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MAJOR INFRASTRUCTURE PROJECTS

What the construction industry can
learn from the UK's mega-projects

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Large infrastructure projects often suffer from “scope creep,” delays, changes in the political landscape, and rising costs.

This guide explores how flagship UK projects illustrate the scale of those challenges, and highlights key considerations for all parties involved with mega-projects.

Major infrastructure projects rarely fail because of engineering alone. More often, they unravel gradually through shifting scope, delayed decisions, evolving governance structures and underestimated commercial risk. This guide examines a cross-section of the UK’s most significant infrastructure schemes to identify common patterns in how large projects change once contracts are signed and consent is granted.

By analysing how scope, timing, financing and cost assumptions evolved across these projects, the guide highlights why even well-intentioned programmes struggle to stay on track. For those involved in procurement, construction, design, or funding, these case studies offer practical lessons on where risk materialises, how it migrates through contracts, and why disciplined contract management is critical once change becomes inevitable.

HS2 (HIGH SPEED RAILWAY)

HS2 is the UK's principal high-speed rail project designed to improve travel between London, the Midlands, and (originally) the North of England. The project, which is currently under construction, consists of building 140 miles of high-speed railway and four new stations between London and the West Midlands.

EVOLUTION OF SCOPE

HS2's original plan was a Y-shaped high-speed network: London to Birmingham (Phase 1), then branching to Manchester and Leeds (Phase 2 and its sub-legs). Over time, large parts of Phase 2 have been curtailed or cancelled. Notably, the northern leg to Manchester and the eastern leg to Leeds have been trimmed back or cancelled. The Euston terminus plan was scaled down (from ten platforms to six), and some land-safeguarding in route corridors has been removed.

DELAYS

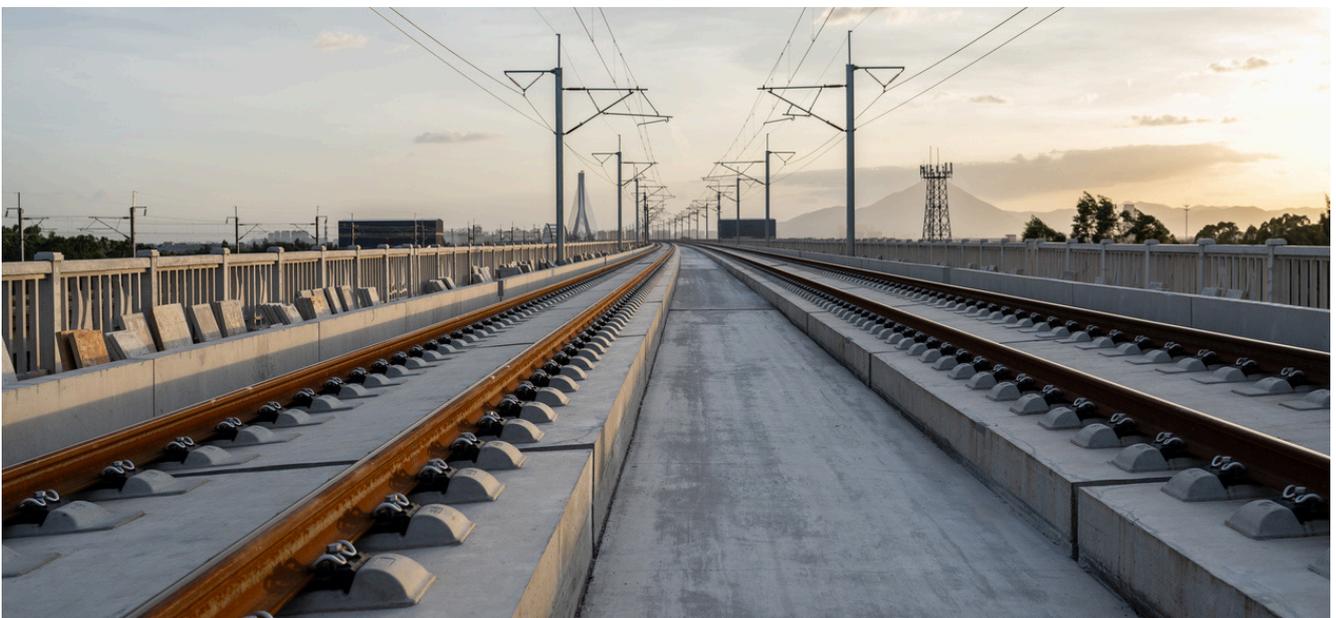
Phase 1 (London to Birmingham) has been delayed multiple times. Originally projected to open in 2026, its completion is now being pushed further back to 2033. Also, because Phase 2 has been drastically modified, many of the planned benefits and connections have been delayed indefinitely or dropped.

