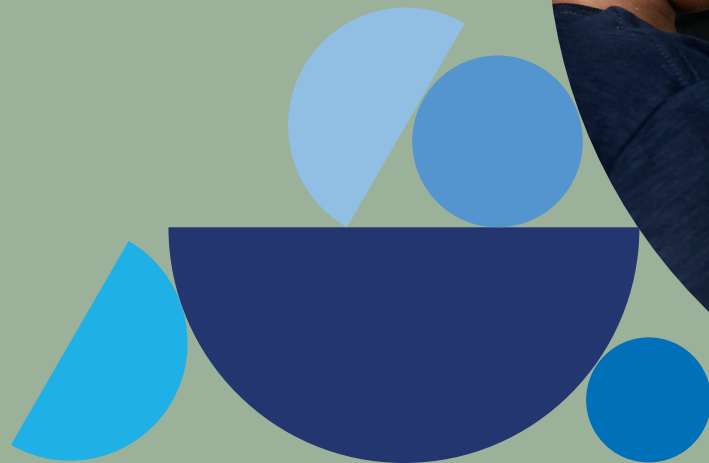


Sustainability in a changing built environment

Rethinking sustainable construction
and development

May 2021





Are we thinking holistically enough about sustainability?

The built environment is changing and as it changes, we must create resilient futures for people and communities as well as meet zero carbon goals. Discussions about sustainability in the area of development and construction are often focused on the decarbonisation of buildings, particularly residential housing stock. There is often increased attention on the methods and materials that can be used to improve the energy performance of existing buildings and on the need to reach net zero construction targets.

These are important considerations, critical to the achievement of climate targets, considering the built environment is responsible for 40% of our national carbon footprint in the UK.

However, a truly sustainable built environment is about more than this. It also requires buildings to be fit for purpose, adaptable to future need, built to last, and affordable to live in or run. Any definition of sustainable construction should factor in the whole lifecycle of a

building, its resistance to damage, including the likelihood that it would survive a fire or flood, and what the impact would be in the event of a total loss. Resilience and building safety are also important considerations. A mindset of repairing buildings in a more resilient way must also be adopted.

A true definition of sustainable construction, particularly as it relates to the public and voluntary sectors, must also put the occupant first. It should carefully consider the needs of those people using the building, of vulnerable people who could face being rehomed in the event of a major flood, or of schoolchildren who could lose exam work or miss out on education if their school suffered a major fire. Zurich's own definition of sustainability shows how we aim to take a broad, holistic view. We define sustainability as doing business today in a way that safeguards the future of our company and our society.

In this whitepaper, we consider if putting critical but narrow climate targets centre stage risks obscuring the

bigger picture in terms of sustainability for organisations in the public and voluntary sectors. We want to help organisations ensure that their definition of sustainability enables them to take a wider holistic view of sustainable construction that puts people, communities, and resilience first.

We will discuss some of the key risks associated with contemporary construction methods and materials, and the impact these risks can have on local communities. We will also explain the work Zurich Municipal has been doing to engage politicians and industry leaders so that we can build a consensus on a better way to approach sustainable construction.



Alix Bedford
Risk Proposition Manager
Zurich Municipal



What does sustainability mean to your organisation?

Understanding the link between sustainability and resilience

At Zurich Municipal, we have long argued that sustainability and resilience should be treated as two sides of the same coin when it comes to construction. Embedding resilience into the built environment and the communities within it is critical to the delivery of sustainable outcomes.

When applied to an asset, resilience means the ability of a building to withstand a major loss event, such as a fire or escape of water, or a climate event such as flood, windstorm or heatwave. In broader terms, resilience is also about how well-equipped organisations are to respond to these kinds of incidents and to protect and support people and communities, including the most vulnerable members of those.

It is of course important to consider the environmental impact of construction materials and methods, and the energy efficiency of a finished property. However you cannot truly evaluate how sustainable a building is without also factoring in whether it has been built to last, built to be adaptable, built to withstand climate-related events and what the consequences of a total or major loss would be.

