DUFF & PHELPS

Protect, Restore and Maximize Value

Insurance Valuation TODAY

Providing insights into current trends and issues affecting insurance valuation of real and personal property.

April 2019

INSIDE

In this issue of Insurance Valuation Today we cover topics of interest for insurance professionals, risk managers and others that need to determine insurable values and replacement costs of real and personal property. In one of the feature articles, experts from Kroll, a division of Duff & Phelps discuss techniques to mitigate the cost of investigations associated with cybersecurity breaches. Our second feature story discusses replacement cost valuation for water and wastewater treatment plants.

Included in this issue is a Cost Trend Update providing construction and equipment cost indices for the U.S. and UK that can be applied to building and equipment book values to determine indicators of replacement cost.

We hope you find the information contained in this newsletter useful and encourage you to contact us if you require additional support.

U.S. Cost Trend Update January 2019

Construction Cost Indices

The jump in construction costs seen in 2017 continued in 2018 based upon three of the four sources we use to track construction costs. Only the Engineering News-Record index remained flat in a year-on-year comparison. Steel prices, a leading indicator of construction indices, stabilized at $662 per ton in 2016, increased to an average of $767 per ton in 2017 and jumped up to an average of $907 per ton in 2018.[1] In general, increasing prices of raw materials and growing labor shortages are pushing costs higher. As wages continue to rise, more experienced individuals are entering the workforce, however, there is a limit to the availability of qualified individuals. The average wages for those working in construction and paid on an hourly basis increased to $30 per hour.[7] Total construction was 3.4% higher as of November 2018 compared to the prior year. The private sector saw a 2.3% increase from a year ago, while public works had a 7% boost. Non-residential construction in both markets experienced increases over the past twelve months compared to this time last year.[2] It is important to notice that in three of the four national construction cost indicies we follow, there has been greater than a 5% in construction costs year-over-year.

	2015	2016	2017	2018
ENR – Building Cost Index[2]	+1.7%	+2.9%	+3.3%	+3.3%
FM Global – US Industrial Buildings Average[3]	+1.9%	+1.6%	+1.2%	+5.2%
RSMeans – 30-City Average[4]	+0.1%	+0.8%	+4.0%	+5.5%
Marshall & Swift, US Average[5]	+0.2 to + 0.9%	0.0 to +0.9%	+2.7 to +3.7%	+3.2 to +6.0%

Note: The range of change shown by Marshall & Swift represents different classes of construction.

Equipment Cost Indices

Three sources for equipment cost indices had significant increases in 2018, compared to the previous three years.

	2015	2016	2017	2018
Marshall & Swift/Boeckh - Industrial Equipment Avg.[5]	-1.0%	+0.9%	+2.6%	+4.8%
US Bureau of Labor Statistics - Producer Price Index for Finished Goods, Capital Equipment[6]	+0.7%	+0.9%	+0.9%	+2.7%
FM Global - Industrial Equipment Composite[3]	+0.8%	+0.0%	+1.2%	+2.8%

Take care when selecting an index to track the rate of cost change for your company's capital equipment. The three indices in the table above all track average capital equipment cost change percentages, and indicate the differences that have occurred over the past four years. Developers – as well as insurance brokers, underwriters and valuation consultants – can all recommend appropriate indices for your particular facilities. Select one that represents your capital equipment as closely as possible; there are significant differences between the average indices shown and specific industrial-sector indices.

Always remember that cost indices are just average indicators of change; they are not absolutes, and there is no average building or average assemblage of equipment. After five to seven years, you should establish a new replacement cost basis by using a qualified valuation consultant.

