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## BUILDING STANDARDS

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## **DIVISION ES – EXECUTIVE SUMMARY AND INTENT**

### **0.1 PURPOSE**

The Florida International University Building Standards are furnished as a guide for Design Professionals providing services to the Owner (herein referred as Florida International University, FIU or the University). As of 2007, an initiative has been undertaken to update & revise to current Disaster Resistant University practices and to incorporate sustainability initiatives. This document is under review and subject to revision by staff. It is intended to assist Design Professional in fulfilling both its respective contractual and professional responsibilities. These Building Standards are incorporated by reference into the Owner-Architect Agreement, and are organized in the traditional CSI (Construction Specifications Institute) divisions of the Work as well as addressing sequence of services, from schematic design through the warranty period of a project. The University is in no way attempting to place undue restraints on Design Professionals; rather it seeks to permit design latitude necessary to develop the program. However, deviation from these standards will be permitted only with written justification and approval by the Associate Vice President for Facilities Management.

### **0.2 INTENT**

Florida International University is a young institution. A member institution of the State University System of Florida, it was established by the State Legislature on June 22, 1965 and opened to students in 1972. The University has grown dramatically over the years. As of 2010, the student body population is approximately 42,179, with a growing resident campus population. Modesto Maidique Campus is the main campus occupying approximately 350 acres, on the site of the old Tamiami Airport in central western Miami-Dade County. The Engineering Center is located just north of the main campus in the city of Sweetwater. Biscayne Bay campus in North Miami, and the Wolfsonian Museum and Annex in Miami Beach complement these facilities contributing with their unique programs at their respective sites. These facilities support the educational mission of the institution in diverse areas of agricultural, medical, and other missions. For more information, please visit [www.fiu.edu](http://www.fiu.edu).

The facilities which support the University's academic mission are critical in both function and their relation to the environment. The challenge is to impart a cohesive image of the "feel" of a university. Design and construction of new facilities at FIU is an exciting, dynamic, and challenging undertaking addressing the needs of multiple stakeholders and users with varied and at times conflicting concerns. Such considerations include, but are not limited to:

A. **Cost** – project must be in compliance with the Owner's stipulated budget.

B. **Scope** – compliance with and delivery of project meeting if not exceeding the agreed-to scope of work in full support of the academic program for which it is intended.

C. **Time** – time is of essence. The Design Professional shall provide for the timely completion of all submittals and/or work product which its Agreement for Services calls for.

D. **Constructability** – design shall be consistent with local current construction market capabilities. The Design Professional shall provide a design based on a 50 year facility life cycle based on durability of materials, sustainable design parameters, ease and economy of maintainability & efficiency of systems components.

E. **Disaster Resistant University (DRU)** – the design shall strive to reduce or mitigate potential vulnerabilities. Even though building codes addresses specific considerations for projects in the HVHZ High Velocity Hurricane Zone (See current edition of Florida Building Code) the Design Professional is instructed to look beyond and submit suggestions for the Owner's approval which would reduce the university's exposure to hazards (e.g. hurricanes).

F. **Operational Efficiency** - Energy efficiency, air quality, weather-tightness, and other sustainable considerations. FIU ranks as one of the most efficient users of electricity amongst other state agencies in the State of Florida. Specific requirements as to interphase with the University's Building Management System, lighting controls, equipment efficiencies may be found in the technical sections of these Standards. As resources of potable water become more limited and energy costs escalate, the challenge to the Design Professional is to envision passive ways to mitigate these challenges.

G. **Safety and security**

H. Working within a sprawling urban context, siting, footprint, density and compatibility issues are critical in addressing existing adjacent facilities. The resulting design shall strive to enhance the diverse fabric of a "university context" seeking common vocabulary of references contributing to a vision of a physical environment identifiable as a university.

I. **Accessibility and paths of circulation / traffic.** Awareness of and compliance with applicable codes and standards must address not just ultimate built conditions, but must be cognizant of the impact of construction activities. Segregation of vehicular traffic, bicycle traffic, service, trash disposal and public pedestrian paths must be anticipated by the Design Professional.

K. **Evolving technology and its impact on facilities** – design professional must provide a design which allows for the necessary changes design process.

The successful design team will produce concepts and systems that address these and other factors in a timely and flexible design solution.

## 0.3 DEFINITIONS

- A. **Owner** refers to Florida International University, FIU, or the University as may be referenced interchangeably in this document.
- B. **FIU Project Manager** the primary point of contact for Design Professionals and Builders is the FIU Facilities Construction Project Manager (FIU PM). This position serves as the Owner's agent and customer liaison with end-users, providing leadership and guidance on all aspects of the project. All project-related communications, meetings, and actions shall be routed through the FIU PM, inclusive of submission of invoices and project progress payments, potential changes or variances, impacts to the budget or schedule, and dealings with other agencies, both internal and external to FIU.
- C. **Building Code Administrator** Any construction, remodeling, or renovation of facilities within university property is subject to the most current edition of the Florida Building Code. All construction building permits are issued by FIU. Permits are issued by one of two methods; by affidavit or by the traditional process of plans review and inspections using in house staff or consultants. Any licensed Contractor performing work shall obtain all permits from the Building Code Administrator (BCA)
- D. **Design Professional** refers to the team of professionals who collectively produce design and construction documents, studies, surveys or other instruments of professional services wherein they serve as the Architect or Engineer for their respective professional licenses in conventional Design/Bid/Build, Construction Management, or Design/Build delivery methods. For purposes of this document the term Design Professional is used interchangeably with Architect and/or Engineer of Record unless otherwise specified.
- E. **Builder** refers interchangeably to a General Contractor, Construction Manager, as well as Design/Build Lead unless otherwise specified.
- 0.4 **ROLE OF OWNER** FIU may provide programmatic guidance, funding information, design review assistance, construction permitting, and general oversight, coordination, and management of the project. The Facilities Planning Department – [www.facilities.fiu.edu](http://www.facilities.fiu.edu) – is specifically charged with managing the Capital Budget Request Process, Design Professional Selection and contract negotiations, carrying a project through schematic design. Facilities Construction and the designated FIU Project Manager manage all major capital construction as well as Minor Projects which may consist of remodeling / renovation projects from inception through warranty.

The Design Professional shall comply at all times with the provisions contained in the FIU Building Standards, the State University System Professional Services Guide and the Cost Containment Guidelines of the State University System. In the event the Design Professional determines that the best interests of the University would be served by deviating from the guidelines, it shall deliver to the FIU PM a written statement requesting a waiver of the guidelines and substantiating rationale. The Owner may grant or withhold waiver of the guidelines in its discretion. No waiver made by the Owner shall be effective unless in writing, and the waiver of a particular guideline shall not be deemed a waiver of such guideline in a subsequent project unless otherwise provided in the waiver. In the event of an

irreconcilable difference between the guidelines and the written agreement between the University and the consultant, the Design Professional shall, in writing, request the Owner to clarify such conflict.

Technical review of the Design Professional's submittal(s) by FIU staff does not constitute a waiver of requirements contained within the referenced guidelines. The Design Professional shall submit to the Project Manager a completed listing all deviations proposed by the Contract Documents together with a rationale.

Said review does not constitute an exhaustive, detailed analysis of all conditions described in the Contract Documents. Reviews shall serve to highlight specific concerns of Facilities staff as well as other University staff and is thereby limited in its scope. The Design Professional(s) shall respond in writing explaining actions taken in response to each area of inquiry or comment. Responses shall be submitted via hard copy as well as in electronic media format to the Project Manager.

- 0.5 **ENTITIES HAVING JURISDICTION** - other entities that do or may play critical roles in FIU's design and construction projects, and with whom the Design Professionals must interact in coordination with the FIU PM, include:
- A. **State Fire Marshal (SFM)** - authority having jurisdiction on matters related to fire and life safety, compliance with Florida Fire Code, plan review, and inspections at 50 and 100% construction completion. All State Fire Marshal inspections shall be arranged and coordinated with the FIU Project Manager. Requests shall be forwarded by both e-mail and fax to the Code Compliance Coordinator's attention. No Building Permits are issued by the BCA until the SFM has released the Permit Set. The SFM must further issue its approval prior to issuance of Final Certificate of Occupancy by the BCA.
  - B. **Miami-Dade Water and Sewer (MDWASD)** - jurisdictional authority for sewer and water allocation. Consistent with concurrency requirements of Florida Statutes §163.3180, the Design Professional shall request on behalf of the Owner an allocation letter from MDWASD. In order to minimize delays in issuing permits for facilities requiring new or expanded water/sewer services, the Design Professional shall submit the request as soon as practicable, during the Schematic Design phase of a Project. Design Professional shall coordinate all contacts, requests for allocations, information requests with agency through the FIU/PM.
  - C. **South Florida Water Management District** - jurisdictional authority over wells.
  - D. **Florida Department of Environmental Protection** – jurisdiction over all state mandated environmental regulations.
  - E. **Miami-Dade County Health Department** - jurisdiction over all food preparation and service areas.
  - F. **US Army Corp of Engineers** - jurisdiction over any coastal construction at the Biscayne Bay Campus.

- G. **AHCA Agency for Health Care Administration** – Office of Plans and Construction responsible for reviewing plans and supervising construction of all hospitals, nursing homes and licensed ambulatory care centers.
- H. **City of North Miami** jurisdictional authority for sewer and water allocation for the Biscayne Bay Campus. Design Professional shall coordinate all contacts, requests for allocations, information requests with municipal government through the FIU/PM.
- I. **Facilities Management Building Code Administrator** - building code enforcement and building construction permitting authority; liaison with SFM; provides regular construction inspection upon request and grants Construction Permits and Certificates of Occupancy;.
- Jl. **Environmental Health & Safety (EH&S)** - provides miscellaneous services such as Welding Permits on existing occupancies, indoor Environmental Quality, and consultation on occupational safety, hazardous materials, industrial hygiene, and radiation control.
- K. **Facilities Management Plant Maintenance** management and maintenance entity for all grounds and facilities - provides programmatic guidance for necessary extensions or upgrades to utilities infrastructures; provides design review input, and coordination of utility outages.
- L. **University Public Safety Department** - may provide design review input on matters related to security and Emergency Operations
- M. **University Technology Services** - provides design review input on information technology, and telecommunications standards
- N. **FIU Space Committee** - provide programmatic phase review and approval of campus projects as they relate to compliance with the adopted Campus Master Plan, academic programs, and space allocations within university facilities

Detailed information about these offices and their relationship to design and construction can be found at the FP&C website.

## 0.6 **PROCESSES GOVERNING DESIGN AND CONSTRUCTION**

This procedure outlines the University's processes governing the design and construction of facilities.

## 0.7 CONSTRUCTION PROJECT PLANNING

A facilities project plan involves three interrelated elements:

1. S Scope (program description, size)
2. Q Project Quality
3. B Budget & Time

The goal of project management is balancing these three elements to provide a facility on time, within budget while meeting the user's needs.

A realistic assessment of a project's feasibility recognizes that an owner can control only two of these elements at any given time. If the budget and time allocated for constructing a project to the desired level of quality are a constant, then the size of the project must be recognized as a variable. A fixed budget adhering to the university's standards of quality results in project that must be reduced in terms of its size to remain within the budget. Failure to design within university standards compromises the ability to properly maintain facilities within funding Maintenance & Operations formulas.

The project team includes:

1. **The User** (Client) -The primary user is the client on the project.
2. **The Design Professional** (Consulting Architects and/or Engineer).
3. FIU Facilities Construction Project Manager (PM)
4. **The Construction Manager or General Contractor.** Throughout the text, the term Contractor is used for both the construction manager and the general contractor.

The User is responsible for clearly stating the requirements of the project through academic plans, campus master plans and program specifications. During the project development, the user provides input related to the scope, size and quality of the facility, as well as the desired completion date of the project. The end user, as the client, is identified as the dean, department chairperson, or designee. One individual must be empowered to speak on behalf of the program users as their representative.

The Consulting Architect is the team of architects and engineers selected by the University responsible for developing a facilities solution as articulated by the Construction Drawings and Specifications (the Project Manual) that meets the user's scope requirements.

FMD's Facilities Construction will manage the project in an effort to achieve the user's desired goals regarding scope of work, budget and time frame. The FIU PM acts as the project team leader as the end user's representative on behalf of the university. This position serves as the liaison and sole point of contact between user, Design Professional(s) and Contractor. As team leader, the PM may assist the user in clarifying and defining the project requirements.



The Construction Manager or General Contractor team member is the entity responsible for construction of the facility.

The general tasks required for facilities development include, but are not limited to:

1. Facilities (Comprehensive) Master Plan, including the Capital Improvement Program (CIP) and other funding source requests as mandated by Rule
2. Budgeting
3. Programming
4. Schematic design
5. Design Development
6. Construction Documents
7. Bidding
8. Construction
9. Move-in
10. Warranty period

## **0.8 MASTER PLAN**

### **FACILITIES COMPREHENSIVE MASTER PLAN, INCLUDING THE CAPITAL IMPROVEMENT PROGRAM (CIP), EDUCATIONAL PLANT SURVEY AND OTHER FUNDING SOURCE REQUESTS**

The University's facilities needs are identified through an Educational Plant Survey and Comprehensive Master Plan, conducted every five years and managed by FMD's Facilities Planning department. The planning process begins with an inventory of all University sites, facilities and rooms. Each space is identified as to space category (classroom, lab, physical education, library, audio-visual, etc.), the net assignable square feet, its condition (as satisfactory, requiring renovation/remodeling, or unsatisfactory), and the program or function accommodated within the space.

Using five-year capital outlay full-time-equivalent (CO-FTE) student enrollment projections and space category formulas, total square foot projections are developed for each campus. Survey recommendations are developed by subtracting the University's existing inventoried spaces from the total needs. The survey makes recommendations for site acquisitions, development and improvement, remodeling, renovation, and new construction for sites and facilities owned by the University. Recommendations also include provisions for correction of defective building components and safety deficiencies, and modifications required for compliance with the safety requirements and standards established by university practices, applicable laws, and building code requirements.

The Facilities Comprehensive Master Plan identifies facilities needs by project and the amount and source of funds requested for each project. The master plan summarizes the needs of the proposed academic plan in coordination with local municipal governments and their impact on the design of facilities. The master plan develops a strategy for locating the program components in facilities at the site and a facilities phasing plan, if applicable. All projects in the master plan must be survey-approved to receive State funding, including funding for future operations and maintenance.

Any revision(s) to the academic plan or project requirements after the master plan has been approved may require an amendment or even a new master plan. Examples are a new program or a comprehensive change in land use that trip thresholds in allowable changes in density or intensity of use.

Approvals:

Director Facilities Planning, Associate Vice-President Facilities Operations, Executive Vice-President Business Affairs, Provost, University President, Board of Trustees.

## **0.9 BUDGETING**

A budget is prepared based on meetings with the user to define the requirements for a project described in the Facilities Comprehensive Master Plan. The factors affecting budget in this phase are institutional resources and commitments. The project budget is composed of the following anticipated costs:

1. Land acquisition costs, surveys, environmental tests, and legal expenses;
2. Infrastructure to support the program requirements including site work and utilities, parking, fixtures, etc.;
3. Construction Costs;
4. Costs attributed to design professional fees, miscellaneous testing services
5. Telecommunications costs attributed to purchase and installation of telephone equipment and computer data outlets;
6. Furniture and equipment to support the program requirements;
7. Project contingency funds.

Project funds may be requested in the Comprehensive Master Plan from a number of sources:

- 1) State sources
  - a) Public Education Capital Outlay funds (PECO)
  - b) Capital Improvement Trust funds (CITF)
  - c) Critical deferred maintenance funds
  - d) Auxiliary Revenue Bonds
  - e) Joint-use funds (facilities to be shared with other State educational institutions);
  - f) Facilities Enhancement Challenge Grant funds (including 50 percent from private donations)
  - g) Student Health Fee Auxiliary Funds
- 2) Other sources
  - a) Federal, State and local funds (including grants)
  - b) Insurance funds (to repair/replace damaged facilities)
  - c) Private/matching funds Courtelis Matching Funds Program

§1013.79 F.S. The process begins with a statement of need for a facility for consideration in the master planning process for assessment and appropriate approvals. The statement of need should include University Advancement's assessment and support of the fund raising effort. Facilities Planning translate the proposed need statement into a "Short Term Project

Explanation and Budget Estimate," (CIP-3). The project and correlating matching funds request must be approved by the University's BOT to be included in the Capital Improvement Plan and legislative budget request. Private funds must be raised for half of the project budget and deposited into university accounts by the end of the calendar year. A report of projects for which funding has been raised is sent to the BOG in January for inclusion in the Spring legislative budget session. When State funding becomes available in August, the project can start and a contract can be awarded to the design professional team.

Approvals:

Dean, University Foundation, Executive Vice-President Business Affairs,  
Provost, University President, University Board of Trustees

## **0.10 DEFINITION OF PROJECT SCOPE & PROJECT REQUIREMENT SPECIFICATIONS**

Prerequisites for development of Project Requirement Specifications:  
Academic plan, included in Educational Plant Survey, Facilities  
Comprehensive Master Plan, and fund source(s)

The user prepares Project Requirement Specs, which are reviewed and approved by Academic Space. Facilities Construction may assist by initiating and/or facilitating planning meetings. Consultants may be retained to assist the user. Funding for the consultant(s) utilized must be arranged by the user or from the project funds. The user assigns a contact person with authority to make decisions related to the project's development. Facilities Construction assigns a Project Manager (PM) responsible for the overall management and coordination of the project. At the end of this step, the work may assigned to a Continuing Contract Architect or Engineer, if the projected construction budget is less than \$2,000,000 (Two Million Dollars) in construction value.

Overall size of the facility described by the Project Requirement Specifications must be within the estimated budget and Educational Plant Survey recommendation. Project Requirement Specifications, which indicate that the furniture and equipment budget can be reduced to support the construction budget, must identify other fund sources for furniture and equipment.

### **Program Definition / Budget Validation**

- The initial phase of a project is crucial. The end user defines the project scope. The definition must be unambiguous as to desired objectives, scope of the work, and the project budget.
- The Project Team must reconcile facility needs and goals within the allotted budget at all project phases.
- Clearly defined budgets inclusive of hard and soft costs are mandatory. Inclusive of: construction, design fees, survey(s), inspection(s), construction testing & permitting, miscellaneous fees, F&E, and contingencies.

- If budget is insufficient to support educational program requirements, it must be recognized as a recipe for ultimate failure.
- When estimates do not match program, project teams must reach to establish achievable goals and project specifications.
- The ultimate goal is to strive for the achievement of maximum programmatic return without sacrificing quality. Quality cannot be transferred to deferred maintenance.

Approvals:

Dean, Academic Space, Associate Vice President for Facilities Operations

## **0.11 ARCHITECTURAL PROGRAMMING**

Items required for architectural programming:

Project Requirement Specifications, budget, and fund source(s)

Architectural programming services may be contracted to the selected consulting architect to provide Project Requirement Specifications. Facilities Construction may arrange for the consulting architect to meet with the user to define the project requirements in facility terms and present concepts, which will meet the requirements. The architectural program contains a narrative statement that includes tabulations of the rooms, area required, and estimated cost. Said services are considered an additional service to the agreement.

Overall size of the project described by the architectural program must be within the budget. The addition of program requirements requires a revision of the Project Requirement Specifications, an amendment and identification of fund source(s) to the project budget, and potential Master Plan amendments, if required, before proceeding.

Approvals:

User, Dean, Academic Space, Director Facilities Planning, Associate Vice President for Facilities Operations

## **0.12 SCHEMATIC DESIGN**

Prerequisites for schematic design:

Project Requirement Specifications, budget, and fund source(s)

The consulting architect presents options on the basic shape and organization of the facility as required by the SUS Professional Services Guide, the Cost Containment Guidelines and the University's Design Guidelines. Locations of departments and major functions are determined. Forms and appearance of the project are established and approved. The footprint of the building is described, and the height of the building is determined. The exterior character of the building is generally determined. Overall size of the project described by the schematic design must be within the budget. The schematic design must contain all the primary elements of the Project Requirement Specifications. Deletions or additions to program requirements must have written approval of the user. Revisions to the

Project Requirement Specifications prompted by changes in program requirements must be approved as described in Step 3 before proceeding.

If any of these changes increase the project budget, or require Educational Plant Survey amendments, fund sources must be identified and the changes must be approved. Changes beyond the schematic design phase will cause the University to incur additional costs beyond those outlined. Pre-construction services may be required of the construction manager.

Estimated cost of the schematic design must be within the budget. The Vice President for Business Affairs must approve estimated costs that exceed the budget. Approval by University President required as to the design's concept and intent.

Approvals: User, Dean, Facilities Construction Project Manager, Associate Vice President Facilities Operations, Executive Vice President for Business Affairs, Provost, University President

#### **0.13 DESIGN DEVELOPMENT**

Prerequisite for design development:  
Schematic design

The final scope (size and quality) of the project, and relationships, including the location of rooms and furniture and equipment in the rooms, are established. FMD staff reviews and approves the project for maintenance and operations standards. Changes in the elements approved in the schematic design (i.e., locations of departments and major functions, footprint, height, exterior character) will result in a delay of the project and additional costs. Estimated cost of the facility described in design development must be within the budget.

Approvals:  
User, Dean, Facilities Construction Project Manager, Director Facilities Construction

#### **0.14 CONTRACT DOCUMENTS**

Prerequisite for development of contract documents:  
Design development

The consulting architect prepares contract documents describing the project so contractors can bid on and build the project. The user's role at this stage is to confirm and clarify the project requirements established during schematics and design development. Estimated cost of the project must be within the budget. Changes in the elements approved in the design development (scope, relationships, forms, appearance, room location and furniture layout) will result in a delay to the project and additional costs. Projects that exceed the budget may proceed only if approved by the Vice President for Business Affairs.

Approvals:

Facilities Construction Project Manager, Director Facilities Construction, Associate Vice President Facilities Operations.

**0.15 BIDDING**

Prerequisites for bidding/acceptance of a guaranteed maximum price: Contract documents and construction permits by State Fire Marshall, other jurisdictions having authority and the University Building Official

Bids that are over budget may delay the project as additional approvals to proceed and/or negotiations are completed. As experience in the highly inflationary construction market of the 2003-2006 years demonstrated, the use of F&E (Furniture and Equipment) Budgets to supplant a project's Construction Budget is not advisable and will not be approved by Facilities Construction. If redesign is required to bring the project within budget, additional time will be required.

Approvals: Purchasing (for Bid Projects only), Executive Vice President for Business Affairs, University President (for Construction Management Projects in the form of a Contract Amendment accepting GMP Proposal)

**0.16 CONSTRUCTION**

Prerequisite: Bidding, Building Permit(s), Notice of Commencement

To ensure proper contract management, no individual is authorized to meet or discuss the construction progress or changes with the contractor or the architect without the Facilities Project Manager. Design-based change orders may result in additional fees from the consulting architect to document the changes. Any change(s) requested by the user in excess of the project contingency, must be approved by the Vice President for Business Affairs before they are designed and documented by the consulting architect. The Facilities Project Manager may arrange meetings with the user, consulting architect and contractor to discuss progress of the work. Except for construction-related personnel, no individuals should enter a construction site without prior approval by the contractor.

The construction schedule is the responsibility of the contractor. Change orders, including design-based change orders, may cause delays. The University should avoid any action that may result in an extension of time.

As the project nears completion, systems of the project (HVAC, data network, etc.) are started and tested to make sure they meet the requirements of the contract documents. Work to be performed by the University is completed toward the end of this phase, such as installing furniture. The facility is inspected by the authorities having jurisdiction to ensure compliance with applicable building codes. The contract documents outline the requirements for substantial completion. This is generally the point at which only administrative contract requirements remain and final inspection by the State Fire Marshall and Certificates of Occupancy or Use are issued by the University Building Official. The contractor's warranty period begins on the date of substantial completion.

Approvals:  
Facilities Project Manager, State Fire Marshal, University Building Official and the Architect/Engineer of Record

**0.17 MOVE-IN**

Prerequisite: Executed Certificate of Occupancy or Use

Construction work is substantially complete and all life/safety issues are satisfied. The user moves in and begins using the facility. The Facilities Project Manager may organize and facilitate a post-occupancy evaluation of the facility with users, the architect of record and other appropriate staff.

**0.18 WARRANTY PERIODS**

Prerequisite: Move-In

The standard construction warranty period is one year from the date of substantial completion. Some elements of the work may have a longer warranty. Facilities Management will respond to all requests by the user, for service and will forward warranty requests to the Contractor with copies to the Facilities Project Manager. The contractor will be notified to correct all issues that are contract-related. Non-contract-related issues may be new work and require new funding. The Facilities Project Manager, Facilities Management, and the user will participate in a warranty walkthrough within eleven months after substantial completion. Facilities Construction may send out surveys to the users of the project as part of a post-occupancy evaluation.

**0.19 REMODELING/RENOVATION OF NEW CONSTRUCTION PROJECTS**

Any construction or addition to an existing facility is considered as new construction through the fiscal year in which the project is completed, and the first fiscal year thereafter. Thus, it is not survey recommended or eligible for use of remodeling/renovation funds during that period.

## **DIVISION 1 – GENERAL REQUIREMENTS**

### **1.01 SPACE REQUIREMENTS**

#### **A. Classrooms**

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Classrooms are medium to relatively large sized rooms for approximately 30 to 80 students. They are spaces designed for efficient teaching on a relatively informal basis.

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Classrooms house instructional processes that are multi-disciplinary in function. These rooms must be physically designed to maximize the teacher to student personal communication through the use of chalkboard and voice. Classroom design elements (architectural, electrical, and mechanical) must serve individual and group use of various electronic instructional media, i.e. television, slides, etc. (See Educational TV and Audio-Visual Media "Appendix F"). This utilization suggests that nearby media storage/preparation rooms permit the readying of materials for a subsequent class while a class is in session.

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To design for flexibility of space, use is an important aspect of classroom planning. Space flexibility begins with simple floor area shapes and includes total coordination of such physical characteristics as chalkboards, student seating, lighting, fenestration, instructor's furnishings, audiovisual equipment placement and necessary controls.

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Classroom floor areas are determined by the number of occupants, viewing requirements, and acoustic considerations. Generally, a relatively square floor plan shape is more desirable than an extended rectangular shape. If rectangular, a two-to-three floor area proportion is recommended with students facing a longer wall.

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The following is a partial list of planning factors to aid the architect in classroom design:

1. Study the classroom configuration based upon given student station capacity and diversified functional needs.
2. Provide as much chalkboard (use marker boards in rooms planned for computers) as possible. Provide map rail with integral cork strip at top.
3. The entrance to the classroom should be at the rear corner of the room (initial layout).
4. Seating shall be movable. Plan for interlocking seats where classroom codes provide the option of fixed or movable seating.
5. Chalkboards should be mounted on partitions to minimize writing noise transmission to adjacent rooms.
6. Eliminate window light glare problems on chalkboards.



7. Classroom lighting must produce a high degree of uniformity on the chalkboard surface.
8. Design considerations are to include studied classroom acoustics, colors, textures, contrast ratios and finishes of room surfaces and furnishings.
9. Provide chair rails where possible.
10. Refer to Appendix "B" for sound level design guidelines.

## **B. Offices**

Offices should be arranged in such a way that the rooms can be assigned and used with flexibility according to present and future needs.

Office space should be planned and partitioned on a modular basis coordinating ceiling systems with fenestration, lighting, heating, ventilating, and air conditioning supply and controls and other utilities to permit quick and economical remodeling. In particular, office areas should be designed to allow the addition or removal of partitions with minimum loss of services to any of the adjacent areas.

Assignments of offices to specific departments, or units, shall always be subject to change as functional requirements dictate. The physical planning must facilitate this need.

The offices will be used primarily for studying, preparing lectures, preparing and correcting examinations and papers, and conferring with students. Generally the conferences will be with individual students, infrequently two or three students. Acoustical privacy is essential.

Faculty offices should be arranged in departmental clusters and should be segregated from the classroom areas, but must be conveniently accessible to students for conferences. The offices should be well lighted (adequate artificial lighting and a large outside window).

The Dean's Administrative Suite and each faculty office shall be provided with electrical conduit for TV, computer and random dial access in addition to standard electrical duplex outlets.

Partitioning between adjoining offices and adjacent to the corridor shall be sound retardant with closure above ceiling to structural slab above.

Refer to Appendix "B" for sound level design guidelines in offices.

## **C. Laboratories**

The basic design concept of the laboratories is that they facilitate total involvement of students and faculty for learning and research.

**Noise attenuation and visual communication are primary environmental and technical design considerations in all laboratories. Refer to Appendix "B" for sound control design guidelines. Additional considerations include:**

1. Research Labs of a building should be remotely located from the building principle entrance(s) and egress areas.
2. In Instructional Labs, provide fluorescent flush ceiling lighting, evenly distributed, with incandescent system with dimmer control to accommodate AV-TV needs.
3. All laboratories electrical system shall be tested for function and operation.

**D. Educational Television**

**Design for extensive provisions for optimum television and listening conditions, except where noted otherwise in all classroom and instructional laboratories.**

**With television, it is noted that the teacher also shares in the reception as well as the presentation of information.**

**Refer to Appendix "B" for sound control design guidelines.**

**E. Audio-Visual Media\* See Appendix "F"**

**The utilization of instructional aids and media will account for a significant percentage of a total educational experience. Instructional rooms to support the utilization of these media must be environmentally compatible with individual and group study, and interactions or discussion activities, in order to function as spaces for total education needs.**

**F. Design and Planning Considerations and Requirements:**

1. The placement of lighting and electrical media controls, wall and floor outlets, must be carefully considered and located.

**\*Slides, films, filmstrips, film loops, dial access, open and closed circuit television, overhead projection, shadow projection, audio and videotapes, demonstration apparatus and graphic materials.**

2. Projection screens should be placed for optimum viewing by students while maintaining maximum chalkboard exposure. A/E planning must coordinate screen placement with specific seating arrangement of each classroom. An adjustable matte white projection screen shall be capable of keystone correction to accommodate an overhead projector.
3. Provide for classroom general illumination which controls amount of light on the screen, (separate switch).
4. Provide for complete room - darkening capability.

