) | | | |

02938 - Sodding

.01 Are all areas not otherwise landscaped sodded with sod appropriate to the local area? (Refer to ASPA (American Sod Producers Association) - Guideline Specifications to Sodding.)
(Specific drawing sheet #/specification page #_____.) | | | |

.01-1 Has Floratam St. Augustine sod been specified for sodded irrigated areas? | | | |

.01-2 Has Argentine Bahia sod been specified for sodded non-irrigated areas? | | | |

.01-3 Has sod been specified to be top dressed and rolled? | | | |

.01-4 Has sod been specified to be installed with the solid earth based level with adjacent walking? | | | |

.01-5 Has it been specified that grassed areas shall be cut at least weekly by contractor and a minimum of twice prior to turn over to the University's Physical Plant Department? | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 Is it specified, where appropriate, to scarify subsoil to a depth of six inches where topsoil is to be placed? Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Placing Topsoil

.03 Is topsoil specified at a minimum of two inches over area to be sodded?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

02950 - Landscaping Plant Materials

Trees, Plants, and Ground Cover

.01 Are trees, plants and ground cover in a schedule contained in the drawings? The schedule should include plant name in botanical identification, nominal size of trunk or spread of branches, height or other identifiable criteria. These plants shall be specified as "Florida Grade" and selected for the climatic conditions of the specific University location.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.02 Has the Architect/Engineer reviewed these requirements with the University Facilities Planning Project Manager to ensure appropriate coordination and incorporation in the contract and future grounds maintenance?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03 Has the selection of plant material been based on water-conservation principals? ☐ ☐ ☐

.04 Has recycled mulch been specified? Has it been specified that cypress mulch is prohibited? ☐ ☐ ☐

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 3 - CONCRETE

03001 - Concrete

Are tests performed as specified in appropriate articles of the FAU Professional Services Guide dated 2003? For quality control, all material products and execution shall conform to ACI 301 and applicable ANSI/ASTM Standards tests.
(Specific drawing sheet #/specification page #_____.) | | | |

.01 **Has all required concrete testing been specified to be provided by an independent testing agency and paid for by FAU, and test reports to be delivered directly to the Architect/Engineer and FAU?** | | | |

.02 **Has it been specified/determined that the tops of all footings shall be below the bottoms of all utilities entering and leaving the building?** | | | |

03200 - Concrete Reinforcement

.01 **Is proper coverage of reinforcement ensured (particular care should be exercised in preparation of specifications and during inspection)? Reinforcing bar supports frequently are exposed to the weather on soffits and other surfaces, and corrode. Plastic supports are desirable.**
(Specific drawing sheet #/specification page #_____.) | | | |

Miscellaneous

Admixtures

.02 **Has the Architect/Engineer clearly justified the use of admixtures? (In general, admixtures are not desired.)**
(Specific drawing sheet #/specification page #_____.) | | | |

Cold Weather Concreting

.03 **Are specifications provided for cold weather concreting to be done in accordance with ACI 604?**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Pipe Shafts

.04 **Are proper seals specified where pipes pass through floors to be made tight around the piping to prevent passage of vermin, rodents and fire? If expansion space is needed, is proper filler specified?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Bush Hammer Finish

.05 **Are precast units as a facing specified instead of Bush Hammer finish?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Exposed Vertical Concrete Wall Finishes

.06 **Is "plyform" specified on all form work for exposed vertical surfaces? (Existing conditions on campus indicate that several types of forming material have been used thereby creating numerous types of finish surface appearances.)**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Snap-Tie-Cone-Holes

.07 **Have snap-ties, when specified, been coordinated with the University Facilities Planning Project Manager to determine the project standard to be used?**
(Specific drawing sheet #/specification page # _____) ☐ ☐ ☐

Sidewalks and Ramps

.08 **Has a method to ensure straight expansion-joint-filler appearance been specified?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Stairs

.09 **Have poured in place concrete stairs or structural step stairs with pan filled treads been specified?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.10 All ramps, stairs, landings and exterior walks should have an integral non-slip finish; has this been specified? (Specific drawing sheet #/specification page #_____.)

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 4 - MASONRY

04100 - Mortar

.01 **Mortar without a color admixture is preferred. Is ASTM C-27073, Type "S", specified for above grade use and Type "M" for below grade? If the building to be restored is historic, have provisions been made to use matching grout? (This may be revised for structural consideration and to conform to code requirements.) (Specific drawing sheet #/specification page #_____.)**

Admixtures

.02 **Plasticizers, accelerators, retardants, water repellent agents, or other admixtures are not recommended for mortar unless specifically required. Has prior approval of the Owner been given?
(Specific drawing sheet #/specification page #_____.)**

04200 - Unit Masonry

.01 **Have ANSI/ASTM Standards been specified?
(Specific drawing sheet #/specification page #_____.)**

Tolerances

.02 **Tops of all masonry walls, exterior and interior, where applicable, should be built tightly against the floor construction above for stability, fire and sound protection, except where provision must be made for expansion, requiring alternative means for ensuring stability, etc. Have masonry and other anchors sizes and spacing been stated?
(Specific drawing sheet #/specification page # _____)**

Mock-up

.03 **Have specifications required a composite masonry mock-up? Erect a 4 x 4 foot minimum panel size, include specified mortar and accessories. The panel shall show color range and texture of masonry units, bond mortar joints and demonstrate minimum standard for the work. Completed masonry work in the building shall be equal to that shown in the approved panel. The panel shall not be removed until**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

masonry work is completed or until removal is authorized. (Specific drawing sheet #/specification page #_____.)

Concrete Unit Masonry

.04 Have concrete block units been used wherever feasible for interior wall finish? All units shall comply with all structural codes and shall be properly protected at the job site to insure placing in the wall without excessive moisture content. (Specific drawing sheet #/specification page #_____.)

.05 Are the walls exposed on both sides 6" thick (minimum)? (Specific drawing sheet #/specification page #_____.)

.06 Have all exposed external concrete block corners which extend to the floor (or to top of base) been bullnosed? Rub out all casting irregularities (so as to result in smooth transitions from flat face to rounded corner) before any finish treatment is applied. (Specific drawing sheet #/specification page #_____.)

Weeps and Vents

.07 Have treated wick in weep holes been indicated? (Specific drawing sheet #/specification page #_____)

Cavity Wall

.08 Has a cavity been provided where concrete blocks are veneer faced with brick or precast units? Do not use units directly against the concrete block without employing a proven form of waterproofing. (Specific drawing sheet #/specification page #_____.)

Joint Reinforcement and Split Coursing

.09 Has split coursing been checked at the head of any type of opening? (Specific drawing sheet #/specification page #_____.)

04210 - Veneer Masonry System

.01 Has all brick proposed, and their range of color, been

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

approved by the Owner, and does it conform to the Secretary of Interiors Standards for color, texture, pattern, bond, and size for historic brick work?
(Specific drawing sheet #/specification page #_____.)

Mock-up (Sample Panel)

.02 Has a mock-up been specified for review and approval? Mock-ups shall be erected in 4 X 4 foot panels, including specified mortar and any accessories. When accepted, the mock-up will demonstrate minimum standards for the Work (Color and blend of face brick shall generally match brick-work in a specific adjacent building or that typical on campus).
(Specific drawing sheet #/specification page #_____.)

Size

.03 Has it been specified that all face brick shall be standard size (8" long x 2-½" high x 3-¾" wide) with net cross-sectional area not less than 75% of the gross area in the same plane, and with core holes not less than ¾" from any edge and must conform to appropriate ASTM Standards?
(Specific drawing sheet #/specification page #_____.)

Coursing

.04 Has it been indicated that all brick shall be laid with modular coursing, three courses to 8", unless otherwise required to match existing coursing or to accentuate an architectural feature or pattern. ASTM standard shall be complied with for all face brick, Grade SW, Type FBS. In addition, manufacturer's certification will be required stating that the rating for effervescence is not more than "slightly effervesced" in accordance with ASTM.
(Specific drawing sheet #/specification page #_____.)

Existing Face Brick Description

.05 (Has the university inserted its face brick requirements with as much specificity as possible?)
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

04270 - Glass Unit Masonry

Is there any non load bearing glass unit masonry for either interior or exterior construction? If so, do the horizontal joint reinforcement and uniform joint treatment interface with adjacent wall systems? Are strict structural and code compliance being met?
(Specific drawing sheet #/specification page #_____.)

04500 - Masonry Cleaning

.01 **Has the Southern Brick and Tile Manufacturing Association been referred to for bulletins covering cleaning. (Cleaning should be done sufficiently early for the walls to dry thoroughly; at least four weeks prior to application of silicone or other recommended waterproofing. Sandblasting is not recommended for bricks, terracota, or ceramic finished material. Specify that brickwork especially historic brick or stone work must be inspected prior to application of waterproofing.)**
(Specific drawing sheet #/specification page #_____.)

Cleaning Materials

.02 **Have cleaning agents of detergent or solvent been specified?**
(Specific drawing sheet #/specification page #-____.)

Exterior Waterproofing

.03 **Is any exterior waterproofing being applied to masonry or stone walls?**
(Specific drawing sheet #/specification page #_____.)

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 5 - METALS

05010 - General Requirements

Shop Painting

Has it been specified that all iron and steel items must have additional coats applied at the job? (Specific drawing sheet #/specification page #_____.)

05120 - Structural Metal

Does all structural steel work comply with AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" and applicable ASTM Standards? (Specific drawing sheet #/specification page #_____.)

05500 - Metal Fabrications

.01 Has it been specified that at least three mils of paint on all steel lintel surfaces in interior walls be used if not galvanized? Use galvanized steel angles in all exterior masonry, stone or precast concrete walls and in all interior walls where used in conjunction with stone. (Specific drawing sheet #/specification page #_____.)

.02 All metal components shall conform to applicable ASTM requirements and shall include gratings, castings, supports for ceiling hung equipment and framed partitions, construction inserts and fastening devices, expansion joint inserts and covers, stair nosing and access doors for both ceiling and wall applications, vertical ladder for elevator pit; welded steel ladder (to meet OSHA). Elevator pit sump gratings; corner guard angles; steel angles, channels and clips; pipe sleeves for mechanical and electrical trades; trench drain gratings and frames; galvanized steel corner guards and, miscellaneous structural shapes. (Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

05520 - Handrails and Railings

Handrails should not end in 90 degree angles where there are circulation paths nor should they extend 3 inches past the circulation areas.

.01 Are all rails: 1-¼" standard steel pipe?
(Specific drawing sheet #/specification page #_____.) | | | |

.02 Are all posts: 2 X 2-½ standard steel pipe size?
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Does the design comply with all applicable codes, including handicap requirements and ADA?
(Specific drawing sheet #/specification page #_____.) | | | |

.04 Have exterior handrails and railings been specified to be clear anodized aluminum? | | | |

.05 Have interior handrails and railings been specified to be clear anodized aluminum, or fluorocarbon/siliconized polyester-finished steel? | | | |

05530 - Tree Grates

Are the tree grates of dimensions as required with concentric patterns having gray iron frame sections and gray iron grate bolted to the frame?
(Specific drawing sheet #/specification page #_____.) | | | |

05800 - Expansion Control

Is the system complete and of compatible materials to produce waterproof expansion joint seals including matching wall, deck and wall, wall and roof and wall intersection systems?
(Specific drawing sheet #/specification page #_____.) | | | |

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 6 - WOOD & PLASTICS

06114 - Wood Blocking and Curbing

Pressure Treated Lumber

Is pressure treated material used for all lumber in contact with concrete, masonry or steel? Wolmanizing process is considered best of the treatments for lumber in buildings; Boliden salts are excellent and treatment is equivalent to Wolmanizing if pressure treatment of 100/150 psi is used.
(Specific drawing sheet #/specification page #_____.) | | | |

06200 - Finish Carpentry

Laminated Plastic

.01 **Is plastic laminate used? Is a backing sheet of manufacturer's recommendation used and specified? (This material shall meet flamespread rating requirements of NFPA 101 for interior finish consistent with the occupancy classification.)**
(Specific drawing sheet #/specification page #_____.) | | | |

Back-Painting

.02 **Is wood to be back-painted before setting specifically called for under Division 9 so there is no room for question on the part of the Contractor?**
(Specific drawing sheet #/specification page #_____.) | | | |

Millwork

.03 **Are any door sections used to make up closet walls? Are the edges concealed where possible since the veneers exposed to view present an unsightly appearance?**
(Specific drawing sheet #/specification page #_____.) | | | |

.04 **Are floor-to-ceiling door openings being coordinated (door and transom)? Have the location of the ducts and pipes been coordinated with engineers?**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Wood Railings

.05 **Do wood handrails return to walls and newel-posts? The use of these handrails should be minimized because of the difficulty of maintaining an acceptable finish.**
(Specific drawing sheet #/specification page #_____.) | | | |

06 **Has it been specified that all cabinetry shall have plywood cores with no particleboard allowed?** | | | |

.07 **Have chair rails/wall protectors been specified in Division 10 – Specialties?** | | | |

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 7 - THERMAL & MOISTURE PROTECTION

07115 - Elastomeric Sheet Waterproofing

.01 **Is water-proofing product (sheet butyl, PVC, EPDM, CPE, CSPE, neoprene, hypalon, or composite laminated membrane) functioning as principal moisture stop in arresting water predominantly in a horizontal application; adhesive bonded, self-adhered, loose laid, or mechanically secured installation? (Specific drawing sheet #/specification page #_____.)** | | | |

Slabs on Grade

.02 **Is there a requirement for design of slabs on grade to prevent damage to membranes during construction. Are there any special areas and where damp-proofing is considered necessary for any slab on grade? If so, a double slab system is preferred in order to reduce chances of a punctured membrane. A product equal to "Bituthane" by W. R. Grace should be considered under the wear slab. For a basement water-proofing condition, a water bar is essential at walls and columns.**
(Specific drawing sheet #/specification page #_____.) | | | |

.03 **Is a Radon Barrier required? If so, special consideration shall be given to design.**
(Specific drawing sheet #/specification page #_____.) | | | |

Vertical Surfaces

.04 **Is there a through-wall damp-proofing membrane to prevent moisture in the soil from extending up the wall by capillary action? Material can be as light as 2 oz. copper-backed sisal paper if properly lapped and sealed at joints.**
(Specific drawing sheet #/specification page #_____.) | | | |

.05 **Have the basement walls been damp-proofed or waterproofed on the soil side? The type of material to be used depends upon the condition; a brushed-on coat of bituminous paint might be adequate for dampness but sheet membrane waterproofing or**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

"Bentonite" or equal should be considered where hydro static pressure is suspected.
(Specific drawing sheet #/specification page #_____.)

Shower Room Floors

.06 Has special consideration been given to preventing leakage in shower and drying room areas?
(Specific drawing sheet #/specification page #_____.)

.07 Has a depressed floor been used for toilet areas where ceramic tile is used since they allow space for the waterproofing pan and they avoid a step at the entry door?
(Specific drawing sheet #/specification page #_____.)

.08 If floor is not depressed, have the details of stopping the water at the entry door where the membrane stops been shown?
(Specific drawing sheet #/specification page #_____.)

.09 Is a 24-hour water test required prior to placement of the finish flooring? If leaks occur, another test is required after repairs are made.
(Specific drawing sheet #/specification page #_____.)

07180 - Water Repellent Materials

Are clear elastomeric water repellent coatings specified for various surfaces? Clear elastomeric coatings are preferred to water or solvent based materials.
(Specific drawing sheet #/specification page #_____.)

07190 - Vapor Barriers and Retarders

Is a method used to continue a seal formed by a vapor and air barrier for each building enclosure construction, and to seal gaps between adjacent materials forming wall and roof opening?
(Specific drawing sheet #/specification page #_____)

07270 - Fire Stopping

Are fire stop openings created when site conditions require forming or cutting walls, partitions, or floors? Is fire stop

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

material used to close openings and continue a fire resistance rating uninterrupted?
(Specific drawing sheet #/specification page #_____.)

07536 - Roofing - "Special Treatment"

Have the Architect/Engineers adhered to the latest State University System Standard Practice for Roofing?
(Specific drawing sheet #/specification page #_____.)

07540 – Roofing Membrane

Has modified bitumen with mineral surfaced cap sheet been specified?

07620 - Sheet Metal Flashing and Trim

Has it been indicated that all sheet metal flashing and trim shall be in accordance with the Architectural Sheet Metal Manual by the Sheet Metal and Air Conditioning Contractors National Association (SMACNA)?
(Specific drawing sheet #/specification page #_____.)

.01 Has it been detailed that all parapet walls shall have metal copings?

.02 Has it been specified that all exposed metal copings, gravel stops, etc., shall be aluminum (clear anodized or mill finish) or stainless steel?

07631 - Gutters and Downspouts

Are gutters and downspouts, hangers, straps and shoes completely detailed and/or described? Gutters and downspouts should be held 1" from the building wall to allow air to circulate between gutter/downspout and wall surface.
(Specific drawing sheet #/specification page #_____.)

07820 - Skylight Structures

.01 The Owner does not recommend the use of skylights. Have clerestory structures been specified in lieu of skylights?
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 **If skylights are used in the building design, the Owner cannot stress enough the quality of the skylight and the care of its installation and related moisture protection. During preparation of the specifications, have the performance requirements been made as stringent as possible?**
(Specific drawing sheet #/specification page #_____.)

07900 - Sealants, Caulking and Seals

.01 **Has this work been specified to be done by experienced mechanics? Has the highest quality of sealants been used for each individual application? There is no substitute for life cycle costs in a sealant product.**
(Specific drawing sheet #/specification page #_____.)

.02 **In addition to caulking for water tightness, has caulking been specified for finished appearance, i.e., at cracks between the juncture of different materials or of horizontal with vertical surfaces? (Specific sheet #/specification page # _____)**

.03 **Caulking is not to be used as permanent construction. Has caulking been specified for uses other than as a supplement to properly designed and detailed joints?**
(Specific drawing sheet #/specification page #_____.)

07910 - Scuppers

Have overflow scuppers been provided in parapet walls to prevent water building up even though drains are required or specified?
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

07920 - Gravel Stops

Where no gutter occurs but gravel stops are used over exterior entrances or decorative panels, have high gravel stops, to prevent water from spilling over with resulting stain effect from the metal, been specified?
(Specific drawing sheet #/specification page #_____.)

Initial Approval

Date

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 8 - DOORS & WINDOWS

08110 - Steel Doors and Frames

		N/A	Y	N
.01	Where hollow metal doors and frames are used, is the reinforcing of frames for hardware completely described? A light angle is desirable. Where two doors swing from the same mullion the metal should be of heavier material and reinforced. (Specific drawing sheet #/specification page #_____.)			
.02	Are all frames specified made of 14 gauge metal? (Specific drawing sheet #/specification page #_____.)			
.02-1	Have exterior frames been specified to be 14 Gauge hot dipped galvanized?			
.02-2	Have interior frames been specified to be 16 Gauge galvanized?			
.03	Do all doors used as means of egress (including those in corridors) that require vision panels have wire or other approved glass panels installed to meet NFPA 80 requirements? (Specific drawing sheet #/specification page #_____.)			
.04	If fume hoods or other large equipment occurs in a room, re the doors adequate width to provide clearance for moving the items in or out provided? If size is questionable, use larger size opening. (Specific drawing sheet #/specification page #_____.)			
.05	Are all exterior doors insulated metal doors with adequate weather stripping utilized to conserve energy? If glass is used, is the glass thermal/safety glass, and non-reflective? (Specific drawing sheet #/specification page #_____.)			
.06	Do all operable items on exterior doors have an integral finish -- not applied, painted, baked on, etc.? (Specific drawing sheet #/specification page #_____.)			

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.07 At least one main entry door shall be accessible from adjacent sidewalks by wheelchair and shall display the proper handicapped signage. All other entry doors shall have proper signage to direct wheelchair handicapped persons. In addition, the ANSI standards shall apply as to raised letter signage for the blind. Automatic door opening for the handicapped is preferred. Does at least one door conform to required Accessibility Codes and ADA?
(Specific drawing sheet #/specification page #_____.) | | | |

.08 Exterior doors shall be of "monumental" quality unless determined otherwise. Is each leaf 3'-0" wide x 7'-0" high for 32 inches clear opening?
(Specific drawing sheet #/specification page #_____.) | | | |

08210 - Wood Doors

.01 Are all corridor doors and doors to closets 1-¾" solid core to meet requirements of NFPA 80 and 101, and are they able to use standard locksets? Where cutouts for closers are required, the head rail should be not less than 6 inches. If hardwood edges are desired, they should be completely specified with the thickness given. Has it been specified that wood doors shall meet the Standards of The National Woodwork Manufacturers Association?
(Specific drawing sheet #/specification page #_____.) | | | |

.02 Do all doors used as means of egress (to include corridors) that require vision panels have wire or other approved glass panels installed to meet NFPA 80 requirements?
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Are 7-foot high doors used as a standard rather than 6'8"?
(Specific drawing sheet #/specification page #_____.) | | | |

.04 Is wood door quality clearly specified as well as manufacturer's name noted? For example, the term "equal to Mengel" is not sufficient.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05 To prevent the flexing and breaking of the wall along the door frames, has a nest of studs been provided around each door installation to accommodate the weight of the door and the shock caused by the closing of the door? Does the finished wall extend into the door frame throat opening a minimum of 1-½ inches for wrap-around frames?
(Specific drawing sheet #/specification page #_____.)

.06 Are interior doors 3'-0" x 7'-0" solid or solid core? Do classroom doors have wired glass view panels set in steel framing or stops according to code?
(Specific drawing sheet #/specification page #_____.)

.07 Are all doorways numbered? Do not place number on door, but to the open side with raised numbering at a height of five feet. Has the room numbering schedule been reviewed by the University's Facilities Planning Department at 50% Construction Documents? Is all signage in accordance with ADA requirements?
(Specific drawing sheet #/specification page #_____.)

.08 Does view panel in any fire door conform to NFPA Life Safety Code specifications and requirements?
(Specific drawing sheet #/specification page #___--.)

08213 - Plastic Faced Wood Doors

Facing and Adhesives

Does plastic laminate conform to NEMA LD-3? Do adhesives for both exterior and interior conform to ANSI/NWMA-I.S.1?
(Specific drawing sheet #/specification page #_____.)

08400 – Entrances and Storefronts

Has it been specified that all entrances, storefronts, and windows shall be clear anodized aluminum finish?

08500 - Metal Windows

General

.01 Has consideration been given to the provision of operable windows as a means of ventilation in the event that air-conditioning equipment is not in operation? Consideration

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

should also be given to the use of double panes (thermopane) with outer shield of solar glass, especially if windows area exceeds 3% of wall area. Glass should be installed so it can be cleaned from the inside of the building. Are operable windows provided with positive locking devices? (Specific drawing sheet #/specification page #_____.)

.02 Has consideration been given to all metal windows having dual pane glass and thermal break-insulation filled frames? (Specific drawing sheet #/specification page #_____.)

.03 Have all classroom windows, unless otherwise advised by the University Facilities Planning Project Manager, been equipped with audiovisual blinds or acceptable window coverings? (Specific drawing sheet #/specification page #_____.)

.04 Have guardrails at all full height glass panels been specified in accordance with applicable codes? (Specific drawing sheet #/specification page #_____.)

.05 Have hurricane shelter considerations been used in the design of windows and materials used? (Specific drawing sheet #/specification page #_____.)

08700 - Finish Hardware

General

.01 Is the hardware schedule included in the specification? (This is to avoid change orders and delay in taking bids. A completely itemized schedule is preferred, i.e., not a group listing.) A cash allowance for finish hardware shall not be used unless otherwise authorized. (Specific drawing sheet #/specification page #_____.)

Locksets

.02 Has the university provided the consultant with their standard locking and keying system? (Specific drawing sheet #/specification page #_____.)

.02-1 Have mortise locksets been specified to be Sargent 8200 series with lever handles and removable cores?

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02-2 Have removable cores been specified to be Sargent 6-pin old style with FAU restricted keyway for Boca Raton and Northern Campuses? Have removable cores been specified to be Sargent 5-pin new style with FAU restricted Keyway for Broward Campuses? Keyway series shall be verified with University Facilities Planning Project Manager prior to ordering. Supplier must be authorized by Sargent and approved in writing by FAU.

Butts

.03 Provide only five-knuckle, stainless steel. Have ball bearing butts for doors equipped with closers (heavy duty, with 4 ball bearing for exterior doors and interior doors over 3 feet wide, standard weight butts with 2 ball bearing for interior doors up to 3 feet wide) been specified? Have non-ball bearing for all doors without closers been specified? Have stainless steel butts been used on exterior doors, except as otherwise noted? (Specific drawing sheet #/specification page #_____.)

.04 Have extra-heavy adjustable pivots been specified at exterior doors that have a high frequency of use? (Specific drawing sheet #/specification page #_____.)

.05 At exterior service doors: have stainless steel ball-bearing butts (2 or 4 as required with non removable pin) been specified? (Specific drawing sheet #/specification page #___--.)

Exit Devices

.06 Has Von Duprin type 99 or comparable, in finish compatible with door been specified? Have aluminum or steel removable mullion at all lockable pairs of doors, interior and exterior been provided? At exterior pairs of aluminum doors, have Kawneer Panic Guard, or comparable, entrances been specified? (Specific drawing sheet #/specification page #_____.)

.06-1 Have exit devices been specified to be Sargent 8800 series rim-type?

.06-2 Have all electrically - controlled exit devices been specified to have steel dogging screws and to be 2-wire?

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.07 **Do all building entrance/exit doors contain exit devices with concealed vertical rod? Surface vertical rod for exit devices are not acceptable due to handicapped interference. (Specific drawing sheet #/specification page #_____.)** | | | |

Closers

.08 **At exterior doors is surface applied, similar to Russwin 2820 series or LCN 4040 series (Corbin 110 series at 2821 dormitories)? (Specific drawing sheet #/specification page #_____.)** | | | |

.09 **At interior doors is surface applied, similar to Russwin 2820 series or LCN 4040 series, (Corbin 100 series at dormitories) on room side of doors so as not to be visible from corridors, lobbies, and other public spaces? (Specific drawing sheet #/specification page #_____.)** | | | |

.09-1 Has it been specified that closing strength of all closers shall comply with State handicap requirements and AE has verified that closers specified will meet this requirement? | | | |

Stops

.10 **Are wall mounted convex rubber bumpers, with concealed fasteners specified? (At drywall partitions, solid blocking must be provided within the stud space. Use floor stops only where absolutely necessary.) (Specific drawing sheet #/specification page #_____.)** | | | |

Kickplates

.11 **At locations where severe usage is anticipated, is stainless steel specified? (Specific drawing sheet #/specification page #_____.)** | | | |

Provisions for Noise Control

.12 **On machine room doors and other doors where excessive noise is anticipated, is weatherstripping at heads and jams, and are surface applied automatic door bottoms specified? (Specific drawing sheet #/specification page #-----.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Hardware for Metal Entrance Doors

.13 **Is all hardware for such doors furnished under this section (unless otherwise noted)? Has it been specified that the hardware supplier furnish to the door manufacturer templates or the actual hardware?**
(Specific drawing sheet #/specification page #_____.) | | | |

Prohibited Materials and Installations

.14 **Have the following conditions been avoided: thresholds raised above floor levels at doors to trash and receiving rooms and at all doors intended for use by handicapped persons?**
(Specific drawing sheet #/specification page #_____.) | | | |

Finish (unless otherwise noted)

.15 **Are USP finishes specified for butts on exterior hollow metal doors which are not exposed to public view? Closers shall be finished to suit room decor. Is the typical finish specified as stainless steel US 32D? Are all hardware finishes typical? (Other finishes may be used only where necessary to match materials to which hardware is applied.)**
(Specific drawing sheet #/specification page #_____.) | | | |

.15-1 **Have finishes been specified to be brushed stainless steel (US32D) for exteriors and brushed stainless steel or brushed chrome (US26D) for interiors?** | | | |

Standards and Approved Equals

.16 **For each item, has one manufacturer been specified and scheduled as the standard and, whenever possible, two other manufacturers whose products are PROVEN EQUAL?**
(Specific drawing sheet #/specification page #_____.) | | | |

.17 **Has a complete list of items proposed as the standards, together with manufacturers' names and with the names of manufacturers whose products are proposed as equals, been included in the hardware schedule? This schedule must be approved by the Owner at 50% Construction Documents.**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Keys and Keying

.18 Is each lock cylinder compatible with specified hardware and with existing university hardware and keying systems? (Specific drawing sheet #/specification page #_____.)

.19 Are lock cylinder parts brass, bronze, stainless steel or nickel silver as approved by the University Facilities Planning Project Manager? (Specific drawing sheet #/specification page #_____.)

.20 Is each lock cylinder operated by one of the following keying system:

.20-1 1 New Master Key established for this project (if applicable). (Specific drawing sheet #/specification page #_____.)

.20-2 Existing Grand Master Key. (Specific drawing sheet #/specification page _____.)

.20-3 Existing Great Grand Master Key. (Specific drawing sheet #/specification page #_____.)

.21 Has it been specified that key bows shall be stamped on one side "PROPERTY OF STATE OF FLORIDA - DO NOT DUPLICATE" and on the other side with change bitting? (Specific drawing sheet #/specification page #_____).

.22 Has it been specified that mechanical, telephone, and janitor rooms shall be operated only by the Great Grand Master Key and by the Change Keys established for those respective areas as follows:

.22-1 Mechanical: GGM 1. (Specific drawing sheet #/specification page _____.)

.22-2 Telephone: GGM 2. (Specific drawing sheet #/specification page #_____.)

.22-3 Janitor: GGM 3. (Specific drawing sheet #/specification page #_____.)

.23 Has it been specified that paper storage areas (toilet paper, paper towels, etc.) shall be operated only by the Great Grand

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Master Key and by special key (SKD1)?
(Specific drawing sheet #/specification page #_____.) | | | |

.24 Has the final keying been reviewed with the university prior to issuance to the Contractor?
(Specific drawing sheet #/specification page #_____.) | | | |

.25 Have the keys been provided as follows (verify for each project):

.25-1 No Grand Master Keys.
(Specific drawing sheet #/specification page #_____.) | | | |

.25-2 Ten (10) Master Keys.
(Specific drawing sheet #/specification page #____.) | | | |

.25-3 Ten (10) keys for each submaster established.
(Specific drawing sheet #/specification page #____.) | | | |

.25-4 Four (4) Change Keys per lock.
(Specific drawing sheet #/specification page #_____.) | | | |

.25-5 Three hundred (300) Change key blanks ("S" bow, stamped).
(Specific drawing sheet #/specification page #_____.) | | | |

.25-6 Twelve (12) Construction Master Keys "CMK".
(Specific drawing sheet #/specification page #_____.) | | | |

26. Has it been specified that each project shall be a Construction Master Key project? All locks shall be shipped to the job Site operated only by the Construction Master Key. Permanent keys, together with the Key Bitting Record, shall be sent via registered mail direct from the factory to: University Facilities Planning Project Manager, Florida Atlantic University, 777 Glades Road, COB#69-Room 107,Boca Raton, Florida, 33431 Manager.
(Specific drawing sheet #/specification page #_____.) | | | |

.27 Has an electric-powered automatic door opener been scheduled for each major exterior entry to the building? Only one door needs to be provided with the automatic opener when the entry consists of multiple doors. Standard operator is Nabco Gyro Tech GT-500 system. Activators are Linear transmitters-receivers. Transmitters are battery powered. Pushplates are 6 ¼" diameter brushed stainless

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steel with engraved handicap symbol. Microswitch and transmitter fit within a standard 4" square junction box. verify transmitter frequency is 310MHz. | | | |

08720 - Schedules

Hardware Schedule

.01 Locksets should be related to the Architect/Engineer's space number when preparing the hardware schedule, i.e., Door No._____ Space___ . Has the university provided room Numbers with comments during the design development review (do not list by group)? (Specific drawing sheet #/specification page #_____.) | | | |

Keying Schedule

.02 Has the keying schedule been prepared by the university locksmith? (Specific drawing sheet #/specification page #_____.) | | | |

08730 – Card Access Control System

.01 Has a complete, operable, tested and certified Card Access Control System (C.A.C.S.) been specified? | | | |

.01-1 Is the specified system Software House-C. Cure 800 System? | | | |

.01-2 Has the C.A.C.S. been designed and specified to connect to and interface with the Campus Central Control System through the campus data system? | | | |

.01-3 Has the Campus Central Control System been analyzed to verify capacity for the proposed new access control system? If the Central Control System requires an upgrade of hardware or software to function properly campus-wide after the addition of the proposed new access control system, has the upgrade been designed and specified as a part of this project? | | | |

.01-4 Has it been specified and scheduled that an adequate number of exterior entry doors are controlled by card readers and connected to the C.A.C.S.? AE shall confirm locations with FAU Project Coordinator. | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.01-5 Has it been specified and scheduled that all exterior doors are connected to the C.A.C.S. and monitored for open-close conditions? ☐ ☐ ☐

.01-6 Have all wiring/cabling, operating devices, door contactors, relays, controls panels, boxes, grounds, and testing been specified to be performed by a system-manufacturers' factory-trained and certified installer? ☐ ☐ ☐

.01-7 Have all C.A.C.S. devices been shown on the construction documents and has the AE coordinated all electrical requirements with the electrical drawings and specifications, including raceways in door frames and j-boxes? ☐ ☐ ☐

.01-8 Has a campus data port been provided at the C.A.C.S. Building panel location? ☐ ☐ ☐

.01-9 Has a 4' x 4' x ¾" plywood backboard been specified to mount the C.A.C.S. equipment? ☐ ☐ ☐

.01-10 Has a dedicated 110v/20A circuit been provided at the C.A.C.S. building panel location? ☐ ☐ ☐

08800 - Glazing

.01 Are the types of glass and location indicated on the drawings or in the specifications as follows: ☐ ☐ ☐

.01-1 A "type number" to each type of glass being used on the job.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-2 Location of each by the simple note, "glass type 1", "glass type 2," etc. (Avoid lengthy descriptions of the glass on the drawings.)
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-3 Each glass type precisely defined in the specifications.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-4 Use of obscure glass in toilet and bathroom windows.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 **Is all window glass replaceable from inside the building wherever feasible?**
(Specific drawing sheet #/specification page #_____.) | | | |

.03 **Have hurricane considerations been made in regard to the type of materials and processes used on the glass?**
(Specific drawing sheet #/specification page #-____.) | | | |

Future replacement of glass

.04 **Has it been specified that windows should be glazed in the closed position and left closed for several weeks? (This applies particularly to awning or projected types.)**
(Specific drawing sheet #/specification page #_____.) | | | |

.05 **Has safety glass been specified in all hazardous locations to comply with Life Safety Code, ADA Requirements, etc?**
(Specific drawing sheet #/specification page #_____.) | | | |

.06 **Has it been specified that all exterior glass on the Boca Raton campus shall be PPG Solargreen glass, or approved equal? (In ¼" thickness:67% visible light transmittance, 0.60 shading coefficient.)** | | | |

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 9 - FINISHES

General Material and Finish Guidelines

.01 **Has the selection of materials been assessed for long range, life-cycle cost analysis?**
(Specific drawing sheet #/specification page #_____.) | | | |

.02 **Has the Architect/Engineer coordinated all color and material color selections with the University Facilities Planning Project Manager?**
(Specific drawing sheet #/specification page #-____.) | | | |

.02-1 **Have color schedules been reviewed by the University with the check set of working drawings?**
(Specific drawing sheet #/specification page #_____.) | | | |

.02-2 **Have schedules and samples been provided for interior finishes, such as paint, vinyl, baseboards, carpet, tile, bathroom partitions, etc., as well as exterior finishes, such as paint, roof shingles, glazing, and so on?**
(Specific drawing sheet #/specification page #_____.) | | | |

.02-3 **Have colors been presented in the form of a non-returnable "color board", which demonstrates all color selections in the form of an overall project color palette?**
(Specific drawing sheet #/specification page #_____.) | | | |

.03 **Have samples of all finishes and finishing material been submitted to the Owner for approval? In case of special concrete finishes or stucco work, a sample at least 4'-0" square shall be submitted.**
(Specific drawing sheet #/specification page #_____.) | | | |

09200 - Lath and Plaster

.01 **Has galvanized steel metal lath in conjunction with acoustic plaster to eliminate rust stains been specified?**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 Where highest corrosion resistance is considered desirable, has it been specified that lathing accessories such as corner and casing beads be made of zinc alloy; otherwise call for galvanized steel?
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Have ample control joints in stucco, particularly in overhangs, been provided? Two No. 60 expansion type casing beads butted together offer a means of control.
(Specific drawing sheet #/specification page #_____.) | | | |

09220 – Portland Cement Plaster

Have the requirements of Appendix 6- been incorporated into the project specifications and drawings? | | | |

09300 - Tile

General

.01 Has the Architect/Engineer determined preferences for finishes from conferences with the University Project Manager?
(Specific drawing sheet #/specification page #_____.) | | | |

Quarry Tile

.02 Because of its enduring quality, ease of maintenance and fire resistance, quarry tile is a desirable material for stairways, corridors, kitchens and for many other areas both interior and exterior. Has this material been considered anywhere in the project?
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Is quarry tile being considered for stairs? (Quarry tile treads are preferred for main stairs and should have an integral abrasive of approximately 65% aluminum oxide, ceramically bonded at high temperature.)
(Specific drawing sheet #/specification page #_____.) | | | |

.04 Are quarry tile treads replaceable?
(Specific drawing sheet #/specification page #_____.) | | | |

.05 Is quarry tile specified for exterior slab finishes? (If so, quarry tile must also have integral abrasive.)
(Specific drawing sheet #/specification page #-____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Ceramic Tile

.06 **Is the current edition of "The Handbook for Ceramic Tile Installation," published by the Tile Council of America, listed as a reference guide for selecting design details and specification wording? (List the current edition.) (Specific drawing sheet #/specification page #_____.)** | | | |

.07 **Ceramic tile is desirable for floors and walls or wainscots in toilets as well as in some laboratories and utility rooms. Has any been specified? (Toilet floors should have dark sealed grout.) (Specific drawing sheet #/specification page #_____.)** | | | |

Shower Room Floors

.08 **Has this area been addressed specifically in the drawings and specifications to eliminate maintenance problems? (Specific drawing sheet #/specification page #_____.)** | | | |

.09 **Has a 24-hour water test been required prior to placement of the finish flooring? (If leaks occur, another test should be required after repairs are made.) (Specific drawing sheet #/specification page #_____.)** | | | |

Shower Room Walls

.10 **Ceramic tile on a masonry wall is insufficient to prevent water from permeating a shower room wall. Has parging or painting the back of the wall and providing a through-wall flashing near the base been specified as a means of conducting the water back to the shower room floor? (Specific drawing sheet #/specification page #_____.)** | | | |

09511 - Suspended Acoustical Ceilings

.01 **Extreme care must be taken to choose the correct acoustic units. Do not specify exotic patterns, etc. Have only standard patterns been specified that will be available for many years in the future? (Specific drawing sheet #/specification page #_____.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 Has it been specified that the Contractor cannot accept discontinued acoustic units, since matching replacements is impossible?
(Specific drawing sheet #/specification page #_____.)

