When a Laboratory is not a Laboratory?

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WHAT ARE FORENSIC SCIENCE FACILITIES?

- Forensic Science Laboratory
- Forensic Pathology Facility
- ID Labs
- Computer Forensic Labs
WHAT MAKES A FORENSIC FACILITY UNIQUE

- Not a Research Laboratory
  - Minimal development of new research techniques
  - Security – Internal & External
  - Cross Contamination
- Evidence – Chain of Custody
  - Law Enforcement influence – Prove Guilt or Innocents
  - Potential one of a kind evidence - Can not be reproduced
  - Contamination concerns
  - Documentation of evidence handling throughout analysis process
- Specialized Lab Units & Rooms for Evidence Investigation.
  - Compartmen talized laboratory suites
  - Evidence examination rooms
  - Workstations layout to avoid contamination potential
  - Separation of victim & suspect
  - Chemical use minimal
  - Low air flow
- Flow of evidence analysis dictates lab layout
- Flexibility in spaces to accommodate unique cases
- Building Systems reliability - support analysis conclusions during court testimony
SPECIFIC FEATURES OF A CRIME LABORATORY

- Forensic Biology DNA Lab
- Mitochondrial DNA Lab
- Low Copy DNA Lab
- CODIS
- Trace Evidence Lab
- Scanning Electron Microscope (SEM) room
- Arson Lab
- Firearms Lab / Firing Range (Projectile recovery tank)
- Toolmarks
- Gun Shot Residue Lab
- Toxicology Lab
- Blood / Breath Alcohol Lab
SPECIFIC FEATURES OF A CRIME LABORATORY

- Controlled Substances Lab
- Latent Prints
- Questioned Documents
- Computer Forensics
- Digital Imaging
- Audio/Video/Photography
- Vehicle Examination
- Evidence Processing
- Evidence Storage
- Evidence examination/screening room
- Instrumentation Room for laboratory equipment
- Crime Scene Re-enactment Room - Multi-Use
SPECIFIC FEATURES OF A FORENSIC PATHOLOGY FACILITY

- Body Delivery
- Body Preparation
- Body Coolers / Freezers
- Autopsy Suite Types
  - General
  - Homicide
  - Bio-Hazardous
- Evidence Drying Rooms
- Tissues Specimen Storage
- X-Ray Room
- Autopsy Equipment Cleaning
- Autopsy Suite Bio-Vestibule / Lockers / Showers / Restrooms
SPECIFIC FEATURES OF A FORENSIC PATHOLOGY FACILITY

- Histology Laboratory
- Toxicology Laboratory
- Chemistry Laboratory
- Microbiology Laboratory
- Anthropology Laboratory
- Odontology Laboratory
- Specimen Dissection
- Grossing
- Evidence Storage
- Investigation Unit
- Family Viewing Area
SPECIFIC FEATURES OF A FORENSIC PATHOLOGY FACILITY

- Certified BSL3 vs. Verified BSL3
- Components of Containment
- Decontamination
FORENSIC FACILITIES

- Adjacencies
- Relationships
- Expandable Laboratories
- Flexible Laboratory Design
- Future growth
- Accreditation Requirements
  - American Society of Crime Laboratory Directors (ASCLD)
  - ISO Accreditation Requirements
  - National Association of Medical Examiners (NAME)
- Structural column spacing
- Evidence security
- Evidence flow
- Evidence delivery
  - Entry point
  - Hours of operation
- Cross Contamination
- Regional caseload types
• Laboratory function (Generalist -vs.- Specialized)
• Layout based upon function in Laboratory
• Linear layout -vs.- U-Shaped layout
  o Circulation path impact
  o Air flow issues
  o Contamination concerns
  o Fine particle disturbance
• Standing -vs.- Sitting height
• Fixed – Adjustable - Mobile
• Accommodate future growth
• Function determines casework type
  o Wood Casework
  o Metal casework
  o Plastic Laminate
  o Stainless Steel
FORENSIC FACILITIES

- Security
- Protection Levels
- Access
- Evidence Delivery
- Parking – Public and Staff

- Vehicle Examination
- Impound Areas
- Major Event Staging Areas
- Utility Infrastructure
- Future Expansion
FORENSIC FACILITIES

- Increasing automation in certain lab procedures
  - Robotics
  - Future DNA Analysis
- Emergence of digital evidence
  - Computer Forensics
  - Cell Phone Digital Data
  - Video Surveillance Data
- Increasing reliance upon computerized data bases:
  - Automated Fingerprint Identification System (AFIS)
  - Combined DNA Index System (CODIS)
  - National Integrated Ballistic Information Network (NIBIN)
- Digital photography - throughout the laboratory
- Robust utility services to accommodate future instrument upgrades & technologies
- National Academy of Sciences – Forensic Report
- Forensic lab buildings need to be designed with the ability to expand
FORENSIC FACILITIES

• Spaces of synergy
FORENSIC FACILITIES

- Temperature Control / Sensitivity
- Air Supply
- Room Pressurization (Bio Vestibule)
- Zoning of each laboratory unit
- Humidity & De-Humidification
- HEPA Filters
- Fume hood exhaust – Separate from building exhaust system
- Exhaust systems
- Acoustics & Vibration
• **Water systems**
  - Industrial
  - Domestic
  - Ultra Pure (Type I – IV)
  - Deionized Water
  - R.O. Water

• **Disposal systems**
  - Lab waste
  - Chemical
  - Floor drains

• **Emergency Showers / Eyewash Units**

• **Vacuum system**

• **Lab Gases**

• **Lab Gas distribution system**
  - House system
  - Point-of-use generators
  - Cylinders

• **Fire Protection systems**
• Standard power
• Emergency power
• Power distribution
• Uninterruptible Power Systems
• Clean Power – Harmonic Distortion
• Data / Communications Systems
• Lighting systems
  o Exterior and Interior
  o Lighting levels – Vary
• Task lighting
• Grounding system
• Fire Alarm System
• Paging & Public address systems
FORENSIC SERVICES & CORONER’S COURT

CASE STUDY
Pushing the Envelope in Forensic Facility Design
<table>
<thead>
<tr>
<th>Facility</th>
<th>Square Feet</th>
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</thead>
<tbody>
<tr>
<td>Centre for Forensic Science</td>
<td>300,000sf</td>
</tr>
<tr>
<td>Office of the Chief Coroner</td>
<td>35,000sf</td>
</tr>
<tr>
<td>Forensic Pathology Unit</td>
<td>110,000sf</td>
</tr>
<tr>
<td>Coroners Courts</td>
<td>40,000sf</td>
</tr>
<tr>
<td>Shared Services</td>
<td>180,000sf</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>665,000sf</strong></td>
</tr>
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LAB DESIGN
FLEXIBILITY IN DESIGN
LAB DESIGN

NATURAL DAYLIGHT
LAB DESIGN

NATURAL DAYLIGHT
OFFICE ENVIRONMENTS

- Floor to ceiling glazing for all office areas
- Access to views
- Reduced glare
- Improved ventilation
- Comfortable temperatures
- Access to natural daylight
- Noise reduction
CORONERS COURT ENTRANCE

THE DESIGN
SECURITY

THE DESIGN
FORENSICS ENTRY

THE DESIGN
FORENSICS COMMONS

THE DESIGN
CAFÉ / WORK SPACE

Academy of Architecture for Justice 2011
• 4 DIFFERENT TYPES OF GLASS
• 80% VISION GLASS
• 10% FRITTED GLASS
• 10% SPANDREL GLASS
• SPANDREL GLASS AT STRUCTURE
SOUTH ELEVATION
THE ARCHITECTURE
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