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Building renovation: Have you considered all the costs such as environmental remediation?

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Hidden costs associated with contaminated building components and disposal of hazardous materials can turn a small renovation project into a complex environmental remediation. If these hidden environmental concerns are discovered during renovation or demolition, the impact on project budgets, funding mechanisms and construction schedules can be significant. Assessing the presence and extent of these types of environmental concerns is typically completed during due diligence, but as project budgets become more restrictive, the extent and thoroughness of such initial assessments may be limited which may result in significant cost and schedule concerns if the scope of abatement of hazardous building materials is underestimated.

The presence of hazardous materials, mainly asbestos-containing materials (ACM) and lead-based paint (LBP), require considerable consideration during renovation. Other hazardous materials including polychlorinated biphenyls (PCBs) and mercury associated with lighting, transformers or past operations in the building and biological factors such as mold may also affect the scope of renovation projects. Comprehensive assessments of all hazardous materials should be conducted during initial due diligence and include a review of available as-built drawings, inspection of the building, and sampling and analytical testing of suspect materials. Sampling must be performed by licensed inspectors in accordance with applicable federal and state requirements. Survey results should be reviewed with renovation plans to determine whether hazardous materials will be disturbed or require removal, limited mitigation, or encapsulation prior to or in conjunction with building renovation.

The most detailed surveys may not identify all hazardous materials that proposed renovation might disturb. Often, these materials are only encountered during partial demolition and renovation, resulting in work stoppage and contractor change orders. Examples of such materials include concealed ACM below flooring (i.e. multiple layers of floor tile), within wall cavities (pipe insulation), between walls and foundations (waterproofing materials along perimeter curtain walls), and below ground (steam piping); LBP in multiple layers of painted walls; and mercury-impacted flooring and subflooring. When segregation of this material from demolition debris or soil to be exported offsite is impractical, state regulations may preclude disposal of the material as typical C&D waste or clean fill, resulting in additional costs and delays for disposal and handling of this material as hazardous waste or ACM.

For demolition debris, the lead in paint can potentially be listed as a Resource Conservation and Recovery Act (RCRA), characteristic hazardous waste, which has specific requirements for handling, storing and disposing of hazardous materials. All demolition or renovation debris-generators are responsible for determining whether their debris is a hazardous waste as identified in RCRA (Subpart C of 40 CFR Part 261).

State regulations or guidance (as in Connecticut) may have requirements for LBP assessment which must be satisfied in order to obtain demolition permits. In addition to state requirements, the EPA's "Lead: Renovation, Repair and Painting Program" rule will take effect in April 2010. This rule seeks to minimize lead-poisoning in children by implementing lead-safe work practices and by certification and training requirements for contractors and maintenance professionals working in pre-1978 housing, child-care facilities and schools.

Another consideration is mercury, which is often encountered on urban sites, particularly in 19th century industrial buildings. Historic sources of mercury include the manufacturing of felt hats, mercury thermostats, barometers, lamps and dental amalgam. While the source of mercury contamination may not always be identifiable, the implications of such contamination on a renovation project scope and budget can be easily understood.

Mercury remediation is expensive and time consuming, especially if the mercury is causing an indoor air-quality concern. Remediation is complicated by various exposure pathways, which include dermal contact and volatilization, depending on the physical state of the compound. Mercury can be remediated by: removing mercury and mercury-contaminated building components, cleaning building components in place, heating and venting the work space, encapsulating the source, installing floor and ceiling vapor barriers, and installing a fresh-air ventilation system.

After project completion, costs associated with hazardous materials can still be incurred. When identified early in the decision making process, hazardous building materials can be properly managed and the risk associated with these materials appropriately mitigated.

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