.03 Has it been specified that all acoustical ceiling materials shall meet flame-spread rating requirements of NFPA 101 and the Florida Building Code for interior finish according to occupancy classification?
(Specific drawing sheet #/specification page #_____.)

.04 To avoid misunderstandings, have acoustical ceilings been specified, not only by noise reduction coefficient, but also by tile thickness?
(Specific drawing sheet #/specification page #_____.)

.05 Has a thickness of ¾" been specified for mechanical systems?
(Specific drawing sheet #/specification page #____.)

.06 Has a mechanical suspension been specified? (poor results have been experienced for the newly developed "wonder" adhesives.)
(Specific drawing sheet #/specification page #_____.)

.07 Is a ceiling system other than acoustical tile been specified in dormitories? (Acoustic tile is a poor material to use in dormitories because of vandalism and is not approved for use.)
(Specific drawing sheet #/specification page #_____.)

.08 Where exposed grid systems are specified, a reflected ceiling plan is required on the drawings. Has proper provision been specified for construction tolerances regarding plumbness, dimensions and locations, particularly where exposed masonry and concrete is used?
(Specific drawing sheet #/specification page #_____.)

.09 Has it been specified that the buildings must be dried by heat or other means prior to installation to control humidity?
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

09650 - Resilient Flooring

Has it been specified that no product shall contain asbestos? (Specific drawing sheet #/specification page #_____.)

09680 - Carpeting

.01 Is carpeting in compliance with University standards? (Specific drawing sheet #/specification page #_____.)

.02 Has carpet grain direction, seaming, and scribing been carefully addressed in drawings and specifications? (Specific drawing sheet #/specification page #_____.)

.03 Has it been specified that carpets may be subject to testing by an independent laboratory to determine that the minimum specifications have been met if the Architect/Engineer thinks testing is desirable? Cost of testing shall be borne by the Owner if the carpet meets the specifications; if not, the cost is to be borne by the Contractor. (Specific drawing sheet #/specification page #_____.)

.04 Has it been specified that the carpet supplier must furnish carpet care and maintenance instructions bound in a substantial looseleaf binder? (Specific drawing sheet #/specification page #_____.)

.05 Has it been specified that carpet with carpet pad is preferred except in high use traffic areas; integral sponge rubber backed carpet is acceptable, foam rubber backing is not acceptable. Consideration will be given for direct glue down carpet where appropriate. (Specific drawing sheet #/specification page _____.)

.06 These specifications are for a medium quality carpet for general use; has a higher quality been specified for heavy use areas and for special services? (Specific drawing sheet #/specification page #_____.)

Carpet Edge Taper

.07 Has a product similar to Mercer Imperial Reducer been specified to comply with ANSI requirements for wheelchair traffic? (Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Carpet Specifications

.08 Have the following manufacturer and related specifications been followed as a minimum for new construction? The Architect/Engineer need not use it verbatim but may prepare his/her own specification after consultation approval from with the University Facilities Planning Project Manager.

Is the carpet similar to:

.08-1 MFG. Bigelow (Campus, or approved equivalent as described in specifications and drawings)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-2 Type: (Velvet woven through back)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-3 Pitch: (216)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-4 Rows per inch: (7.0)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-5 Face Yarn: (100% Antron B.C.F., static controlled and soil resistant)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-6 Yarn Ply: (8 ply equivalent)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-7 Yarn Weight: (shall be specified)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-8 Total Weight: (shall be specified)
(Specific drawing sheet #/specification page #____-.) | | | |

.08-9 Backing Materials: (Wrap - Synthetic; Stuffer – Synthetic; Filler - Synthetic)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-10 Dye Method: (Yarn)
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.08-11 Flammability: (Doc-FF1.70)
(Specific drawing sheet #/specification page #_____.) | | | |

.08-12 ASTM-E-84-81A TUNNEL TEST
(Specific drawing sheet #/specification page #_____.) | | | |

08-13 Smoke Density: (NBS Smoke Density Chamber, NFPA-258-450 or less)
(Specific drawing sheet #/specification page #_____.) | | | |

08-14 Static Test: (AATCC Test Method 134-1979 Under 3500 Volts) | | | |

.08-15 Direct Glue Down
(Specific drawing sheet #/specification page #_____.) | | | |

.08-16 Has the following FAU-Standard carpet, or approved equal been specified? | | | |

- **a. Usage: Offices, Classrooms, Common Areas**
- **b. Description: Level Loop Pile w/ Lifetime antimicrobial**
- **c. Gauge: 1/10 Min.**
- **d. Stitch Rate: 10 Min. per inch**
- **e. Pile Height: .090 - .187 inch**
- **f. Fiber: Advanced generation continuous filament nylon w/static control 3 or 4 ply.**
- **g. Dye Method: Solution Dyed**
- **h. Yard Weight:22 oz. Min.**
- **i. Primary Back:Moisture barrier with or without cushion in 6' or 12' roll goods or carpet squares.**
- **j. Pile Density: Minimum 6000 oz/yd^3**
- **k. Fire Rating: Class I**
- **l. Standards: Collins & Aikman "Explorer"**
  Shaw "Parallels"
  Cambridge "Turnberry" (with B-1 Backing)
  Interface "Southern Plains"

.09 Is carpet better than recommended guidelines?
(Specific drawing sheet #/specification page #_____). | | | |

.10 Has it been specified that one (1) lineal ft. of sample carpet shall be provided for the purpose of testing?
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Instructional and General Office Buildings

Rooms and Corridors

.11 Has it been specified that class "A" or "B" carpets and under padding shall be used in all areas of instructional and general office buildings? (Specific drawing sheet #/specification page #_____.) | | | |

Stairways

.12 It is preferred that stairways shall not be carpeted. However, if they are, is Class "A" carpet and under padding used? (Specific drawing sheet #/specification page #_____.) | | | |

Installation

.13 Are the following requirements specified?

.13-1 A minimum of three copies of a printed installation manual written by the carpet manufacturer's Technical Service Department to be delivered to the Owner's Representative to be turned over to the University. (Specific drawing sheet #/specification page #_____.) | | | |

.13-2 The Contractor shall inspect floor construction and surfaces to receive carpeting. This inspection must cover and identify all defects in the floor which affect this Work. (Specific drawing sheet #/specification page #_____.) | | | |

.13-3 The Contractor shall be held responsible for the accuracy of measurement and fit of this Work. The Contractor shall also be held responsible for preparing existing hard floor for carpet. (Specific drawing sheet #/specification page #_____.) | | | |

.13-4 The Work shall be done by skilled workers fully experienced in this type of Work. (Specific drawing sheet #/specification page #_____.) | | | |

.13-5 Floor areas to receive carpet shall be smooth, broom clean, and dry prior to installation of carpeting. (Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.13-6 Tackless carpet gripper shall be installed in accordance with manufacturer's recommended procedures. Carpet cushion shall be installed waffle side up and trimmed neatly to carpet grippers.
(Specific drawing sheet #/specification page #_____.) | | | |

.13-7 Stretch cushion and butt all seams to obtain wrinkle-free underlayment. Secure cushion to floor with paste at the seams and at such other areas as necessary to insure that underlay is flat.
(Specific drawing sheet #/specification page #_____.) | | | |

.13-8 Carpet to be directly glued-down is to be done in accordance with the manufacturer's recommended methods and adhesives. Where a carpet manufacturer does not have a recommended adhesive, the adhesive manufacturer is to provide written instructions to the Architect/Engineer.
(Specific drawing sheet #/specification page #_____.) | | | |

.13-9 Carpet shall be installed, wall to wall, using continuous lengths and widths as broad as possible, minimizing the placement of seams in traffic lanes. Cut edges shall be trued and appropriately treated to form invisible and non-raveling joints where exposed.
(Specific drawing sheet #/specification page #_____.) | | | |

.13-10 Carpet shall be installed in accordance with manufacturer's recommendations for seaming technique and for proper amount of stretch in width and length.
(Specific drawing sheet #/specification page #_____.) | | | |

.13-11 Metal binder shall be installed at all areas where floor covering material changes, or at carpet edges that do not abut a vertical surface.
(Specific drawing sheet #/specification page #_____.) | | | |

.13-.12 Installed carpet shall be free of spots, dirt or soil, and shall be without tears, frayed or pulled tufts.
(Specific drawing sheet #/specification page #_____.) | | | |

.13-13 The Contractor shall apply appropriate covering over carpeted areas until acceptance. Upon acceptance, the Contractor shall remove all debris and the protective covering.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Replacement, Remnants and Maintenance

.14 Replacement carpet, remnants and usable scrap and overage in carpeting shall be packaged in appropriate wrapping, labeled and left on premises at job site for the Owner. (Specific drawing sheet #/specification page #_____.) | | | |

.15 Requested number of copies of a printed maintenance manual written by the carpet manufacturer's Technical Service Department shall be delivered to the Owner. (Specific drawing sheet #/specification page #_____.) | | | |

09900 - Painting

General

.01 Have the following recommendations been considered in the specifications to assist in obtaining the quality desired:

.01-1 Has it been specified to require undercoats to have slightly different tints, and to be inspected and approved by the Architect/Engineer prior to application of the next coat? (Specific drawing sheet #/specification page #_____.) | | | |

.01-2 Has it been specified that the total thickness of paint by "dry mil" or "wet mil" thickness (according to which is recommended by the paint manufacturer), and verify the thickness on the job by use of special low-cost gages. (Specific drawing sheet #/specification page #_____.) | | | |

.01-3 Has the University issued information to assist the Architect/ Engineer in specifying the quality of paint required? This information shall contain acceptable vendor products as well as paint specifications for specific types of paint and their application, and may be included in the Project Manual. Paints with the highest proportion of titanium dioxide should be used for dirt shedding properties. (Specific drawing sheet #/specification page #_____.) | | | |

.01-4 Have substrate preparation requirements been clearly described? (Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.01-5 Have door frames in masonry walls been specified to be back painted prior to installation?
(Specific drawing sheet #/specification page #_____.) | | | |

Ferrous Metal

.01-6 Has paint on steel and iron items been specified on the basis of mil thickness rather than number of coats? For items exposed to the weather a total of six mils is considered necessary; for Work exposed inside a building, four or five mils is desirable. (Dry film measurement). This includes structural steel and miscellaneous iron and steel items.
(Specific drawing sheet #/specification page #_____.) | | | |

Exterior Waterproofing

.01-7 Has this section been correlated with Section 04500 - Masonry Cleaning/Exterior Waterproofing?
(Specific drawing sheet #/specification page #_____.) | | | |

.01-8 Has the use of a clear silicone waterproofing or approved alternative been specified on the exterior of all brick buildings Including the stone? A 3% silicone is considered adequate; for limestone a 5% silicone is desirable. Products which have been used and found acceptable are: Florida Laboratories Chemclear 30 and Sonneborn-Hydrocide S-X.
(Specific drawing sheet #/specification page #_____.) | | | |

Suggested Specification

.01-9 Has a clear silicone solution containing a minimum of 3-5% silicone resin solids in a hydrocarbon solvent conforming to formulation and performance standard of Federal Specifications SS-W-OO11O (G.S.A.) been specified? Container label shall certify that it meets above requirements. Where an interior paint is used on masonry or concrete surfaces, no silicone waterproofing is desired.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Millwork

.01-10 Has a paint finish been specified to be used on closets made up of standard solid core doors if exposed edges show? A stained and varnish finish doesn't have a good appearance because of putty used to fill nail holes and imperfections. (Specific drawing sheet #/specification page #_____.)

.02 Where appropriate, are official FAU logo/seal colors been specified? The official colors are based on the Pantone Matching System (PMS) used in the print industry Blue- 287, Red – 485, Yellow – 122 for coated paper stock, Yellow – 121 for uncoated paper stock. The blue color is also used on the exterior metal signs, and matches high-gloss automotive enamel code TB6.

.03 Have the following FAU - standard interior paint colors and finishes been specified? Paint colors listed for color matching are from Sherwin Williams Color Answers Color Selector; AE shall specify paint manufacturers and grades appropriate for the intended use.

Color Scheme 1 (Looks creamy white)
Walls (flat finish) - Dover White #SW1648
Doors & Frames (gloss finish) - Silverado #5W1005

Color Scheme 2 (Looks white white)
Walls (flat finish) - Pure White #SW1004
Doors & Frames (gloss finish) - Silverado #SW1005

Color Scheme 3 (Looks gray white)
Walls (flat finish) - White Pepper #SW1912
Doors & Frames (gloss finish) - Silverado #SW1 005

.04 Have the following FAU - standard exterior paint colors been specified for work on the Boca Raton Campus? Paint colors listed for matching are from Sherwin Williams Color Answers Color Selector; AE shall specify paint manufacturers and grades appropriate for the intended use.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Building Exterior Walls
Approved Exterior Colors:
Boulevard Beige #SW2045 (looks beige with peach tint)
Egret White #SW2004 (looks warm white)
Cosmopolitan Gray #SW2274 (looks medium warm gray)
Torrey Pine #SW2384 (looks hunter green)
Exterior Sign Bases (Looks light gray)
Big Chill #SW1002
Accents & Exterior Signs (Looks royal blue)
No Sherwin Williams direct match. Contractors must match Pantone Matching System (PMS) #287, high gloss automotive enamel Code TB6

\Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 10 - SPECIALTIES

10100 - Chalkboards and Tackboards

.01 **Has the Architect/Engineer scheduled the sizes and locations of chalkboards and tack boards with the University Facilities Planning Project Manager during planning meetings? (Specific drawing sheet #/specification page #_____.)** | | | |

Chalkboards

.02 **Glass chalkboards are not acceptable because of breakage. Slate chalkboards are preferred but steel is acceptable. Dark green or dark brown chalkboards are preferred. Light colored chalkboards are unacceptable, even if they are considered as projection screens. Have the appropriate chalkboards been specified? (Specific drawing sheet #/specification page #_____.)** | | | |

.03 **Where chalkboards are combined with projections screens, have complete details been provided? (Specific drawing sheet #/specification page #_____.)** | | | |

.04 **On fixed chalkboards, provide at least four map hooks per eight feet of length. Have the tops of the chalkboards been specified at seven feet above the floor for normal adult use? (Specific drawing sheet #/specification page #_____.)** | | | |

.05 **Have chalkboards been specified for all general classrooms?** | | | |

.06 **Have white porcelain-on-steel marker boards been specified in all other locations?** | | | |

10150 - Compartments

.01 **Has it been specified that toilet partitions should be 1" solid plastic, although consideration will be given to other types where appropriate? Partitions should be wall and floor mounted (avoid ceiling mounted systems wherever possible). Full length attachment brackets should be used. Manufacturer: Santana or equal. (Specific drawing sheet #/specification page #_____.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.02 Do toilet compartments for the handicapped comply with all requirements of ANSI A117.1, Florida Accessibility, and ADA requirements?
(Specific drawing sheet #/specification page #_____.) | | | |

10155 – Toilet Compartments

.01 Has it been specified that toilet and shower compartments shall be solid plastic, high density polyethylene, floor mounted, head braced? | | | |

10200 - Louvers and Vents

.01 Are all wall louvers extruded aluminum, storm proof, and do they include bird screens? Has it been specified that all louver perimeters will be sealed to provide full perimeter integrity?
(Specific drawing sheet #/specification page #_____.) | | | |

.02 Have hurricane considerations been made?
(Specific drawing sheet #/specification page #_____.) | | | |

10260 - Wall and Corner Guards

Has it been specified that high impact vinyl and stainless steel may be used with approval of the University Facilities Planning Project Manager? (Light gauge aluminum is unsatisfactory; 3/16" or a heavier gauge pvc or aluminum is necessary to prevent warping).
(Specific drawing sheet #/specification page #_____.) | | | |

Has AE specified and shown on the drawings wall guards for all classrooms and conference/seminar rooms that will have moveable (non-fixed) furniture? AE shall determine which walls in each room are subject to damage from the furniture and schedule wall guards on only those walls. Wall guards shall be equal to Pauling Corp. Model CR-40, 8" high, textured PVC, 0.040" thickness, provided and installed by CM/GC. | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

10400 - Identifying Devices

.01 Has the University assigned room numbers to all spaces during the review of the Design Development Phase? (Specific drawing sheet #/specification page #_____.)

.01-1 Has FAU Room Numbering – General Guidelines, Appendix 7, been utilized on the project?

.02 Are these numbers on the construction bid documents and used under doors, hardware, electrical panel schedules, etc.? (Specific drawing sheet #/specification page #_____.)

.03 Has this section been used to include building directories, door signs, address signs, and similar directional material, and is it generally used when more than one of those items will be required? A narrow scope section dealing with the particular item is common when only one item (such as "building directory") is required. (Specific drawing sheet #/specification page #_____.)

.04 Are identification systems, especially for piping, in Section 01080 or in an appropriate section of Division 15? (Specific drawing sheet #/specification page #_____.)

.05 Are project signs specified along with other temporary facilities in Division 1? (Specific drawing sheet #/specification page #____.)

.06 Is pavement marking, including graphics, in Division 2? (Specific drawing sheet #/specification page #_____.)

.07 Is the text on all permanent room signs easily changeable? (Specific drawing sheet #/specification page #_____.)

Signs

.08 Is all signage in accordance with ADA requirements? (Specific drawing sheet #/specification page #_____.)

.09 In buildings of four or more stories in height, has a sign been provided at each floor level landing in accordance with

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

NFPA 101 (Life Safety Code), Chapter 5? The sign shall indicate the floor level, the terminus of the top and bottom of the stair enclosure, and the identification of the stair. The sign shall also state the floor level of the direction to exit discharge. The sign shall be located approximately 5 ft. (152 cm) above the floor landing in a position that is readily visible when the door is in the open or closed position.
(Specific drawing sheet #/specification page #_____.) | | | |

.10 **Has the Architect/Engineer included directional signs for direction of the public through corridors to destination together with identification of specific functions of rooms such as, MEN, WOMEN, CUSTODIAL CLOSET, MECHANICAL ROOM, DEPARTMENTAL NAMES, HIGH VOLTAGE, etc.? Observe requirements of the Handicapped Codes and ADA. Particular attention should be given placement of exit signs to ensure compliance with applicable codes and occupancy limit at designation on signs at specific areas . Design, placement, and other details will be in accordance with the Fire Marshal's requirements.**
(Specific drawing sheet #/specification page #_____.) | | | |

.11 **Are all room signs easily changeable?**
(Specific drawing sheet #/specification page #_____.) | | | |

.12 **Has the following FAU - standard interior sign system or approved equal been specified?** | | | |

- **a. Manufacturer:Innerface Architectural Signage**
- **b. Series:Inner Dot Tactile/Braille ADA Plaque Module**
- **c. Sizes: Room #'s – 4 ½" x 4 ½" or 7" x 7"**
  Directional or informational – 7" x 11 ¾"
- **d. Style: Radius corners**
- **e. Usage:Raised, contrasting letters/numbers for room number. Braille message to match text. A changeable semi-rigid polymer insert slides into a pocket in the sign frame, behind a transparent faceplate identifying text may be added to this insert.**
- **f. Text Font: Helvetica Medium**

.13 **Has the FAU exterior Building Letters Specification Appendix 8, been utilized on the project?** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.14 Has the FAU Exterior Building Signage Specification, Appendix 9, been utilized on the project? | | | |

10420 – Letters and Plaques

The Owner requires a plaque on each major building, which Is discussed in the Special Conditions. Have additional details been provided by the University's Facilities Planning Project Manager? (Specific drawing sheet #/specification page #_____.) | | | |

10522 - Fire Extinguishers, Cabinets, and Accessories

.01 Have UL approved fire extinguishers been provided as per NFPA 10 for all buildings and located by the University Director of Environmental Health and Safety in cooperation with the University Facilities Planning Project Manager unless otherwise specified? (Recessed type in Exit Corridors) (Specific drawing sheet #/specification page #_____.) | | | |

.02 Have 10# ABC extinguishers been provided in all corridors? (Specific drawing sheet #/specification page #_____.) | | | |

.03 Have 10# CO2 extinguishers been provided in all mechanical spaces? (Specific drawing sheet #/specification page #_____.) | | | |

.04 Have 10# Halon 1211 extinguishers or a suitable substitute been provided in all computer areas and laboratories? The use of Halon extinguishers shall be verified by the State Fire Marshal and applicable Codes and Regulations. (Specific drawing sheet #/specification page #_____.) | | | |

10800 - Toilet and Bath Accessories

.01 Have the following accessories been verified with the University Facilities Planning Project Manager? (Careful placement of accessories are required to protect sight lines.) Where applicable, are these items required to be lockable on a Physical Plant standard key? (Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.01-1 The following Toilet & Bath accessories are required on FAU projects. Has the AE specified and shown these items to be provided and installed by the CM/GC

Feminine Napkin Disposal

.02 Bradley Model #4781-15, surface mounted BradEX. One at each water closet. | | | |

.02.1 Partition mounted Bobrick B-354 (or American #47) to serve two adjacent toilet compartments; recessed unit B-353 (or American #39) elsewhere. Provide at each water closet in Women's toilet room.
(Specific drawing sheet #/specification page #_____.) | | | |

Feminine Napkin-Tampon Vendor

.03 Bradley Model #B-282 25
classic series, surface mounted, satin stainless steel.
One at each water closet. | | | |

.03.1 Combination dispenser, 10a" x 30¼" x 5½", white enamel, wall mounted, with 25 cent locked coin box. Provide at each Women's toilet room.
(Specific drawing sheet #/specification page #_____.) | | | |

Mirror

.04 Stainless steel framed without shelf, Bobrick Series B-290 (or American series 500) minimum 16" x 24". Mirror for handicapped usage shall have the bottom mounted at 40" above the floor or shall be a fixed tilt unit, Bobrick B-293 (or American #573). Provide above each lavatory.
(Specific drawing sheet #/specification page #_____.) | | | |

Soap Dispenser

.05 Supercedes SUS CCG's. | | | |

a. Counter-mount automatic dispenser – Technical Concepts One Shot soap dispenser, Model #401310. Provide one for each 2 counter-mounted lavoratories.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

b. Wall-mount manual dispenser – Johnson Soft Care Dispenser, Model #05613. Provide one for each 2 wall-mounted lavatories.

.05 Basin-mounted push-down valve liquid unit with 2½" long spout and polyethylene container, Bobrick B-829 (or American #29 Likwidurn), mounted in hot water hole where no hot water is Required at the lavatory. At counter installation where hot water is provided to the lavatory use Bobrick B-8295 (or American #29L Likwidurn) mounted in the countertop Adjacent to the lavatory.
(Specific drawing sheet #/specification page #_____.) | | | |

Toilet Tissue Dispenser

.06 Handicap stalls Bradley Model #B-7686 polished stainless steel double roll dispenser. Non-handicap stalls Johnson Model #9550 JRT JR. twin large-roll dispenser, In-sight, smoke gray color. | | | |

.06.1 Surface mounted unit for two rolls of standard toilet tissue, brushed chrome. Provide at each water closet.
(Specific drawing sheet #/specification page #_____.) | | | |

Towel Dispenser

07 Merfin Model #1001 Jumbo Hand Towel Surface Mount bottom dispensing plastic dispenser. | | | |

.07.1 Wall mounted brushed chrome, crank action. For handicapped usage, install with center of crank 48" above floor. Provide at each toilet room.
(Specific drawing sheet #/specification page #_____.) | | | |

Waste Receptacle

.08 Stainless steel semi-recessed, Bobrick B-3644 (or American #840). Provide at each toilet room.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Coat Hooks

.09 **Provide one coat hook on the back of each toilet stall door. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Shelf

.10 **Bobrick B-296 (or American #638) x 24", stainless steel. Provide in each student-used toilet compartment (for books, purse, etc.), mounted on the side wall, rear corner. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Grab Bars

Note: All items shall be securely installed. Use solid wood blocking at drywall locations.

Note: All accessories to be in accordance with the requirements of the ADA.

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 11 - EQUIPMENT

11160 - Loading Dock Equipment

.01 This section again is one of the broad scope type, used for specifying a complete system of loading dock equipment. CSI's Master format lists several narrow scope section numbers and titles for use when only individual items of equipment are required.

.01-1 Dock levelers.
(Specific drawing sheet #/specification page #_____.) | | | |

.01-2 Adjustable dock ramps.
(Specific drawing sheet #/specification page #_____.) | | | |

.01-3 Portable ramps, bridges, and platforms.
Specific drawing sheet #/specification page #_____.) | | | |

.01-4 Seals and shelters.
(Specific drawing sheet #/specification page #_____.) | | | |

.01-5 Dock bumpers.
(Specific drawing sheet #/specification page #_____.) | | | |

.02 Are improved loading dock seals specified rather than wood dock bumpers?
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Have provisions been made to adequately light the interior of truck trailers with dock lights? | | | |

11457-Television Units and Accessories

Have the requirements of the FAU "Audiovisual Requirements for the Electronic Classrooms and Teaching Auditoriums", Appendix 10 been incorporated into the drawings and specifications? All infrastructure, i.e., conduits, pull boxes, electric & data outlets, etc. shall be shown to be provided and installed by CM/GC. | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

11600 - Fume Hood and Exhaust Systems Installations

OSHA regulates and sets standards for ventilation and Exhaust systems under Sub-part G - Occupational Health And Environmental Control. 1910.93 Air Contaminants. Employees' exposure to materials listed in these standards shall be limited as specified. The University is responsible for establishing and enforcing administrative and engineering controls as needed to achieve OSHA compliance.

.01 **A significant amount of technical information must be prepared and submitted to the Owner during Conceptual Schematics, Advanced Schematics, and Design Development. Has the FAU Professionals Services Guide dared 2003 been provided to the consultant?**
(Specific drawing sheet #/specification page #_____.) | | | |

.02 **The design and installation of exhaust systems (including hoods, ducts, air mover, and discharge outlet) shall comply with the American National Standard Institute (ANSI) Z9.2-1971 Fundamentals Governing the Design and Operation of Local Exhaust Systems, the manual, Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists 1970; NFPA-91, Blower and Exhaust Systems; NFPA-45, Laboratory Systems; and the latest American Society of Heating, Refrigerating and Air Conditioning Engineers' (ASHRAE) Handbooks. Has the airflow and pressure loss data provided by the manufacturer of any air cleaning device been included in the design calculations?**
(Specific drawing sheet #/specification page #_____.) | | | |

.03 **Has the "Fire Protection Handbook" current edition as used by the State Fire Marshal's Office as regulating the design and installation of blower and exhaust systems, been referenced?**
(Specific drawing sheet #/specification page #_____.) | | | |

.04 **Perchloric Acid Fume Hood Criteria**
Are hoods used for perchloric acid specified to have identifying signage on the face of the hood by either the manufacturer's label and/or an appropriate warning sign indicating: FOR PERCHLORIC ACID ONLY?
(Specific drawing sheet #/specification page #-____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05 Has the AE specified the appropriate material for fume hood exhaust piping? Galvanized steel is to be used only with the written approval of FAU Environmental Health and Safety Department. | | | |

11860 - Waste Handling Equipment

Trash Disposal

.01 Has it been specified that the Contractor is to obtain the Architect/ Engineer's and the University's Facilities Planning Project Manager's agreement on trash disposal? (Most universities use steel trash collection boxes (dumpsters) for trash disposal.)
(Specific drawing sheet #/specification page #_____.) | | | |

.02 Have buildings three or more stories high been designed with a trash receiving room large enough to place a 10 cu. yd. (8' wide X 7' deep X 8' high) steel trash collection box directly below a vertical chute? (A roll-up door is suggested, not less than 10' X 10'.)
(Specific drawing sheet #/specification page _____.) | | | |

.03 Have recycling bins and areas been provided?
(Specific drawing sheet #/specification page #_____.) | | | |

_____ _____
Initial Approval **Date**

_____
Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

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DIVISION 12 - FURNISHINGS

12100 - General

.01 **Fixed equipment covered in Division 11 should be included in the general construction contract insofar as is possible. Fixed items are identified as those items which are secured in place by fastening devices or by rigid piping including conduit.**
(Specific drawing sheet #/specification page #_____.) | | | |

.02 **Offices and classroom furniture and loose equipment such as desks, chairs, filing cabinets, etc., are generally provided from Owner's furniture and equipment funds. A sum is stated in the project budget from which the University will normally purchase additional items. The Architect/Engineer should not consider the budgeted sum a part of the funds for which the Architect/Engineer has responsibility.**
(Specific drawing sheet #/specification page #_____.) | | | |

.03 **Has consideration been given to PRIDE of Florida to provide layouts and estimates for all moveable furniture and furnishings? Call (813) 535-4900 for more information.**
(Specific drawing sheet #/specification page #_____.) | | | |

12300 - Laboratory Casework

General

.01 **Has the Architect/Engineer received review/sign-off from the University personnel?**
(Specific drawing sheet #/specification page #_____.) | | | |

Approved Manufacturers

.02 **Has the Architect/Engineer obtained the Owner's agreement by signature as to acceptable casework construction materials and manufacturers? (Quality should be of the highest.)**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Countertops

.03 **Have working surfaces been selected for the intended use? Laminated plastic tops are satisfactory for many labs but epoxy countertops must be specified where top is exposed to heavy usage, strong chemicals, heat, etc.**
(Specific drawing sheet #/specification page #_____.) | | |

.04 **Has laboratory casework been specified to be high pressure plastic laminate on medium-density fiberboard specifically made for use in cabinetry and casework as base-bid, with solid core wood casework as an add alternate?** | | |

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 13 - SPECIAL CONSTRUCTION

13000 - General

.01 In the event that special environmental rooms, diagnostic labs, coolers, sound proof rooms and other specialty construction is involved, has the University Facilities Planning Department arranged conferences with the appropriate staff members so the Architect/Engineer can obtain full information directly from the technician responsible? (Specific drawing sheet #/specification page #_____.) | | | |

Miscellaneous

.02 Are clocks on a master clock system? (Specific drawing sheet #/specification page #_____.) | | | |

.02-1 Have clocks been specified? Clocks shall be 12" round analog battery-operated. No master clock systems. Provide clocks in each elevator lobby and each classroom/lab/lecture hall. | | | |

.03 Are telephone conduits for pay phones kept totally separate from all other telephone conduits? (Specific drawing sheet #/specification page #_____.) | | | |

.04 Elevator Emergency Telephone Compartment: Are the doors equipped with an opening device in full compliance with ANSI A117.1 and ADA Handicapped requirements? Is there an Intercommunication panel tied in to the University Police Department, to be used in case of emergency? (Specific drawing sheet #/specification page #_____.) | | | |

Telephones

.05 Is it specified that phones and wiring to wall plugs will be provided by the university (unless otherwise agreed in writing)? (Specific drawing sheet #/specification page #_____.) | | | |

.06 Has the FAU Information Resources Management Communication Infrastructure Specification dated June 2000 or latest, been incorporated in this project? Architect/Engineer shall confirm in writing to the University Facilities Planning

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Project Manager what edition is being used for design prior to beginning. | | | |

.07 Has a riser diagram for telephone, data and coaxial cable (CCTV) been included in the contract documents? All Riser diagrams shall be complete and show connectivity to campus system. All components shall be shown, including owner furnished items, ie: data and/or telephone switch(es). | | | |

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 14 - CONVEYING SYSTEMS

14200 - Elevators

Code

.01 **The Architect/Engineer must thoroughly set forth the code requirements, including provisions for handicapped. Do the specifications establish the requirements? (The Architect/Engineer must not depend on the elevator Subcontractor or the Contractor to meet code conditions.) (Specific drawing sheet #/specification page #_____.)** | | | |

.02 **Do all elevators, dumbwaiters, escalators, and moving walks meet the requirements of ANSI A117.1 and the ADA and the State of Florida? (Specific drawing sheet #/specification page #_____.)** | | | |

.03 **Do all buildings three or more stories in height have "fire control elevators" and emergency power? (Specific drawing sheet #/specification page #_____.)** | | | |

Diagrams, etc.