Narrow focus on targets obscures the bigger picture

Too often, organisations are not making the connection between sustainability and resilience. You need to continue to focus on the environmental impact of your decisions, but sustainability will only be achieved if you holistically consider the impact of what you do now on your future operations and needs, and on society and the planet.

Buildings should be designed and constructed with a long-term, holistic view that considers factors including:

- Any additional risks that could be introduced during the construction phase as a result of the materials and methods used
- The likelihood that the building would have to be completely reinstated in the event of a major fire/flood
- The impact this could have on occupants, particularly the most vulnerable members of society
- How well the development meets local needs, and how well connected it is to other amenities and services
- How occupants will use the building and how this could affect its energy efficiency, fire compartmentation and so on. Occupants need to be aware of these factors and the impact of their actions on them.
- How energy performance will be monitored (and if necessary, corrected) throughout the lifecycle of the building. Building telematics can be used to monitor not only energy performance, but also other environmental factors such as water efficiency which could prove increasingly important as heatwaves and water shortage events become more common.

Sustainability and resilience in the construction supply chain

Achieving true sustainability in the built environment also requires careful consideration of what happens before the design and construction phase. Construction supply chains can be long and complex, and the choice of suppliers can have a big impact on the successful pursuit of sustainability goals.

Organisations need to think about how they identify, manage and work with suppliers to improve resilience and sustainability throughout their supply chains.

The Get it Right Initiative, in which Zurich participates, is a group of UK construction industry experts, organisations and businesses actively working to improve productivity, quality, sustainability and safety in the construction sector by eliminating error.





Residential development in focus

Retrofitting once and well will be key to meeting sustainability targets without compromising building resilience

Much of the discussion around sustainable construction understandably focuses on residential development.

The housing sector is subject to some of the UK's most demanding climate targets, with a requirement for all new homes to be zero carbon ready by 2025. In order to achieve these targets, without compromising the sustainability factors mentioned previously, ensuring that homes are built to last, built to be adaptable and so on, it is crucial that all new builds are resilient by design to the range of risks they may have to respond to.

However, new homes form only a small part of the UK's housing stock. Retrofitting the 29 million existing homes in a way that meets future low carbon and energy efficiency standards, at the same time as satisfying climate change mitigation and adaptation requirements, will be essential. This means retrofitting once and well, with a whole house approach, using resilient methods and materials that meet the highest possible environmental standards.

Adaptability and longevity are key considerations, but this requires asking the right questions at the outset of new builds and refurbishments, and carefully considering the full building lifecycle and the potential impact of changing lifestyles and changing climate conditions. Building to current minimum standards and climate requirements is not enough. We must ensure that in our efforts to mitigate climate risks we are not introducing other, new risks into the process.

Building towards the 20 minute neighbourhood concept

In order that urban developments meet the needs of communities with minimal environmental impact, it is

important that everybody has access to basic services and amenities without having to travel significant distances.

In recent years, the concept of a 20-minute neighbourhood, where daily services can be accessed within a 20-minute walk, or in some cases, within 15 minutes, has become increasingly popular. In order for such a concept to succeed, however, there needs to be a greater degree of joined up thinking across the public and private sectors.

A development can meet net-zero construction and energy efficiency criteria, but if you have to drive to get a newspaper or some milk, this raises the question of how that interplays with other sustainability targets?

There are plenty of examples of this lack of joined-up thinking, whether that is building homes in places where they are not connected to sustainable transport options so you have to have a car, no green spaces or no consideration given in design to enable the transition to electric vehicles leading to cables dragging across paths and pavements.

Legislative, regulatory and governance requirements can sometimes be unclear or contradictory, and so it is understandable that public and voluntary sector organisations often find it difficult to build a clear, joined-up picture when it comes to sustainable construction.

The extension of permitted development rights is complicating this situation further, as it is reducing the level of control local authorities can exert over development taking place in their area, and thereby diminishing the effectiveness of the local authority planning function as a lever to drive up standards.

These are among several reasons why Zurich Municipal has been campaigning for greater consensus on many of the key issues relating to sustainable construction, as we will discuss later.