Sources

1. MEPS (International), Ltd, All carbon steel products composite price and index
2. Engineering News-Record, Monthly Construction Economics Report
3. FM Global, Industrial Cost Trends
4. RSMeans, Construction Cost Indices, 30-City Average
5. Marshall & Swift/Boeckh, Marshall Valuation Service, Quarterly Cost Index
6. US Bureau of Labor Statistics, Producer Price Index for Finished Goods - Capital Equipment
7. Construction Dive, Q2 construction costs up 5.6% this year, Kim Slowey, June 24, 2018

UK Cost Trend Update

Since the economic crash in 2008, and the sharp decline in building costs the following year the UK construction sector has shown a period of stability as noted by the cost increases of between 1-4% year-on-year, as per BCIS's Building Cost Index. Forecasts predict that construction costs in the UK will see rises of approximately 3-4% a year over the next four years, although this should be treated with some caution due to the current political uncertainty in the UK.

The cost of machinery & equipment in the UK has also noted increased stability, with prices rising on average by 1-3% over the past four years.

Index	Source	2015	2016	2017	2018
Buildings					
Building Cost Index (1)	BCIS	0.3%	1.6%	4.0%	3.9%
Tender Price Index (1)	BCIS	6.6%	1.8%	12.9%	1.9%
M&E					
Machinery & Equipment (2)	ONS	1.2%	1.8%	2.7%	1.4%
Metal Forming Machinery & Machine Tools (2)	ONS	2.9%	1.5%	2.9%	5.3%
Food, Beverage & Tobacco Processing (2)	ONS	-1.5%	1.7%	1.1%	1.7%

Sources
1. Building Cost Information Service (BCIS)
2. Office for National Statistics

Cutting Cost of Investigations as Business Email Hacks Persist

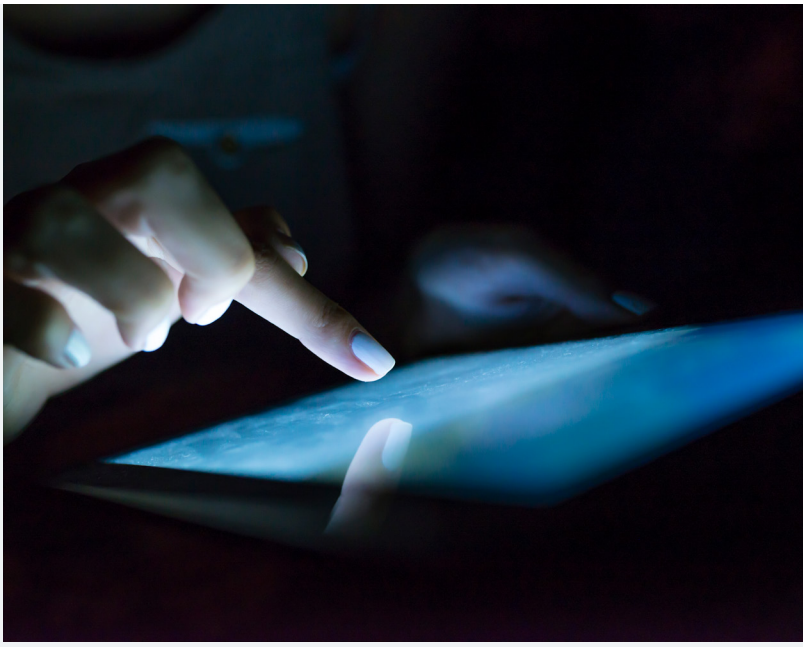
If you're sending emails at work, there's a high probability that you're doing it through Office 365, which bodes well for hackers. Beazley reported in its latest Breach Insights report that cyberattacks on business email accounts continued to rise in the second quarter of 2018, with Office 365 inboxes especially at risk because of the software's widespread use in offices.

Investigations of email accounts can be expensive since targeted companies have to rake through years of messages to determine whether personally identifiable information or protected health information was compromised, according to Beazley, though one firm is leveling the playing field.

"Under normal circumstances or the way those investigations worked in the past, you would go into the portal and you could see a particular IP address that was suspicious logging on to a mailbox, but there wasn't much granularity into what the actor did while he was in that mailbox," said Ben Demonte, U.S. cyber head for Kroll, a corporate investigation and risk consulting company. "Kroll has developed a capability in which we can see exactly what the actor did while he was in that mailbox. That allows for the investigation to be much more efficient and instead of engaging through a document review of an entire mailbox, we can do it now for only specific messages that we know were accessed."

