DIVISION 11 - EQUIPMENT

I. GENERAL

A. This division contains the following elements:

1. Book Theft Detection System.
2. Stage Curtains.
3. Washers and Dryers.
4. Projection Screens.
5. Food Service Equipment
6. Utility Distribution and Canopy Ventilating Systems.
7. Food Service Shelving.
8. Gymnasium Equipment.
9. Kilns.
10. Laboratory Equipment.

B. Comply with the following:

1. Florida Department of Education, Office of Educational Facilities - State Requirements for Educational Facilities - 1999 (SREF).
2. Americans With Disabilities Act and Accessibility Guidelines (ADA).
3. Florida Department of Community Affairs - Florida Accessibility Code for Building Construction (DCA).

C. Quality of materials, shop drawing reviews, equipment integrity, and installation shall be a major concern of the A/E, as M-DCPS does not normally receive replacements for as long as thirty years.

D. Building construction quality in food storage, preparation, and serving areas is extremely important. Eliminate gaps between building materials allowing pests access through floors, walls, or roofs.

E. Equipment and its installation shall be UL listed, if applicable.

F. Installers, service personnel, and contractors for new or existing equipment with refrigerant use shall comply with Environmental Protection Agency (EPA) regulations regarding technician certification and recycling/recovery equipment. See Division 15.

II. BOOK THEFT DETECTION SYSTEM (11052)

A. Install book theft detection systems at student entrances and exits of K-8, middle and high school media centers according to program requirements.

B. Book theft systems include detection sensors, sensing screens, and if applicable, access gates. Access gate use will be determined by M-DCPS on a per condition basis.

C. Comply with the following:

1. Use of electronic low energy field between sensing screens shall provide for absolute discrimination, with no false alarms for three ring binders, metal rimmed briefcases, wire bound notebooks, calculators, and other commonly carried objects. Coordinate locations for sensing screen recessed power requirements.
2. Detection sensors shall be small, thin, flexible, pressure sensitive, and shall not lose sensitivity.
3. Sensing equipment capable of damaging or interfering with magnetic media, wristwatches, hearing aids, heart pacers, or similar items is prohibited.

    a. System operation shall not require the display of warning signs saying the detection system may affect certain types of heart pacemakers.

4. Access Gate Operation:

    a. When the system is turned off or system power failure occurs, gates shall unlock and remain unlocked until power is restored to the system.
    b. Gates shall allow persons with wheelchairs or crutches to pass freely and unassisted, and shall allow easy passage of book carts and rolling stands.
    c. Gates may be opened in case of emergency without system damage.
    d. Entrance and exit gate are normally closed, but not locked.
    e. When opened, gates shall automatically return to the closed position.
    f. Exit gate shall lock upon alarming of the system and remain locked until unlocked by remote switching.

III. STAGE CURTAINS (11062)

A. See SREF and program requirements for curtains at auditoriums, cafeterias, language arts labs (little theaters), and CCTV production rooms,
B. Curtain fabrics shall be inherently flame resistant according to SREF stage requirements and NFPA requirements. A sewn-on permanent label shall name the manufacturer and state the fabric is non-combustible.
C. Provide a minimum of 50 percent additional fullness and box pleats. Provide double bottom hems, canvas chain pocket, and chains at full-length curtains.
D. Provide heavy-duty steel tracks and battens with support assemblies not exceeding 6'0" on center.
E. Provide a pipe grid the full-length of the proscenium opening plus 5'0" at each side as shown in Design Criteria Appendix - Stage Drawings. The pipe grid shall be at 4 feet on center for hanging the longitudinal battens for the curtain tracks and lighting.
F. Stage curtains shall include:

    1. House (Grand) Curtain:

a. Center biparting curtain with manual pulley operation, hung 8 inches behind the front hard wall for the full-length of proscenium opening plus 3'0" at each side.
b. Two-way traversing, heavy-duty, steel track and accessories.
c. Polyester velour fabric of a solid school color or other accepted color.

2. House Valance:

a. Stationary valance designed to conceal the house curtain tracks and lighting pipes. Hang 4 inches behind the front hard wall and extend 18 to 24 inches below and 6 inches above the proscenium for the full-length of proscenium opening plus 1'6" at each side.
b. Polyester velour fabric the same color as the house curtain.
c. School initials or monogram may be sewn on the valance.

3. Leg Curtains:

a. Black polyester fabric, full-length curtains on stationary battens.
b. 6'0" length with 2'0" on stage and 4'0" off stage.