Flood risk in focus

Accurately gauging future flood risk is certainly challenging but organisations should consider if they are as prepared as they could be for what lies ahead

A key area of focus for Zurich Municipal in relation to property risk over the last few years has been to increase understanding and awareness of the changing risk landscape in the housing and construction sectors.

Flooding is one of the property risks causing greatest concern. Too often, homes are built using design and materials that offer minimal flood resilience. When planning approval is granted to developments in areas at risk of flood, planners are relying on the proposed flood mitigation measures actually being done, being done properly and in a way that mitigates against both current and future flood risk, which isn't always the case.

Future flood modelling lacks consistency and clarity

Considering the bigger picture, and planning ahead, is made more challenging by the unpredictability of future flood risk and the lack of consistency in future flood modelling. The nature of flood risk is changing rapidly. We are seeing an increase in storms as a result of climate change, but there are also significant increases in incidents of surface water flooding, which is hard to model because it can be affected by factors such as drain maintenance and capacity, which are dependent on inspection and clearing schedules and regimes.

Published flood frequencies can also sometimes be misleading, meaning many occupants of properties do not understand their flood risk. For example, a 1 in 20 flood risk is not just a 5% chance of flooding. Return period descriptions like this are not an exact science and can give the impression that flood events are cyclical and therefore predictable, which they are not.

Organisations cannot be expected to build in flood resilience measures for every development, but for higher risk developments, they should be considered carefully. You should really be looking 50-100 years ahead, because areas that are not currently prone to flooding could be in the future. Building in resilience now helps to futureproof developments and could provide protection for residents and occupants for decades to come.

Practical flood mitigation measures

On an individual building level, this could include taking simple measures now to prevent much more significant costs further down the line:

- Raising electrical sockets (and cables)
- Orientating plasterboard horizontally, instead of vertically, so that only the lower level boarding needs to be removed in a flood
- Using appropriate insulation materials (within lower level walls and beneath floors) that are resistant to the effects of water
- Greater use of moisture-resisting materials in the construction of fitted furniture, including kitchen units
- Ensuring ground floor construction, materials and finishes can resist the effects of water ingress.

It is also important that organisations consider the potential impact of a flood on the entire development site, not just the properties themselves. Zurich is aware of situations on developments where the properties were unaffected because they were raised up, but the access points were not, so people could not actually live in them because they could not get in or out.



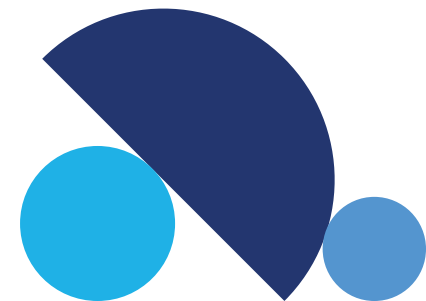


Zurich believes that Sustainable Drainage Systems (SuDs) can play a pivotal role in ensuring that new properties are built in a manner which helps to manage surface water flood risk at the local level. Increased hard landscaping adds to the pressure on traditional drainage systems during periods of extreme rainfall. This is then compounded by the natural deterioration of drainage systems. Whilst we acknowledge that land shortages, and values, are likely to dictate which sites are chosen for development, together with both national and local planning policies, it is essential that drainage is properly taken into account within the wider catchment area, both upstream and downstream, and not just as part of the local development.

Creating a holistic view of sustainable development requires close collaboration between local communities and the anchor institutions that work alongside them. It is important to build a greater understanding about community needs and priorities, as well as resolving pragmatic issues such as how specific flood mitigation measures will be planned, prioritised and resourced.

Flood resilience: key takeaways

- Flood risk is changing rapidly. In many areas, previous resilience measures may no longer be sufficient. Building in a way that satisfies current flood modelling analysis, but which does not account for future flood risk, is unsustainable
- Resilience measures designed to protect developments in areas of increased flood risk must be demonstrably futureproofed
- Renovations or property repairs post flood must also be undertaken with the aim of making assets resilient to future weather events
- Incorporating defences now will save costs and losses in the future.





