EXHIBIT NO. 4 – PROCEDURES TO IDENTIFY AND MANAGE ENVIRONMENTAL ISSUES DURING DEMOLITION, RENOVATION, AND NEW CONSTRUCTION PROJECTS AT THE UNIVERSITY OF WEST FLORIDA
EXHIBIT 4

PROCEDURES TO IDENTIFY AND MANAGE ENVIRONMENTAL ISSUES DURING DEMOLITION, RENOVATION, AND NEW CONSTRUCTION PROJECTS AT THE UNIVERSITY OF WEST FLORIDA

It is incumbent upon the A/E to verify the most current revision of the University of West Florida’s “Contractor Hazardous Waste Management Program” The document can be found at the following link:

http://nautical.uwf.edu/Files/Clan/110/Finalcon1.PDF

OR

http://uwf.edu/Envhs/programs.cfm

Scroll down to the Hazardous Waste bullet. Select the first sub-item: "Contractor Hazardous Waste Management Program"
UNIVERSITY OF WEST FLORIDA

PROCEDURES TO IDENTIFY AND MANAGE ENVIRONMENTAL ISSUES DURING DEMOLITION, RENOVATION AND NEW CONSTRUCTION PROJECTS

February 1998

Environmental Health and Safety
University of West Florida
11000 University Parkway
Pensacola, Florida 32514
(850) 474-2177/2435
PROCEDURES TO IDENTIFY AND MANAGE ENVIRONMENTAL ISSUES DURING DEMOLITION, RENOVATION AND NEW CONSTRUCTION PROJECTS AT THE UNIVERSITY OF WEST FLORIDA

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Summary of
PROCEDURES TO IDENTIFY AND MANAGE ENVIRONMENTAL
ISSUES DURING DEMOLITION, RENOVATION, AND NEW
CONSTRUCTION PROJECTS AT THE UNIVERSITY OF WEST
FLORIDA

The Florida Department of Environmental Protection (DEP) has determined that regulated small and
large quantity generators of hazardous waste are responsible for all hazardous wastes generated on
their sites. Therefore, contractors working on the campus must comply with the same federal and state
regulations pertaining to hazardous waste management and disposal as the University.

All contractors, sub-contractors, and their employees, intending to bid on projects and do work
for the University of West Florida, must comply with these procedures as summarized. A
complete copy of the procedures may be obtained by contacting one of the Departments listed
at the end of this summary. Violations of State and Federal regulations could result in fines or
civil and criminal action against the Contractor or the University. The following guidelines have
been developed to assist the Contractor and the University in meeting the requirements of the
state and federal regulatory agencies.

1. Prior to commencement of all demolition and renovation projects, the contractor shall receive a site
inspection report from the Office of Environmental Health and Safety (EH&S), A/E, Environmental
Consultant, or Project Manager identifying any potential building components of an environmental
concern within the scope of the renovation or demolition only. {10.4.1}

2. Prior to contracting for work, each contractor, subcontractor, and their employees who use hazardous
materials and may generate a hazardous waste must provide evidence of having received RCRA
Hazardous Waste Awareness Training and annual refresher training as required by 40 CFR 265.16
and 262.34. {10.5.3}

3. Contractors and subcontracts shall identify all hazardous materials and maintain Material Safety
Data Sheets (MSDS) for each product on site as required by the OSHA Hazard Communication
Standard. {10.4.2 and 10.7.1.3}

4. Contractors shall be responsible for estimating the type and quantity of hazardous waste that will be
generated by all contractor employees and sub-contractors prior to start of a project. {10.4.2}

5. The General Contractor shall be responsible for the proper identification, and management of all
hazardous wastes within the scope of a given project. Specifically, contractors must identify a secure
waste accumulation area, store waste in appropriate containers, identify the contents of the containers
including the words HAZARDOUS WASTE, and inspect the containers on a weekly basis. The
inspection must be documented. {10.1.5.3}

6. The Contractor shall turn all properly identified hazardous waste over to the University, Office of
Environmental Health and Safety, at the end of the project or other agreed upon time. Any other
arrangements shall have prior written approval from the Office of Environmental Health and Safety and
the Office of Facilities Planning. {10.1.5.4}

7. HAZARDOUS WASTE shall not be removed from the campus by contractors or sub-contractors, unless prior
arrangements have been made with the University and the waste is properly manifested and transported by a
licensed hazardous waste transporter. {10.1.5.5}

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8. The Office of Environmental Health and Safety will verify the identification of the waste. If the identification is unacceptable, EH&S will not accept the waste and the contractor shall bear the cost of laboratory analysis for adequate identification. (10.1.5.6)

9. All hazardous waste will be shipped off site using the University's hazardous waste contractor, under a manifest bearing the USEPA ID# of the University of West Florida, and signed by a University EH&S representative, unless prior arrangements have been made and approved in writing by UWF Office of EH&S and Facilities Planning. (10.13.5)

10. All hazardous waste turned over to the University shall be contained in appropriate, compatible, and closed, containers for the type and volume of waste generated. Containers may include DOT approved 55 or 30 gallon open-head or closed-head drums, 5 gallon pails or cans, etc., or possibly the original container. The contractor shall be responsible for providing the appropriate container for all types of hazardous waste generated. (10.10.3)

11. Paint brushes, rollers, rags, sludges, absorbent, etc. used with oil paints or solvents, and that are waste materials shall be placed in 5 gallon sealable buckets, or other appropriate size containers. (10.1.5.7)

12. In no cases shall evaporation be used to dry solvent laden materials destined for disposal. Evaporation of waste solvents is considered illegal disposal of hazardous waste. (10.1.5.7)

13. All hazardous waste must be stored in a secured, locked, and safe location. Incompatible waste (acids/bases/flammables) must be stored in physically separate locations. Hazardous waste storage locations shall be coordinated and approved by EH&S. (10.6.1)

14. All hazardous waste containers must be closed at all times except when adding waste. (10.1.5.7)

15. Fluorescent bulbs and ballasts shall be removed from all lighting fixtures prior to disposal.
   a. Fluorescent bulbs shall be placed in appropriate size tube cartons from original cartons or available from bulb recycling facilities. Do not break bulbs. Do not tape bulbs. Broken bulbs must be placed in sealed containers and handled separately. Each box must be labeled in accordance with FAC 62-737 and dated. (10.12.3)
   b. Ballasts shall be separated into PCB and non-PCB categories and placed into separate 55 gallon (or appropriate smaller size) open-head steel DOT drum. Each drum must be labeled with appropriate labels: "PCB Ballasts for Recycling" or "Non-PCB Ballasts for Recycling". (10.12.4)

16. The Contractor shall be charged by the University for all hazardous waste based on the current contract rates with the University's Hazardous Waste Contractor. (10.1.5.9)

   The General Contractor and Sub-Contractors shall agree to all requirements as specified in the document entitled PROCEDURES TO IDENTIFY AND MANAGE ENVIRONMENTAL ISSUES DURING DEMOLITION, RENOVATION, AND NEW CONSTRUCTION PROJECTS AT THE UNIVERSITY OF WEST FLORIDA.

   For a copy of PROCEDURES TO IDENTIFY AND MANAGE ENVIRONMENTAL ISSUES DURING DEMOLITION, RENOVATION, AND NEW CONSTRUCTION PROJECTS AT THE UNIVERSITY OF WEST FLORIDA, or if you have questions concerning this information, please contact one of the following:

   Mr. Ron Hambrick, Director of Environmental Health and Safety -- (850) 474-2177
   Mr. Phil Turner, Director of Facilities Planning -- (850) 474-2938
   Mr. Burl McCoy, University Purchasing -- (850) 474-2627

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EXAMPLES OF TRADES THAT MAY GENERATE HAZARDOUS WASTES

Demolition Contractors
Roofing Contractors
Painting Contractors
Carpet/Floor Finish Applications
Speciality Application Contractors
Plumbers

EXAMPLES OF HAZARDOUS WASTE THAT MAY BE GENERATED

Florescent and HID Light Tubes
PCB/non-PCB Ballasts
Lead-containing Paint
Mercury Containing devices (thermostats & Controls)
Mineral Spirits
Toluene
Acetone
Oil based paints and stains
Paint Thinners
Aerosol cans (paints, cleaners, adhesives)
Roof Patch/tar
Carpet glue
PVC Primer and glue
Brushes, rollers, and rags used with oil based paint and solvents
Sludge from cleaning oil paints and equipment
Waste product from any container labeled flammable or combustible or that contain "petroleum distillates" or chlorinated hydrocarbon compounds.
HAZARDOUS WASTE DISPOSAL COSTS for Contractor Generated Hazardous Wastes

General contractors will be invoiced for hazardous waste generated by construction activities, including activities by sub-contractors, on their projects. All costs will be based on the University's most current contract prices with our licensed hazardous waste transporter and -TSD facility. Prices below reflect the maximum price for disposal of most construction related hazardous materials. In most cases, the actual charge will be less. Actual costs will be determined by packing methods after other "compatible" materials are included. (NOTE: These categories only reflect examples of types of waste, containers, and packing methods. Actual charges will be based on material identity, compatibility, properties, container type and sizes, etc.)

1. Flammable, combustible or latex paints, solvents, etc.
   (Examples: roofing patch, acetone, toluene, paint stripper, solvent-based cleaners, oil based paint/stain, mineral spirits)
   1 gallon (or less in 5 gallon overpack) $105 ea
   5 gallons (DOT approved container) $105 ea
   5 gallons (in 20 gallon over pack) $225 ea
   5 gallon (overpack) $105 ea
   10 gallon (overpack) $120 ea
   20 gallon overpack $225 ea
   30 gallon (overpack) $310 ea
   38 gallon AETS PLC, DOT115 Container $380 ea
   55 gallon (overpack) $525 ea

2. 1-tube (or less) of caulking
   (For other container sizes, See #1) $105 ea

3. Bulk Liquids(non-blendable- e.g mineral spirits w/paint residue)
   (In DOT Approved Containers)
   5 gallon $120 ea
   10 gallon $230 ea
   20 gallon $250 ea
   30 gallon $265 ea
   55 gallon $337 ea

4. Corrosives (Acids or bases)
   See #3

5. Aerosol Cans (in DOT approved Drums)
   5 gallon $125 ea
   10 gallon $240 ea
   20 gallon $255 ea
   30 gallon $300 ea
   55 gallon $645 ea

6. Fluorescent or HID Bulbs
   (Properly boxed and stored)
   4' or less straight tubes $0.262 ea
   4' or greater straight tubes $0.30 ea
   Compact fluorescent tubes $0.30 ea
   HID Lamps $0.65 ea
   U-tubes or other irregular shaped bulbs $0.26 ea
   Shatter shields $0.80 ea
   Broken Tubes $0.35 ea

7. PCB Ballasts (in DOT approved containers) $0.65 /lb
    Non-PCB Ballasts (in DOT approved containers) $0.55 /lb

Disposal costs for materials not conforming to these categories or properties will be obtained upon request.

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INTRODUCTION

During renovation, demolition and new construction projects, the Owner (University of West Florida - UWF) is responsible for ensuring that environmental issues affecting such projects, including hazardous waste issues, are handled in compliance with applicable regulations. To meet this obligation UWF requires performance of environmental site inspections prior to beginning building renovation, demolition, or new construction on all contracts awarded after December 1, 1997. Environmental issues identified during this pre-construction assessment are then addressed by either the UWF Office of Environmental Health and Safety, or by procurement of outside environmental consulting.

Contractors performing environmental remediation and traditional construction work on the University property handle hazardous materials on a regular basis. Since UWF may be responsible for hazardous materials brought onto and removed from the University property, contractors performing work are required to properly monitor, handle, transport and dispose of these hazardous materials in accordance with University procedures and Federal and State regulations. To ensure contractor compliance with hazardous material management practices, all construction contracts between the Owner and the Contractor incorporate specific language to contractually obligate contractors to properly manage these materials. This language is incorporated into each standard construction contract in the Section “Supplemental General Conditions for Handling of Hazardous Materials”.

Two options are available for the disposal of hazardous waste: (1) The contractor may turn all hazardous waste generated from a project over to the University and pay direct cost of disposal to the University; or (2) the Contractor may, upon prior approval of the University, sub-contract with a licensed hazardous waste contractor to package and transport the waste to an EPA approved hazardous waste TSD facility following strict guidelines included in this specification and Federal and State regulations. The preferable method is to turn properly identified and contained waste over to the University.

This document contains requirements for a pre-construction environmental site inspection, and contract provisions for modification of the construction contract. A flow chart (Figure 1) on the following page outlines general steps that should be followed by UWF Project Managers when performing a construction project.

This document includes the following exhibits:

Exhibit A Site Inspection for Demolition and Renovation Projects: Exhibit includes the purpose of the site inspection, applicability and scope of work for site inspection, and a site assessment checklist as Appendix A.

Exhibit B Supplemental General Conditions for Handling of Hazardous Materials: Exhibit B includes modification to the contract that provides Contractors general guidance for management of hazardous materials.

NOTE TO THE ARCHITECT: Include Exhibit B in the General Conditions of the Contract for Construction.
FIGURE 1
FLOW CHART FOR CONSTRUCTION PROJECTS
TO MANAGE HAZARDOUS MATERIALS
Exhibit A

SITE INSPECTION FOR DEMOLITION AND RENOVATION PROJECTS
SITE INSPECTION FOR DEMOLITION AND RENOVATION PROJECTS

Applicability

A site inspection will be performed during pre-design phase of all demolition and demolition/renovation projects on the UWF campus. The inspection can be performed by appropriately trained UWF personnel when coordinated with the Office of Environmental Health & Safety (EH&S) and/or appropriately trained outside environmental consultants (licensed if required). The scope of work, outlined below can be used as a guideline to perform such inspections or can be used as part of the request for proposal for the environmental consultant and/or Architect/Engineer (Designer).

Purpose and Scope of Site Inspection

Perform an environmental assessment of the structure (building) to be demolished or the part of the building which will be renovated to address any potential on-site environmental liabilities associated with waste generation, handling, storage and disposal activities. Site inspection, interviews, record reviews and report preparation shall be performed by an environmental professional possessing sufficient training and experience or UWF Environmental Health and Safety personnel as appropriate. The report shall be reviewed by UWF EH&S. The tasks to be performed include but are not limited to the following:

- To identify the presence or likely presence of any hazardous substances or other environmental issues at the demolition/renovation site.

- To conduct additional investigations or tests to determine whether solid waste material is hazardous waste or not.

- To inform the contractor and University personnel of pertinent findings which may affect its work by amending the General Conditions of the Contract for Completion with Supplementary Conditions.

Records Review

The purpose of the records review is to obtain and review records that will help identify the potential environmental issues at the project site.

Pertinent records shall be reviewed to determine past or present use or storage of asbestos-containing material (ACM), lead-based paint (LBP), lead-containing building components, PCBs in transformers/capacitors, mercury-containing light devices, underground or above ground storage tanks, equipment containing hydraulic fluids, equipment containing refrigerants, photographic equipment, radioactive material or biological hazards.

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Available records to be reviewed include the following:

1. As-built and renovation drawings
2. Asbestos records
3. Lead paint records
4. Hazardous waste records
5. Material Safety Data sheets (MSDS)
6. Other pertinent available records
7. Past/Present use of facility (i.e. clinical or research laboratory, chemical manufacturing, etc.)

• **Interviews**

The objective of interviews is to obtain information from persons concerning knowledge of environmental issues of the project site. Interview with project manager, building occupants, building maintenance personnel, EH&S personnel and others to obtain information outlined in the checklist and questionnaire.

• **Evaluation and Report**

Summarize findings of the inspection and conclusions of the impact of recognized environmental conditions in connection with the renovation/demolition project, and provide recommendations to resolve potential environmental / hazardous waste issues which may be encountered during the upcoming project.