5. Position of projection equipment, i.e., motion picture and slide, approximately 24 ft. to 30 ft., from the screen with 20 AMP 115V AC double convenience outlets within three (3) feet of the position. Consider classroom flexibility in the location of outlets.
6. Convenient access to projections positions with standard 18" x 24" x 46" high projection cart. Cart shall be furnished with 100-watt incandescent light attachment and 115V AC duplex outlet.
7. Conduit, cable and outlets for television, dial access and antenna to be of a size and location(s) as required by the University.
8. Each classroom must have "RG58u" cable running from TV location in front of the classroom. Cables must be marked for each run for later identification.
9. Large classrooms and laboratories require conduit from projector position to speaker position for remote control cables and clear path to stage area for ceiling mounted video projection units.
10. Minimum of 9 sq. ft. of bulletin board space near door.
11. One lockable 200 sq. ft. media equipment storage-preparation room for ten classrooms or fraction thereof (adjacent to elevators). Include high security, air-conditioning, and phone outlet.
12. Loading ramp accessibility in each building.
13. Specify only University-approved electrical screens or other specialized equipment, such as sliding chalkboards, etc.

**NOTE: All quantitative specifications are written for a 30-student classroom. Refer to Appendix "B" for sound control guidelines.**

#### **G. Acoustic Design**

**Special attention should be given to resolving sound transmission problems at all offices and instructional spaces (classrooms and laboratories), i.e. sound created by the mechanical system and sound attenuation and transmission at partitioning including doors and spaces above suspended ceilings. Particular attention must be given to sound reverberation qualities within lecture and classroom spaces. (Refer to Appendix "B" for sound control guidelines).**

#### **H. Computer Spaces**

**Provide for rigid humidity and temperature control. Rooms for computer input-output operations shall include facilities and space for keypunch machines, remote card reader printer, recycling containers and storage for card decks and printed output. Refer to detailed space requirements of specific building programs.**



I. Roof Access

Access must be provided to all roof areas. The doors shall be on the Roof Master Key only. Egress from the roof must be possible at all times without the use of keys. Design preference on roof access shall be via a stair case extended to the roof. Alternate means may be provided via an inclined ship ladder (as indicated on the image at right) and access hatch through a secured mechanical or electrical room not accessible to the general public.

Figure 1 BT833 Frost Museum

J. Security

Keying shall accommodate all building functional needs for user convenience as well as building security. All rooms are to be lockable. Generally, restrictive building circulation elements, such as corridor security gates, in addition to door keying systems, shall be determined in an early stage of project development.

Door hardware should be of high quality. The key system shall be integrated with the present campus keying system.

The A/E should coordinate floor plan room numbering with University-wide standards at the beginning of the Design Development Phase. Contact Facilities Development for approved numbering system.  
(Refer to Division 10 Specialties).

K. Telephones (by FIU)

Plan for minimum requirements to include one main extension telephone for each workstation as required by University policy. Additional telephone and communications equipment shall be furnished in accordance with programmed requirements and functional needs. Provide for answering telephone when the office is vacant and telephone intra and intercommunications systems for administrative, departmental and individual needs. (Refer to Appendix "C" for telecommunications wiring standards).

The A/E shall plan for public telephone service in appropriate places in the building. Provide a campus telephone for general use, to be located in a public service area of a facility.

L. Restrooms

Provide Bookshelves

1.02 BUILDING REQUIREMENTS

A. Codes and Standards

1. The design professional of record shall ascertain & ensure the project's conformance with the latest edition of applicable building codes and standards. In case of conflict, consult the University Building Code Administrator (BCA). Written approvals shall be obtained when required from the State of Florida Fire Marshal, Miami-Dade County

Water and Sewer Department, other agencies as necessary as well as utility companies such as Florida Power and Light Company.

- a. Florida Building Code (including related specialty codes for Existing Buildings, Energy Conservation, Plumbing, Mechanical, Fuel Gas, Accessibility and Test Protocols for HVHZ's (High Velocity Hurricane Zone), 2010, including all amendments thereto.
- b. Other Codes and Agencies having jurisdiction:
  - (1) Florida Fire Prevention Code, 2010 or latest edition.
  - (2) NFPA 101 (Life Safety Code), 2009 or latest edition.
  - (3) Agency for Health Care Administration (AHCA) – refer to [http://ahca.myflorida.com/MCHQ/Plans/Hospitals and other Licensed Facilities](http://ahca.myflorida.com/MCHQ/Plans/Hospitals%20and%20other%20Licensed%20Facilities) - Chapter 59A-3.080 FAC
  - (4) Safety Code for Elevators, dumbwaiters, escalators and moving walks A17.1- / CSA B44-07 (ASME)
  - (5) State Requirements for Educational Facilities, Florida State Board of Department, 2007 as revised 2009 (or latest edition), Section 6.1 only, "Size of Space and Occupant Design Criteria Table"
  - (6) Department of Transportation
  - (7) NFPA 70, National Electrical Code, 2008 or latest adopted Edition
  - (8) SMACNA
  - (9) Corps of Engineers
  - (10) ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
  - (11) Florida Department of Environmental Protection – NPDES (Rule 62-621.300(6), Florida Administrative Code (FAC)
  - (12) ASHRAE 15-2004 and 62.1-2004
  - (13) Florida Department of Transportation
- c. Structural Materials Design Codes
  - (1) ACI 318-77 08 including 1980 supplement
  - (2) AISC (American Institute of Steel Construction)
- d. Highlighted applicable Florida Statutes:
  - (1) Local Enforcement Agency. Florida Statutes, § 553.71.

- (2) Authority of University Building Code Administrator to enforce the Florida Building Code and the Florida Fire Prevention Code. Florida Statutes, § 1013.371(2).
  - (3) State Fire Marshall Inspection of state buildings & premises; tests of fire safety equipment; building plans subject to review and approval. Florida Statutes, § 633.085.
  - (4) University campus master plans and campus development agreements s. 1013.30.
  - (5) Threshold Buildings. Florida Statutes, § 553.71
  - (6) Compliance with Local Ordinances. As a public university, all public educational and ancillary plants constructed by the FIU Board of Trustees are exempt from county, municipal, or other local amendments to the Florida Building Code, local amendments to the Florida Fire Prevention Code, or local ordinances, road closures or other impact fees or service availability fees. Florida Statutes, § 1013.371(1)(a).
2. The design of the facilities shall meet all requirements of the State of Florida Energy Life Cycle Evaluation criteria as approved by the University.
  3. It is the express intent of this program to acknowledge this building as a continuum relating the existing and future developments on this campus, as outlined in the University Campus Master Plan, through the selection of design, materials, and systems utilized. Comprehensive systematizing of the campus complex provides energy and construction cost efficiencies, maintenance and repair savings by reducing replacement parts inventories and simplifying service needs, aesthetic cohesiveness, and overall life cycle cost savings based on existing plant experience.
  4. Design of projects and infrastructure must be closely coordinated with plans of the existing structures, systems development, campus utilities development, and University Campus Master Plan for building development.
  5. It is the policy of Florida International University to provide architectural accessibility for the physically disabled in compliance with the provisions found in the Florida Building Code - Accessibility.

**Of particular interest in this document shall be provisions for physically disabled persons in the following areas:**

- a. Wheelchair, crutches, and braces restrictions to mobility.
- b. Building access: entrance door thresholds, closets and handles, interior and exterior multi-level transitions by means of ramps (Slope 1:16), stairs, elevators or escalators, emergency exit from all levels for the physically disabled, hallway and corridor clearances.
- c. Design criteria for public service areas such as restrooms (with or without doors), drinking fountains, telephones, etc.

- (1) Visual fire alarm signals in all toilet rooms.
- (2) Door levers approved for handicap use on all major rooms. Coordinate locations with Facilities Management/Design.
- (3) Braille numbers and auditory signals on elevator doors and cabs.
- (4) Accessible signage on all rooms.

## **B. ARCHITECTURAL PARAMETERS**

**It is the intent of all programs to define building standards and specifications which will ensure environmental sensitivity, construction materials quality, construction system efficiency, adherence to building codes and standards and awareness of University requirements to ensure functionality, ease of maintenance, energy efficiency and cohesiveness to the existing campus mega structure.**

**Design of any building must include review and updating of the Building Standards for either Campus. Review of this document will be coordinated with the University's Facilities Management staff. This document sets forth standards for construction materials, interior and exterior finish, paving surfaces, common building elements, accent materials, utilities, environmental and building systems landscaping and other design guidelines appropriate for this campus. Design of any project must be closely coordinated with plans of the existing structures, campus master plan and campus utility and development base maps.**

**In the development of conceptual design, careful consideration must be given to the following items:**

1. Building Design should take advantage of prevailing breezes and the sub-tropical climate. Special consideration must be made for tropical rain and natural ventilation should be developed wherever practical and desirable based on initial costs, operating costs, energy conservation and the degree of environmental control required in various functional areas. Building design should eliminate need for excessive mechanical controls through the use of such design parameters as building orientation, sun control, breezeways, operable windows, large overhangs, insulated exterior materials, etc.
2. Where applicable, weather protected floor level walkway connections are to be provided, with consideration given to future expansion. All Connections must be coordinated with design of adjacent buildings.
3. Careful consideration must be given to alternative means of accommodating level changes. The nature of the functions housed in all facilities requires that most of them be directly and conveniently accessible. Design should attempt to maximize vertical accessibility to all areas in buildings. Concepts to be explored include ramped walkways, exterior multi-level design and terracing. Where stairs are used, they must be prominent, inviting and readily accessible. NOTE: No terraces are allowed over habitable spaces.

4. The A/E's attention to monitoring overall project costs, as well as costs of specific design elements, shall be reviewed with the Facilities Development and Facilities Operation Department. COST CONTAINMENT IS UNDERSTOOD TO BE A MAJOR DEVELOPMENTAL WITH LONG TERM MAINTENANCE THE PRIME OBJECTIVE.
5. Interior finishes should be responsive to the traffic levels to which they will be subjected with recognition of the permanence of the institution and a desire for low maintenance. Hard or resilient floor surfaces shall be specified for high volume, public traffic areas. Specific room areas should be carpeted with strong, tight weave fibers, easy cleaning and/or repair. Wall surfaces in public traffic areas should anticipate wear and abuse due to student traffic volumes, use tough-wear paints.
6. Furnishings and equipment, interior finishes and color selections shall be coordinated with University Facilities Management personnel in design stages of project development prior to implementation.
7. Large glass areas that may cause sun and weather problems peculiar to South Florida should be avoided, but daylight illumination should be present on all floors for psychological reasons. Use of windows to permit views of the campus is encouraged. Building design should accommodate the use of windows on the North sides while limit the use on South and West sides. Windows should incorporate high quality glazing or film in order to reduce the amount of heat infiltration, but not of lighting, into the building. All windows must meet the South Florida Building Code Hurricane protection requirements without the use of shutters.
8. Public telephones should be located in alcoves, so as to provide privacy and not interfere with traffic flow in corridors.
9. Consideration should be given to providing an appropriate time capsule in the cornerstone of any new Building.
10. Vending areas shall be provided within the building at ground floor level. Provide space for recycling containers. All services (electrical, plumbing, floor drains, etc.) are to be included. Vending areas are not permitted in exterior areas.
11. Provide copy rooms with electric service to accommodate copy machines located in administrative and faculty office areas of the building. Provide space for recycling containers.
12. There should be one custodial workroom for each 18,000 square feet or less of floor space. All space within the building should be reachable from one of these workrooms without negotiating any stairways. Each workroom should be at least 80 net square feet, with an 8' minimum dimension, with 36" minimum out-swinging door. Provide a floor mounted slop sink, shelves (18 to 24" deep) for storing paper goods in case lots, smaller shelves for cleaning supplies. Custodial doors shall swing out wherever allowable to prevent loss of floor space. For large floor areas, or separating wings or pods, provide closets as required to limit travel to 300 feet to a closet. In addition, provide for extra furnishings, special setups, etc. No telephone panels, electrical panels, alarm system panels, or pipe chases are to be located in these rooms. Provide at least one custodial storeroom, per floor or wing of at least 100 square feet for maintenance support.



13. The A/E shall include in the project design, fabrication by FIU and installation by Contractor of an informational graphics, and/or signage system in accordance with University standards.
14. Roofing construction details shall be designed in accordance with the National Roofing Contractors Association Construction Details (latest edition) publication. Slope roofs minimum 1/4" per foot for positive directional drainage.
15. Provide roof traffic pads, min. 48" in width where equipment maintenance occurs.
16. At the construction completion inspection, provide the following to the University:
  - a. Complete set of reproducible "As-Built" drawings both in reproducible and CADD (AutoCAD) format.
  - b. Four copies of operating manuals on all types of equipment used in the building.
  - c. Provide all Warranties and list of Contractors, Subcontractors, and their suppliers of materials and equipment.
  - d. Three copies of cut sheets on all door hardware, window hardware, keying schedule, and all mechanical, electrical, fixed equipment and plumbing installed in the building, shall be provided in loose-leaf binders.
  - e. Two copies of all "as-built" construction drawings in electronic medium, compatible with CAD Auto release 12 and 3-1/2" disk format systems located in University Facilities Management and Physical Plant offices.

**It is intended that all programs will generate buildings that will be attractive, dignified, easy to maintain, economically staffed and operated, and functionally and aesthetically satisfying to the majority of persons who see and use it. These ends can probably be best achieved through a plan that is devoted to flexible use of space with appropriate materials, light and color, as opposed to a plan centered upon a particular architectural style, symmetry, or other non-functional planning considerations.**

### **1.03 Minority Contractors**

1. In order to document the level of Minority Contractors participation in bidding University projects, the Builder will be responsible to provide reports on a monthly basis as to the level of minority consulting firms retained by the project architect Obtain reporting format from the office of Facilities Construction.

### **1.04 Project Completion**

**Prior to substantial completion, the Project Architect will send a letter to the contractor requesting the following closeout documents:**

- A. Record drawings
- B. Record specifications and addenda

- C. Operating manual and maintenance data
- D. Warranties
- E. Bonds
- F. Evidence of payment and release of liens.
- G. Requirements of Section 01700 of specifications list of companies providing warranties and/or bonds, contact person, address and phone number/FAX number.
- H. Equipment instruction session with University staff Electrical, Mechanical, Plumbing and Landscaping (attendance sign off).

## **DIVISION 2 - SITE WORK**

### **2.01 General**

- A. Coordination - The Architect/Engineer shall be responsible for careful coordination of the design for the power and communication duct banks including stub outs for future expansion.
- B. Utility Companies - The Architect/Engineer shall arrange coordination meetings between the utility company, FIU and him/herself. These meetings should be held at the beginning of the schematic and preliminary design phase and at the end of the contract document phase.
- C. FIU As-Builts -
  - 1. Facilities Construction will provide the Architect/Engineer with the current site-utility as-builts during the schematic phase of the project.
  - 2. The Architect/Engineer shall include a print of the FIU as-builts with each bid and contract set of documents.
- D. Project As-Builts - The Contractor shall hire a licensed surveyor who will accurately record the precise size, location and depth of all underground utilities within the project limits. Information to be given to A/E a minimum of 30 days prior to project's final acceptance inspection.

### **2.02 Site Investigations**

**To determine surface and subsurface conditions at a site.**

**Visual inspection: Obtain data on surface soils, surface water, slopes, existing structures on the site, former structures, and adjacent construction. Also determine whether underground utilities may cross the site. Contact UNCLE 1-800-432-4770.**

**In-place soil tests and load tests should be performed at the discretion of the Architect/Engineer.**

### **2.03 Subsurface Soil Investigation**

**Piles: Shall be designed and installed on the basis of a foundation investigation and report including boring, test pits or other subsurface exploration sufficient to determine the position and adequacy of the bearing soils. The investigation and report shall include at a minimum the following:**

- 1. Recommended pile types and installed capacities
- 2. Driving criteria
- 3. Installation and field inspection procedures
- 4. Pile load test requirements
- 5. Durability of pile materials
- 6. Designation of bearing stratum or strata

## 2.04 Earthwork

### A. Site Examination

Ascertain exact locations of utilities and substructures that may be affected by the Project.

### B. Subsurface data

Maintain existing benchmarks, monuments and other reference points.

### C. Conformance Standards

1. American Society for Testing and Materials
2. D2487-69 (1975) Classification of Soils for Engineering Purposes
3. D698-78 Moisture-Density Relationship of Soils
4. D2922-81 Density of Soil and Soil-Aggregate in Place by Nuclear Methods
5. D1556-82 Standard Methods of Test for Density of Soil in Place by Sand Cone Methods
6. D1557-78 Methods of Test for Moisture-Density Relations of Soils Using a 10-lb. Hammer and 18-in. drop
7. D1557, Method D.

### D. Compaction

Under structures and building slabs (minimum compacted depth: two (2) feet, except footings each layer. 95%

Under footings and foundations (minimum compacted depth: 98% two (2) feet.

Under walk areas, top twelve (12) inches, each layer. 95%

Under all pavements, top twelve (12) inches, each layer. 98%

Under walk areas and pavements, below twelve (12) inches, each layer. 90%

Under landscaped areas, each layer. 85%

### E. Testing

All testing shall be performed by a testing laboratory approved by the Owner, Architect/Engineer.

The University will pay for all testing except for tests that fail. Contractor will pay for all failed tests.

Test from each type of material encountered and/or proposed to be used.

## 2.05 Paving and Surfacing

**Use F.D.O.T. Standards.**

**2.06 Landscaping**

- A. The project architect will obtain from the University a copy of the landscape design manual to use as a guideline.
- B. Landscaping - The Architect/Engineer must employ a registered Landscape Architect to design, coordinate, and prepare the contract documents for this project.
- C. Florida International University has a wide variety of native and exotic flora, and is striving hard to transform its diverse landscapes into a unique botanical garden filled with aesthetically pleasing vistas, interesting theme gardens and one-of-a-kind rare ecosystem displays.
- D. One of the University's primary goals is to retain as many native and exotic varieties as possible, with a special interest in natives, while removing as many invading and toxic species as possible. Exotic flora should be implemented with discretion.
- E. Incorporate xeriscaping principals (use of plants requiring little or no water) whenever possible.
- F. See Appendix "D" - Landscaping Preliminary Outline.

**2.07 Grading**

**Provide positive drainage away from all buildings, interior/exterior patios and walks.**

**2.08 First Floor Finish Elevation**

- A. DRU INITIATIVE. The first floor elevation of all new construction shall meet a minimum of +10.00 feet (NGVD).

**2.09 Berm or Mounds**

**The use of berm and mounds is to be limited. See Landscape Design Manual.**

**Sod covered - maximum slope 1:8.**

**2.10 Sodding**

- A. Provide a minimum of 2 inches of approved topsoil at all areas to be sodded.
- B. Types of sod-See Manual

**2.11 Irrigation**

**Each new irrigation system will have its own set of construction documents. The following requirements are to be used for irrigation systems at FIU:**

- A. MODESTO MAIDIQUE CAMPUS: The use of city water for irrigation is prohibited. Lake or pond water is to be used rather than ground water.
- B. BISCAYNE BAY CAMPUS: Gray water irrigation system will provide irrigation needs, consult Physical Plant Director at 940-5565.
- C. All irrigation systems must designed to incorporate the latest technology available for water conservation. (Bubblers and drip systems)
- D. All components of the irrigation system will consist of TORO brand, unless otherwise approved by FIU. Provide protection of sprinkler heads from vehicular traffic.
- E. All piping and fittings in the pipe network will be scheduled 40 PVC and will be sleeved under paved areas. Main lines will be installed a minimum of 18 inches below grade and laterals, a minimum of 12 inches below grade. In areas where hard rock is encountered, pipe excavated trenches must be backfilled with sand, to prevent pipe ruptures.
- F. Pump station and controllers will be enclosed from weather and vandalism.
- G. Irrigation systems will consist of electronic zone timing controllers, which offer the latest technology feature for water conservation, i.e., moisture sensing, rain switches and tensiometer.
- H. Zone controlling valves will be in valve boxes at an elevation to prevent them from being under water during heavy rains and all zones controlling valves will be electric only. Hydraulics are not acceptable.
- I. Sprinkler heads will be pop up type, in turf grass areas. Systems will be designed to provide head to head coverage. In areas where water staining may occur, bubbler heads or other low volume technology must be used.
  - 1. Maximum gallons per minute.
  - 2. Minimize operating time.

## **2.12 Soil Treatment**

**All building sites shall receive termite soil treatment for an area at least five feet outside the structural footprint.**

## **2.13 Fences and Gates**

- A. At Modesto Maidique Campus use hot dipped galvanized chain link fencing.
- B. At Biscayne Bay Campus use black vinyl clad hot dipped galvanized chain link fencing.

## **2.14 Interior Plants**

**No sap releasing palms or similar trees in atriums, courtyards or other interior spaces.**

**All interior plant spaces will be designed with adequate light.**

## 2.15 Existing Trees Relocation or Removal

All existing trees that are scheduled to be relocated or removed must be carefully scrutinized for any bird nests PRIOR to the commencement of such relocation or removal.

If birds are found they are to be protected as per Landscape Architect's recommendation or the National Arborist Association guidelines.

All existing trees in a construction site must be relocated or replaced in kind at the direction of Facilities Management Operations.

## **DIVISION 3 - CONCRETE**

### **3.01 General**

- A. TESTING - The University will pay for all concrete tests except those that failed will be paid by the contractor.
- B. All exposed architectural concrete will receive two coats of clear sealer, thoroseal, or approved equal.
- C. Slabs and walks
  - 1. All sidewalks and slabs-on-grade will have adequate construction joints and complete edge joints.
  - 2. Do not feather edge concrete over adjacent floor and walks.
  - 3. Slope walks, plazas, court yards, etc. to have positive drainage (1/8" per ft. min.)

### **3.02 Concrete Form Work**

#### **Codes and Standards**

- 1. ACI 347 Recommended Practice for Concrete Form Work
- 2. ACI SP-4 Form Work for Concrete
- 3. National Forest Products Association National Design Specifications for Tree Grade Lumber and Fastenings.
- 4. American Plywood Association Properties, Design and Construction; and APA Form V 315
- 5. ACI 347 Allowable Tolerances

### **3.03 Concrete Reinforcement**

#### **Codes and Standards**

- 1. Florida Building Code
- 2. CRSI: Manual of Standard Practice
- 3. AWS: D1.4 Structural Welding Code-Reinforcing Steel
- 4. ACI: SP-66 Detailing Manual
- 5. ACI: 318 Building Code Requirements for Reinforced Concrete
- 6. ASTM: A-615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement, including the Supplementary requirements.
- 7. ASTM: A-185 Specifications for wire fabric for concrete reinforcement.

### **3.04 Cast-In-Place Concrete**

#### **Codes and Standards**

- 1. Florida Building Code
- 2. ACI-117-Allowable Tolerance
- 3. ACI-301-Specifications for Structural Concrete for Buildings



4. ACI-304-Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete
5. ACI-305-Hot Weather Concreting
6. ACI-308-Recommended Practice for Curing Concrete
7. ACI-309-Recommended Practice for Consolidation
8. ACI-311-Guide for Concrete Inspection
9. ACI-318-Building code Requirements for Reinforced Concrete
10. ASTM C31-Making and Curing Concrete Test Specimens in the Field
11. ASTM C33-Concrete Aggregates
12. ASTM C39-Compressive Strength of Cylindrical Concrete Specimens
13. ASTM C42-Drilled Cores and Sawed Beams of Concrete, Obtaining and Testing
14. ASTM C94-Ready-Mixed Concrete
15. ASTM C172-Sampling Fresh Concrete
16. ASTM C173-Air Content of Fresh Concrete by Volumetric Method
17. ASTM C260-Air-Entraining Admixtures for Concrete
18. ASTM C494-Chemical Admixtures for Concrete

### **3.05 Tests and Inspections**

**All drawings shall have the ultimate compressive strength @ 28 days specified shall be noted on all structural drawing and the standard concrete cylinder tests (ASCM C495) shall be the basis for strength determination.**

**Compression tests shall be made in accordance with the "Standard Method of Making and Curing Concrete Compression and Flexural Test Specimens in the Field" (ASTM C-31).**

### **3.06 Moisture Barrier**

**Provide min. 10 mil moisture barrier cover in accordance with ASTM E 154.**

### **3.07 Precast Prestressed Concrete**

#### **Codes and Standards**

**Reference is to the edition in force at the time the specifications are issued.**

1. Florida Building Code
2. ACI 301 Specifications for Structural Concrete for Buildings
3. ACI 318 Building Code Requirements for Reinforced Concrete
4. PCI MNL 115 Fundamentals of Prestressed Concrete Design
5. PCI MNL 116 Manual for Quality Control for Plants and Production of Precast Prestressed Concrete Products
6. PCI MNL 120 Design Handbook - Precast and Prestressed Concrete
7. PCI MNL 127 Recommended Practice for Erection of Precast Concrete
8. ASTM C94 Specification for Ready-Mixed Concrete
9. Fine Aggregate: DOT Standard Specifications Section 802.
10. Coarse Aggregate: ASTM C-33 or DOT #9
11. Prestressing strands to conform to ASTM-A 416
12. Reinforcing steel to conform to ASTM A 615-60

### **3.08 General Provisions**

- A. Structural Design of Slabs: Consideration shall be given in the design of floor and roof slabs to provide exposed construction which can be used as finished ceilings whenever practicable. Such construction, however, shall be planned only if requirements for limits in heat losses and for noise control can be met.
- B. Design of Concrete Footings: Tops of footings for exterior foundations should be at least 3'0" below finish grade to provide sufficient depth of soil for plants.

### **3.09 Cast-In-Place Concrete**

- A. On-Site Supervision: The project architect or his approved representative shall observe the placing of all concrete and shall report non-compliance with specifications and drawings to the University Architect.
- B. Test Reports: A copy of all concrete test reports shall be furnished to Facilities Management.
- C. Integral Finish shall be specified for all floors. No separate topping.
- D. Hardener Treatment: All finished floors which will be left exposed shall receive hardener treatment applied when concrete is still green.
- E. Protection for Nosing on concrete steps shall be provided by rounded cast nosing with non-slip surface.
- F. Non-Slip Surfacing: Ramps, treads, and platform of stairs shall have non-slip aggregate surfacing when not covered with finish flooring materials.

### **3.10 Architectural Concrete**

**A Sample Panel 4 by 8 feet in size shall be erected at the site when cast-in-place architectural concrete is to be used. Panel shall be protected from construction operations, but shall be left exposed to the elements. Panel shall be left in place until all architectural concrete has been approved by Facilities Management.**

### **3.11 Precast Concrete**

- A. Precast Structural Concrete: Base design and specifications on recommendations of the Prestressed Concrete Institute.
- B. Precast Concrete Panels: Base design and specifications on recommendations of the Prestressed Concrete Institute.

### **3.12 Cementitious Decks**

**Include the following general requirements in the specifications.**

**Certificate from Manufacturer of Materials: Upon completion of the installation, a certificate from the manufacturer of insulating materials used, stating that materials were**

**installed by an approved applicator and that materials were installed in accordance with the drawings and specifications, shall be furnished to the project architect.**

## **DIVISION 4 – MASONRY**

### **4.01 General Requirements**

- A. All exterior masonry units will be insulated to R-11.
- B. All exterior masonry units will be sealed.
- C. Conformance Standards
  - 1. American Society for Testing and Materials
  - 2. ASTM C91 Standard Specification for Masonry Cement
  - 3. ASTM C144 Standard Specification for Aggregate for Masonry Mortar
  - 4. ASTM C150 Standard Specification for Portland Cement
  - 5. ASTM C270 Standard Specification for Mortar for Unit Masonry
  - 6. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purpose
  - 7. ASTM C94 Standard Specification for Ready-Mixed Concrete

### **4.02 General Provisions**

- A. Split Coursing: Only full coursing will be permitted at the head of any type of opening.
- B. Overhung Masonry: Construction where the masonry units are suspended using mechanical devices, or where the units extend beyond lower courses and mechanical support devices are required, are not to be used. Buildings being renovated/restored, which have such overhung structured, shall be examined for safety and a report of condition provided.

### **4.03 Mortar**

**Mortar for Laying Masonry: May be ready-mixed or job mixed. Specify by types listed in ASTM C-270. Do not specify mortar, which may corrode steel reinforcement or structure (i.e., Sera-bond).**

### **4.04 Masonry Accessories**

- A. Joint Reinforcement: Wire mesh type is prohibited. Trussed type is preferred over ladder type.
- B. Weep Holes: Stamped aluminum louvered vents of size to fit head joints in brickwork or plastic tubing are preferred over treated sash cord or rope. If cord or rope is specified, specify that the material be left in place and cut off flush with the joint.

### **4.05 Concrete Unit Masonry**

- A. Cinder Block: The use of cinder block is prohibited.
- B. Concrete block, types and uses.
  - 1. Load-Bearing - normal weight.

2. Non-Loading Bearing - lightweight, made with expanded shale aggregate.
3. Exposed Exterior - washed crushed limestone coarse aggregate and washed limestone sand, only, shall be used.

## **DIVISION 5 - METALS**

### **5.01 General Requirements**

- A. Electrolysis - The joining of any dissimilar metals is prohibited.
- B. Materials - Special attention should be given to the selection of metals exposed to the elements, especially on the Biscayne Bay Campus.

