Building “failures” and how to avoid them
Lessons learned to guide your use, lease and purchase of buildings

The recent collapses of the I-5 Bridge over the Skagit River and the floor of the Vancouver Warehouse and Distribution Co. are two recent examples of dramatic structural failures. Such sudden failures often severely impact the usability of the structure and have high costs associated with repair. But there are other ways that a building can “fail,” and the effects may be no less dramatic to the owners and users of those structures. The four most common types of failures that can impact new construction, remodels or even purchases of existing buildings are classified as 1) structural, 2) life-safety, 3) functional and 4) feasibility failures.

What is a building failure?
A building failure occurs whenever a building’s performance does not meet expectations, often resulting in a significant loss of value, inconvenience, loss of use, and in some cases, injury or death. When reasonable expectations are not met, regardless of the nature of those expectations, a building failure has been realized.

Structural failures
In the case of Vancouver Warehouse and Distribution Co, the actual loads placed on the floor exceeded the structural capacity of the floor. This is a clear example of a structural failure. These kinds of failures often make news headlines. Such failures can occur when building owners or users are unaware of structural capacity limits, hidden deterioration, the effects of defered maintenance upon the building’s structural capacity, a flaw in the original design or construction of the building, or modifications to a building that unknowingly weaken the structure.

Fixing structural failures is frequently very costly and time consuming. For example, the recent structural failures of the Courthouse Square Complex in Salem, Oregon resulted in a four-year evacuation of the building after it was declared “dangerous” by engineers, resulting in lawsuits and a $23 million price tag to repair the $34 million building.

Life-safety failures
Life-safety failures occur when a building doesn’t meet minimum life-safety expectations during an emergency. Such failures can take many forms and the building owners may not be aware of the deficiency until an emergency occurs. Building components may break under minor seismic activity, materials may off gas toxic emissions into the indoor air, or building components may burn so quickly in a fire the occupants don’t have time to escape. In most buildings, the single most effective life-saving feature is the ability for the occupants to escape quickly during an emergency. A building with narrow, labyrinthine-like corridors may fail during an emergency.

Functional failures
Functional failures are most obvious if the design is not intended to meet the unique character of the occupied building into account. Engineers and planners typically design buildings that don’t meet the business’s growth or functional projections may become obsolete decades before the mortgage is paid off. Functional failures are most typically realized in purchases of existing buildings. Purchasers may overlook certain key requirements for their business, only to find later that the building they just purchased isn’t appropriate for their needs. Many prospective building buyers are lured by an attractive purchase price expecting that the necessary modifications will be cheap or easy to perform, only to discover after closing that significant zoning, structural or practical obstacles stand in their way. In many cases, whatever savings were generated through the initial purchase may be quickly eroded and ownership now becomes a financial hardship.

Feasibility failures
Feasibility failures are the result of improperly considering your financial position prior to construction or purchase. Feasibility failures became so common during the last five years.

There is no substitute for good preparation when undertaking a significant project.

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Regional manager. “They need the high-end speed to utilize their time in the best possible way — and they will pay for the services because this is what they’re looking for.”

Jack Burkman, Vancouver city council member, stated in an online comment that “this is great news for Vancouver. The more of this infrastructure [that is] installed in new buildings, the more we will attract new digital economy businesses and their employees.”

Mind shift
Ebin Barnett, business development manager at CenturyLink, said developers need to change the way they’re building to accommodate these new services.

“There needs to be a strong partnership between [the fiber optic provider] and engineering, the project superintendent and electricians,” said Barnett, adding that this team approach enables the developer to understand the necessary space and power requirements, jacks, smart panels, distribution modules, structured wiring cabinets, universal power supplies and other components of the system.

Brents mentioned additional considerations, such as where to locate docking stations and even electrical outlets. Beyond stereotypical Internet access for PCs and smartphones, Barnett sees the “Internet of Things” “coming at us like never before.” The 2014 Consumer Electronics Show (CES), for example, featured fridges, microwaves, washing machines and other appliances connected to the cloud for better energy management.

Scott Conley, president of Essential Building Technologies, said that smart systems for building-wide temperature control and energy management are increasingly cloud-based. For example, a building manager might receive an email or text message alert about a fan failure or a high temperature alarm.

“Developers and builders need to make sure they know what’s new and coming and how to stay competitive,” said Brents.

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can be catastrophic.

Avoiding failures
Given the right circumstances, every building can fail. Significant seismic events, severe weather or unforeseen economic turmoil may cause even well-designed, maintained and financed buildings to fail. Property risks cannot be entirely avoided, but with appropriate actions, they can be managed and minimized through proper planning. Errors that lead to building failure may occur at the very beginning of the project, through improper planning, during the design phase, during construction and even in the operation of the building. Involving knowledgeable, qualified consultants early in the project planning process will help you identify your development priorities, set a realistic budget and timeline, and help guide the project through permitting, construction and operation.

The complexity of the building development and acquisition process requires a knowledgeable team of experts that prioritizes communication and works best in an integrative process. There is no substitute for good preparation when undertaking a significant project. Most engineers, architects, contractors, financial and real estate professionals are happy to discuss these topics with prospective clients, even if the project is nothing more than an idea developed over a weekend. Take advantage of these resources!

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Martin Flynn, CenturyLink senior marketing manager put it a little more strongly. “Prestige Plaza and the Reserve – this is the future,” he said. “The landscape is changing dramatically and quickly. If [developers] spend more time on cabinet colors than on the network, they’re going to be left out.”

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