• **Review of Inspection Report**

The inspection report shall be reviewed by UWF EH&S prior to the bidding phase of the project.
Appendix A

SITE ASSESSMENT CHECKLIST FOR DEMOLITION AND RENOVATION PROJECTS

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SITE ASSESSMENT CHECKLIST
FOR DEMOLITION AND RENOVATION PROJECTS

1. General Information

1.1 Building Information
UWF Building Number ____________________________________________
Current Use of the Building _______________________________________
Occupied or Unoccupied _________________________________________

1.2 Type of Construction Project
Demolition ___________________________________________________________
Renovation __________________________________________________________
New construction ______________________________________________________
If Demolition/Renovation, Specify Area or Scope. ____________________________________________________________

1.3 Project Design By
Name of A/E Firm or UWF Project Manager ___________________________

1.4 Site Assessment By
UWF EH&S Environmental Consultant ________________________________
Date _______________________________________________________________

1.5 Site Construction
UWF Maintenance Contractor Name _________________________________

2. Site Inspection

2.1 Asbestos
- Asbestos Survey Conducted _________________________________________
- Is ACM Present? _________________________________________________
  If yes, must be abated prior to demolition/renovation ________________

2.2 Lead Based Paint
- Lead Paint Survey Conducted ______________________________________
- Lead Paint Present ________________________________________________
  If yes, work practices and disposal issues must be evaluated.
2.3 Lead Containing Building Materials
- Are other lead containing products present  yes  no
- Roof Flashing  yes  no
- Plumbing  yes  no
- Lead Plaster  yes  no
- Batteries  yes  no
- Other ________________________________

If yes, must be handled and disposed properly.

2.4 PCB
- Are known PCB containing products present?  yes  no
- Light ballasts  yes  no
- Capacitors  yes  no
- Transformers  yes  no
- Other ________________________________

If yes, must be handled and disposed of properly.

2.5 Mercury Containing Devices
- Fluorescent Lamps  yes  no
- HID Lamps  yes  no
- Thermostats  yes  no
- Switches  yes  no
- Other ________________________________

2.6 Fume Hoods
- Are Fume Hoods present?  yes  no
- If yes, what type? ________________________________
- Do they contain ACM?  yes  no
- Have contents been removed?  yes  no

2.7 Solvents/Paints/Flammable Materials
- Are solvents/paints stored in the area  yes  no
- If yes, they must be relocated or addressed.

2.8 Underground/Aboveground Storage Tanks
- Are UST's/AST's located on site?  yes  no
- If yes, describe. ________________________________

2.9 CFC's/Refrigerants
- Does the site contain any refrigeration equipment?  yes  no
- List ________________________________

If yes, freons must be recovered/recycled by qualified individual.
2.10 Miscellaneous Hazardous Material/Waste

Identify if any of the following are present

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Batteries</td>
<td>yes no</td>
</tr>
<tr>
<td>b) Adhesive glues/removers</td>
<td>yes no</td>
</tr>
<tr>
<td>c) Pressurized gas cylinders</td>
<td>yes no</td>
</tr>
<tr>
<td>d) Poisons</td>
<td>yes no</td>
</tr>
<tr>
<td>e) Oxidizers</td>
<td>yes no</td>
</tr>
<tr>
<td>f) Flammable Materials</td>
<td>yes no</td>
</tr>
<tr>
<td>g) Aerosol Cans</td>
<td>yes no</td>
</tr>
<tr>
<td>h) Other</td>
<td></td>
</tr>
</tbody>
</table>
EXHIBIT B

SUPPLEMENTAL GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION
SUPPLEMENTAL GENERAL CONDITIONS
FOR HANDLING OF HAZARDOUS MATERIALS

The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction." Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by the Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause shall remain in effect.

ARTICLE I BASIC DEFINITIONS

1.1.8 HAZARDOUS MATERIAL. The term "Hazardous Materials" shall include hazardous substances and hazardous wastes as follows:

1.1.8.1 A hazardous substance shall include the following:

(a) Listed hazardous substances. The elements and compounds and hazardous wastes appearing in 40 CFR Part 302, Table 302.4.

(b) Unlisted hazardous substances. A solid waste, as defined in 40 CFR 261.2, which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b), is a hazardous substance if it exhibits any of the characteristics identified in 40 CFR 261.20 through 261.24.

1.1.8.2 A hazardous waste is defined as a waste that:

(a) Causes, or significantly contributes to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness:
or

(b) Poses a substantial present or potential hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed.

These wastes can either be specifically listed in 40 CFR 261 Subpart D, or they may meet any of four hazardous waste characteristics: Ignitable (flash point less than 60°C/140°F); Corrosive (pH less than 2.0 or greater than 12.5); Toxic (TCLP extract exceeds regulatory limits in 40 CFR 261.24); Reactive (unstable, reacts violent or capable of detonation.)

3.20 HANDLING OF HAZARDOUS MATERIAL
Add the following paragraphs:

3.20.1 The Contractor shall be responsible to the University of West Florida for proper handling, storage and disposal of any Hazardous Materials identified in the Contract Documents to be within the scope of the Work, any Hazardous Materials brought to the Project site by the Contractor or anyone for whom the Contractor is responsible, and any Hazardous Materials generated by the Contractor or anyone for whom the Contractor is responsible.

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3.20.2 If the Contractor performs any Work knowing or having reason to know that it is contrary to laws or regulations governing the handling, storage and disposal of Hazardous Materials, the Contractor shall bear all claims, costs, fines, penalties, losses and damages caused by, arising out of or resulting therefrom; however, it shall not be the Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with laws and regulations, but this shall not relieve the Contractor of Contractor's obligations under Subparagraph 3.7.3.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY OF PERSONS AND PROPERTY
Replace Subparagraphs 10.1.2, 10.1.3, and 10.1.4 with the following Subparagraphs.

10.1.2 The Owner shall be responsible for any asbestos, PCBs, petroleum, Hazardous Material or radioactive material uncovered or revealed at the site which was not shown or indicated in Drawings or Specifications or identified in the contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the site. The Owner shall not be responsible for any such materials brought to the site by the Contractor, Subcontractor, Suppliers or anyone else for whom the Contractor is responsible. Refer to Paragraph 3.20 of the Supplementary Conditions to the General Conditions of the Contract for Construction for requirements concerning hazardous materials brought on-site or otherwise generated by the Contractor.

10.1.3 The Contractor shall immediately: (1) stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by Paragraph 10.3, and (2) notify the Owner and the Architect/Engineer (and thereafter confirm such notice in writing). The Owner shall promptly consult with the Architect/Engineer concerning the necessity for the Owner to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. The Contractor shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after the Owner has obtained any required permits related thereto and delivered to Contractor special written notice: (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely. If the Owner and Contractor cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Sum or Contract Time as a result of such Work stoppage or such special conditions under which Work is agreed by the Contractor to be resumed, either party may make a claim therefor as provided in Articles 7 and 8.

10.1.4 If after receipt of such special written notice the Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then the Owner may order such portion of the Work that is in connection with such hazardous condition or in such affected area to be deleted from the Work. If the Owner
and Contractor cannot agree as to entitlement to or the amount or extent of
an adjustment, if any, in Contract Sum or Contract Time as a result of
deleting such portion of the Work, then either party may make a claim
therefor as provided in Articles 7 and 8. Owner may have such deleted
portion of the Work performed by Owner’s own forces or others in
accordance with Paragraph 6.1 of the General Conditions of the Contract for
Construction.

10.1.5 Purpose

10.1.5.1 General: The University of West Florida (UWF) Main Campus is
classified by the EPA as a "small quantity generator" of hazardous
waste. As a result of this classification, UWF must comply with
stringent regulations in regard to hazardous waste handling,
storage, disposal, and personnel training. Regulations also require
UWF to take steps to reduce the amount of hazardous waste it
generates. The purpose of this Section is to define minimum
requirements to be followed by the Contractor for hazardous
waste characterization and disposal, waste minimization, personnel
training, and notifications.

10.1.5.2 Scope: This Section outlines procedures necessary for handling
small quantities of hazardous waste generated by the Contractor
during the Work, or hazardous waste generated incidental to the
Work, and basic pollution prevention requirements.

10.1.5.3 The General Contractor shall be responsible for the proper
identification, and management of all hazardous wastes within the
scope of a given project. Specifically, contractors must identify a
secure waste accumulation area, store waste in appropriate
containers, identify the contents of the containers including the
words HAZARDOUS WASTE, and inspect the containers on a
weekly basis. The inspection must be documented.

10.1.5.4 The Contractor shall turn all properly identified hazardous waste
over to the University, Office of Environmental Health and Safety,
at the end of the project or other agreed upon time. Any other
arrangements shall have prior written approval from the Office of
Environmental Health and Safety and the Office of Facilities
Planning.

10.1.5.5 HAZARDOUS WASTE shall not be removed from the campus by
contractors or sub-contractors, unless prior arrangements have
been made with the University, and the waste is properly
manifested and transported by a licensed hazardous waste
transporter.
10.1.5.6 The Office of Environmental Health and Safety will verify the identification of the waste. If the identification is unacceptable, EH&S will not accept the waste and the contractor shall bear the cost of laboratory analysis for adequate identification.

10.1.5.7 Paint brushes, rollers, rags, sludges, absorbent, etc. used with oil paints or solvents, and that are waste materials shall be placed in 5 gallon sealable buckets, or other appropriate size containers. In no cases shall evaporation be used to dry solvent laden materials destined for disposal. Evaporation of waste solvents is considered illegal disposal of hazardous waste. All hazardous waste containers must be closed at all times except when adding waste.

10.1.5.8 Intent of Hazardous Waste Disposal: If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, the Contractor shall be responsible for performing: waste characterization; waste packaging; completion of the Uniform Hazardous Waste Manifest; transportation; and disposal. The Contractor shall furnish all labor, equipment, materials, worker training, analytical services, transportation and disposal, and is responsible for costs, fees, licenses and permits related to handling these hazardous wastes.

10.1.5.9 Limitations: Projects that result in generation of 55-gallons or greater of hazardous waste or one (1) quart of acutely hazardous waste will require review by UWF's Office of Environmental Health and Safety to determine if this Section remains applicable to the Work. For all projects, the contractor shall make arrangements with UWF Office of EH&S to collect, temporarily store, and dispose of the waste. Contractors shall be responsible for all costs incurred for hazardous waste disposal. Method of payment shall be determined at the pre-bid conference.

10.2 Applicable Regulations and Publications: In order to prevent and provide for the control of any environmental pollution or damage arising from the construction activities of the contractor in the performance of this Contract, all applicable federal, state, and local laws and regulations concerning environmental pollution control and abatement, as well as the specific requirements stated elsewhere in the Contract Documents, shall be complied with. The Contractor shall be familiar with applicable codes and regulations if it generates, manages, transports, or disposes of hazardous wastes. Following is a listing of applicable regulations. The most recent issue of each rule, code, or regulation shall govern. Where conflict exists among various requirements or with these specifications, the more stringent requirements shall apply.

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10.2.1 TITLE 29, CODE OF FEDERAL REGULATIONS, U.S. DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS.

Part 1910.20 Access to Employee Exposure and Medical Records
Part 1910.120 Hazardous waste operations and emergency response
Part 1910.134 Respiratory Protection
Part 1926.21 Safety Training and Education
Part 1926.59 Hazard Communication

10.2.2 TITLE 40, CODE OF FEDERAL REGULATIONS, U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) STANDARDS.

Part 50 National Primary and Secondary Ambient Air Quality Standards
Part 260 Hazardous Waste Management Systems - General
Part 261 Identification and Listing of Hazardous Waste
Part 262 Generators of Hazardous Waste
Part 263 Transporters of Hazardous Waste
Part 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Part 268 Land Disposal Restrictions
Part 279 Standards for the management of used oil
Part 761 Polychlorinated biphenyls (PCBS)

10.2.3 TITLE 49, CODE OF FEDERAL REGULATIONS, U.S. DEPARTMENT OF TRANSPORTATION (DOT) STANDARDS

Part 171 Hazardous Substances
Part 172 Hazardous Materials Tables and Hazardous Subparts B & C Materials Communications Regulations
Part 173 Shippers - General Requirements for Shipments and Packaging
Part 178 Specifications for packaging

10.2.4 STATE OF FLORIDA:


Florida Statutes Section 403, Chapter 93-207 Section 55, Environmentally Sound Management of Mercury-Containing Devices and Lamps.

Florida Administrative Code Rule 62-710, Used Oil Management


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10.3 **Permits And State Licenses:** If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, the Contractor shall be responsible for obtaining necessary permits, state licenses, and certifications of personnel in conjunction with hazardous waste removal, hauling, and disposal and shall provide timely notification of such actions as may be required by Federal, State, regional, and local authorities. Fees and/or charges for these licenses, permits and notifications shall be paid by the Contractor.

10.4 **Pre-Work Inspection:**

10.4.1 Pre-Work Inspection - Prior to commencement of work, request from UWF Project Manager information on a site specific environmental building assessment. Inspect areas where the Work will be performed to determine if hazardous materials or hazardous waste will be impacted.

10.4.2 Contractor's Materials: The Contractor shall estimate the quantity and types of hazardous wastes that will be generated due to Contractor's materials and operations. As a submittal, provide a table that lists each material to be brought on-site, material quantity, and attach a copy of the MSDS for each material listed.

10.4.3 Pre-Work Notification - Notify UWF Office of Environmental Health and Safety and provide an estimate of the quantity of hazardous wastes that will be generated, and description on how wastes will be managed (stored, transported, recycled, reclaimed, disposed) prior to commencement of work.

10.5 **Contractor's Responsibility for Protection of Human Health the Environment:**

10.5.1 General Requirements: The Contractor shall be responsible for the safety and protection of its workers, the public and the environment from hazards created by the construction operations.

10.5.2 Protection of Water Resources: The Contractor shall not take any action which will adversely affect the existing Water Quality Standards of any waters of the State (ground water and surface water runoff), or which would otherwise contribute to pollution of these water resources. No fuel oils, bitumens, calcium chloride, acids, paints, construction wastes or otherwise harmful materials shall be permitted to enter these waters.

10.5.3 Personnel Training: All Contractor's employees (including Subcontractor and Sub-Subcontractor) exposed to or otherwise working with hazardous substances and health hazards, and their supervisors and management responsible for the site, shall receive training required under EPA regulation 40 CFR 265.16 and applicable OSHA regulations prior to the start of the Project. Affected employees, supervisors and management shall complete and submit the "RCRA Required Hazardous Waste Awareness and Handling Training" form or certificate of course completion. The Contractor shall maintain on-site a copy of all applicable training certificates, and shall supply copies to the UWF Office of Environmental Health and Safety.

February 1998
10.6 Security:

10.6.1 Contractors that generate and store hazardous materials or hazardous wastes on UWF property shall ensure the secure storage of these materials, and prevent unauthorized persons from access to these materials. Hazardous materials and hazardous waste shall be stored in sealed and properly labeled containers, removed from physical damage, and physically locked in a secure area.

10.7 Submittals:

10.7.1 Pre-Work Submittal:

10.7.1.1 RCRA required Hazardous Waste Awareness and Handling Training form (see Appendix) or certificate of training.

10.7.1.2 Provide statement affirming that Contractor has developed and implemented a Health and Safety Plan, Hazard Communication Program Contingency Plan and site specific Emergency Response Plan as required by applicable OSHA regulations, and that all the Contractor's Employees and anyone for whom the Contractor is responsible are familiar with the documents to the extent necessary to perform their specific tasks.

10.7.1.3 Inventory of chemicals or other hazardous materials to be brought on-site by the Contractor, and MSDS sheets for each substance listed.

10.7.1.4 If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, provide proof of Hazardous Waste Contractor's U.S. EPA Identification Number for transportation, and disposal of hazardous waste (refer to 40 CFR 262.12),

10.7.2 During-Work Submittal:

10.7.2.1 Special Reports (See 10.9.1):

a.) Accident Reports; i.e. accidents, spills, etc.

b.) Report Discovered Conditions; i.e. leaking containers, etc. (See 10.9.2)

10.7.2.2 Analysis report for waste sampling.

10.7.2.3 Contractor certification for hazardous waste disposal, if the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University.
10.7.3 **Post-Work Submittal:** If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, the Contractor shall furnish:

10.7.3.1 Receipts from the landfill operator, that acknowledge the Contractor's delivery(s) of material.

10.7.3.2 Copy of all hazardous waste manifests used for shipment of hazardous wastes.

10.8 **Recordkeeping:**

10.8.1 EPA Record Requirements: Maintain all records related to hazardous waste generation, testing, transportation and recycling or disposal, for a period of 3 years in accordance with EPA regulation 40 CFR 262.40.