### **5.01 Structural Steel**

- A. Codes and Standards
  - 1. Florida Building Code
  - 2. AISC Code of Standard Practice for Steel Buildings and Bridges
  - 3. AISC Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings
  - 4. AISC Specifications for Structural Joints using ASTM A325 or A490 Bolts
  - 5. AWS D1.1 Structural Welding Code
  - 6. ASTM A36-Standard Specifications for Structural Steel
  - 7. ASTM A325-Standard Specifications for High Strength Bolts for Structural Steel, Suitable Nuts and Plain Hardened Washers
  - 8. ASTM A 307-Standard Specifications for Carbon Steel Externally Threaded Standard Fasteners
  - 9. ASTM A 6 General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet piling and Bars for Structural Use
  - 10. SSPC Painting manual
- B. Where requirements of AWS are in conflict with requirements of AISC, requirements of AISC shall take precedence.
- C. Hot Dip Galvanize after Fabrication

**In accordance with ASTM A123, ASTM A385 and ASTM A386, all steel exposed to the weather. Erect those members with galvanized A325 bolts. Seal weld all members to be hot dipped galvanized.**

### **5.02 Steel Joists**

#### **Codes and Standards**

**Comply with Standard Specifications and Load Tables for Open Web Steel Joists, Long Span and Deep Long span Steel Joists.**

### **5.03 Steel Decking**

- 1. Florida Building Code
- 2. AISI Specification for the Design of Cold-Formed Steel Structural Members
- 3. AWS D1.3 Specification for Welding Sheet Steel in Structures SDI Design Manual for Floor Decks and Roof Decks

## 5.04 Metal Fabrications

### Codes and Standards

#### A. American Welding Society

1. AWS D1.0 Code for Arc and Gas Welding in Building Construction
2. AWS A5.1 Welding Electrodes for Steel

#### B. Steel Structures Painting Council

1. SSPC Surface Preparation Specification

#### C. American Society for Testing and Materials

1. ASTM A27 Specifications for Mild to Medium-Strength Carbon Steel Castings for General Application
2. ASTM A36 Specifications for Structural Steel
3. ASTM A53 Specification for Pipe, Steel Black and Hot-Dipped, Zinc-Coated Welded and Seamless
4. ASTM A307 Specification for Carbon Steel Externally Threaded Standard Fasteners
5. ASTM A325 Specifications for High Strength Bolt for Structural Steel Joints
6. ASTM A366 Specification for Steel, Carbon Cold-Rolled Sheet, Commercial Quality.
7. ASTM A385 Recommended Practice for Providing High-Quality Zinc Coatings.
8. ASTM A386 Specification for Zinc-Coating on Assembled Steel Products
9. ASTM A570 Specification for Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality
10. ASTM A611 Specification for Steel, Cold-Rolled Sheet, Carbon, Structural
11. ASTM B103 Specification for Phosphor Bronze Plate, Sheet, Strip and Rolled Bar
12. ASTM B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate
13. ASTM B211 Specification for Aluminum-Alloy Bars, Rods and Wire

### Products

14. ASTM A611. Flat-rolled carbon steel sheets.
15. ASTM A366. Cold-rolled carbon steel sheets.
16. ASTM A53. Steel pipe: Type E, Grade E.

**Welding electrodes for steel: AWS A5.1-69, Class E60 and E70 for manual welds.**

### Bolts

17. ASTM A307. Smaller than one half inch diameter.
18. ASTM A325. One half inch and larger diameter.
19. Aluminum Castings: ASTM B 103, alloy and temper best suited for purpose

**Extrusions: ASTM B 211, temper best suited for purpose.**

**Plates and sheets: ASTM B 209, temper best suited for purpose.**

## 5.05 Hot-Dip Galvanizing

**Hot-dip galvanize ferrous metals in accord with ASTM A 385-80 and ASTM A386-78, minimum two point zero (2.0) ounce per square foot.**

**5.06 Metal Joists**

- A. Manufacturer's Certificate of compliance with Steel Joist Institute Specifications is required.
- B. Prime Coat and Touch-Up Painting will be considered adequate for joists, except where subjected to moisture or where exposed to view.

**5.07 Metal Decking**

- A. Manufacturer's Certificate of compliance with Steel Deck Institute Specifications is required.
- B. Prime Coat and Touch-Up Painting will be considered adequate for metal deck, except where subjected to moisture or where exposed to view.

**5.08 Metal Fabrications**

**Galvanizing Requirements: All exterior ferrous metals shall be hot-dip galvanized after fabrication.**



## DIVISION 6 - CARPENTRY

### 6.01 Rough Carpentry

**PROTECTION AGAINST DECAY: Wood used in conjunction with roofing installations and wood, which is installed in contact with concrete, or masonry shall be pressure treated with an approved preservative to meet AWPS Standards. Other installations shall receive prime coats suitable for finishes specified as soon as installations are completed. Back prime where dampness or warping is anticipated.**

### 6.02 Finish Carpentry

- A. MATERIALS AND FABRICATION: Conform to Architectural Woodwork Institute specifications for Custom quality work.
- B. ARCHITECTURAL WOODWORK
- C. CABINET WORK: Material and fabrication shall conform to Architectural Woodwork Institute specifications for Premium quality work.
  - 1. CABINET HARDWARE: Although this may be specified in the section entitled, FINISH HARDWARE, it is preferred that hardware for cabinet work be furnished and installed by the installer of cabinetry.

## **DIVISION 7 - THERMAL & MOISTURE PROTECTION**

### **7.01 Thermal Design**

- A. Roofs - Minimum R-30
- B. Exterior walls - Minimum R-11

### **7.02 Design**

- A. Walks
  1. In areas where wind driven rains might occur, careful consideration should be given to the sloping of slabs and details at thresholds.
  2. Non-skid surfaces must be provided in all major circulation zones.
  3. All walks, balconies, landings and floors exposed to the elements shall be sloped for drainage.
- B. Waterproofing
  1. All roofs will have a minimum of 20 year Warranty with no dollar limit.
  2. No roofs will be absolutely flat. Use a minimum of 1/4" slope on all roofs.
- C. Roofing Systems

**The Board of Regents Office of Capital Programs has been involved in studies of roofing materials, systems, and installations over the past several years. Based on those studies, the selection, design, and repair of roofing systems shall be subject to the following requirements:**

1. 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.
2. The use of roofing materials containing asbestos is prohibited in the installation of new or the repair of existing roofing systems. The following exclusions to the warranty/guarantee as documented in the "National Roofing Contractors Association (NRCA)", Roofing Materials Guide, Volume 12, February 1988 will be permitted. For the sake of brevity, they are indicated by the numbers shown on pages 154, 155, and 157 of that guide. Exclusions: 1, 2, 3, 6, 9, 15, 16, 18, 22, 24, 25. The following specific conditions to make the warranty ineffective on null and void shall be acceptable and for the sake of brevity listed by letter as shown on page 155 of the guide documented previously noted. Items: B, C, F, G, H, I, J, K, L, M, N, O, P, Q, R, S. The Office of Capital Programs may approve an alternate roofing system for a university building for the purpose of gaining experience with a new product. A request to install an alternate roofing system shall be in writing and include circumstances justifying the experiment.

3. All new and replacement roofing projects shall have plans and specifications developed by a registered architect.
4. All penetrations of the roof membrane shall be detailed by the architect and installed according to the recommended procedures provided in the latest NRCA manual.
5. Utility supply lines (electrical, water, gas, etc.) to roof mounted equipment shall be installed within the supporting curb of that equipment.
6. Roof-mounted equipment will not be acceptable if other reasonable locations can be found. Roof-mounted heating, ventilating, and air conditioning systems are not acceptable. Projects for re-roofing buildings which currently have roof-mounted should include removing and relocating such equipment when feasible. Plans for such removal should be examined by the Office of Capital Programs before re-roofing is done. All roof-mounted equipment shall be provided with roof surface walkway access to allow ease of maintenance and minimize roof surface damage.
7. 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, or utility needs shall be designed and provided using approved NRCA details to the extent available.
8. Pitch pockets will not be permitted, including those filled with urethane, butyl rubber, or similar pourable caulking, and bituminous material.
9. Field mixed, sprayed on roof insulations, and roof coatings are not acceptable roof systems for new roofs or re-roofing projects.
10. A minimum slope of 1/4" per foot shall be required on all areas of the roof system before final acceptance of that roof system by the University.
11. The roofing system includes all plies of the roofing membrane, flashing, roof curbs, roof expansion and control joints, insulation, roof walkway systems, roof cants, and drainage scuppers. Roof ballast material is not permitted.
12. All base flashing shall extend a minimum of 10" up the vertical surface of curbs, walls, or roof penetrations.
13. Four inch (4") treated wood cants shall be required around all vertical interruptions of the roof system, such as curbs or walls. Wood fiber cants are not permitted.
14. 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.
15. All roofing contractors working on University facilities shall have a current license issued by the State of Florida and be roofing contractor approved by the manufacturer for the system being installed or repaired.
16. The application of new roof materials over an existing roof will not be permitted until a nuclear of that roof has been completed and all wet areas detected by that scan have

been removed. After a new roof is installed, roof scans and cuts of built-up roofs are to be made to record the conditions of the new roof and compliance with specifications.

17. DRU INITIATIVE. Insulating lightweight concrete over vented (perforated) metal roof decking on new roofs is not permitted. Insulating lightweight concrete over structural concrete slabs, as part of the roof system or over existing roof assemblies is acceptable provided:
  - a. Insulating light-weight fill thickness (over substrate or insulation board) is a minimum 1", not to exceed 1½, and;
  - b. Insulating lightweight concrete is aggregate based and has a minimum compressive strength of 300 psi.
18. Roof vents through the membrane will be acceptable provided they are insulated, spun aluminum roof vents having a one-way valve design. Roof vents constructed of PVC are not acceptable.
19. All lightweight insulating concrete systems must meet the following standards:
  - a. Tested by Underwriters Laboratories in accordance with the procedures of ASTM E 119 and listed in the most recent Underwriters Laboratories Fire Resistant Directory.
  - b. Tested by Factory Mutual Research and listed in the most recent Factory Mutual Approval Guide as non-combustible or Class 1; and
  - c. Tested by Factory Mutual Research for windstorm classification I-120 and listed in the most recent Factory Mutual Approval Guide.
20. Buildings built near coastal regions shall avoid the use of galvanized metal flashing due to high salt air concentrations.
21. A representative of the Roof Material Manufacturer must be present during the entire roof installation.
22. Acceptable manufacturers are, W.P. Hickman Co., Garland Roofing Co., and Tremco Co. or approved equal.
23. Roof contractors must be certified by the approved manufacturer.
24. Recess all interior drains to insure rapid runoff from the roof surface. Insure that all flashing plies can be contained inside the recess area to prevent a damming buildup of bituminous or stripping materials on the roof surface.
25. Expansion or control joint covers should be elevated above the roof surface along the same guidelines as elevations for membrane flashing. Expansion joint curbs should be approximately 8 in. above roof level to raise membrane base flashing well above the roof water level. The use of expansion or control joints flush with the roof surface runs the risk that pounded water will leak into the building through any damaged spot in the closure. Damage to closures on elevated details will admit limited quantities of water and can be more easily repaired.

26. Perimeter wood nailers should be anchored to the structural deck to isolate the roof/deck system from adjacent structural components. When wood nailers are attached to perimeter walls, differential structural movement may cause damage to the roofing system at the critical wall/deck juncture. Even when the structural members are tied into bearing walls, masonry thermal contraction and expansion can damage the waterproofing membrane.
27. Two-piece, through wall flashing should be installed at all masonry walls. Through wall metal reduces the possibility of water entering the roofing system or building interior through vertical wall cavities. By including the counter flashing receiver with the through wall metal, continuity of the "watershed" is assured and counter flashing metal may be easily removed and reused at the time repairs are necessary to base flashing or at the time of re-roofing. Weep holes should be provided on top of the through wall metal to allow escape of any water entering the wall above the metal.
28. Continuous metal cleats should be used to secure the face side of metal coping, gravel stop and/or fascia metal. The cleat allows for lateral expansion/contraction of the exposed fascia metal while insuring positive securement against wind uplift. Cleats should be of heavier gauge metal than the coping, gravel stop/fascia or perimeter curb metal.
29. Gravel stop metal should be fabricated from light gauge metal to allow more positive anchorage of horizontal flanges and minimize expansion/contraction forces.
30. Extend metal cap or counter flashing a minimum 3 in. down over the tops of membrane base flashing to insure positive water shedding.
31. Specify watertight mechanical joints for coping and expansion joint cover sections. Sections should be maximum 60" long to control expansion. Keep corner "legs" to a maximum 18" long.
32. Roofs should be finished or coated with light colors (white preferably) especially if roof is to be over an air-conditioned area. The use of lightly colored elastomeric paints is highly preferred as these offer additional waterproofing as well as heat reflectivity.

#### D. Re-roofing Projects

**The following is a collection of do's and don'ts related to re-roofing projects.**

1. Coordinate timing to correspond to take advantage of the dry season.
2. Coordinate project schedule with ongoing campus activities, i.e. exams, special events, etc.
3. Coordinate re-roofing traffic with respect to other projects. Student and faculty pedestrian and vehicular traffic.
4. Protect the items inside of the building to be re-roofed (visqueen covers if necessary).
5. If removing insulation provide emergency scupper holes at low point under existing overflow scuppers.

## **DIVISION 8 - DOORS & WINDOWS**

### **8.01 Material Doors & Frames**

- A. Doors - Use solid core wood or hollow metal.

**The use of exterior wood doors is not acceptable.**

- B. Frames will all be hollow metal 14-gauge minimum.

**All metal frames in block walls shall be filled solid with grout.**

- C. Label Doors - Provide where required by code.

### **8.02 Approved Manufacturers**

- A. **All Hardware as set forth in FIU Finish Hardware Specification Master Section 08 71 00.**

### **8.03 Storefront, Curtainwalls & Window Frames**

- A. All exterior storefront and window systems must meet the latest edition of Florida Building Code. DRU INITIATIVE: All window assemblies, regardless of height, shall be designed to meet large missile impact criteria.
- B. Cylinders: Must be compatible with the master key for the building.
- C. The color of the frames shall be coordinated with the Facilities Management Department. The finish of the aluminum must be salt spray resistant, at Biscayne Bay Campus.
- D. Aluminum Windows: Window glass is to be replaceable from inside of building and windows shall have locks on a master keying system.

### **8.04 Hardware**

- A. During the preliminary design phase of the work the Architect/Engineer shall meet with FIU's Facilities Management, Facilities Operations, Key Bank and user groups to determine the keying arrangement.
- B. Handicapped requirements: Use ADA Requirements
1. No vertical rise greater than 1/2" for thresholds.
  2. Use lever type knobs for handicap access.
  3. No Floor Mounted Door Hold Opens.
  4. Floor Closer with Integral Smoke Detectors: Smoke detection systems must be made a part of the documents for fire protection work.

### **8.05 General Requirements**

- A. Allowance: Consult the University Architect regarding provisions for a contingency allowance to cover items inadvertently omitted in hardware schedules. Provisions for this

allowance might be particularly desirable for remodeling projects in which some existing hardware is scheduled for reinstallation. Allowance stipulated should not exceed 2 percent of the estimated cost of contract subdivision for finish hardware. Permission to specify this allowance shall in no way relieve the contractor of responsibility to furnish a complete and accurate hardware schedule.

- B. Hardware for Metal Entrance Doors: With the exception of butts and weather stripping, which should be furnished and installed by the door manufacturer, all hardware for such doors shall be furnished under this section. Note: Pivots should not be used. Specify that hardware supplier furnish, to the door manufacturer, templates or the actual items of hardware for which cutouts are required.
- C. Pulls: Bases for grips shall project straight out, perpendicular to face of door. No curved bases.
- D. Quality and Design: Hardware must be adequate for the intended use and must satisfy code requirements, but shall not be excessively sophisticated nor unnecessarily expensive. Specifications for finish hardware shall be reviewed with the University Architect, Physical Plant, Key Bank and the Department of Facilities Management prior to completion of construction documents. Make submittal at a time, which will allow for adequate review and for making required changes before final printing.

## **DIVISION 9 - FINISHES**

### **9.01 Miscellaneous Requirements**

#### **A. General**

1. Color charts and material samples shall be submitted on a board to the Facilities Management Department for its approval prior to the completion of working drawings. This same color board will be revised during construction if any items are changed by substitution.
2. All finishes must have a Class "B" flame spread rating or better.
3. All finishes shall be easily cleaned and maintainable.
4. The contractor shall supply the University with an additional 5% of all manufactured finish materials at the end of the project. (Acoustical Tile including Grid System, Floor Tile, Vinyl Base, Ceramic Tile, Carpet, Wall covering, etc.)

#### **B. Prohibited Construction Practices and Materials**

1. ACOUSTIC TILE: The use of acoustic tile or panels at 8 feet or less above floor is prohibited unless approved by University Architect.
2. REMODELING: In buildings requiring remodeling, patched materials and surfaces must be made to look as much like new as is economically feasible. It is the intent to avoid a patched appearance.

#### **C. TRANSITIONS:** In areas where partitions must be removed to create new areas, careful planning is required to insure that finishes of the newly created surfaces are homogeneous. If new materials butt against existing materials in any one plane, existing and new materials must be finished to match each other, not only in color but also in patterns and surface texture. If such a match is impossible to achieve and the budget is such that existing materials cannot be replaced, the Associate shall show, by detailed drawings, and specify that existing materials be blended with the new in such a manner that the transitions from one material to the other cannot be readily observed, OR that the different materials be arranged in a pleasing design at the juncture of the materials.

#### **D. SURFACE PREPARATION:** Existing surfaces with several old coats of paint or varnish, to which paint, vinyl covering or other thin finishes will be applied, must have old finished stripped off, down to the substrate. Deteriorated areas of substrate must be removed and replaced with suitable filler; voids and gouged areas must be patched. A skim coat of veneer plaster shall be applied to previously plastered areas and troweled to a true, smooth surface. Wood surfaces shall be spackled and sanded smooth.

#### **E. DESIGN INTENT:** Public Restrooms – all ceilings within a public restroom facility shall be suspended metal lath and plaster. In facilities where this feature is not possible or feasible, all partitions on the perimeter and/or separating adjoining different sex restrooms shall be extended to the underside of the structural deck above with all abutting drywall surfaces caulked and sealed.



## **9.02 Ceiling Suspension Systems**

- A. SUPPORTS FOR CEILINGS: The requirements for independent supports for ceiling grid systems shall be repeated in the applicable sections of the specifications.
- B. CEILINGS: All areas shall have free access to all ceilings spaces; therefore, lay-in ceilings are preferred wherever possible. Lay-in ceilings offer the University flexibility in meeting future needs. (Except restrooms which should have plaster or drywall ceilings).
- C. Access panels should be provided in restrooms for accessibility.

## **9.03 Acoustical Treatment**

- A. ACOUSTIC MATERIALS: Mineral fiber lay-in type acoustic ceilings shall be specified. Panels shall be a minimum of 5/8 inch thick and maximum panel size shall be 2 ft. x 2 ft. THE USE OF NON-STANDARD SIZES IS PROHIBITED because of difficulties and costs of obtaining replacement panels.
- B. COORDINATION WITH WORK OF OTHER TRADES: Ceiling panels may be laid only after ALL work, including telephone wiring, has been completed above the ceiling.
- C. SUSPENSION SYSTEMS: Ceiling suspension systems shall be supported directly from the building structure and shall be supported at all four corners of fluorescent light fixtures. Installations require coordination with electrical layouts. Separate safety supports for light fixtures must specified in Division 16.

## **9.04 Tile**

- A. CERAMIC TILE: The use of the word "mosaics" is prohibited on drawings or in the specifications because of the connotation of this word implying pictorial work. If ceramic mosaics are actually used, specify by giving tile sizes.
- B. CERAMIC TILE: To be specified for all restrooms. Submit colors, samples for University approval to Facilities Management.
- C. WALL AND BASES: Glazed ceramic tile is required.
- D. FLOOR TILE: Unglazed ceramic tile is required.

**Minimum size 2" X 2".**

## **9.05 Resilient Flooring**

- A. RESILIENT TILE FLOORING: Vinyl composition tile, 1/8 inch thick. Approval of the University Architect is required prior to specifying thicknesses other than 1/8 inch.
- B. OTHER RESILIENT FLOORING MATERIALS: In some instances the Consultant may feel that the use of rubber tile, vinyl tile, sheet vinyl, or materials other than vinyl composition tile may be advantageous. Approval of the University Architect is required prior to specifying such materials.

- C. WALL BASES: 1/8 inch thick with cove toe, rounded top edge and 4-inch minimum height. Specify that internal and external corners be formed on the job with joints at 18-inches from corners. PERFORMED, PREFABRICATED CORNERS ARE PROHIBITED. Terminal ends of base shall be beveled and toes rounded.

## 9.06 Carpeting

### A. CARPET SPECIFICATIONS

<u>Construction:</u>	<u>Tufted Loop</u>
<u>Pile Fiber:</u>	<u>Type 6.6 hollow core, continuous filament nylon with antimicrobial and fluocarbon</u>
<u>Gauge:</u>	<u>1/8" or 1/10"</u>
<u>Dye Method:</u>	<u>Stain resistant solution dye or better</u>
<u>Stitches/Inch:</u>	<u>8 or more to achieve weight density factor</u>
<u>Pile Weight:</u>	<u>28" onz. minimum per sq. yard</u>
<u>Pile Height:</u>	<u>187 minimum</u>
<u>Tuft Bind:</u>	<u>20 Lbs. (ASTM D1335) wet or dry</u>
<u>Density:</u>	<u>5,390 oz./sy</u>
<u>Weight Density:</u>	<u>150,000 minimum</u>
<u>Primary Back:</u>	<u>Woven Polypropylene</u>
<u>Secondary Back:</u>	<u>Woven Polypropylene (Required)</u>
<u>Roll Width:</u>	<u>12 feet</u>
<u>Cushion:</u>	<u>Bonded polyurethane cushion (When required)</u>

### B. PERFORMANCE SPECIFICATIONS

<u>Static:</u>	<u>less than 3.5KV when tested under Standard Shuffle Test (70 F-20% R.H.)</u>
<u>Flammability:</u>	<u>DOC-FF-1-70, ASTM D2859 Pile Test: Passes</u>
<u>Flooring Radiant Panel:</u>	<u>Meets NFPA Class 1 when tested under ASTM 648 glue down</u>
<u>NBS Smoke Chamber:</u>	<u>Density Less than 450, NFPA 258 Minimum Critical Radiant Flux of 0.45 Watts/CM<sup>2</sup></u>
<u>Wear Guaranteed:</u>	<u>No more than 10% face yarn loss 10 years normal use.</u>
<u>Edge Ravel:</u>	<u>Guaranteed no edge ravel normal use without the use of seam sealer to be 10 years.</u>
<u>Secondary back-adhesion:</u>	<u>Guaranteed not to delaminate-10 years. Chairs pads are not required.</u>
<u>Tuft Bind:</u>	<u>Average face yarn tuft bind of 20# when tested using the ASTM D-1335-6 method-tuft bind guaranteed 10 years.</u>
<u>Breaking Strength:</u>	<u>150 Lbs. minimum each direction - ASTM D1682</u>
<u>Static Warranty:</u>	<u>Lifetime of carpet.</u>

1. Installation - must follow manufacturer's installation procedure
2. Submittals for carpet to be given consideration must consist of a quality sample, manufacturer's identification trade name and catalog number for carpet and manufacturers signed certificate stating that carpet supplied complies with the specifications required. Samples (including required documents) must be submitted to FIU for approval seven (7) days prior to bid date. No submittals will be considered after this date.

3. Testing: Carpet may be subject to testing by an independent testing laboratory to verify that specification requirements have been met.
4. Vent carpet prior to installation to reduce the release of formaldehyde once installed.

C. Restricted Areas

1. HEAVY TRAFFIC AREAS: Do not plan carpet for corridors, which carry heavy traffic or classrooms. Provide adequate sound deadening in classrooms.
2. VENDING AREAS: Omit carpet under vending machines and for a distance of at least 6-feet in front of machines.
3. CAFETERIA SERVING LINES: Omit carpet in or near serving line area.
4. PREVIOUSLY UNCARPETED AREAS shall not be carpeted without review and approval for carpet by the University Architect.

## 9.07 Special Coatings

- A. ELASTOMERIC COATINGS: If coatings specified can be applied with equipment ordinarily used by painters, these coatings may be specified in the section entitled, PAINTING.
- B. FIRE RESISTANT COATINGS: The following provisions must included in the specifications:

**Qualifications of Applicator: Materials shall be applied by applicators franchised and approved by manufacturers of materials. General Contractor shall furnish the manufacturer's certification that materials delivered to the project meet requirements specified. Certification shall be countersigned by the General Contractor, who shall assume the responsibility of complying with the manufacturer's specifications. Materials and application equipment shall be of type approved by the manufacturer.**

## 9.08 Painting

- A. INTERIOR WOODWORK: Natural finish--stain, 2 coats sanding sealer, 2 coats semi-gloss varnish. If polyurethane varnish is used, delete sanding sealer. Painted finish--primer and 2 coats semi-gloss alkyd enamel.
- B. METAL DOORS AND FRAMES: Shop coat, touch up and two coats semi-gloss enamel.
- C. NEW GYPSUM WALLBOARD OR PLASTER: Spackle as required, primer and 2 coats semi-gloss alkyd enamel or 2 coats semi-gloss latex.
- D. EXISTING PREVIOUSLY PAINTED GYPSUM WALLBOARD OR PLASTER: Primer and 1 coat semi-gloss alkyd enamel or semi-gloss latex. If surface is in poor condition or crazed or cracked, repair as required and use link or similar agent. If surface is poor, remove finish to substrate, repair and finish the same as new gypsum wallboard or plaster.
- E. INTERIOR CONCRETE OR CONCRETE BLOCK (Unpainted): 1 coat self-sealing heavy filler-type primer and 2 coats semi-gloss alkyd enamel or 2 coats semi-gloss latex. For

laboratories requiring chemical resistance, replace the alkyd or latex paint with epoxy two-component finish. For corridors or abuse areas, replace the semi-gloss alkyd or latex paint with high gloss alkyd enamel.

**9.09 ITEMS TO BE NOTED IN SPECIFICATIONS:**

- A. TOP AND BOTTOM EDGES OF WOOD DOORS shall be sealed after fitting and finished with at least two coats of varnish or paint.
- B. TOPS AND BOTTOMS OF METAL DOORS shall be painted with the same materials and number of coats as used on the door faces.
- C. DRY FILM THICKNESS shall be specified for all coats of paint on metals.
- D. ACCENT COLORS: If it is anticipated 5% or more of the scheduled finishes will be in accent colors, attention should be called to this fact. Estimated percentage of accent colors should be given as an aid to bidders in preparation of bids.
- E. COLOR CODING FOR PIPING: Include finish painting of insulated and un-insulated piping in the General Contract documents and include color banding of finished piping in the appropriate contract documents.

## **DIVISION 10 - SPECIALTIES**

### **10.01 Signs**

- A. Room Numbering System - The Architect/Engineer shall provide the Facilities Management Department with architectural floor plans in CAD format at the end of Design Development phase and prior to commencement of working drawings. The Facilities Management Department will return the CAD disk(s) to the Architect/Engineer that will indicate the room numbers that must be used on the construction documents.
- B. Building Directories and Room Signs - Allowances shall be made within the contract for Building Directories. The Architect shall contact the Facilities Management Department for allowance data and University approved specifications for these Directories and Signs. The University will design and fabricate all room and directional signs. The Contractor shall install all signs. The project budget will reimburse the University's Architectural and Engineering Services department.
- C. Vehicular & Directional Signs - The project budget shall pay for all additions or alterations to both vehicular and directional signs and kiosks. The Contractor shall install all signs. The project budget will reimburse the University's Architectural and Engineering Services department.

### **10.02 Chalkboards and Markerboards**

- A. Guarantee: Furnish a written guarantee to the University signed by an officer of the manufacturer of the chalkboard stating that all chalkboards which do not retain the original writing quality, the original erasing quality, and the original visual acuity for 20 years after date of acceptance will be replaced and installed without charge to the University.
- B. Materials and construction: Chalkboards shall be porcelain enameled steel of construction equal to, or better than the following:
  - 1. Writing Surface - 24 gauge LCS face
  - 2. Core shall be ½ inch exterior grade plywood or tempered hardboard or 80 pcf density particle board.
  - 3. Backing shall be aluminum .015 inch thick or shall be rust resistant steel.
  - 4. Trim: aluminum in manufacturer's standard sections; include chalk trough and map rail complete with map hooks.
- C. Mounting: Mount on primed wood grounds. Except for approved special conditions, all chalkboards shall be mounted with the chalk trough 36 inches above the floor and with a vertical dimension of 48 inches from chalk trough to top of board.
- D. Electrically Operated Boards: In Case Study Rooms use chalkboards only. Provide access panels for servicing motors, drives, and controls. Operating switches shall be toggle or light switch type. Coordination with Division 16 is required.

### **10.03 Toilet Partitions**

- A. Plastic laminate over  $\frac{3}{4}$ " exterior or marine grade plywood (pressed wood not allowed) or 1" solid plastic. Partitions to be floor mounted only.
- B. Anchors and Fasteners: Anchors shall be screw anchors, toggle bolts, hollow wall anchors, or other approved type to suit construction on which compartments are hung: Wood, lead, and plaster plugs are prohibited. Fasteners shall be vandal-proof type screws. Provide wood blocking behind all toilet partitions anchoring points.
- C. Door Latches and Pulls: When it is necessary to provide out-swinging doors, specify slide latches and door pulls.

#### **10.04 Louvers and Vents**

- A. Metal Wall Louvers: Louvers and vents for air distribution systems should be specified in Division 15. The HVAC Contractor shall be required to furnish and install all interior louvers and vents. If such items are an integral part of the exterior design of a building and are not connected directly to an air distribution system, specify that the General Contractor purchase and install them.
- B. Door Louvers: Include these in the specifications for doors.

#### **10.05 Pedestrian Control Devices**

- A. Planning Requirements: If the Program of Requirements calls for pedestrian control but does not detail the requirements for pedestrian control, the University Architect will consult the using agency and the Department of Public Safety and will indicate the kind of control devices required.
- B. Coordination with Building Security System: Pedestrian control devices will usually be used in conjunction with electronic security systems. Installations will require close coordination with electrical installations.
- C. Planning for Accessible use: Control devices shall be planned to provide ample room for the passage of wheelchairs and crutches.

#### **10.06 Fire Extinguisher and Cabinets**

- A. Fire Extinguisher Cabinets: Cabinets shall be fiberglass, flange, recessed (similar to fire hose cabinets), lockable, break-glass type with full flat glass in the door. The full fire rating and acoustical rating of the structure walls must be maintained.
- B. General: All portable fire extinguisher and non-valved cabinets shall be furnished and installed by the General Contractor. All portable fire extinguisher and components shall conform to National Fire Protection Association (NFPA) Pamphlet 10, latest edition. Each extinguisher shall be approved by Underwriter's Laboratory (UL) and bear their label.
- C. Approvals: The selection and locations of fire extinguisher are subject to the review and approval of the Director of Environmental Health and Safety.
- D. Selection and Quantity: Refer to NFPA pamphlet 10, chapters 2, 3, 4. Chapter 2 is used to determine the classification of potential fires and the rating or relative fire extinguishing effectiveness of various types of extinguisher. Chapter 3 assists in selection of extinguisher

which is dependent upon the character of anticipated fires, property construction and occupancy, the vehicle or hazard to be protected, ambient temperature conditions, and other factors. The quantity of extinguisher is determined by Chapter 4.