Fire risk in focus

Contemporary construction methods are helping developers to hit housebuilding, net zero and energy efficiency targets, but this can come at a cost to the resilience of the built environment

There is no question that contemporary construction methods, including lightweight timber frame, modular, and off-site construction, have made a significant contribution to meeting a range of government targets, not least the push for at least 300,000* new homes to be built each year. They also have a lower carbon impact than some more traditional methods.

But it is also clear that many contemporary construction methods are less resilient to fire. Timber has featured prominently in a number of sizeable residential property claims Zurich has handled in recent years. While people generally get out safely, they often do not have homes to go back into.

It is important to consider the resilience of the built environment as part of the wider conversation around sustainability. There is an increased focus on the greenhouse gas emissions of steel and concrete, but buildings constructed using these materials generally perform far better in a fire event. It goes back to the whole definition of sustainability. Timber can be green if you build once, but if it goes wrong the consequences are significant.

Modular construction brings a fresh set of challenges

There are great benefits in terms of the quality of off-site manufacture and fabrication, with high precision achievable in a factory environment. However, it is not always clear how well these qualities will endure when components are moved on-site, and the modular elements are brought together, and how this could affect the finished building's resilience to fire. These are not just challenges for the residential sector. School buildings,

too, are constructed very differently to 20 or 30 years ago and can often have much less fire resilience due to the building methods and materials chosen.

Zurich has experienced several significant losses in recent years. Often school buildings are designed to have 30 or 60 minutes' fire resistance so that people can get out safely, but by the time the fire service arrives, much of the building may already have been significantly damaged by fire. Protecting and saving lives is of paramount importance and measures to achieve that would be enhanced if systems also addressed property preservation. Looking at how buildings, as well as lives, can be protected through incident management, design, building regulations (inc. Building (Scotland) Regulations) and building management will increase the resilience of the built environment and the community it serves.

The human impact of losing a building that is an important community asset is perhaps not as well understood as it could be. That is why, as we will discuss later in this whitepaper, Zurich is campaigning with parliamentary stakeholders to establish a Property Protection Baseline, which would introduce minimum resilience standards in new buildings, to give them a greater chance of surviving a major fire or flood event.

The potential environmental benefits of construction methods such as timber framing and modular construction cannot be ignored. However, they must be considered as part of a wider conversation around sustainability that incorporates a greater understanding of the importance of building resilience, and a greater understanding of the cost – both in human and financial terms – of losing a community asset.

Fire resilience: key takeaways

- Modular construction introduces a new element of risk, as components have to be moved onsite and brought together in a way that does not compromise the building's performance or resilience from a fire perspective
- There are concerns as to how the factory standards associated with many types of off-site construction can be maintained during the on-site elements of the construction, for example potential weaknesses and breaches in fire separation and compartmentation
- Firefighting tactics have evolved, meaning there is less focus on protecting buildings
- Zurich is campaigning for minimum standards in new buildings, to increase their resilience to fire.

*100,000 affordable new homes target in Scotland over the next decade.





Understanding the human cost of a major loss

Sustainable development needs to be firmly focused on people and communities

In construction projects, there can be too much focus on what is being built and how, and not enough on who it is being built for and for what purpose.

In the social housing sector, there is an increasing need for buildings to be adaptable, so they can continue to be fit for purpose as individuals' personal or family circumstances change. Can rooms feasibly be reconfigured? Can buildings be extended? Is there space for electric vehicle charging points to be installed if none exist?

At the same time, there is a real need to work with tenants and leaseholders to ensure they understand the properties they are moving into or living in, and how their actions and behaviour could influence energy performance, fire resilience and so on. There is a need to bring communities into conversations about how and where they live, and how they will benefit from sustainability, for example through cheaper fuel bills.

And it is, of course, the occupant who has most to lose in the event of a major fire or flood. The uncertainty of when access to a permanent accommodation will be regained or the fear of a similar event happening could have an impact on anyone's mental health. The loss of workplace hubs, community spaces and school buildings can impact the way in which the communities of people using them can carry out their lives and work. The loss of revenue from buildings affected by such events impacts organisations and the people employed by them.

