FLORIDA INTERNATIONAL UNIVERSITY

UNIVERSITY SAFETY COMPLIANCE GUIDE

CONSTRUCTION

SECTION 700

ENVIRONMENTAL HEALTH & SAFETY,
INSURANCE & EMERGENCY MANAGEMENT SERVICES

TABLE OF CONTENTS

Section Page Number

USCG 701 – LOCAL EXHAUST VENTILATION EQUIPMENT

Last Update: 06/01/01

PURPOSE

To ensure local exhaust ventilation equipment is designed and installed in accordance with standards and recommended practices for the control of hazardous materials.

GUIDELINES

1. Local exhaust ventilation equipment includes, but is not limited to, the following:
2.

- Laboratory fume hoods
- Dust collectors
- Biological safety cabinets
- Welding hoods
- Canopy hoods
- Electrostatic
- Bench hoods
- Precipitators
- Downdraft hoods
- Scrubbers
- Slot hoods
- Other local exhaust equipment

3. All construction plans and/or requisitions for new local exhaust ventilation equipment shall be made available to the Department of Environmental Health and Safety and Facilities Management for review.

4. All material modifications to existing local exhaust ventilation equipment shall require the review of the Director of the Department of Environmental Health and Safety, and Facilities Management.

5. The Department of Environmental Health and Safety approval of plans for modifications to local exhaust ventilation equipment shall be based on standards and recommended practices for the control of hazardous materials.

6. The Facilities Management Department shall ensure that the local exhaust ventilation equipment is installed in accordance with the approved plan.

For more information regarding these guidelines, contact the Department of Environmental Health and Safety (305) 348-2621.

USCG 702 – WALL PENETRATIONS

Last Update: 06/01/01

PURPOSE

To ensure that all penetrations in fire and smoke rated walls are properly sealed.

STANDARD

University shall have a program to ensure that all penetrations in smoke or fire rated walls resulting from construction, repair or other work, are sealed with approved material.

PROCEDURE

1. **Requirements**

   Pipes, conduits, bus ducts, cables, wires, air ducts, pneumatic tubes and ducts, cable trays, and similar building service equipment that pass through fire and smoke barriers shall be protected as follows to prevent the passage of flame, smoke, fumes and hot gases:

   The space between the penetrating item and the fire or smoke barrier shall:

   a. Be filled with a material capable of maintaining the fire resistance of the fire barrier, or
   b. Be protected by an approved device (see Section I.2.) designed for the specific purpose.

2. **Responsibilities**

   Environmental Health and Safety

   a. Environmental Health and Safety will inspect for penetrations during hazard surveillance rounds.
   b. Facilities Maintenance personnel will report any unsealed penetrations which may be discovered during routine inspection or service to Environmental Health and Safety.

   Facilities Management

   a. Facilities Management shall repair penetrations they may find in the immediate area where they may be working.
   b. Facilities Management has the responsibility of maintaining the building in a safe condition, and therefore, the ultimate responsibility for sealing all fire and smoke wall penetrations is with the Facilities Management Department.

   New Construction

   a. All bids and contracts will include the above requirements for wall penetrations. Compliance with this standard will be a condition for selection of all contracts.
   b. All construction permits will include the above requirements for wall penetrations.

   Renovations / Equipment Installations

   a. All renovations, upgrades and equipment installations performed by electricians, plumbers, HVAC, telephone workers, computer systems installers, fire alarm

maintenance, TV Rental, or other workers, whether in-house or outside contractors, shall comply with the above requirements.

b. Notification of penetrations made and actions taken to seal penetrations must be provided to the Physical Plant on a routine basis by the department performing equipment installations or by the department hiring contractors to perform equipment installations.

For more information regarding these guidelines, contact the Department of Environmental Health and Safety at (305) 348-2621.