10.8.2 OSHA Record Requirements: Maintain all personnel medical surveillance records in accordance with OSHA regulation 29 CFR 1910.120 (f), if applicable.

10.9 **Special Reports:**

10.9.1 Accident Reports: When an accident, personal injury or an event of unusual and significant nature occurs at site, the Contractor shall prepare and submit a special report listing the chain of events, persons participating, response by the Contractor's personnel, and similar pertinent information.

10.9.2 Report Discovered Conditions: When hazardous conditions, hazardous materials or hazardous wastes are unexpectedly uncovered during the work, the Contractor shall stop all Work in connection with such hazardous conditions and immediately notify UWF Office of Environmental Health and Safety and the Architect/Engineer. Within 24 hours the Contractor shall submit a report indicating the condition discovered and details of the actions taken.

10.10 **Hazardous Waste Accumulation:**

10.10.1 General: Generators of hazardous waste may accumulate at or near any point of generation up to 55-gallons of hazardous waste or one (1) quart of acutely hazardous waste. This area will be a "satellite accumulation area" as defined in 40 CFR 262.34(c). Unless prior arrangements have been made, EH&S should be contacted for collection of the waste.

10.10.2 Approval for Accumulation and Storage of Hazardous Waste: Prior to accumulation and storage of hazardous waste on UWF property the Contractor must obtain from UWF written approval for conditions of storage proposed.
10.10.3 Conditions of Waste Accumulation: All containers shall be marked with the words "HAZARDOUS WASTE" and the contents. Once the 55-gallon or one quart limits of acutely hazardous waste have been reached, the waste must be transferred to off-site permitted treatment, storage or disposal facility within three (3) days. The Contractor may accumulate waste on-site provided it is in accordance with 40 CFR 262.34(a).

10.10.4 Storage and shipping containers shall be both airtight and watertight and conform to DOT Standard 49 CFR 178.224. Each container shall be constructed of fiber, hard plastic, or metal, as appropriate for the waste contained, and provided with locking lids.

10.10.5 Time - The date and time when accumulation began, and the date and time when the container was filled and sealed, shall be marked on each waste container.

10.10.6 Prior to UWF EH&S collecting the waste from the Contractor, the Contractor shall complete the Contractor Certification Form (FORM II) attesting to the contents and label information.

10.11 Waste Characterization:

10.11.1 Solid Waste Characterization: If unable to characterize waste using product knowledge in accordance with 40 CFR 262.11(c)(2), solid wastes shall be sampled and submitted for testing by the Contractor to determine if the waste is hazardous in accordance with 40 CFR 261. The Contractor shall provide one copy of any material analysis report to the UWF Office of Environmental Health & Safety.

10.11.2 Sampling Requirements: Any waste sample collection performed for waste characterization analysis must be witnessed by UWF Office of Environmental Health and Safety or the Owner's Representative.

10.11.3 Notification: Based on the results of waste characterization testing, the Contractor shall prepare a written notification and certifications, in accordance with 40 CFR 268.7(a)(1) and (2), for submittal to the appropriate treatment, storage, or disposal facility to which the waste will be shipped. If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, notification and certifications, as defined above, shall accompany each shipment of hazardous waste and shall include as a minimum:

- EPA Hazardous Waste Number
- Waste constituents Treater will monitor
- Waste analysis data, where available
- Manifest number associated with the waste shipment
10.12 Special Waste Recycling or Reclamation:

10.12.1 General: Where possible, all hazardous materials and hazardous wastes shall be sent to a State approved recycler or reclamation center. Materials that shall be recycled include but are not limited to the following: used oil, freon, mercury, lead, lighting ballasts, and solvents.

10.12.2 Used Oil: Used oil and oil filters shall be managed and recycled in accordance with FAC 62-710.

10.12.3 Mercury: Fluorescent lighting tubes, high intensity discharge (HID) lighting, thermostat switches, and batteries may contain mercury. Should the Contractor’s Work include demolition of lighting fixtures or generation of spent mercury containing devices, the Contractor shall remove bulbs and devices undamaged and turn them over to the University. Fluorescent bulbs shall be placed in appropriate size tube cartons from original cartons or available from bulb recycling facilities. Do not break bulbs. Do not tape bulbs. Broken bulbs must be placed in sealed containers and handled separately. Each box must be labeled in accordance with FAC 62-737 and dated. If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, generators and transporters of mercury containing devices shall comply with provisions of the FAC 62-737.

10.12.4 Ballasts: Lighting ballasts removed during the work shall be turned over to the University for recycling. Ballasts shall be separated into PCB and non-PCB categories and placed into separate 55 gallon (or appropriate smaller size) open-head steel DOT drum. Each drum must be labeled with appropriate labels: "PCB Ballasts for Recycling" or "Non-PCB Ballasts for Recycling". Disposal of lighting ballasts removed from Owner's property is prohibited unless the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University.

10.13 Pre-Transport Requirements for Hazardous Waste:

10.13.1 General: The Contractor shall not mix hazardous materials or hazardous waste with other materials. Hazardous wastes shall be segregated until removal from the site.

10.13.2 Packaging: If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, the Contractor shall insure, before transporting hazardous waste, packaging shall be in accordance with applicable DOT regulations 49 CFR 173 and 178.
10.13.3 Marking and Labeling: If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, the contractor shall insure before transporting hazardous waste, that markings and labeling on each package are in accordance with DOT regulations 49 CFR 172 and EPA regulations 40 CFR 262.31, .32. Markings, labels, and generator identification information (including UWF's EPA I.D. number) shall be permanently affixed to all drums and shipping containers.

10.13.4 Storage of Containerized Hazardous Waste: Place sealed and labeled disposal containers of hazardous waste in a lockable trailer, dumpster, or other container approved for satellite storage of hazardous waste. Hazardous waste shall remain under the direct control of the Contractor and must never be left where unauthorized persons could gain access.

10.13.5 Manifest: If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, a properly completed manifest (EPA form 8700-22) shall accompany hazardous waste transported to the treatment, storage, or disposal site. Use the Owner's (University's) EPA identification number as the Generator. The manifest shall be completed by the Contractor's Hazardous Waste Contractor/Waste Hauler. Prior to shipment the Contractor shall complete the "Contractor's Certification" form (FORM III) located in the Appendix to this Section, and bring the completed manifest and certification form to the UWF Office of Environmental Health and Safety Hazardous Materials Manager for signature as the "Generator". The Contractor will be provided with copies of the manifest and certification by the Office of EH&S.

10.13.6 Placarding: If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, the Contractor shall insure that hazardous waste vehicles are placarded in accordance with DOT regulation 49 CFR 172 before transporting.

10.13.7 Third Party Supervision: If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, all shipments of hazardous waste must be supervised by the UWF Office of Environmental Health and Safety, Hazardous Materials Manager. Provide the Office of EH&S notification 24 hours in advance of any shipment of special or hazardous wastes.
# FORM I

**UNIVERSITY of WEST FLORIDA**  
**OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY**  
**RCRA REQUIRED**  
**HAZARDOUS WASTE AWARENESS AND HANDLING TRAINING**

## TRAINING TOPICS:

- HAZARDOUS WASTE GENERATOR TRAINING REQUIREMENTS
- WHAT IS A HAZARDOUS WASTE
- HAZARDOUS WASTE GENERATOR STATUS
- ACCUMULATION TIME LIMITS
- CONTAINER MANAGEMENT & ACCUMULATION POINT REQUIREMENTS
- SPILL CONTROL PROCEDURES
- HAZARDOUS WASTE PICK-UP SERVICE
- HAZARDOUS WASTE DISPOSAL OVER VIEW

I acknowledge that I have received instruction and written materials regarding the points listed above on the date indicated below.

<table>
<thead>
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<th>Annual Retraining</th>
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<tr>
<td>Trainee's Name</td>
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<td>Date of Training</td>
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**Other Information:**

- Trainee's Title: ____________________________
- Gender: M F
- Employer/Contractor: ______________________ Phone: __________ FAX: __________
- Supervisor's Name and Title __________________________

Do you require accommodations under the Americans with Disabilities Act? Y N

February 1998
FORM II

CONTRACTOR'S CERTIFICATION

(Hazardous Waste Turned over to the University)

This certification shall accompany each completed Uniform Hazardous Waste Manifest submitted to the UWF Office of Environmental Health and Safety. This is required to obtain the "Generator's" signature.

CERTIFICATION: By means of this certification, the Contractor hereby declares that the content of this consignment are fully and accurately described in the attached description or label including the wording "Hazardous Waste", contents, volumes, weights, and percent composition, as applicable.

I certify that I have made a good faith effort to minimize my waste generation.

Contract BR#/Name/or Other ID

Contractor's Signature ____________________________ Date __________

Contractor's Name (Printed) ____________________________ Date __________

Title or Position of Signatory

*******************************************************************************

(for EH&S Use Only)

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February 1998
FORM III

CONTRACTOR'S CERTIFICATION

(Contractor Disposes of Waste)

If the Contractor so chooses to dispose of the Hazardous Waste generated on a project, and prior approval has been obtained from the University, this certification shall accompany each completed Uniform Hazardous Waste Manifest submitted to the UWF Office of Environmental Health and Safety. This is required to obtain the "Generator's" signature.

CERTIFICATION: By means of this certification, the Contractor hereby declares that the content of this consignment are fully and accurately described in the attached Uniform Hazardous Waste Manifest by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable state, federal, and international regulations.

I certify that I have made a good faith effort to minimize my waste generation and select the best waste management method that is available.

Contractor's Signature _________________________ Date __________

Contractor's Name (Printed) _________________________ Date __________

Title or Position of Signatory __________________________

February 1998
EXHIBIT 5
PROJECT SIGN
EXHIBIT NO. 6 – CLOSEOUT SPREADSHEET (SAMPLE)
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EXHIBIT 7

TREE PROTECTION POLICY

UNIVERSITY POLICY PP- 01/2000 - revised 10/2001

TO: The University of West Florida Community

From: Dr. Morris Marx, President

SUBJECT: Tree Protection Policy

Policy/Purpose: To articulate UWF Policy concerning tree protection on campus

PREPARED BY: THE CAMPUS BEAUTIFICATION COMMITTEE MARCH 2000

Background and Philosophy

The University of West Florida, a state-designated preserve, is committed to the preservation of existing trees and advocates new tree plantings to promote the education, public health, general welfare, the environment, and aesthetics of the university. The purpose of these guidelines is to ensure the preservation and replacement of trees as a part of the University’s planned growth and development.

UWF and the local community enjoy many benefits that can be directly attributed to our trees:

- Trees produce oxygen, which is essential to the well being of all animal life.
- Trees help to reduce the amounts of dust and airborne pollutants, and they eliminate carbon dioxide.
- Trees and their root systems reduce soil erosion and storm-water runoff, decreasing sedimentation problems and improving water quality.
- Trees provide food and shelter for desirable wildlife.
- Birds take haven in trees and also assist in the control of insects.
- Trees help moderate air temperature to provide us with a comfortable environment.
- Trees provide pleasing scenic amenities to soften the harshness of buildings and streets, creating special and inviting spaces.
- Trees enhance property values and can have a positive impact upon the economy of an area.
- Trees provide a protective physical and psychological barrier between pedestrians and traffic.
- Trees create a civic identity.

Campus trees are a valuable public resource, which may be damaged or destroyed through malicious, careless, or even well intentioned actions. This Policy is intended to educate the University community, citizens, contractors, and consultants about the importance of trees, including “best management practices” for maintaining trees.

The Tree Protection Policy provides standards for the preservation of trees as a part of the growth and land development process; establish and maintain appropriate diversity and volume in tree species and age classes to
provide a stable and sustainable urban forest; allow trees to attain their natural shape and size while growing to maturity; prevent clear-cutting, and/or significant changes of grade that results in the loss of mature trees, and to ensure appropriate replanting when tree loss does occur; and protects trees during construction of University facilities and utilities projects.

General Policy

UWF will:

• Provide resources in a consistent and adequate program that will budget for maintaining, watering and preserving trees.
• Plant trees only in the appropriate season.
• Consider placement of the trees in relation with all federal and state regulations, including the needs of the disabled, utilities, emergency vehicles and trucks.
• Promote the diversity of its existing campus forest to avoid devastation of an individual species and create a campus wide distribution.
• Install automatic irrigation systems particularly where watering is likely to be difficult.
• Utilize strategies to encourage long tree life by maintaining long-lived trees, planting trees in a manner to maximize adequate growth, by structural soils, and root growth.
• Encourage the development of innovative strategies in places where there is limited space either for the roots or for the canopy and provide guidelines for root pruning.

Offenses against Property

Abuse, destruction, or mutilation of any tree, or any endangered or threatened plant species on University property is prohibited.

• Abuse or mutilation is the attachment or placement of any rope, wire, sign poster, handbill, or bicycle, to any tree/plant growing at the University.
• Destruction or mutilation of any tree/plant is to cause and/or permit any wire charged with electricity to be placed or attached to any such tree/plant.
• Abuse or destruction is to allow any gaseous, liquid or solid substance, which are harmful to such trees/plants to come in contact with their roots, trunks, or leaves.

University Grounds &
Tree Use Regulations

No one shall undertake any construction or development activity unless there has been a request for and/or receipt of written permission from the Office of Landscape Services, or designated Agent. Construction activity and parking vehicles within the drip line of trees is prohibited.

When roots of a tree planted with the planting area between the sidewalk and the street damage university curbs, gutters and sidewalks, including driveway ramps, the university shall take appropriate corrective measures which is least damaging to the tree. Where sidewalk or curb damage due to tree roots occurs, every effort shall be made to correct the problem without removing or damaging the tree. The Office of Landscape Services shall be responsible for developing or approving corrective measures. All
trees shall be planted in good condition and meet "American Standard for Nursery Stock" requirements.

- Parking vehicles under University trees is prohibited.
- The practice of tagging trees with nails during surveying is prohibited.
- The use of nylon string to tie signs is prohibited. The use of cotton string for tying signs is acceptable.

Applicability

The UWF Tree Protection Policy shall apply to any University projects, that have the potential to adversely impact trees or designated "Tree Save Areas." Variance from this policy requires written approval from the Office of Landscape Services.

New Construction & Rehabilitation Projects

Procedures include the following:

- Prior to completing a program of requirements and preliminary budget for a new construction, rehabilitation, or utility project that could impact trees, a meeting will be held between the Department of Architecture and Engineering Services and Landscape Services, to discuss the site evaluation impact to plant material and related site issues. At this meeting, significant issues discussed and decisions made will be documented.
- Except as provided elsewhere in this policy, a tree survey and impact analysis shall be required from Facilities Maintenance to the Department of Architecture and Engineering Services as part of any new construction, rehabilitation, or utility project which will accurately identify size, species and location of all trees. A Tree Protection Plan shall be submitted with the other drawings as part of the overall project approval process with the construction documents. Include the following information:
  - Definition of spatial limits: limits of land disturbance, clearing, grading, and trenching; "Tree Save Areas"; Specimen Trees; and areas of re-planting.
  - Detailed drawings of tree protection measures and their location: location, species and size DBH of existing Significant Trees and an indication of which Significant Trees would remain on the site; tree fences around trees at the drip line; erosion control fences; tree protection signs; tree wells, aeration and irrigation systems; transplanting specifications; staking specifications; and other applicable drawings as determined by the Landscaping Services Unit.
  - The Tree Protection Plan shall show all utility lines existing and proposed. The University shall coordinate the location of these utility lines with the contracting companies in order to minimize root damage within the Critical Root Zones of Protected Trees, and to minimize damage to trees located in Protected Zones.
  - Procedures and schedules for the implementation, installation, and maintenance of tree protection measures, including taking into consideration seasonal planting requirements are included.
The contractor will further be required to assign an individual "on-site" whose responsibility is to assure that barriers are maintained and the Plan adhered throughout the construction process. The University may issue a Stop Work Order at any point of unauthorized departure from the Plan and a system of fines will be developed to cover costs of soil enhancement and tree replacement. If "damage" (soil compaction, roots severance, wounding, uprooting, decline in vigor, etc.) occurs.

