High-Quality Waterproofing is Cost-Effective

A below-grade waterproofing system that is either poorly designed, poorly installed, or both, can be a financial time bomb to an unsuspecting building owner if the system fails within the lifetime of the building. This is usually not due to the high cost of repairing or replacing the waterproofing membrane itself, but rather of the disproportionately high costs related to re-accessing and exposing the membrane.

When a roof develops a leak, locating and repairing the failure can be relatively straightforward. The materials are accessible and any standing water can be easily swept or drained away. Or, when a masonry wall has to be tuck pointed, it is above ground and easily accessible by use of scaffolding. However, it is far more time consuming and expensive to re-access and expose a failed waterproofing system for the following reasons:

- **Removal, redesign and replacement of unrelated site features:**

Such site features can include plant materials, wearing slabs, pavements, lighting, retaining walls, stairs ways and ramps, curbs, bollards, signage, etc. If the waterproofing that needs repair or replacement is on a foundation wall then, depending on the foundation depth, the excavation "angle of repose" can affect a very large surface area and thereby also affect a great many existing site features as well. Photo A is a good example of this. If the foundation of this building had to be rewaterproofed, the excavation would affect retaining walls, mature trees, wearing pavement with granite feature strips and many other amenities unrelated to the waterproofing itself.

Photo A: Existing site features above a waterproofed foundation wall.

- **Excavation and re-compaction of backfill.**

In addition to the obvious additional cost of excavating and backfilling, there are the related cost of compaction testing and the inconvenience of on-site stockpiling.

- **Existing hydrostatic conditions.**

Such existing conditions would not only add the cost of temporary site dewatering, but can also delay the construction schedule by making it necessary to allow the substrates to properly dry before installing the new waterproofing.

- **Warranty exclusions for damage of interior finishes and contents.**

Depending on the use of the interior space, the damage to finishes, furniture and other contents caused by the water infiltration can sometimes match and even exceed the entire cost of the project, especially if computer equipment is affected. These costs would be assumed by the Owner since this author currently knows of no waterproofing manufacturer or installer who has ever included compensation for such damages in their warranty.

- **Structural capacity limitations.**

In the case of a waterproofed plaza, the removal of the over burden can be more time consuming and expensive if the structural capacity of the existing deck cannot support the dynamic loading of large construction equipment, thereby compelling the contractor to use smaller more time consuming equipment.

Waterproofing, continued

- **Disruption of building access and egress.**

During foundation excavation, required building access and egress must by maintained by means of temporary code compliant bridges, stairs, handicap ramps, walkways, etc. Obviously, the design, construction and removal of these temporary items can add considerable cost to the project.

To further reveal how disproportionate the waterproofing repair / replacement costs can be to the overall project we have provided those cost breakdowns on six completed waterproofing projects that we have designed.

Inspec Project	Total Remedial Construction Cost	Remedial Waterproofing Cost Only	Percent of Total
Assisted Living Facility	$165,000	24,000	15%
Office/Computer Facility	$147,000	31,000	21%
Medical Research Facility	$116,000	12,000	10%
Classroom Building	$550,000	60,000	11%
Classroom/Library Facility	$510,000	110,000	22%
Bookstore/Administration Facility	$225,000	46,000	20%

Average 17%

You will note that the remedial waterproofing cost averages 17% of the total cost of the entire project. This means that 83% of the project cost was related to things that have nothing directly to do with the waterproofing repair / replacement itself.

Whether the waterproofed substrate is a plaza above constructed space, a building foundation, or a tunnel, it is cost effective to select qualified professionals who have the expertise and experience to design and construct a waterproofing / subdrainage system that will last the life of your building. As a wise man once said," There is never enough money to do it right, but there always seems to be enough money to do it over again."

Many facilities have significant levels of occupancy. That means they also have significant levels of heat gain from the bodies, lights, sunshine, computers, office equipment and more. So when you turn the thermostat setpoints down, in an effort to save energy, air handling systems with constant 60F mixed air temperatures will simply continue to blow cold air when the thermostats stop adding heat at low setpoints. When you have captured all that free heat, the air handling unit sequence of operation should stop the heating at low space temperatures but continue to allow that free heat to take the space temperature to more comfortable levels, before adding any cooling, no matter the outside air temperatures.

Thanks to Dave Campbell of Inspec for authoring this article. Inspec is an independent engineering / architectural firm focusing on roofs, walls, pavements and waterproofing systems. Known throughout the country as a premier professional organization, Inspec has designed and implemented thousands of solutions for a wide range of clients for more than 30 years.

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