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Surfing The Wave of Transformation

Risk Allocation for Climate Change Impacts in Construction

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Risk Allocation for Climate Change Impacts in Construction

Climate change poses multiple risks to the construction industry and the built environment. Historically, the focus has been on building more green buildings and sustainable projects, but climate change poses a multitude of risks during key phases of the construction process for all projects including:

- the procurement phase;
- the building phase; and
- the project itself once completed.

What are the potential legal ramifications of failing to address these risks in what is now a transforming construction industry? How can we minimize these risks through sensible risk allocation, risk management, risk transfer and project resilience measures? With such an impacted project spectrum how can we work towards achieving successful execution and completion of projects?

Answering these questions means focusing on adapting the built environment to climate change. This paper explores both the US and International perspectives and current trends in this field.

1. The US Perspective – Adapting the Built Environment to Climate Change

While climate change may continue to be a hot-button item in U.S. politics, its potential impact on the built environment, both during the construction phase and after a project is completed, has serious financial, legal, and life-and-death consequences that cannot be ignored. According to NOAA, the U.S. sustained 403 weather and climate disasters from 1980–2024 where overall damages/costs reached or exceeded $1 billion (including CPI adjustment to 2024), with the total cost of those disasters exceeding $2.915 trillion.[i] In 2024, there were 27 confirmed weather/climate disaster events with losses exceeding $1 billion: one drought, one flood, 17 severe storms, five tropical cyclones, one wildfire, and two winter storms. The American Meteorological Society (AMS), which researches the attribution of weather events to climate change, publishes an annual review of extreme events and their connection to climate change and it has found that many extreme events have been affected by climate change.ii

In the face of these disasters, adaptation and resiliency are gaining traction as more and more communities face the frequently horrific toll on lives, communities, and businesses caused by climate change. Failing to adapt to potential climate change impacts at all stages of a building project can lead to lawsuits, loss of insurance coverage, or even loss of life. Identifying the potential risks posed by climate change and ensuring that the appropriate parties to the construction project address those risks (and are contractually responsible to do so) can minimize these risks at each stage of the building process.

Construction projects in certain parts of the U.S. already take into account weather conditions that have always been a challenge—such as dealing with cold weather conditions in the Northern states, hurricanes in Florida, or extreme heat in Texas. But climate change is both super-charging existing conditions as well as introducing new weather patterns and phenomena, such as heat domes, derechos, and polar vortexes. These, along with increased rainfalls, floods, and wildfires, can pose risks that have historically not been significant problems in many regions of the United States.

The challenge, under the current U.S. legal framework, is that there are still several climate-related factors that are often not clearly addressed in construction projects, including: (1) what challenges or problems are caused, at least in part, by climate change; (2) whose responsibility is it to address the risks posed by climate change; (3) do

the relevant building codes (if there are any) address the local risks posed by climate change; and (4) what is the standard of care owed by architects/engineers relative to climate-change-related risks?

Turning briefly to each of these in turn…While it may still be difficult to pin a particular weather event to climate change, attribution science is improving each year and becoming more specific about which events have a link to climate change. Attribution science compares the world as it is now to a hypothetical world that has not warmed as a result of carbon emissions in order to determine the likelihood of or severity of a particular weather event happening due to the increased global temperature.[iii] Climate modelling is similar but more prospective—looking ahead to determine likely weather conditions as a result of global warming.[iv] These two sciences, while still developing, allow owners, developers, engineers, and other parties to the construction project better understand the risks that climate change can pose both during the construction process and to the final project.

Despite this information, contracts still frequently fail to address who is responsible for identifying potential risks and addressing them, leading to confusion if or when there are problems, which can then lead to litigation. The American Institute of Architects, known for its standard contract forms used in many private construction projects, has created a simple form to address this problem: the AIA Hazard and Climate Risk form. Arup, meanwhile, has developed the Universal Taxonomy for Natural Hazard and Climate Risk and Resilience Assessments, which Arup states "provides a universal language for evaluation of risk assessments for buildings as well as the people, communities, and organizations they support."[v] These are two guides which parties to a project can use to identify risk and assign responsibility for managing that specific risk to the appropriate party.

This leads to the last two issues mentioned above—building codes and the standard of care owed by architects and engineers to their clients and the general public. Incorporating resiliency into the built environment is something architects and engineers are increasingly focusing on in the face of the threats posed by climate change. At the same time, engineers and architects generally look to building codes to determine certain functionality and safety standards for their designs. As of 2020, however, approximate 65% percent of counties, cities, and towns in the U.S. had not adopted modern building codes.vi Many building codes are updated infrequently and are based on historical climate data instead of future climate estimates. In 2021, FEMA announced the results of a survey of the nation's building codes, finding that $1.6 billion in losses have been avoided since 2000 thanks to buildings constructed following stringent building codes, but that does not capture the losses caused by a failure to comply with those stringent codes.vii

