

Covid-19 pandemic impact and lessons learned in construction projects

SUMMARY REPORT FOR CIOB



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Executive summary

The report captures the best practice in the management of COVID-19 hazards in construction projects commissioned by the Wokingham Borough Council (WBC). Specifically, the focus is on gaining a better understanding of the impact of COVID-19 from the perspective of Tier 2 and Tier 3 construction firms. The construction sector and its clients has had to adapt to mitigate the significant impacts caused by COVID-19. The findings are based on three case study projects commissioned by WBC from two workshops and ten interviews representing the client, the principal contractors, the sub-contractors, and the end-users.

It was found that the case study project teams managed the impact of COVID-19 astoundingly well, given the rapid, almost overnight, onset of the pandemic, and the sheer scale of the disruption. The innovation and adaptation displayed confirms the old proverb, ‘necessity is the mother of invention.’ The projects teams translated and assimilated government and other guidance in a ‘learning by doing’ fashion, adapting their current practices to meet specific project needs. There was a clear demonstration to ‘relax’ firms’ particular interests to work even more collaboratively with project partners – there was a collegiate ‘let’s tackle the challenges that COVID-19 is throwing at us together, for our collective good.’ The flexible, at times almost hour-by-hour adjustments to practices worked. In many ways, the ability of small-medium sized firms (SMEs) to be highly responsive to changing circumstances was a strength. The next challenge is how SMEs (and clients) can embed what they have learned into their strategies, structures and processes to build resilience for the future. COVID-19 is in fragile retreat through vaccination rollouts, and so on; but there is now at acceptance that this virus is not going to disappear – the mantra, the reality, is now how to ‘live with it’ for the foreseeable future. The recent Omicron variant is testament to this new reality. For construction SMEs this will require the type of centralised investment normally more associated with large firms. And, in response, this report makes the principal recommendation for a collective, structured learning cycle across WBC’s projects and supply chains to build resilience: a vaccine, as it were, to protect against future pandemic shocks.

1.0 Introduction

The impact of COVID-19 on construction has been significant since the first national lockdown in England in March 2020. Research has been conducted on these impacts but, understandably, during this fast moving and uncertain period, it has been limited and patchy, and has a heavy focus on the perspective of large construction firms, rather than an interest in small-medium sized firms (SMEs).

The aim of this report seeks to help rebalance the research agenda, and capture the best practice in the management of COVID-19 hazards in WBC-commissioned construction projects from the perspective of Tier 2 and Tier 3 construction firms.

The structure of the remainder of the report is as follows:

- Methodology (section 2)
- Learning cycle (section 3)
- Key findings (section 4)
- Summary of key findings and recommendations (section 5)

2.0 Methodology

The results come from three case studies of construction projects where the Wokingham Borough Council (WBC) is the client. The projects were selected by the research team in consultation with WBC using the following criteria: (1) the contracts were awarded prior to 23rd March 2020 and have experienced the COVID-outbreak during its construction stage; (2) the principal contractor is a SME; (3) type of project (new build and refurbishment); and (4) examples of both completed projects and on-going projects. Figure 1 shows the chronology of the COVID-19 lockdowns and the case study projects.

