



FORENSIC SCIENCE FACILITIES

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

INSPIRATION

- **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.**
 - Compartmentalized 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

CRIME LABORATORY SECTIONS

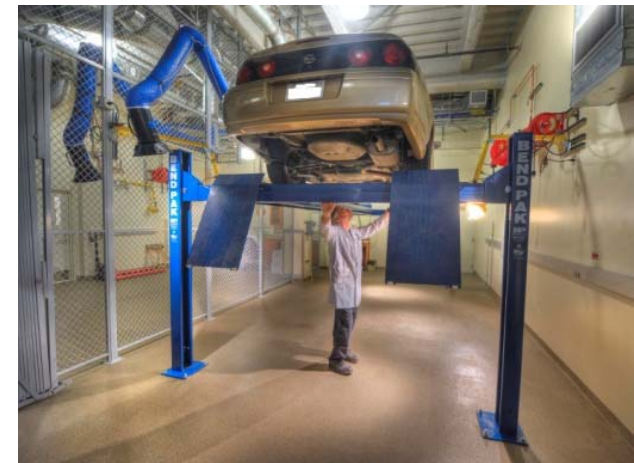
- Forensic Biology DNA Lab
- Mitochondrial DNA Lab
- Low Copy DNA Lab
- CODIS
- Trace Evidence Lab
- Scanning Electron Microscope (SEM) room
- Arson Lab
- Firearms Lab / Firing Range (Projectile recovery tank)
- Toolmarks
- Gun Shot Residue Lab
- Toxicology Lab
- Blood / Breath Alcohol Lab



SPECIFIC FEATURES OF A CRIME LABORATORY

CRIME LABORATORY SECTIONS

- 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

MEDICAL EXAMINER / CORONER

- 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

MEDICAL EXAMINER / CORONER

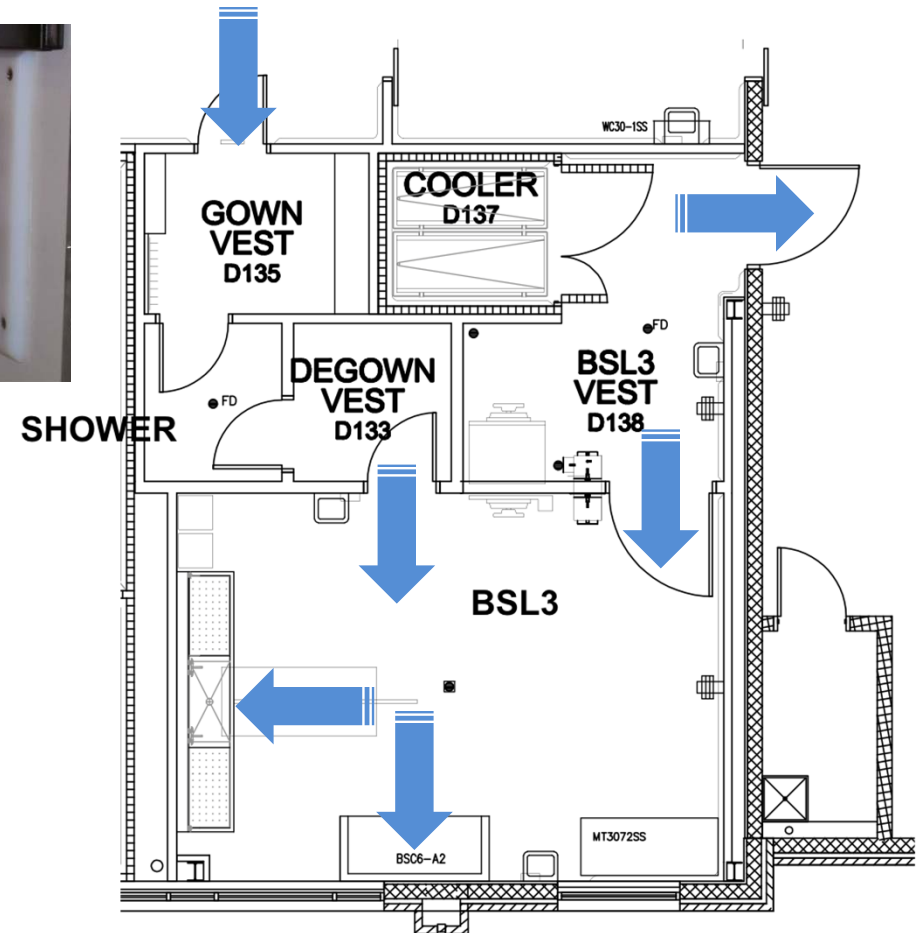
- Histology Laboratory
- Toxicology Laboratory
- Chemistry Laboratory
- Microbiology Laboratory
- Anthropology Laboratory
- Odontology Laboratory
- Specimen Dissection
- Grossing
- Evidence Storage
- Investigation Unit
- Family Viewing Area