4. Border Curtains:

a. Black polyester fabric curtains on stationary battens located in front of leg curtains.
b. Provide border curtains with an overall height as the house valance for the full-length of the proscenium opening plus 6'0" at each side.

5. Travelers:

a. Black polyester fabric, full-length, center biparting curtain with manual pulley operation.
b. Stack stage right and left with 2'0" remaining on stage.

6. Backwall Curtain:

a. Black polyester fabric, full-length, center biparting curtain with manual pulley operation.
b. Full-length proscenium opening plus 4'0" at each side.

7. Backwall Valance:

a. Black polyester fabric valance on a stationary batten.
b. Provide backwall valance with an overall height as the house valance for the full-length of the proscenium opening plus 4'0" at each side.

8. Cyclorama:

    a. Light blue polyester fabric suitable for theater light projection.
    b. A stretched and taut curtain, at the rear of the stage, with an overall height as the house valance for the full-length of the proscenium opening plus 4'0" at each side.

IV. WASHERS AND DRYERS (11110)

A. Provide washing machines and clothes dryers in food service areas, locker rooms, and vocational instructional spaces according to program requirements and the following:

1. Residential washers and electric dryers for student use in home economics.
2. Residential washers and gas or electric dryers for staff use in elementary and middle school food service and locker rooms.
3. Stacking washers and dryers for use in PLC□s
4. Fifty pound capacity commercial washers and gas dryers for staff use in high school food service and locker rooms.
5. Food service washers and dryers shall be on a 4 inch high raised concrete platform matching the finish floor material and the minimum required equipment footprint.

B. Provide gas dryers when gas is available and economically feasible, except at home economics instructional spaces.
C. Dryers shall be vented to the exterior.

V. PROJECTION SCREENS (11132)

A. Typical instructional space projection screens shall be as follows:

1. 70 inches by 70 inches of a durable, matt white, fireproof, viewing surface.
2. Projection screens shall be manually operated.
3. Projection screens shall be wall mounted and not attached to instructional boards. Locate as high as possible to allow bottom edge of projection screen to reach chalk/marker trough of instructional board. Coordinate location of clocks, speakers, strobes, and audible alarms.

B. Stage movie screens shall be as follows:

1. 15 feet by 15 feet of a durable, matt white, fireproof, viewing surface.
2. Stage movie screens shall be electrically operated roll-down.
3. Locate directly behind the house curtain, concealed from view in roll-up position, centered on the stage.

VI. FOOD SERVICE EQUIPMENT

A. General.

1. For most facilities, the equipment lists will be in M-DCPS Master Specifications. Additional equipment or different models of the equipment listed may be required to accommodate special program requirements. Consult M-DCPS Food and Nutrition, to verify equipment selection before design layout, at 7042 West Flagler Street, telephone, (786) 275-0400.
2. Use foam expanding agents and refrigerants not contributing to the depletion of the Earth's protective ozone layer. The use of products containing R-11, R-12, R-113, R-114, or R-115 is discouraged.
3. Equipment and installations are required to be listed by Underwriters Laboratories (UL).
4. Construction documents shall note the contractor to be responsible for the disconnecting and moving of equipment to designated M-DCPS storage facilities or as otherwise directed at kitchen renovations involving existing equipment removals.
5. Kitchen plumbing drawings shall be coordinated with food equipment and counter layout.
6. Kitchen Floor Drains: See Division 15 for kitchen drainage requirements.
7. Use easily cleanable materials in food service areas. Components such as "Unistrut" or other similar materials are not allowed.

B. Trash Compacting System

1. Compactors will be used for dining room and facility waste instead of pulping and extractor equipment. Compactors are not-in-contract.

    a. In the dining room, locate compactor 2 feet away from a wall near the dining room exits and at least 3 feet away from the exits. If more than 1 unit in the dining room is provided, locate at remote exits.

        1) Provide quarry tile under and extending 4 feet from the sides and front of the compactor and to the rear wall. Use a quarry tile or rubber base.
        2) Walls at the unit shall be standard dining room wall finishes.

    b. If an additional compactor location is program required, locate in a staff secured space.
    c. Provide a convenient route, not through the kitchen, from the compactor to a service yard dumpster.
    d. See Division 16 - Power System Design for additional information.