References:

1. National Fire Protection Association:
   a. *Life Safety Code 101* Section 6-2.3.6
   b. *Fire Walls and Fire Barrier Walls 221* Section 6-1
2. New York State Uniform Fire Protection and Building Code
   a. Title 9 Section 771.6

USCG 703 – CONDUCTING A FIRE ASSESSMENT FOR CONSTRUCTION SITES IN AN OCCUPIED BUILDING

Last Update: 01/20/06

Risk assessments are used to establish priorities and in so doing allow more dangerous situations to be addressed first and those less likely to cause major problems to be scheduled for future response.

PURPOSE

To assist building project managers to conduct fire safety risk assessments in occupied buildings undergoing construction and renovation activities. This activity takes on increased significance when a project involves the use or storage of flammable materials, work in close proximity to hazardous materials, welding or tasks that result in interruption of building fire suppression or alarm system.

SCOPE

All buildings/facilities owned or maintained by the University, which are occupied during a significant renovation, repair or maintenance activity.

REFERENCES

- U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
- Public Health Service
- Centers of Disease Control and Prevention (CDC)
- National Institute for Occupational Safety and Health (NIOSH)

GUIDELINES

1. **Determine who will conduct the analysis.**
   Those involved in the analysis should be knowledgeable about the scope and schedule of the work and the area that is being assessed. The findings from various sources including, but not limited to: area occupants, contractors, EH&S staff, and maintenance personnel should be combined for a comprehensive site analysis.

2. **Define the area to be included.**
   The area to be included involves potential impact as well as work areas. If a large area is selected, it is best to subdivide and, then, combine the results. Conduct an analysis of each problem area identified and combine these results to assess the hazards in the total area.

3. **Identify *all the possible fire hazards* that exist in the area selected for evaluation.**
   Start by determining all likely sources of ignition in the area and organize them with the help of the attached form: POTENTIAL FIRES (Attachment #1). Under each general label, i.e., electrical, frictional, etc., list all specific sources of ignition of this type that can be found in the area being analyzed. For example, under the label "electrical" - list power centers, fan motors, etc., and under the label "frictional" - belt rollers or the belt of a motor may be identified. Be as specific and as realistic as possible when listing fire hazards.

4. Evaluate the Risks

Use the following two concepts: *Probability of occurrence*, and *Severity of effects.* For each fire hazard identified, a judgment is required about the probability of a fire being caused by that ignition source and the severity of the consequences.

In summary, to assess risk:

- Identify a source of ignition; (i.e., hazard).
- Determine the likelihood that this source will actually cause a fire; (probability)
- Estimate how serious the damage to life, property, and the environment could be.

5. Use Hazard Ratings

Those hazards deemed to have the greatest probability of occurring should be flagged. They should be made the top priority for mitigation, and/or response efforts.

Organize these findings in terms of their severity potential and allocate resources accordingly.

For more information regarding this guideline, contact the Department of Environmental Health and Safety at (305) 348-2621.

USCG 704 – RENOVATION / CONSTRUCTION SAFETY

Last Update: 01/20/06

PURPOSE
To identify minimum* construction safety criteria for renovation projects or building additions.

SCOPE
University wide

GUIDELINES
1. Contractors are required to complete and conform to requirements identified on the attached Renovation / Construction Safety Addendum, before the start of any project.

2. The Renovation / Construction Safety Addendum identifies the basic safety standards that each contractor must adhere to, but is not an all inclusive document.

3. The Facilities Planning and Construction Department shall ensure that a completed Renovation / Construction Safety Addendum is included in each project file and will provide a copy of the completed form to EH&S upon request.

For more information regarding these guidelines, contact the Facilities Planning and Construction Department – Permit Section at (305) 348-4000 or the Department of Environmental Health and Safety (305) 348-2621.

*The items identified are based on the concerns most frequently observed on projects.

Attachment: Renovation / Construction Safety Addendum

USCG 705 – WHAT IS A HOT WORK PERMIT?

Last Update: 01/20/06

PURPOSE

The Hot Work Permit system is intended to assure that the individuals involved in construction, renovation, repairs and maintenance of University facilities are aware of the hazards associated with hot work and welding and that they implement control measures to help mitigate them.

The Hot Work Permit is the means by which the departments of Facilities Management, Facilities Planning and Construction, and the department of Environmental Health & Safety & Risk Management Services will be able to keep track of construction activities that involve hot work, and that these activities are being conducted safely.