.04 **Is it specified that wiring diagrams and inspection certificate are to be furnished and placed under glass on wall-mounted frame, and that the cost of all elevator inspections and certificates are to be paid for by the Contractor? Certificate shall be dated to begin on date of Substantial Completion or acceptance, whichever is later. Copy of all certificates shall be provided to the Owner. (Specific drawing sheet #/specification page #_____.)** | | | |

Finishes

.05 **Are stainless steel cab interiors, doors and door frames specified? Formica or other plastic laminate will be considered for cab interiors on a limited budget. (Specific drawing sheet #/specification page #_____.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Special Features Generally Desirable

.06 **Is it specified that all exposed screws are to be tamper-proof? (Specific drawing sheet #/specification page #_____.)** | | | |

.07 **Is it specified that top and side emergency exits shall have contacts which will stop the car and ring a bell? Side emergency exits shall be key locked from inside the car and openable from outside the car. (Specific drawing sheet #/specification page #_____.)** | | | |

.08 **Is it specified that the emergency stop switch shall have an alarm bell connected to it which shall include a bell mounted under the platform and a bell located at the main floor lobby or some other designated place? (Specific drawing sheet #/specification page #_____.)** | | | |

.09 **Is it specified that the car operating panel shall include no buttons other than the emergency stop, alarm, open door, close door and floor buttons? Any other switches required for operation of the elevator shall be either key operated or contained in a separate cabinet having a locked door, including light and fan switches. (Specific drawing sheet #/specification page #_____.)** | | | |

.10 **Is it specified that all buttons shall be stainless steel. Markings and placement must be in accordance with provisions for handicapped. (Specific drawing sheet #/specification page #_____.)** | | | |

.11 **Is it specified that, in addition to the load weighing device, provision shall be made to ring a bell and a light if the car is overloaded beyond 120% of normal capacity? (Specific drawing sheet #/specification page #_____.)** | | | |

.12 **Is it specified that safety edges furnished in connection with the car doors shall be either metal or extruded vinyl plastic? (Specific drawing sheet #/specification page #_____.)** | | | |

.13 **Is it specified that floor numerals should be neatly placed and in accordance with provisions for handicapped? (Specific drawing sheet #/specification page #____.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Warranty & Service

.14 **Is it specified that the period of free maintenance (24 hour callback service) by the installer must be one year or equal to the warranty period? Warranty period to the university should start at the time of Substantial Completion or time of acceptance of the elevator installation -- whichever is the later date.**
(Specific drawing sheet #/specification page #_____.) | | | |

.15 **Is it specified that elevator pits shall be waterproofed or designed to provide a dry pit area?**
(Specific drawing sheet #/specification page #_____.) | | | |

.16 **Is it specified that where a sump pump is provided in the pit, the pump shall be set into the sump and a metal cover shall be provided to cover the entire sump?**
(Specific drawing sheet #/specification page #_____.) | | | |

.17 **Is it specified that conduit or plastic pipe shall not be installed in pit, hoistway or machine room? Only metal sump pump discharge lines are allowed in pits and hoistways.**
(Specific drawing sheet #/specification page #-_____.) | | | |

.18 **Is it indicated that a pit 4'-0" deep or more shall be provided with a metal ladder, permanently installed, extending at least 30" above the access floor and have a rung at the top for a hand grip?**
(Specific drawing sheet #/specification page #_____.) | | | |

.19 **Is it indicated that moisture proof type light shall be provided in each pit and the light switch located as to be accessible from pit entrance and adjacent to pit stop switch; 24" to 30" above first floor sill for switch height?**
(Specific drawing sheet #/specification page #_____.) | | | |

.20 **Is it indicated that beams, floor slabs or other building construction shall not project more than 2" inside the general line of the hoistway unless the top side of projection is beveled at an angle of not less than 75 degrees?**
(Specific drawing sheet #/specification page #_____.) | | | |

.21 **Is it indicated that hoistways of elevators serving more than three floors shall be vented to outside air to prevent accumulation**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

of smoke or gases? The area of the vents shall be not less than three and one-half (3-½%) percent of the area of the hoistway nor less than three (3) square feet for each elevator, whichever is greater. Vents and frames shall be of noncombustible material. All vent openings shall reject a ball two (2) inches in diameter and may be covered with a screen.
(Specific drawing sheet #/specification page #_____.)

.22 Is it indicated that all door frames, headers, etc., shall be grouted solid to maintain fire ratings?
(Specific drawing sheet #/specification page #_____.)

.23 Is it indicated that machine room doors shall be not less than one and one-half (1-½) hours fire rating B label, not less than 3' 4" in width and not less than 6' in height, self-closing and locking? Is it indicated that doors shall be provided with a spring type lock arranged for opening from the inside without a key? (However, a key is required to open the door from the outside.)
(Specific drawing sheet #/specification page #_____.)

.24 Is it indicated that all voids, holes, slots, etc., in the hoistway shall be grouted or pointed up to obtain fire rating? Is it indicated that all nails, snap-ties, form straps and wood shall be removed from hoistway, machine room walls and ceiling?
(Specific drawing sheet #/specification page #_____.)

.25 Is it indicated that machine room floors shall be smooth and level?
(Specific drawing sheet #/specification page #_____.)

.26 Is it indicated that machine rooms shall have a head room of not less than 7' 0"? (Head room is determined by measuring from the floor to overhead items such as wire duct, beams, lights, etc.)
(Specific drawing sheet #/specification page #_____.)

.27 Has it been indicated that duplex receptacles of the grounded type shall be provided in machine rooms and pits?
(Specific drawing sheet #/specification page #_____.)

.28 Has it been indicated that adequate lighting shall be installed in pits and machine rooms to provide not less than ten (10)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

footcandles at the floor level? Machine rooms shall have not less than two lights provided with the light switch located on the lockjamb side of the access door. It is suggested that fluorescent lights be installed in machine rooms.
(Specific drawing sheet #/specification page #_____.) | | | |

.29 **Has it been indicated that only elevator equipment shall be installed in machine rooms? No piping, drain or vent pipes, smoke stacks, laundry vents, television or other items not related to operation of the elevator are allowed in machine rooms.**
(Specific drawing sheet #/specification page #_____.) | | | |

.30 **Has it been indicated that main line switches for elevators shall be of the fused type and shall provide means of locking the switch in the open position?**
(Specific drawing sheet #/specification page #_____.) | | | |

.31 **Has it been indicated that fuses in the main line disconnect switch shall be "Class K5" or "Class R"? Fuses shall be properly sized for the load and rating of the disconnect switch.**
(Specific drawing sheet #/specification page #_____.) | | | |

.32 **Has it been indicated that main line feeder wires must be phase identified in the main line switch and also at terminals of controllers?**
(Specific drawing sheet #/specification page #_____.) | | | |

.33 **Has it been indicated that stairways for access to elevator machine rooms shall be of metal and shall conform to the following:**

.33-1 Maximum angle of sixty (60) degrees from the horizontal.
(Specific drawing sheet #/specification page #_____.) | | | |

.33-2 Stair treads shall not be less than 28" in length.
(Specific drawing sheet #/specification page #_____.) | | | |

.33-3 Stair treads shall be level and not less than 6" in width with slip-resistive surface.
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.33-4 The rise shall not be less than 8" or more than 10".
(Specific drawing sheet #/specification page #_____.) | | | |

.33-5 The headroom from the top any tread shall be not less than 7' vertical clearance, measured in line with the face of the riser.
(Specific drawing sheet #/specification page #_____.) | | | |

.33-6 There shall be no more than 14' in an unbroken vertical rise.
(Specific drawing sheet #/specification page #_____.) | | | |

.33-7 Stairway floor opening shall be guarded by a metal railing 42" in height with intermediate rail and toe board.
(Specific drawing sheet #/specification page #_____.) | | | |

.33-8 Open side of stairs shall be protected with a metal handrail not more than 34" in height form the upper surface of top rail to surface of tread in line with face of riser at forward edge of tread, and with intermediate rail.
(Specific drawing sheet #/specification page #____-.) | | | |

.34 Has it been indicated that for access across roof: steps or ramps with metal railing shall be built over pipes or other obstructions?
(Specific drawing sheet #/specification page #_____.) | | | |

.35 Has it been indicated that all construction sites shall have removable barricades with toe boards to protect hoistway or other open areas?
(Specific drawing sheet #/specification page #_____.) | | | |

.36 Has it been indicated that buildings having emergency power generators shall have generators operable at the time of initial inspection by State Elevator Inspector? (Elevator performance on emergency power shall be checked during inspections and tests as required.)
(Specific drawing sheet #/specification page #_____.) | | | |

.37 Has it been indicated that all carpets used for elevator cab floor shall have flame-spread rating of not more than

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Class B, 25 to 75, with negligible fuel contribution factor? ASTM-E-84 (Tunnel Test).
(Specific drawing sheet #/specification page #_____.) | | | |

.38 Has it been indicated that elevator machinery rooms shall be no larger than necessary to house, maintain and repair the machinery?
(Specific drawing sheet #/specification page #_____.) | | | |

.39 Has it been indicated that elevator machinery rooms are not to be used for storage of any kind?
(Specific drawing sheet #/specification page #____.) | | | |

.40 Has it been indicated that gratings shall be provided in shafts to permit safe lubrication of sheaves and equipment?
(Specific drawing sheet #/specification page #_____.) | | | |

.41 Has it been indicated that all elevator equipment shall be specified to include solid state power control systems, not motor control systems?
(Specific drawing sheet #/specification page #_____.) | | | |

.42 Has the Architect/Engineer included a statement in the specifications that elevator equipment must be able to be maintained by multiple qualified elevator service contractors and that this service will not require proprietary procedures? The Architect/Engineer must verify that all "standard" manufacturers listed in the specification comply with this requirement. | | | |

Initial Approval _____ Date _____

Date Revised _____

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

DIVISION 15 - MECHANICAL EQUIPMENT

15000 - Design Checklist

General:

		N/A	Y	N
.01	Has all of the design professionals standardized specifications, controls and details been "tailored" to the project? Check that all unnecessary items are removed.	☐	☐	☐
.02	Where future expansion is contemplated, has it been noted in the contract documents the assumptions that have been made? An example would be air handling unit 1 is designed to provide 2,500 cfm for three additional classrooms in the future.	☐	☐	☐
.03	On remodeling projects, has phasing been planned? Has known constraints and objectives been discussed and coordinated with all disciplines?	☐	☐	☐
.04	Have all mechanical requirements such as shaft vents and air conditioning been addressed for Elevator Equipment Rooms?	☐	☐	☐
.05	Has equipment loads from the manufacturer been secured?	☐	☐	☐
.06	Has a mechanical and electrical roof plan been included showing all equipment and connections required instead of attempting to show them on the floor plan drawing directly below the roof?	☐	☐	☐
.07	Have all thermostats and humidistats been shown?	☐	☐	☐
.08	Have all switchgear rooms been air conditioned?	☐	☐	☐
.09	Have all telephone equipment rooms been air conditioned?	☐	☐	☐
.10	Is emergency power required for cooling in telephone equipment room?	☐	☐	☐
.11	Have all structural penetrations been coordinated with the structural engineer in new and existing buildings?	☐	☐	☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.12 Have ¼ inch scale mechanical rooms been shown with all equipment indicated? ☐ ☐ ☐

.13 Has a minimum of one section been shown for all mechanical rooms and crowded areas such as above corridor ceilings? ☐ ☐ ☐

.14 Has a minimum of 75 cfm pressure differential been shown for positive and negative rooms? ☐ ☐ ☐

.15 Has a pretest and balance with drawings indicating what is required been provided? ☐ ☐ ☐

15001 - Design Information

.01 Does the Conceptual Schematic submittal contain technical narrative discussing options, advantages, disadvantages, relative costs and recommendations? (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.02 Does the Advanced Schematic submittal technical narrative provide greater detail of the concept selected? (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03 Have all major technical decisions been made before end of Design Development; are these decisions recorded in the Design Development submittal, and do they form the basis for the Design Development cost estimate? (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.04 Does Division 15 work comply with the FAU Professional Services Guide dated 2003? Attention is drawn to the specific requirements for 100% outside air systems, fume hood exhaust systems, clean room systems and other unusual or complex mechanical systems. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.05 Have ASHRAE Standard 62-1989 outside air quantities (typically 20 cfm per person for offices; 15 cfm per person in housing units and other occupancies) been specified? Has positive means for measuring and controlling outside air quantities into VAV air handling units, such as outside air fans or outside air VAV box, been provided? (Specific drawing sheet #/specification page #--_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.06 **Has it been specified that mechanical ventilation shall be provided per the Standard Mechanical Code? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

.07 **Has it been specified that combustion air shall be provided for all fuel-burning equipment in strict accordance with the Florida Building Code for Mechanical and Plumbing? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

.08 **Has it been specified to utilize the campus chilled water system for cooling when available? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

.09 **Has it been specified to utilize the campus steam system or hot water system for comfort heating, hot water heating (through building heat exchangers) and AHU reheat when available? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Energy Savings Design and Required Life-Cycle Cost Analysis

.10 **The Owner is most interested in the Architect/Engineer providing creative thinking to provide designs which will decrease annual operating costs. Many of these opportunities will be in MEP systems. The Owner requires discussion and consideration of these opportunities in a life-cycle cost analysis study which compares energy-saving options during Advanced Schematics. Does the life cycle cost analysis computer program and procedure comply with FAU Professional Services Guide requirements? Items found to be cost-effective shall be incorporated into the design in compliance with Section 255.251, F.S. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Interconnection with the Central Chilled Water Utility

.11 **The central chilled water system is designed as a variable flow system to achieve maximum energy economics. Is the design of the building established to operate over a varying pressure range with variable flow and relatively constant temperature rise? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.12 Does the building design provide 15 degree F temperature rise across all air handling unit coils, and properly interface with the chilled water system to assure the needed temperature rise is achieved while satisfying the building design criteria? The interface will also insure that the building pump(s) and the distribution pump(s) will be completely decoupled. (Specific drawing sheet #/specification page #_____.)

.13 The CUP is designed to provide not higher than 45degree F chilled water leaving the plant. Has the Architect/Engineer verified the project's design temperature, as some universities require lower temperatures (e.g., 42degree F)? Have the air handling units been designed for not less than 46degree F entering chilled water temperature, to allow for distribution system temperature rise? (Specific drawing sheet #/specification page #_____.)

.14 Has the mechanical system been designed to provide not less than 40-45% ASHRAE Standard 52-76 Dust Spot filtration in all major air handling units with 30% "throwaway" prefilters? (Discuss with the University's Department of Physical Plant.) (Specific drawing sheet #/specification page #_____.)

.15 Has the application of fan coil units been approved by the Owner? Fan coil units where approved shall not be installed above the ceilings unless University Facilities Planning Project Manager also approves in writing. (Specific drawing sheet #/specification page #_____.)

.16 Do the construction contract specifications require training/ orientation of University Maintenance and Engineering personnel on all installed equipment and systems? (Specific drawing sheet #/specification page #_____.)

.17 Has FAU approval been given for factory-prefabricated insulated chilled water piping for underground use? (It may be used with University approval.) It is the responsibility of the Architect/Engineer to investigate to assure approved vendors are limited to those with proven acceptable service at other locations for not less than two years, and to document this investigation in a formal project submittal. (Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.18 Has it been indicated that all utilities are to be metered for each building, including electricity, water, steam, and chilled water?
(Specific drawing sheet #/specification page #_____.)

.19 Has it been specified that all utility metering must be coordinated with the University Facilities Planning Project Manager both during design and with the Contractor prior to construction? All metering devices should have a pulse and 4-20 ma output for remote connection to a computer.
(Specific drawing sheet #/specification page #_____.)

.20 Has appropriate separation been provided (using both distance and material) of mechanical equipment and other noisy areas from academic and office areas?
(Specific drawing sheet #/specification page #_____.)

15001.1 - Classroom Design Information

.01 Has the following design criteria for noise in classrooms been followed?

1. Apply NC-30 criteria to all University classrooms unless the following special purpose classroom applies which should be NC-25. These include hearing-impaired students students who do not speak the native language, and foreign language classrooms. For drama or music classrooms, the design professional shall submit in writing his or her proposed design criteria before producing documents.

.02 Have the following HVAC systems been avoided in classroom applications?

1. Self-contained AC units located in the classroom
2. Rooftop AC units located directly above the classrooms
3. Water source heat pumps above the classroom ceiling.
4. Any unit mounted in a window or wall.

.03 Has a low velocity ductwork system been specified for the classrooms?

.04 For classrooms less than 1,000 square feet in area, have at least four 4-way ceiling diffusers been provided?

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05	Have the diffuser been selected for at least 9NC points less than the criteria (i.e. NC=21 for the diffusers)?			
.06	Have all air devices been selected with no volume dampers at the device face or at the device inlet?			
.07	Have all volume dampers been located at least six feet from the air device?			
.08	Has three diameters of flex ductwork been specified to be in the straight section of ductwork between the branch takeoff and the diffuser?			
.09	Has round ductwork been used as much as possible above classroom ceilings to minimize duct breakout noise?			
.10	Has the air handling unit been located away from the classrooms?			
.11	Has a sound attenuator been located in the air handling unit?			
.12	Has internal spring vibration isolation been provided on the fan/motor assembly of the air handling unit?			
.13	Has the unit been externally vibration isolated if a self-contained unit?			

15001.2 Mechanical Equipment Rooms

.01	Has roof mounted equipment, exposed to the environment been avoided?			
.02	Has a concrete vibration inertia base been specified for air handling units located anywhere above slab on grade?			
.03	Has the University painting guide for MER's been specified?			
.04	Has the MER been sized sufficiently so that maintenance access and coil pull is available?			
.05	Has coil pull space been kept clear of any piping?			

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.06	Have the MER doors been sized large enough to be able to take coil, or fan out of the building?			
.07	Have drywall MER walls been avoided?			
.08	Has proper consideration been given to noise control? Such as concrete block walls?			
.09	Has the design avoided using the MER as a return air or outside air plenum?			
.10	Has access been provided to roof for rooftop equipment?			
.11	Have sprinkler heads been located above and below wide sections of ductwork?			
.12	Have smoke detectors been provided and wired?			
.13	Have housekeeping concrete pads been specified or shown on the drawings?			
.14	Are all pieces of equipment shown in the MER that will actually be located there? Things such as VFD's, temperature control panels, electrical panels (space requirements in front of panel) etc.			
.15	Has a supply and return grille been provided for some ventilation of MER (south Florida humidity)?			
.16	Has a section been cut through the MER on the drawings?			
.17	Have marine lights been shown and coordinated with the electrical?			
.18	Has passage way around equipment and exit from room been given minimum of 7 feet headroom?			
.19	Has a minimum of 8 inch concrete block and two layers of 5/8 inch gypsum board been used for mechanical room walls for noise prevention?			

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.20 If there are occupied spaces above or below the MER, has proper precautions been taken? (such as thickening the slab above and/or below) ☐ ☐ ☐

.21 Has a heavyweight door with gasketing been used for the MER? ☐ ☐ ☐

.22 Has a minimum of 28 inches been left all around equipment per OSHA 1910 requirements? ☐ ☐ ☐

15001.3 – Laboratory Design Information

.01 Has the air pressure in each laboratory been designed to be negative to the corridors or adjacent non laboratory area? ☐ ☐ ☐

.02 Have the controls and dampers been designed to fail in an open position to assure a positive draft? ☐ ☐ ☐

.03 Has the location of all diffusers been carefully selected to avoid air currents that would adversely affect performance of laboratory hoods? ☐ ☐ ☐

.04 Has the use of fire dampers been avoided in hood exhaust systems? ☐ ☐ ☐

.05 Has the use of interlocks to automatically shut down lab exhaust fans been avoided? ☐ ☐ ☐

.06 Has it been specified to install airflow indicators and alarms on new laboratory hoods or, on existing laboratory hoods, when modified? ☐ ☐ ☐

.07 *(existing buildings)* Has a second means of access to an exit been provided from the laboratory work area if a hood is located adjacent to the primary means of exit access? ☐ ☐ ☐

.08 *(new buildings)* Have all laboratory hoods been located such that they are not adjacent to a single means of access or high traffic areas? ☐ ☐ ☐

.09 Has any air exhausted from laboratory hoods or other special local exhaust systems been designed such that it will not re-circulate? ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

		N/A	Y	N
.10	Has NFPA Standard 45 been reviewed in detail?			
.11	Has the design professional received a written hazard assessment from the University Safety Officer?			
.12	Have pressure independent supply and exhaust systems been specified or shown on the drawings?			
.13	Has a study been done for wind effect on airflow around the buildings or adjacent buildings and the potential for reentry of exhaust into outside air intakes of the buildings?			
.14	Has the use of auxiliary air type fume hoods been avoided?			
.15	Has the use of low flow type fume hoods been avoided?			
.16	Has it been determined in writing the types of effluents to be exhausted so that hood and ductwork materials may be appropriately selected? Perchloric hoods? Radioisotope hoods?			
.17	Has all positive pressure exhaust ductwork been kept out of the building?			
.18	Has it been determined whether insulation, watertight construction, or sloped and drained ductwork is required on any of the systems?			
.19	Has the latest edition of ANSI Standard Z 9.5 been reviewed in detail?			
.20	Have variable frequency drives been specified for all laboratory exhaust fans and air conditioning fans?			
.21	Has the use of belt driven laboratory exhaust fans been avoided?			
.22	Have fume hoods been located away from doors, operable windows, and in general located to minimize cross drafts and air disruption?			
.23	Have laboratory exhaust systems been constructed of non-combustible materials; have all joints and connections sealed; and have materials resistant to acids, bases, solvents and corrosive gases?			

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

.24 Are fume hood systems designed to keep noise levels less than 68db(A) one foot in front of hood face with hoods running? ☐ ☐ ☐

.25 Have fume exhaust stacks been designed for termination 10 feet above the highest point of roof and for 3000 fpm discharge velocity? ☐ ☐ ☐

.26 Has all exposed horizontal ductwork on the roof been designated round to avoid puddling of rain on top of ductwork? ☐ ☐ ☐

.27 Has all laboratory fume hood exhaust fan motors been connected to emergency electrical service provided for building? ☐ ☐ ☐

.28 Have all eye washes been plumbed to drain directly to sanitary or installed in a sink where sink is plumbed to sanitary? ☐ ☐ ☐

.29 Have floor drains been kept out of Laboratories and Chemical storage areas? ☐ ☐ ☐

15001.4 Museum and Library Design

.01 Has the collection space been designed with air being constantly circulated at full volume and with efficient air distribution? ☐ ☐ ☐

.02 Has the outdoor air been kept to a minimum? ☐ ☐ ☐

.03 Has pressurization been employed to minimize infiltration? ☐ ☐ ☐

.04 Has the humidity levels been specified for a constant humidity of 45% to 50%? ☐ ☐ ☐

.05 Have the humidity sensors been shown in the location of the collection and not in the return air duct? ☐ ☐ ☐

.06 Has the design accomplished humidity levels with mechanical cooling rather than dessicant methods? ☐ ☐ ☐

.07 Are reheat capabilities present so dehumidification can occur when space cooling is not required? ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.08 **Has incandescent lighting been used? (Lighting which has high UV is not recommended, nor is light which generates heat.)** | | | |

.09 **Has it been specified to operate HVAC equipment and air purification continuously in collection spaces? (No unoccupied modes)** | | | |

.10 **Has filtration of 80-85% bag filters with 30% pleated pre-filtering been specified?** | | | |

.11 **Has the space temperature been designed to provide 72-74 deg F?** | | | |

.12 **Has UV-C high output lights been specified to be down stream of the cooling coils in the AHU's?** | | | |

15010 - Heating, Ventilating, and Air Conditioning Equipment General Requirements General Considerations:

.01 **Has utility work been coordinated through the University Facilities Planning Project Manager? Utility Work and connections to University utility systems must be properly planned to prevent disruption of classes and/or research efforts. (Specific drawing sheet #/specification page #_____.)** | | | |

.02 **Has care been taken in placement of all outdoor air inlets to assure that odors and other pollutants (automobile exhaust; toilet/fume hood exhaust, etc.) do not reenter the building? (Specific drawing sheet #/specification page #_____.)** | | | |

Site Utilities

.03 **Has the Architect/Engineer discussed with the University the various utility's demands created by the Project and documented that sufficient capacity exists to serve the demands? (Specific drawing sheet #/specification page #_____.)** | | | |

.04 **Has the Architect/Engineer investigated and determined the actual location of all underground utilities or obstructions**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

at the building site before beginning design? This involves surveyor work, supplemented by further site investigation as needed.
(Specific drawing sheet #/specification page #_____.)

.05 Has it been specified that electrical, water, sewer and chilled water utilities during construction shall be paid for by the Contractor on a monthly basis as arranged through the University?
(Specific drawing sheet #/specification page #_____.)

.06 Has it been specified that heat, air conditioning, humidity control and any other environmental factors shall be the responsibility of the Contractor throughout the construction period?
(Specific drawing sheet #/specification page #_____.)

Training

.07 Has the Architect/Engineer discussed training needs with the University's Department of Physical Plant and specified the required training in the Construction Documents?
(Specific drawing sheet #/specification page #_____.)

.08 Has it been specified that training sessions should be videotaped and tapes given to the University?
(Specific drawing sheet #/specification page #_____.)

.09 Has the following minimum amount of training been specified for new mechanical systems:

.09-1 HVAC Control Systems - 32 hours divided into four sessions.
(Specific drawing sheet #/specification page #_____.)

.09-2 VAV Boxes - 16 hours divided into four sessions.
(Specific drawing sheet #/specification page #_____.)

.09-3 Variable Speed Drives - 16 hours divided into four sessions.
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.09-4 Boiler and Associated Controls - 24 hours divided into four sessions.
(Specific drawing sheet #/specification page #_____.) | | | |

.09-5 HVAC Air Handling Units, Fans, Other Mechanical 16 hours divided into two sessions.
(Specific drawing sheet #/specification page #_____.) | | | |

.09-6 Fire Sprinkler Systems - 16 hours divided into two sessions.
(Specific drawing sheet #/specification page #_____.) | | | |

Mechanical Rooms

.10 Do the mechanical rooms have adequate openings to facilitate the removal and replacement of major pieces of equipment? (provide double 3'-0" doors which swing outward or larger, if necessary. Consider roll-up doors for rooms opening to outside with large equipment.)
(Specific drawing sheet #/specification page #_____.) | | | |

.11 Is there adequate space in mechanical rooms to provide ample access space around all equipment for routine maintenance items and procedures, such as filter replacement, lubrication, and so on?
(Specific drawing sheet #/specification page #_____.) | | | |

.12 Are lighting and utility receptacles provided for equipment servicing?
(Specific drawing sheet #/specification page #_____.) | | | |

.13 Access to electrical rooms, mechanical rooms, telephone closets, elevator machine rooms, fan rooms, pump rooms, etc. shall not be through other rooms. Has access to these spaces been achieved from a main corridor and/or exterior space? (doors to these spaces shall comply with NFPA Fire Safety Codes. Vertical ladders shall not be used for this access ("ship's ladders", which are actually steep stairs, may be used with the University's Department of Physical Plant approval).)
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.14 Are mechanical rooms and similar spaces separated from storage areas?
(Specific drawing sheet #/specification page #_____.) | | | |

.15 Are all power disconnects to equipment located as to be easily accessed?
(Specific drawing sheet #/specification page #_____.) | | | |

.16 Are telephone system "backboards" installed in separate telephone equipment rooms?
(Specific drawing sheet #/specification page #_____.) | | | |

.08 Has it been indicated to install drip traps before all thermostatic temperature regulating valves and pressure reducing valves?
(Specific drawing sheet #/specification page #_____.) | | | |

Basic Mechanical Requirements

.01 Has it been specified to provide submittals including: | | | |

1. Automatic temperature control system.
2. Concrete pads and foundations including anchor bolt and sleeve locations.
3. Fire protection systems.
4. Layouts for utility plant, fan rooms, and equipment rooms, including:

    a. Room dimensions.
    b. Support column locations.
    c. Locations and dimensions of equipment foundations and pads required.
    d. Locations and dimensions of equipment and apparatus, including electrical control panels and starters, and service and coil pull areas.
    e. Dimensioned floor drain locations.
    f. Locations of wall mounted equipment.
    g. Trench locations and sizes
    h. Sleeve locations in mechanical rooms and equipment rooms.
    i. AHU (fans) and duct layouts in AHU equipment rooms.
    j. Roof layouts: Include air intakes, exhaust fans, Plumbing vents, and boiler stacks.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

15015 - Toxic/Hazardous Materials--General Guidelines

.01 **Has the Architect/Engineer, Contractor and other related personnel contacted the University's of Environmental Health and Safety Department concerning instructions on all toxic/hazardous materials involved in a project? (Specific drawing sheet #/specification page #_____.)** | | | |

.02 **Where toxic/hazardous materials are involved, has all construction, maintenance, and/or investigative Work been coordinated with the University's Physical Plant Department and the University's Environmental Health & Safety Department? (Specific drawing sheet #/specification page #_____.)** | | | |

.03 **Has asbestos been removed from all products in this building? (Asbestos, or any building material containing asbestos shall not be specified or used in any building project. This requirement includes roofing materials, paint and related projects among others.) (Specific drawing sheet #/specification page #_____.)** | | | |

.04 **Has it been specified that all electrical transformers, switches, or other electrical equipment which contains polychlorinated biphenyls (PCB) or other equipment which has come in contact with PCB is to be returned to the University? Absolutely under no circumstances is the Contractor, Subcontractor, or other related personnel allowed to dispose of such equipment off the site. The Architect/Engineer shall contact the University's Physical Plant Department and the University's Environmental Health and Safety Department regarding handling procedures of this equipment. (Specific drawing sheet #/specification page #_____.)** | | | |

.05 **Has it been specified that any hazardous or toxic material, such as asbestos or PCB, which is discovered during the course of a project should be reported immediately to the University's Facilities Planning Project Manager? All Work involving suspected asbestos, hazardous, or toxic materials should halt immediately and not resume until notice to resume Work has been given by the University's Facilities Planning Project Manager. (Specific drawing sheet #/specification page #_____.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.06 Has the Architect/Engineer contacted the University's Environmental Health and Safety Department prior to the commencement of a renovation project in order to determine the extent of asbestos or other hazardous contamination in a particular building?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.07 Has only lead-free paint been specified?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

15050 Basic Materials and Methods

.01 Has it been specified to provide brass engraved valve tags for all valves? ☐ ☐ ☐

.02 Has it been specified that the following piping within each mechanical room, fan room, boiler room, and utility plant shall be painted in its entirety. This piping shall also be stenciled for Identification. Sherwin Williams color codes are listed here as a University standard. ☐ ☐ ☐

1. Chilled water: Circuit Breaker SW4077
2. Condenser water: Emerald Ice SW4069
3. Hot Water Heating: Power Orange SW4074
4. Domestic Cold Water: Turbine Blue SW4064
5. Domestic Hot Water: Recycled Red SW4073
6. Natural Gas: Safety Yellow SW4084
7. Propane: Plumb SW 4080
8. Fire Protection: Safety Red SW 4081
9. Fuel Oil: Copperplate SW4038
10. Condensate Return: Corrugate Brown SW 4016
11. Low Pressure Steam: Optic Yellow SW 4035
12. Medium Pressure Steam: Junction Yellow SW 4034
13. High Pressure Steam: Solar Yellow SW 4075

15060 - Pipes, Valves, Pumps and Pipe Fittings

.01 Has it been specified that all HVAC air handling unit condensate lines shall be of insulated type "L" copper?
specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.02 Has it been specified that all hot and chilled water taps shall be made without system interruption and each juncture

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shall be provided with a shut-off valve and valve box for easy access? Maximum acceptable "weldolet" size is six inches; use welding saddles or encirclement for greater than six inches diameter branch piping.
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Has it been specified that all HVAC water coils shall have air eliminators installed (both hot and cold if separate)? All coils shall have both inlet and outlet pressure and temperature gauges.
(Specific drawing sheet #/specification page #_____.) | | | |

.04 Has it been specified to provide flow measuring element at all major air handling unit chilled water supply lines? Discuss with University's Physical Plant Department for their standard. Venturi type are preferred.
(Specific drawing sheet #/specification page #_____.) | | | |

.05 Has it been specified that all piping will be identified in accordance with ASA A13.1, the American Standard Scheme for the identification of Piping Systems?. Identification shall include color coding, labeling of piping contents, and flow arrows. Purchased preprinted labels are preferred.
(Specific drawing sheet #/specification page #_____.) | | | |

.06 Has it been specified that chilled water pumps will usually be required to circulate chilled water throughout the building? A fine mesh monel or stainless steel strainer shall be installed in the chilled water supply line of each building to prevent contamination of the building chilled water system. All chilled water strainers should have a pressure gauge installed across the strainer so as to quickly determine when strainers are dirty. The pressure gauge should also have a 4-20 ma output for remote computer monitoring. Design of the interface between the building and central utilities systems shall be coordinated with the University Facilities Planning Project Manager.
(Specific drawing sheet #/specification page #_____.) | | | |

Steam and Hot Water Piping

.07 Has it been specified that all flange studs, bolts and nuts shall be hex configuration and coarse threaded, and be of

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ASTM A-193, Grade B7 alloy steel such as USS Supertanium alloy, or equivalent?
(Specific drawing sheet #/specification page #_____.) | | | |

.08 Has it been specified that all high pressure and low pressure steam piping shall be Grade A- ASTM A-106, schedule 40 seamless piping, and condensate return lines shall be schedule80 seamless pipe?
(Specific drawing sheet #/specification page #_____.) | | | |

.09 Has it been specified that valves installed above grade as part of the high pressure steam system, and valves installed below grade shall be 300 lb. valves? Valves that are 2-½" and larger shall be flanged, and all valves less than 2-½" shall be screwed unless otherwise agreed with the University Facilities Planning Project Manager.
(Specific drawing sheet #/specification page #_____.) | | | |

.10 Has it been specified that all piping that is 2-½" and larger shall be welded and flanged, not screwed? All underground fittings shall be welded by a certified welder.
(Specific drawing sheet #/specification page #_____.) | | | |

.11 Has it been specified that steam piping with operating pressures greater than 50 PSIG shall use butt welded fittings with backing rings? Fittings that are 1-½" and smaller shall be forged steel screwed or socket weld fittings. Unions that are 2" in size shall be 300 lb. screwed; cast iron or forged steel. All high pressure steam nipples shall be schedule 80.
(Specific drawing sheet #/specification page #_____.) | | | |

.12 Has it been specified that steam piping with operating Pressures 50 PSIG or less that are 2" and larger shall be schedule 40 butt welded fittings with backing rings, and flanges shall be slip-on or weld neck flanges? Steam fittings that are 1-½" and smaller shall be 150 lb. cast iron using 300 lb. cast iron unions and schedule 0 nipples.
(Specific drawing sheet #/specification page #_____.) | | | |

.13 Has it been specified that condensate lines that are 2-½" and larger shall be schedule 80 butt weld fittings with backing rings and steel weld neck or slip-on flanges that

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are the same pressure class as the valves? Condensate lines that are less that 2-½" shall be forged steel or socket weld using 300 lb. screwed unions and schedule 80 nipples. (Specific drawing sheet #/specification page #_____.)