In the social housing sector, there are large numbers of elderly and vulnerable tenants who may not have as much personal resilience as others, and for whom their home and their community are a crucial part of their life and identity. Losing the home they have lived in for generations, and their belongings, and having to be rehomed away from their local area, can have a devastating impact.

This human dimension affects organisations across the public and voluntary sectors, including education. A school being out of action for a day, a month, or a year not only results in significant educational disruption, but also has wider ramifications for the wellbeing of students, parents and teachers forced to adapt to new environments and patterns.

It could also have a massive impact on the local community. School buildings are no longer just for teaching; they are community hubs, used for all sorts of activities and events, and there is much greater reliance on school buildings than there used to be.

As well as the human cost, the financial impact of a major loss cannot be ignored.

For a university with a lot of new student accommodation, or a local authority with a large property portfolio, a major loss could have a significant impact on revenue streams. It could also impact service delivery.

If we fail to put resilience front and centre when thinking about sustainability, the risks go far beyond the potential loss of a property.





How Zurich Municipal is campaigning for change

Flood resilience grants and sprinklers in schools are two key areas of focus – but the UK's building regulatory system also urgently needs to be updated



Organisations in the public and voluntary sectors are to some extent caught in a system that makes it harder to take a long-term view of sustainability, and to make informed decisions about which construction methods and materials to use.

The overarching issue is a regulatory system that is failing to keep pace with the changing needs of the built environment and the construction methods that are being used in contemporary developments. Building regulations and standards guidance is still updated too infrequently and in a piecemeal way, and there are still construction materials being used for which there is not a recognised test methodology, so nobody can be sure how resilient they will be against floods or fire.

In recent years, Zurich Municipal has been engaging with stakeholders across Parliament and industry – as well as working with organisations in the public and voluntary sectors – in an attempt to build consensus on some of these key issues and drive meaningful change.

We have reached out to the National Housing Federation and Alarm, held customer-facing events and one to one meetings, and engaged with designers, developers and construction companies, to encourage a

discussion about some of these broader risks.

Societal impact is at the heart of discussions

We witness first-hand the devastating impact a large-scale flood or fire can have and we are committed to working with Parliament to improve the resilience of the built environment. Whilst the financial impact of these events is evident, it is also vital to highlight to stakeholders the wider societal impacts these events can have. This includes the impact on school pupils' educational attainment as a result of lost teaching hours after a fire or to the impact on individuals' mental health and wellbeing as a result of being displaced from their home following a flood event.

As part of Zurich's engagement with parliamentary and civil service stakeholders, we are committed to bringing together a coalition of voices to demonstrate the cross-sector alignment on these topics and the widespread impact these events can have on the public and voluntary sectors as well as the communities who rely on them.



Establishing a Property Protection Baseline

Much of Zurich's focus going forward will be on influencing new legislation and responding to key consultations. In particular, the Government's Building Safety Bill presents a once-in-a-generation opportunity for change.

Our focus will be on working with parliamentary stakeholders, departmental officials and industry bodies to ensure that the Bill introduces what we are calling a Property Protection Baseline. This means updating building regulations and standards with a prescriptive resilience baseline which establishes both lifespan and performance characteristics for new buildings in the event of a flood or fire.

With the unknown impact of climate change on the built environment, minimum resilience standards will ensure greater levels of protection are provided as a matter of course.

Public Policy and Sustainability in the Built Environment

Zurich is committed to improving the sustainability of the built environment and is working with Parliament on the following key policy areas:

- Extend, reform, and improve the flood resilience grant scheme by ensuring that the grants are available all year round; complemented by a fundamental review and reform of building regulations to provide a set of resilience standards that need to be met when properties that have been flooded are being reinstated.
- Update building regulations so that they unequivocally and clearly mandate the implementation of sprinklers in all new build and major refurbished schools as is the case in Scotland and Wales.
- Use the Building Safety Bill and relevant Secondary Legislation to establish the changes necessary to the Building Regulations Regime to ensure it provides proportionate baseline health, safety, accessibility and sustainability (including energy efficiency) standards for buildings of the future.
- Raise awareness of the risks associated with Modern Methods of Construction (MMC) and extend the combustible cladding ban to the entire external envelope of both residential and non-residential buildings.