SPECIFIC FEATURES OF A FORENSIC PATHOLOGY FACILITY

CONTAMINATE LEVEL 3
AUTOPSY SUITE

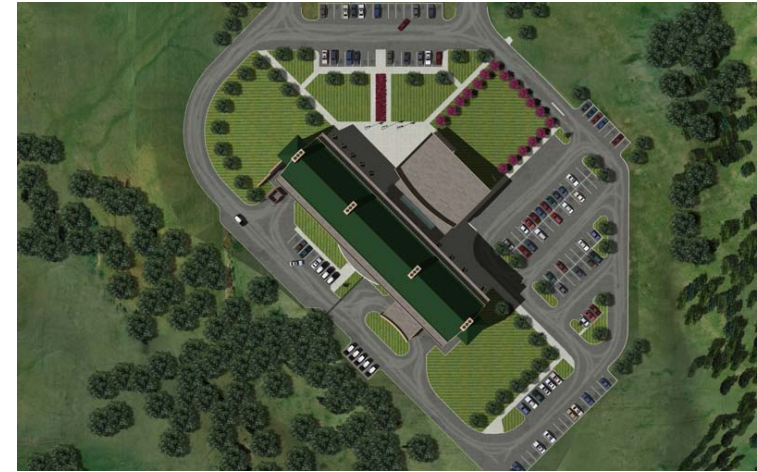
- Certified BSL3 vs. Verified BSL3
- Components of Containment
- Decontamination



FORENSIC FACILITIES

PLANNING & DESIGN ISSUES

- **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**



FORENSIC FACILITIES

PLANNING & DESIGN CONSIDERATIONS

- **Laboratory function (Generalist -vs.- Specialized)**
- **Layout based upon function in Laboratory**
- **Linear layout -vs.- U-Shaped layout**
 - Circulation path impact
 - Air flow issues
 - Contamination concerns
 - Fine particle disturbance
- **Standing -vs.- Sitting height**
- **Fixed – Adjustable - Mobile**
- **Accommodate future growth**
- **Function determines casework type**
 - Wood Casework
 - Metal casework
 - Plastic Laminate
 - Stainless Steel



FORENSIC FACILITIES

SITE DESIGN CONSIDERATIONS

- Security
- Protection Levels
- Access
- Evidence Delivery
- Parking – Public and Staff
- Vehicle Examination
- Impound Areas
- Major Event Staging Areas
- Utility Infrastructure
- Future Expansion



FORENSIC FACILITIES

FUTURE TRENDS IN FORENSIC INVESTIGATION

- **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

DESIGN FOR A SENSE OF COMMUNITY

- Spaces of synergy



FORENSIC FACILITIES

MECHANICAL DESIGN ISSUES

- 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



FORENSIC FACILITIES

PLUMBING DESIGN ISSUES

- **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**



FORENSIC FACILITIES

ELECTRICAL DESIGN ISSUES

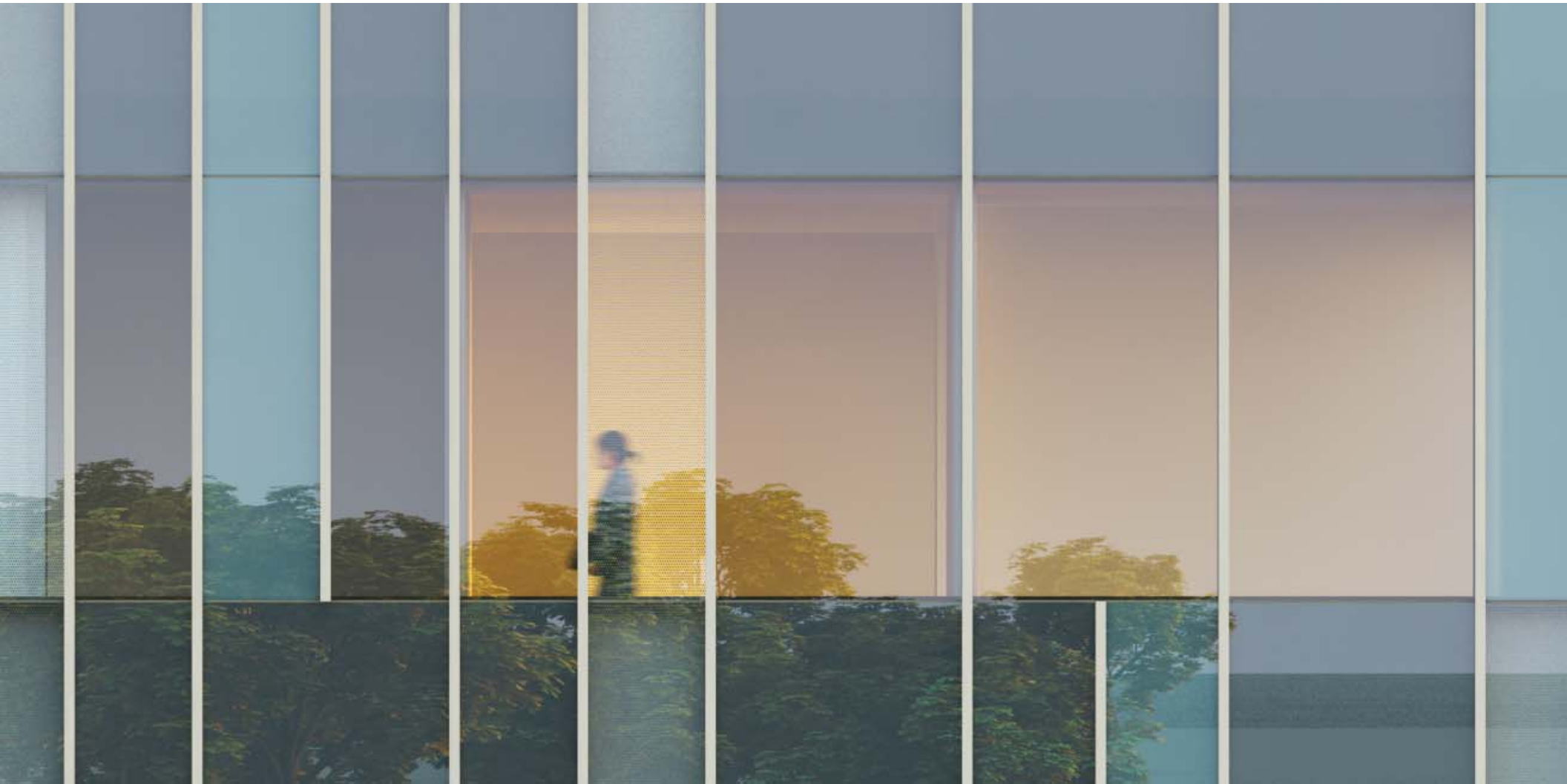
- Standard power
- Emergency power
- Power distribution
- Uninterruptible Power Systems
- Clean Power – Harmonic Distortion
- Data / Communications Systems
- Lighting systems
 - Exterior and Interior
 - Lighting levels – Vary
- Task lighting
- Grounding system
- Fire Alarm System
- Paging & Public address systems