2. See program requirements for compactor sizes and quantities.

C. Walk-in Cooler/Freezer (11400)

1. Insulated cold storage rooms are prefabricated, foamed-in place, free standing walk-in rooms, designed for easy, accurate, indoor on-site assembly over a recessed slab.
2. Refrigeration system components include a fully automatic outdoor air -cooled condensing unit and a ceiling mounted evaporator unit in the refrigerated room.
3. Prefabricated floor, ceiling, and wall sections shall contain at least 4 inches of insulation.
4. Depress kitchen slab at walk-in cooler/freezer to provide equal cooler, freezer, and finish kitchen floor elevations. Depth shall include thicknesses for floor insulation, quarry tile over a galvanized steel floor, and setting bed.
5. Stainless steel finish floor overlay panels shall be used only at a renovation project without a depressed slab.
6. Cold storage room floors shall be designed to carry 600 pounds per square foot loading and be finished with quarry tile.
7. Doors:

    a. The freezer door shall open into the cooler and the cooler door shall open into the kitchen.
    b. Provide vision panels in the cooler door and the freezer door.
    c. Doors shall be self-closing.

8. Provide wet-trap floor drains for condensate.
9. Provide at least 8'6" clear kitchen ceiling height for walk-in cooler/freezer rooms.

D. Custom Fabricated Food Service Equipment (11401)

1. At food service areas, provide the following, but not limited to, custom stainless steel fabricated equipment including necessary accessories.

    a. Cook's table with 1 compartment sink and overhead utensil rack.
    b. Baker's table with 1 compartment sink and overhead utensil rack.
    c. Vegetable/salad sink, 3 compartments.
    d. Pot washing sink, 3 compartments with overflow/scraping compartment.
    e. Worktables wired for electric with outlet.
    f. Pot racks, wall mounted.
    g. Serving counters/bays (Secondary Schools)

E. Serving Line Equipment and Units (11416)

1. Serving line aisle widths shall be at least 42 inches wide.

2. Stainless steel serving line equipment shall include:

    a. Milkbox/Beverage Counter: Refrigerated according to program requirements. Provide floor drain near unit as needed/required.
    b. Top and Tray Slide: Counter top unit with 3 die formed inverted ridge tray slide.
    c. Hot Food Section: Dry, moist, electric, with 12 inch by 20 inch openings according to program requirements to fit standard cafeteria pans.
    d. Cold Food Section: Refrigerated frost top with a perimeter drain and refrigerated storage below with adjustable shelves.
    e. Protector Cases: Plexiglass front and ends installed over hot food section.
    f. Display Cases: 18 inch wide unit with plexiglass shelves and sneeze guards.
    g. Cashiers Stand: With footrest, cash drawer, and electrical and data connections routed to underside of cabinet base.

3. Interior/exterior serving bays (middle and high schools) shall include:

    a. A serving counter at least 9'0" long with utility space for hot/cold equipment according to program requirements.
    b. Under counter electrical for mobile units and drop-in counter top equipment.
    c. Under counter shelving.
    d. Point-of-sale (POS) station with electrical and data connections routed to underside of cabinet base.
    e. Roll-thru refrigerated and heated units.

4. Fronts, soffits, and walls of serving lines shall be designed with decorative themed colors and tile. If tile is not used on fronts and sides, edges must be finished with stainless steel angle.
5. Theme Package Line (Primary Learning Centers) shall include:

    a. POS station with drawer and electrical and data connections.
    b. Milk box for self-service.
    c. Frost top. ($\pm$ 60 inches long x 34 inches high).
    d. Hot food section with four wells.
    e. Sneeze guard and tray rail.
    f. Utility station ($\pm$ 46 inches long x 34 inches high) with under storage.
    g. Theme Package.

F. Food Preparation, Holding and Dispensing Equipment (11417)

1. Food preparation equipment includes, but is not limited to:

    a. Floor mounted 60 quart mixer with a power bowl lift, bowl and beater accessories. (See M-DCPS Master Specification Guidelines for accessory list).

b. Ice Maker Daily Production Capacities:

1) Primary learning centers: 200 lbs.
2) Middle learning centers: 400 lbs.
3) Elementary schools: 500 lbs.
4) Middle schools: 750 lbs.
5) High schools: 1,000 lbs.

c. Mobile Can Storage and Dispenser Racks.
d. Stationary Can Storage and Dispenser Racks.
e. Inclined Can Rack.

