Historic Preservation

Applied Industrial Hygiene
ESTABLISHING PRIORITIES

Applied Industrial Hygiene in Construction Projects

- Testing
- Pricing Metrics
- Construction Sequencing
Design Team

- Architect
- Interior Design
- Structural
- MEP
- Food Service
- Hazardous Materials
- Lighting
- Audio & Visual
- Acoustics
- Security
- Civil Engineering
BUILDING TESTS

- Materials Tests (ASTM): Concrete, wood, steel, …for strength, composition, quality

- Performance Tests: pressure differentials, heat loss, moisture intrusion, air quality
HAZARDOUS MATERIALS

- Location, Quantity, Condition
- Common Concerns: ACM, LBP, Hg, PCB,
AIR TESTS
PERFORMANCE TEST

Cincinnati Museum Center

Outdoor Admin Office President's Office Outdoor QA

Spores/m3

Location

Concentration 8/3/06
Pricing Metric

- Square Footage ($0.10 to $1.50) – economies of scale
- Billing Rate * Man-Hr
- $\sum$ Activities = ACM + LBP + PCB + IAQ + Mold + etc.

KEY POINT: This price may seem small, relative to total costs of between ($200 - $400 per SF), but it is important to demonstrate value inline with other professional disciplines.
Construction Sequencing

Occupant Health: Hazmat Survey & Air Testing
Business Interruption: Hazmat, IAQ, Materials Testing
Building Preservation: Materials Testing, Hazmat
Architectural Inspiration: 4 miles to the north, the Western Hills viaduct “arch” span was called “an outstanding structure” Railway Age Vol. 94 1929
**Dome:** “believed to be largest half dome ever built”

**Rotunda:** 28% chrysotile acoustic plaster mural
CMC Rotunda Murals

Cincinnati “Porkopolis” Mural

Cincinnati “Soap Manufacturing” History
Concrete Formation of CMC Dome

Workers: “crawl like ants, spreading concrete”

Size: height 106 ft.
Cincinnati Museum Center

- Anticipated Tax Levy $200M (50% Admin = $100M Const. Budget)
- T & I (5% = 5,000,000)
- Hazmat (1% = $1M)
- $1M/500,000 SF = $2/SF
- Anticipated Budget
  $0.10 * 500,000 SF = $50,000
- Actual Phase 1 Budget
  $28,000/500,000 SF = $0.06/SF

500,000 SF on 287 acres constructed in 1933
Daily 17,000 passengers and 216 trains
45,421 tons of steel; 224,534 cu. yd. concrete
Art Museum

- $20M Renovation ($700/SF)
- 5% T & I ($100K)
- 1% HazMat ($20K)
- $20,000/28,000 = 0.71/SF budget
- $28,625 actual

28,000 SF constructed in 1865
150-300 daily visitors
TAFT MUSEUM

- Conservation of ceiling, wall, window murals
- Conservation of thin veneers
- Refurbishment or Restoration of historic hardware, light fixtures, windows, window treatments, carpet, furniture, accessories (fans, clocks, etc.)
TAFT MUSEUM WALL SECTION

- Wall Section
- 3 ½" x ¾" cladding
- 4" x 1" sheathing
- 4" x 3" studs w blown-in asbestos insulation
- Foil paper w fiberglass
- 1 ½" x ¼" lath
- Metal lath
- Rough coat plaster
- Final coat plaster

Blown in ACM was 20% to 50% chrysotile – ALL wall cavities interior/exterior
IH TESTING – performed upfront is valuable management tool, particularly when non-destructive methods support preservation.

THE DESIGN TEAM – pricing must demonstrate value and be in alignment with other disciplines.

CONSTRUCTION – tests show the performance of the building envelop & mechanical systems as an integrated whole – this is useful for construction sequencing.