FORENSIC SERVICES & CORONER'S COURT

CASE STUDY

Pushing the Envelope in
Forensic Facility Design





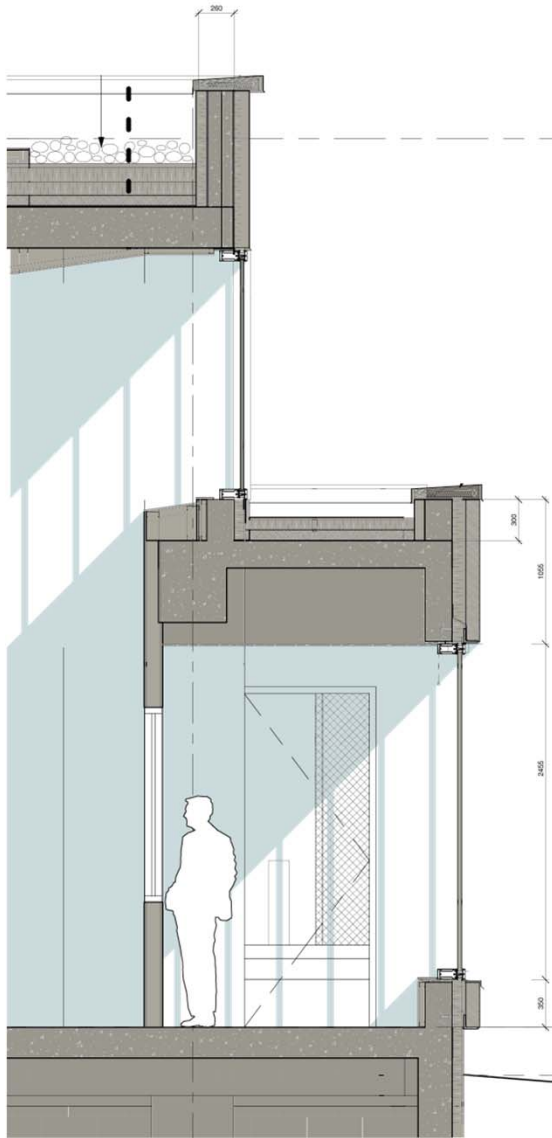
THE PROGRAM

BREAKDOWN

Centre for Forensic Science	300,000sf
Office of the Chief Coroner	35,000sf
Forensic Pathology Unit	110,000sf
Coroners Courts	40,000sf
Shared Services	180,000sf
<u>Total</u>	<u>665,000sf</u>