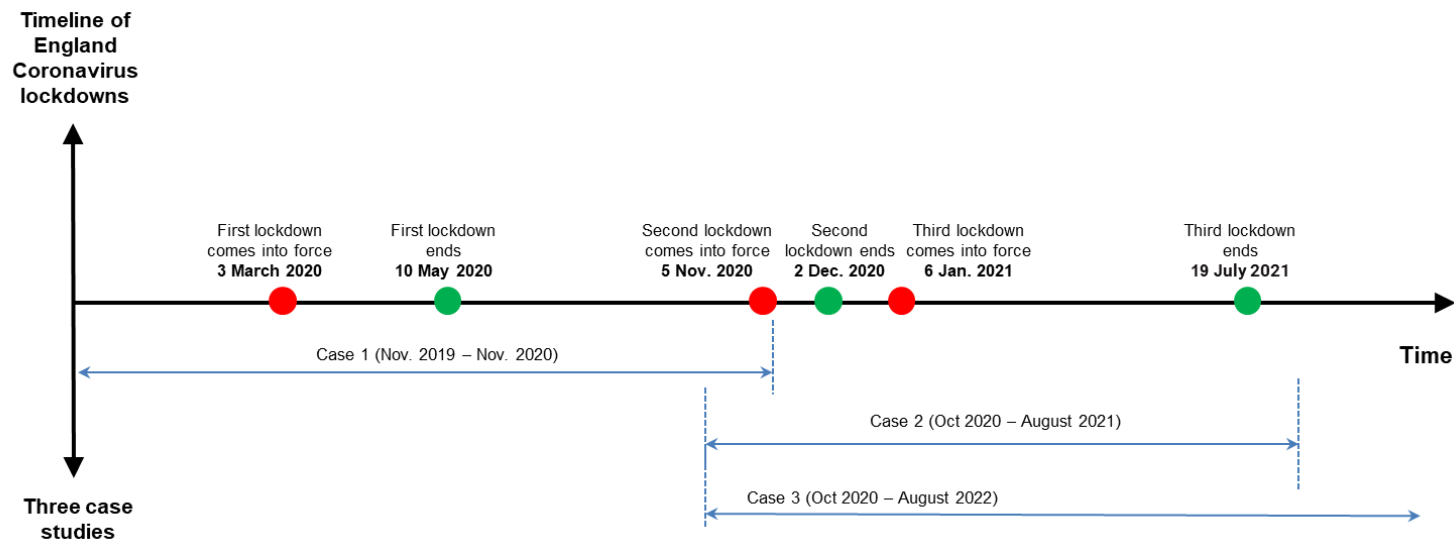


Figure 1 Timeline of England Coronavirus lockdowns 2020-2021

The research was carried out in two stages:

Stage 1: Desktop survey of relevant published literature (July 2021)

A scoping report was produced based on a desktop survey. The report identified potential areas for further investigation in the case studies. The scoping report was used as an agenda for a workshop in July 2021. The workshop was attended by three people from the client side, three representatives from the three principal contractors, and the two researchers from the UoR. There were further comments from people outside of the workshop via e-mail. The outcome of the workshop discussions was the design of the semi-structured interview protocol for the case studies.

The interview protocol was structured into three sections: SECTION 1 was designed to collect background information about the interviewee and his/her organisation; SECTION 2 aimed to identify relevant features of the construction building projects that the interviewee (either as the client - WBC, the principal contractor, the subcontractor, or the end-user) are involved in; the roles of key stakeholders in influencing the adoption and implementation of COVID-19 measures within that specific project; and SECTION 3 aimed to provide the interviewee with an opportunity to express any ideas, issues or comments regarding the interview or project.

Stage 2: Semi-structure interview and review of project documentation (August – Mid-November 2021)

Ten semi-structured interviews were conducted using MS Teams. All of participants involved in the first workshop (see the 'stage 1' discussion above) were invited for interviews. The interviews represented each of the three projects included one from the client (WBC) to get an overview, two from the project team (one principal contractor and one subcontractor) and one from end-user (such as the leisure centre manager). The sub-contractors were identified and facilitated access to the interviewees by each of the three principal contractors (Morris & Blunt Ltd, Pellikaan and Reds10); while end-users were identified and facilitated access to the interviewees by the client. The client and supply chain partner interviews lasted approximately one and a half hours each, and the sub-contractors and end-users

interviews approximately one hour. Interview data was captured through note taking and MS Teams recording which then were transcribed. The transcripts were analysed using qualitative coding techniques to identify and group key themes. Relevant project documentation (e.g. COVID-19 risk registers) was also examined.

A draft report was produced. The document stimulated discussion in the workshop to prioritise issues for the final report. The second workshop was attended by two people on the client side, three representatives from the three principal contractors, and the two researchers from the UoR. All of the participants involved in the workshop were the same people being interviewed. There were further comments from people outside of the workshop via e-mail.

3.0 Learning cycle

The central recommendation from the case studies is the establishment of a transparent learning cycle that is collectively owned by WBC and its construction supply chain: scanning, action planning, action taking, action evaluation and specifying learning (see Figure 2). The phases are briefly defined below.

1. Scanning, awareness of information: The scanning phase generally scans the relevant information for the 'COVID-19 hazard': government and professional body guidance, etc.

