EH&S, Fire Marshal and Site Analysis

1. EH&S GUIDANCE CHECKLIST PROJECT PLANNING PHASE

References: EH&S Laboratory Safety Design Guide

1.1 NEW CONSTRUCTION PROJECTS

Industrial.Hygiene.and.Laboratory.Safety.Issues

1. HVAC systems design:
    - Indoor air quality including air volume, flow, air distribution in space to avoid short-circuits, balancing, outside fresh air versus percent recycled air, and American Society of Heating and Refrigeration standards
    - Technical input on specific equipment, duct work, and filters
    - Consultation on location of building air intakes in relation to fume hood exhaust stacks, emergency generator exhausts, and effects from other buildings
    - Clean room air balance issues
2. Laboratory fume hoods:
    - Technical advice on fume hood type, location, and design
    - VAV (variable air volume) controls, clearance, and air flow
    - Interaction between VAV controls and HVAC system
    - Required filter systems
    - Duct size and quality (noise and deterioration issues)
    - Height and location of fume hood exhaust stacks
    - Fume hood alarms
    - Initial requirements for fume hood testing and certification
3. Consultation on general laboratory design:
    - Review of general layout and floor plans
    - Bio-safety Level 3 construction requirements
    - Design of specific areas, such as clean rooms and laser-use areas
    - Relationship to nearby interior building uses
    - Biohazard laboratory considerations
4. Bio-safety storage cabinet review:
    - Type and design
    - Ventilation requirements
    - Certification requirements
5. Laboratory design specifications for bio-hazardous and infectious-agent containment:
    - Agent use and storage
    - Waste storage and disposal safeguards

6. Air emissions:

- Permits to construct new buildings and operate stationary sources (fume hoods, cooling towers, boilers, generators, incinerators, ETO sterilizers, spray booths, degreasers, fuel storage and dispensing facilities, etc.)
- Consultation on emissions caps or limitations
- Consultation on toxic air contaminant issues
- Consultation on best available control technologies (BACT)
- Consultation on emissions record-keeping requirements
- Animal laboratory and care facilities design

7. Vacuum system discharges
8. Design and locations of safety devices:
    - Eye washes
    - Showers

Sanitation.Issues

1. Water supply consultation:
    - Permit application assistance and approval
    - Water quality requirements
    - Backflow protection device design and requirements
    - Development of on-site sources of water supply
    - Chlorination of domestic water supply piping
    - Separation of water and sewer mains
    - Water treatment device design for potable water systems
    - Water reclamation projects
2. Wastewater disposal and cross connections considerations:
    - Permit application assistance
    - Local regulatory compliance requirements for wastewater discharges and sampling
    - Cross connection controls
    - Specifications for types and locations of on-site wastewater disposal systems
    - Specifications for types and locations of floor and sink drains
    - Public food service facilities
    - Design and compliance with codes
    - Approval of food service equipment
    - Housing unit kitchen requirements
3. Recreational swimming facilities:
    - Compliance with California Health and Safety Code and Code of Regulations requirements
    - Consultation on engineering design and safety features
    - Consultation on filtration system design

Radiation.Safety.Issues

1. Review of laboratory design specifications for radioactive use/storage areas and location of clean areas
2. Consultation on design and location of required designated radioactive waste rooms
3. Review of proposed use for shielding requirements and consultation on shielding design in areas where diagnostic X-ray equipment is located and in other applicable research or treatment facilities
4. Review of special fume hood and ductwork design for required filter systems and other radiation safety features
5. Review of sink design for specialized auxiliary fixtures (foot or elbow operating fixtures, etc.)
6. Review of flooring material design and composition for safety and practicality in high-use areas

Hazardous.Waste.Issues

1. Consultation on design of hazardous waste handling and accumulation areas
2. Consultation on contractual provisions requiring contractors to properly manage and dispose of any hazardous waste generated during construction projects

Environmental.Site.Assessment

1. Phase 1 (Preliminary Site Assessment) due diligence investigation components:
    - Identification of past and present uses of the site
    - Site inspection
    - Determination of site environmental characteristics
    - Determination of the presence of hazardous materials or hazardous waste on the site
    - Assessment of hazards posed by adjacent sites
    - Determination of the need for further investigation or remediation
2. Site inspection red flags:

The following table lists signs of potential problems (red flags) which may require further investigation:

"RED FLAGS"	ITEMS TO CONSIDER
1. Dead, dying, or unhealthy vegetation	Soil or water contamination
2. Soil or pavement stains or discoloration	Spills or dumping
3. Any obvious signs of spillage or residues on property or in buildings	
4. Piles of water, trash, or unidentified mounds	Something buried
5. Insulation, thermal, acoustical, or electrical (1980 or earlier)	May contain asbestos
6. Unusual odors	Solvents
7. Unidentified truck tracks on open lots	Illegal dumping