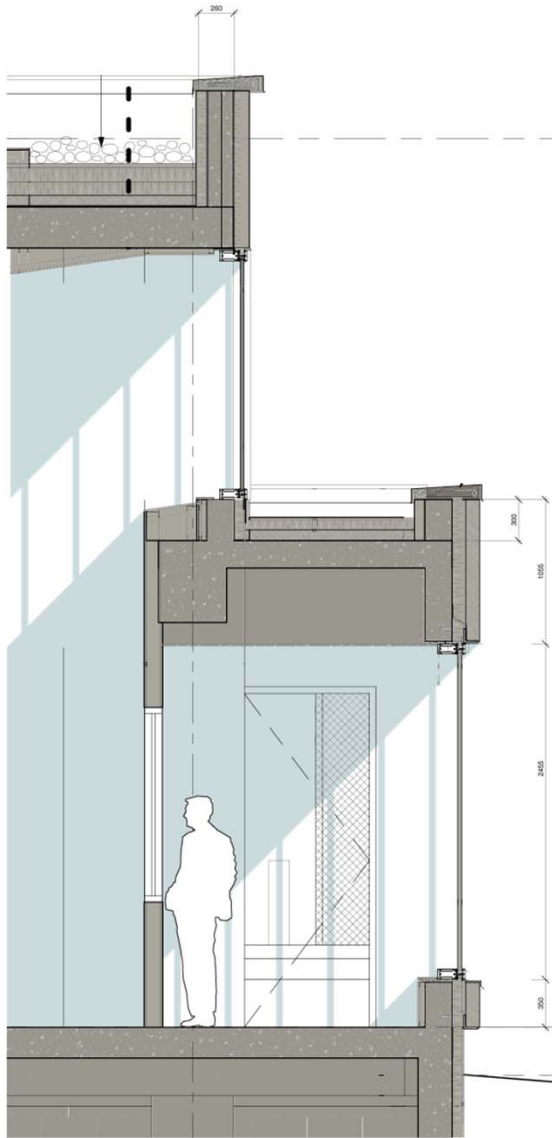
LAB DESIGN

NATURAL DAYLIGHT



LAB DESIGN

NATURAL DAYLIGHT



TEACHING AUTOPSY

PLANNING CONCEPTS





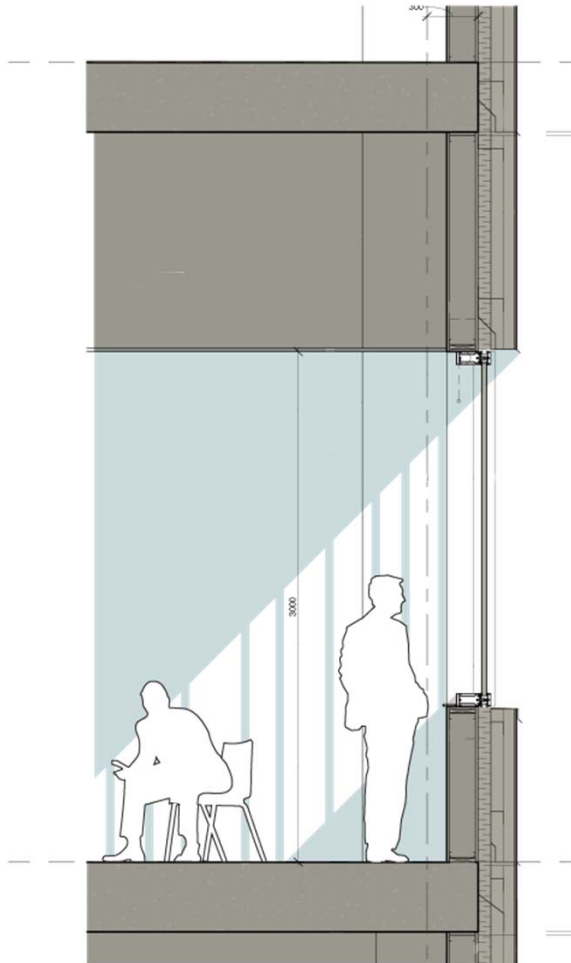
LAB DESIGN

FLEXIBILITY IN DESIGN



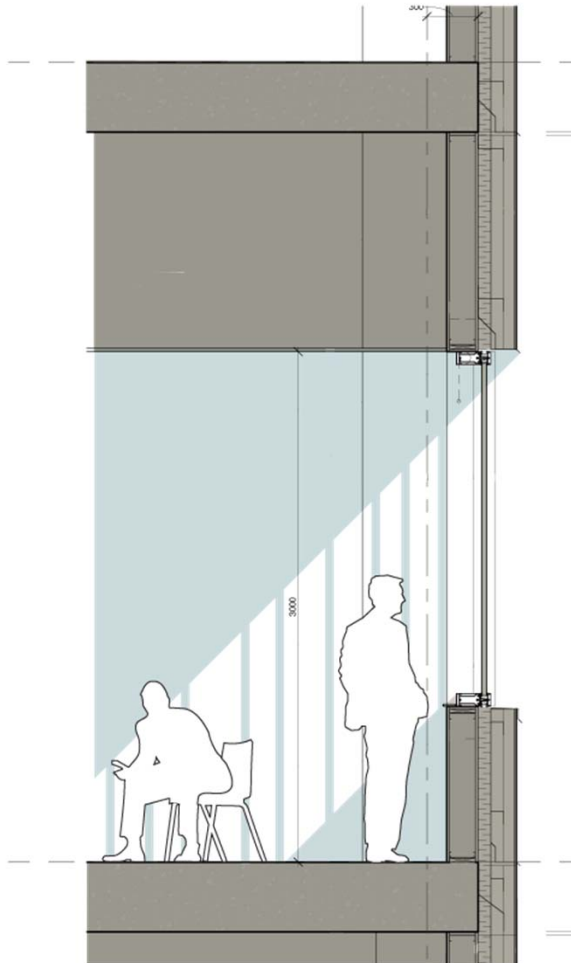
LAB DESIGN

NATURAL DAYLIGHT



LAB DESIGN

NATURAL DAYLIGHT