#### **10.07 Demountable Partitions**

**If outlets, switches, etc. are furnished by the partition manufacturer, specify devices of same quality as those specified in Division 16. (Note limitations and prohibitions regarding conduit types and sizes.)**

#### **10.08 Toilet and Shower Accessories**

- A. Mirrors: Specify framed mirrors without shelves. Specify mirrors, for use of handicapped persons. Check and coordinate mirror locations to prevent image reflection through room entrances. Use tempered polished plate only.
- B. Toilet Tissue Holders: Bobrick B-2892 Stainless steel twin 9" roll toilet tissue dispenser. In handicapped stalls use Bobrick B-2730 or B-2740.
- C. Towel Dispensers: Bobrick B-3960 or B-39603.
- D. Soap Dispensers: Bobrick B-4112 or B-4063 Soap dispensers (Minimum two per bathroom) with 40 oz. to 50 oz. capacity.
- E. Garment Hooks: Each toilet stall shall have a garment hook. The hooks shall be mounted on the partition; hooks in stalls for the handicapped shall be on the partition, reachable from the water closet and approximately 40" above the floor. Hook can incorporate door bumper (and purse hook in stalls for women).
- F. Toilet Seat: Olsonite No.10 High-Impact solid plastic open front seat less cover for elongated bowl. Stainless steel hinge post standard. White only.
- G. Sanitary Napkin Vendor: Bobrick B-435009 or B-43500X2.
- H. Sanitary Napkin Disposal: Bobrick B-270.

## **DIVISION 11 - EQUIPMENT**

### **11.01 General Provisions**

- A. **EQUIPMENT CATEGORIES:** Equipment, as applied in Capital Improvements Projects, falls into one of two categories.
1. **Contract Equipment.** (Fixed Equipment) is acquired through one or more of the construction contracts and is funded within the project construction budget.
  2. **Non-Contract Equipment.** (Movable Equipment) is acquired by the Using Agency utilizing a fund allocations within the total project funds, but independent of the project construction budget.
  3. Typically movable equipment funding allocations are provided for new building construction projects, but not for remodeling/renovation projects.
- B. **GENERAL CONTRACT ITEMS:** Unless otherwise directed by the University Architect, include the following fixed equipment in the General Contract Work.
1. Library Equipment
  2. Food Service Equipment: All new refrigeration systems must use 134A type refrigerant where applicable, 123 is not acceptable.
  3. Unit Kitchens and Cabinets
  4. Projection Screens
  5. Grandstands & Bleachers
  6. Laboratory. This will include fume hoods and laboratory controlled temperature rooms, sometimes called environmental rooms or growth chambers.
  7. Laundry Room Equipment: Washing Machines and Dryers.
- C. **SEPARATE EQUIPMENT CONTRACT PRE-BID SUBMITTALS:** When separate equipment contracts are required by the Program or the University Architect, include the following requirements in the specifications regarding bidder qualification required prior to opening of bids.
1. Minimum of five years experience in manufacture of similar or duplicate equipment.
  2. Minimum of five years completed installations of equal size which can be inspected prior to award.
  3. Adequate financial resources and personnel to manufacture, deliver, install and guarantee the equipment.
- D. **EQUIPMENT CONTRACTOR OR SUPPLIER SUBMITTALS:**



1. Price Breakdown. A breakdown for each piece of equipment, keyed to contract drawings or shop drawings, must be stipulated to accommodate auditing and inventory needs.
  2. Rough-in Drawings must be required in time to enable checking by the contractor and coordination with all concerned prime contractors.
- E. COORDINATION: In specifications, clearly define which contractors have responsibilities relative to equipment receiving, unloading, inventory, and installing (including accessory items such as plumbing, heating, cooling, electric hook-ups, etc.).
- F. FITTINGS AND FIXTURES: Utility fittings and fixtures specified for laboratory equipment shall be of quality at least equal to that specified for the Plumbing, HVAC, and Electrical contracts. This is critical! Associate shall certify in writing to the University Architect that (1) specification quality is equal, and (2) that installation conforms to specified quality.
- G. Automatic Shut-off Valves. Specify that these must have a ten year written warranty.
- H. VENDING EQUIPMENT: If vending equipment is required, it will be provided under a separate contract with a franchisee; however, the A/E shall plan spaces, plumbing, HVAC, electric and recycling containers to accommodate the desired vending equipment. Check the Program of Requirements and consult the University Architect. Be certain to provide for hook-ups.
- I. LABORATORY EQUIPMENT: The Consultant must plan spaces, plumbing, HVAC and electric to accommodate all laboratory equipment. Be sure to provide for hook-ups and coordination of installation sequences.

## **DIVISION 12 - FURNISHINGS**

### **12.01 Multiple Seating**

- A. PORTABLE CHAIRS: Chairs will be furnished by the University. The Consultant shall plan adequate storage space for these. Include space for chair trucks if required.
- B. AUDITORIUM SEATS:
  - 1. SPECIFICATION REQUIREMENTS: Specify seats by only ONE manufacturer for the Base Bid and by two other acceptable manufacturers as approved alternates. NOTE: THE UNIVERSITY MUST APPROVE ALL SEATING MANUFACTURERS PRIOR TO THEM BEING SPECIFIED.
  - 2. TABLET ARMS: Specify that ALL seats be equipped with articulating tablet arms. Ten to twelve percent of these shall be left-hand; it is suggested that these seats be grouped to avoid interference of right and left hand tablet arms.

### **12.02 Window Treatment**

**BLINDS, SHADES AND DRAPES: Necessary blocking, grounds, tracks, and other devices for installing vertical blinds and/or draperies shall be included in the contract documents even though these blinds and draperies might be furnished by the University.**

### **12.03 Art Work**

### **12.04 Graphics**

- A. UNIVERSITY INVOLVEMENT IN DESIGN: Facilities Development has the responsibility of designing appropriate signage and graphics for by the University.
- B. DESIGN BY THE CONSULTANT: Identification signs, which are a part of the General Contract, shall be designed by the Consultant, shown on the contract drawings, and specified in Division 10. Refer to Division 10 and the Appendix.(Must be approved by FD)
- C. DESIGN BY THE UNIVERSITY ARCHITECT'S OFFICE: Other graphics may be designed by Facilities Development and procured by the University, possibly after completion of the project.
- D. The room signage system is fabricated by Facilities Operations and installed by the contractor.
- E. PLANNING OF SPACES TO RECEIVE GRAPHICS: If general concepts of future graphics are known during the design phase of the project, the Consultant will be shown sketches of planned installations can be given consideration in the total design of the project.
- F. SUGGESTIONS BY THE CONSULTANT on design of graphics will be given due consideration; however, suggested designs must not appear on the contract drawings.
- G. PAINTING AND COLOR SCHEDULES: Wall surfaces, to which graphics designed by the University will be applied, must be included in the schedule of surfaces to receive finishes,

specified in the Section entitled, PAINTING. Colors of such finishes might be selected by the University Architect in order to provide suitable backgrounds for planned graphics.

H. MEMORIAL PLAQUES: Coordinate with University Architect on location.

## DIVISION 13 - SPECIAL CONSTRUCTION

### 13.01 Swimming Pools

#### PRE-ENGINEERED STRUCTURES

ENGINEERING DATA REQUIRED: An analysis of framing and structural components is required. Data shall bear the seal and signature of a professional architect or engineer registered in Florida attesting that the structures meet requirements of the specifications and comply with requirements of the SBC. Copies of this data shall be submitted to the University Architect.

### 13.02 SOUND & VIBRATION CONTROL

#### INTEGRATED CEILINGS

COORDINATION OF INSTALLATION: It is preferred that integrated ceilings be made a part of the General Contract and the General Contractor be required to coordinate the complete installation including the work of the HVAC and Electrical Contractors. If the Associate feels that such ceilings should be installed by either of the other contractors, he should discuss the matter with the University Architect during the review conference for Basic submittal. The Associate's HVAC and electrical consultants shall be present at this discussion.

### 13.03 RADIATION PROTECTION

- A. MATERIAL STANDARDS AND INSTRUMENTATION: Materials and equipment shall conform to applicable recommendations of the National Council on Radiation Protection and Measurements Reports No. 33, 34, 35 and 36, and shall be furnished and installed in accordance with the Code of Federal Regulations, Title 21, Department of Health, Education, and Welfare (FDA Division). Installation shall be in strict adherence with manufacturer's requirements and approved shop drawings.

<u>NCRP Report No.</u>	<u>Title</u>
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<u>33</u>	<u>Medical X-ray and Gamma Ray Protection for Energies up to 10 Me V-Equipment Design and Use.</u>
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<u>34</u>	<u>Medical X-ray and Gamma Ray Protection for Energies up to 10 Me V-Structural Shielding Design and Evaluation.</u>
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<u>35</u>	<u>Dental X-Ray Protection</u>
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<u>36</u>	<u>Radiation Protection in Veterinary Medicine.</u>
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- B. TESTING: After the X-ray equipment has been installed and placed in operating condition, a radiation protection survey shall be performed by a qualified expert recommended by NCRP.
- C. LISTING REQUIRED: The University Office of Radiological Health and Safety has the responsibility of registering all sources of radiation generated by an electronic product, subject to Radiation Control for Health and Safety Act of 1968. A listing of all such devices, specified in the contract documents, shall be submitted by the Associate to the University Architect with those documents. Devices include, but are not necessarily limited to:

lasers and masers  
radar  
microwave generators  
electron microscopes  
infrasonic, sonic, and ultrasonic generators  
X-ray generators and accelerators  
electron welders  
diatherapy units  
infrared and ultra-violet sources  
TV sets (of the protection type only)

## DIVISION 14 - CONVEYING SYSTEMS

### 14.01 Elevators

#### A. Elevators - Passenger

1. Each multi-story building shall have at least two passenger elevators. The design professional shall provide a vertical transportation analysis to determine the appropriate size and number of cabs required to meet the anticipated use and population served.
2. Elevators shall meet all Florida Building code requirements, inclusive of accessibility requirements.

#### B. Service Elevators

1. Each multi-story building shall have at least one service elevator, which may also serve as a passenger elevator.
2. Provide pad hooks and one set of protective pads.
3. Service elevator cab height shall provide a minimum 9'-0" clearance and removable within the cab and minimum 4,500 lb. capacity.
4. Entrance doors shall be 8'-0" high

#### C. Dumbwaiters

**Where required by FIU operations such as Libraries, Bookstores, Cafeterias located above the ground floor.**

#### D. Use of Existing Elevators

**If permission is granted to use existing elevators, the contractor should be alerted that elevators will be inspected before and after construction to appraise any damage caused by this use. The General Contractor shall be required to arrange and pay for maintenance during the use period and to restore interiors of cabs to original condition before acceptance of the project.**

**In new construction projects, if the Contractor uses permanent elevators during construction, the Contractor shall turn over the elevators in an "as-new" condition to be determined by the elevator manufacturer. The Owner shall not assume any responsibility for any wear and tear caused by the Contractor during construction.**

#### E. General Requirements

1. Contract: Elevators shall be included in the general contract. No separate contract.
2. Provisions for Servicing: The elevator manufacturer shall be required to provide evidence that a service office is located within 50 miles of the installation and a warehouse of parts is maintained within 100 miles.

3. Maintenance and callback service shall be provided for one year from projects date of substantial completion. Include the following provisions in the specifications.
4. Maintenance by Manufacturer: Furnish total maintenance servicing for a period of one year beginning on the date of University acceptance of elevator. Service shall include regular examinations of the equipment, during regular work hours, by competent and trained employees of the manufacturer, and shall include necessary adjustments, greasing, oiling, cleaning, supplies, and parts to keep equipment in proper operation, except such parts made necessary by misuse, accidents, or negligence not caused by the manufacturer. Frequency of maintenance service will be established, by the University Architect based on location and use of elevator during specifications writing period.
5. Instructions for Maintenance Personnel: Provide three copies of complete wiring diagrams, repair parts catalogs, instruction manuals, and lubrication charts. Furnish required verbal and written instructions to designated University personnel. Give notice of inspections so that personnel of the University may be present.

#### F. Minimum Construction Standards

1. Verify prior to bidding that all code requirements have been met and that the plans have been reviewed and approved by the Chief Elevator Inspector.
2. DRU Initiative: Provide sump pump pit at all elevator pits. Where emergency power generation is provided, connect power supply to emergency circuit.
3. Provide ample equipment room ventilation for cooling of elevator machinery spaces. In spaces served by a ventilating system other than A/C provide a thermostat, vents with adjustable louvers and rain stops. All pressure relief vents shall be further protected with vertical louvers designed for maximum water penetration resistance. Provide operable shutters to close off pressure relief vent to protect elevator electronics in cab during hurricane weather conditions. Temperature inside elevator machinery room shall meet the requirements of equipment manufacturer.
4. Only equipment required for elevator operation is permitted in elevator equipment spaces. No extraneous piping, ductwork, conduits, etc. will be permitted in elevator equipment spaces.
5. Provide proper separation between equipment room and hoist way.
6. Provide two vapor proof lights and switch in each hoist way pit. Provide also one weather proof receptacle, sump pump and drainage system. Where emergency power is provided, sump pump shall be connected to the generator. All elevator pit foundations and walls shall be waterproofed.
7. Finishes
  - a. Doors and Jambs –stainless steel satin (non-directional) finish
  - b. Cab panels – stainless steel textured (non-directional) finish. No polished mirrored finish permitted
  - c. Floor finish – studded rubber tiles
  - d. Vandal-resistant control devices and indicators

7. Contractor shall coordinate installation of emergency phone with University UTS.



## DIVISION 15 - MECHANICAL EQUIPMENT

### 15.01 Submittals

- A. Maintenance Manuals - Contractor shall deliver to the Architect/Engineer, Four (4) bound copies of manufacturer's operating instructions and maintenance recommendations on all motors and moving equipment and machinery installed under the contract. All equipment shall cross referenced by equipment designation and actual room locations. A complete listing of all equipment and location shall be provided in an electronic spreadsheet format (Microsoft Excel). This is to be done before completion of the project.
- B. Training Sessions – Contractor shall provide a full demonstration of all operating systems. Contractor shall videotape the training and demonstration sessions. The complete training session shall be videotaped by the Contractor. Three (3) copies in DVD format shall be submitted to the Owner prior to Final Payment. The Contractor shall submit an outline of all components to be covered during the training sessions for the Owner's approval prior to scheduling actual training sessions.
1. Training shall be conducted by applicable sub-contractor and authorized factory representative.
  2. Training shall include normal operations, required maintenance operations affecting warrantee, cleaning operations.

### 15.02 Charts

- A. The Design Professional shall include the following requirements in the general instructions to the Contractor for specialized equipment (e.g., filtration systems, environmental controls, etc.):
1. Mount lubrication and recommended periodic maintenance, i.e., filter replacement etc., schedule for each item of equipment, laminated under plastic on solid mounting boards..
  2. Mount valve charts showing location and identification of all valves, laminated under plastic on solid mounting boards.
  3. Mount wiring control diagrams (both power and control voltage) laminated under plastic on solid mounting boards.

### 15.03 Plumbing

- A. The Facilities Management Utilities Dept. will supply information on existing water and sewer utilities.
- B. Water mains inside FIU property lines do not require a permit. But plans and specifications must be submitted to Miami Dade Water and Sewer Authority for review and approval as required by M.D.W.&S. The Design Professional of Record is responsible for the complete and timely submittal of all requisite documents for permit.. Facilities Construction will provide copy of complete procedures.
- C. Sanitary sewers and force mains inside FIU property lines do not require a permit from M.D.W.& S. but a DERM Sanitary Sewage Allocation/Sewage Transmission Capacity Certificate is required (VERIFY).

**NOTE: CONNECTIONS MADE TO UTILITIES OUTSIDE OF UNIVERSITY PROPERTY WILL REQUIRE PERMITS. THE NORTH CAMPUS WILL REQUIRE PERMITS FROM THE CITY OF NORTH MIAMI.**

- D. Dissimilar Metals - Copper is to be used for domestic water systems, coat copper pipe with bitumastic paint where underground. Underground pipe above 3" in size shall be Ductile Iron, cement lined. If dissimilar metals must be combined in the systems, then a proper dielectric coupling must be provided where they join.

#### **15.04 Plumbing Equipment**

- A. Floor Drains - One or more floor drains shall be provided for each restroom, custodial room, emergency showers in labs, and mechanical equipment rooms in event of fixture overflow. Resealing Prime connections are required on all floor drains. Provide adequate slope to floor drains.
- B. All mechanical rooms shall be provided with continuous six inch (6") containment curbs at the entire equipment inclusive of all floor penetrations and doors.
- C. Hose Bibs - Provide chrome plated hose bibs with removable handles. Install hose bibs 18" above the finish floor in each restroom, air handling room, and every 100 linear feet along the building exterior perimeter. Exterior mounted hose bib cabinets shall be keyed and recessed.
- D. DRU Initiative: Provide floor drain at all Safety showers and Eye Wash locations. Include flow switch with alarm.

#### **15.05 Plumbing Fixtures and Trim**

- A. Sloan Optima Electronic Royal Flushometers or Zurn Aquasense Battery Flush valves, low water consumption only.
- A. Chicago Faucets. Delta Faucets, kitchen sinks only.
- B. American Standard water saver fixtures (less than 1.5 GPM flow), wall hung only.
- C. Eljer custodial floor service sink acid resisting enameled cast iron.
- D. Elkay barrier-free drinking fountains.
- E. Josam 17100 series floor mounted single carriers with concealed arms.
- F. Haws emergency equipment model 8347.
- G. Zurn access doors.
- H. Olsonite open front less cover No.10 white only.

#### **15.06 Hot Water**

- A. Do not provide for public toilets, classrooms, laboratories or other areas unless specially programmed or requested.

- B. Gas Heaters - Use liquid propane gas unit high efficiency commercial type hot water heater with instant recovery with insulated storage tanks and a recirculating pump system. (Use Instant-On water heaters only when gas service is not available.)
- C. Hot water recirculating pumps use wet rotor single - stage, direct drive pump. All lines from water heaters to point of use shall be insulated with pipe insulation. (See piping insulation)

#### 15.07 Valves

- A. Provide shut-off valves on water mains for each building, for each riser in each building, for each floor level, and for each group of fixtures (e.g. separate valves for each men's/women's restrooms). Valves shall be accessible but not visible. Identify shut-off valve locations on finish ceiling surfaces. Valves outside the building shall be provided with concrete valve boxes and covers. Shut-Off valves in restrooms shall be wall mounted..
- B. Gas shut-off - Each laboratory that is equipped with liquid propane, or other piped gas under pressure, shall have a cut-off valve to control all outlets in the laboratory. The Cut-off valve shall be concealed in an accessible location in the ceiling or similar area, which would be out of the normal traffic flow in the building. The location of the cut-off valve shall be identified.

#### 15.08 Fire Protection

- A. Fire Protection System: Refer to the Appendix A for directions in the preparation of drawings to meet requirements of the State Fire Marshal and for procedures for obtaining inspections and approvals by the Fire Marshal.
- B. Fire Alarm Control Panel: Location shall be in a public area readily accessible to emergency personnel.
- C. Fire Extinguisher Cabinets: Specify these in Division 10 as part of the General Contract.
- D. Reference to NFPA Pamphlets: Whenever specifying materials and installations by National Fire Protection Association use only the current edition and include the date of each referenced publication in the specifications.
- E. Testing of complete Fire Protection System: Include in the specifications the requirement that the contractor shall pretest under full emergency mode all components inclusive of emergency generator, transfer switch, sequence of operations, fire pump, emergency lighting, strobes, smoke detectors, etc., prior to State Fire Marshal inspection.. Specifications shall address and detail appropriate piping and appurtenances required to perform the test and demonstrations as stipulated by NFPA..

#### 15.09 FIRE PROTECTION PIPING

- A. Centrifugal Type Pumps shall be provided; *turbine vane pumps are prohibited*. Installation shall comply with NFPA 20, Standard for the Installation of Centrifugal Fire Pumps.
- B. Controller: All factory pre-wired and enclosed in a NEMA IV wall mounted enclosure. Design features may include excess pressure controller containing magnetic starter,

disconnect switch, dual pressure switch, three position selector switch, and an alarm bell to sound when the pressure drops below the second control point of the dual pressure switch.

- C. Bearings: Wherever practical, equipment shall be furnished with sealed ball or roller bearings. Specify that the contractor shall not lubricate sealed bearings.
- D. Relief Valve and Drain: The fire pump shall have a pressure relief valve integral with the casing. Provide drain line piped to mechanical room floor drain.
- E. Fire Pump Test Connection: The test connection cluster valves, shall be located on the building exterior adjacent to the fire department siamese connection for the purpose of performing proper testing of the fire pump for initial acceptance and annual testing. Include piped drainage.
- F. Jockey Pump: Fire pump installation shall include a jockey pump of ample capacity in addition to the fire pump. Test valve drain line shall be piped to mechanical room floor drain.
- G. Inspector Test Valve: All Inspector Test Valves shall be provided with sight glass to monitor flow. Provide drain line piped from inspector test valves to exterior of building.

#### **15.10 FIRE PROTECTION Valves:**

- A. Gate Valves: Use UL approved OS&Y, 175 lb., except hose cabinet valves.
- B. 2-1/2" and smaller, bronze or iron body, trim and stem, solid wedge, rising stem, union bonnet, threaded ends.
- C. 3" and larger, iron body, bronze trimmed, OS&Y flange ends.

#### **15.11 Sprinkler Systems:**

**Sprinkler systems shall be automatic systems designed, installed, and tested according to NFPA Pamphlet 13, Standards for the installation of sprinkler systems.**

#### **15.12 Standpipe and Fire Hose Systems:**

- A. Design, Installation, and Testing: Comply with NFPA Pamphlet 14, Standards of Installation of Standpipe and Hose Systems. Wherever standpipes are installed, siamese pumper connections shall be provided as required.
- B. Standpipes: In buildings where standpipes are installed, the first-aid hose for occupant use shall be in stairwell.
- C. Fire Hydrants: Locations of fire hydrants shall be checked with the University Architect and approved by The State Fire Marshal. One hydrant shall be located near the exterior siamese pumper connection in accordance with NFPA Pamphlet 24.
- D. Installation shall be in accordance with NFPA Pamphlet 24, Outside Protection, and The State Fire Marshal.

#### **15.13 Fire Hose Valve Cabinets :**

- A. Fire Hose Valve Cabinets shall be stainless steel, flange, flush mounted type (similar to extinguisher cabinets) large enough to accommodate a fire extinguisher and valve. Each extinguisher and fire valve cabinet shall have a locking break-glass type door with full flat glass in the door. The full fire rating and acoustical rating of the walls shall be maintained where recessed

**THE FOLLOWING 9 PAGES ARE UNDER REVISION**  
**CONTACT FIU FOR FURTHER INFORMATION**

**~~15.14 General Requirements for HVAC Systems – the following general requirements shall be included in the HVAC design.~~**

- ~~A. Unless otherwise specified in this section of the Building Standards, or otherwise directed by the Owner, the latest edition of Duct Manual and Sheet Metal Construction for Ventilating and Air Conditioning Systems published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. herein after called the “Duct Manual” shall be used as a guide for construction of duct systems for air distribution.~~
- ~~B. DRU INITIATIVE: Hurricane Design Criteria. In the event of an impending tropical storm or hurricane, all facilities shall be switched into a “lock-down” mode. The intent is to cease operations on all mechanical equipment including ventilation make up air and exhaust systems (restroom fans, food service hoods, fume hood exhaust fans, etc.) for a “no-flow” condition. All fume hood sashes will be closed and facilities will become unoccupied. Louvers will be internally closed to minimize the transfer of water penetration into mechanical rooms. To maintain refrigerated and frozen specimens in research or laboratory occupancies, refrigerators and freezers will remain operational under emergency power along with an electric DX standby air conditioning unit to maintain environmental conditions.~~
- ~~C. Plans for HVAC systems shall be drawn as nearly as possible to show exact dimensions and locations of all air handling equipment, duct work, control work, wiring, etc., so as to give the contractor a complete picture of the work required. Particular attention shall be given to space requirements so that the various phases and trades will not conflict. The design engineer shall graphically indicate the profile of an AHU coil removed from the unit to show required clearances for servicing the unit in the future. In no case will one line schematic drawings of duct work be acceptable.~~
- ~~D. Drawings shall show all necessary sections and details so that the Contractor will not have to make assumptions in order to visualize the scope or physical layout of his work. Sections shall be made of all risers, pipe chases, vertical take-offs and equipment rooms, as well as other areas necessary for clarity.~~
- ~~E. Space Requirements~~
- ~~1. In laying out any ventilating system, ample space shall be allowed for servicing of equipment and probable expansion. Also, special consideration shall be given to sound isolation and noise control.~~
  - ~~2. Space requirements for the ventilating and air conditioning systems shall be coordinated with the preparation of preliminary architectural studies to be certain that ample space is provided and properly located for the mechanical equipment and duct shafts.~~

~~B. Identification~~

#### ~~1. Piping Identification~~

- ~~a. All pipe 1" in diameter or larger exposed or concealed in accessible pipe spaces and ceilings shall be provided with color bands, legend, and flow arrows in accordance with ANSI A13.1 latest edition.~~
- ~~b. Identification markings shall be laminated plastic appropriately color coded with a clearly printed legend to identify the pipe contents.~~
- ~~c. Piping 3/4" and smaller shall be provided with 1-1/2" diameter brass identification tags indicating the product in 1/4" depressed black filled letters.~~

#### ~~2. Valve Identification~~

- ~~a. All valves in each system shall be identified by system and number with Seton Style 2070 engraved aluminum or PVC valve tags.~~
- ~~b. Markings shall be installed at each valve, at each branch or riser take-off, at each equipment connection, where pipes pass to underground, and on all horizontal piping at 25 foot intervals.~~
- ~~c. Provide in quadruplicate, a typed valve directory using 8-1/2" x 11" sheets, each sheet enclosed in clear plastic envelope and all sheets mounted in a three-ring binder with hard cover. The directory shall give the number, location and purpose of each valve.~~

#### ~~3. Labels shall be applied at each horizontal and vertical change in direction and behind each access door.~~

#### ~~4. Equipment Identification~~

- ~~a. **All equipment except plumbing fixture served by piping systems shall be identified by number and/or legend where shown on drawings. Identification shall be with engraved plastic name plates using 1" letters on equipment having cabinets and with appropriate size brass tags where cabinets do not exist.**~~

- ~~b. DRU INITIATIVE: All roof top equipment (Fans, exhaust fans, etc.) shall bear Identification markings which shall be laminated plastic attached to the structural mounting frame with a clearly printed designation consistent with identifications found in the mechanical plans and electrical panel schedules (for example EF-07).~~

#### ~~G. Codes and Regulations~~

~~**Latest editions with current revisions and amendments of the following codes and standards are considered minimum requirements for materials, workmanship, and safety where not covered elsewhere in these specifications.**~~

- ~~1. Florida State Board of Health~~
- ~~2. Florida Building Code~~

- ~~3. Public Law 91-596 Occupational Safety and Health Act~~
- ~~4. NFPA No. 90A Air Conditioning and Ventilating~~
- ~~5. NFPA No. 91 Blower and Exhaust Systems~~
- ~~6. NFPA No. 54 Gas Appliances and Gas Piping~~
- ~~7. NFPA No. 101 - Safety to Life from Fire in Buildings~~
- ~~8. UL 555 - Fire Dampers~~
- ~~9. Sanitary Code of Florida~~
- ~~10. Ashrae Guide - Equipment, System and Applications~~
- ~~11. SMACNA - Low Velocity Duct Construction Standards~~
- ~~12. SMACNA - High Velocity Duct Construction Standards~~
- ~~13. ANSI B9.1-1971 Safety Code for Mechanical Refrigeration~~
- ~~14. ANSI B31.1, 0-1967 (with Agenda) Power Piping~~
- ~~15. ANSI B31.2 - Fuel Gas Piping~~
- ~~16. NFPA - 70 National Electric Code~~
- ~~17. NFPA - 1 & 2 Fire Sprinklers~~
- ~~18. UL - Equipment bearing a "UL" seal of approval~~

~~D. Ventilation~~

~~E. Air Conditioning~~

**All new or remodeled buildings or buildings over 5,000 square feet gross area will be cooled by a chilled water system. New or remodeled buildings and/or additions under 5,000 square feet will be cooled as indicated in the building program. Interface to separate the building loop from the central distribution loop will be as instructed by the Facilities development Utilities Planning Engineer.**

~~F. Zone Pumps~~

- ~~1. Provided each building with two, zone chilled water pumps, connected in parallel. Each pump will be sized for 50% of the total flow at the total building system pressure. Total building system pressure for zone shall include all pressure from the supply valve at the transport loop through the building back to the return valve at the transport loop. Consider pressure at the valves connecting to the transport loop as 0 psig.~~
- ~~2. Pumps up to 250 gpm shall be suction, base mounted, with mechanical seals, bronze trimmed. Pumps over 250 gpm shall be split case, double suction, with mechanical seals, bronze trim.~~
- ~~3. All end suction pumps to be selected at a minimum 75% efficiency. Split case, double suction pumps to be selected at a minimum of 80% efficiency. All pumps to be selected to be non-overload at any point on their curve. Impeller diameter shall not exceed 90% of the maximum catalog published impeller diameter for each pump.~~
- ~~4. Pumps shall be provided with variable speed drives. Changes in flow through building due to load variation to be sensed across main supply and return pipes downstream of pump discharge. Pumps will be controlled in response to this variation by reducing speed, and/or shutting off one pump. The characteristics of each specific system to be approved by University Development Engineer.~~
- ~~5. 5. At 50% construction document submittal phase, submit a pump report and composite curve showing hydraulic curve and the curve representing the sum of the operating~~