The hot work permit also provides a step-by-step check list for hot work fire safety and serves as a reminder to contractors of their fire prevention responsibilities before, during, and after any hot work is conducted.

SCOPE

All operations in buildings/facilities owned or maintained by the University, which are occupied during a significant renovation, repair or maintenance activity. (Occupied is defined as "the presence of one or more persons")

DEFINITION

Hot Work is defined as cutting, welding, soldering and brazing operations for construction/demolition/maintenance/repair activities that involve the use of portable gas or arc welding equipment. The use of these types of equipment for cutting and welding can introduce significant fire hazards into University buildings.

GUIDELINES

1. **How Does the Hot Work Permit System Work?**

   Before a contractor or FIU Maintenance employee can perform Hot Work in an occupied building at FIU, they will be required to obtain a valid Hot Work Permit. In order to obtain a Hot Work Permit, contractors must coordinate with their project manger to meet with the Fire Prevention Officer at the Department of Environmental Health & Safety, Insurance & Emergency Management Services, CSC 162. University employees may contact the Department of Environmental Health & Safety directly in order to complete an application.

   The Fire Prevention Officer will issue the permit to the contractor or supervisor of the maintenance department. The permit will be valid for a specified time period. The contractor or employee may then perform the hot work, following the precautions outlined on the permit. After the Hot Work is completed, the contractor turns the permit over to their FIU Construction Project Manager and Facilities Management returns their expired permit to the Department of Environmental Health & Safety.

2. **<u>When</u> is a Hot Work Permit Necessary?**
   Hot Work Permits are needed for all cutting, welding, soldering and brazing activities, in occupied buildings, that are conducted with portable gas or arc equipment on Florida International University construction, maintenance, repair or renovation projects.

3. **<u>Where</u> is a Hot Work Permit Necessary?**
   Hot Work Permits are needed for each building where Hot Work will be performed (utility tunnels are considered to be separate buildings). For example, if one contractor is performing work at several different buildings for one project, a permit is necessary for each building.

4. **<u>Who Needs</u> Hot Work Permits?**
   Hot Work Permits are needed for each and every contractor or sub-contractor/trades or University building maintenance employee performing Hot Work in an occupied building. *For example, if there are three different sub-contractors/trades performing Hot Work on one project, each sub-contractor/trade is responsible for obtaining a permit for their own work.*

5. **<u>Who Issues</u> The Hot Work Permit?**
   The FIU Fire Prevention Officer (FPO), at the Department of Environmental Health & Safety, Insurance & Emergency Management Services issues Hot Work Permits:
   a. Contractors must coordinate appointments through their construction project managers.
   b. University building maintenance employees may schedule appointments at any time they need to consult with the FPO. (One month special permits may also be issued in the first week of each month, at the discretion of the FPO.)

6. **How Long Is A Hot Work Permit Valid?**
   The duration of a Hot Work Permit depends upon the type of project (new or existing construction) and the type of the Hot Work to be performed. The FPO will use the following guidelines to determine the time limit for each permit issued.

   <u>NOTE – These are guidelines only:</u>
   - FIU Building Maintenance departments will be issued permits on 28-day intervals.
   - Contractors involved in renovation and/remodeling of existing occupied buildings, titled to the University, will be issued permits valid for 7-days only.

7. **Should The Hot Work Permit Be Posted?**
   Hot Work Permits do not need to be posted at the job site but should be accessible and available upon request by the FPO or any authorized representative of the University.

8. **Who Checks To See If the Hot Work Requirements Are Met?**
   The contractor or sub-contractor/trade performing Hot Work is ultimately responsible for conducting their Hot Work activities in a sound, fire-safe manner and following the precautions outlined on the Hot Work permit. However the FPO or the designated FIU Construction Project Manager may periodically check the work and job site to verify that the contractor is carrying out the requirements of the Hot Work permit. FIU maintenance

supervisors are responsible to verify that work is being carried out as prescribed on the permit.