OFFICE DESIGN

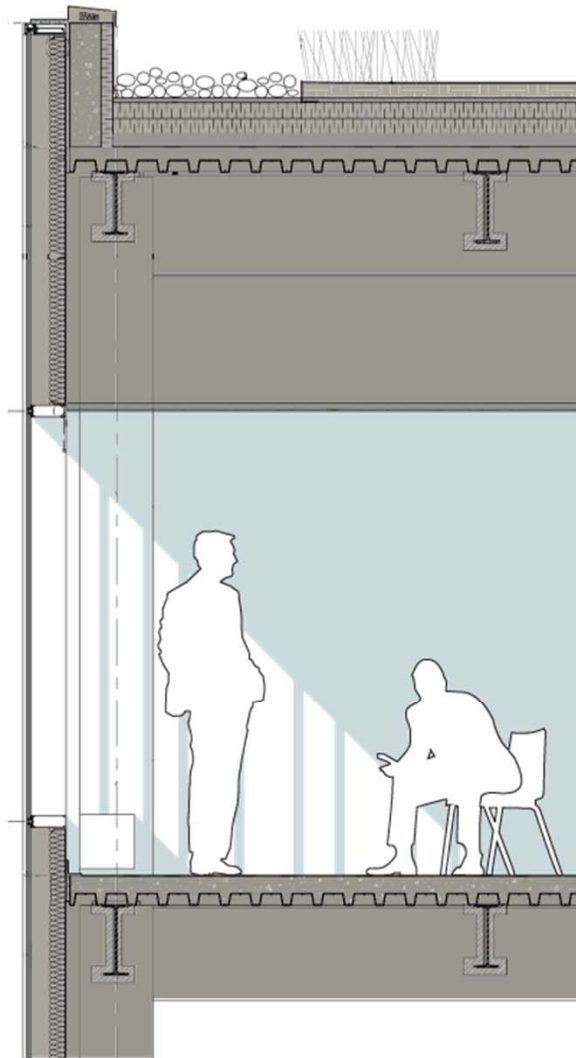
BASEMENT FLOOR



OFFICE ENVIRONMENTS

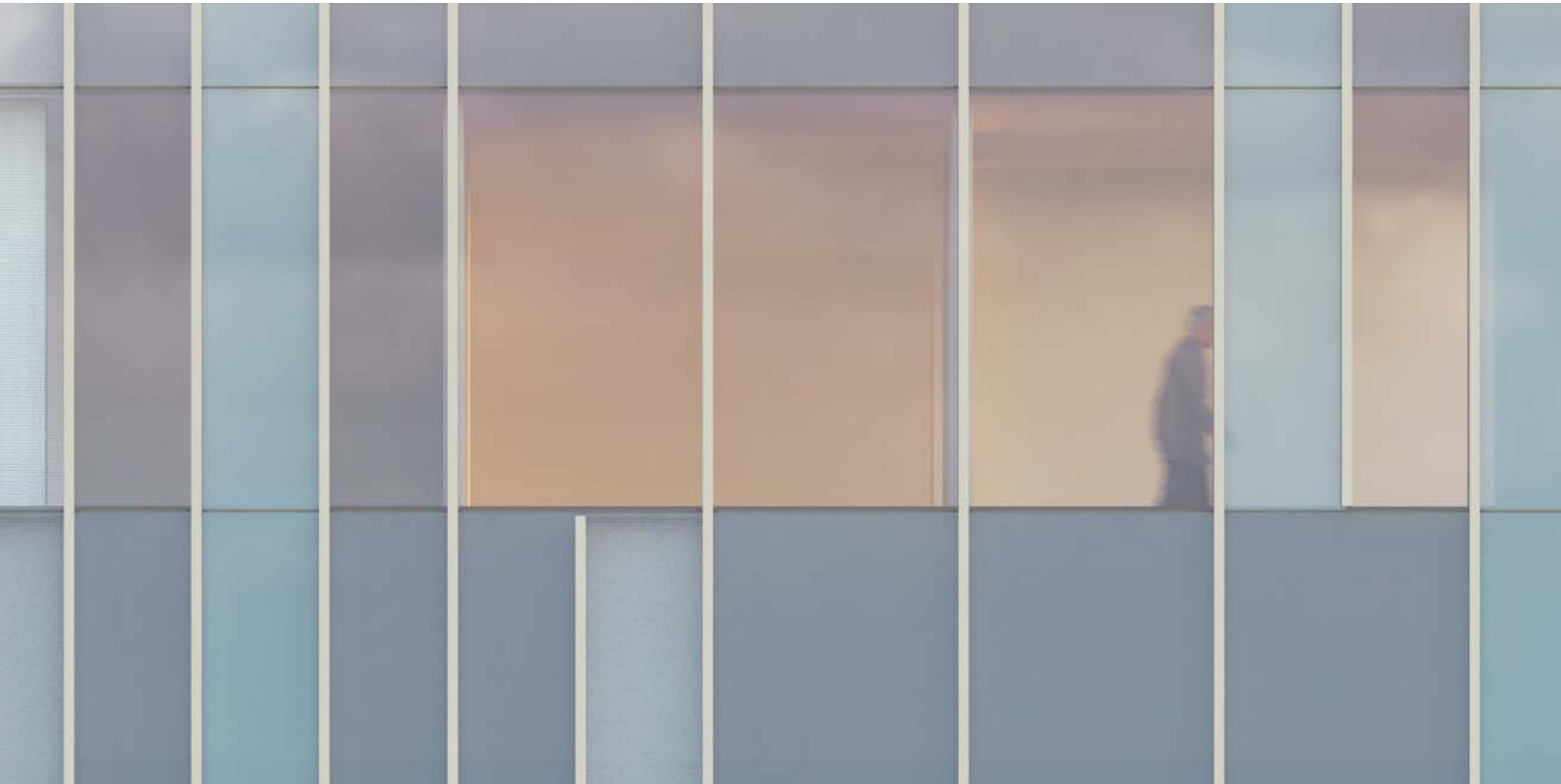
ACCESS TO DAYLIGHT

- FLOOR TO CEILING GLAZING FOR ALL OFFICE AREAS
- ACCESS TO VIEWS
- REDUCED GLARE
- IMPROVED VENTILATION
- COMFORTABLE TEMPERATURES
- ACCESS TO NATURAL DAYLIGHT
- NOISE REDUCTION