G. Cooking Equipment (11405)

1. Cooking equipment for food service shall include, but not limited to, the following:

a. Double stacked convection ovens with porcelain steel liners, stainless steel doors with glass panels and stainless steel front, left side, right side, top and back panels.
b. Convection steamer with filtration equipment at boiler.
c. Steam Kettle: Stainless steel unit, gas fired, complete with hot and cold water and filter system.
d. Tilting/braising pan located according to program requirements.
e. Hoodless fryer located according to program requirements.
f. Deep fry combination with fryer drain cabinet and built-in filter system.
g. Electric heavy-duty 2 burner range with polished stainless steel cabinet base, 6 inch stainless steel legs and adjustable bullet feet.
h. Roll-thru refrigerated units.
i. Roll-thru heated units.

2. Cooking equipment for Instructional Food Lab Commercial Cooking Center:

a. Convection Oven: Stainless steel.
b. Deep fat fryer with adjustable legs.
c. Griddle with adjustable legs for mounting.
d. Convection Steam Cooker with in-line water conditioner and legs for mounting.

VII. UTILITY DISTRIBUTION AND CANOPY VENTILATING SYSTEMS (11420)

A. Modify accepted manufacturers' standard items or construction as necessary to conform with M-DCPS Master Specification Guidelines.
B. Provide a utility distribution system (stainless steel horizontal raceways with vertical risers) under canopy ventilator island for electric, gas, cold water, and hot water to

kitchen equipment locations.

C. Gas Requirements:

1. Design of quick disconnects furnished for gas hose connections from appliances shall not allow connection of hoses of other utilities, even if of the same size.
2. Provide gas equipment with factory installed internal piping loop with a single service connection.
3. Provide gas shut-off controls.
4. Emergency gas shut-off by hood activation and not fire alarm.

D. Electrical Requirements:

1. Label raceways, ventilator, breakers, receptacle plates, and components as specified in M-DCPS Master Specification Guidelines.
2. Label remote breakers with equipment identification, amperage, voltage, and phasing.
3. Provide receptacle plates concealed or below raceways with a duplicate identification label located in plain view and designating location of plate.
4. Provide each receptacle plate in kitchen area with a hinged, waterproof cover over each receptacle.
5. Electrical components used in raceways, chases, and controls shall be readily obtainable locally.
6. Provide main electrical service disconnect in service riser.
7. Locate fuses or circuit breakers in raceways behind a labeled and hinged access door.
8. Connection or installation of electrical components shall not require soldering.

E. Plumbing Requirements:

1. Isolate plumbing compartments from electrical compartments.
2. Color code and label piping and disconnects in system.
3. Provide wall mounted retractable hose reel assemblies with heavy duty 3/8" hose where required according to program requirements and M-DCPS Food and Nutrition.
4. See Division 15 for additional requirements.

F. Provide letter or word identification and color coding for utilities as follows:

1. Gas: Yellow
2. Hot Water: Red
3. Cold Water: Blue

G. Exhaust hood (ventilation canopy) shall be UL listed, comply with NFPA 96, and include the following:

1. Stainless steel construction.
2. Grease extracting baffle plate assembly the full-length of each canopy.
3. Fluorescent lights.
4. Wash-down system at new construction or at existing conditions able to support a wash-down system or a dry baffle system for a direct replacement.
5. UL Standard 300 listed wet chemical automatic fire suppression (extinguishing) system (AFSS) for the protection of grease removal devices, hoods, duct systems, and under hood cooking equipment.

    a. Extinguishing agent cylinder shall be stored pressure type with a pressure indicating gauge device. Cartridge type systems with an unpressurized extinguishing agent cylinder are not allowed.
    b. The portion of the extinguishing system for the protection of grease removal devices and hoods may be omitted if all cooking equipment is served by a listed exhaust hood containing a constant or fire-actuated listed water-wash down system to extinguish a fire in grease removal devices and hoods. The water-wash down system shall not adversely affect the operation of the extinguishing equipment for the duct and cooking equipment.
    c. The portion of the extinguishing system for the protection of the duct system may be omitted if all the cooking equipment is served by a listed exhaust hood with or without damper and a constant or fire-actuated listed water-wash down system to extinguish a fire in the duct system.

6. Filter less ventilation system.
7. Supply air plenum with maximum discharge velocity of 150 FPM.
8. See Division 15 for additional requirements.