~~pumps. This data to be superimposed on the manufacturer=s published pump curve for the proposed pump. Indicate points of system operation at full flow, reduced flow due to speed changes and shutting off pump. Indicate required NPSH at each point. Individual pump curve and report and composite curves shall be as generated by H2O optimizer, Pace Select or equivalent computer program output by Goulds or Weinman pumps.~~

#### ~~G. Air Handling Units~~

- ~~1. Air handling unit coils will be selected for 45 \_\_\_\_\_ ☐ F enter  
F minimum water temperature rise. Units with 100% outside air shall have coils selected at 20 \_\_\_\_\_ ☐ F minimum  
way, normally closed valves. Each building shall be provided with at least one 2-  
position, 3-way valve to allow a trickle flow through the building. Buildings required to  
maintain round the clock temperature or humidity in designated areas shall try to group  
all such loads in a single air handler.~~
- ~~2. Air handler units to have sealed bearings, motor & fan.~~
- ~~3. No air handling units shall be located above any suspended ceiling.~~
- ~~4. Provide mechanical equipment room for all equipment.~~
- ~~5. Locate all air conditioning equipment external to classroom areas so they may be serviced without interrupting classes.~~
- ~~6. Fan size shall not exceed 15,000 CFM per system.~~
- ~~7. Filters - Filter types will be pleated filters or permanent self charging electrostatic filters with 55% or higher efficiency rating. Construction filters must also have 55% or better efficiency rating. For design conditions requiring different media than these, consult with University project engineer.~~

#### ~~H. Fan Drives~~

- ~~1. Provide cast iron sheaves, vee belt drive, belt guard, motor sheave with adjustable pitch diameter, for plus or minus 10 percent variation from rated speed.~~
- ~~2. After test and balance, remove adjustable sheave and replace with fixed sheave of proper diameter.~~
- ~~3. Air handling units used with Variable Air Volume systems, to be provided with variable speed drives.~~

#### ~~I. Motor and Starter~~

- ~~1. Select with 1.15 service factor but not to exceed name plate current at normal operation load.~~
- ~~2. Provide reduced voltage starters for all motors above 60 HP at 480 volt and 30 HP at 208 volt. All motors 1 H.P. and above shall be 480V. Fractional H.P. motors shall be 120V. Air handler units, supply fans, exhaust fans, etc.~~



- ~~3. All exterior supply and exhaust fans shall be constructed of stainless steel or aluminum.~~
- ~~J. Outside Air Dampers – Provide motorized dampers on all outside air intakes. These dampers shall close automatically when the unit is off. Dampers to be constructed of stainless steel or aluminum only.~~
- ~~K. Chilled and Hot Water Coils and Piping.~~
- ~~1. Provide ball valves on supply and return piping with balancing cock on return line to all air handling units. Provide ball valves and tee handle up to 3".~~
  - ~~2. Provide two-way modulating valves on return line at all air handling units.~~
  - ~~3. Provide gauge cocks and thermometer wells on supply and return piping on all air handling units.~~
  - ~~4. Provide a trap from the drain pan of each cooling coil designed for the static pressure of the AHU.~~
  - ~~5. Coils shall be specified in accordance with ARI 410-64, max. 11 fins/inch.~~
- ~~6. Piping, Fittings, and Valves~~
- ~~a. Chilled and Hot Water Piping.~~
- ~~(1) Use standard weight black steel, ASTM-A-53 grade B seamless steel with welded fittings for pipe 3" diameter and larger.~~
  - ~~(2) For pipe 2-1/2" diameter and smaller, use threaded ends 150 psi class malleable iron fittings.~~
  - ~~(3) For pipe sizes 3" diameter and smaller use solid wedge gate valves.~~
  - ~~(4) Strainers – Provide wye type with valved blowdown lines piped to floor drains. For strainers 2-1/2" and larger, provide flange bonnets for basket removal.~~
  - ~~(5) Air Eliminators – Provide at the high points of all chilled and hot water lines drain lines.~~
- ~~(6) Gauges~~
- ~~(a) Provide pressure gauges with 4-1/2" minimum dial with 1.0 psi graduations on each chilled water supply and return line at building entrance.~~
  - ~~(b) Install gauges with gauge cocks.~~
  - ~~(c) Gauges shall also be installed at strainer entering pumps, pump suction, pump discharge. Gauges shall be bourdon tube types with an accuracy of 1/2% of scale range.~~
- ~~(7) Provide venturi flow measuring device in return lines from each handling unit, and in main return line to building pumps.~~

- ~~(a) Venturi stations shall be complete with permanent rust-proof metal identification tag showing designed flow rates, meter readings or differential pressure outputs at designed flow rates.~~
- ~~(b) Provide each venturi with valve taps.~~

#### ~~L. Ductwork~~

- ~~1. Specify galvanized sheet metal designed and constructed in accordance with the latest edition of Sheet Metal and Air Conditioning Contractor's National Association, Inc. manual (SMACNA) low or high velocity as applicable.~~
- ~~2. Special Exhaust Systems such as exhaust from laboratory hoods shall be made of acid resistant materials and construction.~~
- ~~3. Wall penetrations shall be sealed with mineral wool or other non-combustible material.~~
- ~~4. Use Underwriters Laboratories label fire dampers at all penetrations of fire rated walls, floors, ceilings and in accordance with NFPA pamphlet 90A.~~
- ~~5. Provide smoke dampers in all ductwork that pierces smoke partitions. These dampers will be in addition to those specified for air units. Dampers shall be actuated by a smoke detector mounted within occupied space.~~

#### ~~M. Air Distribution Products~~

- ~~1. Use criteria as outlined in ASHRAE Guide and Data Book, latest edition. Chapter entitled "Space Air Distribution".~~
- ~~2. All supply air grilles, registers and ceiling outlets to be aluminum.~~
- ~~3. All sidewall supply grilles and registers shall be 4-way adjustable deflection type.~~
  - ~~a. Provide multi-blade volume control dampers which are adjustable by removable key from the front of each outlet.~~
  - ~~b. Provide plaster frames for each register.~~
- ~~4. Ceiling diffuses to be adjustable type with volume damper, equalizing deflector and volume damper.~~

#### ~~N. Insulation~~

- ~~1. General Provisions for Fire and Smoke Hazard ratings: All insulation shall have a system fire and smoke hazard rating as tested by procedure ASTM-E-84, NFPA-255, and U.I. 723 not exceeding: Flame Spread 25 and Smoke Developed 50. The system rating shall be based on insulation, jacket, adhesives, coatings, fittings, and cements. Any treatment of jackets or facings to impede flame and/or smoke shall be permanent. The use of asbestos containing material is prohibited.~~
- ~~2. Piping Insulation~~
  - ~~a. Required Installation: The following piping shall be insulated:~~

- ~~(1) Steam lines~~
- ~~(2) Domestic hot water lines~~
- ~~(3) Condensate lines~~
- ~~(4) Chilled water lines - Foam glass only~~
- ~~(5) Refrigerant lines, where necessary~~
- ~~(6) Rainwater leaders above ceilings, under roof deck~~

~~b. Insulation for water heaters shall meet or exceed ASHRAE standard 90A-1980 for energy conservation.~~

~~(1) Piping with an operating temperature under 400 \_\_\_\_\_ ☐F shall be molded pipe covering composed of fiberglass wool, resin-bonded and factory applied jacket. Compression strength at 25% deformation shall be 500 lbs. per sq. ft.~~

~~(2) Fittings, flanges, unions, and valves, in hot water lines, shall be insulated. Insulation covers shall be either prefabricated or fabricated of pipe insulation. Insulation efficiency shall not be less than that of the adjoining piping. Specify that insulation vapor barrier be installed continuous and unbroken.~~

~~(3) Hangers, supports, anchors, secured directly to cold surfaces, must be adequately insulated and vapor sealed to prevent condensation.~~

~~(4) Rigid insulation inserts of proper length shall be installed between pipe and insulation protection shield to prevent sagging of pipe covering at hanger points. Compressive strength of insulation inserts shall be not less than 350 psf at 10% deformation. Specify that inserts be installed as pipe is erected.~~

~~(5) Insulated piping lines running outdoors shall have corrugated or plain 0.016 in. aluminum jacket complete with integral longitudinal Pittsburgh seam and butt joint strips to lock out the weather. In addition to the vapor barrier, this jacket is required on cold lines.~~

~~3. Insulate chilled water piping 6 inches and smaller with 2" thickness of foamglass with approved protective covering where exposed in equipment room.~~

~~4. Insulate chilled water piping 6" and larger with 2-1/2" thickness of insulation and other details as specified for smaller pipe. Insulate hot water heating pipe with 1-1/2" thickness of tubeglass with factory applied jackets.~~

~~5. Insulate underground steel chilled and hot water heating piping with 2-1/2" foamglass covered with factory applied felt or glassed fabric and mastic coatings to render water tight vapor barrier.~~

#### ~~6. DUCT INSULATION:~~

~~a. THERMAL INSULATION: Thickness of supply air duct and plenum insulation shall be selected to prevent condensation on the surface of insulation when the ambient relative humidity is 90% at the maximum difference between the ambient air temperature and the supply air temperature. Minimum thickness of supply air or return air duct insulation shall be 1 in. nominal, and 2 in. nominal on outside air duct~~

~~or plenum. Insulation shall be continuous through all openings, but shall be interrupted at fire dampers. Insulation shall meet or exceed ASHRAE Standard 90A-1980 for energy conservation.~~

- ~~(1) Exposed rectangular air conditioning supply ducts and return ducts in non-air conditioned space shall be insulated with rigid fiberglass insulation board having a density not less than 3 lb./cu. ft. and with factory applied fire retardant glass cloth or vinyl jacket with vapor barrier.~~
- ~~(2) Concealed air conditioning supply air ducts in ceiling space above an air conditioned room shall be insulated with fiberglass duct wrap insulation of  $\frac{3}{4}$  lb./cu. ft. density with factory applied vapor barrier and fire retardant jacket. When insulation is necessary on return air ducts, ducts shall be insulated in the same manner.~~
- ~~(3) All exposed round air conditioning supply air and return air ducts shall be insulated the same as specified for concealed ducts except that glass cloth jacket shall be field applied over the factory applied vapor barrier.~~
- ~~(4) Outside air intake ducts and air plenums shall be insulated the same as specified for exposed rectangular air conditioning supply air ducts.~~

~~7. EQUIPMENT INSULATION: All pieces of equipment with surface temperatures over 130 \_\_\_\_\_ shall be insulated. Type and thickness of insulation shall be as specified for piping.~~

☐ F or with

~~O. Testing and Balance: The contractor is required to test and balance the HVAC system. The University will retain a company to verify that the system has been properly tested and balanced.~~

~~P. Controls and Instrumentation: KWRH pulse meter and BTU HR annubar measurement system compatible with the "Energy Management System" located at the Central Utilities Building shall be installed. The design engineer shall also follow the guidelines described in the University Master Plan.~~

#### ~~Q. Zoning~~

- ~~1. In buildings of different occupancies, provide a separate zone with individual thermostat control for each classroom, conference room, seminar room, lecture room and laboratory. For areas with similar solar exposure and heat gain/loss characteristics provide a separate zone with individual thermostatic control.~~
- ~~2. Provide (where practical) separate equipment operation of similar occupancies so entire systems may be shut down or set back for operating economies.~~

~~R. Minimum requirements of a Bio-Safety Level II Research Laboratory as promulgated by EH&S. The following items are to be considered in the project scope. Some recommendations may be redundant with regards items that may already be under consideration:~~

- ~~1. All hoods must be equipped with a monitoring device.~~
- ~~2. Modifications to the space should be such that the performance of the fume hood is not adversely affected.~~

3. ~~Modifications to the space should include the capability to limit or restrict access via a "smart card" and possible use of a surveillance camera specific to the lab.~~
4. ~~Bench tops should be impervious and resistant to acids, alkali, organic solvents and moderate heat.~~
5. ~~An eyewash station should be easily accessible.~~
6. ~~The number of air changes per hour should be at least 10.~~
7. ~~The laboratory must be maintained under negative pressure of at least — 0.76mm of water.~~

## **DIVISION 16 - ELECTRICAL**

### **16.01 General**

- A. Codes and Standards (Latest edition of each)
  - 1. Florida Building Code
  - 2. NFPA All applicable codes
  - 3. Standards of Underwriters' Laboratories, Inc.
  - 4. Standards of National Electrical Manufacturing Association
  - 1. Applicable regulations and requirements of local utility company.
- B. Requirements described in the FIU Master Plan.

### **16.02 Electrical Service**

- A. Primary Service - Electrical energy distributed underground throughout the Campus at primary voltage to transformer vaults located at major buildings or to pad mounted transformers locate near small buildings. Distribution system pad mounted transformers and vault equipment installed, owned, and maintained by Florida Power and Light Company.
- B. Secondary Service - Secondary distribution from transformer vaults to individual or grouped facilities at nominal 480Y/277 volts for major buildings, 208Y 120 volts for small buildings.
- C. Electrical Meters - Every new building and any additions to existing buildings must be separately metered. Meters must comply with FP&L requirements.
- D. Provision must be made so that utility meters may be read by University personnel. Major buildings must also have a terminal block in a weather proof enclosure receiving pulse signal from FPL meters. This signal is to be used for demand limiting control by the Energy Management System.

### **16.03 Communications Services**

- A. Telephone: Telephone service to each facility is through underground cabling in duct banks and manhole system. Provide a UPS for telephone or dedicated circuits in buildings where necessary.
  - 1. Modesto Maidique Campus - ESSX Communication System. Communication Center is in Primera Casa Bldg., Room 205.
  - 2. North Campus - Rohn Communication System. Communication Center is in Academic II Bldg., Room 146.
  - 3. See Appendix "C" for complete telecommunication requirements.

### **16.04 Interior Distribution System**

**Power distribution for major buildings will be 480 Y 277 V. Dry-type transformers will provide 208 Y 120 V 3 4W circuits where required. Engineer shall coordinate with FIU Laboratory personnel the need for 240/120V 1 phase and 240V delta 3 phase circuits.**

### **16.05 Raceways**

A. Electrical

1. Conduit below ground floor or grade to be Rigid Steel.
2. Conduit above floor to be intermediate metal conduit for classified locations.
3. Electric metallic tubing for all other purposes.
4. **Install ground wire size as per N.E.C.-ART 250 in all conduit runs.**

B. Telephone, Communications, and Computer Data Cables

1. Conduit below ground floor or grade to be non-metallic PVC.
2. Conduit above floor to be electric metallic tubing.

C. Special Purpose

1. Metal surface and under floor raceways.
2. Multi-outlet raceway assembly

D. Systems Controlled by Computers

**The following systems shall be either controlled or monitored by a computer:**

1. Temperature Reset
2. Energy Management
3. Remote control of selected lighting fixtures

**Preliminary details of these systems shall be agreed with the Campus Architect at the early stages of the design.**

## **16.06 Distribution Equipment**

A. Switchgear - Free standing metal enclosed assemblies of busses, main and feeder breakers, and instrumentation. Each cubicle and compartment totally isolated from all others. Assembly and all components rated to withstand available fault currents. All panels shall have at least for two spare feeder circuits.

B. Distribution and Branch Panels

1. Metal enclosed assemblies with common keyed hinged fronts, containing busses and bolted-on molded-case circuit breakers, with adequate interrupting capacity.
2. All lighting and outlet panels shall have a minimum of approximately thirty percent spare breakers. Load shall be balanced between all phases.
3. All panels shall be provided with an index of use, key to the FIU space Manual floor plan.
4. Electrical distribution switchgear and branch panels to be located in a space separate from communications, air handling and custodial rooms.
5. Identification
  - a. Major components - Engraved plastic nameplates shall be secured with machine screws to identify switchgear main and feeder breakers, distribution panels, branch

circuit panels, motors controllers, control centers, and other major system components.

- b. Panelboards - Accurate typed circuit directories shall be placed on the inside of panel fronts using FIU numbering system.
  - c. Control Conductors - Adhesive labels corresponding to approved Control Diagrams shall be affixed to all control wire terminations.
  - d. All room numbers shown on working drawings shall be those furnished by the University and will be permanent numbers under which the building will operate. These numbers shall be used in describing the location of equipment, items on valve charts and other identifications required.
6. Installation and Maintenance Information.

**Three bound sets of manufacturer's installation, operation and maintenance instruction shall be required for the following:**

- a. Busway
  - b. Power Circuit Breakers
  - c. Dry-type Transformers
  - d. Motor Controls and Control Centers
  - e. Engine-Generators
  - f. Day - tanks
  - g. Batteries and Charges
  - h. Air Compressors
  - i. Fluorescent and HID Ballasts
  - j. Fire Alarm Systems
  - k. Clock and Bell Systems
  - l. Other Special Systems and Equipment
7. Record Drawings

**Provide a one line diagram of each switchboard and main distribution Panelboards, to be permanently framed and mounted.**

8. Permanently frame and mount four (4) charts indicating the fire zones.

## **16.07 Motor and Control Equipment**

### **A. Single-phase Motors**

**All single-phase motors, unless inherently self-protected, to be provided with manual or magnetic motor starters, dependent on system of control.**

### **B. Three-phase Motors**

- 1. All three-phase motors to be provided with magnetic motor starters.
- 2. Where motors are grouped, starters to be grouped in Motor Center Assemblies. Large motors utilizing reduced-voltage starters or Vari-Speed control may utilize single free-standing controllers.



3. Each starter shall be equipped with three overload relays and auxiliary contacts necessary to complete any indicated control function.
4. Motors must have built-in protection against phase imbalances. That is, each phase needs to have protection.

C. Electric motor characteristics shall be:

<u>Below ½ HP</u>	<u>Single phase</u>
<u>½ HP and larger</u>	<u>3 phase</u>
<u>Single phase power</u>	<u>120 or 208 volts, depending upon conditions</u>
<u>Three phase power</u>	<u>208 or 480 volts, depending upon conditions</u>

**In general, 3600 RPM motors shall not be used.**

D. Motor Control Characteristics

1. Motors shall be connected to re-start after loss of voltage except those which are continuously attended by an operator and those where automatic re-start will create a hazard to property or personnel. Where equipment requires a delay prior to re-start, provide suitable time-delay relay at the equipment control.
2. All combination magnetic control starters to have breakers, not fuses, and to have three overload trips, and sufficient auxiliary contacts to interlock associated equipment.
3. Motor starter, circuit breakers or disconnect switch shall be capable of being locked open during maintenance.
4. All motor starting equipment used on 460V and above shall have a control transformer to operate control items at 120 volts.

## **16.08 Emergency Power**

- A. Source - When required by the UNIVERSITY, diesel-engine driven generators should be located near main electrical room.
  1. Generators shall start and stop automatically upon failure or restoration of electrical utility supply but shall also be operable by a "test" push-button or switch. Transfer switch shall operate automatically after generating set has reached proper operating conditions but shall also be operable by a "test" push-button or switch for testing on-load.
  2. Electrical loads connected to the generator shall not exceed the generator capacity and shall all be connected to a separate emergency panel(s).
  3. The following should be connected to the emergency generator as a minimum requirement:
    - a. All sump pumps
    - b. Lighting in mechanical rooms
    - c. Utility outlets in mechanical rooms
    - d. Refrigerators, Freezers, & Cold Rooms (Research facilities)

- e. Emergency night lighting and exit lights
  - f. Fire pumps
  - g. Essential utility outlets throughout the building
  - h. Fire alarm panel
  - i. Adjacent lift stations.
- 4. Emergency panel breakers should be in the same room with normal power breaker panels.
  - 5. Specialized lab equipment that cannot tolerate a power loss.
  - 6. Diesel tank will be provided with a fuel gauge and will be installed above ground ONLY.

## 16.09 Lighting and Power

- A. Indoor and Outdoor lighting control shall be designed to permit remote lighting control by zones from a central control station, location of central control station to be determined by the Director of Facilities Management, FIU.
  - B. Indoor and Outdoor lighting at North Campus shall be activated automatically from the Central Control console located in the Central Utilities Building.
  - C. Outdoor lighting at Modesto Maidique Campus shall be controlled by local digital timers or from the central control console located in the Central Utilities Building. Whenever it is appropriate photocells shall be used to control lighting.
- 1. Site Lighting Required. Design, construction, and installation of exterior security lighting shall be provided for:
    - a. Auto, bus, and service drives and loading areas.
    - b. Parking areas.
    - c. Building perimeter.
    - d. Covered and connector walks between buildings and between buildings and parking.
  - 2. Lighting for Parking Areas. Parking area lighting standards shall be designed to withstand appropriate wind loads. Parking areas shall be illuminated to an average maintained horizontal foot-candle, measured at the surface as follows:
 

a. Parking areas	1 foot-candle
b. Covered and connector walks	1 foot-candle
c. Entrances/Exits	2 foot candles
  - 2. Building Exteriors. Building exteriors, perimeters, and entrances may be illuminated to the minimum number of foot-candles, measured at the surface with a suggested uniformity ratio of 2:1 as follows:
 

a. Entrances	5 foot-candles
b. Building surrounds	1 foot-candles
  - 3. Shielding. Exterior lighting shall be shielded from adjacent properties.

- D. Parking lot lighting standards shall comply with the Florida Energy Conservation Manual and employ Metal-Halide Lamps (MH) as recommended by the University's Facilities Construction, Public Safety and Environmental Health and Safety Departments.
- E. Provide GFI receptacles at each public restroom, at counters with sinks and within 5' 0" of water source.
- F. Electrical breakers at North Campus to be Square D or GE. Whenever possible, existing Federal Pacific breakers are to be replaced.
- G. Indoor Lighting and Outlets.
- 1. Fluorescent lighting fixtures shall use energy efficient lamps and ballasts and comply with National Energy Policy Act of 1992. T8 bulbs and electronic ballast shall be used. Lighting through incandescent bulbs should be limited to areas where dimming is necessary.

a. THE RECOMMENDED STANDARDS FOR UNIVERSITY ILLUMINATION LEVELS, IN FOOT CANDLES AT WORK SURFACES

AREA

Cafeterias	
Cashier	50 "Foot Candles" (TYP)
Food Displays	50
Kitchen Inspection, Checking, Pricing	50
Classrooms	
Drafting Rooms	100
Lecture Rooms, Audience area	50
Shops	100
Study Halls	50
Typing	50
Corridors and Stairways	10
First Aid Rooms	
General	50
Examining Room	100
Library	
Reading Areas	
Reading printed matter	30
Study and Note Taking	50
Conference Areas	30
Book Repair & Binding	50
Cataloging	50
Card Files	50
Rare Book Rooms	
Reading Areas	50
Use Areas	50
Audiovisual Areas,	

Preparation Rooms	50
Viewing Rooms	50
Audio Listening Areas, Record Inspection Table	50
Microfilm Areas, Files	50
Lounges	
Reading Books, Magazines, Newspapers	30
Toilets and Washrooms	20
General	
Dormitories	10
Reading Books, Magazines	30
Study Desk	50
Television Rec. Room, (Shield Viewing Screen)	50
Offices	50

- b. The color temperature of fluorescent bulbs shall be 4100 degrees Kelvin. The Color Rendering Index (CRI) of fluorescent bulb used shall be no less than 80.
  - c. Consideration for luminance ratios, light distribution, and shadows should be in each lighting design with appropriate supporting calculations.
2. All lenses must be of the non-yellowing type easily cleaned and easily changed by one unskilled man without special equipment.
3. All lamps should be standard and easily changed by one unskilled man without special equipment. Stairway lamps shall be wall mounted at landings and shall be accessible from a ladder. DO NOT install ceiling mounted fixtures over stairs. On high ceiling areas, specify fixtures which can be mechanically lowered for re-lamping. Verify with Facilities Management availability of existing university equipment to reach ceilings beyond a 12 foot ceiling height.
4. Fluorescent tubes longer than 4 feet and U-Bent bulbs, should not be used.
5. Corridor lighting shall be arranged to permit separate switching of certain fixtures for use at night lights and from both ends of corridors.
6. Hallways/Common areas night lights shall be connected to the emergency generator system (if available).
7. Provide 20A 125V. duplex outlets every 60 feet in public spaces. Each public outlet must be capable of enabling the simultaneous use of a floor cleaning machine and wet vacuum. In each toilet area, provide one 20A 125V. duplex outlet for floor machine and wet vacuum.
8. Exit signs MUST NOT USE incandescent bulbs. The use of LEDs (light emitting diodes) or electroluminescent technology should be used. Exit signs must be provided w/emergency power and must remain on during power outages.

9. Provide passive infrared sensors to control lights in offices, restrooms, classrooms and lab areas. Ceiling sensors should be used in classrooms and wall plate type sensors should be used in office and restrooms. All sensors should be set for a maximum of 30 minutes of on time of overall occupancy is desired. Cover lenses in sensors should be vandal proof type.
10. Photocells shall be used for all outdoor lighting wherever it is appropriate.

#### **16.10 Fire Alarm System**

Fire alarm systems shall be addressable, microprocessor controlled and shall include alarm initiating devices, notification appliances, control panels, auxiliary control devices, annunciators, printers, power supplies and wiring.

All systems shall be compatible. Systems shall be power limited type and comply with latest NFPA 70 and 72.

Systems shall be fully compatible with either of the two central fire alarm systems (JOHNSON CONTROLS or NOTIFIER) located in FIU's Central Utilities Building. (Rev. 1/31/97)

Fire alarm panels shall have components to allow remote annunciation by devices at the central fire alarm panel.

A two (2) inch empty conduit shall be provided to the nearest telephone manhole from the central fire alarm panel for future cable installation.

#### **16.11 Lightning Protection**

All major buildings are required to have a lightning protection system.



## II. CONTACT INFORMATION:

**Bureau of Fire Prevention**  
**James Goodloe, Bureau Chief**  
200 East Gaines Street  
Tallahassee, Florida 32399-0342  
Telephone (850)413-3621  
Fax (850)414-6119

**Inspection Section**  
Arlan Davis, Senior Management  
Analyst Supervisor  
200 East Gaines Street,  
Tallahassee, Florida 32399-0342  
Phone (850)413-3688  
Fax (850)414-6119

**Regulatory Licensing**  
Casia Sinco, Safety Program  
Manager  
200 East Gaines Street,  
Tallahassee, Florida 32399-0342  
Phone (850)413-3644  
Fax (850)410-2467

**Plans Review**  
William R. Fowler, Engineer IV  
200 East Gaines Street,  
Tallahassee, Florida 32399-0342  
Phone (850)413-3736  
Fax (850)922-2553

**Boiler Safety Program**  
Mike Burns, Chief Boiler  
Inspector  
200 East Gaines Street,  
Tallahassee, Florida 32399-0432  
Phone (850)413-3614  
Fax (850)414-6119

### Field Offices

**North Region: Tallahassee  
Office**  
John Walker, Regional Supervisor  
200 East Gaines Street,  
Tallahassee, Florida 32399-0342  
Phone (850)413-3656  
Fax (850)414-6119

**Northwest Region: Fort Walton  
Beach Office**  
William Shaw, Regional  
Supervisor  
105 Lewis Street, Suite 103,  
Fort Walton Beach, Florida  
32547-3182  
Phone (850)833-9015  
Fax (850)833-9131

**Northeast Region:  
Jacksonville Office**  
John Holley, Regional Supervisor  
921 N. Davis Street, Bldg B, Suite  
270  
Jacksonville, Florida 32209-8605  
Phone (904)798-5805  
Fax (904)353-2179

**Central Region: Orlando Office**  
Kimberly Mendoza, Regional  
Supervisor  
3655 Maguire Boulevard, Suite  
101  
Orlando, Florida 32803-3047  
Phone (407)893-3655  
Fax (407)897-4384

**Southeast Region: West Palm  
Beach Office**  
Fred Chaplin, Regional  
Supervisor  
400 North Congress Avenue,  
Suite 230  
West Palm Beach, Florida 33401-  
5213  
Phone (561)640-6705  
Fax (561)681-6383

**Southwest Region: Tampa  
Office**  
Agustin Valdes, Regional  
Supervisor  
8600 Hidden River Parkway  
Palm Court @Hidden River, Ste.  
200  
Tampa, Florida 33637-1016  
Phone (813)972-8605  
Fax (813)558-5055

### State Fire Marshal Contact Information:

Plans Review Manager \_\_\_\_\_  
Phone \_\_\_\_\_  
Fax \_\_\_\_\_  
Regional Office \_\_\_\_\_

Address \_\_\_\_\_

Regional Supervisor \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

Fire Protection Specialist \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

Building Name \_\_\_\_\_

Address \_\_\_\_\_

County \_\_\_\_\_

Architect \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Engineer \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Contractor \_\_\_\_\_

Phones (office) \_\_\_\_\_

(Construction) \_\_\_\_\_

## III. STATUTES – RULES – CODES and STANDARDS:

The Bureau obtains its authority from Florida Statutes, Chapter 633. This statute provides authority for the development of rules and the adoption of fire-safety standards such as those produced by the National Fire Protection Association. The rules of the Division of State Fire Marshal are listed in Chapter 69A of the Florida Administrative Code. The applicable codes and standards are listed in Chapter 69A-3 of the Florida Administrative Code. All projects must first comply with any statutory language addressing the issue in question. If the statute is silent to the issue, the applicable rule would prevail over any adopted code of standard.

All state-owned buildings are subject to the Uniform Fire Safety Rules listed in Chapter 69A of the Florida Administrative Code. Uniform fire-safety rules are developed by the State Fire Marshal and may not be modified by any law, rule, or ordinance of any other state agency or local fire authority. Deviations from the approved requirements may be permitted with the advance approval of the Plans Review Section Manager.

The following is a partial listing of the more frequently used codes and standards:

NFPA 1, Fire Prevention Code and its referenced standards

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NFPA 10, Standard for Portable Fire Extinguishers  
 NFPA 13, Standard for the Installation of Sprinkler Systems  
 NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and including Four Stories in Height  
 NFPA 17A, Standard for Wet Chemical Extinguishing Systems  
 NFPA 24, Standard for the Installation of Private Fire Service Mains and their Appurtenances  
 NFPA 30, Flammable and Combustible Liquids Code  
 NFPA 70, National Electrical Code  
 NFPA 72, National Fire Alarm Code  
 NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations  
 NFPA 101, Life Safety Code and its referenced standards

The above list does not constitute a complete list of the applicable standards for your project. Please refer to the full text of Chapter 69A-3 Florida Administrative Code for other applicable standards.