THE ARCHITECTURE

THE DESIGN



CORONERS COURT ENTRANCE

THE DESIGN



SECURITY

THE DESIGN



CAFE

THE DESIGN



COURTS WAITING

THE DESIGN



FORENSICS ENTRY

THE DESIGN



FORENSICS ENTRY

THE DESIGN



EXHIBITION WALL

THE DESIGN



FORENSICS COMMONS

THE DESIGN



CAFÉ / WORK SPACE

THE DESIGN



MEETING SPACES

THE DESIGN

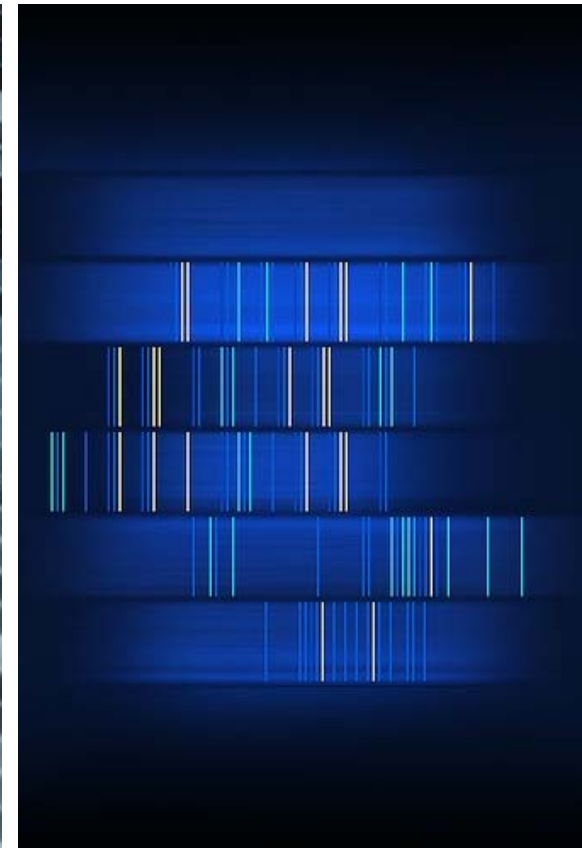


THE LANGUAGE

INSPIRATION



AUTORAD

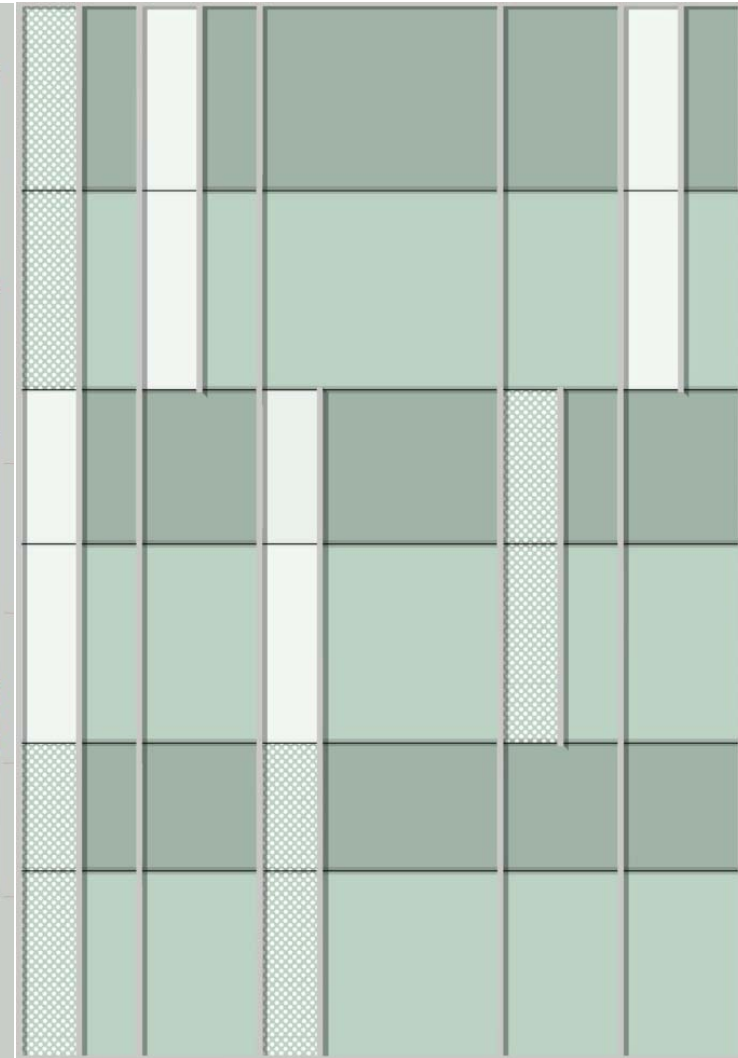
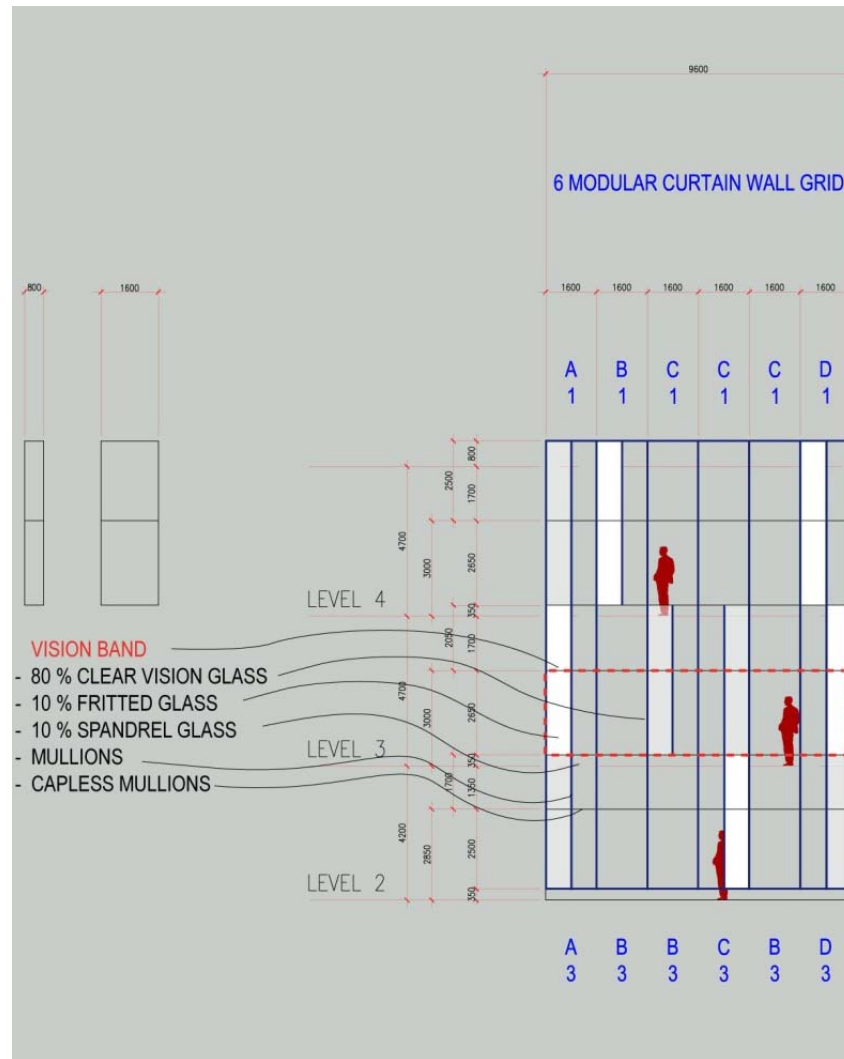