VIII. FOOD SERVICE SHELVING (11446)

A. Selection, quantity, and sizes of shelving shall be decided by M-DCPS Food and Nutrition, program requirements, and configuration of specific project floor plans.
B. Shelving shall be freestanding, unless indicated as mobile.
C. Install first shelf 10 inches above finish floor with remaining shelves equally spaced.
D. Dry Storage Shelving:

1. Bright chrome finish open-wire shelving or smooth polypropylene with steel core posts and traverses.
2. Minimum weight bearing of 400 pounds at corners and 600 to 800 pounds on straight shelving.
3. Shelving shall be guaranteed against rust.
4. Shelf widths shall be between 18 to 24 inches by length to fit individual plan.
5. Stationary shelving shall be 5 tier high with a post height of 74 inches.
6. Mobile shelving shall be 4 tier high with a post height of 63 inches, high density

stem type casters with at least 2 casters having brakes.

E. Cold Storage and Freezer Shelving:

1. High density polymer or polypropylene construction.
2. Units shall be easy to clean, guaranteed against rust, able to withstand -35 degree F temperatures.
3. Shelving shall be attached to posts marked with 1 to 4 inch increments.
4. Shelf widths shall be between 20 to 24 inches by length to fit individual plan.
5. Capacity of corner shelves shall be at least 400 pounds and straight shelves shall have a capacity of at least 600 pounds.

F. Pot Pan Shelving shall be standard bright stainless steel open-grid shelving with stainless steel posts.

1. Shelving and posts shall be non-corrosive and guaranteed against rust.
2. Shelf widths shall be 18, 21, or 24 inches by length to suit the project.
3. Stationary shelving shall be 5 tier high with a post height of 74 inches.
4. Mobile shelving shall be 4 tier high with a post height of 63 inches.
5. Casters shall be high density stem type with at least 2 casters having brakes.

IX. GYMNASIUM EQUIPMENT

A. Basketball Backboards (11480).

1. Provide ceiling supported basketball backboards.
2. Coordinate with ceiling construction, lighting layout, duct layout, and adjacent wall construction to provide an electrically operated forward folding and rear braced backboards.

B. Scoreboards (11485).

1. Basketball scoreboards shall have bar/LED numbers and wrestling captions.
2. Scoreboards shall be properly grounded.

X. KILNS (11515)

A. Kiln rooms are required at new construction projects when serving students from kindergarten through grade 12.

1. See program requirements for kiln area renovations serving grades 4 through 12.
2. See program requirements for kiln quantities.

B. Kiln rooms and kiln areas shall comply with the following:

1. Locate away from exits and paths of egress.
2. Fire rated wall partitions for new, renovated, or remodeled projects are not required.
3. Specify a sealed concrete floor with a trowel and light broom finish.
4. Provide square footage according to program requirements.
5. Kiln rooms will be used only for kiln operations and contain only kiln equipment. Provide "COMBUSTIBLE STORAGE NOT PERMITTED" signage.

C. Ventilation.

1. At kiln rooms, provide a wall or door makeup air louver 12 inches above finish floor and an exhaust fan with a grille at the opposite end of the room.
2. At kiln areas, provide a M-DCPS accepted exhaust hood to fit over the M-DCPS accepted kiln.
3. Provide manually operated thermostatically controlled exhaust systems, rated at 250 CFM minimum, and vented to the exterior. Outside makeup air is not required, unless the kiln room has only exterior access.
4. Exhaust ducts shall be under negative pressure.

D. Shielding and Clearances.

1. Provide 18 inch minimum clearance between kilns and walls.
2. Provide adequate clearances at the front of kilns for proper loading and unloading. Kiln rooms shall be HC accessible.
3. Provide kiln areas with 48 inch high minimum side/rear walls.

E. Electrical.

1. Verify available voltage of 208 or 220/240 at new and existing kiln rooms before kiln selection.
2. Drawings shall coordinate the locations of the appropriate power outlet, the exhaust hood when required, and the in-contact kiln.

    a. Kilns with on/off switches shall receive an appropriate, visible, and easily accessed outlet to be within reach of the 6 feet long power cord of the kiln and have the panel circuit breaker identified "KILN".
    b. Provide an accessible disconnect switch within the room for hard-wired kilns.

3. Install rate of rise heat detectors at kiln rooms.

XI. DUST COLLECTION SYSTEMS (11520)

A. Locate dust collection equipment in mechanical rooms or provide security fencing if at an exterior location.

XII. LABORATORY EQUIPMENT (11600)

A. Equipment and casework lists are contained in M-DCPS Master Specification Guidelines. Select equipment and casework according to program requirements.
B. Provide certified performance test reports of materials, equipment, and testing procedures by an independent commercial testing laboratory of the following equipment.

1. Safety cabinets.
2. Fume hoods.
3. Instructor demonstration tables.
4. Science tables.
5. Work tops.
6. Sink and cup drains.
7. Mechanical service fittings.

