Lederle Graduate Research Center

Abatement Project
Tower A and Low-rise
May 23, 2007
EH&E Experience

- 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

- 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

- 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

• 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

• 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

- 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

• 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

- 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

• 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

• 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

• 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

• 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 (μg/100 cm²)
  – Metal frames above the first floor will be at or below 100 μg/100 cm²
Post Abatement Core Samples

• 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

• 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

• 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

• 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