#### IV. LICENSING REQUIREMENTS:

Engineered Fire Protection System: The layout, fabrication, inspection, installation, alteration, or repair of an engineered fire protection system as defined in Section 633.021, Florida Statutes requires certification and licensing by the State Fire Marshal as follows:

- Contractor I Business includes all types of engineered systems.
- Contractor II Business is limited to water-based engineered systems.
- Contractor III Business is limited to chemical systems
- Contractor IV Business is limited to detached one family or two family dwellings
- Contractor V Business is limited to the underground piping for an engineered fire protection system beginning at the point piping is exclusive for fire protection and ending no more than one foot above the finished floor.

A Fire Protection System Contractor I, II, and V, may install the underground piping of a fire protection system, however the contractor who installs the underground piping from the point of service is responsible for completing the installation to the aboveground connection flange, which by definition is no more than 1 foot above the finished floor, before completing the Contractor's Material and Test Certificate for Underground Piping document.

Aboveground contractors may not complete the Contractor's Material and Test Certificate for Underground Piping document for underground piping or portions thereof which have been installed by others.

The Fire Protection System Contractor V may install the cross-connection backflow prevention device on new installations only. The retrofitting of a backflow device on an existing fire protection system will cause a reduction in available water pressure and probable system malfunction. The development of aboveground fire protection system hydraulic calculations is a task of the Contractor I and II.

A Contractor V is expressly prohibited from retrofitting cross-connection backflow prevention devices on an existing fire protection system, and only a Contractor I or Contractor II who is tasked to recalculate the system and take corrective actions to ensure that the system will function with the available water supply may retroactively install these backflow devices on existing fire protection systems.

NOTE: A utility contractor, licensed pursuant to Chapter 489, Florida Statutes, is prohibited from engaging in the layout, fabrication, inspection, installation, alteration, or repair of any fire protection piping.

Fire Alarm: The contractor installing the fire alarm system must be licensed by the Department of Business and Professional Regulations in one of the following classes:

- EC - Certified Electrical Contractor
- EF - Certified Alarm System Contractor I
- EY - Registered Alarm system Contractor I

Fire Equipment Dealer: The installation, service, repair, recharge, testing, marking, inspection, or hydrotesting of fire equipment must be conducted by a business or individual licensed in one of the following classes:

- Class A - Portables excluding pre-engineered
- Class B - Portables, excluding carbon dioxide hydro testing
- Class C - Portables, excluding carbon dioxide hydro testing and recharging
- Class D - Pre-engineered Systems

#### V. TYPES OF CONSTRUCTION SITE VISITS:

The plans review process and fee includes a full and complete review of all required construction documents and up to three (3) construction site inspections. During the initial site visit, the regional inspector and supervisor, if available, may modify the number of inspections. The purpose of the site inspection is to ensure the project is constructed in accordance with the approved construction documents and in compliance with all applicable laws, codes and standards. The site inspection may include verification and/or witness of an underground fire main installation, including flush and pressure testing, flow testing of sprinklers, testing of alarm devices, and pull stations, emergency lighting, fire and smoke dampers, assessment of the egress system, and other features of fire protection.

##### 1. Underground Fire Main Visit:

If applicable, this site visit is required before backfilling the open trench, and covering the supply piping. The inspector will verify the underground installation is in compliance and witness the required pressure test and system flush.

##### 2. Intermediate Inspection Visit:

This inspection occurs at approximately 50% of completion (before enclosing walls and ceilings). This inspection may include pressure test for sprinklers, location of pull stations, connections for strobes and horns, alarm wiring, stairs, ramps, etc. The intermediate inspection may be exempted at the State Fire Marshal's discretion, depending upon the size and complexity of the construction project.

##### 3. Final Inspections Visit:

Final inspection must be completed by the State Fire Marshal to ensure that the construction/renovation is in accordance with the approved construction documents and in compliance with all adopted laws, codes and standards.

##### 4. Other Inspections

- a. Special: This inspection would include any inspection not otherwise specified such as but not limited to, an on-site visit to review and discuss proposed changes to the approved plans before submitting a change order to Plans Review Section.
- b. Boiler: "First Inspections" are required after the installation of non exempt boilers. This inspection may be performed by a State Inspector employed by an insurance company authorized to write boiler and machinery insurance in Florida.

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- c. **Fire Protection Systems:** This inspection is for an installation of any fire protection system associated with or without new construction or renovations. The inspection will include all aspects of the proper installation and acceptance testing of the system.

## VI. HOW TO REQUEST AN INSPECTION:

### **State Owned Property:**

The following visits must be considered and/or requested:

1. **Underground Verification:** REQUIRED if an underground fire main is installed. This must be performed before backfilling the trench and covering the piping.
2. **Intermediate Inspections:** The complexity of the project may require one or more inspections as determined by the assigned inspector.
3. **Final Inspection:** REQUIRED.

The construction documents must be approved prior to commencing construction. Any request for the use of an alternative system or changes made to the approved plans, must be approved by the Plans Review Section prior to installation or change. Throughout the various construction phases, all requests for inspection shall be made at least five (5) working days prior to the date requested using the enclosed "DFS-K3-1528". The request may be forwarded by electronic mail, U.S. mail, or facsimile to the Plans Review Section at their address or fax number listed therein.

The Plans Review Section will route the completed form to the appropriate regional field office. The assigned inspector in the office will contact the requestor to make final arrangements for the inspection.

The request form shall be completed in its entirety; otherwise, the request for inspection may be delayed. Furthermore, if the construction documents/plans have been disapproved by this office, the inspection will not be performed, and a stop work order may be issued. Revised plans must be submitted, approved, and the plans review fee paid in full before inspection services resume. Should you have any questions, please notify the Plans Review Section (850) 413-3733 prior to requesting an inspection.

Should the project fail the inspection due to deficiencies, a re-inspection within thirty (30) days should be scheduled with the assigned inspector at the time. If the corrections cannot be made within the thirty (30) day period, it will be the responsibility of the state agency or requesting party to complete another request form and submit it to the Plans Review Section in Tallahassee, noting the date on which the project will be ready for re-inspection. The original assigned inspector will reschedule the re-inspection.

### **State Leased Property:**

Construction inspections for state leased property are requested in the same manner as for inspections of state owned buildings. The approved construction documents/plans should be secured on site. The complexity of the project may require one or more intermediate inspections as determined by the assigned inspector.

## VII. INTERMEDIATE INSPECTION CHECKLIST:

Listed below are some features that may be inspected or witnessed during your intermediate construction inspection:

Fire rated partition construction, penetrations and locations, manufacturer's specifications or listings by recognized testing laboratories required to verify the quality of fire-stopping material.

Fire/smoke damper installations at required locations.

Stair details including the run and rise of treads and risers

Handrails and guardrails including height and spacing.

Integrity of stair enclosures and other vertical openings.

Number of exits.

Travel distance, common path of travel and dead-end corridors.

Placement of exit signs and emergency lighting fixtures.

Above ground fire sprinkler system that includes the following:

Witness hydrostatic test and obtain copies of Schedule A test certificates that are found in NFPA 13  
Ensure that sprinkler head coverage meets code requirements.  
Installation of risers, mains and lines including hangers  
Review hydraulic calculations  
Manufacturer's specifications or listings by recognized testing laboratories required to verify the quality of fire-stopping material.

Underground fire main for the fire sprinkler system that includes the following:

Witness hydrostatic test and flushing of the supply main and obtain copies of Schedule U test certificates that are found in NFPA 13.  
Verify location and installation of joints, retainers, and thrust blocks.  
Verify locations and accessibility of fire department connections, post indicator valves, fire hydrants, and backflow prevention valves.  
Manufacturer's specifications or listings by recognized testing laboratories required to verify the quality of fire-stopping material.

- Installation of emergency generator and witness acceptance (load) test. Obtain copy of test results.
- Installation of fire-jockey pumps and witness acceptance test. Obtain copy of test results.
- Kitchen hood installations including clearance of ducts from combustible material, clean-out doors on ducts, seamless exterior welds, height of discharge vent above roof, and that the top of the vent is hinged for access and cleaning of the fan motor.
- Inspection of fuel storage tank(s) and dispensing piping, and/or performance testing of LPG, flammable and combustible liquids and other hazardous material systems.

## VIII. FINAL INSPECTION:

Listed below are some features that may be inspected during your final construction inspection:

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- Final fire rated partition construction and all visible penetrations through partitions.
- Perform or witness operational test of all smoke or fire dampers and ensure they are accessible for inspection/cleaning.
- Final stair details and enclosures.
- Locations of required fire rated doors/windows and ensure that doors and windows are a listed/labeled assembly or product, and that each function properly (self closures, latches, etc.).
- Placement of required exit signs.
- Exit door swing.
- Exits and access to exits: Check exit discharge for obstructions, and verify that it leads to the public way.
- Fire extinguisher ratings and placements.
- Conduct a final inspection on the fire sprinkler system including exterior items. Make sure valves are supervised, required signage is provided, riser is tagged, hydraulic calculation label is attached, required spare heads and wrench are present, and as-built drawings are provided to the building.
- If emergency generator is installed, a time activation test, emergency lighting, exit signs and other items connected to the generator will be tested while the building is on emergency power and in non-emergency modes.
- Building's electrical system to ensure there is no exposed wiring or live parts, and all circuit breakers are legibly identified as to their purpose.

- Final fire alarm system inspection to include testing EVERY device in the system and provide the following:
  - Certificate of Completion
  - Owner's manual and installation instructions covering all system equipment
  - Record Drawings (as-built)
  - Tag on panel in accordance with F.A.C. 69A-48
- Pre-engineered systems and witness acceptance test in accordance with manufacturers recommendations. Obtain copies of test results, owner's manual, and as-built drawings.
- Fire sprinkler system including flow test and alarm activation.
- Other fire suppression systems protecting special hazards, fuel storage tanks, and dispensing systems.
- Placement of building signage, including street address and other identifying markings.
- Evaluation of the fire alarm system layout.

#### IX. FEES:

The Plans Review Fee will include review of the construction documents, and up to three (3) construction site visits including, underground fire main verification, and intermediate, and final inspections. Additional visits required as a result of deficiencies found during the final inspection may result in additional fees billed to the contractor at a portal to portal rate of \$65.00 per hour, per inspector, plus expenses. With this in mind, the contractor should have completed all systems testing and inspection punch list, and should make the necessary corrections to prevent additional visits to the site. If, however, the contractor feels the need to cancel or postpone the final inspection, he may do so, without additional costs, by notifying the assigned inspector or regional office a minimum of 24 hours in advance of the established date and time of the scheduled inspection, exclusive of weekends and holiday

**REQUEST FOR BUILDING SITE INSPECTION**

**GENERAL INFORMATION**

APPLICANT'S NAME: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

E-MAIL ADDRESS: \_\_\_\_\_

STATE AGENCY: \_\_\_\_\_

**TYPE OF INSPECTION (CHECK APPROPRIATE ONE)**

- |  |   |
|--|---|
| <input type="checkbox"/> FINAL             | <input type="checkbox"/> SPRINKLER SYSTEM, ABOVE GROUND                               |
| <input type="checkbox"/> INTERMEDIATE      | <input type="checkbox"/> SPRINKLER SYSTEM, UNDER GROUND                               |
| <input type="checkbox"/> FIRE ALARM SYSTEM | <input type="checkbox"/> LEASE, PRE-OCCUPANCY <input type="checkbox"/> LEASE, RENEWAL |
| <input type="checkbox"/> HOOD SYSTEM       | <input type="checkbox"/> OTHER (SPECIFY): _____                                       |

**NAME, STREET ADDRESS OR EXACT LOCATION OF FACILITY:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**INSPECTION DATE:**

(Provide this office with a **MINIMUM** of five (5) working days notice prior to requested date of inspection.  
The SFM inspector for this facility will contact you for final scheduling.)

**STATE FIRE MARSHAL'S FILE #:** \_\_\_\_\_

(Contact this office should you need assistance)

**OCCUPANCY CLASSIFICATION, NFPA:** \_\_\_\_\_

(Business, Assembly, etc.)

**PROJECT SQUARE FOOTAGE:** \_\_\_\_\_ **NUMBER OF STORIES:** \_\_\_\_\_

**LIST THE FACILITY'S LIFE SAFETY FEATURES:** \_\_\_\_\_

(Sprinkler, Standpipe, Fire Alarm, Smoke Control, etc.)

**TYPE OF CONSTRUCTION, FBC:** \_\_\_\_\_

**E-MAIL ALL REQUESTS TO:**  
[fire.prevention@myfloridacfo.com](mailto:fire.prevention@myfloridacfo.com)

**[or]**

MAIL: Bureau of Fire Prevention - Plans Review Section  
200 East Gaines Street  
Tallahassee, Florida 32399-0342

COURIER: 325 John Knox Road, Atrium Bldg 3<sup>rd</sup> Floor  
Tallahassee, Florida  
PHONE: (850) 413-3733 FAX: (850) 922-2553

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## APPENDIX “C” STANDARDS FOR TELECOMMUNICATIONS FACILITIES FOR NON RESIDENTIAL BUILDINGS

### EXECUTIVE SUMMARY AND INTENT

The FIU network utilizes a hierarchical, layered architecture that includes core, distribution/aggregation, and access layers. Each layer assumes specific functions and provides services to its adjacent layers. This layered architecture provides many advantages including modularity, scalability, adaptability, redundancy, and ease of management. The core layer provides maximum transport data rates and high reliability. The distribution/aggregation layer imposes traffic control functions such as traffic policing/shaping, routing policy, route aggregation, and network security. The access layer provides first level access into the network for end devices such as personal computers and VoIP phones.

FIU has standardized on single mode fiber for inter and intra building connectivity. Cabling to end stations is Cat 6.

All new buildings at FIU connect back to the core of network via redundant 10G fiber links. FIU connects to the Internet, Internet2 and Florida Lambda Rail via two redundant high speed 10G links. FIU has deployed 802.11 a/b/g/n wireless throughout all buildings on the campus.

FIU has standardized on Cisco's Unified Communications Call Manager platform to provide PBX services to the university. Services include dial-tone, voice mail, IVR, and call center among many others. FIU has an emergency alert system that will display text on IP phones and play audio on IP phones as well as to speakers and emergency call boxes throughout the university. This standardization enables the university to leverage its exiting core infrastructure and common platform for communications.

## REVISED AS OF AUGUST 2007

The purpose of this standard is to provide for the planning and installation of telecommunications facilities in new buildings and major renovations. This standard has been developed with little knowledge of the telecommunications equipment that subsequently will be installed. Therefore, the definitions included herewith are for generic telecommunications facilities that will support a multitude of rapidly changing telecommunications technologies in a multivendor and variable end user environment.

This standard recognizes three fundamental concepts related to telecommunications and buildings:

- (1) Buildings are dynamic. Renovation, remodeling and upgrading are more the rule than exception. This standard takes into account that change will occur.
- (2) Building telecommunications systems and media are dynamic. As time passes both telecommunications equipment and media change considerably. This standard recognizes this fact and the facilities prescribed herein are capable of supporting a vast array of telecommunications systems and media.
- (3) Telecommunications is more than telephones. Telecommunications is inclusive of a variety of building systems including data systems, environmental control, security, audio, television, sensing, alarms and much more.

Above all, this standard recognizes a fact of fundamental importance: if a building is to be properly designed, built and provisioned for telecommunications systems, it is imperative that the telecommunications design be incorporated during the architectural design phase.

The FIU/UTS Infrastructure Department developed this document in accordance with industry specifications. It is the standard by which the University defines the physical facilities required for the provisioning of telecommunications systems for new buildings and major renovations to existing buildings. These specifications take into account the physical facilities such as the size and provisioning of telecommunications rooms, cable distance limitations, vertical and horizontal cabling considerations, number and size of conduits and numbers and types of information outlets. The general cabling requirements are not addressed, however, the "Telecommunications Wiring Specifications" which are produced after consultation with the building occupants include the detailed procedures and specifications for the wiring and installation of telecommunications systems for campus buildings. The "Telecommunications Wiring Specifications" are provided to FIU Facilities Management 90 days after completion of the project design phase.

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## 1.0 GENERAL

1.1 RESPONSIBILITY It is the responsibility of the project architect/engineer to ensure the inclusion of the standards for building telecommunications facilities into the design and construction documents for new and major renovation projects.

1.2 REFERENCES In addition to the specifications included herewith the architect/engineer is encouraged to refer to the following publications for guidance during the design of the communications infrastructure:

Building Industry Consulting Service International (BICSI); Telecommunications Distribution Methods Manual (Latest Edition).

Electronic Industries Association, Telecommunications Industry Association (EIA/TIA) Building Telecommunications Wiring Standards.

NFPA's National Electric Code (NEC).

FIU/UTS Infrastructure Department.

1.3 COORDINATION - Prior to the start of any telecommunications related work, the contractor shall contact the UTS/Infrastructure Department to coordinate the installation.

## 2.0 CABLE PATHWAYS

### 2.1 INFORMATION OUTLETS

2.1.1 REQUIREMENTS Specific requirements for information outlets for each room and each project must be coordinated with the building occupants at the onset of the design phase of major renovations and new construction projects. The architect/engineer for major renovation and new construction projects is cautioned that the Building Program for the project includes requirements, but may not be all-inclusive regarding communication facilities. Therefore, the project architect/engineer must work closely with the building occupant and the FIU/UTS Infrastructure Department to minimize the need for revisions and changes after the completion of the design phase.

2.1.2 FLOOR MOUNTED The use of floor mounted information outlets is strongly discouraged as it does not allow for flexibility in furniture layout and inhibits future changes to the telecommunications system.

2.1.3 ELECTRICAL BOXES Locations for information/wireless outlets must be equipped with a 4 in. X 4 in. X 2.5-in. electrical box equipped with a mudring sized for the installation of a standard duplex outlet.

2.1.3.1 WATERPROOF BOXES- Outdoor wireless antenna locations must be equipped with a 4 in. X 4 in. X 2.5-in waterproof box with blank cover.

2.1.4 MOUNTING HEIGHT - Electrical boxes installed for information outlets must be placed at the same level as the adjacent duplex electrical receptacles or at least fifteen (15) inches above the finished floor.

2.1.4.1 Electrical boxes installed for information outlets located above counters equipped with a splash back must be placed at 6 in. above the top of the counter. (Measure to the center of the outlet.)

2.1.4.2 Electrical boxes installed for information outlets located above counters not equipped with a splash back must be placed at 12 in. above the top of the counter. (Measure to the center of the outlet.)

2.1.4.3 Electrical boxes installed for emergency phones in classrooms/lecture halls/auditoriums shall be mounted 48 in. above finished floor.

2.1.4.4 Electrical boxes installed for indoor wireless access points information outlets shall be located above drop ceiling spaces or alternate location that is determined by UTS after site survey is completed.

2.1.4.5 Waterproof boxes for outdoor wireless antennas and emergency paging horns installation heights will be provided to contractor after a site survey of building is conducted by UTS.

2.1.5 FACULTY/ADMINISTRATIVE OFFICES must have a minimum of one (1) information outlet per designated occupant, however two (2) are recommended for furniture relocation of additional staff.

2.1.6 CLERICAL/STAFF OFFICES shall have a minimum of one (1) information outlet per designated occupant plus one (1) information outlet for every two (2) additional occupants.

2.1.7 SECRETARY/ADMINISTRATIVE ASSISTANT OFFICES shall have a minimum of one information outlet per designated occupant plus two (2) outlets per office or two (2) extra outlets per five (5) people.

2.1.8 CLASSROOM/LECTURE HALLS/Auditoriums shall have a minimum of one (1) information outlet for emergency phone, and one (1) to four (4) information outlets for data depending on occupancy size:

<u>Classroom Size</u> <u>(Student Occupancy)</u>	<u>Minimum Number</u> <u>of Outlets</u>
<u>1 50</u>	<u>1</u>
<u>51 100</u>	<u>2</u>
<u>101 200</u>	<u>3</u>
<u>201 or more</u>	<u>4</u>

2.1.8.1 The recommended location priority relationship for the information outlets must be: chalkboard/dry eraser board, lectern, projection booth/rear wall and remaining sides. The recommended location for emergency phone must be: next to chalkboard/dry erase board or teaching station podium.

2.1.9 GRADUATE STUDENT OFFICES shall have a minimum of one (1) information outlets per designated occupant.

2.1.10 LABORATORIES shall have a minimum of one (1) information outlet per room; actual number may be more depending on function and occupant requirements.

2.1.11 CONFERENCE ROOMS shall have a minimum of one (1) information outlet per room. Rooms with more than 500 ft2 shall have a minimum of two (2) information outlets installed.

2.1.12 STORAGE AREAS shall have a minimum of one (1) information outlet for rooms over 500 ft2 and one (1) additional outlet for each additional 2000 ft2.

2.1.13 INDOOR WIRELESS AREAS shall have a minimum of one (1) information outlet location per access point which will be located above ceiling.

2.1.14 OUTDOOR WIRELESS AREAS shall have a minimum of one (1) information outlet location per access point, to be located above ceiling on the inside of the outside wall of building.

2.1.15 OUTDOOR EMERGENCY PAGING HORNS shall have a minimum of (1) information outlet location per horn, to be located on the outside wall of building.

## 2.2 CONDUITS

2.2.1 A 1 inch EMT conduit must be installed from each information outlet electrical box including indoor/outdoor wireless access point, and emergency paging horn location and "stubbed" up above the ceiling level to cable tray. (Please see attached drawing, Fig. 2.2.1-A)

2.2.2 If fixed ceilings are installed cable trays cannot be used and conduit from information outlets must be "homerun" to the telecommunications room or cable tray.

2.2.3 The open ends of conduits and/or sleeves must be equipped with bushings to avoid damage to cable sheaths and must be readily accessible and not concealed within walls.

2.2.4 Telecommunications rooms contain the vertical cable riser space. Conduits and/or sleeves must be used to interconnect telecommunications rooms. The open ends of conduits and/or sleeves must be located a maximum of 3 in. from the wall and extend a minimum of 1 in. above the finished floor.

2.2.5 REQUIRED NUMBER The minimum number of conduits, and/or sleeves interconnecting the telecommunications rooms must be determined as follows:

<u>Building Total</u>	<u>Quantity of Conduits</u>	<u>Size of Conduit</u>
	<u>(Square Footage)</u>	
Up to 50,000 ft2	3	4"
50,001 ft2 to 100,000 ft2	4	4"
100,001 ft2 to 300,001 ft2	5 8	4"
300,001 ft2 to 500,000 ft2	9 12	4"

2.2.6 PULL BOXES A pull box must be installed in sections of conduit longer than 100 ft. or containing more than two 90-degree bends or if there is a reverse bend in the run.

2.2.7 Minimum requirements for installed conduit, such as support, end protection, and continuity, are found in appropriate electrical codes.

2.2.8 The inside radius of a bend in conduit must be at least 6 times the internal diameter. When the conduit size is greater than 2 in. the inside radius must be at least 10 times the internal diameter of the conduit.

2.2.9 PULL CORDS All conduits must have a fish tape or pull cord, rated for 200 lbs. of pull force, and installed end-to-end.

2.2.10 ELEVATOR – A ¾” conduit must be installed from each elevator equipment room to the nearest telecommunication room or cable tray.

2.2.11 EMS – A ¾” conduit must be installed from each mechanical room “homerun” back to the nearest telecommunication room or cable tray.

2.2.12 FIREALARM - A ¾” conduit must be installed from the fire alarm panel to the nearest telecommunication room or cable tray.

Note: (1) Under no circumstances will flexible metallic conduit be used for any telecommunication wiring.

(2) Under no circumstances will any conduits be “daisy-chained” together.

## 2.3 CABLE TRAYS

2.3.1 Cable trays are rigid structures for the containment of telecommunications cables.

2.3.2 GROUNDING Cable trays must be installed and grounded in accordance with the National Electric Code (NEC) and local requirements. (Please see attached drawing, Fig. 2.3.2-A)

2.3.3 TYPE Cable trays must be of the 12-in. ladder type, equivalent to Wiremold, Part No. A060612, unless otherwise specified by the UTS Project Manager.

2.3.4 Cable trays must be installed above false ceilings and run down hallways and corridors providing a pathway for telecommunications cable from the information outlets to the respective telecommunications closet.

2.3.5 Cable tray installation must be coordinated with all work of other trades to avoid any interference. Cable trays must be installed such that they are not obstructed by other trades equipment, i.e. air conditioning ducts, electrical conduit etc. Cable trays must be easily accessible for the installation of cables and, future changes to telecommunications systems.

2.3.6 A minimum of 3-in. clear vertical space must be available between the top of the ceiling tiles and the bottom of the cable tray. A minimum of 12 in of clear horizontal space on each side of the cable tray must be available. Also, minimum of 6 in of clearance must be available between the top of the cable tray and any other utilities.

2.3.7 Under no circumstances, shall any other utilities pass within the distances specified in 2.3.6

2.3.8 To avoid electromagnetic interference, all cable pathways must provide clearances of at least:

4 ft. from large motors or transformers.

1 ft from conduit and cables used for electrical power distribution.

5 in. from fluorescent lighting. Pathways should cross perpendicular to fluorescent lighting and electrical power cables or conduits.

### 3.0 TELECOMMUNICATIONS ROOMS

#### 3.1 DESCRIPTION/DEFINITION

3.1.1 Telecommunications rooms must be dedicated to the telecommunications function and related support facilities. Telecommunications rooms must not be shared with janitorial facilities or other trades especially with electrical installations other than those required for telecommunications systems.

3.1.2 Telecommunications room refers to any room where telecommunications facilities terminate and telecommunications system equipment is housed.

3.1.3 The term building Intermediate Cross Connect (IC) is used to indicate the telecommunications room where the campus backbone facilities enter the building.

3.1.4 The term Telecommunications Rooms (TR) is used to designate the telecommunications room required for the distribution of facilities to adjoining floors and areas exceeding distance limitations.

3.1.5 NUMBER OF ROOMS. There must be a minimum of one telecommunications room per floor and centrally located in the building, unless otherwise specified by the UTS Project Manager. Additional telecommunications rooms must be provided when:

- (1) The floor area to be served exceeds 10,000 ft<sup>2</sup>, or
- (2) The horizontal distribution distance to the workstation exceeds 295 ft. .

3.1.6 SIZING OF ROOMS. Telecommunications rooms must be sized as follows:

<u>Serving Area</u>	<u>Room Size</u>
<u>(net bldg. ft<sup>2</sup>)</u>	
<u>10,000 ft<sup>2</sup></u>	<u>10 ft. X 11 ft.</u>
<u>8,000 ft<sup>2</sup></u>	<u>10 ft. X 9 ft.</u>
<u>5,000 ft<sup>2</sup> - less</u>	<u>10 ft. X 7 ft.</u>

10 ft. X 7 ft. is the minimum size for telecommunications rooms.

3.1.7 Telecommunications rooms must be stacked vertically to provide for the installation of telecommunications facilities between floors. Telecommunications rooms must be interconnected as specified in section 2.2.5.

**3.1.8 BACKBOARDS** – All four walls must be covered with rigidly fixed 3/4 in. x 4 ft. X 8 ft. A C plywood, preferably void free, capable of supporting attached equipment and painted with black fire retardant paint.

**3.1.9 LIGHTING** Lighting must be a minimum of 50-ft. candles measured 3 ft. above the finished floor, mounted 8.5 ft. minimum above finished floor.

**3.1.10 CEILINGS** False ceilings are not allowed in any Telecommunication Room.

**3.1.11 DOORS** The door must be a minimum of 36 in. wide and 80 in. high, without doorsill, hinged to open outward and fitted with a lock.

**3.1.12 KEYING** Access to all telecommunication rooms will be through one uniform master key system. Facilities Management will establish the lock type to be used.

**3.1.13 TREATMENT** Floors, walls, and ceiling must be treated to eliminate dust. Floors must be covered with VCT tiles.

**3.1.14 ELECTRICAL REQUIREMENTS** Two dedicated 30 A, 110 or 208 V AC electrical outlets (L5-30R/120, L6-30R/208), each on separate circuits, must be provided for equipment power, unless otherwise specified by UTS Project Manager. In addition, a third 20A, 110 V AC circuit shall feed duplex outlets, which must be placed at 6 ft. intervals around the perimeter wall, at a height of 18 in above the floor. In addition, all dedicated outlets in IC's and TR's must be connected to the emergency power system (generator). All dedicated circuit outlets must be readily identifiable by using a different color outlet.

**3.1.15 GROUNDING** Each telecommunications room must have direct attachment to the closest point in the building's electrical service grounding electrode system. A Number 6 AWG solid conductor cable must be placed between the ground source and a bus bar of the type: Chatsworth Products, Inc. part number 13622-010 or equivalent.

**3.1.15.1** A #6 THW ground cable shall be installed for each Outdoor Wireless Access Point location from the nearest Intermediate Closet (IC) or Telecommunications Room (TR).

**3.1.16 SLEEVES/CONDUIT** Sleeves or conduit passing through the telecommunications room floor should be adjacent to the door with a minimum of 1 in. exposed above the finished floor. Sleeves and conduit must be no more than 3 in. away from the wall. Sleeves and conduit shall not be left open except during cable installation and must be properly fire stopped per the applicable codes.

**3.1.17 FIRE PROTECTION** Fire protection of the telecommunications rooms, if required, must be provided as per applicable code. All conduits and cable trays penetrating any Telecommunications Rooms must be properly sealed with the appropriate fire stopping material, as per NEC and local fire codes.

**If used, fire sprinklers shall not be water based. An optional gaseous system must be used.**

**3.1.18 AIR CONDITIONING** HVAC must be provided on a 24 hours per day, 365-days per year basis. If the building system cannot assure continuous operation for large equipment applications, a stand-alone unit must be provided for the equipment room.

3.1.19 TEMPERATURE The temperature and humidity must be controlled to provide continuous operating ranges of 64 degrees F to 75 degrees F with 30% to 55% relative humidity.

3.1.20 COLLOCATION OF OTHER TRADES No water, sewer etc. pipes must be placed within or pass through the telecommunications rooms.