Until there are binding government requirements, it is up to project engineers and architects to understand the design risks projects face due to climate change and plan with future climate estimates in mind; incorporating resilience above and beyond what building codes require will therefore be crucial. Engineers and architects are on the forefront of recognizing the threats climate change poses and the changes that need to happen as a result in the design and construction processes. The World Federation of Engineering Organizations has issued a Declaration on Climate Emergency, declaring "The crises of climate breakdown are the most serious issues of our time. Our major infrastructure systems of transport, energy, water, waste, telecommunications and flood defenses play a major part, accounting for a vast portion of energy-related carbon dioxide (CO2) emissions whilst also having a significant impact on our natural habitats. As a result, the WFEO has pledged, among other things, to "apply, and further develop, climate mitigation and adaptation principles as key measures of our industry's success, demonstrated through rating systems, awards, prizes and listings."

Given that architecture and engineering groups recognize both the risks posed by climate change and their responsibility to address it, engineers and architects are not immune from litigation risks merely because they followed the local building rules. The question engineers and architects must ask in designing buildings in the face of climate change is whether they are fulfilling their professional standard of care. Engineers and architects, like

doctors and lawyers, are legally obligated to provide services to their clients with the ordinary degree of skill and care that would be exercised by other reasonably competent professionals in their industry, taking into consideration the contemporary state of the art and the region in which the professional practices. Failure to exercise that standard of care can expose engineers to legal liability. This standard of care is not static, however, as it "changes over time based on research, development, and new information." City of Huntington v. AmerisourceBergen Drug Corp., 2022 WL 2399876, at *37 (S.D.W. Va. July 4, 2022).

Finally, while much of the climate-adaptation focus in the built environment is on the design and construction of the building itself, the health and safety of construction workers is also becoming an increasing concern in the face of extreme heat (and, to a lesser degree, wildfire smoke, even from fires thousands of miles away). Extreme heat can cause serious damage to workers' health and safety, even killing workers.[viii] Extreme heat can also impact worker productivity and delay work, leading to the potential risks of liquidated damages if substantial completion deadlines are missed. OSHA continues to debate a potential rule addressing extreme heat protections.[ix] In the meantime, however, OSHA's General Duty clause (29 U.S.C. § 654) requires an employer to provide a safe workplace, including protection from natural disasters and other emergencies. The General Duty clause requires an employer to provide a safe workplace free from hazards. OSHA may find an employer violated the General Duty clause if a hazard existed that was likely to cause death or serious physical harm, the employer was aware of the hazard, the hazard was foreseeable, and workers were exposed to the hazard. In addition, five states have occupational heat standards (California, Colorado, Minnesota, Oregon, and Washington) with other states and municipalities looking at efforts to protect workers. As heat domes and heat waves and oppressive humidity increase, the risks to workers of long-term damage or death from that heat increases as well, imposing on contractors the obligation to ensure that workers are getting the rest and shade they need, which may also mean reevaluating construction schedules.

The above issues capture, at a high level, some of the most pressing issues facing those involved in the construction process in the U.S. Construction litigation in the United States is already an expensive and time-consuming process and the failure to identify, address, and transfer climate-change-related risks will only lead to more litigation. Fortunately, there are a number of resources available now to assist those who develop, own, design, and construct buildings, in order to minimize those risks.

2. The International Lens – Middle East Projects & Climate Change Risk

The global construction industry is no stranger to environmental challenges, with variances ranging from extreme cold to scorching temperatures, and long stretches of rain as well as drought. Recent events have highlighted the fact that climate change impacts are increasing in their frequency, their duration, and their severity.

The Middle East region, whilst infamous (or notorious depending on how you want to look at it) for some of the world's most iconic projects and developments including NEOM, Qatar Football World Cup 2022 and The Burj Khalifa, has recently experienced a surge of extreme weather events. These, alongside increasingly poor air quality and further increasing temperatures, have prompted serious project stakeholder considerations as to the impact of climate change on construction projects. Governments across Europe, Asia, South America, Africa, and Australasia, having all experienced similar conditions have been forced to undertake similar reviews.

Whilst more frequent weather events were anticipated, we see added to that the additional impacts being experienced on construction projects particularly as regards design, the physical works, and the workforce on site. Alarm bells on climate change in the Middle East have certainly been sounding for some time now. In 2013 Oman's submissions to the United Nations on climate change warned that, on a conservative calculation, more than 375 km2 of Oman is expected to be flooded by rising sea levels. In 2021, the UAE government issued a report warning of anticipated increases in cyclonic activity in the Arabian Sea and the Persian Gulf. Oman, Yemen

and the UAE were affected by Cyclone Tej in October 2023. In 2024 Bahrain, Qatar and UAE were all hit by widespread flooding following unprecedented rainfall.