.14 Has it been specified that condensate return, when used, shall use above floor pumps? (Specific drawing sheet #/specification page #_____.)

.15 Has it been specified that all condensate receiver unit vents shall be run full size from unit to atmosphere through the building roof? (Specific drawing sheet #/specification page #_____.)

.16 Has it been specified that all steam condensate lines underground shall have properly sized expansion loops and shall be properly anchored? (Specific drawing sheet #/specification page #_____.)

.17 Has it been specified that all chilled water supply and return piping and heating hot water piping conforms to the specifications for Steam & Hot Water Piping in 15060.07 through 15060.16

.18 Has it been specified that on multi-floor buildings isolation valves shall be supplied at each floor where chilled and hot water piping connects to vertical risers and also that taps for pressure gauges shall be provided on both supply and return lines.

.19 Has it been specified that pipe hanger & clamp materials shall be electrolytically compatible with materials with which they are in contact?

.20 Has it been specified not to use mechanically coupled joints for HVAC or plumbing systems?

.21 Has Type L hard copper been specified for the following?
- a. Domestic hot water
- b. Domestic hot water recirculating piping
- c. Domestic cold water
- d. HVAC reheat water
- e. HVAC chilled water
- f. Hydronic heat pump piping 1” and less

.22 Has cast iron soil and vent pipe standard weight with drainage

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fittings been specified for?

a. Waste, vent, and drainage pipe 2" and larger
b. Storm water
c. Rainwater leaders inside building
d. Drain lines under buildings, and under exterior concrete or other paving. Extend cast iron piping at least 5 feet outside of building.

.23 Has the following joints in cast iron pipe been specified? | | | |

a. Below grade: Bell and spigot with neoprene compression gaskets.
b. Above grade: No-Hub using stainless couplings.

.24 Has it been specified that PVC schedule 40, Type I, DWV, ASTM D-2665, 1120, 160 Psi at 73 deg F may be used for the following? | | | |

a. Inside gravity, under floor slab sanitary and Storm waste systems, with waste temperatures Below 140 deg F
0

.25 Has it been specified that PVC schedule 40 , Type-PSM, Sewer Pipe, ASTM D-3034 with SDR as gasketed slip type joints may be used for outside gravity, underground sanitary sewer drainage piping, from 5'0" outside the building to the connections point to local municipality? | | | |

.26 Has it been specified not to install water pipes in electric rooms, telephone rooms, transformer rooms, or elevator rooms? | | | |

.27 Has it been specified not to install water piping above electrical equipment such as starters, motor control centers, or disconnects? | | | |

.28 Has it been specified not to use "T" Drill Branch Tee connections for copper piping systems? | | | |

.29 Has it been specified to provide ceiling/wall access panels at shutoff and control valves for proper access and operation? | | | |

.30 Has it been specified that all branch piping shall be provided with a shutoff ball or butterfly valve where the branch leaves the main? | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.31 Has it been specified that all equipment such as fan coils, terminal reheat coils, etc. shall be provided with a shutoff valve with which to isolate each piece of equipment? ☐ ☐ ☐

.32 Has it been specified to use flanges and unions throughout the pipe systems at all equipment? ☐ ☐ ☐

.33 Has it been specified to make provisions for servicing and removal of equipment without dismantling piping? ☐ ☐ ☐

.34 Has it been specified that all nonmetallic underground piping is marked with a metallic marking device to enable location by underground utilities locators in the future? ☐ ☐ ☐

.35 Has it been specified that all branch piping is to come off top of mains to insure that sediment and metal particles, such as solder, welding material, threading remnants, and shavings do not normally enter the branch lines to cause clogging or damage to valves? ☐ ☐ ☐

.36 Has dielectric unions been specified for connection of dissimilar materials? ☐ ☐ ☐

15100 Valves

.01 Has it been specified that all butterfly valves are to be full lug? ☐ ☐ ☐

.02 Has it been specified that butterfly valves 5 inches and larger shall have a hand wheel and closed housing worm gear and that less than 5 inches shall have a clamp lock hand lever? ☐ ☐ ☐

.03 Has it been specified to provide chain operators for all gate valves, butterfly valves, and plug cocks located 7 feet or higher above finished floor ? ☐ ☐ ☐

.04 Has it been specified to provide valves in each piping connection at each piece of HVAC or plumbing equipment to allow equipment to be isolated from piping systems? ☐ ☐ ☐

.05 Has it been specified to provide valves in HVAC circulating water piping to isolate each floor or main section of the building? ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.06 **Has it been specified to provide butterfly valves in water piping systems so that ordinary maintenance work can be performed on the equipment butterfly valves isolate, without having to drain the system beyond the butterfly valve?** ☐ ☐ ☐

15250 - Mechanical Insulation

.01 **Is underground chilled water piping insulation foamglas with Owner approved outside wrap?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.02 **Is chilled water piping above grade insulation foamglas covered with a .016 inch thick aluminum weatherproof jacket that has a factory applied integral vapor barrier?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03 **Has it been specified that the foamglas should be glued to the piping and fastened with aluminum bands located not more than 12" apart?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.04 **Has it been specified that if condensation occurs on any cold surface at any time during the warranty period, or before substantial completion after systems are activated, the Contractor shall be required to rework the insulation until satisfactory, at no additional expense to the Owner?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.05 **Has it been specified that if condensation occurs on the outside of insulated ducts, HVAC equipment, VAV boxes, flex ducts, etc. during the construction period, the Project Team shall take immediate action to determine the reasons, determine whether due to Architect/Engineer error or Contractor error, and initiate corrective action? Substantial Completion shall not be approved until corrections are agreed to in writing, including responsibility for cost. (It is preferred to stop Work or delay completion, if necessary, rather than to delay resolution and correction.)**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.06 **Has it been specified that all building hot and cold water piping shall be insulated? All cold AHU condensate piping shall be insulated.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.07 Has the pipe insulation thickness been discussed and approved by the Owner during the early design process?
(Specific drawing sheet #/specification page #_____.) | | | |

.08 Has it been specified that insulation for high and low pressure steam and condensate lines above grade shall consist of calcium silicate? Below grade steam lines shall have a calcium silicate inner layer and a foamglas outer layer wrapped with glass fabric cloth and with proper mastics applied.
(Specific drawing sheet #/specification page #_____.) | | | |

.09 Do condensate lines below grade have foamglas insulation wrapped with glass fabric cloth and with proper mastics applied?
(Specific drawing sheet #/specification page #_____.) | | | |

.10 Are the attachments for the insulation below grade; stainless steel wiring, bands, or 16 gauge copper wire, on 9" centers?
(Specific drawing sheet #/specification page #_____.) | | | |

.11 Has it been specified that below grade steam fittings are to be insulated with mitered segments of calcium silicate wired in place and that below grade steam flanges, unions, and valves are to be insulated with oversized pipe insulation?
(Specific drawing sheet #/specification page #_____.) | | | |

.12 Has it been specified that below grade, all domestic hot and cold water piping shall be standard schedule 40 galvanized iron pipe or type "K" copper?
(Specific drawing sheet #/specification page #_____.) | | | |

.12-1 Specifier certifies that galvanized iron pipe shall <u>NOT</u> be specified for domestic water piping. | | | |

.13 Has it been specified that the hot water lines should be coated, insulated with foamglas, and wrapped with glass fabric cloth?
(Specific drawing sheet #/specification page #_____.) | | | |

.14 Has it been specified that insulation on equipment and devices that require service such as strainers, pump bodies, etc. shall be removable? | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.15 Has it been specified to insulate condensate drain lines? ☐ ☐ ☐

.16 Has it been specified to insulate return air ducts where there is a roof directly above? ☐ ☐ ☐

.17 Has it been specified that all systems will be insulated to the values required by the Florida Energy Code? ☐ ☐ ☐

.18 Has it been specified that mechanical room duct systems will be insulated with semi-rigid fiber board and not blanket type insulation? ☐ ☐ ☐

.19 Has it been specified for flexible tubular elastomeric pipe and fitting insulation when exposed to view inside building or exposed to the weather, to finish with two coats of fire retardant self-extinguishing vinyl lacquer type highly flexible coating equivalent to Armstrong "Armaflex Finish", custom color blended to match surrounding surfaces? ☐ ☐ ☐

.20 Has it been specified that ducts shall not be internally-lined or internally-insulated? ☐ ☐ ☐

.21 Has it been specified that duct insulation on ducts concealed and/or above ceilings shall be ASTM C553, Type 1, Class B-4 flexible mineral fiber blanket with UL-rated integral vapor barrier? ☐ ☐ ☐

15400 - Plumbing Systems & Toilet Rooms

01 Has it been specified that water meters, meter boxes and taps shall be furnished by the Contractor? On sizes above 2", provide by-pass line and gate valve of the same size as the main line, if possible. These meters may be obtained from the local municipal authority with University approval.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.01-1 Has it been specified that water meters shall be installed with full size 3-valve by-pass piping ☐ ☐ ☐

.02 Has it been specified to put access panels for all cutoff valves installed for each floor level behind all showers

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and other fixtures that must be maintained, or provide access panels into pipe spaces from which the fixtures can be maintained?
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Has it been specified that all wye strainers shall be equipped with valves for blow down cleaning?
(Specific drawing sheet #/specification page #_____.) | | | |

.04 Has it been specified that drains for water systems shall consist of gate valves and hose nipples, rather than hose bibs?
(Specific drawing sheet #/specification page #_____.) | | | |

.05 Has it been specified that hose bibs shall be provided in toilet rooms, machinery rooms, and at 100 foot intervals in exterior areas for maintenance use? All exterior and machinery space hose bibs shall be key operated.
(Specific drawing sheet #/specification page #_____.) | | | |

.06 Has it been specified that all water supply pipe shall be type "L"copper? Plastic piping is not acceptable for potable water service inside buildings. All solder used in potable water systems shall be non-lead bearing in accordance with Code.
(Specific drawing sheet #/specification page #_____.) | | | |

06-1 Has it been specified that domestic water piping larger than 3" shall be ductile iron pipe. | | | |

.06-2 Has it been specified that waste piping shall be service weight cast iron pipe? | | | |

.06-3 Has it been specified that interior vent piping shall be Galvanized steel or no-hub cast iron. | | | |

.06-4 Has it been specified that dielectric fittings shall be used for connections between dissimilar metal pipes? | | | |

.06-5 Has it been specified that backflow preventers shall be furnished by the contractor? | | | |

.07 Has it been specified that floor drains with trap primers or deep seal traps, as agreed with the University, shall be

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provided in all toilet rooms, janitorial closets and rooms, and mechanical equipment rooms?
(Specific drawing sheet #/specification page #_____.) | | | |

.07-1 Has it been specified that floor drains shall have trap primers in all locations where constant water flow to keep the trap full is not otherwise assured? | | | |

.08 Has it been specified that clean-out plugs in piping shall be set with Teflon sealer or other approved lubricant?
(Specific drawing sheet #/specification page #_____.) | | | |

.09 Has it been specified that metal access doors shall be provided in walls and ceilings for all valves, regulators, and clean-out? (A piping chase is desired.)
(Specific drawing sheet #/specification page #_____.) | | | |

.10 Has it been specified that all exterior valves shall be fitted with a complete one-piece valve box unit having an attached hinge cover and set in concrete?
(Specific drawing sheet #/specification page #_____.) | | | |

Fire Safety Systems

.11 Has it been specified that all fire safety systems shall comply with current State Fire Marshal Rules, including the NFPA Codes? This includes, but is not limited to underground site firewater piping/valves, building entry valves/fittings/ test piping, extinguishers, sprinkler systems, and standpipes.
(Specific drawing sheet #/specification page #_____.) | | | |

.12 Has it been specified that certification of the NFPA Code is required on all fire safety systems and pressure testing shall be provided on NFPA forms to the University?
(Specific drawing sheet #/specification page #_____.) | | | |

.13 Has it been specified that connections for fire fighting equipment (location, thread standards) shall be approved by both the University and the local fire fighting authority; and shall conform to NFPA requirements?
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Toilet Rooms

.14 Has it been specified that toilet rooms for men and women must be supplied on each floor? All restrooms are to be sized and equipped for the handicapped in accordance with ANSI and ADA standards.
(Specific drawing sheet #/specification page #_____.) | | | |

.15 Has it been specified to provide valves at each floor level on hot and cold water, steam, condensate and gas lines?
(Specific drawing sheet #/specification page #_____.) | | | |

15-1 Has it been specified that isolation valves shall be installed in water supply lines to each toilet room grouping and at riser take-offs for each floor? | | | |

.16 Are all lavatories acid resisting enameled cast iron?
(Specific drawing sheet #/specification page #_____.) | | | |

.17 Are all urinals of the flooded open throat type to avoid stoppages and odor problems?
(Specific drawing sheet #/specification page #_____.) | | | |

.18 Are all floor drains provided in the proper location at the lowest point in the room into which all areas will drain?
(Specific drawing sheet #/specification page #_____.) | | | |

.19 Are all fixtures and partitions wall or ceiling hung to keep floors clear for cleaning? Fastening is to be by means of toggle bolts and through bolts into studding, stringers, or joists to prevent attaching to the wall only.
(Specific drawing sheet #/specification page #_____.) | | | |

19-1 Has it been specified that toilet fixtures shall be floor-mounted? | | | |

.20 Are all floors ceramic tile with dark sealed grout?
(Specific drawing sheet #/specification page #_____.) | | | |

.21 Are all lavatory faucets the type that will not flow over ½ GPM?
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.22 Do all stall walls (1-inch solid plastic) have a graffiti-resistant finish?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.23 Is a wall mounted, key operated hose bib provided in each toilet room two feet above the floor?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.24 Is a ventilation fan with the minimum CFM required for the space (typically not less than 2 cfm per square foot) operated in conjunction with the lights provided?
(Specific drawing sheet #/specification page #____-.) ☐ ☐ ☐

.25 Toilet rooms should not be over-lighted. However, lighting should be adequate to encourage cleanliness and discourage graffiti. Is the average lighting at 40 foot candles with no dark corners? Lighting should use overhead troffers with acrylic lenses.
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.26 Does the standard type wash basin have strainer type drain, lever handles equipped for handicapped use, cold water faucets, no hot water faucets (except in dormitories and service buildings) and soap dispensers?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.27 Has it been specified that drinking fountains shall be water coolers with self contained refrigeration systems and that basins and enclosures shall be stainless steel? ☐ ☐ ☐

Custodial Closets

.28 Are the faucets single delivery mixing type with threaded spout equipped with a 3 foot hose and backflow preventor?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.29 Are faucets 30" - 36" above sink rim?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.30 Is this space separate from the building mechanical, plumbing, electrical, and telephone equipment and entered directly from a corridor and is not a passageway to any other room?
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

15450 – Plumbing Equipment

.01 Has Technical Concepts chrome #50030 hand faucets been specified? ☐ ☐ ☐

.02 Has Technical Concepts #401186 urinal flushometers to fit Sloan/Zurn or #401207 to fit Coyne-Delaney been specified? ☐ ☐ ☐

.03 Has Technical Concepts #401187.03 commode flushometers to fit Sloan/Zurn or #401207 to fit Coyne-Delaney been specified? ☐ ☐ ☐

.04 Has a manual pushbutton flush been specified on all automatic flushometers? ☐ ☐ ☐

15500 - Heating, Ventilating & Air Conditioning

.01 Has it been specified that HVAC ductwork shall be fabricated from metal? Duct board is not acceptable. (outside insulation on metal ductwork is preferred.) (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.02 Has it been specified that fume hood exhaust systems require special care? Has Section 15001 of these Guidelines been reviewed and approved by the Owner? (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.03 Has it been specified that laboratory systems including fume hood exhaust systems shall comply with State Fire Marshal's requirements, including NFPA-45? (Fire dampers are not permitted in fume hood exhaust systems.) (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.04 As far as possible, control systems should allow for unoccupied set-back of both temperature and humidity; i.e., HVAC systems should stay off during unoccupied times unless either temperature or humidity levels reach pre-determined limits, or unless special building requirements require continuous operation. Has the Architect/ Engineer discussed this subject in formal submittals before Design Development is completed, and documented the discussion in the Design Development submittal? (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05 Has it been specified to provide air and water test and balance with written report before beginning remodeling or renovation work?
(Specific drawing sheet #/specification page #_____.) | | | |

.06 Has a field evaluation been made to determine if a hot or chilled water booster pump is required for the building HVAC system? Have the results of this evaluation been furnished to the University Facilities Planning Project Manager?
(Specific drawing sheet #/specification page #_____.) | | | |

.07 Has it been specified that all fans shall be stenciled, indicating "exhaust" or "supply" and area(s) served?
(Specific drawing sheet #/specification page #_____.) | | | |

.08 Have all HVAC and thermostat control systems been discussed with and approved by the Owner to determine whether pneumatic, DDC or other systems shall be designed? In addition, has the latest lightning surge protection developed by the central control system manufacturer been provided?
(Specific drawing sheet #/specification page #_____.) | | | |

.09 Have all major air handling unit coils been designed for not less than 15 degree Fahrenheit temperature rise, and provided with 2 way chilled water control valves, for energy conservation?
(Specific drawing sheet #/specification page #_____.) | | | |

.10 Have all water valves that are 2-½" and larger been flanged 125 psi valves? Are all pressure gauges 4-½" face, bottom connection? Are all OS&Y (outside screw and yoke) valves 3" or larger (preferred)?
(Specific drawing sheet #/specification page #_____.) | | | |

.11 Are all temperature gauges mounted in wells?
(Specific drawing sheet #/specification page #_____.) | | | |

.12 Have all permanent metering devices been approved by the University Facilities Planning Project Manager and the University's Physical Plant Division?
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.13 Are all condensate pumping units above grade unless otherwise approved by the University? Are they duplex pumps with cast iron receivers and ceramic seals. The pumps shall be equipped with balanced mechanical seals (packing not allowed).
(Specific drawing sheet #/specification page #_____.) | | | |

.14 Are all hot water and chilled water pumps equipped with balanced mechanical seals?
(Specific drawing sheet #/specification page #_____.) | | | |

15540 HVAC Pumps

.01 Has it been specified that heating pumps shall be suitable for handling water at 230 deg F? | | | |

.02 Has it been specified that pumps casings shall be cast iron with replaceable bronze wearing rings and rated for 150 psig working pressure? | | | |

.03 Has it been specified that the impeller diameter shall not exceed 90% of the maximum diameter for which pump curves are published? | | | |

.04 Has it been specified to make hot alignment check on couplings between motors and pumps? (Operate equipment until components have reached operating temperature before hot check is made.) | | | |

.05 Has it been specified to provide pumps with soleplates, bedplates, or baseplates carefully leveled, grouted, and bolted in place on concrete pads or foundations? | | | |

.06 Has it been specified to insulate all parts subject to condensation and heat? | | | |

.07 Has it been specified that pump construction is to permit complete servicing without breaking piping connections? | | | |

.08 Has it been specified that pump connections shall be flanged? | | | |

.09 Has it been specified that base-mounted pumps shall be provided on suction and discharge lines on pumps and that the valve on the discharge side shall be a balancing

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

type (not gate or butterfly), and that the booster pumps shall have full line size valved bypasses? | | | |

15687 Packaged, Air Cooled Reciprocating Water Chiller

.01 Have barrier walls for sound attenuation been provided in the construction documents? (Louvered panels or decorative walls with any amount of open area should not be used to attenuate sound. Solid walls of masonry with special sound absorbing cavities should be considered for critical applications.) | | | |

.02 If the chiller is being located adjacent to a building with upper stories, has special consideration been given to the height of the barrier to other means of reducing noise levels such as double pane windows on the second floor which faces the chiller? | | | |

.03 Has the unit location been selected next to an unoccupied space where there are no windows? | | | |

.04 Has proper maintenance clearances been allowed between chiller and barrier walls? | | | |

.05 Has acoustical wrap for the compressors been specified? If so has care been taken not to block the air flow across the condenser coil face? | | | |

15710 Cooling Towers

.1 Has a variable frequency drive been specified? | | | |

.2 Has an 81degree WB been used for selection? | | | |

.3 Has a depressed bottom sump outlet been specified? | | | |

.4 Has a bottom equalizer connection with shutoff valve been specified for maintenance of towers? | | | |

.5 Has stainless steel been specified due to proximity to salt air? | | | |

.6 Has the ladder provided by the manufacturer been extended as necessary to be within two feet of the ground? | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

.7 Have sound levels produced by the cooling tower been evaluated for the location that is being considered? ☐ ☐ ☐

.8 Has vibration switch been wired by the electrical designer? ☐ ☐ ☐

.9 Has the manufacturer's recommended clearances around the tower been followed by removing or relocating structures, signs, fences, dumpsters, etc. that interfere with exhaust or air intake? ☐ ☐ ☐

15791 Electric Duct Heaters

(Note: Electric duct heaters are not the preferred HVAC system, however, if they are used, the following guidelines shall apply.)

.01 Has it been specified to provide the following built-in controls: ☐ ☐ ☐

1. Disc type automatic reset primary thermal cutout
2. Manual reset secondary thermal cutouts.
3. De-energizing controlling magnetic mercury contactors for each heater stage.
4. Non-fused, disconnect switch with door interlock.
5. Differential pressure type airflow switch.
6. Fan relay for positive electrical interlock.
7. Fuses to protect each circuit in any heater drawing more than 48 amperes.
8. Control transformer: All safety devices shall be serviceable through the terminal box without removing the heater from the duct.
9. Provide coil with number of circuits sufficient to not exceed 48 amperes full load current per circuit and equivalent to number of stages scheduled on drawings.

.02 Has it been specified to maintain three feet working clearance in front of the heater terminal box in accordance with NEC Article 110? ☐ ☐ ☐

.03 Has it been specified to provide access doors in ducts on entering air side of each heater? ☐ ☐ ☐

.04 Has it been specified that the elements shall be open coil type constructed of high grade nickel-chromium resistance wire? ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

15853 Fan Coil Units

.01 Have draw through type units been specified?

.02 Has double wall construction been specified?

.03 Has outside air to fan coil unit been preconditioned to as follows:

1. If a system of fan coil units has been designed, has a 100% outside air unit been selected to precondition the outside air? If so, has it been selected to provide a leaving air temperature of 53 deg. dry bulb/52.5 deg. wet bulb from an outside design condition of 92 deg DB/80deg WB?

04 Has auxiliary drain pan been specified?

.05 Has unit been selected to care for space load requirements using low fan speed? Do not select unit for high speed.

.06 Has copper condensate drain been provided?

.07 Has the use of fan coil units been approved by the University? Fan coil use is discouraged in occupied spaces.

15855 Factory Assembled, Custom Handling Units

.01 Has factory mounted marine observation lights in all access sections and fan section that are prewired in conduit to switch located on the exterior of the module adjacent to the respective access door been specified? (Switches shall be factory mounted complete with the outlet box for wiring connection by Div. 16 and switch face plate.

.02 Has access sections been specified to be between all unit sections with access doors on one side of section?

.03 Has inlet and outlet silencers been specified for the unit?

.04 Have the following been specified for air handling unit construction?

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

A. Fan Housings:

1. Construct air handling unit casings using heavy gauge construction. All fan housings shall be equipped with removable spun inlet cones designed for smooth airflow into the accompanying venturi shaped inlet cone for the fan wheel.

B. Cooling Coil:

1. The cooling coil shall be rated in accordance with ARI-410.
2. The cooling coil shall be constructed of staggered copper tubing mechanically expanded into die formed continuous collars formed in plate type aluminum fin, brazed tube return joint and brazed copper header. The coils shall be of the continuous plate fin type and shall have 16 ga. stainless upper and tubing coil casing and 18 ga. stainless steel end plates.
3. The maximum face velocity shall not exceed 500 fpm.
4. Cooling coils shall be tested to 325 psig.
5. Coiling coils shall be installed in a vertical position (perpendicular to airflow) to minimize condensate carryover.
6. Coils shall have 5/8" diameter min. 020" wall copper tube, 0.006" aluminum fin, stainless steel casing.
7. The maximum water pressure drop shall be 15 feet, maximum air pressure drop 1.5 inches and maximum fins per inch 10.
8. Coils shall have a minimum of 6 rows.
9. The coil shall be located in a draw through configuration.

C. Heating Coils (Where Scheduled)

1. Provide hot water preheat and reheat coils, factory mounted in access section with hinged door.
2. Coils shall have: 5/8" diameter min. 020" wall copper tube, 0.006" aluminum fin, stainless steel casing.

D. Drain Pan

1. Construction: 16 gauge, type 304 stainless steel.
2. Design to extend entire length of cooling coil, including headers and return bends. humidifier section, fan section, and discharge plenum. Drain pan shall be double wall

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

construction and insulated.

3. Provide IAQ drain pan in accordance with ASHRAE 62, sloped in all directions to drain outlet to prevent water from standing in pan.
4. Provide intermediate condensate drip pan on coils over 48" high. Factory pipe intermediate drain pans to primary condensate pan.

E. Fans

1. Provide supply fan section with centrifugal plug fan designed and suitable for class of service indicated in the unit schedule. Fan wheels shall be air foil or forward curved as scheduled. Fan shaft to be properly sized and protectively coated with lubricating oil. Fan shafts shall be solid and properly designed so that fan shaft does not pass through first critical speed as unit comes up to rated RPM. Fans shall be statically and dynamically tested as an assembly at the required RPM to meet design specifications. Fan wheel shall be properly secured to shaft to prevent slippage.

2. Provide self-aligning, grease lubricated pillow-block ball bearings with lubrication fittings. Provide extended grease lines to drive side of unit casing, for all fan bearings rigidly attached for easy service access. If extended grease lines are not provided, unit shall include an opposite drive side access door and service room must be allowed on the opposite side of the unit to perform regular maintenance. All bearings shall perform to L-10 200,000 hour average life.

3. Drive shall be multiple V-belt and sized for 1.5 times the fan motor horsepower.

   a. All sheaves shall be selected with a 1.5 service factor. Sheaves shall be machined from a close grain cast iron and statically balanced by the manufacturer. Drive belts shall be a V type. A fixed pitch sheave shall be provided on the motor. All drive belts shall be precision molded raw edge construction. Belts shall be oil and heat resistant.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

4. Fan Balancing

   a. Fan assembly balance shall be tested at design RPM with spring isolators adjusted to specified deflection. Test using an electronic balance analyzer with tunable filter/stroboscope, and scan frequencies from 500 cpm to 50,000 cpm to detect misalignment. bearing defects, mechanical looseness or foundation weakness. Measure vibration at each fan bearing (or motor bearings on direct drive fans), in all three planes. Maximum allowable vibration shall not exceed 0.125 inches per second, refer to chart below. Root mean square (RMS) measurements are unacceptable (peak to peak not RMS).

5. Fan Vibration Criteria

   a.

Fan RPM (peak to peak) Velocity (in/sec)	Mils (in each Plan)	
600 or less	4.0 max.	
900	2.6	0.125
1200	2.0	0.125
1800	1.3	0.125
3600 or greater	0.7	

6. Centrifugal fan shall be provided with inlet screens and an OSHA approved fan drive guard with provision for RPM measurement without removing the guard.

7. Fan and motor assembly shall be mounted on a structural steel base and shall be isolated from unit base utilizing 2" deflection, spring type isolators and neoprene duct connector.

8. Provide fan base, inertia type, constructed of structural steel, sized at not less than 10" section height and painted with 4 mils of alkyd enamel paint. Internal reinforcing bars and a steel bottom pan are included to contain the concrete during pouring. Included are the outboard mounted, height saving, isolator supports. The filled inertia base provides a base mass equal to 1.5 time the total

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

rotating mass. The installing contractor will field fit the base(s) with 3000 psi concrete.

9. Fan Discharge: Fan discharge shall include a bell-mouth collar at cabinet penetration. Field fabricated collars or penetrations are not acceptable.

10. Fan section shall have plexiglass view port on each side of unit for specific purpose of observation fan, motor, belts and in let vanes.

11. Fan shall be selected such that discharge velocity is low (i.e., no high rpm fans.

.05 Has the following been specified for air handling unit exterior construction? | | | |

A. Base Construction

1. Each module shall be constructed on a heavy duty steel base which shall support all major components. The base shall consist of electrically welded structural members. Internal members shall be properly sized to allow rigging and handling of the unit.

2. Unit base shall be provided with structural steel longitudinal base rails that provide adequate support to limit floor deflection to 1/200. Cross steel rails shall be no less than 10 gauge steel and shall be spaced properly to provide adequate support for internal components including access section support. The floor surface shall not be the source of strength for component and service personnel weight. Use welding procedures and welders certified for structural steel welding according to AWS Dl. 1.

3. After construction the base shall be cleaned primed with a rust inhibiting primer, and finished with a rust inhibiting exterior enamel equal to Rustoleum.

4. Each module shall be manufactured and shipped in a single piece. Construction shall be suitable to withstand rigors of shipping and rigging.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

5. Each base shall include properly located lifting lugs or brackets.

B. Housing

1. The unit housing shall be constructed of 16 gauge galvanized, G-90 finish panels supported by galvanized steel internal channels.

2. Galvanizing shall be hot dipped, conforming to ASTM A525, and shall provide a minimum of .90 oz. of zinc per square foot.

3. The unit housing shall be tested for deflection and strength characteristics to ensure that proper design and engineering considerations have been implemented during construction. Test results shall verify that the unit housing panel deflections are limited to 1/200th of span dimension while under positive and negative design working pressures.

4. Include test parameters, procedures, and results in submittal data.

5. Fasten panels together with F-bolts and/or mechanical fasteners.

6. Apply sealant to all external seams. Floor sealant to be a high performance polyurethane which meets ASTM C-920, type S. grade NS, Class 25, USDA approved, EPA approved for potable water contact and paintable.

7. Interior Liner: 16 ga. steel BSG ASTM A 525-85, G90 finish.

C. Insulation

1. The walls and roof of the unit shall be insulated with adhesive fastened insulation.

2. Insulation shall be 2", 3 PCF fiberglass.

3. Insulation shall meet NFPA-90A smoke and flame spread requirements and shall be marked to show compliance.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

D. Floor

1. The unit floor shall be constructed as described for housing above, except as follows.

2. The unit floor shall be constructed of 3/16" black steel tread plate.

3. Insulation: 1 in. thick. 1.8 pcf polyurethane foam, R 7.1.

4. Safety Screen over floor openings: Provide floor safety screen where specified on unit drawings. Floor openings or control dampers (>12" wide) in the floor of the unit shall be covered with heavy gauge galvanized, expanded metal steel screen to prevent people and large objects from passing through openings in the floor. Safety screen shall be removable and designed to support 300 lbs. at mid span.

E. Interior solid liner:

1. The unit shall include an interior liner which shall be attached to the housing supports. Liner shall be electrically and thermally insulated from the galvanized steel housing to prevent galvanic action of dissimilar metals by use of an acrylic adhesive/sealant, that also provides "no thru-metal" construction.

2. Liner inside the air handlers shall be 16 gauge steel [BSG ASTM A 525-85, G90 finish.

F. Doors

1. Provide full height (thru 77" tall doors), double wall and insulated (2" 1.5 #) access doors where specified on unit drawings. Door interior and exterior skin shall be constructed from minimum of 16 gauge steel and provided with similar materials/finish as specified for wall construction. Interior door skin will be solid liner, not perforated. The door frame shall be one piece, heavy gauge aluminum extrusion with high performance knife-edge and closed cell, replaceable neoprene gasket seal. Door assembly shall have an additional gasket to provide a double perimeter gasket

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

system (one gasket on frame and one gasket on door) for superior leakage and thermal performance.

2. Door hinges and latches shall be easily adjustable to allow for a tighter seal between the door and door frame. Door hinges, latches and handles are to be bolted to the door and made with corrosion resistant materials. Bolts, nuts, and shafts for door latches, handles and hinges shall be made of 304 stainless steel. Hinge shall have 304 stainless steel removable pin to allow door to be easily removed. Door shall have handle on both the inside and outside of door. Door latch and pawl assembly shall be industrial grade, corrosion resistant and mounted on a square shaft. Door "hardware" that is held in place by set-screws is not acceptable.

3. All doors with access to moving parts shall have provisions for padlocking and meet UL 1995 mechanical protection guidelines. Safety "lockout" capable latches allow owner to padlock doors in closed position.

4. **Provide view window in access doors where specified on unit drawings. View area shall be minimum of 6" x 6" with wire reinforced 1/4" safety glass, mounted in an extruded aluminum frame.**

5. Provide thermal, double pane, view window in access doors where specified on unit drawings. View area shall be minimum of 6" x 6" with wire reinforced 1/4" safety glass, mounted in an extruded aluminum frame.

6. Provide thermal, double pane, view window in access doors where specified on unit drawings. View area shall be minimum 12" x 12" with wire reinforced ¼" safety glass, mounted in an extruded aluminum frame.