3.1.21 PLENUM AIR SPACE - All Telecommunications Rooms must be completely separated from Plenum air space in accordance with NEC and BICSI standards. (Please see 1.2 reference)

3.1.22 LOCATION OF ROOM - All Telecommunications rooms must be accessible at all times. The IC (building main telecommunications room) must be designed to be adjacent to an outside wall in order to facilitate the addition of entrance conduits if needed, unless specified by UTS Project Manager.

#### 4.0 OUTSIDE PLANT

##### 4.1 DEFINITION DESCRIPTION

4.1.1 All new building construction planning must provide for connection of the building to the campus communications infrastructure.

4.1.2 CONDUIT SIZE - All direct buried conduits used to connect to the University Telecommunications infrastructure must be 4" PVC, Schedule 40.

4.1.3 NUMBER REQUIRED The minimum number of conduits connecting the building IC to the campus MC must be at least four four-inch (4 - 4") conduits. Note: More entrance conduits might be needed depending on the size and utilization of the building.

4.1.4 DEPTH - The top of the conduit bank must be buried at least 30 inches below the ground surface and separated from other service structures as required for fiber optical cable under EIA/TIA specifications.

Separation of telecommunications conduits from other utilities shall meet the following guidelines:

##### Separation of Telecommunications Conduits from Other Utilities

###### Structure

###### Minimum Separation

Power or other conduit      3 inches in concrete  
4 inches in masonry  
12 inches in earth

Pipes (gas, oil, water)      6 inches when crossing pipe  
12 inches when parallel to pipe

Power conduit terminated on poles      Separate poles, if possible.  
If on same pole, 180 degree separation

Preferable, but not less than 90 degrees.

Railroads

At a crossing: 5 feet below top of the rail.

Terminating on poles: 12 feet from the nearest rail, except 7 feet at sidings.

The conduits must be placed in accordance with the requirements specified in the FIU building manual. In particular, bidders must pay special attention to the Telecommunications requirements specified in Appendix C.

#### 4.1.5 DUCT BANK PROTECTION - Conduit must be encased in concrete when:

(1) Minimum conduit depth of 30 inches cannot be attained.

(2) Conduits pass under roads, driveways, or railroad tracks.

(3) Bend points are subject to movement.

Note: A detectable warning tape must be placed 18 inches above all duct banks (detectable: containing metallic tracings).

#### 4.1.6 SLOPE - Underground conduit must be installed such that a slope exists at all points of the run to allow drainage and prevent the accumulation of water. A drain slope of no less than .125 in. per foot is desirable.

### 4.2 MANHOLES (MAINTENANCE HOLES)

4.2.1 DESCRIPTION - A manhole (maintenance hole) is used to pull in and splice cables in an underground, concealed manner. Manholes must be equipped with a sump, corrosion resistant pulling iron, cable racks, and manhole ladders. Concrete used for manholes must be of at least 3500 lb./in<sup>2</sup> strength. All manholes must be properly grounded as required by BICSI. (Please refer to 1.2)

4.2.2 SIZE - Manholes must be sized at 6-ft. width X 12-ft. length X 7-ft. height, unless specified by the UTS Project Manager. All manholes must be equipped with a round ring and cover, clearly labeled "TELECOM" or "TELEPHONE". (Please see attached drawing, Fig. 4.2.2-A)

4.2.3 WHERE REQUIRED - Manholes must be placed when the conduit section length exceeds 500 ft., whenever a cable splice will be required, when bends exceed a total of 180 degrees or two bends, or the section length of conduit requires the pulling in of cable in two segments.

4.2.4 HANDHOLES are not an acceptable alternative to manholes described in section 4.2.1, 4.2.2. Handholes can only be used in place of manholes after consultation with and receipt of written approval from the UTS/Infrastructure Department. (Please see attached drawing, Fig. 4.2.4-A)

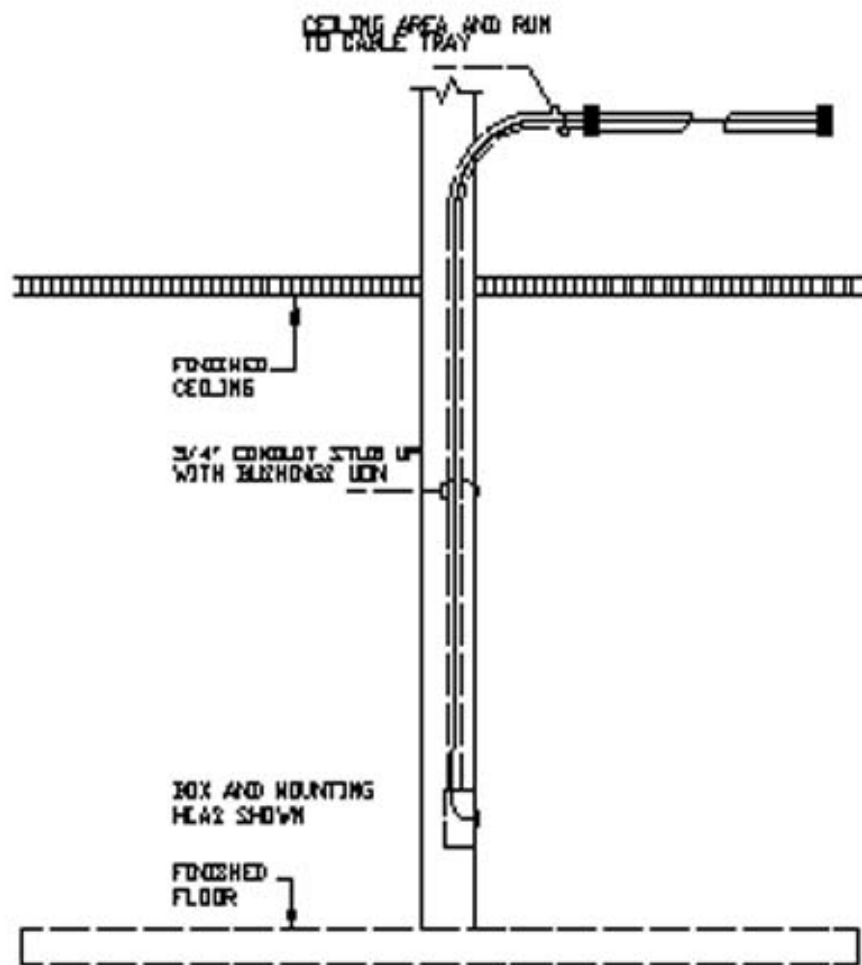
4.2.5 PULL POINTS - Wherever distances between manholes exceeds 200 feet or there are more than two 90 degree bends in the conduit run, a 4' x 4' x 4' pull box must be placed. The number of conduits going in and out of the pull box shall not exceed six. Under no circumstances shall a pull box replace a manhole. (Please see attached drawing, Fig. 4.2.5-A)



**4.2.6 POSITIONING OF CONDUITS IN MANHOLE - Conduits entering a manhole shall do so only through the manhole walls designed for conduit penetration. Under no circumstances shall the structural integrity of the manhole be compromised.**

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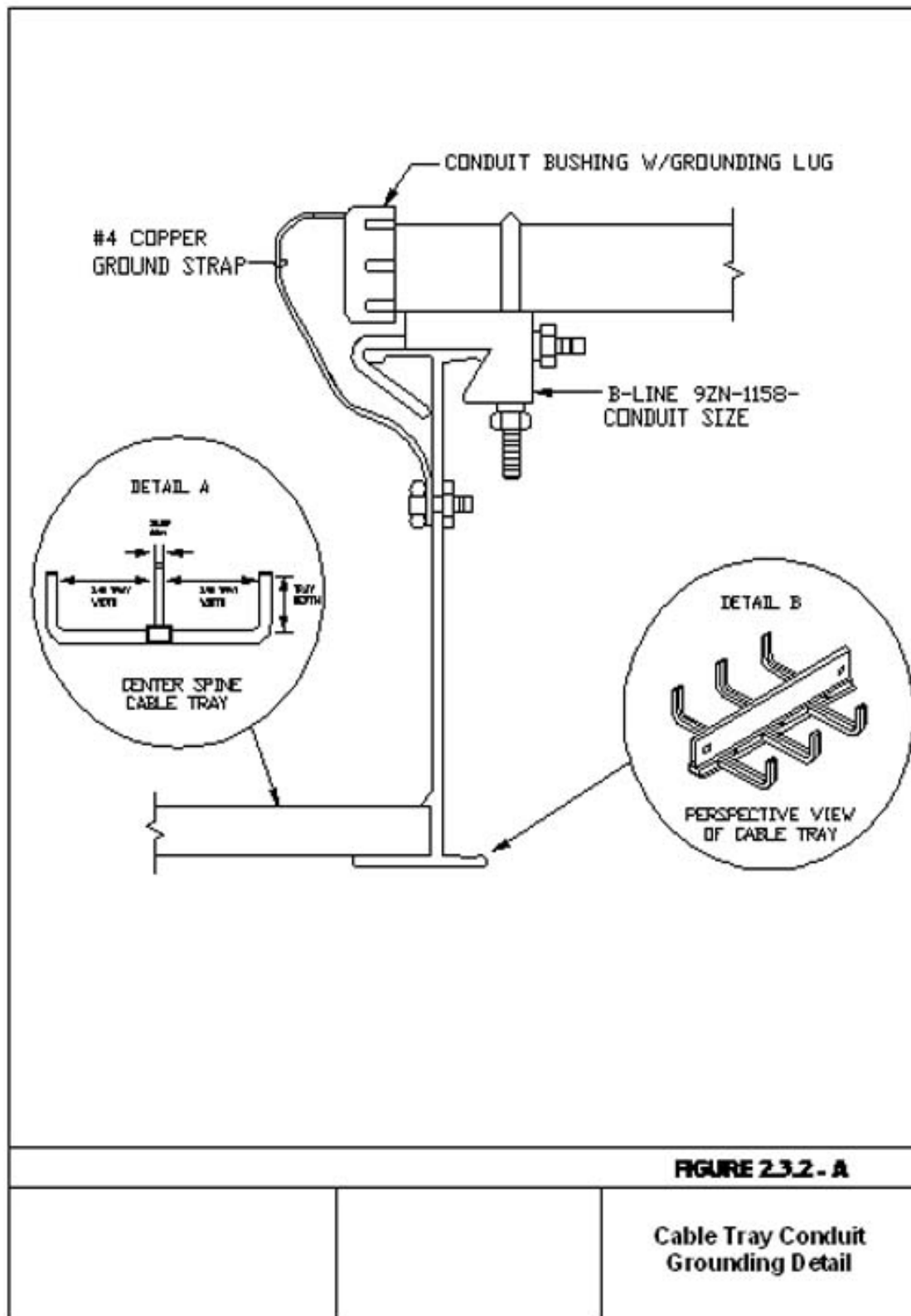
**Note: Conduits being added to a manhole must be placed as deep as possible in order to accommodate future expansion of ductbanks and guarantee maximum utilization of the manhole.**



WALL STUB-UP DETAIL

**FIGURE 2.2.1 - A**

Wall Stub-Up Detail



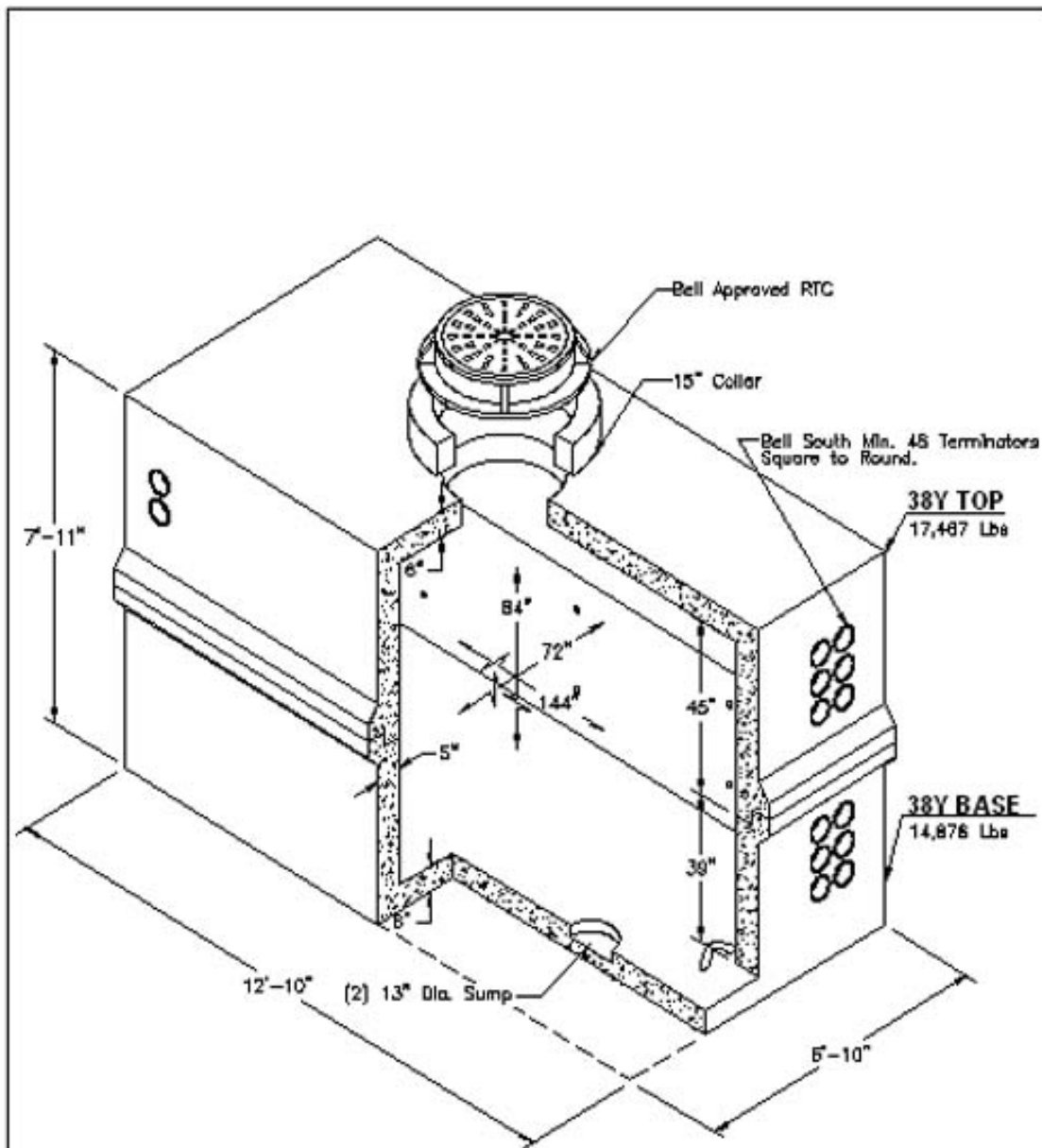
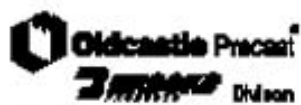


FIGURE 4.2.2 - A



7311 NW 77th Street, Miami, Florida 33148  
Phone: 305.987.2827 Fax: 305-487-7119

**PB72144BELLALAT**

FILE NAME: J76UTPB72144BELLALAT.J90.DWG

ISSUE DATE: January, 2002

[www.oldcastleprecast.com](http://www.oldcastleprecast.com)

**6'-0" x 12'-0" x 7'-0" L.D.  
Manhole  
Type A-Lateral Duct  
32,343 Lbs**

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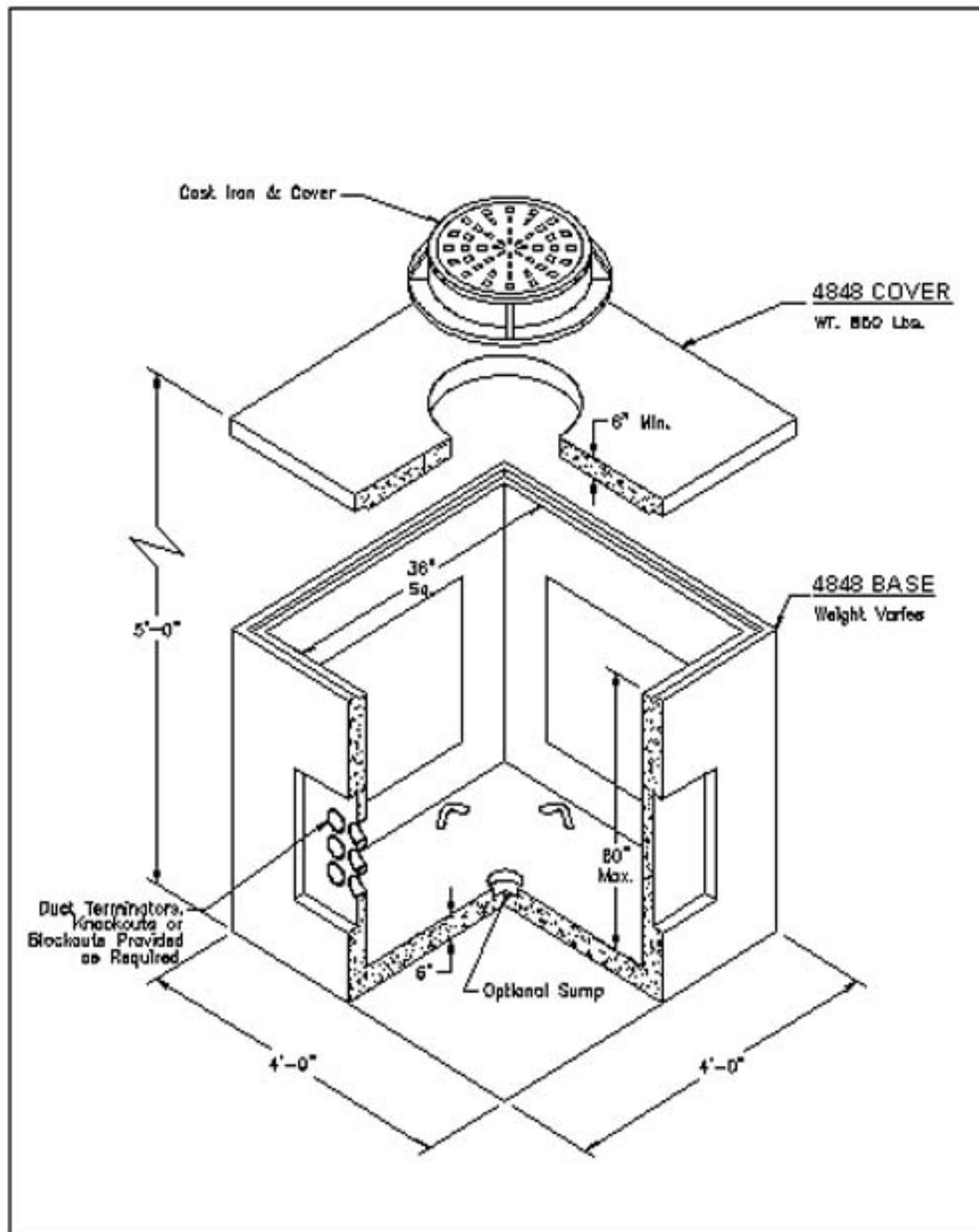
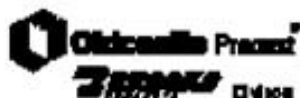


Figure 4.2.4 - A



7311 N.W. 77th Street, Miami, Florida 33166  
Phone: 305.887.2427 Fax: 305-887-7110

HH4848

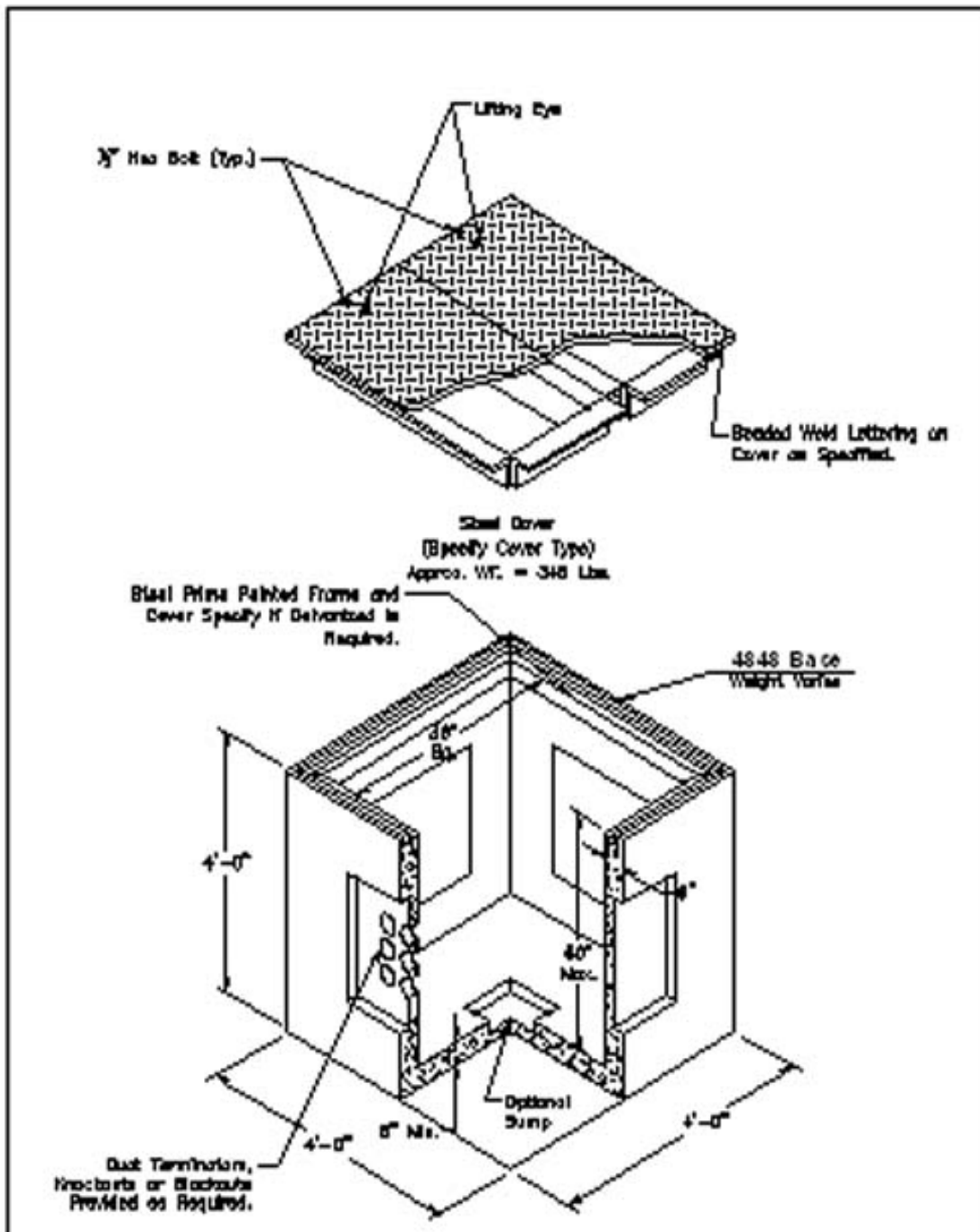
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ISSUE DATE: January, 2022

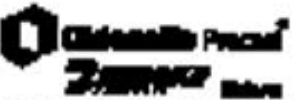
[www.oldcastleprecast.com](http://www.oldcastleprecast.com)

4'-0" x 4'-0" x 5'-0" I.D.  
Handhole  
with 6" Walls  
Weight Varies

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**FIGURE 415-A**

 <p>2341 N.W. 77th Street, Suite 100, Ft. Lauderdale, FL 33309 Phone: 954/577-0000 Fax: 954/577-0119</p>	<p><b>PE4848</b></p> <p>PLS MAIL YOUR REQUEST TO:</p> <p>800 N.W. 100th Ave., Suite 100, Ft. Lauderdale, FL 33309</p>	<p><b>4'-0" x 4'-0" x 6'-0" LD.</b></p> <p>Pull Box with 6" Walls Weight Varies</p>
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**D. 1 PURPOSE AND GOAL**

- A. The Building Standards incorporate herein the Landscape Standards as articulated in the Campus Master Plan 2010-2015 as prepared by Perkins + Will.

**D.2 LANDSCAPE DESIGN GUIDELINES ELEMENT**

Landscape is an essential component of the educational experience at FIU. It provides opportunities for education, demonstration, inspiration and recreation. The purpose of the Landscape Design Guidelines is to provide the campuses of Florida International University with a framework for landscape and hardscape treatments in order to maintain a high level of quality to the design of new spaces and to the enhancement of existing landscaped areas. It is the intent of the Landscape Design Guideline Element to provide an overall landscape framework that unifies each campus with its built environment and its unique natural environment, and to reinforce sustainable design practices as outlined by both USGBC standards for LEED Silver certification and American Society of Landscape Architects Sustainable Sites Initiative (SSI).

Hierarchy of spaces have been identified and main circulation routes will be reinforced with identifiable landscape treatments. Significant pedestrian corridors will continue to be identified, linking unique academic cores within the campus. As the overall character of the FIU campus continues to mature, various spaces will be defined following these guiding principles:

- Integrate architectural and site design in conjunction with landscape architectural design in the planning process to ensure that attractive settings and ample open spaces are provided in conjunction with new facilities.
- Seek to develop new significant landscape features in association with campus growth, including campus spaces such as quads, plazas, campus streets and campus edges while enhancing the concept of the “Avenue of the Arts” and “Avenue of the Professions”, “the Avenue of the Sciences”, and the “Avenue of the Students”.
- Blend new development sites with the character of the mature campus landscapes and other natural areas by retaining islands of natural vegetation in new development areas and creating new and similar vegetative areas that integrate the buildings and site facilities into the landscape.
- Continue the initial style and character of the original campus plantings with emphasis on transitioning and reflecting the natural formation of plantings.
- Maintain a selective palette of indigenous and site-adaptive plant species that express the subtropical environment, as well as those plants that promote Xeriscaping principles.

Create high quality, environmentally sound campus landscape settings which afford outdoor comfort, security, and a rich visual quality, exemplifying the uniqueness and diversity of South Florida's subtropical environments while creating a unifying character that binds the campuses together.

- Objective 1.1                      Landscape Framework: Implement the Landscape Framework for the Modesto A. Maidique Campus, Engineering Center and Biscayne Bay Campus (16.0 Data and Gathering, Figures 16.0 A, 16.0 B, 16.0 C). In the event that provisions contained in the Landscape Framework conflicts with provisions contained in the adopted Campus Master Plan then the Master Plan shall prevail and control.
- Policy 1.1.1                      UNIVERSITY-WIDE:  
Reinforce the critical elements of the spatial organization defined in the Master Plan for a consistent landscape character as outlined in the Landscape Framework. The framework is developed as a guide to further define the character of spaces, streets, and edges within the campuses. The Landscape Framework is not intended to be a typical design solution for each area, but a set of standard principles of how a space shall be developed, enhanced and maintained so that it remains in context with the overall campus.
- Policy 1.1.2                      Locate and orient all future buildings to define the open spaces depicted in the adopted Urban Design Plan.
- Policy 1.1.3                      Continue to incorporate Art exhibits throughout the three campuses as an element unique to FIU. Create an inventory of all installations on-campus and define the parameters for future locations of new art projects on-campus.
- Policy 1.1.4                      Provide a continuous tree canopy (as appropriate) in all remaining surface parking lots and sufficiently screen all surface parking areas without compromising security.
- Policy 1.1.5                      Prior to construction, relocate and incorporate existing valuable plant material in the areas of future construction and development.
- Policy 1.1.6                      Emergency access facilities shall be kept clear of any impeding landscape elements.
- Policy 1.1.7                      **Screen all trash collection facilities from pedestrian or vehicular traffic view with either a fence or wall consistent with architectural guidelines or evergreen plant material.**
- Policy 1.1.8                      Screen maintenance facilities from pedestrian and vehicular traffic with a fence, wall, or evergreen plant material.
- Policy 1.1.9                      Incorporate within the general campus landscape area, gardens and natural habitats as an opportunity for botanical and environmental education and as campus amenities.



- Policy 1.1.10 Improve the integration of existing and new storm water retention areas as landscape enhancement elements.
- Objective 1.2 Enhance the existing and proposed Campus Spaces to better define the open spaces as a consistent unifying element throughout the three campuses Axes
- Policy 1.2.1 MODESTO A. MAIDIQUE CAMPUS (Fig 16.1):  
Avenue of the Sciences - Continue to develop and reinforce the diagonal axis from Panther Village to the intersection of SW 8<sup>th</sup> St and SW 107<sup>th</sup> Ave at the future Academic Health Sciences gateway.
1. Enhance the sidewalk path between Panther Village and the Graham Center/Library Plaza with additional canopy plantings for shade and a defined pedestrian crossing at the existing service street.
  2. Redevelop the existing Graham Center Plaza/Library plaza to allow for a uninterrupted visual and functional pedestrian path through the space from the southwest corner to the northeast corner of the space. Provide canopy trees for shade.
  3. Remove the existing curvilinear path from the northeast corner of the Graham Center and replace with a formal linear path that connects to the existing Health & Sciences Building 2 path.
- Policy 1.2.2 **Avenue of Professions** - Enhance the pedestrian experience of the axis west of the library to the proposed loop road realignment. The space should demonstrate the significance of the axis through the use of canopy trees or palms evenly spaced to create a formal and linear connection. The pedestrian path should be wider than typical sidewalks on campus. Include benches and additional site furnishings to create a repeating pattern along the space.
- Policy 1.2.3 **Ave of the Students** - Develop this axis to a level distinctive from typical pedestrian circulation while clearly defining the linearity of the space. Increase the existing sidewalk width and develop segments of formal plantings at building entrances. Canopy trees should be placed adjacent to the path between formal sections to provide shade.
- Policy 1.2.4 Ave of the Arts - Maintain the already well developed and spatially defined axis.

## Quadrangles

- Policy 1.2.5 MODESTO A. MAIDIQUE CAMPUS:  
Particular attention should be paid to the scale of the quadrangles. Continue to develop the Graham Center, Green Library, Owa Ehan and Chemistry & Physics Buildings Quad with defined hardscape and landscape edges to clearly define the

space. New sidewalks should delineate the edges of the eastern edge of the quad adjacent to the Health & Science buildings connecting north to south. Groupings of canopy trees should be placed within the quad and along existing pedestrian paths to provide shade with the ground plane predominantly lawn. Shade structure or small pavilions should be placed within the quad to increase habitation.