8. Property adjacent to dump or landfill, known hazardous waste site, or high-risk industry	Agency lists of contaminated sites are available
9. Wells	Check caps or covers and permits
10. Wastewater systems on commercial or industrial properties	Septic tanks, leach fields, sumps, dry wells, or systems not connected to city sewer
11. Drums or any other chemical storage or handling areas	
12. Maintenance areas	Shops or vehicle repair operations
13. Ponds, lagoons, or unidentified pits and depressions	
14. Underground tanks	Check caps or fill connections, or vent pipes
15. Transformers or other electrical equipment (1978 or earlier)	May contain PCBs

3. Underground storage tanks and piping:
    - Permit requirements for construction, storage, removal, and air emissions
    - Consultation on construction and installation
    - Consultation on tank level monitoring requirements and devices
    - Leak detection devices
    - Spill and overflow protection

1.2 RENOVATION PROJECTS

1. Asbestos:
    - Surveys and sampling of suspected asbestos-containing materials (ACMs) prior to structural renovation or demolition
    - Assistance in evaluation and removal of buried underground utilities with ACMs
    - Evaluation of potential ACM problems involving tie-ins to existing mechanical systems
    - Notification requirements to applicable regulatory agencies
2. Monitoring and decontamination of laboratory areas for chemical, radioactive, and infectious waste residues in fume hoods, laboratory benchtops, ductwork, drain lines and traps, and vacuum lines
3. Disposal of any abandoned hazardous materials or wastes from laboratories or other facilities
4. Consultation on redesign or renovations of:
    - Existing laboratories
    - Food service facilities

- Housing units
- Recreational swimming facilities

5. Consultation on demolition activity and coatings and coverings air emissions regulatory requirements
6. Review of construction plans for general safety requirements including access, handrails, trench shoring, parapets (building roofs), stairs, lighting, and other items unique to the proposed project
7. Assurance that all fire safety systems and features are addressed, including fire safety considerations such as building access, while construction is in progress
8. Lead paint sampling and abatement consideration
9. Identification and disposal of polychlorinated biphenyl (PCB)-containing fluorescent light ballasts and any other PCB-containing electrical equipment

2. FIRE MARSHAL GUIDANCE CHECKLIST PROJECT PLANNING PHASE

2.1 Fire and Life Safety Issues

1. Fire suppression system design review:
    - Hydrant type and locations
    - Water flow (supply) and pressure requirements
    - Sprinkler and standpipe systems
    - Type and locations of fire extinguishers
    - Specialized extinguishing systems (halon, carbon dioxide, dry chemical)
2. Fire detection system design review:
    - Alarm systems
    - Enunciator panels
    - Smoke and heat detector type and locations
    - Manual-pull station locations
3. Monitor performance tests of fire and life safety systems
4. Building access for fire apparatus including road layout and locations of hydrants and fire department connections to standpipe and sprinkler systems
5. Construction and design requirements for laboratory or hazardous materials storage and handling areas including flammable liquid storage cabinets and compressed gas cylinder storage areas
6. Review of construction plans for general safety requirements including access, handrails, trench shoring, parapets (building roofs), stairs, lighting, and other items unique to the proposed project
7. Review of ventilation systems for smoke control systems, ducting, and dampers
8. Exits and egress, corridor, and stairway requirements
9. Emergency lighting requirements
10. Compliance with fire and building codes for specific building type and construction including review for required setbacks from other buildings, etc.
11. Compliance with fire and building codes and standards for interior finish materials and coverings for walls and ceilings
12. Consultation on seismic safety requirements

13. Compliance with emergency planning, evacuation, and public safety requirements in buildings (signage design and location)
14. Compliance with various fire codes, Cal-OSHA, OSHPD (health care facilities only), and Facility fire safety standards for new furnishings, fabric, and carpet purchases

3. SITE ANALYSIS DATA COMPILATION CATEGORIES

1. Climate:
    - Prevailing winds (direction and velocity)
    - Solar orientation (including shade and shadows)
    - Temperature ranges and seasonal norms
    - Humidity
    - Precipitation
2. Site features:
    - Vegetation
    - Wildlife
    - Surface waters
    - Topography, slope and aspect
    - Land form and features
3. Environmental influences:
    - Noise levels
    - Odors, fumes, dust, or smoke from adjacent sites
    - Air quality
    - Vibration (science facilities are often vibration sensitive)
    - General nuisances
4. Historical data:
    - Previous uses (e.g., landfill, dumping, archaeological grounds, etc.)
    - Existing structures
5. Land-use and regulatory controls (includes on-site and off-site considerations):
    - LRDP land-use designation
    - Facility design guidelines
    - Precinct or area plans
    - Site zoning and surrounding area zoning
    - Existing land-use type and density
    - Permitted uses and exemptions
    - Deed restrictions and covenants
    - Setbacks, lot coverage, and height limitations
    - Parking requirements
    - Signage requirements
6. Building codes and requirements
7. Visual analysis
    - Aesthetics
    - Landform diversity

- Views and vistas to and from site
- Spatial patterns and structure
- Significant features

8. Circulation and access
    - Vehicular
    - Bicycles
    - Pedestrian
    - Service
    - Construction staging areas
    - Emergency access

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