C. Laboratory casework, accepted by M-DCPS, shall be provided by one laboratory furniture company.
D. Accessible components shall have a forward approach for accessibility. A parallel wheelchair approach for side access is not acceptable. See accessibility codes for clearances and allowable heights.
E. Faucets, student centers, and other equipment require prior M-DCPS acceptance.
F. A combined vandal resistant cold water/gas faucet shall be used in science laboratory student sinks and work stations.
G. Provide tamperproof fasteners and fittings on equipment.
H. Use vacuum breaker fittings on gas, water, or water related items.
I. Laboratory sinks and cup drains shall be black, epoxy resin.
J. Laboratory casework includes, but not limited to:

1. Tables and Worktops:

a. Tops designed to contain spills.
b. At elementary schools, provide plastic laminate tops.
c. At middle and high schools, provide solid epoxy resin tops and sinks.

2. Cabinets:

a. At middle and high schools, provide a clear oak or other clear wood exterior and concealed plywood construction.
b. At elementary schools, provide plastic laminate or wood surfaces.
c. Flakeboard, particleboard, and other types of wood composition board are not

allowed.

d. Display cabinets shall have sliding wood framed doors with safety glass. Swinging glass doors are not allowed.
e. Provide locks at doors and drawers according to program requirements. Locks within a room shall be keyed alike.

K. Laboratory equipment includes, but not limited to, the following:

1. Student Stations:

a. Specify with steel support structure and solid epoxy resin tops and sinks.
b. Accessible student stations shall have a forward approach for accessibility. A parallel wheelchair approach for side access is not acceptable. See accessibility codes for clearances and allowable heights.

2. Fume Hoods:

a. Provide a forward approach for accessibility, supplemental air hood, epoxy resin work surface, natural gas, cold water, epoxy resin cup sink, acid waste, electricity, and vapor-proof light.
b. Fume hoods shall comply with SAMA, ASHRAE, NFPA, and other applicable codes.
c. Fume hoods shall be located within the laboratory to allow unimpeded exit in case of a fire or explosion within the fume hood. Locate hoods away from paths of egress.
d. Provide unifacial and bifacial fume hoods according to program requirements. Fume hood selection will decide room layout due to access requirements of each fume hood type.
e. Locate fume hoods away from high traffic areas and provide sufficient aisle space for access.
f. Safety devices such as drench shower/eye wash stations and fire extinguishers shall be near the fume hood. Locate a floor drain at each drench shower/eye wash station.
g. Fume hood exhaust system shall be coordinated with the room emergency exhaust system and the supplemental outside air supply, and not interconnected with other ventilation duct systems.

1) Locate emergency exhaust fan switch within 15 feet of the instructor□s desk and on the primary egress path.
2) When the emergency exhaust fan is turned on:

a) Fume hood exhaust fans shall remain in operation.
b) According to SREF, fume hood supply fans shall automatically shut

down.

3) Locate hoods to avoid cross currents and air turbulence at fume hood face due to ventilating inlets or high traffic.
4) At instructor designated fume hoods and at chemistry labs, provide for normal laboratory usage with an average face velocity of 100 fpm and a minimum at any one point of 80 fpm.
5) At science demonstration classrooms and at physics and biology labs, provide for low toxicity usage with an average face velocity of 75-80 fpm and a minimum at any one point of 50-60 fpm.

h. Fume hood design shall allow for safe and efficient operation during normal laboratory conditions within acceptable specified tolerances when connected to an exhaust system.
i. Dead air pockets and reverse air currents are not allowed along surface of hood interiors.
j. Exhaust and supply system shall be roof mounted with vertical discharge stack on exhaust blower.
k. Required airflow shall be achieved when adjustable baffles are at full-open position.
l. Vision panels shall be safety glass. Polycarbonates, such as "Lexan", are not allowed for glazing materials at view panels.

3. Safety Components:

a. Provide safety cabinets with an emergency shower, eyewash fountain, and storage space for first aid kit, fire blankets, fire extinguisher, and sand bucket. The safety cabinet shall be ADA accessible, easily reached from all areas of the lab, and away from egress paths.

1) An emergency shower shall have a pull valve and pull cord to be held under the shower to wash away chemical contamination. Locate a floor drain at the emergency shower.
2) Eye wash fittings shall have push type flag valves and soft stream heads.

b. Provide 6 foot long rubber drench hoses and hose spray fittings for deck mounting at instructor demo desk and according to program requirements.

END OF DIVISION