The Government's Building Safety Bill will have limited application in Scotland and Wales.





Are you asking the right questions on sustainability?

At the outset of this whitepaper, we discussed the risks of an external environment that is leading many organisations to put a lot of emphasis on hitting a narrow band of targets. By considering sustainability in a wider context, you have the opportunity to hit those targets as well as deliver improved resilience and people-related outcomes.

How to respond

Sustainability across the built environment is a wide-ranging agenda and it can be daunting to address. However, by responding across the following areas, public and voluntary sector organisations can have a meaningful and positive impact:

- Direct control – ensure that your own buildings and developments are holistically sustainable
- Procurement and commissioning – build in the standards you want for your developments, projects and communities to give them a sustainable future
- Place-shaping – use your powers and influence to encourage sustainable development and the associated infrastructure
- Showcasing – demonstrate what is possible through your own innovations, pilot new approaches and technologies, demonstrate and reward best practice and share lessons
- Convening and contributing – bring people and organisations together, join and support partnerships to achieve collective outcomes
- Communicating and engaging – translate the agenda to provide local relevance, in order to raise awareness, gain acceptance and generate ideas for solutions locally.

Consider the questions below in the context of your organisation:

- Are the identified needs of your people and communities driving your development activity?
- Building regulations and standards are minimum requirements, not benchmarks, so do you comply with them, or do you try to go further to achieve greater environmental standards and building resilience?
- When considering sustainability, do you factor in the full building lifecycle, including whether it would survive a loss event?
- Have you considered how a major loss could impact the most vulnerable members of your community and are you doing everything you reasonably can to reduce the likelihood of such a loss?
- Do you engage with your insurer at the design phase of development to ensure the methods and materials chosen are responding to insurable risks?
- When considering the energy efficiency of a building, do you look at how the building will perform in optimal conditions or look at the reality of how it will be used/lived in? Do you monitor and enforce the achievement of agreed energy performance once the building is in use?
- Do you have a clear understanding about how the actions/behaviour of the occupant could affect a building's energy performance or resilience, and have you worked with occupants to ensure they are engaged with these issues?

- Do you take a joined-up approach to sustainable development, including considering how well connected a development is to other services, amenities and transport links?
- (For local authorities) Are you leveraging planning as best as you can to drive up standards in construction?

Working together to find viable solutions

Many organisations are realising the need for a fresh perspective. However, it is important to acknowledge how challenging it can be to balance the need to meet external targets, achieve building resilience by design, and support wider sustainability goals – all while working with finite budgets.

Building partnerships across the public and private sectors, working with communities, and ensuring you are clear on the outcomes you are there to achieve can help. At Zurich, we believe there is a need for everybody to work together to think of solutions. Let's go back to basics and think about how we can develop the buildings that people actually need, and design them in such a way that gives them better protection.

We understand organisations are faced with demanding targets, but we believe you would achieve so much more by looking at construction in a more holistic way, both now and into the future.



How Zurich Municipal can help

It is important to review projects and plans and ask the questions above to ensure you are considering sustainability in a wider context. Our teams of specialist risk consultants cover all strategic and organisational risk aspects and are ready to support our customers as they consider their approach to sustainability in a changing built environment.

If you are a Zurich Municipal customer and suffer a loss in one of the areas outlined in this paper, our in house claims experts can support you and your communities both in terms of the claim but also beyond that with other practical non-claims related services to support personal and mental health challenges. If you should suffer flooding, our Claims and Risk Engineering teams will support you with the options available to 'build back better' by incorporating property flood resilience measures to reduce the risk of further flooding.

At Zurich Municipal we believe in a brighter future for our communities. That's why we make it our purpose to help make them more resilient.

To discuss any aspect of this whitepaper further, or for more information:

Email: info@zurichmunicipal.com or call us on 0800 232 1901



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