2. Action planning: The action planning activity specifies organisational actions for COVID-19 control / preventative measures in order for the organisation / project team work safely.

3. Action taking: Action taking is to implement the action plan. The intervention within this research was intertwined with 'action planning' due to the nature of COVID.

4. Action evaluation: The action evaluation activity takes place to determine that the implemented COVID measures has been a success or a failure.

5. Specifying learning: Specifying learning is to reflect the knowledge gained in the action research whether the COVID measure have been successful or not, i.e. fix problems and look for ways to make what is organisation / project is doing even more effective. The results direct action planning, and so on.

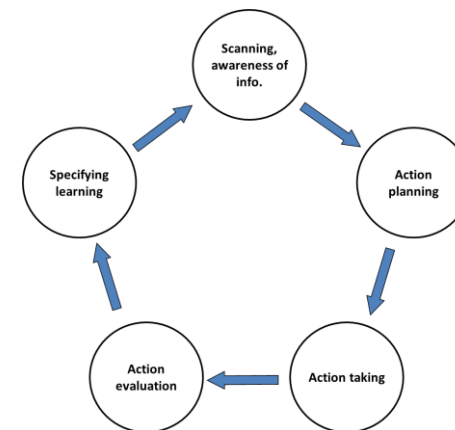


Figure 2 Learning cycle

4.0 Key findings

4.1 Scanning, awareness of information phase: key issues

In the 'scanning, awareness of information' phase, the identified issue centred around data sourcing and awareness of relevant information, particularly in an environment of fast changing and sometimes uncertain central government guidance and communication.

4.2 Action planning phase: key issues

In the action planning phase, three issues were identified. First, there was a need for flexible planning in response to the constrained availability of materials and skills, and also to comply with social distancing requirements. Second, there was a need to consider those people at higher risk from COVID-19; in particular: those people who had underlying health conditions, or those at risk of higher exposure (e.g. on-site teams) compared to others (e.g. office-based staff working from home).

Indicative quotes

"within a company there are people at higher exposure than other people, so therefore higher risk as well." [Principal Contractor]

"we haven't got anybody directly involved in the projects that we are looking at for this review, but we have got within our team. We have got people that were on the vulnerable list and they had to isolate in. So we just made adaptations for them to make sure they could continue to work and so, but not in relationship to the projects that we're looking at the moment." [Client]

Finally, there was the challenge of how to quantify, in a useful sense, unknowable risk. Some of the questions posed include:

- How do we build in resiliency into business models?

- How to not only individual firms learn in the Wokingham Borough Council area, but supply chains as a whole?
- Do we establish this type of learning cycle (shown in Figure 2) coordinated by Wokingham Borough Council?
- How do we balance normal with extreme events in contracts - how to you quantify unknown risks such as COVID-19, and build it into pricing?

Indicative quotes

"... But it's so difficult to quantify these [unknown risks such as COVID]. What is the likelihood and how do you translate it in a risk profile for the future? And in this instance, where did the costs arise for is that this is actually maybe one of the first times that we are asked to adapt really fast as an organisation, as a country, as a world. But this situation can of course repeat in many forms. But first I think what we learned ... is to adapt itself to think differently or to look for different alternatives. But again, a new situation may require a new measurement. But it is very difficult to assess this in a financial audit quality proposal or proposal that will be carried by everyone around this area. ... if we need to make provisions for future situations ultimately that need to be translated through to the client, and the whole chain ... it's difficult to assess, I think." [Principal Contractor]

"...from our perspective in future ... you'll have to build some sort of risk element into our pricing so when we agreed to a fixed price or programme... if we were doing another scheme ... we look to increase while prelims [preliminary] cost, for instance, and generally that sort of risk contingency you carry for unknowns will increase." [Principal Contractor]

"we are still want to do the collaborative working with the guys on site ... that is the only way it's going to work because we work in a risk driven industry anyway. The very beginning when you see if a project is viable, you have to look at the risks and you have to cast those risks out and only then once you know that you can mitigate those risks, or the risks are such a low percentage of happening that you can move forward and project is viable and you'll move forward from the concepts. The concept stage to move forward that you know the life cycle of the project. So we've always been very much looking at risk. And I think maybe what we've got to do is because we are noticing it, about 40% increase on cost ... on some of the projects coming in now." [Client]

