



# Lederle Graduate Research Center

Abatement Project  
Tower A and Low-rise  
May 23, 2007





# EH&E Experience

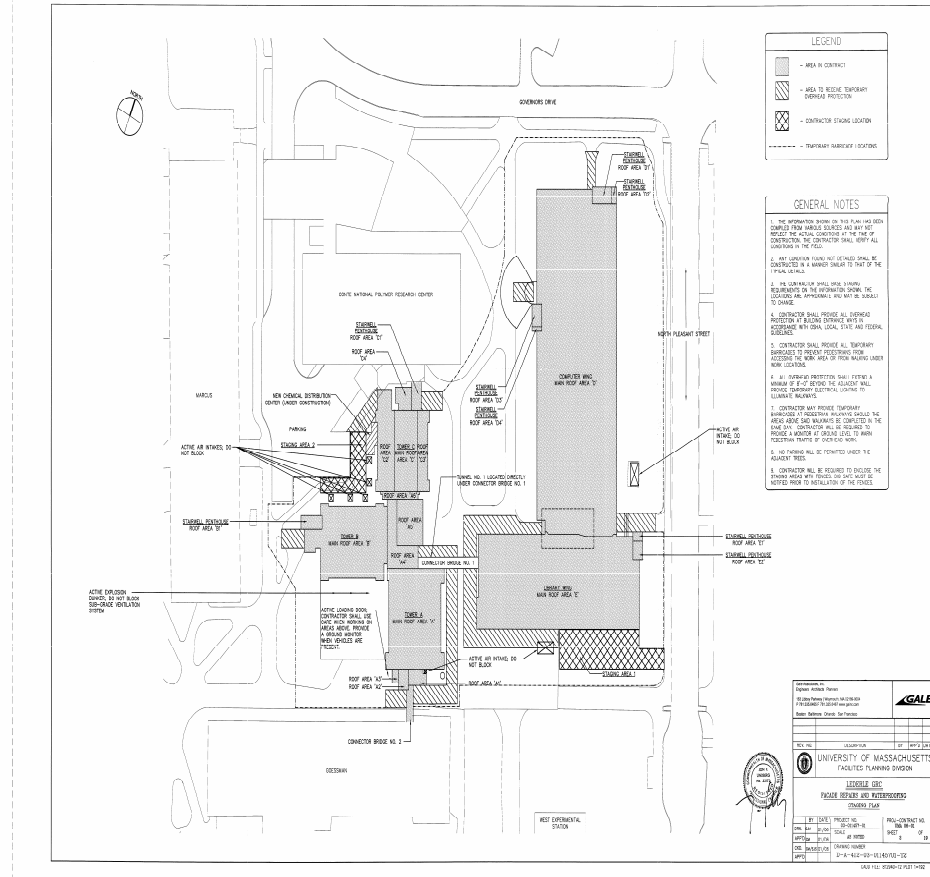
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- Founded in 1986
- 50+ professionals specializing in the indoor environment
- Experience in over 3,000 building investigations
- Projects involving polychlorinated biphenyls (PCBs) in building materials
  - 1995 School building—Cape Cod
  - 2000 University of Rhode Island
  - 2004 Confidential client—Boston
  - 2006 Confidential client—Cambridge



# Building Complex Overview

- Five buildings
  - Tower A (1972)
  - Low-rise (1972)
  - Tower B (1974)
  - Tower C (1974)
  - Polymer Building (1990)



# Project History

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- Pre-cast exterior panels installed throughout the complex (Towers A, B, C, and low-rise)
- Bolts attaching the panels have rusted and have been replaced
- Waterproofing and sealant replacement part of scope of work
- During course of sealant work, regulated concentrations of PCBs were found in exterior caulking for Tower A and low-rise building

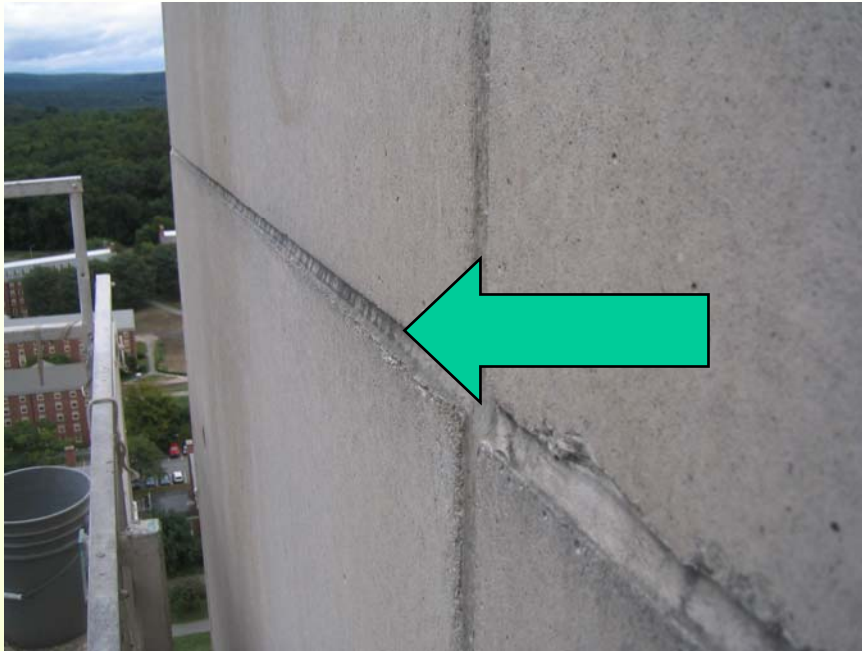
# Polychlorinated Biphenyls

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- Man-made chemical consisting of 209 congeners or “types”
- Used commonly in industry
  - Non-flammable, chemically stable, dielectric properties
- Banned by the U.S. government in 1977 due to concerns over toxicity and environmental persistence
- PCBs generally manufactured as a mixture
  - Trade name Aroclors
  - Aroclor 1254 “54” refers to percent chlorine
- With few exceptions, concentrations over 50 parts per million (ppm) are considered “unauthorized” and regulated by U.S. Environmental Protection Agency (EPA)