STRUCTURAL CHANGES

While HS2 remains publicly owned, the cancellation of Phase 2 has involved significant decisions about land acquisition, property buy-outs, and selling or releasing safeguarded land. For example, land purchases made in anticipation of Phase 2 are now being reversed or repurposed.

COST OVERRUNS

By the end of April 2025, £40.5 billion (nominal prices) had been spent on the HS2 programme. HS2's initial cost estimates are now widely acknowledged as far too low. The original 2009/2010 estimate for the full Y-network was in the tens of billions. Over time, Phase 1 alone has seen large increases in projected cost. The act of cancelling Phase 2 also carried financial penalties: for example, some £2.17 billion has been cited as the cost of the cancellation (write-downs, accounting charges, property remediation) for Phase 2.



LOWER THAMES CROSSING (ROAD/TUNNEL PROJECT)

The Lower Thames Crossing is a new road network that will connect Kent and Essex through a tunnel beneath the River Thames.

EVOLUTION OF SCOPE

The Lower Thames Crossing (LTC) is a proposed new road crossing east of London (Kent / Essex / Thurrock), including twin bored tunnels under the Thames, plus new road connections. Approximately 14.5 miles (23km) in length, it will connect to the existing road network from the A2/M2 to the M25 with two tunnels (one southbound and one northbound) running beneath the River Thames. Its scope in terms of routing, environmental mitigation, design features (tunnel diameter, ventilation etc.) has been through several iterations. As of October 2025, the Department for Transport (DfT) has taken oversight of the Lower Thames Crossing project from National Highways in a drive for growth.

DELAYS

The original development consent order (DCO) application for the construction of the Lower Thames Crossing was withdrawn in November 2020 after early feedback, leading to significant delays. It was resubmitted in late 2022. The decision on whether to grant the DCO has then been delayed multiple times, and was granted on 25 March 2025.

In December 2025, the opening of the Lower Thames Crossing was pushed back by two years, from 2032 to 2034.

STRUCTURAL CHANGES

The Lower Thames Crossing has undergone several important structural shifts as it moved from early proposals to an approved, privately financed megaproject. The scheme experienced major planning-stage restructuring, as explained above. Further, the project's funding structure was overhauled, transitioning toward a "fully private" model in which the crossing will ultimately be sold to private investors and financed through the Regulated Asset Base (RAB) mechanism, meaning construction is privately funded and recovered over time via user charges such as tolls.

COST OVERRUNS

Cost overruns on the LTC have emerged long before construction has even begun, with spending driven sharply upward by planning delays, repeated application withdrawals, and an unusually complex consent process. By October 2024, more than £800 million had already been spent on the project despite no physical works having started, including £295 million on the planning application alone.

In 2022, the estimated capital cost for the LTC, including allowances for risk and inflation, was in the range of £5.2 billion to £9.0 billion. As of December 2025, the project's overall cost was forecast at over £10 billion, with the Government footing £3.1 billion of the cost, and leveraging £7.5 billion of private funding.

EAST WEST RAIL (OXFORD - CAMBRIDGE RAILWAY)

East West Rail is a strategic project to establish a new main line railway between Oxford, Milton Keynes, Bedford and Cambridge.

EVOLUTION OF SCOPE

Originally, East West Rail (EWR) was conceived as a continuous, electrified passenger and freight railway between Oxford, Milton Keynes, Bedford and Cambridge (plus connections further east). The scope of East West Rail has expanded and been fundamentally reshaped as the project moved toward its Development Consent Order, with the most significant changes centred on station provision, routing details, and integration with regional growth plans. A major redesign in 2025 introduced more than 80 design changes, including a transformative overhaul of the Marston Vale Line, where nine older stations will be replaced with four larger, modern ones, including a completely new Stewartby station positioned to serve the newly-proposed Universal Studios resort.