Following inspection, the Landscape Horticulturist and the Department of Architectural and Engineering Services will review the plan for conformance with the Tree Protection Policy, and will either approve or deny the proposed plan. Reasons for denial shall be noted on the Tree Protection Plan or otherwise stated in writing. No approval to proceed will be issued until the Departments of Architecture and Engineering Services and Facilities Management have approved the Tree Protection Plan. All tree protection measures shall be installed prior to any land disturbance.

Issuance of a letter to proceed or contract shall be conditional on the approved Tree Protection Plan and conformance to the provisions of this Policy and any regulations promulgated thereunder. This may be revoked if its terms are violated.

There will be no certificate of substantial completion issued by the Project Manager with respect to any permit subject to this Policy, unless and until the Horticulturist shall have inspected the site. The Horticulturist shall confirm that all existing trees to remain are in healthy condition and all replacement trees have been planted in accordance with this section.

Replacement Tree Guidelines

In developing a site, the first priority under this Policy is to protect and preserve all trees whenever possible according to this Tree Protection Plan. Transplantable trees not in the Protected Zone should be moved into the Protected Zone either permanently or during the construction period for later moving to their permanent sites within the construction area.

All Protected Trees removed in accordance with this Policy shall be replaced using the Tree Value Formula. The Office of Landscape Services shall provide a list of the replacement standards.

Any tree removed without permission must be replaced with trees (not necessarily the same species) according to the Tree Value Formula. As a general rule, all replacement trees shall be 3" caliper unless the approved plan indicates otherwise. Such trees shall be required as part of a Tree Protection Plan. As many trees as possible shall be replaced. The tree(s) must be placed in approximately the same location as the tree(s) removed or as otherwise approved by the University designee and be maintained in good health for a length of time determined by the University.

When the replacement of trees is not possible as provided for under the approved Tree Protection Plan, the equivalent value of the tree as well as projected costs for installation and maintenance will be assessed by the Office of Landscape Services. Monies received from the contractor will be placed in the Argo Tree Preservation Account for planting and maintenance of trees on University property.

University of West Florida Tree Protection Policy 1-2000 Revised: 11-30-2001
The UWF Department of Facilities Management, and specifically the Service Unit of Landscape Services is hereby charged with the responsibility for the enforcement of this Policy and may serve notice to any person in violation thereof.

Public Hazard and Abatement

The UWF Landscape Service Unit shall remove any dead or dying tree on University property, when such a tree constitutes a potential threat to people, other plant life or public safety in general.

Protected Tree Program

The University defines a protected tree as one that is rare, endangered or is of a size or has a feature that the Horticulturist designates as protected. The University hereby declares that the following are Protected Trees: Any Beech, White Oak, Live Oak, Magnolia, Hickory, Hawthorn, Walters Pine, or other species of exceptional quality or size.

Protected Specimen Trees shall be identified by the Office of Landscape Services, and shall be located in the Tree Protection Plan. General standards for the identification, preservation, and protection of specimen trees shall be as follows:

- Any tree in fair or better condition to include (1) large hardwoods, i.e. oaks, hickories, yellow poplars. (2) Large softwoods, e.g. pines, evergreens, etc. (3) Small trees, e.g. dogwoods, redbuds, etc. of exceptional quality or size.
- A tree in fair or better condition should meet the following minimum standards: (1) A life expectancy of greater than 15 years; (2) A relatively sound and solid trunk with no extensive decay or hollow, and less than 20 percent radial trunk dieback; and (3) No major insect or pathological problem.

A lesser-sized tree can be considered a Specimen if it is a rare or unusual species. It is specifically used by a builder, developer, or design professional, as a focal point in a project or landscape. It is a tree with exceptional aesthetic quality.

The Landscape Horticulturist may identify and require the preservation of a tree stand or special plant community if it contains one or more specimen tree(s). If

It is prohibited to cut existing specimen trees without a special exception granted by the campus horticulturist.

Any questions, comments, or recommendations concerning this University Tree Protection policy should be directed to Kent Schwartz, Office of Landscape Services, and Chair of the Campus Beautification Committee through extension 6010, or by e-mail: sschwartz@uwf.edu.
Definitions

- **Argo Tree Preservation Account** --- is an account established by the University to accept monies to be used for tree maintenance and tree planting only.
- **Caliper** --- means the diameter of a tree trunk that is taken six (6) inches above the ground for up to and including four-inch caliper size, and twelve (12) inches above the ground for larger sizes.
- **Critical Root Zone** --- means an area of root space that is within a circle circumscribed around the trunk of a healthy tree using a radius of 1 foot per inch DBH.
- **DBH** (Diameter at Breast Height) --- means the diameter of a tree trunk measured in inches at a height of 4 feet above the ground. If a tree splits into multiple trunks below 4½ feet, then the trunk is measured at its most narrow point beneath the split.
- **Drip Line** --- means a vertical line running through the outermost portion of the crown of a tree and extending to the ground.
- **Landscape Horticulturist** --- means that UWF employee having the primary responsibilities of administration and enforcement of the Tree Protection Policy.
- **Person** --- means any university representative, individual, partnership, firm, corporation or other legal entity.
- **Planting Area** --- means the area between the sidewalk and the street on which trees are planted.
- **Protected Tree** --- means any tree that is rare, endangered or is of significant size or has a special feature as determined by the Horticulturist.
- **Protected Zone** --- means all areas of a parcel required to remain in open space, including all areas required as yard areas buffers, transitional buffer zones or landscaped areas according to provisions of the University Zoning Policy or by conditions of zoning or variance approval.
- **Special Plant Community** --- a naturalized stand of vegetation of value to the University environment.
- **Specimen Tree** --- means any tree that is a representation of a species designated in this policy.
- **Significant Tree** --- means any existing, healthy, living tree on University property.
- **Tree** --- means any living, self-supporting, woody perennial plant which has a minimum trunk caliper of two (2) inches measured at a point six (6) inches above the ground and which normally attains a height of at least ten (10) feet at maturity, usually with one (1) main stem or trunk and many branches.
- **Tree Protection Plan** --- is submitted with other permit drawings required to be submitted as part of the process. It includes definition of spatial limits, detailed drawings of tree protection measures and their location, and an inspection plan.
- **Tree Save Area** --- means the boundaries of the area or areas surrounding trees wherein it is essential that they remain undisturbed in order to prevent damage and loss of trees which are to be retained on site during the development and building process, as determined in an approved Tree Protection Plan.
- **Tree Value Formula** --- means the formula developed by the Council of Tree and Landscape Appraisers: \( V = B \times S \times L \times C \) where \( V \) = estimated value, \( B \) = basic value in dollars per square inch of basal area (subject to change with inflation), \( S \) = species value in percent, \( L \) = location value in percent (street trees valued at 70%) and \( C \) = condition value in percent (good = 80%, fair = 50%, poor = 30%, dead = 10%).
EXHIBIT 8

STANDARD LECTERN DESIGN DRAWINGS
CONSTRUCTION NOTES:
1) INSTALL 3 PCS. OF CONDUIT (2 PCS. AT 3/4" & 1 PCS. AT 1/2")
2) INSTALL DUPLEX DATA/VOICE OUTLET
3) INSTALL QUAD POWER OUTLET (MUST BE DEDICATED CIRCUIT)
4) INSTALL COX CABLE LINE
5) BUILD CABINETS TO SPEC.
6) ANCHOR CABINETS TO FLOOR
7) BUILD RAMP TO SPEC.
8) ANCHOR RAMP TP FLOOR
CONSTRUCTION NOTES:
1) RAMP TO EXTEND FROM EXISTING CLASSROOM WALL TO PODIUM (APPROX. 5')
2) RAMP TO BE ADA COMPLIANT
3) RAMP TO BE ANCHORED TO FLOOR

SECTION SIDE

1 1/2" CONDUIT
EXHIBIT 9
INTERIOR SIGNAGE

GENERAL NOTES

IM SYSTEM

Holder:
Part Code: SH-66
Color: A14 Medium Grey
Mounting: VT

ADA:
Size: 8" x 2"
Color: A14 Medium Grey

Insert:
Part Code: SI-66-A
Background Color: A01 White
Mounting: PL

GRAPHICS

Font: Helvetica Regular
Size: 5/8"
Color: A01 White

Logo: Univ. of W. Florida
Size: 1 5/8" wide
Color: A01 white

Note:
Scale Presentation Only
Not for Production Use!

Gulf Coast Region
821 Robert Street, Suite C
New Orleans, LA 70115
Ph: 504.269.5539
Fax: 504.269.5703
Email: mgordon@apcosign.com
Website: www.apcosign.com

Project: University of West Florida
Date: 25 April 2001
Scale: Full
Coordinator/Drawn By: MG/MG

Sign Type: A
PART 1  GENERAL

1.01 QUALIFICATIONS OF INSTALLER

A. The installation and testing of all components of the system shall be performed by a contractor holding a current certification issued by the State of Florida Department of Professional Regulation. The contractor shall be certified as either an alarm system contractor Type I or an Unlimited electrical contractor in accord with Florida Statutes and the rules of the State of Florida Department of Professional Regulation Electrical Contractors Licensing Board.

The fire alarm contractor shall be an experienced firm regularly engaged in the layout and installation of automatic fire alarm systems. The contractor shall have warranty of systems of the scope of the largest system on this project at least three years prior to bid, and have been regularly engaged in the business of fire alarm systems contracting continuously since.

The fire alarm contractor shall have been certified by the State of Florida Department of Professional Regulation to install fire alarm systems and certified by the fire alarm system manufacturer to perform installation, software programming, testing, adjustment, maintenance, and repair on the manufacturer’s equipment prior to the date of bid.
Refer to paragraph “system warranty” for additional requirements for contractor qualifications.

1.02 GENERAL REQUIREMENTS

A. Section 16011, “Electrical General Requirements”, applies to this section, with the additions and modifications specified herein.

1.03 SCOPE OF WORK

A. The work consists of all labor, materials, equipment and services necessary to provide, install, test and certify a new microprocessor based interior fire alarm system.

B. The Electrical Contractor for the project shall install the indicated conduits, junction boxes, pull string, and all associated equipment and appurtenances as required for a fire alarm system “rough-in”. The Electrical Contractor shall also provide dedicated power supplies as indicated on the contract drawings. Provide
wiring materials for this work as specified in Section 16402, “Interior Wiring Systems”, with the additions and modifications specified herein.

C. The system shall include but not be limited to: control panel and power supply, standby power supply and battery, alarm initiating and indicating devices, monitoring and supervision devices, system wiring, and all accessories and appurtenances required to provide and install a complete and operational system. Any material not specifically mentioned in these specifications or not shown on the drawings, but required for proper performance and operation of the system shall be furnished and installed at no additional cost to the Owner. All equipment and the installation shall comply with the requirements of these specifications and the related drawings. Items specified by either shall be as if specified by both.

D. The system including all equipment, materials, installation, workmanship, inspection, and testing shall be in strict accordance with the required and advisory provisions of NFPA 72, the Florida Administrative code - Chapter 4A, the Standard Building Code, the Life Safety Code (NFPA 101), and the National Electrical Code (NFPA 70). In the case of any discrepancy between these specifications, the project drawings, or any applicable codes, the system shall comply with the most stringent requirement. In the NFPA publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word “shall” had been substituted for “should” wherever it appears; reference to the “authority having jurisdiction” shall be interpreted to mean the State Fire Marshal.

E. The system and all components shall be listed by Underwriter’s Laboratories for specific application as fire alarm equipment. The UL label shall be prima facie evidence of compliance with this requirement. Any equipment not bearing a UL label will be unacceptable and will be removed and replaced with labeled equipment at the contractor’s expense.

F. All fire alarm equipment shall be the standard cataloged products of one manufacturer. System appliances and devices not manufactured by the control panel manufacturer shall be products regularly distributed by the control panel manufacturer and cross-listed by Underwriter’s Laboratories for compatibility with the system control panel.

G. Materials shall be the best of their respective kinds. All materials shall be new. Work shall be accomplished in a workmanlike manner in keeping with the best practices and highest standards of the fire alarm trade.

H. The award of this contract to a fire alarm contractor shall also include unit costs for replacement parts and programming of existing Cerberus Pyrotronics devices previously installed at the University. All requirements such as response time and warranties shall apply to servicing existing systems. Selected contractor shall
retain the programming rights for all Cerberus Pyrotronic devices installed at this institution until such time the Owner formally requests:
1) transfer of said rights to another contractor meeting the qualifications of this specification or
2) such time the Owner’s designated fire alarm maintenance and repair personnel are formally trained and certified in the software.

1.04 SYSTEM DOCUMENTATION

A. Pre-installation Submittals:

Submit four (4) copies for approval in accordance with the General Conditions of these specifications. Submit two (2) additional copies for Owner approval.

No equipment shall be purchased by the contractor for the fire alarm system until the A/E and the Owner have approved the required submittals in their entirety and returned them to the contractor.

It is the contractor’s responsibility to meet the intent of the specifications. Approved submittals shall only allow the contractor to proceed with the installation and shall not be construed to mean that the contractor has satisfied the requirements of these specifications.

1) Qualifications of contractor:
Refer also to paragraph “Qualifications of Installer”.

The proposed fire alarm contractor shall commence no work on the project until he furnishes evidence, satisfactory to the owner, that he holds the required certifications, meets all other requirements of these specifications, and receives notice to proceed with the installation from the A/E and the Owner.

a. Evidence of certification of the proposed fire alarm contractor by both the State of Florida Department of Professional Regulation and the fire alarm system manufacturer as required by paragraph 1.01 of these specifications.

b. Submit data showing that the Contractor has successfully installed interior fire alarm systems of the same type and design as specified herein. The data shall include the names and locations of at least two installations where the Contractor has installed such systems. The Contractor shall indicate the type and design of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 3 months.

c. Certification of Warranty Service Requirements: See requirements under paragraph “SYSTEM WARRANTY”.

2) Design Data:
a. Battery power calculations: Verify that battery capacity exceeds supervisory and alarm power requirements.

3) Manufacturer's Catalog Data:
Furnish complete data sheets bearing the printed logo or trademark of the manufacturer for the following pieces of equipment:
   a. Control panel
   b. Manual stations
   c. Cabinets
   d. Batteries
   e. Battery charger
   f. Heat detectors
   g. Smoke detectors
   h. Alarm horns/strobe combinations
   i. Alarm strobes
   j. Remote annunciator panel (if panel is indicated on drawings)

4) UL Certification: Evidence of listing of all proposed equipment by Underwriter's Laboratories for application as fire alarm equipment.

5) Drawings: Drawings shall provide a complete and detailed graphical and text based description of the fire alarm system. The floor plans, wiring diagrams, description of components, sequence of operation, and software description shall be cross referenced, and they must use uniform descriptions for acronyms, abbreviations, symbols, products and process references.

Drawings shall be produced using Autodesk Inc. AutoCAD Release 12 or later version. Format shall be furnished in standard 24" x 36" or 30" x 42" blueprint form at the submittal stage.

Furnish the following drawings:

a. A custom wiring diagram of the system showing point to point wiring to each individual system component, and showing wiring identification by number coding and color coding. The wiring diagrams shall clearly define all points of interconnection or interlock to the HVAC system.

b. A scaled floor plan of the building showing the location of the fire alarm panel, placement of each individual item of fire alarm, raceway/conduit size and routing, location of all pull boxes and junction boxes, and conductor size, quantity, and color in each raceway.

c. A detailed description of each fire alarm system component on the drawings.

d. A detailed sequence of operation for each system and subsystem on the drawings.

e. A detailed software description of all routines programmed into the system.
B. Post-installation Submittals:

1) Operation and Maintenance Manuals: Furnish six copies of Operation and Maintenance Manuals for the fire alarm system. Operation and Maintenance Manuals for the fire alarm system shall be separate from the manuals for the other building systems.