9. After the Hot Work Complete ... Then What?

Once a Hot Work permit has been filled or when the Hot Work has been completed, the contractor shall return the completed Hot Work permit to the FIU Construction Project Manager for the project; FIU supervisors for building maintenances shall return their permit at the time of renewal of their new permit for the upcoming 28 day period.

For more information regarding this procedure, contact the Department of Environmental Health and Safety at (305) 348-2621.

USCG 706 – CONTRACTOR SAFETY GUIDELINES

Last Update: 01/20/06

PURPOSE

The purpose of these guidelines is to highlight safety requirements applicable to contractors working on University campus.

SCOPE

All contractors and persons performing work on facilities or property at Florida International University (FIU).

GUIDELINES

- It is the contractor's responsibility to ensure the safety of his/her employees; to conduct the work in a safe and responsible manner and in compliance with applicable environmental, health and safety regulations, and to provide for the protection of others who may enter the vicinity of the work activity, or who may otherwise be exposed.

- The contractor is required to follow all federal and state laws, acceptable industry practices, and FIU policies. In case of uncertainty, the contractor must discuss the situation with FIU's project manager prior to proceeding with the work.

- In order to protect pedestrians, contractors are responsible for installing barricades to delineate the boundaries of work areas. Signs must be posted to warn people of dangers and to identify the construction company.

- Contractors are required to maintain certification that their employees have been trained in accordance with regulatory requirements pertaining to the work to be performed. Proof of such certification may be requested by the FIU Environmental Health & Safety Department at any time during the course of the work.

- Contractor’s employees are required to wear appropriate personal protective equipment whenever job hazards so warrant, or if the FIU Project Manager has determined that it is required due to the hazards in the work area.

- The contractor should instruct employees to promptly report all injuries and unsafe conditions to their supervisors and the FIU Project Manager as soon as possible after occurrence, or identification, and maintain appropriate documentation.

- A contractor working inside FIU buildings shall prominently display ID badges on their clothing or be otherwise identified by clothing that identifies their company name.

- Contractors shall not permit possession or use of any alcohol or illegal controlled substance by its employees, while working on the University's property.

- Smoking in any building on University campuses is prohibited.

- All contractors shall:
  Observe all aspects of the FIU Golf Cart Safety Policy # 15.9
  Obey all posted traffic signs
  Obey posted speed limits

- Infractions of University parking & traffic rules will result in fines and revocation of privilege to use golf carts on University campuses

- Any unauthorized vehicles parked in handicap spaces will be issued a violation by the FIU Police Department.

In the event of any emergency, contractors shall contact the FIU Department of Public Safety at (305) 348-2626. For more information regarding this guide, contact the Department of Environmental Health & Safety at (305) 348-2621, or visit the EH&S construction safety page at www.fiu.edu/~ehs/const/home.htm

USCG 706 – ADDENDUM: REGULATORY REQUIRED TRAINING

Last Update: 01/20/06

NOTE: This list may not be all-inclusive. It is the responsibility of the vendor/contractor to provide their own training. Vendors/Contractors may be required to provide proof of such training to FIU at any time. The vendor/contractor must adhere to applicable safety/environmental codes and regulations established by Local, City, County, State, and Federal authorities. Companies seeking to do business with Florida International University are expected to have a current and relevant company safety plan.

TABLE A: General Safety Training Requirements

The following table identifies training that all vendors/contractors should have prior to start of work at FIU. Training is based on job scope. It is the responsibility of the vendors/contractors to identify and provide the required training to their personnel.

Training Course	Target Audience	Training	Applies	Possible
Hazard Communication	Mandatory for all vendors and contractor using any hazardous materials or doing any type of work in a lab or research area	General Hazard Awareness, Chemical Categories, MSDS's, Safe handling, PPE, Emergency Response Procedures. Workplace Specific Hazard Training.		
Control of Hazardous Energies (Lockout/Tag out)	Mandatory for all vendors and contractors conducting any type of work involving potentially hazardous energy sources.	Types of potentially hazardous energies, for situations and/or conditions that require hazardous energies to be controlled, lockout and tag out, procedures for de-energizing, locking out, tagging out, re-energizing, and releasing equipment, lockout/tag out procedures.		
Electrical Safety (EEW)	Mandatory for all vendors/ contractors conducting electrical work	Energized Electrical Work (EEW) responsibilities of supervisor permit issuer qualified person, and buddy, proper grounding procedures, safe working distances, procedures for EEW, Hazardous energy control procedures, emergency procedure.		