DELAYS

A major upgrade of the existing railway line from Oxford to Bicester was completed in December 2016, and services are already running on this section of the line (operated by Chiltern Railways). The next two stages of East West Rail, Oxford to Bedford (Connection Stage 2) and Oxford to Cambridge (Connection Stage 3), remain in the planning phase and continue to depend on final government funding and formal approval. East West Rail is still in the early, pre-statutory stage of the Development Consent Order process, with the most recent non-statutory consultation running from November 2024 to January 2025. These delays have been driven in part by the scale of consultation, more than 6,200 responses with over 90,000 individual pieces of feedback during the 2024–2025 consultation, and by the need to address extensive environmental and local concerns. A full route-wide consultation is planned for Spring 2026.

STRUCTURAL CHANGES

East West Rail's governance, funding, and delivery approach for Connection Stages 2 and 3 has been formally re-baselined, meaning the Department for Transport is re-drawing the project's scope, funding profile, and delivery options in response to slower-than-expected progress and costs running nearly double earlier forecasts. In practical terms, this means decisions that were previously treated as fixed, such as station plans, service patterns, construction sequencing, and the extent of upgrades along the Marston Vale Line, are now being revisited.

COST OVERRUNS

The cost estimate has evolved. The cost estimate at the time the route update was announced in May 2023 was in the £4 to 5 billion range for the full scope of works. As EWR proceeds, the government is alert to possible overruns. There have already been increases. The current cost estimate is now between £5 to £6 billion.

The NAO (National Audit Office) has warned that EWR may not represent good value for money in part because cost-benefit assumptions are sensitive to route, speed, ridership etc. While there is no significant published figure for budget overruns on the scale of HS2 or Hinkley, the risk is growing, especially given inflation, supply chain costs, stakeholder delays etc.

HINKLEY POINT C (NUCLEAR POWER STATION)

Hinkley Point C (HPC) is a major new nuclear power station under construction at Hinkley Point in Somerset, England.

EVOLUTION OF SCOPE

Originally, Hinkley Point C was approved in 2016, with an estimate that its total cost would be approximately £18 billion (in 2015 prices), and that it would begin producing power around 2025. Over time, its scope in terms of design has had to accommodate additional safety measures, more material (steel, concrete), regulatory demands (e.g. UK nuclear regulatory changes), and additional environmental mitigation measures. Changes in financing (see below) have also affected how the project is structured.

DELAYS

The project is facing significant delays in its completion. Construction began in 2017 and HPC is not expected to be generating power until 2030, with potential additional delays.

Instead of the original planned completion date of 2025, the first unit operation is likely in 2029 under target scenarios, possibly 2031 under worse cases. These delays stem from Covid-19, Brexit (supply chain and labour issues) and inflation, regulatory changes, and design challenges.

STRUCTURAL CHANGES

A key structural change is the withdrawal of funding by the Chinese partner, China General Nuclear (CGN), in 2023 (after its removal from the Sizewell C project), which leaves French utility company Electricité de France (EDF) with significantly greater financial exposure. Also, EDF has sought private finance (for example from Apollo) to fill funding gaps. Since Hinkley is financed under a contract-for-difference (CfD) model, EDF bear all construction-phase cost overruns, schedule-delay costs and financing & debt-servicing cost increases.

COST OVERRUNS

The original cost estimate was approximately £18 billion in 2015. It is now estimated that the project will cost £48-49 billion (2015 prices), more than double the original. EDF has said that the chief reasons for the escalating costs include unexpected electromechanical complexities, in addition to inflation, rising costs for raw materials and labour challenges.

EDF publicly confirmed in 2024 that it had taken a €12.9 billion (£11 billion) impairment caused by HPC's spiralling costs and extended schedule. An impairment charge is an accounting adjustment that recognises that an asset on the balance sheet (here, EDF's investment in HPC) is now worth less than previously assumed.



DOGGER BANK (OFFSHORE WIND FARM)

Dogger Bank Wind Farm is the world's largest offshore wind farm, located in the North Sea, between 130 km and 190 km off the northeast coast of England. It is being built in multiple phases and will play a major role in the UK's transition to clean energy.

EVOLUTION OF SCOPE

Dogger Bank, located off the east coast of Yorkshire, is being built in phases: A, B, C (each with a capacity of 1.2 GW), plus proposals for Dogger Bank D. Originally, there were further subdivisions (e.g. Teesside C & D) under Forewind, a consortium formed in 2008 specifically to bid for and develop the Dogger Bank. In 2015, Dogger Bank Teesside C & Dogger Bank Teesside D were abandoned to concentrate resources on the four consented projects.

In 2017, the project ownership was restructured. Forewind's role ended as the individual project areas were taken over by the current developers.

