Up.

UNIQUE PERSPECTIVES
FROM OUR WORLD

Liberty Specialty Markets

IS RAIN UNDERMINING THE FOUNDATIONS OF CONSTRUCTION?

In today's increasingly unstable climate, infrastructure and buildings are designed to withstand the worst that nature can throw at them. But during construction these assets are vulnerable to natural perils including significant rainfall events. Liberty Specialty Markets' Patrick Bravery and Gareth Evans argue the case for a new approach.

Authors

Patrick Bravery
Underwriting Manager – Global Construction
Liberty Specialty Markets
United Kingdom

Gareth Evans
Senior Risk Engineer – Global Construction
Liberty Specialty Markets
United Kingdom

> "Rainfall is all about frequency. A construction project could be affected multiple times."

According to a study of the global climate published this year, extreme weather events around the world have become more frequent and more severe. In its report comparing 2020's weather with comparable data from 1951–2010, the World Meteorological Organisation concludes that, as the concentration of greenhouse gases in our atmosphere reaches a new high, so does the global mean surface temperature of our planet. It's that rising temperature, it's argued, that powers extreme weather. A scientific paper published in 2019 concludes that for every one-degree Celsius rise in temperature, the total precipitation resulting from extreme weather events doubles.

This is clearly bad news for the insurance industry – not just because of the potential for flooding and damage, but because many in the insurance market has had something of a blind spot where heavy rain is concerned. As a sector, insurance is highly effective at managing the exposures posed by natural catastrophes such as hurricanes and earthquakes. It's even well versed in what's known as fluvial flooding – flooding due to a river bursting its banks. But when it comes to inundation created by significant rainfall events – pluvial flooding – some underwriters have been less focused, something that's all too evident from the construction market's loss statistics.

Construction projects

Construction is a good example of the problems that can be caused by significant rainfall. This may seem counter-intuitive because new buildings and infrastructure projects are increasingly designed with flood resilience front of mind. When complete, these structures can withstand significant rainfall events along with associated flooding. The finished level of a road or railway will be set above flood levels; a new supermarket built on a flood plain may have flood protection walls, or the entire site may be elevated. But it's during the construction phase that the blind spot is revealed.

Significant rainfall has the power to wash away material, inundate excavations, even remove soil. Washed-in materials may be deemed contaminated, which requires expensive environmental disposal treatment. Trenches may have to be re-dug and base courses re-laid. Road and rail embankments can be washed away before newly planted vegetation is able to get a grip. If run-off waters can enter a tunnel under construction, damage to the boring machine could paralyse the project.

Rainfall damage of construction sites is rarely front-page news and certainly won't be the most severe of losses, but that's not the problem. Rainfall is all about frequency. A construction project could

be affected multiple times. While the quantum for each event can be relatively low, add them all up and the total loss over the life of the project could be comparable to one catastrophic event.

Changing risk profile

The other factor that makes the exposure posed by rainfall difficult to address effectively is the changing nature of the risk profile of a construction site. Pits are excavated and then filled; land is elevated; soil is replaced by concrete or tarmac. The potential for flooding can change week by week as the site develops. Consider two construction sites adjacent to one another. Changes in the ground elevations of one of the projects may temporarily channel surface water run-off towards the neighbouring project, not previously considered to be vulnerable to flooding. One of our insureds suffered such an event costing many millions of dollars to repair.

The risk is there even in regions of the world considered arid. The likelihood for pluvial flooding in the Middle East may intuitively seem low due to the perception of the climate there. But if 50mm of rain falls over a few hours onto surfaces baked hard by the sun, the impact can be high, with construction site storm water management infrastructure becoming overwhelmed and pluvial site-wide flooding developing.

Claims history

So why hasn't the insurance industry responded more proactively to this risk? At Liberty Specialty Markets, our claims history told a story we didn't like: water-related perils represented 56% of all loss activity on our civil construction portfolio. Anecdotally, our loss adjusters and risk engineers knew that rainfall events were behind many of the claims they reviewed. River flooding, by contrast, was thankfully rare, validating our established approach.

The reason our teams now fully appreciate the potential damage that can be caused to construction sites, lies in our newly developed Construction Portfolio Analysis Tool. This specially designed software – part of our strategy to be a data-driven business – allows us to consolidate all the information about our construction portfolio and give us the ability to comprehensively analyse it. The results were plain to see. We needed to act.

Insurance response

First, internally, we are working to improve the tools and techniques available to us during underwriting. In the short term, we have put in place guidance based around a combination of the three-day maximum precipitation figure – essentially, the historical maximum amount of rainfall (based on annual exceedance percentages) falling in three days – and the project type. For example, a long, linear road or pipeline has a different inherent exposure to that of an isolated bridge or basement.

Further work is required to take account of regional differences. In some territories, persistent rainfall and the saturation of the ground is the concern; in others, it's short, sharp intense downfalls causing localised inundation. Furthermore, rainfall data available in different countries and regions varies in quantity and quality. To help address these issues, we are collaborating with in-house and external experts to develop analytical techniques that will better assess any project's exposure to rainfall.

Second, taking the lessons learned from the Portfolio Analysis Tool, we are reviewing the profitability of certain sectors and determining if changes are required to how we apply deductibles, draft policy conditions and determine premium levels. Our goal here is to create sustainable insurance solutions.

Third, we want to collaborate with the wider insurance market and the construction industry to improve risk engineering in this area, possibly in the form of best practice guidelines. When we speak to clients, we now highlight the damage that a significant rainfall event and pluvial flooding can cause, share our loss experience and discuss potential mitigation strategies. We want to generate increased awareness at the construction site level.

Climatic instability

Events like the recent Australian wildfires and exceptionally cold weather in Texas are further indicators that things are changing. Extreme weather is increasing in frequency: hearing commentators refer to one-in-100-year events now feels commonplace. For the construction sector, it means that the potential for significant rainfall and pluvial flooding is rising globally.

As an industry, faced with a negative loss experience and increased threat from climate change, insurers must address this exposure. Better data and analysis will certainly take us part of the way, but an industry-wide collaboration is critical.■

> "Water-related perils represented 56% of all loss activity on our civil construction portfolio."

GET IN TOUCH

Patrick.Bravery@LibertyGlobalGroup.com
Tel: +44 (0)20 3758 0282

Gareth.Evans@LibertyGlobalGroup.com
Tel: +44 (0)20 3758 1741

libertyspecialtymarkets.com