Training Course	Target Audience	Training	Applies	Possible
1st Aid/CPR	Mandatory for all vendor/ contractor personnel per-forming EEW	This training is for electrical workers who may have to initiate CPR and 1st Aid, but will have the back up support or emergency responders. Contractor personnel performing EEW or serving as a "buddy" to those performing EEW work must be 1st Aid/CPR trained.		

TABLE B: Task Specific Exposures
The following table identifies training that must be acquired prior to performing any work related to the given exposure. It is the contractor's responsibility to identify and provide this training, based on job scope.

Training	Target Audience	Training	Applies	Possible
Fall Protection	All vendors / contractors exposed to a potential falls from above 6'	Use of fall protection gear, work conditions, components of personal fall arrest systems, how to put on and take off full body harness, care of systems.		
Respirator Safety	Any vendors / contractors required to wear an: • Air Purifying respirator, • Airline respirator • SCBA as part of their job.	Knowledge of potential respiratory hazards, criteria for wearing a respirator, determining when a situation becomes too hazardous, how to don and remove respirator, appropriate fit test for respirator, care, maintenance and storage guidelines. Airline and SCBA functional test and safe operations.		
Confined Space	All vendors / contractors required to enter confined spaces	Understand hazards of confined spaces, differences of permit and non-permit, emergency response/retrieval, air monitoring and other safety precautions.		
Laser Safety	Any vendors / contractors working on Class 3b, or 4 laser equipment	Differences between conventional and laser light, 3 parts of a laser system, how lasers work, classes of lasers, eye and skin damage, beam and non-beam damage, PPE, components of FIU's Laser Safety Program, examples of controls, emergency response steps.		

Training	Target Audience	Training	Applies	Possible
Hearing Conservation	Any vendors / contractors working in high noise areas per OSHA requirements	Consequences of hearing loss, effects of noise on hearing, hearing protection – advantages and disadvantages, criteria for determining what to use.		
Hoist & Crane Safety	Any vendors / contractors responsible for operating or maintaining any hoisting device	Explain OSHA and ANSI/ASME requirements for operator safety, identify the nine basic components of a hoisting unit, explain a Pre-Operational inspection, summarize how to make a safe lift, identify what to do and not do while operating a crane.		
Radiation Safety	Any vendors / contractors working on equipment incorporating Ionizing (x-ray)	Knowledge of potential health affects, sources, limits and controls, and leak detection.		

For more information regarding this procedure, contact the Department of Environmental Health and Safety at (305) 348-2621

USCG 707 – BUILDING RENOVATION SAFETY GUIDELINES

Last Update: 01/20/06

PURPOSE

The purpose of these guidelines is to identify frequent health hazards related to building renovation activities and in so doing help to assure they are effectively managed and controlled.

SCOPE

This guide is applicable to all contractors and persons performing work on facilities or property at Florida International University (FIU).

GUIDELINES

Roof Renovation: Several different types of roofing applications are available. While older methods include applying coal-tar pitch and asphalt, newer roofing technologies use rubber or other synthetic membranes as roofing materials. Each type of roofing application should be evaluated for their potential to release chemical contaminants.

Studies by the National Institute for Occupational Safety and Health (NIOSH) have documented that health problems can occur from exposure to coal-tar pitch products during roofing operations. Roof removal operations may release coal-tar pitch dust that contains polynuclear aromatic hydrocarbons (PAH's).

Rubber or synthetic membrane applications use organic solvents in adhesives, primers, sealants and hardening agents. During the applications of poly-urethane roofing, methylene-bisphenyl-isocyanate and organic solvent vapors may be released which can cause adverse health symptoms.