The current developers have also dropped some proposed elements. Notably, green hydrogen production tied to Dogger Bank D has been shelved in favour solely of a connection to the electrical grid.

DELAYS

The first phase, Dogger Bank A, has been delayed. Dogger Bank A began generating power in October 2023, with full completion anticipated by 2027. Key causes include weather, vessel availability, supply-chain issues. The delay to commissioning Dogger Bank A is expected to also affect the Dogger Bank B timetable.

STRUCTURAL CHANGES

In terms of ownership, Dogger Bank is a joint venture. Originally developed by the Forewind consortium (SSE, RWE, Statoil, Statkraft), the project underwent a major structural change in 2017 such that there were two different development paths: Dogger Bank A, B, C (SSE/Equinor/Vårgrønn) and Sofia Offshore Wind Farm (RWE).

In addition to changes to the stakeholders, there have also been changes in what parts of the project are pursued (for example, green hydrogen activities dropped from Dogger Bank D).

COST OVERRUNS

Dogger Bank has not yet seen the same dramatic public cost overshoots as, say, HS2 or Hinkley, but delays and scope changes have increased risk and likely cost. The capital expenditure for Dogger Bank phases A and B was estimated to be £6 billion. The current total estimated cost of the project is around £7.8 billion. The equity partners, SSE (40%), Equinor (40%), Vårgrønn (20%), are absorbing the effects of the delay.



COMMON PATTERNS & LESSONS

Looking across all five projects, several patterns emerge.

SCOPE SHIFTS AFTER CONTRACT

It is common for scope to change even after planning approval or contract award. Examples include the cancellation of HS2's Phase 2a and 2b (Birmingham–Crewe–Manchester) and the downsizing of the Euston terminus from 10 platforms to 6, and the removal of Dogger Bank D's hydrogen production component following confirmation of the grid-only connection strategy. These adjustments often arise either because early assumptions prove optimistic, or because political, regulatory, environmental, or market pressures shift the project's priorities.

COST OVERRUNS ARE ALMOST UNAVOIDABLE

In each case, the original estimate was significantly exceeded, whether in nominal terms, real (inflation-adjusted) terms, or in time. This includes both direct construction cost overruns and "ancillary" costs (land purchases, design changes, environmental mitigation, delays in decision making).

DELAYS TRIGGER COSTS

Delay isn't just "late delivery". Delays trigger cost escalations, stakeholder demands, inflation, additional financing costs, and sometimes regulatory rework. In many of these cases, delays long after construction or planning began have been very costly. HS2's schedule resetting, which now places the opening of the Old Oak Common–Birmingham section beyond the previously stated 2029–2033 window, illustrates how prolonged uncertainty undermines programme stability and increases expenditure.

These projects highlight how mega-infrastructure is rarely static once underway. Even after major contracts are signed, numerous variables such as political, regulatory, environmental, financial, and logistical factors often force changes in scope, design, timing, and cost. The practical lessons for policy makers and funders are to build more resilience into scope planning, maintain strong oversight and transparency, allow for realistic contingencies, and treat scope, not just procurement, as an evolving risk.

Megaprojects routinely fall into a self-reinforcing feedback loop. Early cost pressure leads to scope adjustments (such as deferrals, design simplifications, or resequencing), but those very adjustments destabilise the programme and raise costs further. Reducing scope can require re-design, renegotiation with contractors, and re-approval from regulators. Longer schedules then expose the project to inflation, supply-chain volatility, political change, and evolving standards, which in turn drive new scope changes. Once this cycle begins, it becomes structurally difficult to stop, and each change decision made to "manage" costs ironically becomes a catalyst for greater cost escalation.

Political transitions can decisively alter infrastructure programmes, particularly where long delivery timelines exceed electoral cycles. HS2 is a clear example. In October 2023, the government cancelled the northern sections of HS2 (Phase 2a and 2b), fundamentally reshaping the programme's intended national impact and triggering significant land write-offs and remediation obligations. Subsequent decisions under later administrations also reshaped the project's London terminus, reducing Euston from its earlier 10-platform plan to a 6-platform, privately financed model. This demonstrates how changing political priorities can lead to cancellations, downsizing, or restructuring even after extensive investment. For megaproject sponsors and contractors, this underscores the need to anticipate political-economy risk as seriously as technical or financial risk.

AVOIDING ISSUES AT THE CONTRACT NEGOTIATION STAGE

Many of the problems seen across these projects can be at least partially mitigated through careful contract drafting and negotiation at the outset.