The Operation and Maintenance Manuals shall contain all information necessary for the operation, maintenance, replacement, installation, and parts procurement for the fire alarm system. This documentation shall include specific parts numbers and documentation for software and field programming. A complete recommended spare parts inventory list shall be included.

a. Quantity: four (4)
b. Format: 8-1/2” x 11” loose leaf 3-ring binders with clear vinyl overlay designed to receive identification inserts. Furnish identification on the front cover and the back spline.
c. Contacts: Provide a list with name, address, contact person, phone number, and fax number for the following:
   - Fire alarm contractor. A 24 hour emergency number shall be provided for the fire alarm contractor, who shall, upon being called by authorized University personnel, be required to respond within a 4 hour time period to commence repairs, including software programming, to the fire alarm system.
   - Fire alarm system manufacturer
   - Local source(s) of supply for parts and repair (within 50 mile radius), including items not normally furnished by the fire alarm manufacturer.
d. Sections: All sections shall be separated with a tabbed section divider with the section title clearly indicated on the tab.
e. Contents:
   - Copies of approved submittal data
   - Installation instructions
   - Operating and maintenance instructions
   - Recommended spare parts inventory list
   - A list indicating all routine maintenance procedures based on recommended interval.
   - User’s Guide
   - Programming Reference Guides
   - Software Documentation

2. As-built Drawing: Furnish all drawings required under paragraph “Pre-installation Submittals” above. Modify to reflect the actual installation. As-built drawings shall define the system exactly as it is installed. Floor plans shall show the actual installed location of each component of the fire
alarm system, conduit, and junction/pull boxes to an accuracy of plus or minus one foot. Format shall be as follows:

a. Furnish one set of drawings plotted on permanent reproducible mylar media, size 24” x 36” or 30” x 42”.

b. Furnish two sets of drawings in AutoCAD Release 13 format on 3-1/2” high density floppy diskettes.

3. Final report of Final Acceptance Test and Certification including Contractor’s letter of certification and NFPA document title “Fire Alarm System Certification and Description”. Quantity (4)

1.05 SPARE PARTS

A. Spare parts shall be directly interchangeable with the corresponding components of the installed system. Spare parts shall be suitably packaged and identified by nameplate, stamping, or tagging. Keys and locks for equipment shall be identical where possible. Furnish the following:

1) Four keys or tools for resetting manual stations
2) Four keys for locks of control panels or cabinets
3) Two of each type heat detector
4) Two of each type smoke detector

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials, equipment, and devices shall be new and shall be UL listed for the intended use.

2.02 WIRING

A. Wiring for intelligent/analog devices shall be two conductor copper twisted pair in accordance with the system manufacturer’s written recommendations. Conductors shall be color-coded and number coded in accordance with UWF Physical Plant Standards.

B. Identification of conductors (for number coding) shall be accomplished using numbered heat shrink type sleeves.

2.03 SYSTEM DESIGN

A. System Arrangement and Operation: Provide a complete, microprocessor based, electrically supervised, noncoded 24 volt DC, power limited, manual and automatic, annunciated fire alarm system. The system shall be capable of having all initiation devices in alarm at one time, up to system capacity.
The separate items of fire alarm equipment shall be arranged and interconnected to provide an integrated system for: the early detection of fire; the notification of building occupants; the override of normal HVAC system operation; the activation of other auxiliary systems as shown on the drawings for specified herein to inhibit the spread of smoke and fire and to facilitate the safe evacuation of building occupants; and the transmission of an alarm signal to the authorized receiving station.

The fire alarm system shall be fully supervised for the detection and reporting of the derangement of any component or circuit on the system. Initiating device circuits shall provide the level of performance designated as style D by UL and the NFPA. Indicating circuits shall provide the level of performance designated as style X by UL and the NFPA.

The fire alarm system shall include the alarm initiating and indicating devices shown on the project drawings. These devices shall be connected to the zones designated on the drawings. The operation of initiating device shall cause the system to go into the alarm mode. This in turn shall cause the illumination of the corresponding zone indicator on the system control panel the energizing of the indicating circuits for the notification of building occupants; the activation of auxiliary circuits to override the normal operation of building HVAC systems and release doors; and the performance of any other function indicated on the project drawings or specified herein.

The system shall latch into alarm mode so that it can only be reset by restoring the activated device to its normal condition and operating the system reset switch, except that the indicating the circuits may be de-energized by operating the silence switch. The operation of the silence switch, however, shall not prevent the re-energization of the indicating circuits if an initiating device on another zone should be subsequently activated. Neither shall the operation of the silence switch cause the zone alarm lights on the control panel and remote annunciators to be extinguished. The operation of the silence switch shall also not reset any auxiliary control functions such as door release, or the functional override of HVAC controls.

The system shall be returned to normal supervisory mode after an alarm by restoring the activated initiating device to its normal condition and operating the system reset switch.

B. Supervision: A ground fault condition which prevents system operation or a single break or open condition in any circuit shall result in activation of system audible trouble signals. Loss of AC power shall also result in operation of system trouble signals. Trouble signals shall sound continuously until system has been restored to normal at the control panel or manually switched to a trouble indicating lamp. Upon correction of the trouble condition, trouble signals shall
automatically resound until the control panel is restored to the normal position. System shall be electrically supervised for:
1) Signal initiating circuits.
2) Alarm signal notification (audio or visual) circuits.
3) Battery supply circuits, including low and no voltage across the standby battery terminals.

C. Primary Power: The project Electrical Contractor shall provide a dedicated 120 volts AC power supply from a dedicated circuit breaker to the fire alarm control panel. The Fire Alarm Contractor shall protect the power supply with a surge protector mounted immediately adjacent to the fire alarm panel. The surge protector shall be approved for use in this application by both the manufacturer of the fire alarm control panel and by any/all code/agencies previously cited in this specification.

2.04 COMPONENT DESIGN

A. Colors: Provide finish colors under this section in accordance with FED-STD-595.

B. Main Control Panel: Modular type, installed in a surface-mounted steel cabinet with hinged door and cylinder lock. Mount panel such that operator controls and visual readout are 5 feet A.F.F. Control panel shall be a factory-wired assembly containing components and equipment necessary to perform specified operating and supervisory functions of the system.

The main control panel shall be a Cerberus Pyrotronics Model MXL or MXLIQ as determined by number of devices required for the installation.
1) The control panel shall be modular in construction, and shall contain all modules necessary to operate according to these specifications and the drawings. The system shall be capable of reading, displaying, and adjusting at the control panel the sensitivity of remote intelligent/analog smoke detection devices. Intelligent/analog devices shall be individually identified by the system. The control panel shall be capable of supporting conventional detectors as well as intelligent/analog detection devices.

2) The panel shall be furnished with an integral annunciator. The annunciator shall be an 80 character backlit and supertwist alphanumeric display, which shall provide a 32 character user definable message associated with each detection device or zone. The display shall provide custom message and give readings of detector sensitivity. Each device on an intelligent circuit shall be checked continuously for the following: sensitivity, response, opens, shorts, ground faults, functionality and status.

3) The control panel shall operate from a dedicated 120 volt AC power supply, and internal 24 volt DC back-up battery. Provide a minimum of 72 hours of battery back-up. All power connections whether AC or DC shall be separately fused within the control panel.
4) Furnish an output module for central reporting of an alarm condition to the campus proprietary station. The module shall be system interconnected by card edge connector, and shall be operable by the control panel. The module shall be supervised by the control panel for open and shorted circuits. Open and short circuits shall report trouble only and respond with circuit identification. The output module shall be a Controllable Signal Module, Pyrotronics Model CSM-4.

5) Furnish additional modules, system interconnected by card edge connector, and operable by the control panel, for monitoring of conventional devices or shorting type contact devices, and for relay control of interlocked equipment such as HVAC air handling units.

C. Manual Stations: Furnish intelligent noncoded manual fire stations which shall operate on any intelligent/analog detection circuit. Stations shall be individually annunciated on the control panel. Stations shall be Pyrotronics Model MSI-1. Stations shall be semi-flush mounted. Mount stations with the base at 42 inches above the finished floor or as required by ADA and NFPA.

D. Heat Detectors: Furnish intelligent/analog thermal detectors of the rate compensated fixed temperature type. Detectors shall be individually annunciated on the control panel. Heat Detectors shall typically be a Pyrotronics Model ID-60T with a DB-3S base, unless the environment conditions are not suitable for this device as determined by the manufacturer.

Mount detectors at the underside of ceilings or roof decks unless otherwise indicated. Detectors shall be semi-flush mounted. Each detector shall be designed for outlet box mounting, shall be supported independently of wiring connections, and shall be connected by separate screw terminal for each conductor. Temperature rating of detectors shall be in accordance with NFPA 72. No detector shall be located closer than 12 inches to any part of any lighting fixture.

E. Smoke Detectors: Furnish intelligent/analog smoke detectors designed for detection of abnormal smoke densities by the photoelectric principle. Detectors shall be individually annunciated on the control panel. An automatic gain control circuit shall be provided to maintain correct sensitivity by compensating for detector aging and dirt accumulation. It shall be possible to adjust and/or electronically measure the sensitivity of each individual detector from the control panel. The intelligent/analog detectors shall provide complete supervision of the detector optics. The detector shall be supervised for failure of the LED light source or a critical reduction of light output by the LED light source or a critical reduction of light output caused by excessive dirt which could not normally be compensated for by the automatic gain control circuit.
Smoke detectors shall typically be a Pyrotronics Model ID-60P with a DB-3S base unless installed environmental conditions exceed manufacturers recommendations.

F. Duct Smoke Detectors: Detectors in ducts shall be photoelectric type and shall consist of an intelligent/analog smoke detector mounted in an air duct sampling assembly and sampling tube that protrudes across the duct of the air system. The duct smoke detector shall have all the features specified above for space mounted smoke detectors, and shall be installed in strict accordance with the manufacturer’s printed instructions. Duct smoke detectors shall be Pyrotronics Model ID-60P and shall be mounted in a Pyrotronics Model AD-3P housing with a Pyrotronics Model STA-2, 3, 6, or 10 air sampling tube.

G. Alarm Horn/Strobes: Combination horn/strobe units shall be Pyrotronics Model ESH-24S or as required to satisfy the requirements of NFPA 72 when installed.

H. Strobes: Strobe light units shall be Pyrotronics Modes SVD-24 or as required to satisfy the requirements of NFPA 72.

PART 3 EXECUTION

3.01 INSTALLATION

A. Equipment, materials, installation, workmanship, inspection, and testing shall be in strict accordance with all applicable codes and standards, the conditions of the system manufacturer’s UL listing, and these specifications.

B. Wiring and Equipment Installation: Wire the alarm initiating and notification signal devices so that removal will cause the system trouble device to sound.

All circuits shall be identified by using a unique conductor insulation color throughout the system for each type of circuit. The color-code shall be submitted on the drawings required by the “Submittal” section of these specifications. Transposing or changing circuit colors will not be permitted. Additionally, all circuits shall be neatly labeled (number coded) with heat shrink type sleeves at each junction box, at each connected device or appliance and at the system control panel.

Termination of conductors shall be by means of factory wiring terminals or factory pigtails. Pigtails fabricated in the shop or field will not be allowed. “T” tap connections will also not be allowed on wiring serving conventional (non-intelligent) devices.

Fire alarm conductors shall not be placed in any enclosure, conduit, compartment, outlet box, junction box, or similar fitting containing conductors of electric light or power, or any other low voltage system.
Junction Boxes and Splices: Wiring slices are to be avoided to the extent possible. Where splices are necessary, they shall be made in junction boxes that contain the minimum volume per conductor required by Table 370-6(b) of the NEC. A maximum of two extension rings will be permitted on 4-inch square boxes which contain splices. Where greater volume is required by the NEC or for ease of wiring, manufactured UL labeled junction boxes shall be used. Splicing of conductors shall be by means of UL listed connectors. All circuits contained in junction boxes shall be neatly tagged with legible labels.

The Electrical Contractor shall identify all fire alarm junction boxes and outlet boxes with red paint, and shall identify all fire alarm conduit with red paint at every 10 feet on center.

Installation of Initiating and Indicating Appliances: Installation of system appliances and devices shall be in strict compliance with the equipment manufacturer’s written instructions. Installation of appliances and devices shall not commence before all splices are made and all circuits have been tested for faults and shorts.

The circuit shall again be tested for faults and shorts after all manual stations, audible/visual indicators, heat detectors, and smoke detector bases are installed and before the circuits are connected to the fire alarm control panel.

Installation of Control Panel and Related Equipment: Installation of the fire alarm control equipment shall be in strict compliance with the manufacturer’s written instructions. The control equipment shall not be installed until all wiring and system appliances and devices have been installed and all circuits checked for faults and shorts as required in these specifications.

The contractor shall neatly lace all circuit conductors in the gutter spaces of the control panels and secure the wiring away from the circuit boards and components. All circuits shall be neatly and legibly labeled in the control panel. No wiring except homeruns from fire alarm system circuits and system power supply circuits shall be permitted in the control panel enclosure. Additionally, no wiring splices will be permitted in the control panel enclosure.

3.02 FINAL ACCEPTANCE TEST AND CERTIFICATION

Note: Final acceptance testing and certification of the fire alarm system, including approval by a representative of the State Fire Marshal’s Office, shall be completed prior to full or partial occupancy of the building.

A. System Test and Certification: The completely installed fire alarm system will be fully tested in compliance with Testing Procedures for Signaling Systems (NFPA 72) and manufacturers recommendations. The contractor shall test every alarm
initiating appliance and device for proper response and zone indication; every indicating appliance for proper operation and audible/visual output; and all auxiliary control functions such as door release, and functional override of HVAC controls.

B. Before final acceptance of the work, and after the system has been completely tested to the satisfaction of Owner; the contractor shall complete the Fire Alarm System Certification and description form published by the NFPA. In compliance with published NFPA standards, parts 1, 2, and 4 through 10 shall be completed after the system is installed and the wiring has been checked. Part 3 shall be completed after the operational acceptance tests have been completed. The completed form signed by the Qualifying Agent (as defined by the State of Florida Department of Professional Regulation) of the alarm system contractor shall be delivered to the Owner with the other system documentation required in these specifications.

C. All records of testing and compliance shall be recorded on approved NFPA 72 forms. All information/data recorded shall be numerical values or initials, no exceptions. Information recorded as OK, X, or check mark will not be accepted.

3.03 INSTRUCTION OF OWNER

Instruction of Owner: The contractor shall schedule a time to provide not less than two (2) hours of formal training to the Owner’s representatives in the operation of the fire alarm system. The instruction shall also cover the schedule of maintenance required by NFPA 72H and any additional maintenance recommended by the system manufacturer. The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation.

3.04 DELIVERY OF SYSTEM DOCUMENTATION

The contractor shall deliver to the Owner the following documents after the fire alarm system has been completely installed and tested. Refer to paragraph “SYSTEM DOCUMENTATION” for additional instructions.

A. Operation and Maintenance Manuals.

B. As-Built Drawings.

C. A letter certifying that the installation is in strict compliance with all applicable codes and in strict compliance with the requirements of these specifications. The letter shall also clearly explain any discrepancies between the originally submitted system drawings and the as-built system drawings.
D. Two (2) originals and four (4) copies of the NFPA document titled Fire Alarm System Certification and Description completely filled-in and signed as required in these specifications.

E. Two (2) originals and four (4) copies of the document titled Fire Alarm System Warranty (attached to these specifications as Appendix No. 2) completely filled-in and signed by the alarm system contractor's Qualifying Agent (as defined by the State of Florida Department of Professional Regulation)

The contractor shall deliver the above documents to the Owner at one time.

Final payment of the contractor will not be authorized until the complete documentation specified herein is delivered to the Owner.