G. Acoustical Performance

1. The housing shall have been tested for acoustical performance by an independent laboratory that is

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

accredited by the U.S. Department of Commerce, National Bureau of Standards under the National Voluntary Laboratory Accreditation Program and shall meet the following criteria;

2. Test methods and facilities used to establish sound transmission loss values shall conform explicitly with the ASTM Designations E90-85 and E413-73.

a. Sound Transmission Loss DB ATSM E-90-85 AND E413-73

b. Construction 2 3 4 5 6 7 STC+

c. No Metal Liner 23 27 35 49 50 49 39

d. Perf. Alum. Liner 22 27 32 43 48 44 38

e. Solid Liner, 24 Ga. 21 38 44 52 51 53 45

(a) +Sound Transmission Class

(b) Test and methods and facilities used to establish sound absorption values shall conform explicitly with the requirements of the ASTM Standard Test Method: ASTM C423-84A and E795-B3.

f. Sound Absorption ASTM C423-84a & E795-83

1) Construction 2 3 4 5 6 7 NRC+
2) No Metal Liner, 1.5 .21 .44 .87 .94 .89 .80 .80 PCF insulation
3) No Metal Liner, 3 .26 .71 1 .09 1.02 .96 .83 .95 PCF insulation.
4) Perf. Alum. Liner .21 .43 .86 .92 .87 .79 .80 1.5 PCF insul.(calc.)
5) Perf. Alum. Liner .26 .70 1.08 1.00 .94 .82 .95 3 PCF insulation
6) +Noise Reduction Coefficient Based on 2" steel housing Per. galvanized essentially the same values as perf. aluminum.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

3. **Unit Air Leakage Rate:**

   a. **Provide data to prove the housing design has been previously tested to meet air leakage rates not to exceed the greater of the following values (1 or 2 below) at the design static pressure (not to exceed 8 in. wg).**

      1) **1% of the design airflow**

      2) **SMACNA Leakage Class 6, which is defined by: F=CxP (to the .65 power), L=FxA. Where F-Leakage flow (CFM per sq.ft. housing area)1 C - Leakage class (equal to 6). P – Design static pressure (in wg)1 L - Total leakage (CFM), A – Housing area (sq.ft.).**

   b. **Determine leakage using the testing methods as described in SMACNA Publication l5d - HVAC Air Duct Leakage Test Manual (Air Distribution Equipment And Ducts).**

   c. **Terms are defined as follows**:

      1) **Design Static Pressure: The maximum positive or negative pressure referenced to the unit exterior (usually the design negative pressure will be the fan inlet static pressure, and the design positive pressure will be the fan discharge static pressure).**

      2) **Design Airflow: The maximum unit total supplied airflow at the unit discharge connection.**

      3) **Housing Area: The total area of the unit air containment, including the fan wall area on units having both positive and negative sections.**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

H. Electrical

1. Factory mount all motors.

2. Wire each motor and lighting to a motor control center.

3. Wiring: 600 volt rated type MTW/THWN stranded copper, enclosed in EMT or Liquidtite (max.3') conduit. All junction boxes shall be UL approved

4. Provide a minimum of 1 light in each module. Module lights shall be controlled from a unit light switch. Each unit will be provided with 1 convenience outlet, in combination with a light switch. Wiring from lights to switch shall be by unit manufacturer.

I. Variable frequency drives

1. Receive, mount and wire variable frequency drives which are furnished under Section 15171.

.06 Have the following manufacturers been specified? | | | |

A. Pace
B. Air Enterprise
C. Buffalo
D. Air Systems (Trane)
E. Temptrol

15860 – Centrifugal Fans

.01 Has it been specified that all fans shall be certified in accordance with AMCA Certified Air and Sound Rating Criteria Standard 210, 300 and 301? | | | |

.02 Has it been specified that all exhaust fans shall be provided with backdraft dampers and bird screens? | | | |

.03 Has it been specified that all direct drive fans shall have a variable speed controller? | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

_____

_____

.04 Has it been specified that bearings are to have a minimum AFBMA 1-50 life in excess of 200,000 hours for operating conditions? ☐ ☐ ☐

.05 Have fans been selected in the middle of their operating range? ☐ ☐ ☐

.06 Have belt drive fans been selected with adjustable pulleys? ☐ ☐ ☐

.07 Have airfoil/non-overloading type been specified? ☐ ☐ ☐

15886 - Filters

.01 In new construction has the following minimum filtration been specified for continuously occupied spaces? ☐ ☐ ☐

A. 22-1/2 inch deep two-stage side access housing with 4 inch deep 30-35% ADS Efficiency (MERV 8) prefilters (0.25 in. initial static pressure) and 15 inch deep 80-85% ADS efficiency (MERV13) bag type filters (0.42 in. initial static pressure)

B. Each filter bank equipped with an air filter pressure Differential gage kit to indicate when change out is required. One gage kit is required for each prefilter and final filter. Dwyer Series 2000 magnehelic type only.

.02 In building renovations or existing air handling unit upgrades, has the following minimum filtration been specified? ☐ ☐ ☐

A. For existing AHU's with less than 1 inch filter track: Use 2-ply internally wire supported heat sealed synthetic media panel type (Poly Ring Panel), MERV 5 Rated.

B. For existing AHU's with 1 inch (nom) filter track: Use Pleated high velocity Hi-Capacity cotton blend media in die cut carrier board frame, MERV 7 (25-30% ADS Effy.) rated.

C. For existing AHU's with 2 inch (nom) filter track: Use pleated high velocity Hi-Capacity precharged synthetic media in die cut carrier board frame, MERV 11 (45-50% ADS Effy.) rated.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

D. For existing AHU's with 4 inch (nom) filter track: Use pleated high velocity Hi-Capacity precharged synthetic media in die cut carrier board frame, MERV 11 (45-50% ADS Effy.) rated.

E. For existing AHU's with dual 2 inch and 4 inch filter tracks:
Prefilters-Use pleated high velocity Hi-Capacity precharged synthetic media in die cut carrier board frame, MERV 8 (30-35% ADS Effy.) rated.
Final filter-Use Microfine fiber glass minipleat media in die cut carrier board frame, MERV 13 (80-85% ADS Effy.) rated.

If less than 1.35 inches dirty filter allowance is available, use MERV 4, or MERV 3, 2 inch fiberglass T/A prefilter. If less than 1.1 inches dirty filter allowance is available, use MERV 11 (60-65% ADS Effy.) minipleat final filter also.

F. For existing AHU's with dual 2 inch and 1 inch filter tracks:
Prefilters-Use pleated high velocity Hi-Capacity precharged synthetic media in die cut carrier board frame, MERV 8 (30-35% ADS Effy.) rated.
Final filter-Use 15 inch deep (min.) 12 synthetic pocket, or equivalent media area (64 sq. ft. min.) longer bag filter, MERV 13 (80-85% ADS Effy.) rated.

G For existing AHU's with dual 4 inch and 1 inch filter tracks:
Prefilters-Use pleated high velocity Hi-Capacity precharged synthetic media in die cut carrier board frame, MERV 11 (45-50% ADS Effy.) rated.
Final filter-Use 15 inch deep (min.) 12 synthetic pocket, or equivalent media area (64 sq. ft. min.) longer bag filter, MERV 13 (80-85% ADS Effy.) rated.

H. Each filter bank equipped with an air filter pressure differential gage kit to indicate when change out is required. One gauge kit is required for each prefilter and final filter. Dwyer Series 2000 magnehelic type only.

.03 Have the selections been made on the following criteria or guidelines? | | | |

A. ASHRAE Std. 52.1-92 and 52.2-99 minimum efficiency reported values.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

B. **ADS (Average Atmospheric Dust Spot) Efficiencies per ASHRAE Standard 52.1-92 shown are based on approximate efficiencies at 1.0 micrometers NOT on Size Range 1.0 to 3.0 micrometers used in the Standard 52.2 Appendix.**

C. **Initial static pressure differentials shown are at 500 fpm.**

15890 – Sheet Metal Ductwork

.01	Has all medium pressure ductwork been specified to be flat oval or round? (Rectangular medium pressure is not acceptable)	☐	☐	☐
.02	Has all medium pressure ductwork been designed for 2500 fpm or less velocity?	☐	☐	☐
.03	Has coordinated sheet metal shop drawings been specified as a requirement of the project?	☐	☐	☐
.04	Have all longitudinal and transverse joints and duct sidewall penetrations, regardless of pressure classification, been specified to be sealed?	☐	☐	☐
.05	Has it been specified to have the same Test and Balance agency specified in Section 15990 witness all duct leakage tests and so certify in writing?	☐	☐	☐
.06	Has it been specified to prepare the system for tests as specified in Section 15990 and to correct deficiencies found by the Test and Balance agency?	☐	☐	☐
.07	Has a return air ducted system been specified?	☐	☐	☐
.08	Has the outside air for all air handlers on the project been ducted to the units? (MER shall not be used as plenum.)	☐	☐	☐
.09	Has it been specified that all ductwork shall have access doors for future cleaning not to exceed 50 feet apart?	☐	☐	☐
.10	Has it been specified or shown on drawings that fan discharge discharge ductwork shall be transitioned to full size ductwork before first elbow?	☐	☐	☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

15896 – Special Ductwork

.01 Has it been specified that dishwasher exhaust ductwork shall be welded aluminum above the ceiling and stainless steel from the ceiling to the dishwasher connection? ☐ ☐ ☐

.02 Has it been specified that dishwasher ductwork shall be sloped toward dirty side of dishwasher? ☐ ☐ ☐

.03 Has it been specified that kitchen exhaust ductwork shall be constructed of, and supported by, carbon steel not less than .054" (No. 16 MSG) or stainless steel not less than .043" (No. 18 MSG) in thickness? ☐ ☐ ☐

.04 Has it been specified that the kitchen exhaust ductwork shall have a liquid tight continuous external weld and that cleanout doors shall be installed in the sides of the duct at each change of direction and in straight sections not more than 20 feet apart? ☐ ☐ ☐

.05 Has it been specified that the openings asked for in .04 shall not be less than 1-1/2" from the bottom of the duct and that at each cleanout, a one-hour rated ceiling access panel shall be provided from which to access the cleanout door? ☐ ☐ ☐

15910 – Sheetmetal Accessories

.01 Have these manufacturer's been listed as the only acceptable manufacturers? ☐ ☐ ☐

1. Titus
2. Anemostat
3. Krueger
4. Metalaire
5. Price

.02 Has Titus been used as the basis of specification? ☐ ☐ ☐

.03 Have no return air grilles been located near chalkboards? ☐ ☐ ☐

.04 Has it been specified to provide ceiling diffusers complete with opposed blade volume dampers only where diffuser is installed in inaccessible ceiling? Do not furnish volume dampers for air devices installed in accessible ceilings or exposed. ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05 Has it been specified that flexible ductwork may only be used for alignment and not used for turns and may only be used in lengths up to six feet which do not occur in corridor walls, fire or smoke partition? ☐ ☐ ☐

.06 Have access doors in ductwork been located & sized for cleaning, control devices, heating coils, fire dampers, etc.? ☐ ☐ ☐

.07 Have volume dampers been specified in locations to facilitate system air balancing, such as branch duct duct take-offs, main duct splits, etc.? ☐ ☐ ☐

15915 Kitchen Range Hood and Extinguishing System

.01 Has it been specified to supply air downward through the canopy? (Front discharge supply air will not be acceptable) ☐ ☐ ☐

.02 Has it been specified to provide automatic fire protection system that complies to NFPA 96 and to state codes? ☐ ☐ ☐

.03 Has it been specified that the hood shall be pre-piped at factory with all branch piping concealed and exposed components to be chrome plated? ☐ ☐ ☐

.04 Has it been specified to furnish a roof mounted, factory assembled fan package to include the following? ☐ ☐ ☐

a. Supply fan
b. Intake air hood, screen and automatic damper
c. Filter mounting frames for disposable filters.
d. Upblast centrifugal exhaust fan
e. Roof curb

.05 Has the kitchen design including included proper dampering and controls to allow the kitchen hood to be turned off when not in use without changing the air balance in the kitchen? (This is an energy conservation requirement) ☐ ☐ ☐

.06 Has it been specified, in Division 16, to provide contactors, shunt trip breakers, and fire alarms interfaces for cooling equipment shutdown, fire alarm warning, and fan operation as required by NFPA 96 (Chap 5), and locally enforced requirements? ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

15932 Air Terminal Units

.01 Have these manufacturers been specified as the acceptable manufacturers? | | | |

a. Titus
b. Trane
c. Anemostat
d. York
e. Price

.02 Has it been specified that all terminal units shall be AMCA approved? | | | |

.03 Has it been specified that all terminal units shall? | | | |

a. Be dual wall metal construction with a 26 ga interior liner and a 22 ga exterior casing.
b. Have a multipoint, multiaxis flow ring or cross sensor.
c. Have integral flow taps and calibration chart on each unit.
d. Have factory mounted DDC controller.

15950/15960 - Mechanical Controls, Instrumentation & Energy Management Systems Remote Control/Monitoring of HVAC and other Building Equipment:

.01 All construction is to be connected to the University's central energy management computer system with complete remote monitoring and control capability. The computer system should be hard wired to the remote Data Gathering Panels by a twisted pair of at least 16 AWG unless otherwise approved by the University. Are all sensors, transducers, and actuators that are connected to the Data Gathering Panels compatible with the University's energy management computer system?
(Specific drawing sheet #/specification page #_____.) | | | |

.02 The University's Physical Plant Department is responsible for the maintenance, operation, and modification of the entire system. Have all modifications of the system, including the addition of new applications, been approved by the University's Director of Physical Plant?
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.03 **Is this building connected to the control system and equipped with data gathering panels, sensors, and activators so that major energy consuming equipment can be monitored and controlled by the system? Fire, radiological, and intrusion alarms are to also be installed and connected to the system wherever the application of such alarms is appropriate. (Specific drawing sheet #/specification page #_____.)** | | | |

General

.04 **Is all hardware and software added to existing and new construction physically, mechanically, and electronically, compatible with the University's energy management computer system? (Specific drawing sheet #/specification page #_____.)** | | | |

.05 **Are data gathering panels and system sensors of the digital transmission type not requiring the addition of analog to digital converters within the panel? (Analog to digital converters are acceptable within lease line data gathering panels.) (Specific drawing sheet #/specification page #_____.)** | | | |

.06 **Has it been specified that all point addresses, diagrams, graphics (color slides) shall be updated to include any additions made to the system? (Specific drawing sheet #/specification page #____-.)** | | | |

.07 **Has it been specified to provide: data gathering panels, controls, sensors, wiring, all materials, and labor to acquire and transmit data (temperatures, pressures, alarms, etc.)? In addition has it been specified to provide address and command (start/stop, data and night switch, etc.) data from the central control monitor (existing)? (Specific drawing sheet #/specification page #_____.)** | | | |

.08 **Has it been specified that modification of the system's (including additions and/or deletions) service area, applications, functions, equipment, transmission network segments, and software or any other action that affects the operation of the system must be approved by the University's Director of Physical Plant before commitments for the modifications or other action are made? (Specific drawing sheet #/specification page #_____.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.09 **Has it been specified to provide an Input/Output Summary of all data points?**
(Specific drawing sheet #/specification page #_____.) | | | |

Transmission Lines

.11 **Has it been specified that trunk signal cables inside the building must be installed as continuous runs from remote panel to remote panel, without splices or intermediate junction boxes, and all conductors must be terminated on the terminal strips?**
(Specific drawing sheet #/specification page #_____.) | | | |

.12 **Has it been specified that transmission links between the central control monitor and the individual data gathering panels must not exceed length limitations specified by manufacturer? (Should it be necessary to exceed these transmission lengths, then repeaters must be utilized at appropriate locations in accordance the manufacturer's specifications.)**
(Specific drawing sheet #/specification page #_____.) | | | |

.13 **Has it been specified that maximum wiring runs between the data gathering panels and the remote sensors must not exceed 1,000 feet (except that when the manufacturer of special sensing instruments requires longer runs, then the manufacturers specifications will apply)?**
(Specific drawing sheet #/specification page #_____.) | | | |

.14 **Has it been specified that transmission line runs external to buildings will utilize campus underground communication duct networks and manholes wherever possible? Transmission line runs within buildings should be through conduits. Existing power conduits must not be used for transmission line runs.**
(Specific drawing sheet #/specification page #_____.) | | | |

.15 **Has it been specified that transmission line runs external to the buildings should take advantage of the existing transmission line network? Extension runs should be routed from the building to the nearest accessible communication manhole containing a triaxial cable connected to the central control monitor.**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.16 **Has it been specified that each wire from a sensor to a data gathering panel and to intermediate points is to be identified on each end with a number? A numbered tag or tape may be used as long as it does not physically interfere with equipment as is permanently affixed.**
(Specific drawing sheet #/specification page #_____.) | | | |

Data Gathering Panels

.17 **Have the manufacturers approved for inclusion in the Architect/Engineer's specifications all information pertaining To data gathering panels utilized in the system been approved by the Owner?**
(Specific drawing sheet #/specification page #_____.) | | | |

.18 **Has it been specified that data gathering panels are to be supplied from the factory prewired for the intended functions?**
(Specific drawing sheet #/specification page #_____.) | | | |

.19 **Has it been specified that data gathering panels are to be of a solid state, plug-in circuit card construction with no reed relays? (Reed relays are acceptable on intercom cards only.)**
(Specific drawing sheet #/specification page #_____.) | | | |

.20 **Has it been specified that data gathering panels shall be of all steel construction, 14 gauge with full front, hinged doors?"**
(Specific drawing sheet #/specification page #_____.) | | | |

.21 **Has it been specified that each data gathering panel will be supplied with a separately fused 115 volt, 60HZ, 15 Amp service?**
(Specific drawing sheet #/specification page #_____.) | | | |

.22 **Have data gathering panels been installed in secure areas that discourage tampering by unauthorized personnel? Does the location selected provide a clean environment and moderate temperature and humidity conditions?**
(Specific drawing sheet #/specification page #_____.) | | | |

.23 **Is each data gathering panel provided with its own internal power supply constructed so that sufficient power is available**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

to supply all the cards when the data gathering panel is used to its full capacity?
(Specific drawing sheet #/specification page #_____.)

.24 Has it been specified that for initial checkout (prior to connection to the central control monitor) and future servicing, data gathering panels shall have the ability to accept a data center simulator for complete diagnostic checkout of all sensors, panel inputs, outputs and electronics, including any necessary analog signal converters?
(Specific drawing sheet #/specification page # _____.)

.25 Has it been specified that It should be possible to completely isolate any remote panel from the trunk wiring system? (It shall also be possible to connect or disconnect function cards individually as a checkout or trouble shooting aid.)
(Specific drawing sheet #/specification page #_____.)

Lightning Protection

.26 Are the most effective lightning protection devices currently available installed on each triaxial cable entering and leaving the building?
(Specific drawing sheet #/specification page #_____.)

.27 Are lightning protection devices installed to protect each data gathering panel's power supply? (An effective grounding system must be provided for each lightning protection device and data gathering panel.) Ground connections to steam, chilled water or soft water lines are not permitted.
(Specific drawing sheet #/specification page #_____.)

Intercommunication System

.28 Has it been specified to provide a solid state two-way intercommunication system with the ability to originate calls from remote stations and for multi-station paging from the central control monitor?
(Specific drawing sheet #/specification page #_____.)

.29 Is the intercom system separate from transmission of data or command function operations?
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.30 **Is the intercom trunk cable two-wire twisted shielded wire size number 16 AWG?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Sensors

.31 **Are the temperature sensors installed in a manner that prevents condensation from making direct contact with the sensor's electronic components?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.32 **Has it been specified that chilled water temperature sensors shall read within plus or minus one-half (1/2) degree F?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Start/Stop Function

.33 **Is a remote stop/start capability with status and alarm provided for following types of units:**

.33-1 **All air handling units in excess of two horsepower.**
(Specific drawing sheet #/specification page #____-.) ☐ ☐ ☐

.33-2 **Chillers, water pumps and condenser water pumps.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.33-3 **Hot water pumps used for building heat.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.33-4 **Existing building chillers, chilled water and condenser water pumps that will be used as standby units.**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.34 **Has it been specified that Start/Stop function cards must be such that if power interruption occurs at the data gathering panel due to either a power failure or a damaged power supply, the equipment controlled by the card will not change status?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.35 **Has it been specified that Manual/Off/Auto switches must be installed on all equipment equipped with a remote start/ stop capability?**
(Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.36 Has it been specified that In cases where a building is not connected to the central chilled water distribution system, the chillers must be interlocked with condenser water pumps and chilled water pumps? (These actions shall be accomplished by the independent building control system.) (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Temperature Data

.37 Has it been specified that a temperature data collection function with high/low alarms must be provided for each of the following:

.37-1 Building chilled water supply entering building. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.37-2 Building chilled water return temperature (leaving building). (Specific drawing sheet #/specification page #-____.) ☐ ☐ ☐

.37-3 Condenser water supply temperature. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.37-4 Condenser water return temperature. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.37-5 Supply air temperatures for air handling units. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.37-6 Return air temperatures for air handling units. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.37-7 Hot deck temperatures where appropriate for air handling units. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.37-8 Cold deck temperatures where appropriate for air handling units. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.37-9 Hot water supply and return temperatures for hot water heating systems. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Environmentally Sensitive Areas

.38 **Has it been specified that environmentally sensitive areas in buildings must be monitored for all critical conditions including temperatures, humidity, and any other factors such as radioactivity as may be appropriate? (Specific drawing sheet #/specification page #_____.)** ☐☐☐

.39 **Has it been specified that data supplied by the sensors in these areas will provide quantitative readouts of levels as well as high/low alarms as appropriate? (Specific drawing sheet #/specification page #_____.)** ☐☐☐

Alarms

.40 **Have critical alarm monitoring been provided in all of the following cases:**

.40-1 **Steam low pressure alarms connected on the low side of the steam pressure reducing valve. (Specific drawing sheet #/specification page #_____.)** ☐☐☐

.40-2 **Pneumatic air used specifically as control air within buildings equipped with a digital alarm on the high pressure side. (Specific drawing sheet #/specification page #_____.)** ☐☐☐

.40-3 **Fans that provide essential ventilation to areas equipped with off-status alarms. (Specific drawing sheet #/specification page #____.)** ☐☐☐

.40-4 **Building chillers that are used either as primary or backup units and that are in excess of 40 tons. They must be equipped with at least 3 critical alarms of the digital type. The type of chiller involved (absorption, centrifugal, or reciprocating) will determine which of the following alarms will be selected. (Specific drawing sheet #/specification page #_____.)** ☐☐☐

.40-4-1 Low temperature cut-out (chilled water). Specific drawing sheet #/specification page #_____.) ☐☐☐

.40-4-2 Low temperature cut-out (refrigerant). (Specific drawing sheet #/specification page #_____.) ☐☐☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.40-4-3 Oil pressure cut-out.
(Specific drawing sheet #/specification page #_____.) | | | |

.40-4-4 High head pressure.
(Specific drawing sheet #/specification page #_____.) | | | |

.40-4-5 Condenser pressure.
(Specific drawing sheet #/specification page #_____.) | | | |

.40-4-6 Sewage and sump pumps equipped with high level alarms.
(Specific drawing sheet #/specification page #_____.) | | | |

.40-4-7 Buildings which utilize boilers equipped with low boiler cut-out safety alarms.
(Specific drawing sheet #/specification page #_____.) | | | |

.40-4-8 Chilled water coils located at air handling units provided with freeze alarms.
(Specific drawing sheet #/specification page #_____.) | | | |

.41 Have alarm printout and annunciation lock outs been specified to prevent nuisance alarms when associated equipment is turned off?
(Specific drawing sheet #/specification page #____.) | | | |

The following are examples of such situations:

.41-1 When a chilled water pump is off through programmed start/stop operation (specific chilled water supply and return temperature alarm should be inhibited).
(Specific drawing sheet #/specification page #_____.) | | | |

.41-2 When a hot water pump is off through programmed start/stop operation, (specific hot water temperature alarm should be inhibited).
(Specific drawing sheet #/specification page #_____.) | | | |

.41-3 When an air handling unit is off through programmed start/stop operation, (specific return air temperature and discharge air temperature alarm should be inhibited).
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Optimum Start Time Selection

.42 Has an optimum start time selection capability for the building's heating, ventilating, and cooling systems been specified?
(Specific drawing sheet #/specification page #_____.) | | | |

.43 Has the primary indoor temperature zones been identified? Have temperature sensors, (a minimum of one per floor), with Interconnecting wire back to the data gathering panel been specified. (Typically, one sensor should be installed on each floor of the building in a location that accurately represents the temperature conditions of that floor?
(Specific drawing sheet #/specification page #_____.) | | | |

.44 Has it been specified to provide and install the necessary logic cards in the data gathering panel to provide for the optimum start time selection function?
(Specific drawing sheet #/specification page #_____.) | | | |

.45 Has it been specified to provide for the reassembly of the existing program to accommodate the building and the new points? (As part of the reassembly process, the Owner will provide information relative to occupancy hours, air handling units to be energized, and channel numbers).
(Specific drawing sheet #/specification page #_____.) | | | |

Testing

.46 Has it been specified that prior to connection to the transmission line and the central control monitor, each data gathering panel must be fully tested utilizing a data center simulator to check out all sensors, panel inputs, outputs and electronics, including necessary analog converter signals?
(Specific drawing sheet #/specification page #_____.) | | | |

.47 Has it been specified that upon the satisfactory completion of these tests, the data gathering panel will be connected to the transmission lines and another test will be initiated from the central control monitor to ensure that all command functions operate as intended?
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.48 **Has it been specified that each alarm condition shall be tested at the central control monitor to ensure that the alarm registers properly? Each temperature, humidity, and other types of quantitative sensors shall be checked in the field and at the central control monitor simultaneously to ensure that readouts at the central control monitor are accurate. (Specific drawing sheet #/specification page #_____.)** | | | |

.49 **Has it been specified that all tests shall be witnessed by a representative of the Owner? (Specific drawing sheet #/specification page #_____.)** | | | |

Operating and Maintenance Literature

.50 **Has it been specified that the Contractor shall assemble and bind all manufacturer's operation and maintenance literature pertinent to the system? This material should be bound in a looseleaf type binder. Maintenance literature shall include wiring diagrams sshowing point-to-point identification. Engineering layout drawings must accurately reflect wiring and numbers used in the field installation. Wiring runs from digital sensors to the data gathering panels should be identified by even numbers. Wiring runs from analog sensors to data gathering panels should be identified by odd numbers. (Specific drawing sheet #/specification page #_____.)** | | | |

.51 **Has it been specified that the Contractor shall provide a complete set of updated and/or additional graphics (slides) for use at the central control monitor? (Specific drawing sheet #/specification page #_____.)** | | | |

Flow Measurement

.52 **Has it been specified that for buildings served by the central chilled water system, provide a calibrated flow measuring device in the primary chilled water return from each building? A delta pressure transducer should be provided and wired to a data gathering panel with a flow measuring electronic function card at each building. Flow rate data should be transmitted to the central control monitor for display printout as and when required. (Specific drawing sheet #/specification page #_____.)** | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.53 Has it been specified to provide chilled water instantaneous (gallons per minute) and instantaneous ton-hours with building identification on the CRT of the central control monitor? Provide the central control monitor with the ability to accumulate ton hours for a selectable 24 hour period, the totalized value for the period to be printed out at the end of the 24 hour period. The intent of this is to enable the University to accurately measure and accumulate billing information on chilled water usage.
(Specific drawing sheet #/specification page #_____.)

Other Instrumentation

.54 Has it been specified to provide local instrument displaying HVAC filter pressure drop with alarm?
(Specific drawing sheet #/specification page #_____.)

.55 Has it been specified to provide temperature wells at the building chilled water inlet and outlet piping?
(Specific drawing sheet #/specification page #_____.)

.56 Has it been specified to provide "air monitor" type air-flow measuring device with local readout in all central fume hood exhaust system, to readout the total system air-flow?
(Specific drawing sheet #/specification page #____.)

15970- Facility Management System

.01 Have these manufacturers been specified as the only acceptable manufacturers?

a. Johnson Controls, Inc.
b. Siemens

.02 Has it been specified that space conditions shall be kept at a 74 deg plus one minus two with a relative humidity of 45% plus or minus 5%?

.03 Have air flow stations been shown and specified for all VAV systems?

.04 Have all temperature control panels been shown on the drawings and coordinated for proper access?

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05 Has it been specified that system will be connected such that it is operable from the existing Physical Plant console location? | | | |

.06 Has it been specified that there shall be a leaving air temperature reset schedule based on outside air temperature? | | | |

.07 Has it been specified that there shall be an occupied/ unoccupied mode programmed for the building management system? (During the unoccupied mode automatic outside air dampers shall close and air handling units shall cycle on to maintain both temperature and humidity.) | | | |

.08 Has it been specified that all air handling units shall have automatic outside air dampers? | | | |

.09 Has it been specified that humidity control as well as temperature control shall be specified? | | | |

.10 Has it been specified that a building warm-up sequence shall be specified for cold days? (e.g. At a certain predetermined time in the early morning, the air handling unit shall operate at 100% and a hot water heating coil shall be activated in the unit. Outside air dampers shall be closed. Air shall be re-circulated to bring the building up to temperature before it is occupied in the morning.) | | | |

.11 Has it been specified that the building shall be kept at a positive pressure with respect to the outside at all times? This means that during unoccupied modes (when outside air dampers are closed) that consideration must be given to the control of exhaust fans as well. | | | |

15990 HVAC System Test and Balance

.01 Have these balancing agencies been listed as the only acceptable balancing agencies? | | | |

1. Total Dynamic Air Balance
2. Earl Hagood, Inc.
3. Certified Test & Balance
4. Dade Test & Balance

.02 Has it been specified that during construction, the | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

Balancing Agency shall inspect the installation of piping Systems, sheet-metal work, temperature controls and other parts of the HVAC system? The inspections shall be performed periodically as the work progresses. A minimum of two inspections are required as follows:

1. **When 60 percent of the duct work is installed.**
2. **When 90 percent of the equipment is installed.**
3. **The TAB shall submit a written report of each inspection to the Owner's Representative.**

.03 **Has it been specified that if the TAB is AABC, they shall provide a certificate of warranty? If NEBB, they shall provide certificate of conformance?** | | | |

.04 **Has it been specified that the Mechanical Contractor shall insure the building and systems are ready for test and balance and notify the TAB in writing of same?** | | | |

.05 **Have the following items been specified for the Mechanical Contractor to prepare for the Air Distribution Systems TAB?** | | | |

1. **Verify installation for conformity to design. Supply, return, outside air and exhaust ducts terminated and pressure tested for leakage per specifications.**

2. **Verify that volume, fire and smoke dampers are properly located and are functional. Manual volume dampers gradients and spin damper handles shall be exposed through insulation. All dampers shall be verified to have locking devices installed. Verify that electric actuators have control power and are properly connected for full operation of system test. Verify installation of supply, return, exhaust, grilles, registers, diffusers, terminal units with controls and filters.**

3. **Verify that air handling systems, units duct systems and associated apparatus, such as coils, filter sections, and access doors shall be blanked and/or sealed to eliminate bypass or leakage of air.**

4. **Verify that all fans, while operating at full load, are free of vibration, are rotating in the proper direction, and have proper belt tension. Verify that heater elements in motor starter to be of proper size and rating. Check motor amperage and verify that it is not overloaded.**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

5. Verify proper installation and location of duct mounted smoke detectors.

6. Verify prior to system testing, that new pre-filters and final filters are installed on:
   a. Air handling units
   b. Fan coil units
   c. Heat pumps
   d. Return air filter grilles
   e. Fan powered boxes.

.06 Have the following items been specified for the Mechanical Contractor to prepare for the Water Circulating Systems TAB? | | | |

1. Check and verify pump alignment and rotation. Verify location of gauge cocks or PT test plugs.

2. Verify that valves are in full open position and that bypass valves are in full closed position. Verify that mixing valves are in full flow position to system components.

3. Verify that all strainers have been cleaned and that all air has been purged from water lines including: coils, risers, heat exchangers and other equipment.

4. Verify expansion tanks are set for proper water level and that air vents are installed at high points of systems and operating freely. Verify that system static pressure is set 10 feet water column above highest system elevation.

5. Record each pump motor amperage on each phase and voltage after reaching rated speed.

6. Verify proper size and rating of electrical heater elements.

7. Verify that heat exchangers have been set at correct operating temperatures per design requirements.

8. Verify that piping to cooling coils is complete and set for counterflow. Verify location of thermometer wells, gauge cocks and balance cocks for coils.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

9. Verify set points match design requirements for chillers and boilers.

.07 Have the following Automatic Controls items been specified for the Mechanical Contractor to prepare for the TAB? ☐ ☐ ☐

1. Verify that control components are installed in accordance with project requirements and functional, including electrical interlocks, damper sequences, air and water resets, firestats, temperature/humidity sensors and high and low limit switches.

2. Verify that airflow and static pressure transmitters are installed and calibrated.

3. Insure proper startup and operation of variable frequency drives.

4. Verify that controlling instruments are calibrated and set for designed operating conditions.

5. Verify VFD's are adjusted in manual and bypass mode, to allow drive to meet rated motor nameplate amps.

.08 Has it been specified that the following Notification of System Readiness items be given to the TAB contractor by the Mechanical Contractor? ☐ ☐ ☐

1. After completion of the work is done by the Mechanical Contractor in preparation for the TAB, a letter must be written to the TAB certifying that the work has been accomplished and that the building and the air conditioning systems are ready for testing, adjusting and balancing. Provide to the TAB all project drawings, specifications, addendums, approved HVAC related revisions, RFI's Div. 15 submittal data, approved shop drawings, approved HVAC wiring diagrams, control diagrams, and equipment brochures.

.09 Has it been specified that, as part of this bid, Contractor shall include costs necessary to make any changes in the sheaves, belts, dampers and other devices required for correct balance by the TAB? ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.10 Has it been specified that the Contractor shall install devices to provide access to all devices needed by the TAB for adjustment? ☐ ☐ ☐

.11 Has it been specified that the Mechanical Contractor shall provide access as requested by the TAB firm if any device is not readily accessible? ☐ ☐ ☐

.12 Has it been specified that the Mechanical Contractor shall provide lifts for access to high places for TAB personnel? ☐ ☐ ☐

.13 Have the following TAB PROCEDURES been specified? ☐ ☐ ☐

1. That the TAB shall perform troubleshooting functions such as obtaining by measurement static pressure profiles, temperature and pressure readings, or additional traverse readings to assist in determining any system balancing problems.

2. That the TAB shall render to the Contractor and Architect suggested solutions to any balancing Problem which may occur.

.14 Have the following TAB procedures for the airside been specified? ☐ ☐ ☐

1. Supply Air:

a. Fans checked for rotation, measure and record motor amperage, fan static pressure drops, RPM etc. Measure and record supply outlets prior to fan or

b. VAV boxes set to maximum, minimum and outlets balanced within 10% of design CFM.

c. Measure and record final total supply air through a pitot tube traverse and record static pressure at traverse point. Adjust fan speed to produce design CFM while maintaining minimum system static pressure for proper box operation. This procedure maintains required air quantities and minimum energy consumption.

d. If a pitot tube traverse is not practical, the summation of the outlet's may be used. An explanation why a

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

traverse was not made must be presented on the appropriate data sheet.

d. Inspect supply air system and identify system air leakage through traverse and outlet summation.

e. If traverse quantities and outlet summations differ more than 10% then an explanation must be presented with appropriate recommendations. Report traverse and outlet totals compared to reading from airflow measuring station. If necessary, coordinate the recalibration of the airflow transmitter to insure proper operation of the control functions. Coordinate with the temperature control vendor to insure traverse and airflow station reading are in agreement.

f. Measure final static pressures across each component under full load condition.