First, **scope definition and change control should be realistic**. Employers should resist locking in artificial certainty where political or regulatory risk is high. Contractors, in turn, should ensure that change mechanisms are broad enough to capture indirect effects of scope evolution, not just discrete design changes.

Variation clauses must do more than simply permit a change. Rather, they must ensure that changes are fairly valued, promptly assessed, and implemented without unnecessary delay. Late or poorly administered variations are one of the most common triggers of scope drift, commercial disputes and programme slippage on megaprojects.

Second, **delay and disruption provisions should address prolonged and cumulative effects**, not only critical path delay. Clear entitlement to time and cost for suspensions, remobilisation, reduced productivity and prolonged preliminaries is essential on megaprojects where pauses are likely.

With respect to dispute resolution, a megaproject contract must include a **structured, time-bound claims regime** that spells out what qualifies as a claim, what evidence is required, and when notices must be given. A robust regime should specify:

- mandatory early-warning and claims notices;
- clear time bars that are reasonable and commercially workable;
- the supporting information required (contemporaneous records, substantiation, programme analysis);
- interim assessment procedures to keep payments flowing; and
- rights to review or reopen claims where information evolves.

Third, **inflation and price adjustment mechanisms should reflect project duration and market volatility**. Fixed prices may appear attractive initially but often store up dispute and financial distress later. Transparent indexation or re-opener mechanisms can preserve delivery capability and reduce adversarial behaviour.

Fourth, **notice and early warning regimes should be treated as operational safeguards, not traps**. Contractors should seek reasonable time bars and clarity on information requirements, while employers should recognise that early warnings protect the project as a whole.

Finally, **parties should address termination, suspension and descoping scenarios expressly**. Where political or funding risk is material, contracts should allocate the consequences clearly, including payment for work done, costs incurred, and reasonable compensation for premature termination.



AVOIDING ISSUES AT THE EXECUTION PHASE

Major infrastructure projects are rarely static once contracts are signed. As the examples summarised in this guide illustrate, scope changes, delays, and unforeseen events frequently arise, placing designers, contractors and employers under pressure.

The most important thing to do is to operate the contract, no matter what your role is. Use the contract mechanisms available. These may include issuing or responding to variations, issuing or responding to notices of delay, or issuing or responding to a notice of suspension.

For decision makers, the most important take-away is not to impose directives from above unless there is a crucial need. Late-stage instructions or changes, however well-intentioned, can trigger disproportionate cost, delay and commercial uncertainty, especially in megaprojects where interdependencies have already solidified.

UNDERSTAND CONTRACTUAL MECHANISMS

EARLY WARNING NOTICES

Early Warning Notices (EWNs) are contractual alerts used in many major project forms to ensure risks are surfaced and tackled early, rather than being addressed only once they have already caused delay, disruption or cost escalation.

Delay notices are similarly a form of early warning. On projects such as Hinkley Point C, early signals of delay often emerge long before the full implications become apparent. It is important to check that any notice given complies with contractual provisions regarding timing, content, and specificity, and whether the contractor has identified proposed mitigation measures.

An EWN should be issued as soon as a party becomes aware of any event or circumstance that may impact the project. This includes emerging risks, potential delays, design issues, access constraints, scope uncertainties, supply-chain pressures, or any instruction that may change planned work. Waiting for full information before issuing the notice defeats the purpose; the mechanism is designed to enable early dialogue, not finalised claims.

If a party receives an EWN, the most important step is to engage proactively. This usually means meeting promptly to discuss the issue, assessing options to mitigate or avoid impact, and keeping clear records of decisions made.

VARIATIONS

A variation should first be assessed against the contract: does it meet the definition of a variation under the relevant clause, and have the necessary notice and time-bar requirements been satisfied?

Distinguishing between variations arising from employer instructions, regulatory or policy changes, and contractor-led design or performance issues is critical for understanding entitlement and risk allocation. Where scope has evolved politically or through design development, as on HS2, this distinction can be critical.

Equally, where the employer's instruction amounts to a material re-scoping of the project, the formal contractual variation machinery may be too slow or too fragmented to give the certainty required. Flowing a major change down to subcontractors, designers and suppliers, pricing its effects, and assessing time and productivity impacts can take months and still yield incomplete visibility. In such circumstances, parties may need to consider a substantive renegotiation of scope, price, risk allocation or programme, recognising that this approach carries major commercial, governance and political challenges of its own.