Policy 1.2.6

With the incorporation of the traffic roundabout at the intersection of the loop road and 112 Ave entrance, develop the Ryder Business Building quad as a pedestrian focused space. Remove the existing drive and replace with sidewalk material so the drive is visually similar in type to a sidewalk but allows for service and ADA accessibility. Provide crossing pedestrian paths centered on the existing building entrances for Architecture, Education, and Business Complex. Maintain the current palm tree configuration to allow for the visual corridors into the space from the loop road to continue.

Policy 1.2.7

ENGINEERING CENTER (Fig 16.2):  
Develop a quad east of the existing Engineering Center building with canopy trees and minimal hardscape. The ground plane should be predominately lawn to allow for informal gatherings and create a picturesque quality to the space similar to the proposed park edge along West Flagler Street.

Policy 1.2.8

BISCAYNE BAY CAMPUS (Fig 16.3):  
Continue to develop the quad south of Academic One & Two (referred to as South Quad). Influenced by the shape of the existing lake, the quads, plantings, and pedestrian circulation should be informal in design, responding to the lake's configuration. Informal groupings of hardwood canopy trees should be placed within the quad to provide shade for gatherings and reflection.

Policy 1.2.9

Expand the quad north of Academic One & Two (referred to as North Quad). Canopy trees should be placed in small gatherings within the expanded portion of the quad. Sidewalks should cross the space creating direct links between building entrances (See Figure 16.4A & 4B). The ground plane should be predominately lawn with some understory plantings at the building edges. The formal arrangement of the hardscape and palms that exists north of Academic One should be extended west to edge of the quad. Additional canopy planting should be used to provide shade.

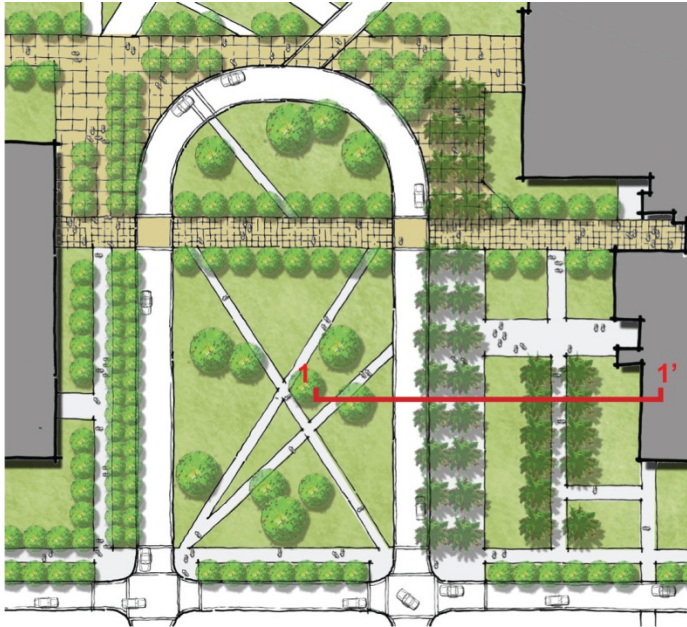


Figure 16.4A North Quad at Biscayne Bay Campus



Key Map



Figure 16.4B North Quad Section 1-1'

## Plazas

### Policy 1.2.10

**MODESTO A. MAIDIQUE CAMPUS:**  
 Redevelop the Graham Center/Green Library Plaza to allow for the Avenue of the Sciences to be developed as an aligned pedestrian spine. The space should be designed as a single space to insure continuity between buildings. Preserve of the existing canopy trees where possible to allow the space to be appear more mature upon completion.

## Promenades

### Policy 1.2.11

**ENGINEERING CENTER:**  
 Develop a pedestrian promenade from the park edge and to the northern parking lot (See Fig 16.5 A & B). The promenade should be formal in character, primarily hardscape with canopy trees evenly spaced and minimal ground plane vegetation.

Site furnishings should include a series of benches for congregation opportunities

Policy 1.2.12                      BISCAYNE BAY CAMPUS:  
Develop a pedestrian promenade from the northern edge of the campus core south to the Kovens Center. The promenade should be formal in character with an unique hardscape material. Provide canopy trees evenly spaced on both sides of the walk to provide shade. Lawn should be the predominate ground plane.

#### Special Purpose Landscapes

Policy 1.2.13                      MODESTO A. MAIDIQUE CAMPUS:  
Maintain and protect from encroachment the teaching and research landscapes including Hennington Island adjacent to SW 8<sup>th</sup> Street.

Policy 1.2.14                      Maintain and protect from encroachment the teaching and research landscapes including the area south of the FIU Arena. The space is defined by three distinctly different plant communities that offer opportunities for teaching and research. Develop a series of interpretive signage to enhance the educational and passive activity elements within the landscape. Directly south of the arena, develop an outdoor space with opportunities for gathering as well as pedestrian circulation. Enhance the space with canopy trees for shading and picnic tables. Provide a defined pedestrian circulation path between the existing Recreation Center within the academic core to the existing soccer and baseball stadiums. The path should minimize the amount of disturbance on existing vegetation while providing adequate width for pedestrian movement and addressing safety issues with view corridors along the path. The establishment of view corridors, pedestrian scale lighting and interpretive signage is crucial in developing a safe and useable space.

Policy 1.2.15                      Develop the area around the President's house as a formal garden that will allow for outdoor gatherings as well as a reflective space that buffers the adjacent commercial street corridor.

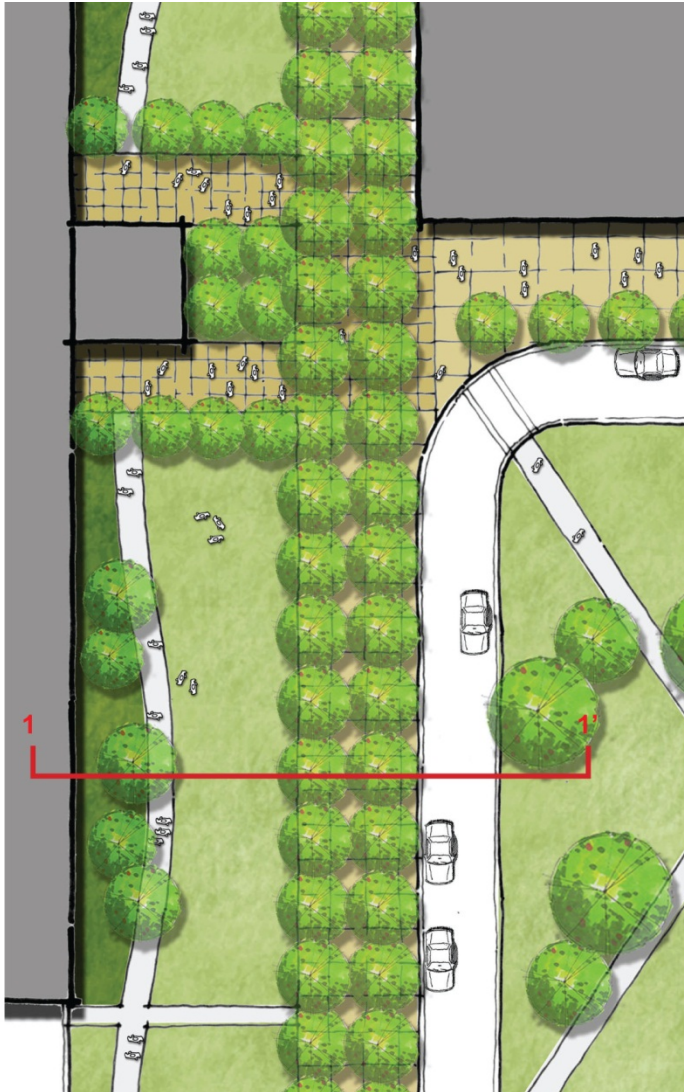
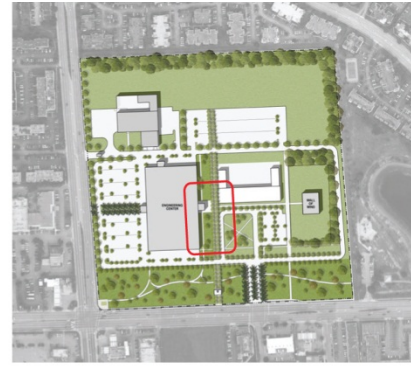


Figure 16.5A Promenade at Engineering Center



Key Map



Figure 16.5B Promenade Section 1-1'

Objective 1.3                      Develop a hierarchy of landscape treatment for Campus Streets

Policy 1.3.1                      UNIVERSITY WIDE:  
Reinforce and improve circulation hierarchy by developing distinct, identifiable landscape treatments for each road type, campus entrances and pedestrian/vehicular intersections.

## **Streets**

Policy 1.3.2                      MODESTO A. MAIDIQUE CAMPUS:  
Greenbelt (Primary loop road): Establish a 'boulevard' treatment with Live Oaks as the dominate canopy tree. Canopy trees should be located on both sides of the road within a planting strip with lawn as the ground plane. Other hardwoods and palms are permissible at significant pedestrian and/or vehicular intersections. Existing hardwoods deemed in good condition should not be replaced. There are various land use characteristics that will define the design of the loop road. More urban development shall have a different character than areas reserved for open space. There are four different types of character proposed for the loop road:

1. Typical – Minimum 8 ft. sidewalk to each side of the street, which is separated from the street with planting strip. Predominantly lawn as the ground plane with canopy trees (See Figure 16.6 A & B, 16.7 A & B).
2. Urban – Located within the Academic Health Sciences District and similar to a city streetscape (See Figure 16.8 A & B).
3. Main Street – Located at the proposed mixed-use student housing south of Panther Village, similar in character to an urban street with canopy trees on regular spacing, with hardscape and limited groundcovers. A proposed widened northern sidewalk with decorative hardscape materials, benches, and lightning to create a gathering area for markets, tailgating opportunities and other outdoor activities (See Figure 16.9 A & B).
4. Major Intersections – A consistent landscape treatment at all internal intersections will provide traffic calming, pedestrian crossings, and visual reference within the campus. The landscape material will be characterized with palms, limited understory planting and a ground plane, that incorporates lawn and ornamental groundcovers. Concrete pavers may be utilized to identify to pedestrian crossings. Pedestrian crosswalk markings will be in place to identify to vehicles that pedestrian crossing is primary.



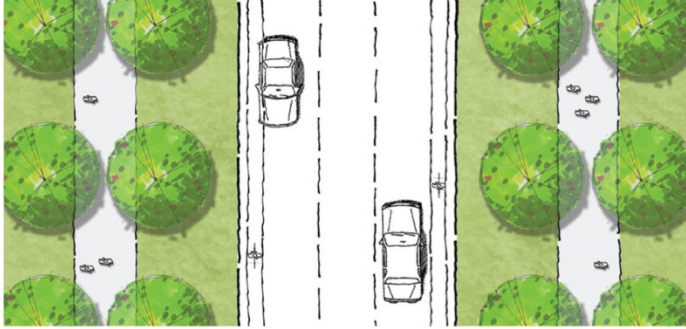
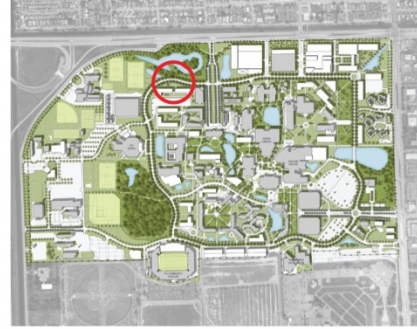


Figure 16.6A Plan of typical three-lane Campus Greenbelt



Key Map

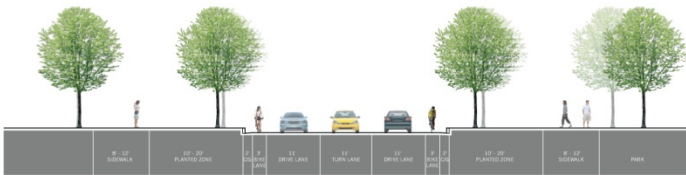


Figure 16.6B Section of typical three-lane Campus Greenbelt

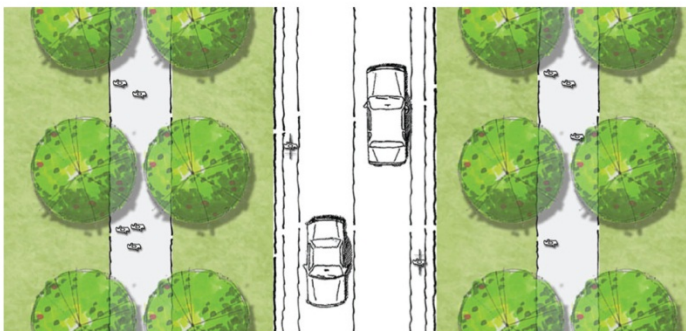


Figure 16.7A Plan of typical two-lane Campus Greenbelt at Northwest of FIU Arena



Key Map



Figure 16.7B Section of typical two-lane Campus Greenbelt

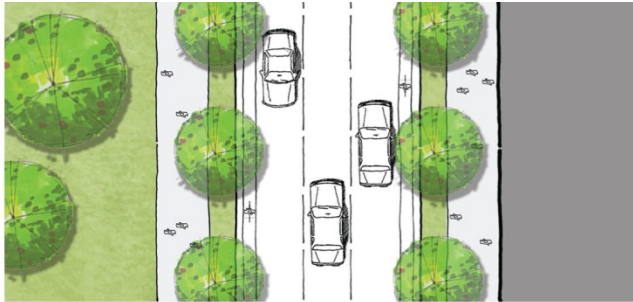


Figure 16.8A Plan of Campus Greenbelt at AHSC quad



Key Map

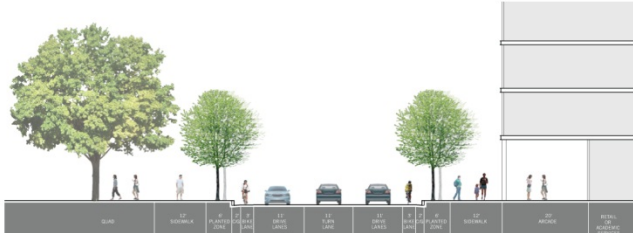


Figure 16.8B Section of Campus Greenbelt at AHSC quad



Figure 16.9A Plan of intersection at Main Street



Key Map



Figure 16.9B Section of Main Street



5. Secondary – Located south of the recreation center and north of Panther Village and similar in structure to the Greenbelt. Canopy trees shall be spaced evenly with pedestrian walkways on both sides. It is anticipated this road will become a pedestrian oriented corridor between the existing parking garages and the residential district. It is vital that it remains operable for service vehicles.

Policy 1.3.3

**BISCAYNE BAY CAMPUS:**

As part of the Green Spine that creates a connection between the existing academic campus and the existing conference center, the development of the street element component of the space will have a large impact on the perception of the campus (see Fig 16.10 A&B). The character of the street is similar to that of a main street with formal planting arrangements, large canopy trees at regular spacing, wide sidewalks and limited ground plane plantings. Crosswalks should be articulated with concrete pavers at the sidewalk level and striping's across the vehicle lanes. The eastern edge of the street is similar to that of a park with informal tree groupings and open lawn areas.

Entrances

Policy 1.3.4

**MODESTO A. MAIDIQUE CAMPUS:**

Primary Entrance: Similar to that of the SW 16<sup>th</sup> St at SW 107th Ave entrance and in a formal arrangement, the SW 17<sup>th</sup> St at SW 117th Ave shall be developed to the level of detail and plant palette (Fig 16.11 A&B). With the growth of the school, an increase in athletic activity associated with the expanded FIU stadium, and exiting access to the Florida Turnpike, this entrance will take on a more significant role as a functionally and visual representation for the school. The use of palms shall visually define the space while understory plantings will screen the existing uses. Sidewalks should be placed on both sides of the entry drive. This treatment will maintain the SW 112<sup>th</sup> Ave as the symbolic main entrance to the campus.

Policy 1.3.5

Secondary Entrances: Develop the SW 13<sup>th</sup> St at SW 117th Ave Entrance with a similar plant palette to the SW 17<sup>th</sup> St entrance. The use of palms in a formal arrangement as the primary canopy tree. The need for significant monument signage is not necessary. Understory plantings should be used to screen the adjacent uses. Sidewalks should be provided on both sides of the entrance.

Policy 1.3.6

Secondary Entrances: Develop SW 109th Ave at SW 8th St entrance as an urban street with evenly spaced canopy trees, wide sidewalks and minimal ground plane vegetation.



Figure 16.10A Green Spine at Biscayne Bay Campus



Key Map



Figure 16.10B Green Spine Section 1-1'

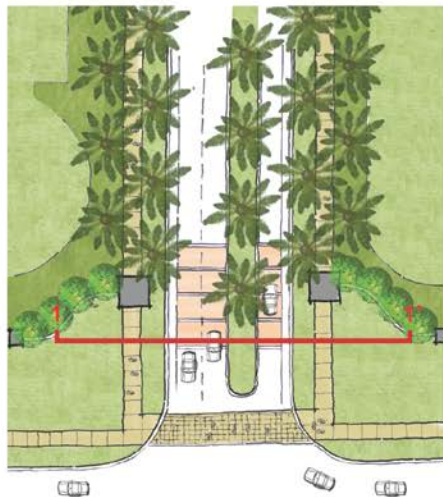


Figure 16.11A Plan of Proposed Entry Drive at Modesto A. Maidique Campus



Key Map



Figure 16.11B Entry Drive Section 1-1'

Policy 1.3.7	<p><b>ENGINEERING CENTER:</b></p> <p>Primary Entrance: Continue to develop an entry feature at West Flagler Street for vehicular and pedestrian access that is similar in plant palette, formal structure, with a similar visual hierarchy to that of Modesto A. Maidique Campus's SW 16<sup>th</sup> Street entry. The sidewalks should be relocated to allow for a planting strip between the existing drive lanes and sidewalks. The entrance should use palms within the median and on both sides of the entry drive. Understory plantings and ground plane vegetation shall be minimal to allow for sightlines to and from the park edge.</p>
Policy 1.3.8	<p>Secondary Entrance: As the campus grows, the NW 107<sup>th</sup> Ave entrance will serve as the primary vehicular entrance to the campus. The existing fence line should be removed and placed closer to the exiting parking lot to allow for a more significant and inviting entrance to be developed. Sidewalks should be located on either side of the entrance but separated from the drive lanes by a planting strip. The use of palms, understory plantings and ground plane vegetation similar to Modesto A. Maidique Campus's SW 16<sup>th</sup> Street entry shall create consistency between the campuses.</p>
Objective 1.4	Develop an enhanced and consistent quality for the Campus Edges.
Policy 1.4.1	<p><b>MODESTO A. MAIDIQUE CAMPUS:</b></p> <p>Develop an urban edge to the campus along SW 107<sup>th</sup> Avenue. As identified in the Academic Health Sciences Master Plan, SW 107<sup>th</sup> Ave is an urbanizing commercial corridor. Future building placement will position buildings closer to the street creating an urban edge similar to downtown cityscapes. Provide hardwood canopy trees and limited/low growing ground plane vegetation located within a defined planting strip between the vehicular drive lanes and sidewalk. Canopy trees should be spaced to allow for a continuous shaded walk.</p>
Policy 1.4.2	<p>Develop an urban edge along SW 8<sup>th</sup> street 600 ft. west of the SW 107<sup>th</sup> St intersection. Future building placement will position buildings closer to the street creating an urban edge similar to downtown cityscapes. Provide hardwood canopy trees and limited/low growing ground plane vegetation located within defined a planting strip between the vehicular drive lanes and sidewalk. Canopy trees should be spaced to allow for a continuous shaded walk.</p>
Policy 1.4.3	<p>Reinforce the existing park edge along SW 8<sup>th</sup> St to SW 117<sup>th</sup> Ave. A park edge is similar to that of a public park. While edges are often defined by street trees and sidewalks, the remaining space has groupings of canopy trees, minimal hardscape and predominately lawn as the ground plane.</p>
Policy 1.4.4	<p>Develop a landscape edge along SW 8<sup>th</sup> St west from the park edge. The planting should be informal in arrangement. Most consistently viewed from the community and along major traffic corridors, canopy trees along</p>

with palms and flowering trees will define the landscape edge. Understory plantings are encouraged to visually screen adjacent uses both into and from the campus. Groupings of palms and flowering trees are encouraged to break the pattern of canopy trees. A decorative perimeter fence integrated within the vegetation massing will further define the limits of the campus.

Policy 1.4.5

ENGINEERING CENTER:

Develop a park edge along West Flagler street. Plantings should be limited to random groupings of canopy trees and some flowering trees located near proposed walks in order to provide shade. Hardscape should be minimal with pedestrian walks creating connections between the campus and the external uses. The ground plane should be predominately lawn (Fig 16.12 A&B).

Policy 1.4.6

Develop a landscape edge along NW 107th Ave that enhances the visual quality of the campus while screening the parking from view. The planting should be informal in arrangement. Canopy trees along with palms and flowering trees will define the landscape edge. Understory plantings are encouraged to visually screen adjacent uses both into and from the campus. Groupings of palms and flowering trees are encouraged to break the pattern of canopy trees. A decorative perimeter fence integrated within the vegetation massing will further define the limits of the campus. Use sidewalks to create pedestrian connections and further enhance the aesthetic quality of the campus.

Policy 1.4.7

BISCAYNE BAY CAMPUS:

Develop a landscape edge along Bay Vista Blvd that enhances the visual quality of the campus while screening the parking from view. The planting should be informal in arrangement. Understory plantings are encouraged to visually screen the adjacent existing surface parking. Groupings of palms and flowering trees are encouraged to break the pattern of canopy trees. A decorative perimeter fence integrated within the vegetation massing will further define the limits of the campus. A bike path should be incorporated to allow for both pedestrian and bicycle circulation.

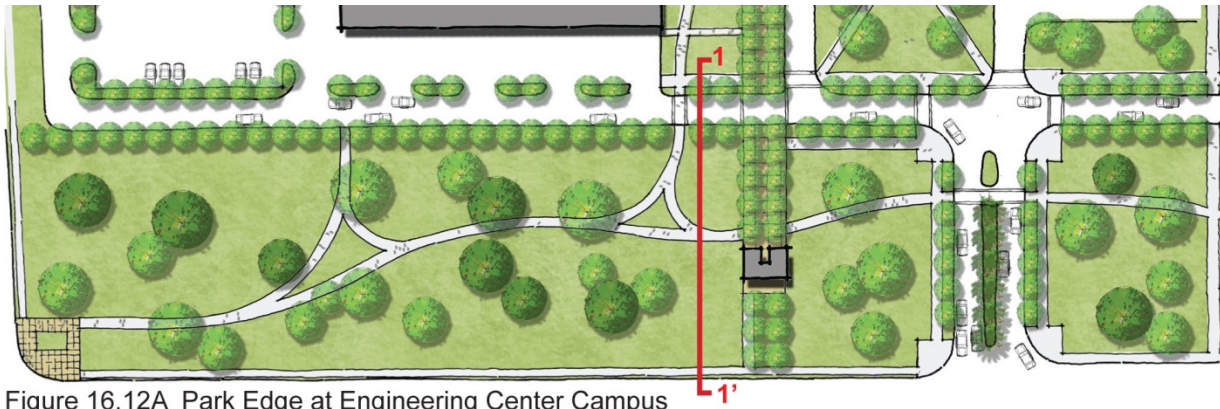


Figure 16.12A Park Edge at Engineering Center Campus

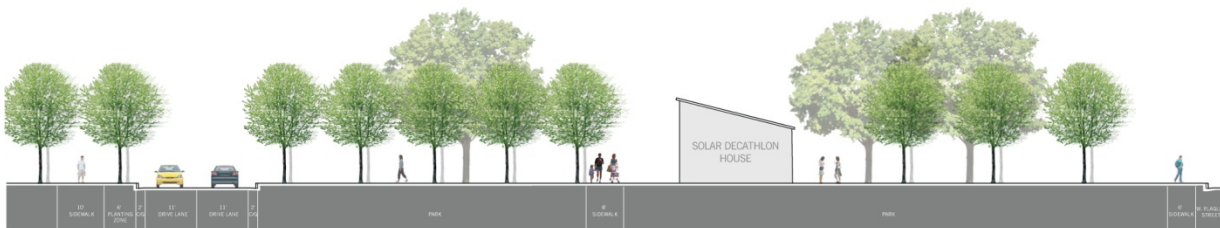
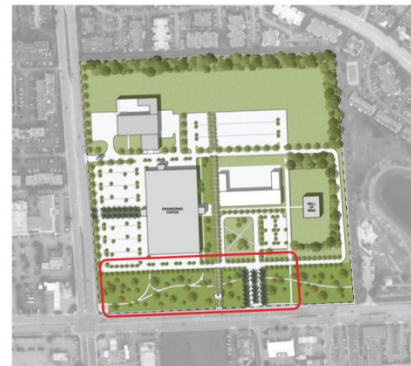


Figure 16.12B Park Edge at Engineering Center Campus Section 1-1'



Key Map

Policy 1.4.8	Continue to develop, preserve, and enhance views to Biscayne Bay along the Baywalk. Additional groupings of appropriate coastal plants should be located to further define view corridors from the campus and conference center. Groupings located adjacent to the existing bike loop shall incorporate additional site furnishings of benches and picnic tables.
<b>Objective 1.5</b>	<b>Plant Materials:</b> Modify and adopt a revised plant materials list upon Master Plan adoption, eliminating use of invasive exotic species and those which necessitate excessive maintenance; and adding species appropriate to traditional college campus settings.
Policy 1.5.1	<b>UNIVERSITY-WIDE:</b> To the degree possible, landscape plans shall include the use of plant species that are indigenous to the native plant communities of the South Florida area. The appropriate selection of native plant species shall be based on their desired size, form, texture and color in the landscape and their positive response to localized environmental conditions including available light levels, soil type and plant community context. In addition, selection of native species should be based on tolerance of existing site conditions, compatibility with other indigenous species and sustainability of the landscape to promote water conservation, to reduce maintenance considerations and to ensure a sustainable landscape or for educational purposes. In cases where non-invasive exotic plants are to be used to enhance the landscape, plantings should be limited to those non-invasive species that are able to resist periods of drought and which require little fertilization and use of pesticides. Prohibited plants as identified by Miami-Dade as well as the Exotic Pest Plant Council's "Florida's Most Invasive Species List" shall not be permitted in any future plantings.
Policy 1.5.2	As established in the Landscape Framework (16.0 Data and Gathering, Figures 16 A, B & C, Design Elements Matrix), the baseline plant list for FIU shall guide all future projects and renovations. Deviations from the approved plant list shall garner permission from FIU planning department prior to a release for construction approval. Prohibited plants as identified by Miami-Dade as well as the Exotic Pest Plant Council's "Florida's Most Invasive Species List" shall not be permitted in any future plantings
Policy 1.5.3	Monitor conformance of future construction projects with revised plant lists through University design review procedures.
Policy 1.5.4	It is the intent of FIU to remove all non-native plants (whether grasses, shrubs or trees) which are identified in the Exotic Pest Plant Council's "Florida's Most Invasive Species List" from the campus grounds. FIU shall coordinate with the Florida Department of Environmental Protection (FDEP) and other appropriate governmental entities to ensure the proper removal and disposal of these exotic species on campus.
Objective 1.6	<b>Furnishings, Lighting and Graphics:</b> Adopt standards for furnishings, lighting fixtures and signage depicted (16.0 Fig 16.0 B)



Policy 1.6.1	<p>UNIVERSITY-WIDE:</p> <p>FIU Facilities Management shall identify projects which may enhance campus safety and handicapped accessibility. Prioritize projects according to the following elements: 1) removal of barriers, 2) visibility, 3) enhanced lighting, 4) pedestrian/vehicular conflict.</p>
Policy 1.6.2	<p>As identified in the Landscape Framework, coordinate site furnishings, lighting fixtures, campus signage and graphic system with the identified manufacture and model numbers from selected materials used on campus and other acceptable products. As existing furnishings and lighting become unusable or deteriorated implement replacement furnishings according to approved University standards.</p>
Policy 1.6.3	<p>Follow the design review procedures established in 15.0 Architectural Design Guidelines Element to ensure that coordination of the landscape, furnishings and graphics on the campus are in accordance with the guidelines.</p>
Policy 1.6.4	<p>Future bicycle facilities shall use one selected type of bicycle rack with adequate adjacent pavement to accommodate bicycle traffic and under cover if possible. Plantings shall be kept away from area a sufficient distance to allow for bicycle maneuverability.</p>
Policy 1.6.5	<p>Public transportation facilities shall be consistent with Architectural Guidelines. They should be sited to allow visibility and ease of access for both vehicular and pedestrian traffic. Landscape treatment of facilities should provide shade if not provided by shelter.</p>
<b>Objective 1.7</b>	<p><b>Retention/Storm water Elements: Adopt standards for landscape edge treatments surrounding ponds, lakes and storm water features.</b></p>
Policy 1.7.1	<p>UNIVERSITY-WIDE:</p> <p><b>Consistent with regulatory requirements, plant native wetland littoral vegetation along gradually sloping banks of lakes and water features located wherever appropriate.</b></p>
Policy 1.7.2	<p>Consistent with regulatory requirements, provide where necessary "hard edge" pedestrian treatments of water bodies in intensely developed areas.</p>
Policy 1.7.3	<p>FIU shall follow the design review procedures established in 15.0 Architectural Design Guidelines Element to ensure conformance of future construction projects with referenced standards.</p>

**Objective 1.8**                      **Phasing: Implement landscape improvements in three phases, consistent with the scheduling of new academic, housing, recreation and support buildings to which landscape improvement components will be allocated.**

**Policy 1.8.1**                      **UNIVERSITY-WIDE:**  
FIU Facilities Management should establish administrative and budgeting procedures to insure the inclusion of landscape features identified in the objectives in the project budgets developed for future campus construction.

**Policy 1.8.2**                      Implement the landscape concept plan by allocating each future and existing building a proportional share of overall planned landscape improvement cost.