2. Return Air:

a. Fans checked for rotation, measure and record, motor amperage, fan static pressure, drops RPM etc. Measure and record return inlets prior to fan or damper adjustments.

b. With supply system in the maximum mode, proportion return inlets.

c. With supply system in the maximum mode, traverse and adjust return fan to design cfm. Remeasure and adjust return inlets within 10% of design cfm.

d. Measure and record final total return air through a pitot tube traverse and record flow and static pressure at traverse point.

e. If a pitot tube traverse is not practical, the summation of the outlets may be used. An explanation of why a traverse was not made must be presented in the appropriate data sheet.

f. Identify system air leakage through traverse and inlet summation.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

g. If traverse quantities and outlet summations differ more than 10% then an explanation must be presented with appropriate recommendations. Report traverse and outlet totals compared to reading from airflow measuring station. If necessary, coordinate the recalibration of the airflow transmitter to insure proper operation of the control functions. Coordinate with the temperature control vendor to insure traverse and airflow station reading are in agreement.

3. Outside Air:

a. With constant volume supply system in the maximum mode, adjust minimum outside air damper to design through pitot tube traverse. Measure and record traverse and static pressure. If a pitot tube traverse is not practical the percentage of outside air maybe determined by calculations from the return air, outside air, and mixed air temperatures. Make allowances for heat of compression and motor heat where applicable. Record all temperatures.

b. After completion, take total air handling unit static profile and record all final statics, motor amperage and rpm, and cfm.

4. Exhaust Air:

a. Fans checked for rotation, measure and record motor amperage, rpm, fan static pressure drops etc. Measure and record exhaust inlets prior to fan or damper adjustment.

b. Insure backdraft damper is open and has free operation.

c. Perform pitot tube traverse for total air, and proportion main branch lines on major exhaust systems and hooded fans, where possible.

d. Proportion exhaust inlets.

e. Adjust fan speed to achieve design CFM and adjust

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

inlets to within 10% of design.

f. Measure and record final total exhaust air through a pitot tube traverse and record static pressure and flow at traverse point.

g. If a pitot tube traverse is not practical, the summation of the outlets may be used. An explanation of why a traverse was not made must be presented in the appropriate data sheet.

h. Inspect exhaust air system and identify system air leakage through traverse and inlet summation.

i. If traverse quantities and outlet summations differ more than 10% then an explanation must be presented with appropriate recommendations.

5. Ventilation and Pressurization Verifications:

a. Balance each supply, return and exhaust air outlet within 10% of design. On systems with volumetric fan control, insure supply and return air fans are tracking to maintain design outside air.

b. Check and/or adjust pressure relationships so that each positive pressure and each negative pressure area is at least 10% positive or negative as appropriate. Calculate and record room volumes, record actual air changes per hour versus design and record pressure differential for the following spaces:

1) Laboratories

6. Duct Mounted Smoke Detectors:

a. Measure and record pressure differential across intake and exhaust tubes. Pressure differential must be within manufacturer's recommendation for specific duct velocity.

b. Report pressure differential for each duct mounted smoke detector on final TAB report.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.15 Have the following TAB PROCEDURES for the waterside been specified?

1. Chilled Water:

a. Check system for cleanliness.

b. With all chilled water valves calling for full cooling, set balance and isolation valves 100% open and coil bypass valves at 50% open; set and record pump gpm and total dead head. Record all suction and discharge pressures.

1) Balance chilled water pumps and all coils to within 10% of design requirements

c. Test and set pressure drops to submittal specifications on all cooling coils. If flow measuring stations are installed, the measuring station shall take precedence over the pressure drops for flow determination. Record all final results. Re-verify final pump gpm, head pressures as well as chiller pressure drops and record.

d. If main flow measuring device is available, record total flow and position of flow indication and measure pressure drop.

e. Test and record pressure and temperature drops through chillers. Record chiller GPM.

f. Test and set pressure drops to submittal specifications on all cooling coils. If flow measuring stations are installed, the measuring station shall take precedence over the pressure drops for flow determination. Record all final results.

g. Verify that piping risers are vented and system purged of air. This includes all coils.

h. Verify removal of pump start up strainer and replacement with operating strainer or existence of suction diffuser.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

i. Re-verify final pump gpm head pressures as well as chiller pressure drops and gpm.

j. Measure and record final motor amps, heater sizes and nameplate data of pump and motor.

k. Permanently, mark settings of balancing valves and record all data after completing the flow readings and coil adjustments.

2. Hot Water:

a. Check system for cleanliness.

b. With all hot water coils (including VAV box reheat coils) calling for full heat, set balance and isolation valves 100% open and coil bypass valves at 50% open; set and record pump gpm and total dead head. Record all suction and discharge pressures.

1) Balance hot water pump and all coils to within 10%of design requirements.

c. Test and set pressure drops to submittal specifications on air handling units and preheat coils. If flow measuring stations are installed, the measuring station shall take precedence over the pressure drops for flow determination. Record all results including GPM, measured pressure drops and position of flow indicator.

d. Measure and set distribution flow stations. Record final settings.

e. Refer to specific instructions specified herein for VAV coils.

f. Test and record pressure drops and temperature drops through heat exchangers and boilers. Calculate and record GPM.

g. If main flow measuring device is available for total pump flow, record total flow position of flow

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

indicator, and measured pressure drop.

h. Verify that piping risers are vented and system purged of air. This includes all water coils.

i. Verify removal of pump start up strainer and replacement with operating strainer or existence of suction diffuser.

j. Re-verify final pump gpm, head and pressures.

k. Measure and record final motor amps, heater sizes and nameplate data.

l. Permanently mark settings of balancing valves and record all data after completing the flow readings and coil adjustments.

3. Condenser Water:

a. With strainers clean and all valves wide open, set pump head and gpm.

b. Proportion hot water basins in tower for even distribution.

c. If flow measuring stations are installed, the Measuring station shall take precedence over the pressure drops for flow determination.

d. Reset pump head and gpm if necessary, and record final results including gpm, suction/discharge pump pressures, motor amps, motor nameplate and heater sizes.

e. Record pressure drop through condenser; calculate and record GPM.

.16 Have the following TAB procedures for Controls been specified? | | | |

1. AHU Controls:

a. TAB shall notify Architect of any control device not properly installed, calibrated or functioning to meet the full intent of the Contract Documents.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

b. For DDC systems, the TAB shall work closely with the controls supplier to verify calibration of all control, sensing and measuring devices. Actual measurements at devices shall match readouts at the FMS computer.

c. Check temperature controls for proper calibration and setpoint. Record final temperatures.

d. Check economizer controls for proper damper operation and control calibration (outside air conditions may preclude actual calibration test).

e. Check and test calibration the supply/retum volumetric synchronization system. Check differential setpoint between supply and retum fan volumes to insure design outside air is introduced into system.

f. Determine system static pressure set point and coordinate with controls supplier.

g. Check static pressure control, under maximum and minimum conditions, for proper operation.

h. Determine and adjust high limit fan discharge static pressure switch; coordinate set point with controls supplier.

2. Chiller Controls:

a. Verify leaving water chiller control loop for design leaving water temperature. Record final entering and leaving water temperatures.

b. Verify lead-lag sequence for proper staging of chillers.

3. Hot water boiler control:

a. Verify operation of boiler 3 way control valve for calibration and outdoor air temperature reset schedule. Record final entering and leaving water temperatures.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

4. Thermostats and Controllers:

   a. Check for proper control of valves, VAV boxes, supply fans, exhaust fans, ventilation fans, and unit heaters.

   b. Determine calibration setpoint of all thermostats.

   c. Set at design set point.

5. Controls Contractor shall:

   a. Provide in writing that all terminal units are operational.

   b. Provide to the TAB Contractor all necessary hardware and software required.

   c. Provide when requested by the TAB Contractor, personnel to operate or assist DOC box/system operation.

.17 Have the following TAB procedures been specified for testing capacities and performance? | | | |

1. Cooling Coils:

   a. Measure and record entering and leaving dry and wet bulb air temperatures.

   b. Measure and record entering and leaving water temperature if thermometer wells are installed. Otherwise, measure water temperatures by bleeding water through a nipple arrangement. If P.T. plugs are installed, use a bi-metal thermometer which reads in 1 degree F. increments and use the same thermometer for both supply and return water temperatures measurements.

   c. Readjust flow through coil until heat transfer test indicates proper gpm. (Heat transfer test takes precedence over coil pressure drop.)

   d. Record final air and water temperatures, Btuh/HR and GPM.

   e. Convert actual test condition to design entering

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

temperatures to insure design coil capacities at design temperatures. (Winter test may have entering temperatures too extreme to accurately convert to design summer loads).

2. Heating Coils (Air Handling Unit and Preheat Only):

   a. Measure and record entering and leaving dry bulb temperature thermometers accurate to 1/2 degree F.

   b. Measure and record entering and leaving water temperature thermometers accurate to 1 degree F., if thermometer wells are provided. If P.T. plugs are installed, use a bi-metal thermometer accurate to 2 degrees F.

   c. Compute BTUH and GPM from heat transfer test.

   d. Readjust flow through coil until heat transfer test indicates proper GPM. (Heat transfer test takes precedence over coil pressure drop.)

   e. Record final and water temperatures, BTUH and GPM.

   f. Convert actual test conditions to design entering temperatures to insure design coil capacities at design temperatures. (Summer temperatures may have entering temperatures too extreme to accurately covert to winter loads.)

3. VAV Heating Coils:

   a. Adjust manual balancing devices to achieve design rated pressure drop at each coil. Record design and actual gpm. (Heat transfer takes precedence over coil pressure drop.)

   b. Measure entering and leaving air temperatures. Use thermometers with 1 degree F. accuracy.

   c. Compute BTUH at minimum CFM through box and compare to design BTUH.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

4. Chillers:

   a. Record full load entering and leaving chilled water temperatures with thermometers accurate to ¼ degree F.

   b. Record pressure drop and GPM at time of test.

   c. Record amperage and voltage.

   d. Perform log-test for a minimum of one hour taking readings at least every ten minutes.

   e. Average all readings and compute test capacity in BTUH and in tons.

   f. Average all readings and compute actual kw/ton of chiller.

5. Cooling Towers: (Test performed simultaneously with chiller test):

   a. Record full load entering and leaving condenser water temperature with thermometers accurate to ¼ degree F.

   b. Record condensing temperature of refrigerant at time of test.

   c. Record GPM at time of test.

   d. Record a minimum of four tower inlet wet bulb readings.

   e. Record a minimum of four tower leaving wet bulb readings.

   f. Perform log-test for a minimum of one hour taking readings at least every ten minutes.

   g. Average all readings and compute actual BTUH and tons rejected.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

h. Convert actual approach at entering wet bulb conditions back to design temperatures to insure design capacity. (Those tests during winter months may not be possible due to extreme reduction in ambient wet bulb conditions and building load.)

6. Thermostat Calibration:

a. Measure and record dry and wet bulb temperatures at each thermostat.

b. Note any thermostat which is not controlling with +/-1-1/2 degree F.

7. Control Temperature Readouts:

a. Test actual temperature next to sensing bulb (if possible) and compare to read-out gauge. BAS readout.

b. Report any gauge out of calibration.

.18 Has the following TAB Report Procedures been specified?

A. Problems Encountered:

1. Report any items not installed, improperly installed or not functioning properly.

2. Items which have not been corrected by Friday of each week will be officially turned over to the Contractor with a copy to the Owner.

B. Final Report:

1. The test-and-balance report shall be complete with all pertinent information such as logs, data, and records as required herein. All logs, data, and records shall be typed on white bond paper and bound. The report shall be certified accurate and complete by the balancing agency's certified test-and-balance engineer or certified supervisor.

2. The report shall contain the following general data in a format selected by the balancing agency:

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

a. Project number
b. Project title
c. Project location
d. Project architect
e. Project mechanical engineer
f. Test and balance agency
g. Test and balance engineer or certified supervisor
h. Division 15 contractor
i. Dates tests were performed
j. Certification

3. The test-and-balance report shall be recorded on report forms conforming to the recommended forms in the AABC National Standards or NEBB Procedural Standards. At a minimum, the report shall include:

   a. Preface - A general discussion of the system, any abnormalities and problems encountered.

   b. Instrumentation list - The list of instruments including type, model, manufacturer, serial number, and calibration dates.

   c. System Identification - In each report, the VAV boxes, zones, supply, return, and exhaust openings, and traverse points shall be numbered and/or lettered to correspond to the numbers and letters used on the report data sheets.

4. Any unresolved problems will be reported in a general remarks section in front of the test and balance data.

5. Any unusual operations or pertinent remarks which may aid the maintenance personnel or ease the reading of the report will be made in the general remarks section of the report.

6. Report operating data and final tests in final report. This data will include, but not necessarily be limited to the scope of work outlined above.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

C. Air handling equipment test-report forms. Record the following on each air-handling equipment test form:

1. Manufacturer, model number, and serial number.

2. All design and manufacturer-rated data.

3. Total actual CFM by traverse if practical. If not practical, the sum of the outlets may be used, or a combination of each of these procedures.

4. Static pressure profile - Suction and discharge static pressure of each fan component as well as unit total and external static data.

5. Outside-air and return-air total CFM include traverses.

6. Actual operating current, voltage, and brake horsepower of each fan motor as well as starter and heater data.

7. Final RPM of each fan.

8. Fan and motor sheave manufacturer, model, size, number of grooves, and center distance.

9. Belt size and quantity.

10. Static-pressure controls - Final operating set points.

11. All unit components identified including filter data, etc.

D. Pump test forms - Submit pump curve showing design – operating - and no-flow points of operation. Also, record the following items on each pump test form:

1. Manufacturer, size, and serial number.

2. All design and manufacturer's rated data.

3. Pump operating suction and discharge pressure and final total dynamic head.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

4. No flow (pump discharge valve closed) suction and discharge pressure and corresponding total dynamic head. This procedure is to determine actual impeller size.

5. Rated and actual operating current voltage, and brake horsepower of each pump motor as well as starter and heater data.

E. Chiller test forms - Record the following items for each chiller:

1. Manufacturer, model number, and serial number.

2. All design and manufacturers' rated data.

3. Rated and actual pressure drop across evaporators and condensers and related GPM.

4. Entering and leaving water temperatures for the evaporator and condenser.

5. Rated and actual operating current and voltage.

F. Heat-exchanger test forms - Record the following items on each heat exchanger test form:

1. Manufacturer and model number.

2. All design and manufacturers' rated data.

3. Service and location.

4. Actual pressure drop and related GPM or steam pressure, primary side.

5. Actual pressure drop and related GPM, secondary side.

6. Primary side entering and leaving temperatures.

7. Secondary side entering and leaving temperatures.

8. Temperature control setting.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

G. Heating and cooling-coil test forms - Record the following items on each test form:

1. Manufacturer

2. All design and manufacturers' rated data.

3. Rated and actual water pressure drop through each coil and related GPM.

4. Rated and actual static pressure drop across each coil.

5. Entering and leaving water temperatures.

6. Wet-bulb and dry-bulb temperatures entering and leaving each cooling coil; dry -bulb temperatures entering and leaving each heating coil.

H. Electric Heating Coil/Duct Heater test forms – Test and record the following on each electric-heating-coil test form:

1. Manufacturer and model number.

2. All design and manufacturer rated data.

3. Actual operating current and voltage.

4. Coil location and identification number.

5. With VAV systems determine minimum air flow at which thermal cutouts will shutdown heater.

6. Entering and leaving air temperatures with actual cfm.

I. Cooling-tower test forms - in accordance with AABC Standards or NEBB Procedural Standards.

.19 Has the following final inspection and call back TAB procedures been specified?

A. At the time of final inspection, the balancing agency shall recheck, in the presence of the owner's representative, specific and random selections of data recorded in the

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

certified test -and-balance report.

B. Points and areas for recheck shall be selected by the owner's representative.

C. If random tests demonstrate a measured flow deviation of 10 percent or more from that recorded in the certified test-and-balance report, the report shall automatically be rejected. In the event the report is rejected, all systems shall be readjusted and tested, new data recorded, a new certified test- and-balance report submitted, and a new inspection test made, all at no additional cost to the owner.

D. TAB firm shall provide for one callback request to retest any unresolved problems noted in the final report. The revised results are forwarded through channels, after completion of test.

E. During the TAB work, the temperature regulation will be adjusted for proper relationship between controlling instruments. Advise Owner of any instruments out of calibration

F. Make one inspection within ninety days after occupancy of the building to insure that satisfactory conditions are being maintained throughout and to satisfy any unusual conditions.

.20 Have the following special FAU requirements for test and balance services been specified? | | | |

A. For VAV systems, total air shall be set to fan or outlet design as applicable. This shall be done with minimum static pressure to operate or maintain design airflow at the most remote VAV box.

B. The minimum static pressure at the most remote box shall be recorded and provided in the test and balance report. It shall be recorded in two operating modes.

1. In the fan or outlet design mode for total air.
2. In the normal operating mode under static pressure control.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

C. **The system operating static pressure shall be recorded and provided in the test and balance report.**

If fan design is less than outlet total, then total air is set to fan design. If outlet is less than fan design then total air is set to outlet total.

D. **For VAV systems without constant flow outside air systems, outside air quantities shall be set with the VAV system operating at the average speed to maintain comfort. If this can not be determined, then the outside air quantities shall be set with the system operating 75% of the fan or outlet design as applicable.**

E. **All balancing dampers shall be marked in a manner that the balanced condition can be reset as needed.**

F. **Any test and balance performed for FAU shall include a pre-balance review of the 100 percent construction documents.**

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

DIVISION 16 - ELECTRICAL EQUIPMENT

16010 – General Electrical Provisions

.01 **Does the electrical design comply with the National Electric Code, latest Florida Atlantic University approved edition; IES Lighting Standards, and State Fire Marshal requirements including NFPA codes?**
(Specific drawing sheet #/specification page #_____.) | | | |

.02 **Does the telecommunications design comply with the University's standards?**
(Specific drawing sheet #/specification page #_____.) | | | |

.03 **Has it been specified that all conductors, bus bars, pull wires, etc. shall be of copper? Conductors 600 volts and below shall have THHN insulation.**
(Specific drawing sheet #/specification page #_____.) | | | |

.03-1 **Has all electrical wiring been specified to be stranded copper with appropriate insulation per NEC?** | | | |

.03-2 **Has wire insulation been specified to comply with the following color coding?** | | | |

120/208 3 PH		277/480 – 3PH	
Phase A	Black	Phase A	Brown
Phase B	Red	Phase B	Orange
Phase C	Blue	Phase C	Yellow
Neutral	White	Neutral	Gray
Ground	Green	Ground	Green

.04 **Has it been specified that all electrical panels shall have easy access? All panels shall have exterior identification and all breakers shall be numbered and identified as to area served by a plastic covered index. Circuit breaker panels shall be lockable, specification grade with full size copper busses braced for maximum available fault current, bolt-on breakers, ground bar and isolated ground bar.**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.04-1 Has it been specified that all junction boxes and pull boxes shall be identified with permanent markings indicating panel designation and circuit number? | | | |

.04-2 Has it been specified that all junction boxes and pull boxes for fire alarm safety systems shall be color-coded red? | | | |

.05 Has a watt hour meter been provided for each building? (Specific drawing sheet #/specification page #_____.) | | | |

.06 Has it been specified that the connected electrical load in any building shall be corrected to 95 percent power factor or above, using automatically controlled capacitors, where required? (Specific drawing sheet #/specification page #_____.) | | | |

.07 Has it been specified that the electrical feed will be from a campus 12,470 volt circuit? (Provide an SF6 gas sectionalizing switch to which the campus circuit is brought). (Specific drawing sheet #/specification page #_____.) | | | |

.07-1 Has it been specified that high voltage primary feeders shall be paper-insulated, lead-covered, with neoprene jacket (P.I.L.C.N.J.) | | | |

.07-2 Has it been specified that the transition from the P.I.L.C.N.J. feeders shall be made at the building site through a transition to Type E.P.R. cable? | | | |

.08 Has it been specified to provide an automatic starting diesel fueled generator to pick up the building emergency panel through an automatic transfer switch in the event of power failure? The generator should have an hour meter and an automatic "exerciser" in its control system. The electrical capacity shall be sufficient to operate at least one elevator. Building emergency generators must be connected to all Building data gathering panels used for HVAC control through a computer. (Specific drawing sheet #/specification page #_____.) | | | |

.08-1 Has it been specified that the emergency generator will be turned over to FAU with contractor-supplied full fuel and coolant tanks, and with all lubricants at required levels? | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.09 Has it been specified that from the campus underground communications duct and manhole system, the Contractor will provide conduits into the buildings for telephone, clocks and bells, instructional television, fire alarm, and HVAC control and monitoring?
(Specific drawing sheet #/specification page #_____.) | | | |

.10 Has it been specified to provide reduced voltage starters for all motors that are 15 horsepower and larger?
(Specific drawing sheet #/specification page #_____.) | | | |

.10-1 Has it been specified that soft-start controls shall be provided for all motors50 horsepower and larger? | | | |

.11 Has it been specified that high efficiency and high power factor motors shall be used in all cases where available for a particular application? Variable speed drives shall be considered during design for all motors over 10 horsepower, for energy savings; and if found to be cost effective, shall be installed.
(Specific drawing sheet #/specification page #_____.) | | | |

.11 Has the following been specified for general requirements? | | | |

A. All conduits and raceways shall be provided with a grounding conductor size per NEC table 250-95, or 250-95, regardless of whether the grounding conductor is required by code or not except for service entrance conduits.

B. Minimum size wiring for emergency system power and lighting wire shall be #10 AWG.

C. Power and lighting equipment schedules and panelboard schedules shall be provided on the plans and not in the specifications.

D. Installation details shall be provided to facilitate a quality and well thought out installation.

E. Special consideration shall be given to the resulting Aesthetics where electrical equipment and conduit must be installed exposed to view outside of equipment or storage rooms. Consideration shall be given to soffits and/or placement (such as in the all/ceiling corner) so as to minimize the negative impact on the aesthetics of

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

the facility. This may require the addition of special notes and/or showing conduit on the plans all the way back to the panel it originates from in lieu of the traditional home run arrow. Electrical equipment and conduit shall be painted to match the adjacent surface where exposed in finished spaces.

.12 Has it been indicated that vending areas shall be supplied with electrical outlets at 4'-0" intervals along walls against which vending machines will be located, each outlet shall be a quadriplex on a separate 120V/20amp circuit? (Specific drawing sheet #/specification page #_____.) | | | |

.13 Have hallway areas been supplied with electrical outlets a minimum of every 50 feet to accommodate building maintenance equipment? (Specific drawing sheet #/specification page #_____.) | | | |

.14 Has the building fire alarm and HVAC systems been tied into the campus control center? (Specific drawing sheet #/specification page #_____.) | | | |

.15 Do electrical design drawings and specifications clearly define the responsibilities for interconnections of elevator fire and smoke detectors into the building fire alarm system? (Specific drawing sheet #/specification page #_____.) | | | |

.16 Are outside utility outlets required around the building to support outside maintenance efforts? (Specific drawing sheet #/specification page #_____.) | | | |

16100 - Electrical and Communication Manholes

General

.01 Are the inside dimensions of electrical manhole walls 7'-0" x 7'-0" or 8'-0" octagonal? (Specific drawing sheet #/specification page #_____.) | | | |

.02 Are the inside dimensions of telephone manhole walls 7'-0" x 7'-0" or 8'-0" octagonal? (Specific drawing sheet #/specification page #_____.) | | | |

.03 Are manhole duct entrances indented at least 4" and

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provided with carbon bell ends? (This will also apply when galvanized steel conduit is indicated). (Specific drawing sheet #/specification page #_____.)

.04 Are grounds provided in accordance with the code requirements? (Specific drawing sheet #/specification page #_____.)

.05 Is the minimum clearance from the centerline of the lowest duct entrance to the floor of the manhole 2'-0"? (Specific drawing sheet #/specification page #_____.)

.06 Is the thickness of the concrete walls 8" for the top and bottom of the manhole, and 6" for the sump walls from manholes? (Specific drawing sheet #/specification page #_____.)

.06-1 Have pre-cast concrete manholes been specified, with design and wall thickness determined by manufacturer?

.07 Are 3" cast iron pipes connecting sumps of adjacent telephone and electrical manholes provided to facilitate pumping water from manholes? (Specific drawing sheet #/specification page #_____.)

.08 Is the flat entrance/exit duct face on the inside of the manhole at each corner a minimum of 1'-6" wide? (Specific drawing sheet #/specification page #_____.)

.09 Are the cable racks used for electrical circuits heavy duty galvanized racks? (Specific drawing sheet #/specification page #_____.)

.10 Are the hooks used for communication circuits 12" lengths or approved substitutes? (Specific drawing sheet #/specification page #_____.)

.11 Do the rack backs in telephone manholes extend from ceiling down 4'-0"? (Specific drawing sheet #/specification page #_____.)

.12 Is the manhole hardware compatible in each manhole? (Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.13 Is the hardware type provided equal to existing? (If not, replace with new hardware plus new quantities as scheduled). (Specific drawing sheet #/specification page #_____.) | | | |

.14 Has it been specified that each manhole shall contain pulling irons located in the walls not less than 6" above or below and opposite the conduits entering the manhole? Irons shall be fabricated from bent steel bars and shall be hot-dip zinc-coated after fabrication. (Specific drawing sheet #/specification page #_____.) | | | |

.15 Has a building master clock and bell system been provided? the system shall contain the ability to be programmed readily by University staff. (Specific drawing sheet #/specification page #_____.) | | | |

.15-1 Specifier certifies that a building master clock system shall not be specified for use on FAU campuses. Battery-operated 12-inch diameter analog clocks shall be specified. | | | |

.16 Has it been specified that switches and controls for lights, heat, ventilation, windows, draperies, fire alarm boxes and all other essentials shall be located at 48" above finished floor? In addition, they should also meet the latest ANSI and ADA standards for the handicapped. (Specific drawing sheet #/specification page #_____.) | | | |

.17 Has it been specified that convenience electrical outlets shall be specification grade, rated for 20 amps and provided as specified in the N.E.C. and mounted 16" above finished floor, unless otherwise specified? In addition, quadruplex outlets shall be provided for each telephone and television equipment backboard provided. (Specific drawing sheet #/specification page #____-.) | | | |

.17-1 Have quadriplex outlets been provided at all work stations, i.e., office desk, telephone, computer, etc.? | | | |

.18 Has it been specified where floor service, electrical, telephone or similar outlets are used? All should be of a flush mounted type with flush carpet plates. (Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.19 Has it been specified that all thermostats shall have tamper-proof covers and shall be mounted on steel mounting boxes which are securely attached to the internal wall structure?
(Specific drawing sheet #/specification page #_____.) | | | |

.20 Has it been specified that all dry type transformers shall have 220 degree C insulation or better and shall have guaranteed sound levels of: 0-9 KVA - 40 Db; 10-50 KVA – 45 Db; 51-150 KVA - 50 Db; 151- 300 KVA - 55 Db; 301-500 KVA - 60 Db?
(Specific drawing sheet #/specification page #_____.) | | | |

.21 Has it been specified that both the 277/480V and 120/208V electrical mains shall have surge protection provided by a surge protector?
(Specific drawing sheet #/specification page #_____.) | | | |

.22 Has it been specified that direct burial electrical wiring for exterior lighting, and the like, shall not be used unless University Facilities Planning Project Manager approves in writing? Underground electrical wiring shall be installed in approved PVC conduit with conduit encased in concrete. A plastic "tell-tale" marking tape shall be installed 12" above all direct buried electric cable.
(Specific drawing sheet #/specification page #_____.) | | | |

.23 Has it been specified that all conduit used to connect secondary electrical service to outbuildings and/or building sections shall be rigid metal (no plastic) and shall be bonded to the building entrance ground system?
(Specific drawing sheet #/specification page #_____.) | | | |

.23-1 Has it been specified that PVC conduit shall not be used above grade either interior or exterior? | | | |

.24 Has it been specified that each building electrical main shall be provided with a qualified ground rod(s)? Ground rods shall be driven with a power driver as required. Additional rods shall be added if required to achieve a 25 OHM reading using the three point test method (150 foot depth require maximum). Multiple rods shall be used as necessary to obtain 25 OHMs. In addition, all manhole ground rods shall be connected by approved exothermic welding. Each rod shall be tested in

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the presence of the University's representative. A written record of the test results shall be prepared and signed by the Contractor's and University's representatives and submitted to the Architect/Engineer.
(Specific drawing sheet #/specification page #_____.)

.24-1 Has it been specified that all ground rods, except for telephone backboards, shall be exothermically welded?

.25 Has it been specified that all large spaces wired for TV cable shall have conduit and outlet at the "front" of the space? (Verify locations with the University's Facilities Planning Project Manager).
(Specific drawing sheet #/specification page #_____.)

.26 Has it been specified that all empty conduits shall contain a polyolefin pull line-JET LINE #232 or approved equal, with engraved metal tag at each end indicating conduit designation?
(Specific drawing sheet #/specification page #_____.)

.27 Has it been specified that oil-type transformers (PCB free) installed within buildings or pad mounted outside are preferred? If dry-type are used, they shall be kept away from mechanical rooms, steam pipes, hot water pipes, and the like. All transformers, switches, and other electrical equipment are to be PCB free and labeled as such.
(Specific drawing sheet #/specification page #_____.)

.27-1 Has it been specified that oil-type transformers shall be provided with a 3-position switch for 1)"Source A, 2) Open, and 3) Source B? Do not provide a loop type switch

16141 – Wiring Devices

.01 Has the following been specified for switching?

A. Classrooms and all instructional spaces: Double Switching (two level lighting).

B. Light fixtures on emergency branch circuits shall be Controlled with a separate red toggle switch via an emergency relay.

C. Corridors: Pilot light switches located in custodial spaces or keys switches located within the corridors.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

D. **Group Toilet Light Fixtures: Shall be controlled by a pilot light switch located in the custodian room.**

E. **Toilet Exhaust System: Individual toilet exhaust fans in rooms without windows shall be connected to the toilet lighting circuit and switch through a five (5) minute time delay relay.**

F. **Outdoor: Energy management system. Time clocks for schools without energy management system. Outdoor lighting shall be divided into three (3) categories and shall be provided with separate branch and circuit controls as stated below:**

1. **Parking lot and bus loop area lighting**
2. **Walkway and canopy lighting**
3. **Security lighting**

G. **Emergency Lighting shall be controlled by a separate switch via override relays for automatic operation upon failure of normal power.**

H. **Other spaces such as reading area, cafeteria, etc. shall have multi-level switching capabilities.**

.02 **Have all 208/220V outlets been identified with User Groups?** ☐ ☐ ☐

16425 – Distribution Switchboards

.01 **Has the following been specified for normal power distribution systems?** ☐ ☐ ☐

A. **Receptacle outlets dedicated for computers (communication outlets) shall be connected to non-linear electrical panels. These non-linear panels shall not feed any other loads. Non-linear panels shall have 200% rated neutral bus bars, the neutral feeder conductor shall be rated at 200% of phase conductors, and dry-type step down transformers (480 volts/208-120 volts) feeding non-linear panels shall be K-13 type.**

.02 **Has the following been specified for surge suppression for power distribution equipment?** ☐ ☐ ☐

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

A. All distribution panels for computer loads and electronic lighting shall be provided with surge suppression devices.

16460 -Transformers

.01 Has a transformer with the following requirements been specified? ☐ ☐ ☐

Liquid filled: Mineral Oil
Proper KVA rating
Primary volt:: 13200 Delta - 96 KV BIL
Secondary volt: 480Y/277 - 30 KV BIL
Standard: 60 Hertz
Impedance: 3.5% - 7.5% Tolerance
Conductor: Copper windings
Temp: 120 degrees insulation class
66 rise over 30 avg-40 max amb
Taps: 2-2 ½ % TA Above and Below.
Altitude: Std. 3300 feet maximum
56 DB sound level

Modifications:

High Voltage-Dead Front
#4 to 4/0 Incoming cable
15 KV Class 800 Amp Bushings
Six One-Piece Bushings (600A NLB)
Three External Mov 18 KV Arrestors
Under Oil Switch Three Position Source A Open Source B, 600A
Fuses: Cartridge Type Weak Link – Bay-O-Net
Low Voltage Bushings: Epoxy
Tin Plated Copper Material
4 Hole Bushing Spade

Accessories:

Substation Accessory Group Included
1inch Drain Valve With 3/8inch Sampler
Dial Type Thermometer
Liquid Level Gage
Pressure Vacuum Gage
Standard Pressure Relief Valve
Nitrogen Test Port
Paint Color Munsell #7.0GY-329/1.5

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

16500 – General Lighting Considerations

.01 Has it been specified that fluorescent fixtures shall include electronic ballasts and be lamped with low energy consumption tubes such as T8? Alternate designs (full spectrum "T10; day lighting with dimming ballasts; lighting controls) should be considered with the life-cycle cost analysis computer program input. See notes in Division 15001. (Specific drawing sheet #/specification page #_____.)

.02 Has it been specified that light fixtures in stairways should be above the landings and not above the steps? (Specific drawing sheet #/specification page #_____.)

.03 Has it been specified that emergency lighting shall be provided at all exits and in all stairways, hallways, mechanical rooms, elevators, etc. in accordance with the State Fire Marshal's requirements? (Specific drawing sheet #/specification page #_____.)

.04 Has it been specified that security lighting and parking lot lighting shall be included in the building design? (Specific drawing sheet #/specification page #_____.)

.05 Has it been specified that no lights are to be used that require scaffolding for re-lamping? (Specific drawing sheet #/specification page #_____.)

.06 Has it been specified that when emergency lighting is required in an interior classroom, a bypass will be provided to permit darkening of the room when visual aids are being used? (Specific drawing sheet #/specification page #_____.)

.07 Has it been specified that exterior walkway and security lighting shall be provided and controlled by both a 7-day time clock and a photoelectric switch connected in series? (Specific drawing sheet #/specification page #_____.)

.07-1 For all FAU campuses except those in Broward County, it has been specified that exterior walkway and security lighting shall be Kim VL-series luminaries, 17" diameter, post top mount for single fixtures, high pressure sodium lamp, dark bronze

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finish round aluminum pole? For Broward campuses has the Architect/Engineer verified existing fixtures and specified to match? | | | |

.08 Has it been specified that the electrical system shall be 277/480 V, 3 phase, 4 wire, with a 120/208 V, 3 phase, 4 wire subfeeder? All mains and feeders shall be protected by circuit breakers rated for the bolted fault short circuit current calculations and data for the building shall be provided to the Physical Plant Director.
(Specific drawing sheet #/specification page #_____.) | | | |

.09 Has it been specified that quantity and quality of lighting shall be provided in compliance with the IES (Illuminating Engineers Society) standard?
(Specific drawing sheet #/specification page #_____.) | | | |

09-1 Have lighting levels been designed and noted on the drawings? following <u>minimum</u> lighting levels from the 1987 IES Lighting Handbook are guidelines only. Safety, security, and activity levels may require that these levels be increased for proper quality and comfort of lighting. | | | |

A. Roadways 0.6 av. maintained footcandles, 6 to 1 uniformity ratio (avg. to min.)

B. Open parking 0.6 avg. maintained footcandles on pavement 4 to 1 uniformity ratio (avg. to min.)

C. Pedestrian ways 0.6 avg. maintained footcandles, 4 to 1 uniformity ratio (avg. to min. includes sidewalks, bikeways, exterior stairways)

.10 Has it been specified that outdoor lighting shall be high pressure sodium, pericline square type fixtures, pole mounted where possible?
(Specific drawing sheet #/specification page #_____.) | | | |

.11 Has it been specified that exit signs shall be L.E.D. type? | | | |

.12 Has the following been specified? | | | |

Avoid using incandescent light fixtures unless it is absolutely necessary in such areas as stage and theatrical lighting. In these areas however, down light fluorescent PL, and general purpose

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fluorescent fixtures shall be provided for non-performance hours. Extensive use of compact fluorescent is highly recommended

.13 Has the following been specified? ☐ ☐ ☐
Fluorescent lighting is highly recommended.