A hacker might have clicked on an email by mistake or viewed it because it contained information they found interesting and potentially profitable, but they likely didn't look at every single email, so being able to narrow down a search from an entire inbox to, comparatively, a handful of emails reduces the cost and time of running an investigation. With Kroll's tool, you could see that the malicious actor looked for the word 'payment' or 'invoice' – a common search for cyber criminals – and clicked into a particular set of emails with that information.

"There are two large groups that are accessing Office 365 – [one is] the group that is trying to get in the middle of a wire transfer and trick someone into wiring them money," said Demonte. "The other actor group [is] trying to send out additional spam because they're trying to continue to perpetrate the phishing email. You're more likely to click on an email that comes from a trusted domain or email account rather than if it just came from a random domain or a free email service - you would find that much more suspicious."



The fact that Office 365 uses cloud computing also makes it a popular choice for businesses and cyber attackers.

"That's where the data is. Office 365 in and of itself is no more or less secure than any other email program. As it's adopted more in the community, it just becomes a natural place to go," said Demonte. "Because it's all in one place, it's easier for the actor to know where to go, so they could just go to [the Office 365 website] and if they have a set of credentials, they can log into the mailbox."

While it's impossible for an organization to avoid using email, there is a simple mitigation measure that employees at companies of any size should implement to help deter hackers.

"We've seen it hit a five-person accounting company to a national company where it's hundreds of mailboxes that have been accessed," explained Demonte. "We always advise and recommend to our clients that they should turn on two-factor authentication because then the actor or the unauthorized person would not have access to that mailbox since they don't have the second factor."

This article originally published in Insurance Business and written by Alicja Grzadkowska.

Water and Wastewater Treatment Plant Replacement Cost Valuation

Risk managers and insurance professionals responsible for safeguarding water and wastewater plants are continually challenged with regard to property replacement cost values. To keep up with effluent guidelines (national regulatory standards which provide guidance as to the amount and quality of wastewater discharge) and community needs, water treatment construction and technology are constantly evolving to give communities more options for treatment. Due to these changes, today's treatment plants are more varied than ever, making it even more important to understand your plant and coverage needs.

We frequently hear the following four questions:

1. How do plants and treatment processes vary?
2. What information is helpful when preparing for a property insurance appraisal of a plant?
3. What will the on-site appraisers do while performing their field inspections?
4. What sources does the appraiser typically use to develop a replacement cost?

Plants are no longer lumped into a conventional category that follows the same methodologies to obtain the required effluent. Growing populations and more stringent regulations are changing the way plants view their water options and achieve their effluent quality. Communities are tasked with expanding, renovating or, in some cases, building completely new plants to achieve their specific treatment needs. In each case, it is important to fully understand those needs and the associated costs, which can vary greatly and may impact insurable values. In some cases, a retrofit can cost substantially more than new construction when accounting for site preparation, demolition costs and the cost associated with tying the process into the currently constructed plant.

Process types vary significantly, as does the actual equipment each plant uses to achieve results. Every plant/entity will consider the various process types, along with their respective capabilities, to build a plant that meets their processing needs and is compatible with the location's site-specific attributes. Below are some examples of the primary processes associated with both water and wastewater treatment.

Water Plants

- Filtration (conventional) — Removal of matter and chemicals by filtration
- Reverse osmosis — Removal of molecules or ions by membranes
- Nanofiltration — Pressure-related use of membranes to separate pollutants and ions
- Distillation — Separation of substances by condensation or evaporation

Wastewater Plants

- Activated sludge (conventional) — Treatment of sewage using air and microorganisms to feed on contaminants
- Sequencing batch reactor (SBR) — Use of a single-tank system to handle all conventional treatment
- Membrane bioreactor (MBR) – Use of membranes and biological process for treatment
- Land application systems (LASs) – Use of land, typically through lagoons, for treatment