Documentation is essential. Substantiation of costs, time impacts, productivity effects, and mitigation measures should be requested before valuation discussions. Early evaluation reduces the risk of later disputes and ensures that any acceptance or deferral aligns with contractual rights.

COMPENSATION EVENTS/CLAIMS

Compensation Events under NEC contracts and Claims under FIDIC contracts both rely on tightly prescribed procedural regimes, and it is essential that these are operated promptly and to the letter. However, on mega-projects the reality is that the information needed to conclude entitlement, quantify time impacts, or establish a robust valuation is rarely available at the outset.

Pricing or programming the effects of an event may require input from various subcontractors, suppliers, designers and specialists. That level of consolidation can take months or even years rather than the few weeks contemplated by standard-form contracts. In practice, this often necessitates interim assessments, provisional figures, or awards based on reasonable assumptions, with a clear understanding that these will need to be revisited and finalised as better information becomes available. Ensuring compliance with the contractual notice and assessment requirements while simultaneously maintaining a pragmatic, staged approach to valuation is critical to avoiding arguments around waiver, disputes, or an accumulation of unresolved changes later in the project lifecycle.

NOTICE OF SUSPENSION

A notice of suspension is one of the most serious contractual events, often triggering significant cost escalation, programme reset, or even partial termination. Suspension should be evaluated immediately in the context of the relevant contract clauses: are the stated grounds for suspension valid, have any notice periods been complied with, and is the suspension total or partial? Invalid suspensions may themselves constitute contractor default, but any response must nevertheless follow the contract precisely.

Suspension rarely occurs in isolation. It often reflects funding interruptions, unresolved variations, regulatory delays, or governance issues. Analysing the root cause and allocating risk according to the contract is therefore critical.

Given the severity of the consequences, parties should exercise their powers to suspend only where there is a genuine and substantive issue requiring intervention, rather than using suspension tactically or as a bargaining tool. A careful assessment of necessity, proportionality, and contractual compliance should always precede any decision to suspend.



LIMIT POLITICALLY-DRIVEN DECISIONS

Decision makers play a pivotal role in shaping the trajectory of major infrastructure projects. Programmes in these projects are already inherently complex. Engineering, procurement, logistics and regulatory pathways are tightly interdependent, meaning that even small variations can disrupt established sequencing and programming. A seemingly minor design tweak or revised instruction can force re-planning across multiple work fronts, trigger delays in upstream or downstream activities, and compound costs far beyond the individual change itself. Recognising this structural fragility is essential before issuing any directive.

Megaprojects also take place in politically charged environments. They span multiple electoral cycles, attract intense public scrutiny, and often become vehicles for wider policy agendas. As a result, shifts in political leadership or ministerial direction can dramatically alter scope, objectives or delivery timelines. Changes driven from the top, however well-intentioned, can generate sudden descoping, re-design, re-funding or re-phasing, all of which carry significant programme and commercial consequences. Decision makers should therefore exercise discipline, ensuring that any intervention is necessary, informed by expert advice, and aligned with the contractual mechanisms already in place.

Maintaining this disciplined, contract-aware approach helps prevent avoidable disruption, limits scope creep, and enables contractors and project teams to deliver with greater certainty and stability.

KEY TAKEAWAYS

Taken together, these projects demonstrate that large-scale infrastructure is dynamic by nature. Scope evolves, priorities shift, funding models change and timelines stretch. Commercial damage rarely arises from change itself, but rather from the failure to anticipate, document and manage change through clear contractual mechanisms. As the case studies show, even small late-stage intervention can reshape sequencing, inflate costs and destabilise delivery programmes.

For contractors, consultants and funders, the message is clear: **robust contract administration is as essential as engineering excellence**. Early warnings, timely notices, contemporaneous records and disciplined claims management are not bureaucratic exercises; they are the primary protections in an environment where uncertainty is the norm and where variations, delays and external directives can materially alter project risk profiles.

For employers and policymakers, the lesson is equally stark. **Unrealistic assumptions, delayed decisions and poorly allocated risk ultimately increase cost rather than control it**. Decision-makers must understand how complex and interdependent these programmes are, and how even well-intentioned directives can create disproportionate commercial and scheduling consequences.

GET IN TOUCH

Our team advises clients on procurement, project risk and complex project delivery across the UK and globally. If you are involved in procurement, design, engineering or delivery, contact us to discuss how we can support your next project.



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