ELECTROPHEROGRAM

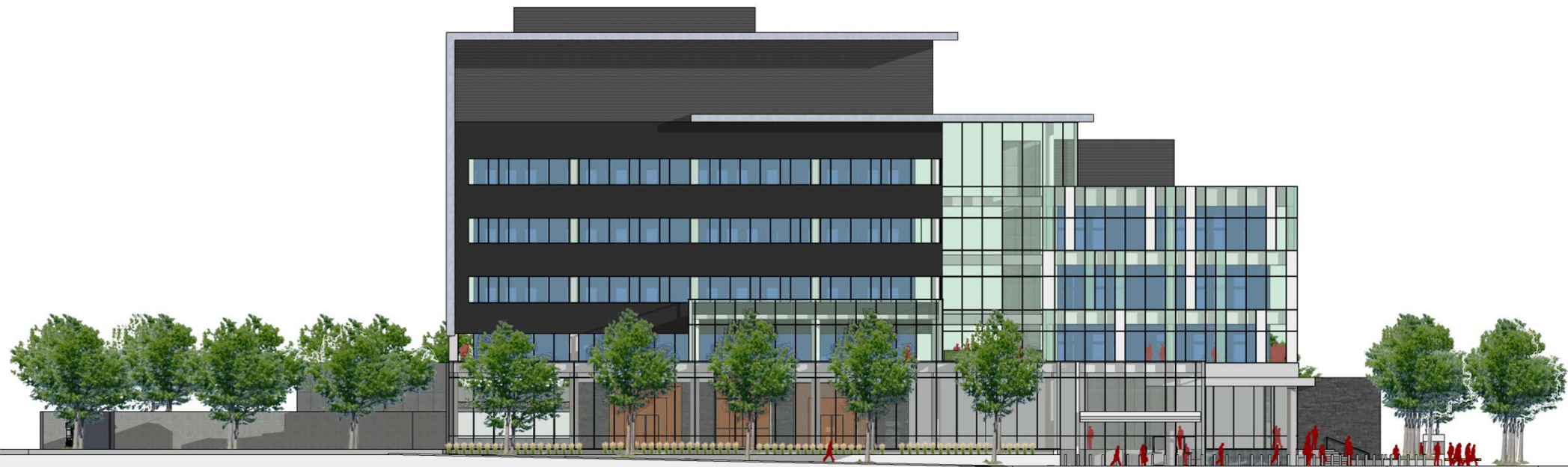
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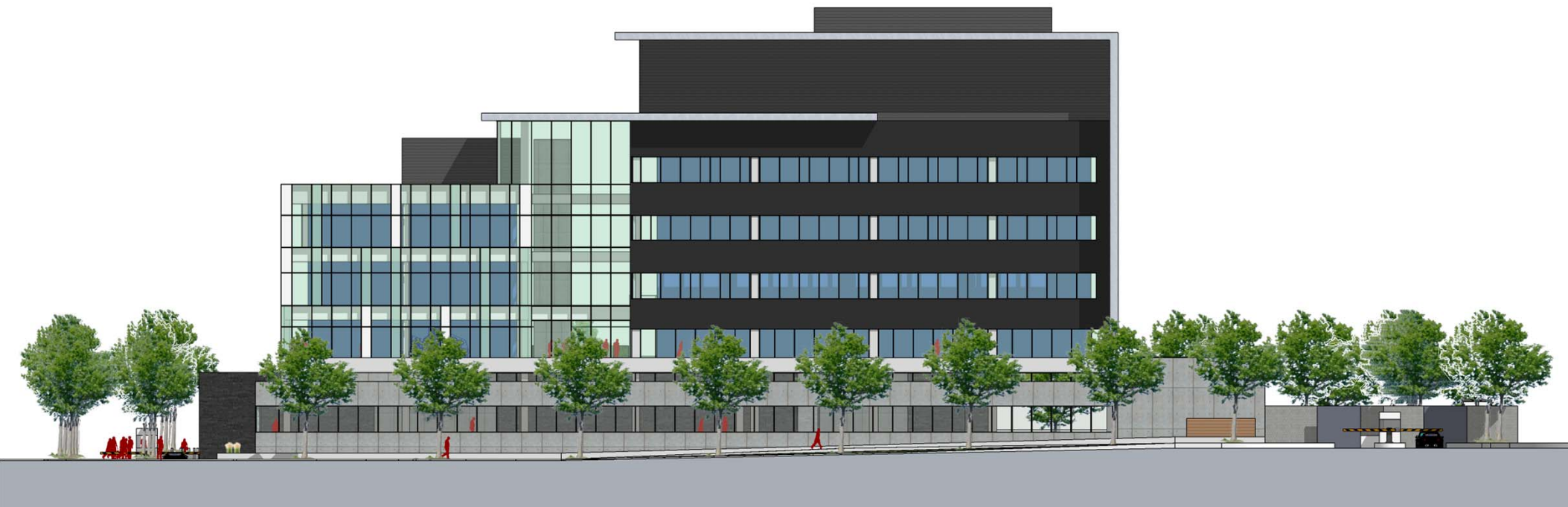
- 4 DIFFERENT TYPES OF GLASS
- 80% VISION GLASS
- 10% FRITTED GLASS
- 10% SPANDREL GLASS
- SPANDREL GLASS AT STRUCTURE



NORTH ELEVATION



SOUTH ELEVATION



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