The direct and indirect impacts on construction and its insurance and reinsurance across the Middle East region are currently under immense scrutiny. It is, still to a large extent and in many respects, a region filled with developing countries, so the impacts on construction projects cannot be understated. The message that is emerging is one that focuses on the criticality of 'adaptation' across projects at all levels. From the funders and investors at the top end and downstream to the owners and operators, the contractors and subcontractors, supply chain and transport/ logistics to testing/ commissioning, operations, and maintenance. Indeed, even down to the very end users including asset purchasers and tenants.

The global construction industry is aware that it must now fully understand, plan and account for a multitude of challenges, risks and issues that may not have been a concern as little as ten to twenty years ago. At this stage, any impacts directly on issues such as building design and materials, disruption and delay, damage to works, and the mitigation costs are the subject of much protracted debate.

On one hand we have a set of stakeholders looking to fund and build out projects for best value, on time and to a succinct return on investment plan as against another set of stakeholders geared towards margin, cashflow and profit. The interests have never been aligned. Climate change risks look set to increase the divide rather than bridge any gaps. The perception that many contractors use or abuse the simplest of adverse weather conditions for example with a view to submitting a contractor claim for time and or money is only increasing. In the Middle East construction industry, the project consultants made up of supervising engineers, project managers and costs consultants are under immense pressure to reject these claims in any way that they can.

Enter then the ever changing and evolving regulations introduced by most if not all the Middle East governments in some shape or form over the last 10 to 15 years to protect the public and construction workforce from climate change risks[x]. The industry is endeavoring to comply, but it still must deliver projects, some at a scale not undertaken before, and in circumstances where project delivery requires new technology and modern methods of construction. Serious issues as to project cost hang heavily over projects that have worked hard to secure funding and increase bankability only to have to spend additional costs on regulatory compliance, digital data collection, enhanced health and safety measures or new risk reporting systems. Queries abound as to whether compliance with the regulations is merely an industry best practice, a nice to have if you like, or in fact a legal requirement that attracts fines, penalties, and corporate consequences where industry stakeholders fail to adhere.

There is a serious trend in construction contract amendment to meet the requirements of new regulations and to allocate or transfer risk between the contracting parties as regards climate change and environmental considerations. The region relies heavily on the FIDIC suite of construction contracts[xi]. It remains firmly wedded to the 1999 editions despite the publication of a new suite from 2017 onwards. That trend is leaning towards a serious and costly risk shift to the contractor, particularly in the arenas of contractor claims for time and/ or cost as well as unforeseeable site conditions and force majeure, all of which are specifically captured by the civil law codes of the GCC countries.

The Middle East is endeavoring to adapt to changing project risk profiles influenced by extreme weather events. These events often result in extensive damage and significant exposures in concentrated geographical areas or high-density urban plans. Usually, the last stakeholder to get involved at the front end of a Middle East project is the insurer. Legal advisors must place an emphasis on obtaining early insurance brokerage and advisory services at the feasibility and concept design stages if possible and if not then at the very least at the procurement stage

including a review of the construction or project contracts and documentation to ascertain accurate risk profile including pertaining to climate change risk.

There is a widely held view that because of the 'developing country' nature of some of the Middle East region's upcoming project portfolios that they will in fact be quicker to undertake the critical adaption required to address and manage climate change risks. They do not have the burden of existing and long-standing legislation and regulation which is taking some time to revise and upgrade such as in the UK[xii]. Whether this stands to be true remains to be seen but certainly the region is taking the opportunities that come with the climate change risk adaptations to drive innovation and technology as well as materials research and development.

Construction costs, and by association contractors' margins, will be influenced by concerns about the longevity and suitability of today's construction for the future climate. Critical evaluations of industry standards and project design must be carried out to ensure that they accurately reflect changing risks and evolving regulatory requirements. Here lies an increased liability risk for negligence claims as professional standards and education in the adaptation, and particularly the asset resilience arena, progress.

Mitigation of risk begins at the front end of the project at the feasibility stage. Climate-resilient design, early adoption of new industry practices to become the new normal, realistic modelling and future planning must be built into project structuring and contract documentation.

Competent and qualified construction professionals with an education in and experience of climate change risk, adaptation and resilience training are the future of global projects. They will be a critical necessity for Middle East projects given its ambitious plans for growth, and particularly its major infrastructure expansion. Supervising engineers and project managers must drive the risk management practices and protocols to be adopted to mitigate against extreme weather and other climate change risks.

Risk management processes will necessitate a focus on early warnings to insurers alongside quality site records and robust project monitoring as a minimum standard otherwise there will simply be no compliance with policy requirements. That in turn exposes Middle East projects and their stakeholders to a vast landscape of potential commercial, project and insurance risks. Where projects in the region can often be in pipeline for a decade or more, the reality is that they are highly likely at some point to be significantly impacted by climate change risk during that period. They are gearing up to adapt and now they must follow through.

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[xii] Progress in adapting to climate change: 2025 report to Parliament - Climate Change Committee; UK falling behind on climate resilience, warns watchdog | Previsico