.14 Has a 5 percent THD filter been specified on all lighting fixtures? ☐ ☐ ☐

16530 – Exterior Lighting and Lamps

.01 Has all of the following Florida Atlantic University exterior lighting standards been specified or shown on the drawings? ☐ ☐ ☐

1. **EMCO decolume deca/decw AZM mount parking lots only dark bronze + pole**

2. **GE power door luminair M-400A2 street lighting only Aluminum only + pole**

3. **KIM VL/VLA luminair for walkway lighting only dark bronze + pole**

4. **KIM compact floodlights (GFL) for ground and sign lighting dark bronze + pole**

5. **KIM wall director for wall up and down lighting dark bronze + pole**

6. **KIM PGL1HP / PGL 2/3 for parking garages only dark bronze + pole**

Do not exceed 30' all poles

16700 – General Telephone & Computer Systems Guidelines

Note: It is recognized that telecommunications/data system technology is rapidly changing. The intent of the following Guidelines is to provide early identification of the needs; promote discussion and agreement early in the design process; and to assure the Project budget contains sufficient budget for these needs. The following represents the minimum. Universities are encouraged to develop their own telecommunications standards. In any event, the discussions, decisions and budget must be provided early in the design process.

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

.01 Prior to final approval of drawings, have the Architect/Engineer and the University reviewed electrical and telephone layouts with the applicable telephone representative? (Specific drawing sheet #/specification page #_____.) | | | |

.02 Has the Architect/Engineer reviewed electrical, telephone, fiber optic and computer systems requirements with University Facilities Planning Department and the University's Telecommunications representative? Guidelines will be agreed for the Project. These Guidelines shall include the following items as well as conduit sizes/locations and telecommunications wiring specifications.
The Architect/Engineer's Advanced Schematic development submittal shall include a full discussion of the agreed Guidelines, conduits and wiring specifications.
(Specific drawing sheet #/specification page #_____.) | | | |

.03 For all new and renovated building projects, has it been specified to provide at least the following in the Construction Contract Base Bid:

.03-1 Two conduits, minimum 4 inch diameter each, encased in concrete, from existing telecommunications manhole to the basement or first floor telecommunications room? (Specific drawing sheet #/specification page #_____.) | | | |

.03-2 One dedicated telecommunications room per floor; with ¾" marine plywood terminal backboard. Provide at least one double 110 volt electrical outlet (four receptacles) in each telephone room. These rooms will normally be "stacked" one above the other for ease of wiring. Provide minimum of two conduits, minimum 4 inch diameter each, penetrating the floor slabs, for wiring between rooms. Have all telecommunications rooms been interconnected? (Specific drawing sheet #/specification page #_____.) | | | |

.03-3 A one inch home run conduit from each phone outlet to the nearest telecommunications room, terminating at the plywood terminal backboard? (Specific drawing sheet #/specification page #_____.) | | | |

.03-4 Installed telephone, computer and data wiring. Normally, the telephone, computer and data wiring will be "all-in-one"

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cable. If specific requirements dictate, the separate conduit and wiring are to be provided?
(Specific drawing sheet #/specification page #_____.) | | | |

.03-5 Telephone and computer/data conduits and outlets shall be provided to all potential spaces and areas. Normally, One 2 gang box, with 4 jack capability, shall be provided for every 100 square feet of usable floor space?
(Specific drawing sheet #/specification page #_____.) | | | |

.04 Are all telephone equipment areas located at least 3 feet from any electrical power panels?
(Specific drawing sheet #/specification page #_____.) | | | |

.05 Are elevators equipped with a recessed steel mounted telephone box?
(Specific drawing sheet #/specification page #_____.) | | | |

16720 – Fire Alarm Systems

.01 Has it been specified that the Contractor shall furnish all labor and equipment for the complete installation of a fire alarm system?
(Specific drawing sheet #/specification page #_____.) | | | |

.02 Has it been specified that the fire alarm equipment shall be manufactured by Simplex, Cerebrus/Pyrotronics or approved equal? (The equipment shall be approved by Underwriters Inc., and the system shall comply with codes and regulations; primarily NFPA 72, NFPA 101 and State Fire Marshal Rules).
(Specific drawing sheet #/specification page #_____.) | | | |

.03 Has it been specified that the Contractor shall submit a list of all material items giving manufacturer's names and catalog numbers?
(Specific drawing sheet #/specification page #_____.) | | | |

.04 Has approval of the list been obtained from the Architect/Engineer?
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.05 **Is maintenance service available within a reasonable distance of the University and shall stock the manufacturer's standard parts?**
(Specific drawing sheet #/specification page #_____.) | | | |

.06 **Has it been specified that the system shall be a low voltage zoned, non-coded, supervised, and annunciated fire alarm system and that fire alarm pull stations, heat detectors, smoke detectors, door holders and water flow switches shall be connected to electrically supervised zone circuits?**
(Specific drawing sheet #/specification page #_____.) | | | |

.07 **Has it been specified that the fire alarm system and zones shall be tied in with the central fire alarm system? (Contractor shall verify operation of alarm signals between the central plant and local annunciator).**
(Specific drawing sheet #/specification page #_____.) | | | |

.08 **Has it been specified that the Contractor shall fully instruct representatives of the University in operation and maintenance of the fire alarm system? (The manufacturer of the equipment shall provide the services of a qualified engineer who shall check the installation and function of the system to insure its proper operation).**
(Specific drawing sheet #/specification page #_____.) | | | |

.09 **Has it been specified that each device shall be tested to insure all functions are operational? Each device and its applicable functions (alarm, annunciation, proper central system indication, fan shutdown, fire damper closings, etc.) shall be separately listed and documentation provided showing all checkouts have been performed.**
(Specific drawing sheet #/specification page #_____.) | | | |

.10 **Has it been specified that the Contractor shall assemble and bind manufacturer's operating and maintenance literature for inclusion in the Maintenance Manual? Maintenance literature shall include wiring diagrams showing point-to-point identification. They are to indicate all wiring labels and physical location of each device on a zone-by- zone basis, including end-of-line resistors. All externally operated equipment shall also be shown, such as fan shutdown equipment and automatic smoke dampers.**
(Specific drawing sheet #/specification page #_____.) | | | |

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

.11 **Has it been specified that the Contractor will provide as-built drawings of existing fire alarm systems as modified? (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

.12 **Has it been specified that the fire alarm system may be connected to the nearest local fire station? Has the University Project Manager pre-approved the request in writing. Both the power cable and signal cable of the fire alarm system**

shall be protected with lightning surge arresters. Visual as well as audible alarms shall be provided in visible locations in all corridors and toilet rooms. (Specific drawing sheet #/specification page #_____.) ☐ ☐ ☐

.13 **Has it been specified that any smoke detectors of the photoelectric type used in the HVAC system or the building alarm system shall have LED (light emitting diode) light source? HVAC smoke detectors and elevator lobby (for elevator recall) shall be wired into the fire alarm system. Fire alarm wiring shall be 19 strands maximum. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

Description of Operations

.14 **Has it been indicated that actuation of any manual pull station, heat detector, smoke detector, or water flow switch shall initiate a local evacuation alarm within the building, light a zone indicating lamp on the annunciator panel, and transmit a signal over the campus security system indicating the building and zone within that building from which the fire alarm was initiated? Manual pull stations shall be zoned separately for each floor. Water flow switches shall be zoned separately for each switch. The area of the building that each zone covers shall be indicated at the annunciator panel or on a schedule adjacent to the panel. In addition to performing the above function, each air handling unit smoke detector shall shut down its associated fan motor. (Specific drawing sheet #/specification page #_____.)** ☐ ☐ ☐

.15 **Has it been provided that the alarm shall continue to sound until the initiating device is reset or silenced by the operation of a switch on the control assembly which will light the trouble**

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

light and cause the zone indicator light to remain lit? (The switch should be under lock and key).
(Specific drawing sheet #/specification page #_____.)

.16 Has it been specified that the system shall be totally supervised on the initiating and the indicating circuits for each zone? Trouble on an initiating zone circuit will sound a distinctive tone trouble signal at the control panel assembly and send a signal by the base loop, reporting the alarm or trouble condition and the zone in which it is located to the central alarm receiving facility.
(Specific drawing sheet #/specification page #_____.)

.17 Has it been indicated that systems containing automatic extinguishing features (Halon, etc.) should be cross-zoned so that at least two devices must detect fire before discharging the extinguishing agent?
(Specific drawing sheet #/specification page #_____.)

.18 Is all wiring #14 AWG stranded copper in dedicated conduit?
(Specific drawing sheet #/specification page #_____.)

.19 Has it been indicated that the Contractor is to provide code gauge size terminal cabinets with terminal blocks at all junction points? Do not splice conductors using pressure type connectors. All wiring is to be terminated with spade-type crimp lugs. All wiring will be plainly marked to match as-built drawings. All cabinets will be stenciled "Fire Alarm System".
(Specific drawing sheet #/specification page #_____.)

.20 Has it been indicated that each zone circuit must be megger checked to conduit ground prior to final checkout? The readings must be no less than 10 meg. ohms.
(Specific drawing sheet #/specification page #_____.)

.21 Has it been indicated that all external equipment, such as fan shutdown systems and automatic smoke dampers, are to be wired at the control panel so that they can be left in normal operating configuration during system testing and maintenance?
(Specific drawing sheet #/specification page #_____.)

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:_____

16722 - EMERGENCY TELEPHONES

.01 Have emergency telephones been specified for this project?

.02 Has the location of emergency telephones been coordinated with the FAU Police Department and FAU Environmental, Health & Safety Department?

.03 Has Ramtech Phone Model R733 been specified? This ensures that the phone comes with the a compatible microchip to be integrated into the Siemens system.

.04 Has it been determined if the telephones are to be wall mounted or column mounted? If a column mounted phone, has a PLC-9 steel column been specified? (Powder coated OSHA Yellow with BLUE lettering on four sides. Wording to alternate as follows:

2 sides – vertical EMERGENCY (front & back sides)
2 sides - vertical INFO PHONE (left & right sides)

Initial Approval **Date**

Date Revised

Note: All "No" responses require a written response from the A/E Consultant. Comments to "No" Responses:

APPENDIX 1

DESIGN GUIDELINES FOR HANDLING UNWANTED WATER INTRUSION

Based upon recent experience of the impact of the growth of mold during the construction phase for a major project, the following information is being provided to prevent issues due to mold growth in renovation and new construction projects. The specifications should indicate that the contractor shall do the following:

1. Prevent water intrusion into the building (including dew point/condensation conditions) during construction, whether it be new construction and/or renovation. If water intrusion does occur, the contractor should take steps to immediately remove water, including dehumidification of the atmosphere as required to dry out building. Prevent entrapment of moisture with construction materials and components of construction. Dry out may require ventilation only, however, it is imperative that the contractor should take the special measures in the even of water intrusion, including dehumidification.

2. If dehumidification is to be accomplished through the use of building HVAC systems, adequate filters are required to be installed to prevent distribution of construction dust, etc., in air handling and duct systems which can lead to operational problems as well as provide an environment for future mold growth.

3. If porous materials are damaged due to water/moisture, removal prior to growth of mold will avoid potential risks and costly mitigation techniques if the material remains and mold develops. Otherwise, treatment of non-porous areas exposed to moisture should be considered to prevent mold growth.

4. If water intrusion occurs, the material remains, and building dry out occurs, inspections should be made on a continual basis to ensure no mold growth or conditions for mold growth exists, including wall cavities or concealed areas affected by moisture. If mold is observed, the contractor shall be responsible to utilize consultant services to address the process and procedure for removing mold by treatment and/or material removal Treatment of mold can include application of an agent, encapsulation and/or removal of material, suspect or damaged. It is important the contractor utilize appropriate procedures for remediation since some microbial agents may be infectious and/or toxic and could pose a health risk.

5. It is important for the contractor to respond immediately to issues that would provide a suitable environment for the growth of mold in order to prevent potential impacts on project budget and timetable as well as risk to personnel during construction and/or occupancy. The issue of mold, and its potential impact on construction and occupancy, is an evolving subject that the University will address in a proactive manner in the design and construction process.

APPENDIX 2

DESIGN CRITERIA FOR HURRICANE SHELTER AREAS FOR STATE UNIVERSITY EDUCATIONAL FACILITIES

REPORT
FEBRUARY 14, 1995

BY THOMAS T. COOPER, A.I.A., A.U.A.
CAMPUS ARCHITECT - FLORIDA INTERNATIONAL UNIVERSITY

INTRODUCTION

Florida Atlantic University has designated housing for residential students and also has obligations for providing emergency shelter for several thousand citizens in the state. The above factors stress the importance of providing secure facilities located at FAU.

In August 1992, Hurricane Andrew emphasized the destructive power of these tropical storms. Properly designed buildings could have saved billions of dollars and many lives. The design criteria in this report will provide the minimum standards for both new facilities and the retrofit of existing facilities into secure Hurricane Shelter Areas (HSAs).

These HSAs will provide protection during a storm for campus residents, shelter commitments by various universities with local organizations (American Red Cross), plus additional occupants estimated at approximately two percent of the total University population (student, faculty, and staff). The additional occupant requirements may vary with the University, site, community needs, proximity to the coast, flood plain, and other factors. Investigative studies should be performed on all existing dormitory facilities for cost benefit analysis for conversion to HSAs. Rehabilitation of a few dormitories might be more cost effective than the construction of new facilities.

The standards in this report are for a hurricane with winds speeds up to 150 miles per hour. Design standards for a category five hurricane, wind speeds up to 200 miles per hour were determined to be excessive as the occurrence for this magnitude is rare. The structural wind loading conditions cited in this report are a combination of three most recent revisions to:

1) **Standard for Minimum Design Loads for Building and Other Structures ASCE 7-93,**

2) **The Department of Education Report on Hurricane Shelters,**

3) **The Florida Building Code 4th Edition and Dade County Special Protocol for Material Testing.**

All of these design standards have been revised with respect to new knowledge obtained from studying the effects of hurricanes and, in particular, Hurricane Andrew.

ARCHITECTURAL GUIDELINES

The following criteria should be used in the design of new Hurricane Shelter Areas (HAS's),site selection and remodeling of existing SUS buildings into HAS's. In situations where strict compliance with these guidelines is not possible, a request for waiver should be obtained by the University.

SITE AND LOCATION

HSA's:

1. **Shall not be located in category 4 storm surge inundation zones. The National Weather Service provides mathematical models for Sea, Lake, and Overland Surges from Hurricanes (SLOSH) and a Special Program to List Amplitudes of Surges from Hurricanes (SPLASH).**

2. **Shall not be located in areas that may be isolated by flood conditions.**

3. **Shall be located outside the 100-year flood plain.**

4. **Shall not be located in areas likely to be isolated by riverine inundation (Flood Insurance Rate Maps – FIRMs).**

5. **Shall not be located down grade or stream from dams or reservoirs.**

6. **Emergency access routes shall be above the 100-year flood plain.**

Emergency adequate pedestrian and vehicular access and egress to and from shelter for emergency vehicles.

GENERAL CONDITIONS

1. Do not use large open areas with long span roof systems (gymnasiums, auditoriums, field houses, convocation and convention area spaces). Long span members, unless specifically designed, are too flexible for hurricane gusts

2. Avoid use of spaces that contain dangerous or hazardous materials (store, shop rooms, and laboratories)

3. Do not use mechanical, electrical, storage, computer, science rooms, laboratories, open corridors, kitchens, offices, or library stack areas for habitable space in HSAs. These areas contain either valuable or hazardous equipment and/or supplies.

4. Only structural building systems of poured concrete, or reinforced masonry shall be used for HSAs. Other systems may be considered if a structural engineer certifies the entire building meets the structural requirements of these guidelines. In addition, certification to the standards in this report by a structural engineer is required for all designated HSAs, new or retrofitted.

5. Consider only buildings in compliance with applicable building and fire codes.

6. Consider only buildings in compliance with ADA.

7. Ensure building exits can accommodate occupancy requirement of 40 NSF/person of shelter space.

SPACE ALLOCATION

Storage space for emergency items, e.g. canned foods, drinking water, batteries, flashlights, bedding supplies, first aid and basic medical supplies, formula, baby food, diapers, and sanitation supplies shall be allocated separately at 10 s.f. per 500 shelter occupants.

The space allocated for each shelter occupant will be thirty (30) net square feet of habitable space. This area will include acceptable rooms, corridors, and restrooms. The projected length of stay will be seventy-two (72) hours. The time period represents twelve (12) hours before the storm and sixty (60) hours during and after the storm.

STRUCTURAL

1. **Wind Loads: The basic design wind speed is to be 150 mph. Provide assemblies capable of withstanding pressures calculated in accordance with the procedures of ASCE 7-93 (or latest edition) except that the importance factor given in ASCE 7-93 shall not apply.**

2. **Large Missile Impact Testing: For building envelope assemblies to be utilized in locations of up to and including 30 feet above grade, test I accordance with section 2315.2 of the Florida Standard Building Code and Dade County Protocol PA 201-94 (See Appendix B & C) with the following modifications:**

    a. **Weight of the large missile 15 pounds.**
    b. **Speed of the large missile shall be 73 ft/sec. (+/- 50 mph)**

3. **Small Missile Impact Testing: For assemblies to be utilized in locations greater than 30 feet above grade, test in accordance with section 2315.3 of the South Florida Building Code and Dade County Protocol PA 201-94 with the following modifications:**

a. **Weight of the small missile 2 grams.**
b. **Speed of the small missile shall be 130 ft/sec. (=/- 89 mph)**

4. **<u>Cyclic Wind Pressure Loading:</u> For all assemblies, test cyclic wind loading in accordance with section 2314.5 of the Florida Standard Building Code and Dade County Protocol PA 203-94. The design load shall comply with loading as determined above.**

ROOFS

1. **Roof decks will be poured reinforced concrete.**

2. **Preferably, skylights on roofs shall be avoided. However, if provided, such skylights shall be designed to meet the structural requirements of this Standard, including the impact requirements.**

3. **Roofs shall have adequate drainage system with overflow scuppers (where applicable) capable of safely disposing of a 2 in/hour (50.8 mm/hr) rainstorm for six hours.**

4. **Parapets and equipment mounted on and/or above roofs shall be designed to meet *the* structural requirements of this Standard.**

5. **Roofing membrane and Insulation: Ensure mechanical fastening of membrane to roof deck.**

   a. **For new HSAs, the roof membrane and other protective coatings and insulation must resist the specified design wind loads of this Standard.**

b. **For retrofit, if the existing roofing system does not need immediate replacement. It could be left alone if it meets the applicable building code design criteria, and when replacement is needed afterwards, the roofing system must be upgraded to meet the requirements of this Standard**

WINDOWS, DOORS AND EXTERIOR ENVELOPE

Windows

All window assemblies or their shutters and anchoring systems shall meet the wind and impact requirements listed above and:

1. **System Performance Requirements: Shall comply with structural performance, air infiltration, water penetration and impact resistance requirements indicated, as demonstrated by testing assemblies according to test methods indicated.**

2. **Thermal Movement: Provide for expansion and contraction resulting from an ambient temperature range of 100 degrees F without buckling, joint seal failure, undue stress on structural elements, damaging loads on fasteners, reduction performance or stress on glass. Doors shall function normally over specified range.**

3. **Structural Performance: Test in accordance with ASTM E 330 and Dade County Protocol PA 202-94. There shall be no permanent damage to fasteners, anchors, hardware or actuating mechanisms or permanent deformation of framing members in excess of 0.2 percent of their clear span.**

4. **Deflection Normal to the Plane of the Wall: Test pressure shall be 1.5 times wind pressure as determined above. Deflection shall not exceed 1/175 of clear span, when subjected to uniform load deflection test.**

5. **Deflection Parallel to the Plane of the Wall: Test pressure shall be 1.5 times the wind pressure as determined above. Deflection of members carrying full dead load shall not exceed amount that will reduce glass bite.**

Windows that do not meet the above requirements shall be protected by a permanent protective system (shutters) over the window assembly and shall meet wind and impact requirements listed above under the structural section.

Doors

Exterior doors, frames, anchoring devices, and vision panels, or shutters shall resist the wind loads and missile impact criteria specified under the structural section. Permanent protective systems and their anchoring devices over exterior doors shall resist the wind load and missile impact criteria listed under the structural section.

Exterior Envelope

Exterior envelope, and louvers over fresh air intake or vents, of shelters shall resist the wind loads and missile impact criteria specified under the structural section of this report. All louvers must either be operable or have the ability to be protected during a hurricane.

MECHANICAL/PLUMBING

1. **Emergency shelters will have either the ventilation system or air handlers on emergency generator system. These systems will provide a minimum five (5) cubic feet per minute per person of fresh air to the facility.**
2. **Emergency toilet facilities shall be provided at a rate of no less than 1 toilet for 40 occupants of HSA.**
3. **Systems for emergency toilets, e.g. portable toilets, water storage tanks or generator supplied power for pumps shall be adequate for water supply and waste storage, for the designed capacity of HSAs for up to 60 hours. This is the projected time both during and after the storm. Water supply shall be estimated at 2 gal/day sanitary and 0.5 gal/day drinking per person.**
4. **Plumbing and valve systems of some normal toilets within HAS's may be designated for conversion to emergency operation to meet the demand stated above.**

ELECTRICAL

Emergency Power Generator(s)

1. **Emergency power generator(s) shall be provided for operation of elevators, air handlers, ventilation fans, emergency lights, fire alarm systems, fire sprinkler, potable water and emergency toilet system, and minimum refrigeration/cooking equipment for 60 hours, of the HSAs operation.**
2. **The emergency power system shall have an outlet for coupling of a second portable generator at the exterior of the HSA. This will allow local emergency teams to provide portable back-up generators to the HSA after the storm.**
3. **Generators shall be installed in an enclosed building for protection from design winds, missile-impact, and rain. This space may be part of the HSA or a separate structure.**
4. **Fuel tanks adequate for 60 hours use shall also meet the wind loads and missile impact criteria of the structural section, if located separate from the generator.**
5. **Air intake and exhaust in the enclosed building shall be designed to resist the wind load and missile criteria of the structural section.**

Emergency Lights

Emergency lights shall provide 10 fc in the HSAs areas and restrooms. These emergency lights shall also have battery back-up.

Lights in generator rooms shall be on the emergency circuit, and have battery back-up.

Emergency Circuits

Necessary elevators, ventilation fans, refrigerators, cooking equipment, potable water and emergency toilet water systems, fire alarms, fire suppression systems, intercom systems, emergency telephones and emergency lights in HSAs shall be connected to emergency circuits per NFPA 70, article 702 (optional standby circuits).

Emergency Outlets

A minimum of four (4) emergency outlets, on emergency circuits, shall be provided in the HSAs manager's office. Others may be located throughout the shelter area as needed.
The manager's office shall be located within the HASs, and shall have provisions for emergency communications on an emergency outlet, i.e. VHF radio base station, antenna, etc.

APPENDIX 3

ROOFING SYSTEMS

Roofing System Guidelines for Florida Atlantic University

Roof system components. The roof system includes the following basic components: roof deck or substrate, insulation, waterproofing membrane, protective surfacing, flashing, counter flashing, roof cants where applicable, caps and copings, perimeter fascia/gravel stops, and sealants, roof expansion and control joints, roof walkway systems, roof hatches, skylights, roof drains, roof drain flashing, scuppers, gutters, downspouts, and ballast material where applicable. These components and all types of roofing material, including metal and tile, are subject to the requirements of this Roofing System Guideline. Patios and decks constructed on roofs require special design consideration and must not violate these roofing requirements.

Approved roofing materials. The selection of roofing materials shall be limited to those manufacturers with a 15-year history of satisfactory manufacture and installation of at least 250,000 squares of their roofing system, and providing not less than a 20-year unlimited warranty/guarantee for labor and materials.

Registered architect required. All new, repair, and replacement roofing projects shall have plans and specifications developed by a registered architect.

Roofing work carried out by University personnel. Roofing projects carried out by University personnel shall be performed in a manner approved by the roofing system manufacturer or one of its licensed roofing contractors.

Roof membrane penetrations. All penetrations of the roof membrane shall be detailed by the architect and installed according to the recommended procedure provided in the latest National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual. It should be noted that the details in the manual show standard conditions, and therefore, they should be adapted to suit each individual project.

Utility supply lines. Utility supply lines (electrical, water, gas, etc.) to roof-mounted equipment shall be installed within the supporting curb of that equipment.

Roof-mounted equipment. Roof-mounted equipment will not be acceptable if other locations for placement can be found. All roof-mounted equipment shall be provided with roof surface walkway access to allow ease of maintenance and minimize roof surface damage.

Roof-mounted antenna, lab equipment, or scientific devices shall be located in areas specifically designed for that purpose. Roof loads, walking surfaces, anchoring devices, mounting pads, curbs, or utility needs shall be designed and provided using appropriate details, adapted as required, from the NRCA Roofing and Waterproofing Manual.

Pitch pockets prohibited. Pitch pockets will not be permitted, including those filled with a urethane, butyl rubber, or similar pourable caulking, and bituminous materials.

Roof coatings. Spray-applied polyurethane foam roofing systems shall not be used on FAU projects. Specific specialized roof coatings will only be considered for new and re-roofing projects where the architect demonstrates that their use is appropriate, and where specific and acceptable monitoring and control measures are carried out throughout the design and construction periods. The FAU Director of Facilities Planning must give written approval for the use of specialized roof coatings. Where replacement of a roof is required, criteria for the replacement roof shall be in full compliance with this Roofing Guideline.

Minimum slope. A minimum slope of 1/4" per foot shall be required on all areas of a new roof system before final acceptance of that roof system by FAU. On existing roofs where it is impractical to attain the required 1/4" slope, a minimum slope of 1/8" may be permitted if other provisions are made to ensure that the integrity of the roofing and drainage systems are maintained.

Base flashing. All base flashings shall extend a minimum of 10" up the vertical surface of curbs, walls, or roof penetrations. It should be noted that the dimension is from the top of the membrane (or ballast) to the top of the base flashing.

Cants. Nominal four-inch pressure treated wood or fiber cants shall be required around all vertical interruptions of the roof system, such as curbs or walls.

Access door thresholds. Access door thresholds to the roof or roof hatches shall be 12" above the adjacent roof surface. An acceptable walking surface shall be installed immediately outside the access door threshold on the roof system.

Roofing contractors. All roofing contractors working on University facilities shall have a current license issued by the State of Florida and be a roofing contractor approved by the manufacturer for the system being installed or repaired.

Roofing over existing roofs. The application of new roof materials over an existing roof will not be permitted until a nuclear or infrared scan, (or other acceptable reliable method) of that roof has been completed and all wet areas detected by that scan have been removed. After the new roof is installed, roof scans shall to be made to record the condition of the new roof and compliance with specifications.

Insulating light-weight concrete. Insulating light-weight concrete over structural concrete slabs as part of the roof system is not acceptable unless approved in writing by the roof system manufacturer in early design phase. Insulating lightweight concrete over vented (perforated) metal roof decking will be permitted. Roof vents through the membrane will not be acceptable in any condition.

Restaurants. Restaurants are not acceptable to rejuvenate an existing built-up roof system.

Galvanized metal flashing. The use of galvanized metal flashing is not acceptable.

Asbestos. The use of roofing materials containing asbestos is prohibited in the installation of new, or the repair of existing, roof systems.

The removal of roofing containing asbestos must be carried out by State certified roofing contractors. Asbestos roofing removal must be conducted in accordance with all Environmental Protection Agency, Occupational Health and Safety Administration requirements, Florida Statutes, and all applicable rules enacted by the Department of Business and Professional Regulation, Department of Environmental Protection, Department of Labor and Employment Security, or other state agencies having jurisdictional authority.

Codes and standards. All architects, roof designers, specifiers, consultants, inspectors, installers and University maintenance personnel shall utilize the following resources: the latest edition of all applicable Florida Building Codes; the Factory Mutual Systems Approval Guide; the Underwriters Laboratory (UL) Building Materials Directory; the UL Fire Resistance Directory; The American Society For Testing and Materials Board of Standards Volume for Roofing, Waterproofing and Bituminous Materials; The Architectural Sheet Metal Manual by The Sheet Metal and Air Conditioning Contractors' National Association; recommended standards and technical details of the Metal Roofing System Association; and, the NRCA Roofing and Waterproofing Manual.

The architect shall design roofing systems to resist extreme wind forces as required by the latest edition of applicable building codes. Structural analysis will be required to verify the integrity of all roof components. The architect shall also be required to design roofing systems with long-term serviceability in mind.

Plans review. The University shall review plans and specifications for compliance with the Roofing Guidelines and applicable codes. A building permit shall be issued before work commences.

Alternate roofing systems. Where the architect proposes a specific alternate roofing system, a request to install an alternate roofing system shall be submitted to FAU in writing and include justification data. FAU shall review and take action on the request for use of an alternate roofing system. Approval must be in writing by the FAU Director of Facilities Planning.

Pre-construction conferences. A roofing preconstruction conference shall be scheduled and conducted by FAU for all new and re-roofing projects at which FAU, architect, general contractor, roofing contractor, roofing manufacturer's representative, and other related trades representatives are present.

Protection plans. A specific protection plan is required from the CM/GC for all new and re-roofing projects to describe the means of maintaining the building in a safe and watertight condition throughout the construction period.

Inspection of installation. FAU shall provide full-time inspection whenever the roofing system is being installed (roofing, flashing, gravel, etc.). The inspector must be readily conversant in the roofing specifications and appropriate installation or repair procedures. Roof system installation inspection may be acquired as professional services from project funds. The architect shall include in the project specifications a

requirement that the roof membrane manufacturer make a minimum of three visits during application and give the architect and FAU a written report of each visit.

Warranties/guarantees. FAU shall maintain copies of all roof warranties/guarantees and records of all roof maintenance work.

Comprehensive roof management program. FAU's Physical Plant Department shall establish a Comprehensive Roof Management Program to include the development of historic records for each facility, listing the architect, general contractor, roofing contractor, manufacturer and supplier, type of roofing system, warranty/guarantee dates and data, history of repairs, regular surveys and inspections data, preventive and planned maintenance procedures, projected replacement and budget needs.

End of Roofing System Guidelines for Florida Atlantic University.

APPENDIX 4

ADDITIONAL PERMIT INFORMATION

1. FAU Permit Application Checklist

- ☐ **Completed application**
- ☐ **Contractor and subcontractor list with all license numbers and expiration dates (BPR)**
- ☐ **Letter of Authorization to sign for permits on the file with signature on permit.**
- ☐ **Copy of appropriate State License**
- ☐ **Copy of Occupational License**
- ☐ **Certificate of Insurance. (Workers Comp., General Liability, Builders Risk)**
- ☐ **Performance and Payment Bonds (for projects over $50,000)**
- ☐ **State Fire Marshal submittal letter and approval**
- ☐ **Florida Dept. of Environmental Protection, SFWMD, LWDD approval.**
- ☐ **Structural Criteria calculations.**
- ☐ **Two sets of construction documents signed and sealed with Letter of Code compliance.**
  Flood Plain Statement (if applicable)
  Wind load calculations
  Life Safety Plan
  Completed energy forms

2. State Fire Marshal

A. Construction documents approved stamped drawings and approval letter. Three sets of signed and sealed construction documents are transmitted to FAU Facilities Planning Project Manager. FAU submits to SFM and obtains approved stamped sets and approval letter

B. Fire alarm and fire sprinkler shop drawings approved stamped set of drawings and hydraulic calculations and approval letter. Contractor submits to NE. NE reviews and transmits to FAU Facilities Planning Project Manager. FAU submits to SFM and obtains approved stamped drawings and approval letter.

C. Underground fire water line inspection and approval letter. Contractor requests inspection in writing three weeks prior to requested date. FAU submits request to SFM for the inspection and receives approval letter.

D. 50% and 100% Construction inspection and approvals. Contractor requests in writing three weeks prior to requested date. FAU submits request to SFM and obtains approval letter. Small projects may not require 50% inspection, verify w/FAU Facilities Planning Project Manager.

3. State of Florida Department of Environmental Protection:

Potable water and sewer construction and use permits. NE prepares all required documents and delivers to FAU Facilities Planning Project Manager for submission to DEP. Some service sizes/distances do not require permits, although forms may still need to be submitted to DEP for record purposes. Has the NE verified the requirements?

A. Is a DEP Public Drinking Water Facility Construction Permit, or, DEP General Permit for Construction of an Extension to a Public Drinking Water Distribution System required and specified?

B. Has a DEP Certification of Construction Completion and Request for a Letter of Clearance to Place a Public Drinking Water Facility into service been specified? Bacteriological test results and 1 set of record drawings are required to be submitted concurrently. Letter of Clearance/Release must be received prior to granting Substantial Completion.

C. Is a DEP Application to Construct Domestic Wastewater Collection/ Transmission Systems, or, Notices of Intent to Use General Permit for Wastewater Collection/Transmission System required and specified?

D. Is a DEP Domestic Wastewater Collection/Transmission Systems Certification of Completion of Construction required and specified? This form requires certification of the system by a Professional Engineer and one (I) set of record drawings.

4. South Florida Water Management District:

Has a Storm water drainage/retention construction permit and final use permit been specified? NE prepares all documents and delivers to FAU Facilities Planning Project Manager for submission to SFWMD.

5. State of Florida Game & Fresh Water Fish Commission:

Will tortoises or burrowing owls be moved? GFWFC Permit allowing relocation of tortoises or burrowing owls will be needed. FAU prior approval required. NE prepares all documents and delivers to FAU Facilities Planning Project Manager for submission to GFWFC.

6. State of Florida Department of Natural Resources:

Are there fuel tanks and/or fuel systems required? DNR Registration and use permits will be needed. NE prepares all documents and delivers to FAU Facilities Planning Project Manager for submission to DNR.

7. Federal Aviation Administration

Has the NE determined if this project will require filing FAA Notice of Proposed Construction or Alteration, FAA Form 7460-1, height restrictions/limits? NE prepares all documentation and delivers to FAU Facilities Planning Project Manager for submission to FAA.