"I think then we're looking at using a different form of contracts, or maybe going with a target price contract. When there's a reduction in the price, both parties benefit, or there's an increase in the price, both parties pay 50% of the cost, a little bit like we have in Wokingham. We've got that type of contract with our reuse and recycling collection because it's whatever money they make on selling their recycling then benefits both companies sort of things ... what we're saying is that in order for the construction industry to be fair that we need to

be looking at alternate contract arrangements. Because JCT and NEC are the main contracts that we use, we think well as far as I'm aware within constructing so as an organisation so maybe that's the answer that we look at a different way of procuring.” [Client]

4.3 Action taking phase: key issues

In the 'action taking' phase, four principal issues were identified. First, some of day-to-day construction tasks were difficult, if not impossible, to do remotely via digital communication technologies – the tasks had to be done in person. Tasks such as quality inspection, design reviews and H&S compliance were particularly highlighted. Second, statutory authorities and utilities connections introduced additional high risk in delaying projects. Third, there was a need to establish a much-expanded support for mental health and wellbeing for, in particular, the on-site team due to the increased risk of COVID-19 in comparison to office-based staff and those working from home. Finally, the whole concept of working from home, ultimately, was not seen as being consistent with the construction sector culture.

Indicative quotes

“It's a construction site. So people who physically on site can't work from home or manufacturing if you're in a factory. Obviously people like yourself ... management level, we can work from home, but I read that as the physical guys on site doing the work and or the site managers.” [Principal Contractor]

“...I think the construction industry ... it's such a traditional industry. If I ask my colleagues who are working generally on site. If I tell my colleagues this week I'm working from home ... it is such a traditional industry. People don't believe that you're actually working from home ... There is a not only a physical limit, the distance ... then there's the risk that we suffered. There is an emotional distance between the people working from home and actually being safe in their protected environment and other people who are working on site there because they need to carry out a quality inspection. They managed to work on our day-to-day side and that's in my view was the biggest challenge to keep a well consistent cohesion between all the team members. Just want to say that we managed to do it though, but it took some batteries or cell phones to convince people that we still working.” [Principal Contractor]

4.4 Action evaluation: key issues

The action evaluation phase aims to evaluate the effectiveness (or otherwise) of the changes and interventions made. It was clear that the sheer speed of changes and the uncertainty around shifting central government guidance, that every project participant were continuously adapting their practices to respond to specific project needs. The general ethos was one of ‘learning-by-doing’ – which the case study projects show they did with incredible intensity and success. However, the very nature of the COVID-19 rapid impact on the projects meant there was not the opportunity to formally evaluate the COVID-19 measures being implemented – individually as firms and collectively as a supply chain.

4.5 Specifying learning: key issues

At the final phase - specifying learning, the issue identified is that although there was tremendous innovation and change to respond to COVID-19, the learning is scattered in sometimes disconnected pockets across projects and firms. There is a need, going forward, for the learning to be better codified and made transparent (the recommended learning cycle collectively owned and operated by the WBC construction supply chain ecosystem). The aspiration for careful evaluation and learning is evident in the following indicative quotes.

Indicative quotes

“Every company should be in detail reviewing the real net effect on COVID on the various projects in the sample. If there can also always be delays on projects which were completely unrelated to COVID. There can be price increases due to failures made by the project team. ...what can be identified as a COVID consequence now and I think if we put that in record and properly evaluated, then we can be prepared for the future.” [Principal Contractor]

“When the project Carnival started, we were already in that process, so we were more or less prepared Now we’ve negotiated for projects in Reading, for example, and everybody said well, COVID is gone now ... so you don't need to take into account any risk anymore. And by the way, if that happens you know what to do and we were willing to pay for I've completely underestimating and potentially impact of a future lock down now and I think within the timescale at unfortunately the start of a pandemic. Never. ... I don't know the exact format without going into too much detail, but I think it requires a little bit more detail and consideration to be more precise


about the effect on COVID on programme and on cost and share the information. Because I fully agree. I'm always striving to full transparency and that may sound well. I think it should sound familiar with in the industry. I mean their profit margins of our main contractor are not that exceptional, so why not be transparent about it? And this information sharing, I don't think we'll harm anyone.”
[Principal Contractor]