Every attempt should be made to control these vapors and prevent potential Indoor Air Quality (IAQ) problems. To obtain more information regarding the FIU IAQ Management Program visit: http://www.fiu.edu/~ehs/general_safety/home_general.htm

Painting: Painting may introduce many chemicals into the indoor environment. In addition to paints, other products such as strippers, primers, and thinners may also be used. The solvents and additives found in paints, strippers, primers, and thinners may cause indoor air quality problems, arising from the evaporation and aerosolization of the solvents and additives found during and after application.

Paints are usually described by the solvent systems utilized in their formulations. The two common types of paints are:

- Alkyd - hydrocarbon solvent based and usually a higher volatile organic compound (VOC) content
- Latex - water based and usually a lower VOC content.

The amount of VOCs present in paints and released into the indoor environment may contribute to indoor air quality problems during painting operations. Paint manufacturers have formulated

paints that have lower VOCs, but these paints tend to be thicker and more difficult to apply. Some companies are producing paints from "natural" products. These paints are not considered to be hazard free, but they are developed from substances that are less harmful and should be considered as alternatives when painting spaces that will be occupied during the renovation process.

Construction and Demolition Work: Construction and demolition work usually creates nuisance dust. The greatest amount of dust may be generated during sweeping. Conscientious housekeeping practices are required to prevent excessive dust in the work area.

CARPETING

Carpeting, and the adhesives used to glue it down, may contain many chemicals. These chemicals can be found in carpet fiber bonding materials, backing glues, solvents, anti-static and anti-stain treatments, fire retardants, pesticides and fungicides. Most commercial carpeting comes with a styrene-butadiene latex rubber backing.

Carpeting may be shipped from the factory in plastic-covered rolls. When it is unrolled for installation, certain chemicals (called volatile and semi-volatile chemicals) may be released into the air. These chemicals may continue to off-gas even after the installation has been completed. Potential adverse health effects depend on the type of carpeting installed, how much adhesive is used, and how much fresh air is being circulated in the building by the ventilation system.

What can be done to reduce potential IAQ Concerns?

- Limit the use of carpeting in the workplace;
- Never use carpeting where persistent moisture may be present;
- Before carpeting is installed, make certain that it is aired out;
- When removing old carpeting, first vacuum it thoroughly;
- Relocate workers during installation, if possible;
- Isolate and ventilate the work area, if possible;
- Keep the carpet clean and dry;
- Use the least volatile adhesive.

The FIU Indoor Air Quality Program contains requirements for building renovation. This program promotes practices that require control during renovation and new construction that results in the diffusion of dust, stone, and other small particles; toxic gases or other harmful substances.

Renovation areas in occupied buildings must be properly isolated, and dust and debris must be confined to the renovation or construction area.

Examples of isolation measures may include:

- Separating and sealing off the work area;
- Shutting down ventilation system and sealing the supply and return grilles;
- Maintaining the work area under negative pressure in relation to adjacent areas;
- Practicing good housekeeping in the work area.

Before using paints, adhesives, sealants, solvents, or installing insulation, particle board, plywood, floor coverings, carpet backing, textiles, or other materials, contractor must check product labels or obtain information from the manufacturers of those products on whether or not they contain volatile organic compounds such as solvents, formaldehyde, or isocyanates that could be emitted during regular use. This information must be used to select products and to determine necessary measures to be taken to prevent unhealthful exposures.

EH&S strongly recommends that building occupants are notified at least 24 hours in advance, or promptly in emergency situations, when work to be performed in their work area could introduce air contaminants.

The following actions may also be necessary:

- Relocation of occupants if they are sensitized to products or materials being used in renovation or construction;
- Occupants should be informed of the location and how to obtain material safety data sheets (MSDS) and Right to Know Hazardous Substance Fact Sheets (HSFS) for products being used during construction and renovation.
- Provide the name of the Facilities Planning & Construction Project Manager who is responsible for building renovation Manager to the building occupants.

For more information regarding this guideline, contact the Department of Environmental Health and Safety at (305) 348-2621.