3.05 SYSTEM WARRANTY

The contractor shall warrant the installed fire alarm system to be free from any defects of material and installation for a period of one year from final acceptance by the engineer. Any deficiencies shall be immediately corrected at no additional cost to the owner.

The fire alarm contractor shall have the necessary facilities to provide the Owner complete warranty service that includes routine on-site inspection, software programming, and seven days a week, 24 hours a day emergency repair service. The contractor shall maintain a service organization with adequate spare parts stock within 50 miles of the installation. Repairs of any defects, including software defects, shall be commenced within 4 hours of the Owner notifying the contractor, and repairs shall be completed within 24 hours of the owner notifying the contractor. All warranty service shall be provided under emergency repair service provisions.

All service work, including software restoration, modifications and upgrades, shall be performed by service personnel in the direct employ of the fire alarm contractor. The service technicians shall be factory trained and certified by the fire alarm system manufacturer to be competent in all aspects of the installed system and shall be authorized by the factory to provide software programming. Third party service or service only during specific working hours is not acceptable.

During the warranty period the contractor shall schedule two follow-up inspections of the fire alarm system with the building owner. The inspections shall be scheduled at semi-annual intervals and shall be conducted in strict compliance with Testing Procedures for Signaling Systems (NFPA 72H at the time of these inspections at no additional cost. The fire alarm system contractor shall also perform any routine semi-annual maintenance required by NFPA 72H at the time of these inspections at no additional cost.

At each of the follow-up inspections and after the system has been completely tested to the satisfaction of the building owner, the contractor shall complete the Fire Alarm System Certification and Description form published by the NFPA (attached to these
specifications as Appendix No.1). The completed form signed by the Qualifying Agent (as defined by the State of Florida Department of Professional Regulation) of the alarm system contractor shall be delivered to the building owner.

The warranty period will not expire until the second semi-annual inspection and maintenance service to the system has been performed to the satisfaction of the Owner, any deficiencies in the system have been fully corrected, and the referenced documentation of such has been delivered to the owner.

System modifications made during the warranty period, including software modifications, shall be incorporated into the as-built documentation.

A software upgrade program shall be implemented on the anniversary of the warranty period. The upgrade shall provide all enhancements offered by the Manufacturer for programs in the accepted system, and shall be provided at no cost to the Owner.

END OF SECTION
PART 1 - GENERAL

1.1 REFERENCES

A. Underwriter’s Laboratories (UL)
B. National Fire Protection Association (NFPA)

1.2 DEFINITIONS

Nautilus Card – The University refers to their identification/swipe card as the ‘Nautilus’ card. The cards and the equipment/readers used on campus are manufactured by General Meters.

1.3 SYSTEM DESCRIPTION

The term “security system” describes an integrated security system serving occupants with a personal access system utilizing the existing “University of West Florida Nautilus Card”.

The work consists of all labor, materials, equipment (The University will purchase and provide the General Meters equipment) and services necessary to provide, install, test, and certify a new building security system including associated equipment and appurtenances necessary for a fully operational system.

Any materials not specifically mentioned in these specifications or not shown on any drawings, but required for proper performance and operation of the system shall be included, furnished and installed at no cost to the Owner.

The system including all equipment installations, materials, workmanship, inspection and testing shall be in strict accordance with the required and advisory provisions of The Standard Building Code, the Life Safety Code (NFPA 101), and the National Electric Code (NFPA 70). In the case of any discrepancy between these specifications, the project drawings, or any applicable codes, the system shall comply with the most stringent requirement. In the NFPA publications referred to herein, the advisory provisions shall be considered to be mandatory. The system and all components shall be listed by Underwriter’s Laboratories for specific application as security equipment.

1.4 SUBMITTALS

Provide information within bid package of cut sheets/manufacturer’s catalog data bearing the printed logo or trademark of the manufacturer for the products listed in 2.4 of these specifications. Products deviating from original cut sheets shall be approved by the project manager before installation.

Security Contractor Selection

Security
Contractor will be required to provide pre-installation drawings (hard copy) before the project commences and modified as-built drawings to the project manager upon completion of each installation. Drawings will include a floor plan with conduit layout and risers and must be in an AutoCad 2000 compatible format. In addition, two copies of an O&M manual will be required and shall contain all information necessary for the operation, maintenance, replacement, installation, and parts procurement information (with specific part numbers).

1.5 QUALITY ASSURANCE

Materials shall be the best of their respective kinds. All materials shall be new. Work shall be accomplished using UWF standards and in keeping with the best practices and highest standards of the trade.

The contractor shall be an experienced firm regularly engaged in the layout and installation of security systems. The contractor shall have successfully completed the installation, testing and warranty of systems similar to the scope of this bid and have been regularly engaged in the business of security systems contracting. Contractor shall be able to complete conduit, wiring, equipment installation, and programming of the system without the use of subcontractors.

The contractor shall be certified by the State of Florida Department of Professional Regulation and be registered as an Alarm Systems Contractor.

1.6 WARRANTY

The contractor shall warrant the installed security system installation for a period of one year. Warranty will include all parts and labor of the system with the exception of any General Meters equipment.

The security system contractor will be responsible for not only new installations but warranty and service work as well. Service work will include assistance in troubleshooting problems if necessary. The contractor shall maintain a service organization with adequate spare parts stock and be located within 50 miles of the installation. Third party service is not acceptable. Contractor will also be asked to attend, at no charge, a one-day training session provided by the University. Training will include information on installation and maintenance of the General Meters equipment.

Contractor shall be prepared to complete maintenance work within at least 24 hours of the call if requested by the University.

1.7 COMMISSIONING

Installation of devices shall not commence before all circuits have been tested for faults and shorts. The circuits shall again be tested for faults and shorts after devices are installed and before the circuits are connected to the security control devices.
The security system contractor shall be fully responsible for commissioning the security system. Accordingly, the contractor shall include as part of each project, the material and manpower necessary for system commissioning as described below. Contractor will be required to be present for a security test/commissioning. Also present will be the UWF fire/security department for signatures documentation required by the UWF Environmental Health and Safety department.

The commissioning process shall include a thorough checkout/testing of the system and a complete exercise of the equipment and software programs such that the fully commissioned system is operational in every detail and at all levels. Commissioning shall be complete prior to final acceptance testing and certification.

Operate the security system and verify all functions for proper operation. Exercise the panel through the full range of operations, and test each feature, including auxiliary power. Provide complete programming, and input of system parameters.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Materials, equipment, and devices shall be new and be UL listed for the intended use.

A. Wiring:
Provide in accordance with NFPA 70, UWF Physical Plant standards, and the system manufacturer’s written specifications or recommendations. Conductors shall be copper, and insulation for wiring shall be THHN or THHN. Conductors shall be color-coded and number coded in accordance with UWF Physical Plant standards. Identification of conductors (for number coding) shall be accomplished using permanent mylar covered markers.

B. Conduit, fittings and boxes:
Minimum conduit size shall be ¾ inch trade size. Conceal conduit in finished area of construction. Fittings for EMT shall be stelset screw type. Fittings enclosed in concrete shall be steel compression type. Cast fittings are not allowable. All outlet boxes and junction boxes for security devices shall be 4” x 4” x 2 1/8” deep unless larger boxes are required. Install plastic insulating bushings at each point of termination.

C. System Design:
System arrangement and Operation – Although the university will be supplying the General Meters equipment, the security contractor will be responsible for a complete building security system ready for operation.

This security system will communicate with the Nautilus Card front-end computer using the campus network. Connectivity will be coordinated through the Nautilus

Security Contractor Selection
Card office as to comply with the UWF computing network standards. Each job will be specific as to connectivity and will be specified at the time of purchase.

D. Component Design:
System should have the following components or approved equals supplied. Substitutions must be submitted to project manager for approval.

1. Door switch devices shall be provided by contractor who shall install conduit and wire and make final electrical connections to devices 7000 Series Key Switch by DynaLock or approved equal.
2. Magnetic holders shall be provided with conduit, wire and final connections to DynaLock Corp. Series 1200 lb electromagnetic door holding device or approved equal.
3. Panic exit devices

PART 3 – EXECUTION

3.1 INSTALLATION

Equipment, materials, installation, workmanship, inspection, and testing shall be in strict accordance with all applicable codes and standards.

All security devices including electric strikes, magnetic door holders, and door electric power transfers shall be installed using conduit and junction/pull boxes such that the device and the wire/cable serving it can be replaced or repaired without disturbing or removing building components or finishes.

All conduit and fittings and the installation of such for the security system shall comply with these specifications and the National Electric Code. Minimum conduit size for the security system shall be ¾ inch unless smaller sizes are specifically indicated on the drawings. Flexible metal or plastic raceway will not be permitted except where specifically called for in this specification. Install plastic insulating bushing at each point of conduit termination.

The contractor shall identify all security system junction boxes and outlet boxes with green paint, and shall identify all security system conduit with green paint at approx. every 10 feet.

Wiring the alarm initiating and notification signal devices so that removal will cause the system alarm to sound.

Make all terminations of wiring on device terminals or within device boxes unless specific approval in writing from project manager has been given. Wiring termination or wire splices shall not be made in junction boxes or pull boxes.

3.2 FINAL ACCEPTANCE AND CERTIFICATION

Security Contractor Selection 16727 - 4

Security
Final acceptance testing and certification of the building security system shall be completed prior to full or partial occupancy of the building.

System Test and Certification: The completely installed and commissioned building security system shall be tested to demonstrate proper operation. Test in the presence of the project manager and the UWF fire alarm system manager. Upon the successful completion of the system test, the contractor shall certify the system as complete and fully operational in writing.

3.3 DELIVERY OF SYSTEM DOCUMENTATION

The contractor shall deliver to the Owner the following documents after the security system has been completely installed and tested. Refer to paragraph “System Documentation” for additional instructions.

A) Operation and Maintenance Manual
B) As-Built Drawings
C) Two (2) originals of a warranty document signed by the security system contractor.

The contractor shall deliver the above documents to the University at one time. Final payment to the contractor will not be authorized until the complete documentation specified herein is delivered to the Architect.

END OF SECTION
EXHIBIT NO. 12 – SECTION 16741, STRUCTURED TELECOMMUNICATIONS CABILITYING SYSTEM
EXHIBIT 12

SECTION 16741
STRUCTURED TELECOMMUNICATIONS
CABLING SYSTEMS

May 2001
DT971PREMIS.DOC
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PART 1 - GENERAL

1.0 SCOPE OF WORK

A. The work awarded will consist of all materials, equipment, and labor necessary to install, test, and certify a "Structured Cabling System" or portions of at various sites on the main campus and affiliated sites of The University of West Florida. Fiber optic cabling is described and awarded under a separate specification. It is the intent of this institution to award a "Term Contract" for a described period utilizing the furnished unit prices to the successful contractor who meets the requirements of this specification for all voice, data, and video cabling.

B. Contractors are advised that they may be required to work with the selected contractors on major construction projects. The telecommunications contractor shall work in harmony with all contractors of major construction and will be held accountable for their workmanship and any damages caused by installation such as, but not limited to, ceiling tiles and finished portions of such structures. Site visitations and inspections are encouraged to familiarize contractors with the projects as directed; appointments may be arranged by calling either Architectural Engineering Services or Telecommunications.

C. The contractor will be responsible for making every effort to retain all existing services and shall present a plan to perform the exchange of services with a minimum of interruptions to the services. Contractor shall be responsible for the removal of all unused and abandoned voice/data/video cabling once the new services are installed and functioning as specified.

D. The structured cabling for this award includes all communications cabling, wireways, communications outlets, terminal blocks, racks, patchcords, cabinets, splitters, surge protectors, connectors, mounting hardware, identification devices, accessories, and appurtenances for the EIA/TIA Category 5E data cabling system / telecom cabling system.

E. The contractors on staff Registered Communications Distribution Designer (R.C.D.D) shall provide design review services prior to the installation and execution of contracted work. A written review report of the proposed work shall be furnished to the University project manager along with a formal quotation to perform the proposed work utilizing the furnished unit pricing for this contract. The contractor is advised that all quotations submitted will be carefully scrutinized for accuracy.

F. Provide a complete telecommunications system, fully operational, capable of operating at 155 Mbps or better, ready for the occupants to use. The General Meters "One Card System" and CATV/video shall be fully operational also. The installation shall include all accessories, devices, and cutover from the campus PBX to provide a complete and functioning system. Any materials and devices not specifically mentioned in these specifications or indicated on the contract drawings that are required for a finished and operating system shall be furnished and installed at no additional cost to the owner.
1.1 REFERENCES/STANDARDS

A. Electronic Industries Association/Telecommunications Industry Association (EIA/TIA) 568A-Commercial Building Telecommunications Wiring Standards.
B. EIA/TIA-569-Commercial Building Standard for Telecommunications Pathways and Spaces.
E. EIA/TIA PN-3398 (Cabling practices for Open Offices), March 7, 1995.
G. Underwriters Laboratories (UL®) Cable Certification and Follow Up Program.
H. National Electrical Manufacturers Association (NEMA).
L. Institute of Electrical and Electronic Engineers (IEEE).
M. SCTE Society of Cable Television Engineers
N. American National Standards Institute (ANSI) X3T9.5 Requirements for UTP at 155 Mbps.
P. F.C.C. Rules, Part 76

1.2 SUBMITTALS

A. Provisioning Section
Provide to the Project Manager submittals that shall include all items called for in this section and manufacturer's cut sheets for the following:
1. All wire and cable.
2. All connectors and required tooling.
3. All termination system components for each cable type.
4. All ER and TC equipment frame types and hardware.
5. All grounding and surge suppression system components.

B. Product Data
Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Manufacturer's Instructions
1. Indicate application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements.
2. Include instructions for storage, handling, protection, examination, preparation, operation and installation of product.
3. A technical data sheet from the cable manufacture should be included with the response for each brand of cable proposed. This data sheet shall include the physical cable specifications as well as the following electrical and transmission characteristics:
a. Mutual Capacitance
b. Impedance
c. DC Resistance
d. Attenuation
e. Worst Pair-to-Pair Near End Crosstalk
f. Error free Transmission Rates with up to 100 workstations

D. Factory Test
Vendor shall submit all factory test information prior to installation to the Project Manager. If equivalent product(s) are substituted, the equivalent product(s) must show demonstrated and documented equivalence to the product(s) specified.

E. Material Guarantee
The wiring vendor (installer) shall guarantee at the time of the bid that all Category 5E cabling and components meet or exceed specifications (including installation) of TIA/EIA-568A and 569.

F. Material Provided
Vendor shall be certain that all correct parts are ordered and installed. Vendor shall submit complete parts and part numbers prior to installation of equipment to the Project Manager.

1.3 MANUFACTURER’S QUALIFICATIONS

A. Manufacture
The company specializing in manufacturing products specified in this Section with a minimum of seven (7) year’s experience and shall be ISO 9001 Certified.

1.4 CONTRACTOR’S QUALIFICATIONS

A. Contractor
The contractor selected to provide the installation of this system shall be certified by the manufacturing company in all aspects of design, installation and testing of the products described herein, and has a minimum of five (5) years experience on similar premises cabling systems. Indicate whether the contractor is a certified Value Added Reseller of the product manufacturer.

B. Contractor Selection
The contractor selected for this Project must be certified by the manufacturer of the products, adhere to the engineering, installation and testing procedures and utilize the authorized manufacturer components and distribution channels in provisioning this Project.

C. Contractor Experience and Training
The contractor shall be experienced in all aspects of this work and shall be required to demonstrate direct experience on recent systems of similar type and size. The contractor shall own and maintain tools and equipment necessary for successful installation and testing of optical and Category 5E metallic premise distribution systems and have personnel who are adequately trained in the use of such tools and equipment.

D. Contractor Resume
A resume of qualification shall be submitted with the Contractor’s proposal indicating the following:

1. A list of recently completed projects of similar type and size with contact names and telephone numbers for each.
2. A list of test equipment proposed for use in verifying the installed integrity of metallic and fiber optic cable systems on this project.
3. A technical resume of experience for the contractor's Project Manager and on-site installation supervisor who will be assigned to this project. The Project Manager shall hold a current BICSI R.C.D.D. Registration and the Installation Supervisor shall possess a current BICSI Cabling Installation Registration.