Once you decide to have an appraisal done, be ready to gather specific information and prepare to assist with the inspection process. Proper preparation greatly assists the appraiser and

helps ensure an efficient and less obtrusive inspection process. Notifications, access and data collection are integral parts of this phase. Once the on-site personnel are notified of the pending inspection and access is granted to the site, data collection can begin. While each plant may have different processes, effluent results and varied equipment, certain information can be gathered regardless of your type of plant. From a global perspective, the appraiser will need to know the design capacity and general plant properties. The following are examples of questions the appraiser may ask:

- Is your plant water or wastewater?
- What kind of treatment processes are used?
- Are there any special requirements to obtain a certain effluent (outflow)?
- What is your current design capacity? (This is different than average operating capacity, as the overall replacement cost of a plant depends on what the plant was intended to process, as opposed to the average daily treatment, which can be affected by various outside factors.)
- Is a plant diagram/map available indentifying all structure and treatment processes?

After these initial questions, prepare to provide further detail to assist the appraiser in data collection and to make the appraisal process as smooth as possible. Plants are extremely busy, and it may be difficult for the staff or operators to assist; however, data collection is imperative to the appraisal process. While the appraiser is touring the facilities, the data supplied is a key part of the inspection. The data collected can be as simple as sizes and capacities of tanks, to makes, models, serial numbers, horsepower, types, cost data from suppliers and maintenance programs in place for the equipment. Typically, provide as much information as possible during the allotted time (as on-site staff generally have limited time to assist with inspection). In each case, as mentioned above, the appraiser will use the same data collection methodologies to ensure consistent, quality results.

Most methodologies will involve the same procedures regarding the physical inspection and valuation. Appraisers physically inspect and collect pertinent information regarding structures, equipment and processes during this phase. The data collection will go beyond the information previously discussed and could include conditions, upgrades, relevant years, types and correlating photos. This is a very comprehensive phase of the process; thus, assistance and access are critical to achieving quality results.

The appropriate definition of value is determined during the contractual negotiation phase and is typically set to mirror the insurance policy covering the plant. The vast majority of inspections and appraisals we complete are based on the cost of reproduction new, which is the equivalent to the insurance-industry term "replacement cost." In certain situations, it may also be appropriate to use a different premise of value, such as cost of reproduction new less exclusions (which may vary per the respective policy), the cost of reproduction new less depreciation (equivalent to the insurance-industry term "actual cash value") or the cost of replacement new (to simply replace the capacity of the plant through the most efficient means possible).

After the inspection phase, the appraiser will compile the data and calculate the replacement costs of the various processes, structures and equipment. Sources used may include proprietary software, RSMeans, supplier costs, invoices, AIA documents, Marshall & Swift, EPA and actual construction costs provided by the insured and other sources.

Many challenges come with constructing, upgrading or replacing a water or wastewater plant. While regulations and a growing population may dictate construction of a certain type of plant, building new plants also requires a substantial amount of land, which may limit a community in its choice of building a specific type of plant and/or a new plant versus retrofitting an older plant. This may also impact technological and process options, which would subsequently affect costs. A multitude of issues go into constructing and insuring a plant that fits your needs, and an appraisal can assist with determining the appropriate replacement cost of a plant — especially one that has gone through various changes and upgrades over time.

For more information, contact Bradley Schulz, Duff & Phelps Managing Director at bradley.schulz@duffandphelps.com or Jeffrey Lank, Duff & Phelps Director at jeffrey.lank@duffandphelps.com

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CONTACTS

Mark Bobber
Managing Director
Fixed Asset Management and Insurance Solutions
+1 414 225 1288
mark.bobber@duffandphelps.com

Brad Schulz
Managing Director
Fixed Asset Management and Insurance Solutions
+1 630 541 4656
bradley.schulz@duffandphelps.com

Rebecca Fuller
Managing Director
Valuation Advisory
+44 (0) 79 4923 1846
rebecca.fuller@duffandphelps.com

Ben Demonte
Managing Director, North America Practice Leader
Cyber Risk
+1 201 687 8732
benedetto.demonte@duffandphelps.com

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