END OF THIS SECTION

APPENDIX 5
FAU PROJECT SURVEY DEFINITIONS
(Excel File Location: AVP\MASTER-FAUCCGL-MAY2003)

APPENDIX 6

PORTLAND CEMENT PLASTER

PART I-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General, Special, and Supplementary Conditions and Division I Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. **Metal furring.**
2. **Metal lath and accessories.**
3. **Portland cement plaster.**

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. **Division 5 Section "Cold-Formed Metal Framing" for load- and non-load bearing steel studs.**
2. **Division 9 Section "Gypsum Sheathing" for gypsum sheathing installed behind metal lath.**

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each product specified.

C. Material Certificates: Submit certificate signed by manufacturer for each kind of plaster aggregate certifying that materials comply with requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver cementitious materials to Project site in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.

Store materials inside, under cover, and dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

1.5 PROJECT CONDITIONS

A. **Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.**

B. **Warm-Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent dry out during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.**

C. **Exterior Plaster Work: Do not apply plaster when ambient temperature Is below 40 deg. F.**

D. **Protect contiguous work from soiling and moisture deterioration caused by plastering. Provide temporary covering and other provisions necessary to minimize harmful spattering of plaster on other work.**

E. **Pre-Installation Conference: Conduct conference at Project site to comply with requirements of Division I Section "Project Meetings."**

PART 2 - PRODUCTS

2.1 MANUFACTURERS

a. **Manufacturers: Subject to compliance with requirements, provide products by one of the following:**

1. **Expanded-Metal Lath:**

- **a. Alabama Metal Industries Corp. (AMICO).**
- **b. Dale//Incor Industries, Inc.**
- **c. Dietrich Industries, Inc.**
- **d. National Gypsum Co.**
- **e. Unimast, Inc.**
- **f. United States Gypsum Co.**

2. Metal Accessories:

a. Alabama Metal Industries Corp. (AMICO).
b. Dale//Incor Industries, Inc.
c. Gordon, Inc.
d. Metalex (Keene Products).
e. MM Systems Corp.
f. National Gypsum Co.
g. Stockton Products.
h. Unirnast, Inc.
i. United States Gypsum Co.

2.2 METAL SUPPORTS FOR SUSPENDED AND FURRED CEILINGS AND SOFFITS

A. General: Size metal ceiling supports to comply with ASTM C 1063, unless otherwise indicated.

B. Cast-in-Place and post installed anchors in concrete: Anchors Of type indicated below, fabricated from corrosion-resistant materials, with holes or loops for attaching hanger wires; and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling construction, as determined by testing according to ASTM E 488 conducted by a qualified independent testing agency.

1. Cast-in-place type designed for attachment to concrete forms.
2. Chemical anchor.
3. Expansion anchor.

C. Wire for Hangers and Ties: ASTM A 641, Class I zinc coating, soft temper.

D. Rod Hangers: Mild steel, zinc coated.

E. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

F. Channels: Cold-rolled steel, minimum O.O598-inch- thick base (uncoated) metal and 7 /16-inch- wide flanges, and as follows:

1. Carrying Channels: 1-1/2 inches deep, 475 lb/l000 feet.
2. Furring Channels: 3/4 inch deep, 300 lb/l000 feet.
3. Finish: ASTM A 653, G60 hot-dip galvanized coating for framing where indicated.

G. Steel Studs for Furring Channels: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Minimum Thickness: 0.0329 inch, unless otherwise indicated.
2. Depth: As indicated on Drawings.
3. Protective Coating: ASTM A 653, G40 galvanized coating.

2.3 LATH

A. Expanded-Metal Lath: Comply with ASTM C 847 for material, type, configuration, and other characteristics indicated below.

1. Material: Fabricate expanded-metal lath from sheet metal conforming to the following:
a. Galvanized Steel: Structural-quality, zinc-coated (galvanized) steel sheet complying with ASTM A 653, G60 minimum coating designation, unless otherwise indicated.
2. Diamond-Mesh Lath: Comply with the following requirements:

a. Configuration: Flat.
1. Weight: 3.4 lb/sq. yd
b. Configuration: Self-furring.
1. Weight: 3.41b/sq. yd

B. Backing: Where lath is indicated to have backing, and where backing is required for machine application of plaster; provide self-furring lath backed with asphalt felts on solid gypsum sheathing.

2.4 ACCESSORIES

A. General: Subject to material limitations specified herein, comply with material provisions of ASTM C 1063 and the requirements indicated below; coordinate depth of accessories with thicknesses and number of plaster coats required.

1. All accessories to be zinc alloy components meeting ASTM B 69, 99% pure zinc.

B. Accessories are to be installed only in horizontal soffits or ceilings or at intersection of vertical surfaces and horizontal soffits or ceilings. Use of accessories in exterior non-protected vertical and horizontal surfaces shall not be permitted.

C. Casing Beads: Square-edged style, with expanded flanges of the following material:

1. Zinc Alloy: Minimum 0.0207 inch thick.

D. Control Joints: Prefabricated, of material and type indicated below:

1. Zinc Alloy: Minimum 0.0207 inch thick.

2. Two-Piece Type: Pair of casing beads with back flanges formed to provide slip-joint action, adjustable for joint widths from 1/8 to 5/8 inch.

a. Provide removable protective tape on plaster face of control joints.

E. Expansion Screeds (Reveals): Face openings in width(s) as indicated on drawings. Depth as required for plaster thickness. Material to be zinc. Provide back-up plates at joints and outside corners.

1. Superior's 15 Type configuration, subject to requirements, is an acceptable product.

F. Lath Attachment Devices: Material and type required by ASTM C 1063 for installations indicated.

2.5 PLASTER MATERIALS

A. Base-Coat Cements: Type as indicated below:

1. Portland cement, ASTM C 150, Type I.

B. Job-Mixed Finish-Coat Cement: Material and color as indicated below:

1. Portland cement, ASTM C 150, Type I.

C. Cement Color: Gray.

D. Lime: Special non air-entraining hydrated lime for finishing purposes, ASTM C 206, Type S; or special non air-entraining hydrated lime for masonry purposes, ASTM C 207, Type S.

E. Sand Aggregate for Base Coats: ASTM C 897.

F. Aggregate for Finish Coats: ASTM C 897 system and as indicated below:
Manufactured or natural sand, white in color.

2.6 MISCELLANEOUS MATERIALS

A. Fiber for Base Coat in 3-Coat Work: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminates, manufactured for use in Portland Cement plaster.

B. Water for Mixing and Finishing Plaster: Potable.

C. Bonding Admixture: A non-re-emulsifiable acrylic emulsion. Approved products include Thoroseal Acryl 60, manufactured by Harris Specialties Chemicals, Inc.; Xycrylic, manufactured by Xypex Chemical Corp.; and Sika Latex, manufactured by Sika Chemical Corp.

I2.7 PLASTER MIXES AND COMPOSITiONS

A. General: Comply with ASTM C 926 for base- and finish-coat mixes as applicable to plaster bases, materials, and other requirements indicated, except that plastic cement and masonry cement not permitted.

B. Base Coat Mixes and Compositions: Proportion materials for respective base coats in parts by volume for cementitious materials and in parts by volume of aggregate per sum of cementitious materials to comply with the following requirements for each method of application and plaster base indicated. Adjust mix proportions below within limits specified to attain workability.

C. Fiber Content: Add fiber to brown coat of 3-coat mixes after ingredients have mixed for at least 2 minutes. Comply with fiber manufacturer's written instructions, but do not exceed 1 lb/cu. ft. of cementitious materials. Reduce aggregate quantities accordingly to maintain workability.

D. Three-coat work over metal lath: base-coat proportions as indicated below:

1. Scratch Coat: 1 part Portland Cement, 0 to 3/4 parts lime, 2-1/2 to 4 parts sand.
2. Brown Coat: 1 part Portland Cement, 0 to 3/4 parts lime, 3 to 5 parts sand.

E. Two-Coat Work Over Concrete Unit Masonry: Base coat proportions as indicated below:

1. Base Coat: 1 part Portland Cement, 3/4 to 1-1/2 parts lime, 3 to 4 parts sand. Water to be mixed with bonding admixture in proportion as recommended by admixture manufacturer.

F. Job-Mixed Finish Coats: Proportion materials for finish coats in parts by volume for cementitious materials and parts by volume of aggregates per sum of cementitious materials to comply with the following requirements:

1. Proportions using sand aggregates as indicated below:

a. 1 part Portland Cement, 3/4 to 1-1/2 parts lime, 3 parts sand.

2.8 MIXING

A. Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 -EXECUTION

3.1 INSTALLATION OF LATH AND FURRING, GENERAL

A. Standards: Comply with ML/SF A 920, "Guide Specifications for Metal Lathing and Furring," and with requirements of ASTM C 1063.

B. Install supplementary framing, blocking, and bracing at terminations in work and for support of fixtures, equipment services, heavy trim, grab bars, handrails, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable written instructions of lath and furring manufacturer.

C. Isolation: Where lathing and metal support system abuts building structure horizontally and where partition or wall abuts overhead structure, sufficiently isolate from structural movement to prevent transfer of loading from building structure. Install slip- or cushion-type joints to absorb deflections but maintain lateral support.

1. Frame both sides of control joints independently and do not bridge joints with furring and lathing or accessories.

D. Install additional framing, furring, runners, lath, and beads, as required to form openings and frames for other work as indicated. Coordinate support system for proper support of framed work that is not indicated to be supported independently of metal furring and lathing system.

3.2 INSTALLATION OF CEILING (SOFFIT) SUSPENSION SYSTEMS

A. Preparation and Coordination: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure inserts and other structural anchorage provisions have been installed to receive ceiling hangers in a manner that will develop their full strength and at spacing required to support ceiling.

1. **Furnish concrete inserts, and other anchorage devices indicated, to other trades for installations well in advance of time needed for coordination with other work.**

B. Hanger Installation: Attach hangers to structure above ceiling to comply with ML/SF A 920, "Guide Specifications for Metal Lathing and Furring," and with referenced standards.

1. **Do not attach hangers to metal deck tabs.**

C. Install ceiling suspension system components of sizes and spacing indicated, but not in smaller sizes or greater spacing than those required by referenced lathing and furring installation standards.

1. **Hangers: Space hangers not over 48 inches o.c, parallel with and not over 36 inches o.c. perpendicular to, direction of carrying channels, unless otherwise indicated, and within 6 inches of carrying channel ends.**

   a. **Where wire hangers are called for or required, provide 0.16 inch-diameter wire.**
   b. **Hangers shall be of ample length and shall conform to the requirements of ASTM C 1063 Table 1 both as to size and maximum area to be supported, except as modified by this section.**
   c. **When 1 inch by 3/16 inch flat inserts and hangers are used, 7/16 inch diameter holes shall be provided on the center line at the lower end of the insert and upper end of the hanger to permit the attachment of the hanger to the insert. The edge of the holes in both the inserts and the hangers shall be not less than 3/8 inch from the ends.**
   d. **In concrete, hangers shall be attached to inserts embedded in the concrete or to other attachment devices designed for this purpose and able to develop full strength of the hanger.**
   e. **Flat, steel hangers shall be bolted to 1 inch by 3/16 inch inserts with 3/8 inch diameter round-head stove bolts.**

f. The nuts of the bolts shall be drawn up tight.
g. Wire hangers shall be saddle-tied to the runners.
h. Smooth or threaded rod hangers shall be fastened to the runners with special attachments appropriate to the design.
i. The lower ends of flat runners shall be bolted to the main runners, or bent tightly around the runners and carried up and above the runners and bolted to the main part of the hanger. Bolts shall be 3/8 inch diameter, round-head stove bolts.

2. Carrying Channels: Space carrying channels not over 36 inches o.c: with 48-inch o.c. hanger spacing.
3. Furring Channels to Receive Metal Lath: Space furring channels not over 16 inches o.c. for 3.4-lb/sq. yd. diamond-mesh lath, 19 inches o.c. for 3.4-lb/sq. yd. flat rib lath, or 24 inches o.c. for 3.4-lb/sq. yd., 3/8-inch rib lath.

3.3 LATHING

A. Install metal lath for the following applications where plaster base coats are required. Provide appropriate type, configuration, and weight of metal lath selected from materials indicated that comply with referenced ML/SF A specifications and ASTM lathing installation standards.

1. Suspended and furred ceilings using 3.4-lb/sq. yd. minimum weight, diamond-mesh lath, except where 3/8 inch ribbed lath indicated.

3.4 PREPARATIONS FOR PLASTERING

A. Clean plaster bases and substrates for direct application of plaster, removing loose material and substances that may impair the Work.

B. Install temporary grounds and screeds to ensure accurate rodding of plaster to true surfaces; coordinate with scratch-coat work.

C. Refer to Division 6 Sections for installing permanent wood grounds, if any.

D. Flashing: Refer to Division 7 Sections for installing tlashit:lg as indicated.

E. Surface Conditioning: Immediately before plastering, dampen concrete and concrete unit masonry surfaces that are indicated for direct plaster application. Determine and apply amount of moisture and degree of saturation that will result in optimum suction for plastering.

3.5 INSTALLATION OF PLASTERING ACCESSORIES

A. General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joiuts and in alignment. Attach accessories securely to plaster bases to hold accessories in place and in alignment during plastering. Install accessories of type indicated at following locations:

1. External Comers: No accessories permitted.
2. Terminations of Plaster: Install casing beads, unless otherwise indicated.
3. Control Joints: Install at locations indicated or, if not indicated, at locations complying with the following criteria and approved by Architect:

    a. Where an expansion or contraction joint occurs in surface of construction directly behind plaster membrane.
    b. Distance between Control Joints: Not to exceed 18 feet in either direction or a length- to-width ratio 2-1/2 to 1.
    c. Horizontal Surfaces such as suspended ceilings (soffits), not more than100 sq. ft. in area.
    d. Where plaster panel sizes or dimensions change, extend joints full width or height of plaster membrane.

4. Install prefabricated expansion joints of 2-piece design where shown as "Expansion Joint"; 1/4 inch joint width for interior work, 3/8 inch for exterior.

5. Install channel screeds (reveals) where indicated. Where ends of channel sections meet, set in bead of sealant; set all splice plates in mastic.

3.6 PLASTER APPLICATION

A. Plaster Application Standard: Apply plaster materials, composition, and mixes to comply with ASTM C 926.

B. Do not use materials that are caked, lumpy, dirty, or contaminated by foreign materials.

C. Do not use excessive water in mixing and applying plaster materials.

D. Flat Surface Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces, as

measured by a 10-foot straightedge placed at any location on surface.

E. Grout hollow-metal frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, and before lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout at least 6 inches at each jamb anchor.

F. Sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.

G. Plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated. Where interior plaster is not terminated at metal frame by casing beads, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.

H. Corners: Make internal corners and angles square; finish external corners flush with corner beads on interior work, square and true with plaster faces on exterior work (no corner beads).

I. Number of Coats: Apply plaster of composition indicated, to comply with the following requirements:

1. Provide 3-coat work on metal lath bases as follows:

	At vertical surfaces	At horizontal surfaces
1st (scratch) coat	3/8 inch	¼ inch
2nd (brown) coat	3/8 inch	¼ inch
3rd (finish) coat	1/8 inch	1/8 inch
Total (minimum)	7/8 inch	5/8 inch

2. Provide 2-coat work on solid masonry/concrete bases as follows:

	At vertical unit masonry	At vertical concrete	At horizontal surfaces
1st (scratch/brown) coat	3/8 inch	¼ inch	varies
2nd (finish) coat	1/8 inch	1/8 inch	varies
Total	½-inch*	3/8-inch**	3/8-inch max.

* ½ inch minimum thickness is exclusive of texture (texture finish will increase thickness)

**Provide ½ inch total where unit masonry and concrete are in same plain on same wall.

J. Finish Coats: Apply finish to comply with the following requirements:

1. Trowel-Textured Finish: Apply finish coat with hand-troweled-textured finish matching Architect's sample.

K. Moist-cure plaster base and finish coats to comply with ASTM C 926, including written instructions for time between coats and curing in "Annex A2 Design Considerations."

3.7 CUTTING AND PATCHING

A. Cut, patch, replace, repair, and point up plaster as necessary to accommodate other work. Repair cracks and indented surfaces. Point-up finish plaster surfaces around items that are built into or penetrate plaster surfaces. Repair or replace work to eliminate blisters, buckles, check cracking, dry outs, efflorescence, excessive pinholes, and similar defects. Repair or replace work as necessary to comply with required visual effects.

3.8 CLEANING AND PROTECTING

A. Remove temporary-covering and other provisions made to minimize spattering of plaster on other work. Promptly remove plaster from door frames, windows, and other surfaces not to be plastered. Repair surfaces stained, marred or otherwise damaged during plastering work. When plastering work is completed, remove unused materials, containers, equipment, and plaster debris.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure plaster work is without damage or deterioration at the time of Substantial Completion.

End of Portland Cement Plaster Appendix

APPENDIX 7

FAU ROOM NUMBERING - GENERAL GUIDELINES

In general room numbers should follow a logical pattern/progression for ease of way finding. The lowest numbers should start at the main entry to the building (and each subsequent floor) and progress in a logical fashion through the building and from floor to floor.

The following general guidelines apply to FAU's room numbering system

1. **FAU's numbering system can accommodate up to a four digit number with a single letter extension.**

2. **Floor numbering starts at 100 for the ground floor, 200 for second floor, etc.**

3. **_99A through Z are to be used to identify exterior covered spaces, if any (199A-Z for first floor, 299A-Z for second floor, etc.)**

4. **_00 A-Z are be used to identify interior corridors. (lOOA-Z for first floor, 200A-Z for second floor, etc.)**

5. **198 A-Z are be used for all Mechanical/Electrical/Storage etc. spaces opening to the exterior of the building. Interior Mech./Electrical spaces would be numbered in the normal room numbering sequence.**

6. **_95A, B, C, etc. are be used for Elevators. (195A, B, C for first floor, 295A, B, C for second floor, etc.)**

7. **For rooms opening off another room use the same room number as the main room, with a letter extension. (For example: a suite of offices opening off a common reception area, where the reception area is numbered 101 in the normal numbering sequence, would be numbered: Reception area 101, Offices lOIA, 101B etc.)**

8. **A room which is not accessible from the corridor but is accessible from two different rooms should be numbered separately/sequentially. (For example: a lab which sits between, and services, two classrooms and is accessible only from either of the classrooms would be numbered as follows: classroom 101 (accessible from corridor), lab 102 (accessible from classrooms 101 and 103 only), classroom 103 (accessible from the corridor).**

APPENDIX – 8

EXTERIOR BUILDING LETTERS SPECIFICATION

In the interest of keeping a visual consistency in our campus and maintaining a homogeneous aesthetic character, the following regulations are defined for the design and specifications for building facade dimensional letters. These regulations are required not only in consideration of the aesthetic quality of the campus, but also to ensure low maintenance costs.

1. Exterior Building Letter Specifications

Letter Material, Thickness and Typeface:

Letters shall be cut from ¼" aluminum. Stud mounted with ½" standoffs. This dimension may vary for existing buildings depending on the façade details). The typeface shall be "OPTIMA MEDIUM" or equivalent w/all letters capitalized.

a. Letter Size:

The building name size shall be 16" high. Other appropriate signage must be 8" high. When appropriate, the size of letters may vary to be proportional to the building size and scale and are subject to approval through the Office of Space Utilization & Analysis.

b. Location of Letters:

The Building Letters must be placed on the building in a location w/ maximum visibility. Letters must be centered when positioned above the building entrance.

d. Letter Color:

In combination with the standard campus color schemes the following must be used.
For buildings of beige, tan or sand color schemes, use the Matthews (41-313) MEDIUM BRONZE or equivalent paint finish. In accordance with buildings of gray or any other tone color schemes, use the Mathews (41-342) BRUSHED ALUMINUM or equivalent paint finish.

e. Coordination:

All exterior final signage plans with dimensions and typeface information, shall be submitted and approved through FAU's Office of Space Utilization & Analysis prior to fabrication.

APPENDIX 9

EXTERIOR BUILDING SIGNAGE SPECIFICATION

In the interest of keeping a visual consistency in our campus and maintaining a homogeneous aesthetic character, the following regulations are defined for the design and specifications for building signs. These regulations are required not only in consideration of the aesthetic quality of the campus, but also to ensure low maintenance costs.

1. Exterior Building Sign Specifications

a. Panel Sign Size, Material & Thickness:
The choice of the panel sign size is based on the building's size and the location of the sign. The sign substrate shall be ¼" aluminum sheets of sizes 3'x4' and 2'x3' dimensions. The panel shall be mounted on to 3" aluminum tubes drilled for 1" supports. The rods are welded to sign blank and secured with pins inside post. Posts are set in a concrete base to project 4" above ground. Posts are topped with an aluminum cap. Posts are to be painted FAU blue.

b. Sign coloration:
Sign panel background is painted FAU blue standard color w/ a red stripe 1/2" thick for the 2'x3' signs or a 3/4" thick for 3'x 4' signs. The red stripe divides the signs' field surface 8.75" from the top edge on 2'x3' signs and 12" from top edge on 3'x4' signs and is trimmed 3" from each side edge. Posts are to be painted FAU blue standard color.

FAU standard colors are as follows:
Pantone Matching System (PMS): Blue 287
Red 485
Gold 122

c. Seal:
The FAU seal shall be in color using the respective school colors and shall align with the left side of the sign surface approximately 4" from the edge. The seal size shall be 6"Dia. on 2'x3' signs and 8" Dia. on 3'x4' signs.

d. Font:
The "Florida Atlantic University" font shall be Baskerville 1.5" high with a line spacing of 1.5" for 2'x3' signs and 2" high with a line spacing of 2" for 3'x4' signs. The text shall be placed to the right side of the FAU seal on the upper section of the sign surface.

Text for the building name/title shall be Helvetica Medium 3" high for 2'x 3' signs and 4" high for 3'x 4' signs. The building name/title shall be centered on the lower section of the sign surface w/ line spacing proportional to the available background area. All text shall be white.

e. See sketch attached: "Exterior Building Signage Specification"

f. <u>Coordination:</u>
All exterior building signs with dimensions and construction & typeface information, shall be submitted and approved through the Office of Space Utilization & Analysis prior to fabrication.

g. <u>Installation:</u>
Signs are to be installed plumb and true.

Insert "Exterior Building Signage Specifications"
(this form is available through the University's Office of Space Utilization & Analysis)

APPENDIX 10

AUDIOVISUAL REQUIREMENTS FOR ELECTRONIC CLASSROOMS AND TEACHING AUDITORIUMS

Foreward

The following proposal outlines specific requirements to be integrated into any classroom designated as a multimedia classroom, electronic classroom, or teaching auditorium. Any classroom with the aforementioned designation should be properly equipped for the teaching and learning experience. The appropriate allocation of building funds for audiovisual needs must be taken into consideration prior to construction. The purpose of this report is to outline pre-construction requirements to properly equip these classrooms with the latest audiovisual technology.

CONTENTS

I. Wiring/Cabling

1.1 Conduit

There will be two (2) 1 ¼" conduits located at the teaching podium (floor) and terminating in the ceiling where an LCD Projector is located. One conduit shall house video & control cables; the second conduit shall house audio cable. Two (2) ½" conduits will be located at the teaching podium terminating at the light switch and electric projector when control is required of both.

1.2 Network

One (1) network drop will be provided for each data projector where the projector mounts to a lift (may be located 6" above "drop-down" ceiling or in the ceiling tile). This drop will terminate in the IRM closet or closest network router available. Four (4) network drops will be located in the floor at the teaching podium. These drops will also terminate at the IRM closet or closes network router. At least one (1) RJ-11 phone jack will be supplied at the teaching podium.

1.3 Cable Requirements

Each teaching auditorium/classroom will be sufficiently pre-wired with determined set of video cables. These video cables are the primary link between the multimedia components at the teaching podium and the data projectors. The data projectors are the "hub" of the entire multimedia system. The audiovisual contractor will supply these cables. The following list of cables is to be the minimum requirement but may be changed depending upon room configuration, routing, and switching requirements:

- **(5) Video cables (RG-59)**
- **(1) RF cable (RG-6)---Terminates at closest cable or CCTV tap**
- **(1) S-VGA Cable (15-Pin HD)**
- **(1) RS-232 Control Cable**

Cables are to be plenum wherever fire code mandates. The RG-6, or RF cable, will terminate in the IRM closet or the closest cable or CCTV tap.

1.4 Audio

Ceiling-mounted speakers on a 70v system are recommended for medium to large classrooms (JBL® Control 25CT or Bogen®). The number of speakers varies according to the size of the classroom. In large auditoriums of 150 seats or more, wall-mounted speakers may substitute for ceiling-mounted speakers. The audiovisual contractor will provide Cables & termination. We suggest using Belden® 1800A, or similar, audio cable. The speaker cables will terminate at the teaching podium, or IRM closet: wherever audio mixer/amplifiers are located.

1.5 Control

Please see cable requirements. An RS-232 communication/control cable will be provided from the teaching podium to the projector, lights, and screen. The controller (Crestron) will be configured to operate all multimedia components including audio, lighting, and projection screen.

1.6 AC Power

There will be a minimum of one duplex outlet at each data projector mount (outlets may be place 6" above the drop-down ceiling or located in the ceiling tile). The teaching podium will have two duplex outlets. An uninterrupted power supply/surge protector will be provided with the teaching podium.

II. Projectors

2.1 Type and usage

LCD Projectors will be considered standard components of any electronic classroom. The projector must be RS-232 controllable and have adjustments for keystone correction, image inversion, color, and brightness. Projectors will have auto-focus and auto-zoom features as well. Auditoriums of 150 seats or more will incorporate two (2) fixed data projectors. These projectors will provide adequate viewing coverage and the ability to project independent images (independent switching is mandatory). Smaller classrooms (100 seats or less) may utilize one projector with appropriate brightness and RS-232 control features.

2.2 Placement

The projectors will need to be placed an appropriate distance from each projection screen. The projectors will be mounted on permanent projector mounts. These mounts should be about 6-12 inches from the ceiling where drop-down ceilings are used. Motorized lifts are not recommended, however, when used the projector must lower to a level where it can be easily accessed. Motorized lifts must be keyless (i.e. Toggle switches for "up" & "down")

2.3 Mounts

Fixed mounts are highly recommended due to the added security features they incorporate (security screws, lockable plates, etc.) These mounts will include a ceiling plate, adjustable column or threaded pipe, hanging bracket, projector housing with roll, pitch, and yaw adjustments.

2.4 Security

Due to a sharp increase in LCD projector thefts on FAU campuses, the following list of mandatory security measures should be in place prior to installation of any audiovisual equipment:

2.4.1 Motion Sensors – This device attaches to the LCD projector and sets off an audible alarm at about 110 decibels (i.e. Aztec Security® Product's Wobbler Alarm). Some of these systems can be wired to a central monitoring station such as a police station or Audiovisual Department.

2.4.1 Security Screws- These can be used to attach the LCD projector to the projector mount. Security screws require a special drill bit to install or remove.

2.4.3. Surveillance---SEE SECTION 6.1, "Surveillance Systems".

III. Screens

3.1 Type

Electric screens will be used in medium to large classrooms and must be RS-232 controllable. A screen with high gain qualities will be used to enhance the performance of LCD projectors (Da-Lite ® Screens are recommended). The screen size will be determined by factors such as room size, seating capacity, ceiling height, and ANSI lumens of the projector.

3.2 Placement

For large teaching auditoriums (150 students or more), two projection systems will be used. Faculty have expressed the desire to have independent images projected at the same time as well as a projection system that does not intrude with a white board or chalk board. These requests can be met by implementing two independent projection systems. Each screen is placed at opposite ends of the white board or chalk board. The screens should have sufficient floor clearance to avoid obtrusions or damage to the screen.

3.3 Control

Many audiovisual components can be controlled utilizing an integration switching system. In such case as control is desired from an integration system, the screen must have an RS-232 control interface. Independent switches, for raising and lowering screens, should be placed next to the appropriate screen (keyed switches are not to be used).

IV. Teaching Console

4.1 Type

Each teaching auditorium shall have a complete multimedia teaching console. The teaching console should include a locking mechanism. The console should be large enough to accommodate a desktop computer and document camera. An equipment rack capable of holding a VCR, DVD-Player, Audio Mixer/Amplifier, Wireless Microphone Receivers, and appropriate switching units. The teaching podium should also have lockable doors providing rear access to equipment. University Learning

Resources recommends the "Distance Education Console" by Spectrum Industries®.

4.2 Placement & Lighting

The teaching podium should be located close to the conduit/floor plate for video and audio wiring. Teaching podiums should be placed away from heavy traffic areas. The podium should not inhibit the data projectors or projection screens when in use. The teaching podium will need track or recessed lighting located above or near the work surface. There should be adequate surface area for faculty materials (i.e. Laptop, notes, text books, briefcase, etc.) The classroom will have separate lighting banks on dimmers. It is recommended that each bank run parallel to the front of the room in zones the can be dimmed from front to rear.

4.3 Control System

Each teaching console will have appropriate switching/control mechanism allowing faculty to successful operate, and integrate, multimedia equipment. A Crestron® or Extron® switching device must be used in order to be supported by FAU's Audiovisual Services Department.

V. Assisted Listening Devices

5.1 Types & Requirements

Adequate number of assisted listening devices will be included where ADA standards mandate. Number of units will be determined using ADA Standards. The following components shall be considered standard in an assisted listening system:

- **Wide-Band FM Transmitter Or Infrared System (with infrared emitters).**
- **Personal Receiver Belt pack with Earphone or Headset style receiver**
- **Rechargeable batteries and battery charger.**

VI. Auditorium Security

6.1 Surveillance Systems

Video Surveillance- Each teaching auditorium will have a network of video surveillance cameras, the minimum being two (2) cameras. These cameras can be IP addressable, however, they must include the ability to record time-lapse images to a central server or video recording system. The minimum requirements for this system include:

- **Cameras with 640 x 480 lines of resolution**
- **Low light sensitivity of at least 3 lux**
- **Motion detection capability internal to camera or external to software with the ability to set "trip" zones for full-motion recording capability**
- **Recording capability of at least 72 hours before rewriting the recording media.**

6.2 Remote Entry System
Each teaching auditorium will have a card, or keypad, access system on all auditorium entrances (emergency exits are excluded). The remote access system should include the capability of executing time-based commands for auto-locking each evening. A centrally monitored access system is preferred.

VII. Originating Distance Learning Content

This following list of equipment is to be considered the minimum standard for properly equipping distance learning classrooms where course content is created for broadcast or streaming (synchronously or asynchronously). The following standards are in place to ensure faculty is properly equipped with the multimedia components needed to create and disperse content and to ensure proper integration of these multimedia components for a successful broadcast or video stream.

Standard Equipment

7.1 Video Conferencing Codec
Each classroom will have a videoconferencing codec configured for H.323 compression standard with a frame rate of 30fps (384 kbps). The codec will have the capability of multipoint conferencing with participation of at least (4) sites. Depending on the level of functionality desired, the camera may be voice-activated as in the Polycom FX or remote controlled as in the Polycom VS4000. The VS4000 does not support voice-tracking cameras. In such cases where the Polycom FX is used, a second remote-controlled camera will be supplied for classrooms where content is originated. ($7,500-$12,000)

7.2 Monitors
Four 32"or 27" (depending on room size) monitors will be provided. Two rear-mounted monitor for faculty view of program feed and remote sites. Two front-mounted classroom monitors for student viewing of remote sites, slides, videos, or presentations (an XGA compliant monitor or projector will be ceiling-mounted for presentations). Monitors will be strategically placed to give faculty a clear view of the remote transmission sites while providing clear view for local students of remote sites, slide presentations, and videos.

7.2.1 Second Camera
A second camera mounted in the rear of the classroom to frame shots of teaching faculty or shots of a white board. This camera will be remote controllable with pan, zoom, and tilt features. Installers will preset several shots of teaching podium for greater ease-of-use. ($1,500)

7.3 Teaching Console
Each classroom will be equipped with a teaching console. The teaching console will have a recessed shelf for a 17" computer monitor. An equipment rack with lockable doors and rear access panels. A 10-outlet power strip. The teaching console will be located away from high traffic areas, entrances, and will not impede any projection screen or projection device. ($1,500-$3,000)

7.4 Preview Monitor
One 9" or 13"color reference monitor may be used to help faculty switch multimedia components and line up documents correctly beneath a document camera. This monitor would show the faculty member a preview of what they are sending to remote campuses when a particular multimedia component is switched. ($250)

7.4.1 Switcher & Controller
The teaching console will be equipped with a multimedia component switcher to enable faculty with a means of easily selecting multimedia components. The switcher must have audio and video switching capability. The switcher will have an interface easily accessible to faculty (podium-mounted control interface). An adapter, or architectural plate, for laptop projection, network connection, and stereo output must be provided. Scan conversion will be provided either as a separate component or as a "built-in" feature of the switcher. A Crestron® control system with touch panel interface is recommended for easy-of-use.

7.3.1 Computer
A desktop computer with dual VGA output and monitor. The computer will have a CD-ROM drive. A ZIP Drive is also recommended. The computer must be a Windows-based system with the latest operating system according IRM Standards of Support. ($1,500-$2,000)

7.3.1.1 VCR & DVD Player
A rack-mounted S-VHS compatible VCR will be considered a standard. A rack-mounted DVD player may be considered an optional component. ($250 for one $500 for both)

7.4 Document Camera
An Elmo® or Canon® Document Camera will be considered standard equipment. The document camera must have both composite and s-video outputs. ($1,800) A digital document camera is recommended for larger rooms ($3,000).

7.5 Slide To Video Converter
A slide-to-video converter is used to display standard 35mm slides in RGB mode for video display. This may be considered any optional component. ($3,000)

7.6 Audio Mixer Amplifier
An audio mixer/amplifier and appropriate input modules is standard. Output watts may vary dependent upon number of speakers present. This mixer/amplifier is primarily for balanced microphone inputs from the student population and component audio output. ($650-1,000)

7.7 Microphones
Push-to-talk microphones will be used to decrease feedback occurrences. One push-to-talk microphone can be used for every 2-3 students. Microphones will be programmed to function with the student, or local, camera. Ceiling-mounted microphones are not desirable due to increased occurrences of feedback. ($250.00 ea.)

7.8 Wireless Lavalier Microphone
Although a pod microphone may be sufficient, it is recommended that faculty be provided a wireless lavalier (lapel) microphone to allow greater mobility. ($650)

7.9 Speakers
Wall-mounted speakers will need to be strategically placed for maximum sound transmission and minimal feedback.

University Learning Resources, Florida Atlantic University

This list of standards has been composed by University Learning Resources. Any attempt to revise, redistribute, or copy this material, in whole or part, requires written permission from the Director, or Associate Director, of University Learning Resources. These requirements are to be considered minimum, non-compromising, standards for audiovisual requirements and may be changed or modified according to specifications of individual teaching auditoriums or as technology advances mandate.

END OF FAU CCGLs