4. A list of technical product training attended by the contractor's personnel that will install the premises wiring system shall be submitted with the response.

5. Any sub-Contractor, who will assist the wiring contractor in the execution of this contracted work, shall be indicated to the owner at time of award.

1.5 CABLING AND BASIC REQUIREMENTS

A. Cable
Cable shall be category 5E unshielded twisted pair (UTP) rated for non-plenum installation that is extended from the network hub location and voice server to the data and voice outlets located at end user points.

B. Cable Pathway
Extension of all data and voice cables shall be within raceway, conduit, cable tray or other designated cable delivery system provided and installed by the contractor where concealed in walls and exposed above ceilings in plenum spaces.

C. Hardware
Required hardware includes, but is not limited to, termination blocks, fastening devices, data outlets, voice outlets and all required accessories to comply with this specification.

1.6 GROUNDING AND BONDING

All grounding and bonding shall meet the National Electrical Code (NEC) as well as local codes, which specify additional grounding and/or bonding requirements.

A. Bonding and Grounding
Communication bonding and grounding shall be in accordance with the NEC and NFPA. Horizontal cables shall be grounded in compliance with ANSI/NFPA 70 and local requirements and practices. Horizontal equipment includes cross connect frames, patch panels and racks, active telecommunication equipment and test apparatus and equipment. Provide all telecommunications equipment bonding utilizing a #6-AWG or larger bonding conductor that provides direct bonding between equipment rooms and telecommunications closets back to the building ground.

1.7 WARRANTY

A fifteen (15) year Extended Product Warranty and System Assurance Warranty for this wiring system shall be provided.

A. Extended Product Warranty
The Extended Product Warranty shall ensure against product defects and that all approved cabling components exceed the specifications of TIA/EIA 568A and ISO/IEC IS 11801. The warranty shall also guarantee that the wiring system will exceed all requirements of TIA/EIA TSB 67, TIA/EIA TSB95 and ISO/IEC IS 11801 for cabling links/channels, and that the installation is warranted for a fifteen (15) year period. This warranty shall apply to all passive SCS components.

B. System Assurance
The System Assurance shall cover the failure of the wiring system to support the application which it was designed to support, as well as additional application(s) introduced in the future by recognized standards or user forums that use the TIA/EIA 568A or ISO/IEC IS 11801 component and link/channel specifications for cabling, for a fifteen (15) year period.
C. Extended Product Warranty
The Extended Product Warranty and the System Assurance shall cover the replacement or repair of defective product(s) and labor for the replacement or repair of such defective product(s).

D. System Certification
Upon successful completion of the installation and subsequent inspection, the customer shall be provided with a numbered certificate, from the manufacturing company, registering the installation.

1.8 DESCRIPTION

A. Structured Cabling System
Furnish and install complete with all accessories a Structured Cabling System (SCS) wiring system. The SCS system shall serve as a vehicle for transport of data, video and voice telephony signals throughout the network from designated demarcation points to outlets located at various desk, workstation and other locations as indicated on the contract drawings and described herein. Applications standards supported should include, but be not limited to, IEEE 802.3, 10Base5, 10BASE-T, IEEE 802.5, 4 Mbps, 16Mbps (328 ft. [100m], 104 Workstations) and TP-PMD. In addition, these links/channels shall be capable of supporting evolving high-end applications such as 100 Base-T and 52/155 Mbps ATM.

B. Campus Telephone Connectivity
Wiring utilized for telephone voice service shall originate at owner furnished, contractor installed Siemens Telephone PBX System RCM (remote control module). Twenty-five pair Cat 5E 50 pin Telco connector with gold plated contacts, gender to suit both block connectors and RCM connectors shall be provided and installed by the contractor as indicated on the contract drawings. The cross connect field shall be installed and terminated as indicated on the provided cross connect schedule. From the backbone blocks of the cross connect field, 25 pair Cat 5E cabling with 50 pin Telco connectors shall be provided and installed terminating on rack mounted pre wired voice patch panels, Cat 5E, with (48) eight pin modular jacks.

C. Data and Voice
Wiring utilized for data and voice communications shall originate at owner provided hubs and concentrators in vertical free standing equipment racks, and/or enclosed wall mounted vertical equipment racks located in the Telecommunications Equipment Room (ER), the Main Cross-connect (MC), the Intermediate cross-connect (IC), and/or the Telecommunications Closet (TC) location(s). Wiring, terminations and patch bays between these designated demarcation points and outlet locations designated on the plans shall be considered part of the contact. Outlets (jacks) shall be furnished, wired and installed by the SCS system contractor. Outlets and patch panels shall be labeled IAW University specifications. (Reference section 1.10D2)

1.10 SPECIAL REQUIREMENTS FOR CABLE ROUTING AND INSTALLATION

A. Cabling
All communications cabling used throughout this project shall comply with the requirements as outlined in the National Electric Code (NEC) article 760 and the appropriate local codes. All cabling shall bear CMP (Plenum Rated), CM/CMR (Riser Rated) and/or appropriate markings for the environment in which they are installed.

B. Plenum Cable Bundling
In suspended ceiling and raised floor areas where duct, cable trays or conduit are not available, the Contractor shall bundle, in bundles of 50 or less, all cables every five (5) feet, between the "J" hooks. The cables shall be bundled utilizing Velcro wraps suitable for this installation and tensioned so as not to deform the cable geometry. The cable bundling shall
be supported via "J" hooks attached to the existing building structure and framework at a maximum of five (5) foot intervals. Plenum rated cable will be used in all appropriate areas or as indicated on the contract documents. The contractor shall adhere to the manufacturers' requirements for bending radius and pulling tension of all data and voice cables.

C. Fire Stopping
Sealing of openings between floors, through rated fire and smoke walls, existing or created by the contractor for cable pass through shall be the responsibility of the contractor. Sealing material and application of this material shall be accomplished in such a manner that is acceptable to the local fire and building authorities having jurisdiction over this work. Creation of such openings as are necessary for cable passage between locations as shown on the drawings shall be the responsibility of the contractor's work. Any openings created by or for the contractor and left unused shall also be sealed as part of this work.

D. Contractor Responsibility
1. The contractor shall be responsible for damage to any surfaces or work disrupted as a result of his work. Repair of surfaces, including painting, shall be included as necessary. Damaged ceiling tiles shall be replaced with identical materials.
2. Telecommunications Structured Cabling Systems labeling for patch panels crossconnect blocks and outlets shall be as follows:
   a. Patch panel port terminations for campus Voice Data and Video infrastructure shall be labeled sequentially beginning with the number "1" regardless of the factory numbering scheme unless otherwise specified in this section. Each port of origin shall bear the room number for the outlet location. Labeling at branch locations shall follow either the termination schedule established at each location or default to the university's labeling scheme as defined in section 16741 1.10 D. of the University Design and Constructions Standards Manual.
   b. Crossconnect blocks for campus Voice Data and Video infrastructure shall be labeled sequentially beginning with the number "1" or "0" as follows:
      i. For patch panel and crossconnect blocks allocated for distribution between sites each pair shall be numbered beginning with the number "1".
      ii. For crossconnect blocks allocated for patch panel outlet terminations only the first pair of each category 5E cable shall be numbered beginning with the number "1".
   c. For crossconnect blocks allocated for SLMA or SLMO port equipment circuit cards for the campus PBX or Remote Communication Modules (RCMs) the numbering shall be 0-23 for a total of twenty four (24) pairs beginning with the first pair unless otherwise specified.
      i. All circuit protector blocks shall be labeled with distribution pair count and point of origin, i.e. equipment, building or company providing service, point of termination, and local distribution pair count to coincide with site location and numbering scheme.
   d. Outlet terminations for Voice data and Video infrastructure, with the exception of the campus identification card system (Nautilus Card), shall bear the origin, i.e. port number, block number or patch panel number, and the room number of it location to parallel the point of origin labeling. All labeling shall be permanently affixed to the terminated outlet faceplate or housing.
   e. The General Meters campus identification card system (Nautilus Card) patch panels, cabling and outlets shall be installed and labeled as follows:
i. Patch panel ports of origin shall be 110 type terminations EIA/TIA 568A configured and segregated from all other patch panels within the communications room. Port labeling shall begin with the number “1”.

ii. Cabling shall be category 5E UTP terminated at the port of origin with a C-4 connector configured 568A and at the outlet White/Blue and White/Orange on pin 1 and Blue/White and Orange/White on pin 3.

f. Outlets shall be Leviton 625B4 Modular wall jack, Leviton 625B3 duplex wall jack or equivalent. Category 5E cable pairs blue and orange shall be terminated on pins 1 and 3. White/Blue and White/Orange terminate on pin 1 and Blue/White and Orange/White terminate on pin 3. Outlet faceplates or housing shall contain the letter “N” and the patch panel port of origin number and room number. All labeling shall be permanently affixed to the terminated outlet faceplate or housing.

Note: Patch panel and outlet labeling shall consist of a permanent label from a labeling machine. Permanent markers, pens or pencil shall not be permitted. Labeling at branch locations shall follow the termination schedule established at each location or default to the university’s labeling scheme as defined in section 16741 1.10 D. of the University Design and Construction Standards Manual.

PART 2 - PRODUCTS

2.0 EQUIVALENT PRODUCTS

Equivalent product(s) may be considered for substitution for those products specified, however, the equivalent product(s) must be approved and show demonstrated and documented equivalence to the product(s) specified in performance and warranty. All like items of equipment and cabling shall be a standard product of the same manufacturer. The request for product substitution, and supporting documentation, must be submitted, in writing, prior to submitting the bid to the project manager. Written approval for product substitution from the project manager must be submitted with the bid.

2.1 OUTLETS

A. Outlets for Voice and Data:
Communications outlets shall consist of one, two, three or four gang utility outlet boxes and plates equipped with 8-pin modular (RJ-45) jacks, utilizing T568B wiring terminations. All outlet cabling shall terminate on termination blocks at their associated equipment rooms. Unless otherwise noted on the floor plans or within this document, all data wall outlets for 24 AWG copper cable shall be:

1. 8-position/8-conductor modular
2. Insulation displacement
3. Universal application/multivendor supportive accepting most phone and data plugs.
4. Faceplates shall be either ivory or white in color, as indicated on the contract drawings and labeled IAW university specifications. (Ref Sect. 1.10D2)
5. Provided with blank module inserts for all unused module locations. Jack module arrangement is shown on the drawings. Provide color-coded jacks at each outlet and patch panel with the following coloring identification:
   
   Data  = Blue
   Voice  = White
   Nautilus  = Green
B. Category 5 Outlets

All Category 5 outlets shall conform to TIA/EIA 568A Commercial Building Telecommunications Cabling Standard, Horizontal Cable Section, and shall meet or exceed the following electrical, mechanical and NEXT specifications:

Electrical Specifications:
- TIA/EIA 568B Category 5 minimum requirements
- Insulation resistance: 500 MW minimum
- Dielectric withstand voltage 1,000 VAC RMS, 60 Hz minimum, contact-to-contact and 1,500 VAC RMS, 60 Hz minimum from any contact to exposed conductive surface.
- Contact resistance: 20 mW maximum
- Current rating: 1.5 A at 68° F(20°C) per IEC Publication 512-3, Test 5b.
- Pair-to-pair NEXT (dB) @ 100 MHz:

Mechanical Performance:
- Plug Insertion Life: 750 insertions
- Contact Force: 3.5 oz. (99.2 g) minimum using FCC-Approved modular plug
- Plug Retention Force: 30-lb. (133 N) minimum between modular plug and jack
- Temperature Range: -40° to 150°F (-40° to 66°C)
- UL® Verified Category 5 Electrical Performance
- Comply with FCC Part 68
- ISO 9001 Certified Manufacturer

2.2 CABLING

A. Category 5E UTP, 4 pair

1. Data cables shall be extended between the station location and its associated TC and consist of 4 pair, 24 gauge, UTP, and shall be terminated on the 8 pin modular jacks provided at each outlet. Cable jacket shall comply with Article 800 NEC for use as either a plenum or non-plenum cable as the project documentation indicates. The 4 pair UTP cable shall be UL® and Listed Type CMP (plenum) or CM (non-plenum).

2. All 4 pair Category 5E cables shall conform to TIA/EIA 568A Commercial Building Telecommunications Cabling Standard, Horizontal Cable Section. Applications standards supported should include, but be not limited to 10BASE-T; IEEE 802.5, 100 Base -T and 52/155 Mbps ATM, and shall meet or exceed the electrical and mechanical specifications listed below:
   - DC resistance 28.6 Ω/1,000 ft (9.38 Ω/100 m), maximum
   - DC resistance Unbalance: 5%, maximum
   - Mutual Capacitance @ 1 kHz: 14pF/1000 ft. (4.6 nF/100m), maximum
   - Capacitance Unbalance (pair to ground): 400pF/1,000 ft. (131.2 pF/100m)
   - Characteristic Impedance: 100 Ω ± 15 Ω from 1-100 MHz
   - Outside diameter: .21 in
   - Weight: 21.6 lb./1000 ft.
   - Worst Pair Attenuation, dB/100m [328 ft.]:

Environmental:
- Storage temperature: 68° F to 122° F (20° C to 50° C)
- Installation Temperature: 32° F to 122° F (0° C to 50° C)
- Operating Temperature: -4° F to 140° F (-20° C to 60° C)
- UL® Verified for Category 5 Electrical Performance
- UL® and c (UL®) Listed for Fire Safety
- ISO 9001 Certified Manufacturer
B. **Category 5, UTP, 25 pair**

1. All 25 pair, Plenum and Non-plenum Category 5 cables shall be composed of 24 AWG bare solid copper conductors insulated with a suitable plastic dielectric material. The insulated conductors shall be twisted into pairs, and stranded into mini-units. The cable shall employ a honeycomb core construction, consisting of multiple three and four pair tightly stranded sub-units. A total of seven unjacketed sub-units (six around one) will be stranded to comprise the cable core. All 25 PAIR, Category 5 cables shall conform to TIA/EIA 568A Commercial Building Telecommunications Cabling Standard, Backbone Cable Section.

2. The cable shall be capable of mixing any number of the following standard compliant signals with each other in the same 25 pair cable: 1 Mb/s, 1BASE5, 4 Mb/s Active Token Ring, 10 Mb/s 10BASET, and 16 Mb/s Active Token Ring. When mixing multiple dissimilar signals, the 25 pair Category 5 cable must support distances up 100 meters. In addition, cables shall also be capable of supporting applications such as 155 Mbps ATM and shall meet or exceed the Electrical Specifications listed below:

   **Electrical Specifications:**
   - Nominal Mutual Capacitance: 14pF/ft (46pF/m)
   - Characteristic Impedance (1-100 MHz): 100 Ω ± 15 Ω
   - Maximum DC resistance 28.6Ω/1,000 ft. (9.40Ω/100m)
   - Worst Pair Attenuation (dB/100m [328 ft.]):

   **Environmental:**
   - Storage temperature: 68° F to 122° F (20° C to 50° C)
   - Installation Temperature: 32° F to 122° F (0° C to 50° C)
   - Operating Temperature: -4° F to 140° F (-20° C to 60° C)

UL® Verified for Category 5 Electrical Performance
UL® and c (UL®) Listed for Fire Safety
ISO 9001 Certified Manufacturer

C. **Video Cabling, Accessories, and Connectors**

1. RG-6 and RG-11 coax should have 100% shield (foil) and more than 50% braid, Belden 9116 or equivalent. (Which is 61% braid.) “F” Connectors should be crimp-type. No external power shall be required. Adapters must meet the following electrical specifications:

   **Electrical Specifications:**
   - Bandwidth: 450MHz or higher
   - Input Impedance: 75 ohms
   - Output Impedance: 75 ohms
   - Insertion Loss: <3dB
   - Return Loss: <20dB
   - Common Mode Rejection: >40dB
   - Noise Figure: <12dB

   Tested to FCC Rules and Regulations, Part 76
   CISPR Pub. 22 for Class B
   Classified by U.L. in accord with IEC Pub. 950

2. CATV/video wall taps shall be Blonder Tongue, V-4897 or approved equal. Faceplate shall be standard electrical duplex plate, ivory or white in color.