# Identified PCB-containing Caulking



EH&E samples from Tower A and the low-rise ranged from 1.4 to 7.4% PCBs

# Assessment and Temporary Mitigation Measures

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- Air samples of all LRGC buildings
- Wipe samples of Tower A and low-rise buildings
- Visual inspection of areas in Tower A and low-rise buildings
- Cleaning of Engineering Library
- Installation of temporary backer rods in exposed joints
- Increased ventilation in Engineering Library
- Installation of fencing around the two buildings
- Initial and continued clean-up of loose debris

# Scope of Abatement Work

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- Tower A
  - Caulking found between concrete joints (~30,340 linear feet)
  - Caulking found between concrete joints and window frames (~1,276 linear feet)
  - Asphalt below debris dumpster
- Low-rise Building
  - Caulking found between concrete joints (~14,148 linear feet)
  - Caulking found between concrete joints and window frames (~2,790 linear feet)



# Abatement Work Plan

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- Submitted to EPA for review and approval
- Protects occupants, workers, and environment
- Details contractor performance requirements
- Details abatement criteria
- Details post abatement verification and sampling procedures

# Abatement Goals

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- Removal of PCB-containing materials in a staged and controlled fashion
- Protect occupants and workers during abatement
  - Restricted access
  - Containment isolation barriers of work areas
  - Pressurization relationships
  - Fenceline monitoring
  - Regular inspection of occupied spaces
  - Restricted cutting and specified removal methods
- Achieve acceptance criteria

# Abatement Contractor

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- Chapman Waterproofing
  - Company founded in 1925
  - Experience in 10,000 waterproofing projects
  - Has worked with EH&E on PCB abatement project
- Abatement workers will be OSHA 40-hour trained
  - Workers will be wearing personal protective equipment since they will be inside work zone

# Containment Controls

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- All abatement work is being conducted outside
- Site Isolation
  - Installation of fences
  - Installation of ground cover
  - Use of swing staging and mast climbers to control work zone
- Work Zone Containments
  - Mesh screens
  - Enclosed poly-sheeting containment for mast climbers
- Fenceline air monitoring for PCBs will occur to verify containment controls

# Engineering Controls



- All masonry grinders/saws will be equipped with high efficiency particulate air (HEPA) vacuums to collect dust
- Additional air movers installed on tower lifts to capture additional debris during Tower work
- Daily vacuuming and cleaning of work zones at the end of each work shift
- Adjust air distribution systems to create favorable pressure differentials without compromising building systems



# Abatement Sequence

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- All abatement work will be completed from exterior of building
- Channel cutting will only take place on the concrete panels where concentrations are near or below acceptance levels
  - Abatement contractor will cut  $\frac{1}{4}$ " or  $\frac{3}{8}$ " of concrete on both sides of the caulking joint
- No abrasive cutting will be done through the caulking itself
- For detailed areas, hand tools will be used to remove caulking prior to the cutting of concrete

# Waste Disposal

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- All material will be collected and discarded as PCB remediation waste or bulk product waste
- Appropriate dumpsters will be used
  - PCB dumpsters will be lined, covered, and secured
  - Access to dumpsters will be limited by fencing to prevent unauthorized access
- Waste will be transported to a TSCA approved disposal site

# Visual and Sampling Acceptance Criteria

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- No visible caulking residue or debris from abated surfaces
- Core samples of concrete need to meet EPA specified acceptance criteria
  - First floor criterion will be at or below one ppm
  - Remaining floors criterion will be at or below 25 ppm
- Wipe samples of window frames need to meet EPA specified acceptance criteria
  - Metal frames on the first floor will be at or below 10 micrograms per 100 square centimeters ( $\mu\text{g}/100 \text{ cm}^2$ )
  - Metal frames above the first floor will be at or below  $100 \mu\text{g}/100 \text{ cm}^2$



# Post Abatement Core Samples

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- Core samples taken from abated concrete joints on the low-rise and Tower A
- Initial sample frequency will be one sample per 50 feet for the first 1,000 feet of both first floor and upper floor abatement work
- If sample fails, that sample area and preceding areas will need to be re-cleaned and re-tested

# Post Abatement Wipe Samples

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- Wipe samples taken from cleaned metal frames from low-rise and Tower A
- Initial sample frequency will be one third of the first 20 window openings of both first floor and upper floor abatement work
- If sample fails, area and preceding areas will need to be re-cleaned and re-tested



# Indoor Air Samples

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- Indoor air sample results will be at or below 0.29 micrograms per cubic meter based on risk characterization calculations specific for buildings
- Air samples will be collected following abatement (source removal)

# Conclusion

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- Work anticipated to start in June pending final approval from EPA
- Work scheduled to last 20 weeks
- Work will directly impact any given area for one to two work weeks
  - One day of preparation
  - Two to three days of cutting and cleaning
  - Test and inspections to take three days
  - Two to three days of restoration work if sample results are favorable