“As the national response became more crystalised, in consultation with colleagues in the Pandemic response team within the Council, NHS and PHE, visits, testing and awareness events were organised specifically focussing on construction sites within the Borough [WBC]. For any works being planned beyond summer 2020 we have started asking contractors to price in the CLC SoP (as current at the time of tender) (in other words we are paying for Covid compliance).” [Client]



5.0 Summary of key findings and recommendations


In summary, the learning cycle was seen to be emerging in the case study projects, but not fully established and operational. It is recommended that the learning cycle is be used at project, firm and WBC supply chain levels to build collective resilience to the ongoing COVID-19 situation (for example, the new omicron variant) and further shocks. The table below summarises the findings and gaps for potential improvement.

Table 1 Summary of key findings and recommendations

| Learning cycle | Identified issues | Gaps | Recommendations |
|--|---|---|---|
| <p>1. Scanning, awareness of information</p>  | <ul style="list-style-type: none"> Sourcing of information and be aware of information – constant uncertainty on requirements. | <ul style="list-style-type: none"> Information sourcing fragmented across the supply chains. | <ul style="list-style-type: none"> Central sharing and collation of information. |

| Learning cycle | Identified issues | Gaps | Recommendations |
|--|--|--|--|
| <p>2. Action planning</p>  | <ul style="list-style-type: none"> Need for flexible, contingent planning. | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Allocating time for more front-end management. Changes to task planning for specialist sub-contractors such as the use of collaborative programme. |
| | <ul style="list-style-type: none"> People at higher risk from COVID-19 (e.g. people with health conditions), or at higher risk exposure (e.g. on-site team compared to office-based staff). | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Make adaption for those people on the vulnerable list. |
| | <ul style="list-style-type: none"> Need to build risk element into pricing (agreed to a fixed price or programme). Cost increases due to inflation, linking to COVID and BREXIT. | <ul style="list-style-type: none"> Risk elements not covered in the current JCT need to be discussed, tabled with the client and the entire supply chain. Building in the risk can lead the bidding price uncompetitive. | <ul style="list-style-type: none"> The inclusion of pandemic clause in new contracts going forward. Need further work on forensic understanding of costs and risk to address the following issues: <ul style="list-style-type: none"> ➤ How to quantify the unknowable risk (e.g. COVID-19) for future projects? ➤ How to build in measures (e.g. increased fixed costs due to COVID) into the business model? Need to consider alternative form of contract, such as a target price contract. |

| Learning cycle | Identified issues | Gaps | Recommendations |
|---|--|--|--|
| 3. Action taking  | <ul style="list-style-type: none"> Some tasks are difficult to be replaced with the use of digital communication technology (e.g. design review, quality inspection, H&S compliance). Statutory authorities and utility connections introduced additional high risk. Mental health and wellbeing support for the site team due to additional responsibility brought out by COVID-19. Working from home (WFH) is not consistent with the construction sector culture. | <ul style="list-style-type: none"> N/A N/A Informal approach being carried out by construction SMEs. N/A – at present ‘WFH’ being very much guided by central government guidelines. | <ul style="list-style-type: none"> Collective review of the role of digital technology for virtual communication and onsite monitoring and evaluation. Planned ahead as risks associated with statutory authorities and utility connections are outside of the control. Promoting mental health and wellbeing support for construction SMEs and site team. Raise awareness of the concepts of remote working, working from home and hybrid working for site-based staff. |
| 4. Action evaluation  | <ul style="list-style-type: none"> Learning by doing – adapting the current practice to meet specific project needs | <ul style="list-style-type: none"> Forensic methodology and analysis of cost, duration and risk impacts of COVID-19 measures on specific projects. | <ul style="list-style-type: none"> Need for formal evaluation and codification approaches. |

| Learning cycle | Identified issues | Gaps | Recommendations |
|--|---|---|---|
| <p>5. Specifying learning</p>  | <ul style="list-style-type: none"> Learning and knowledge scattered across different projects and firms. | <ul style="list-style-type: none"> Systematic approach to knowledge capture and sharing. | <ul style="list-style-type: none"> The need for a sharing space (e.g. dedicated online portal) might be of use for best practices to be codified and shared. |