3. CATV/video cable splitters shall be for 2, 6, or 8 ports as indicated on drawings and shall be good to 900 MHz. Or better as manufactured by Blonder Tongue or approved equal.
D. 525 Category 5, 25 pair connector

1. The 525 Category 5, 25 pair connector will be used to terminate 25-pair Category-5 cables. The connector will be notched in the skirt to facilitate the use of keyed connectors on high-end LAN equipment preventing the possibility of connecting low-performing Category-3 cable assemblies to equipment designed to only work with Category-5 cable assemblies. Performance improvements shall be achieved without having to compromise backward compatibility with current Telco-type connectors. The 525 Category 5, 25 pair connector shall conform to TIA/EIA 568A Commercial Building Telecommunications Cabling Standard, Horizontal Cable Section. All 525 Category 5, 25 pair connectors shall be installed and tested by the manufacturer.

2. The connector will consist of three main parts - the mandrel, the housing, and the hood. Cable pair twists will be maintained up to the edge of the mandrel. The Category 5, 25 pair Cable Connector assemblies will consist of 25-pair 1061C or 2061C cable with a Category 5, 25 pair connector on one or both ends.

Mechanical Performance:
- Meets FCC Part 68 Subpart F and Industry Canada CS-03 Part 3 mating area dimensional requirements
- Contact plating in mating region: 30 µin Gold over 50 µin Nickel
- Operating temperature: -10º C to 60º C
- Insertion Life: 200 insertions Minimum
- Contact force: 100 grams minimum

Electrical Specifications:
- DC Resistance (maximum): 0.3 Ω
- Attenuation and Power Sum NEXT shall meet the requirements of TSB67 and TSB95

2.3 SURFACE RACEWAYS

Communication outlets that require surface mounting shall be mounted in non-metallic backboxes with surface raceways. Surface raceways are only allowed as indicated on contract drawings. Surface raceways may be omitted where access into existing walls is available. Backboxes shall be mounted at power receptacle height. Raceways shall be secured every 15 inches with screws and wall anchors. See drawings for detail of installation.

2.4 EMT CONDUIT

Electrical metallic tubing shall be installed as indicated on single line diagrams of the contract drawings. Metal flex conduit shall not be used without the written consent of the project manager. No section of conduit shall be longer than 100 ft. or contain more than two 90-degree bends between pull points or pull boxes. The inside radius of a bend in conduit shall be 8 times the internal diameter. When conduit is greater than 2 inches the inside radius shall be at least 10 times the internal diameter of the conduit. Any single conduit run extending from a telecommunication closet shall not serve more than three outlets. Conduit shall be sized as per EIA/TIA-569 Table 4.4-1. Pull boxes shall be sized as per EIA/TIA-569 4.42.6.4. All EMT connectors shall be compression type. All conduits shall be marked 10’ on center with blue paint. Plastic bushings shall be installed at each end of the conduit terminations and in every junction box connection. Install 500-lb. pull-string in every conduit run.

2.5 EQUIPMENT RACKS

The telecommunications equipment room shall be equipped with either a wall mounted, swing gate, EIA/TIA standard, 19” hinged rack or a floor mounted EIA/TIA standard 19” rack as indicated on the contract drawings. Provide shelves and wire managers as indicated. Racks shall be manufactured by Chatsworth or approved equal.
A. **Floor Mounted** Single-sided Dimensions - 84 inches x 19 inches x 18 inches with 19 inch center mounting
   - Footprint: 19 inches (length) x 18 inches (depth)
   - Hole pattern: half-inch centered
   - Screw size: 12-24 threads, half-inch length
   - Chatsworth Model: 46383-503

   **Wall Mounted, Hinged**, Single-sided Dimensions - 38.5 inches x 19 inches x 18 inches.
   - Hole pattern: half-inch, centered
   - Screw size: 12-24 threads, half-inch length
   - Chatsworth Model: 11348-523

B. Where sufficient rack space is available on an existing EIA approved rack, the connections may be installed on the existing rack. The minimum rack size shall be a standard 19-inch rack with sufficient rack space to allow the Fiber Distribution Center (FDC) to be placed at the top of rack.

C. Racks shall be mounted on an isolation pad and utilize non-conductive washers to secure the rack to the floor. Floor mounted open racks shall be secured from the top rail to the backboard in the room with a length of cable runway to prevent movement. All racks shall be grounded to the isolated ground bar within the telecom room using a standard ground lug and #6 jacketed green cable. (See grounding requirements section of this specification).

### 2.6 PATCH PANELS AND CORDS

**A. Patch Panels**

Two types of termination block shall be used, either a punch panel or a modular jack panel. The punch panel shall be in 100 pair or 300 pair modularity, whereas the modular jack panel shall be in 24, 48, and 96 port configurations as shown on the drawings. Modular jack panel installations shall contain a retaining trough between every 100 pair termination block. Modular Jack Panels shall be wired for T568B configuration. Patch Panels shall be labeled IAW University specifications. (Ref Section 1.10D2)

1. The termination blocks shall have the following characteristics:

   **Wire Insulation Supported:**
   - Size: 0.05 inches Diameter Over Dielectric maximum for top of connecting block
   - Size: 0.07 inches Diameter Over Dielectric maximum for bottom of connecting block
   - Types: All plastic insulators (including PVC, irradiated PVC, Polyethylene, Polypropylene, PTFE Polyurethane, Nylon, and Teflon)
   - Termination Type: Insulation displacements, dry, gas tight

   **Wire Size Supported:**
   - Solid: Wire Ranges 22-26 AWG, Re-termination >200
   - Stranded (7 Strands): Wire Ranges 22-26 AWG, Re-termination: >200
   - Wire pullout force (24 AWG): 2.2 lb. (9.7 Newtons)
   - Wire retention force (24 AWG): Horizontal 8 lb., Vertical 2 lb.

   **Density:**
   - Modular Jack Panel Type Hardware: 210-pairs/sq. ft.
   - Punch Panel Type Hardware: 340-pairs/sq. ft.
   - Design life: 30 years

   **Electrical Specifications:**
   - Dielectric Strength: 2.0k kVrms @ 60 Hz
   - Capacitance Adjacent Contacts: < 1pF
- Insulation Resistance (@ 500V dc):

Environmental:
- Temperature range: Storage -40° to +70° C, Operational -10° to +70°C
- Humidity: 95% Maximum

2. All blocks shall be UL Listed and Austel (Australian Standards Association) approved.

3. Category 5 Modular Jack Panels shall be used when 8-pin modular plug ended cord administration is required.

4. Designation strips for each jack shall be provided on the patch panel. All cables shall be terminated in numerical sequence and labeled as per the campus standard numbering for outlets.

B. Category 5E Modular Patch Cords

1. Provide Category 5E Modular Patch Cords for each assigned port on the patch panel. All cords shall conform to the requirements of EIA/TIA 568A Commercial Building Telecommunications Cabling Standard, Horizontal Cabling Section. Cords shall be equipped with an 8 pin modular connector on each end and shall conform to the length(s) specified on the detailed drawing. All patch cords shall be factory terminated and tested.

2. All Category 5E cordage shall be round, and consist of 24-AWG copper, stranded conductors, tightly twisted into individual pairs and shall meet or exceed the electrical specifications listed below:

   Electrical Specifications:
   - DC Resistance per lead: 9.4Ω/100m (328 ft), maximum
   - DC resistance unbalance: 5%, Maximum
   - Mutual Capacitance: 6.6 nF/100m (328 ft), maximum
   - Characteristic Impedance 100Ω ± 15% from 1 to 100 MHz
   - The Category 5 patch cord shall incorporate the "cross-over lead" concept.
   - The patch cord shall have built-in exclusion features to prevent accidental polarity reversals and split pairs.

   UL Verified for EIA/TIA 568A Electrical Performance
   UL Listed for Fire Safety
   ISO 9001 Certified Manufacturer
   Austel Approved
   FCC Compliant

2.7 VOICE CIRCUIT TERMINATIONS

Voice telecommunications closet locations shall be equipped with approved patch panels for termination of voice station and host cable pairs. Host cable block shall consist of a minimum 100 pair block, station field blocks shall be supplied as dictated by cable counts, in standard increments. All patch panels shall be securely fastened to the equipment racks. Provide all required D-rings or other approved cable guides as required to provide a neat installation or indicated on contract drawings. Provide ladder racking as manufactured by Chatsworth or equivalent as indicated on drawings. All cables shall be terminated in numerical sequence.

A. Entry connection blocks for Bell RJ21X interface will be amphenol connected on the RJ21X end and terminated on a 66M125.

B. Full/Half backboard shall be 16 gauge mill galvanized steel metal backboard, baked blue polyester paint over primer with either 4 or 8 89 brackets that will accommodate either 4 or 8 66M blocks.
C. Back panel assemblies shall be Reliable Electric/Utility, Model #R187B-1, two white post panels riveted with 16 DP-1, or approved equal.

2.8 UNSPECIFIED EQUIPMENT AND MATERIAL
Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide a complete and functional PDS installation shall be provided in a level of quality consistent with other specified items.

2.9 GROUNDING SYSTEM AND CONDUCTORS
The Contractor shall provide a green insulated #6 AWG stranded copper wire cable between ground bars located at each equipment room and all installed devices. The same type of ground conductor shall be utilized for equipment, termination, rack and hub equipment grounding.

A. Bonding and Grounding
Communication bonding and grounding shall be in accordance with the NEC and NFPA. Horizontal cables shall be grounded in compliance with ANSI/NFPA 70 and local requirements and practices. Horizontal equipment includes cross connect frames, patch panels and racks, active telecommunication equipment and test apparatus and equipment. A bonding plate with lugs is provided in every telecommunications room and closet and is not part of this work.

PART 3 - EXECUTION

3.0 WORKMANSHIP
Components of the premises wiring system shall be installed in a neat, workmanlike manner. Wiring color codes shall be strictly observed and terminations shall be uniform throughout the system. Identification markings and systems shall be uniform. TIA/EIA 568A wiring codes as shown on the drawings shall standardize all UTP wiring.

3.1 PROJECT/SITE CONDITIONS
Conditions of the projects will vary with each installation. Some of the buildings within the scope of this work will be occupied during this installation. Every consideration must be given to the building occupants. The project manager may require some work to be performed when the building is unoccupied. On new construction projects the installation may not begin until substantial completion has been declared.

3.2 SCHEDULING AND SEQUENCING
The contractor shall furnish a work schedule to the project manager clearly indicating the start of the work, duration, and after hours scheduling. Work may not proceed without the approval of the project manager.

3.3 SUPPORT AND ROUTING OF CABLES
A. Station cables and tie cables installed within ceiling spaces shall be routed through these spaces at right angles to electrical power circuits and supported only from the structure. Riser and tie cables shall be extended between closets and equipment rooms utilizing the interfloor conduit sleeves.

B. Use of ceiling tiles, grid or hanger wires for support of premises cables shall be prohibited.

C. The system contractor shall install a complete set of supporting rings, hoods and other supporting hardware for this system as part of the contract. All supporting hardware shall be submitted to the engineer for approval prior to installation.
3.4 **FIRE AND SMOKE PARTITION PENETRATIONS**

Conduit sleeves shall be provided as a means of routing cables between various TC rooms and multi floor buildings. Openings in sleeves and conduits used for the premises wiring system cables and those, which remain (empty) spare, shall be sealed with an approved fireproof, removable safing material. Sleeves, which pass vertically from floor to floor, shall be sealed in a similar manner using an approved re-enterable system. Additional penetrations through rated assemblies necessary for passage of wiring shall be made using an approved method and permanently sealed after installation of cables.

3.5 **INSTRUCTION OF OWNER**

The contractor shall schedule a time to provide not less than two (2) hours of familiarization instruction to the Telecommunications and Data Departments support personnel. Training shall include a “walk-through” of the system for location and labeling orientation, a discussion of overall system concepts and configuration, specific instruction on system reconfiguration using patch cords in the telecom rooms and closets, a review of the as-built drawings, a review of the system testing and acceptance documentation and guidelines for basic troubleshooting of the structured cabling system. A person who is thoroughly familiar with the installation shall present the instruction in an organized and professional manner.

3.6 **TESTING OF WIRING ACCURACY**

A. **Category 5 Testing**

Each jack in each outlet shall be tested for Category 5, TSB 67 and TSB 95 compliance, using an appropriate testing instrument, to verify both the integrity of all conductors and correctness of the termination sequence. Testing shall be performed between modular jacks at the outlets and the modular jacks at the TC station field.

B. **Documentation**

Documentation of cable testing shall be required and the engineer shall be present during all tests. The SCS contractor shall provide a table of test results in a 3-ring binder submitted with the as-built drawings. The table shall include the following measurements for all voice/data station cables, backbone cables, and pairs:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Basic Link Limit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiremap</td>
<td>Continuity on all 8 wires, no shorts, breaks, crossovers, miswires</td>
<td>TSB67</td>
</tr>
<tr>
<td>Length</td>
<td>&lt; 94 m (90 m plus 2 m test cords at each end)</td>
<td>TSB67</td>
</tr>
<tr>
<td>Attenuation</td>
<td>21.6 dB @ 100 MHz: (formula based)</td>
<td>TSB67</td>
</tr>
<tr>
<td>NEXT</td>
<td>29.3 dB @ 100 MHz: (formula based)</td>
<td>TSB67</td>
</tr>
<tr>
<td>Return Loss</td>
<td>1&lt; f&lt;20 MHz: 15 dB 20&lt; f&lt;100 MHz: 15-7 log (f/20)</td>
<td>TSB95</td>
</tr>
<tr>
<td>ELFEXT</td>
<td>&gt; 17 – 20 log (f/100)</td>
<td>TSB95</td>
</tr>
<tr>
<td>PSELFEXT</td>
<td>&gt; 14.4 – 20 log (f/100)</td>
<td>TSB95</td>
</tr>
<tr>
<td>Delay</td>
<td>&lt; 510 ns at 10 MHz</td>
<td>TSB95</td>
</tr>
<tr>
<td>Delay Skew</td>
<td>&lt; 45 ns</td>
<td>TSB95</td>
</tr>
</tbody>
</table>

1. The table shall indicate all defective pairs and test results of all pairs listed above. Cables not complying with EIA/TIA 568A Category 5 tests for 100 Mb/s rating or not passing TSB 67 and TSB 95 test guidelines, shall be identified to the Project Manager for corrective action which may include replacement at no additional expense to the Owner.

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3.7 MATERIAL DELIVERY, STORAGE AND CLEANUP

A. Delivery
No responsibility shall be assumed by the University's Central Receiving Department as to how or when materials are delivered, as this is the responsibility of the awarded contractor. The contractor shall make all arrangements to unload and transport delivered materials and equipment to the jobsite. Equipment and materials shall be received at the site in new condition and shall be maintained in new condition throughout the installation process.

B. Storage
The University does not have the resources to dedicate a storage area for each contractor. It is recommended that the selected contractor provide a lockable material trailer to be parked in an area designated by the project manager.

C. Cleanup
The contractor shall be responsible for the disposal of unused materials subject to the requirements for hazardous materials disposal act. This shall include the disposal of all wire spools.

3.8 AS-BUILT DRAWINGS
As-built drawings shall be provided which indicate accurately all approved changes, pair assignments, labeling, actual device mounting locations, and all pertinent graphical information necessary to facilitate system administration, maintenance, and future moves. Contract drawings will be furnished to the contractor on 3.5-inch diskettes or electronically transmitted media using AutoCad Release 14 and shall be returned, revised to reflect as-built conditions using the same format. The as-built drawings shall be returned no less than five (5) working days from the substantial completion of the project.

3.9 INSPECTION
The Project Manager and the installation supervisor shall perform on-going inspections during construction. All work shall be performed in a high quality manner and the overall appearance shall be clean, neat and orderly.

END OF SECTION