

# CONSTRUCTION LAW INTERNATIONAL

FROM THE IBA INTERNATIONAL CONSTRUCTION PROJECTS COMMITTEE OF THE  
ENERGY, ENVIRONMENT, NATURAL RESOURCES AND INFRASTRUCTURE LAW SECTION (SEERIL)

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**Are standard form construction contracts fit for the 'Smart Infrastructure' of the future?**

**Technology contracts for construction and infrastructure – and how we can do them so much better**

**'What's all the buzz?' Drones in the construction industry**



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Cover image: Engineer flying an unmanned aerial vehicle (UAV) over a construction site, for a land and building survey.  
Credit: zephyr\_p/Adobe Stock

# FROM THE EDITORS

**D**ear readers,  
We are pleased to introduce the June issue of *Construction Law International*, which we hope our readers will find to be interesting and instructive.

A number of contributions to this issue address the use of technology in the construction industry, including a look at current approaches to the delivery of complex technology sub-projects in infrastructure and construction projects; the use of drones for planning and design as well as to carry out virtual site visits; and the growth of technologies, such as the use of drones, producing non-text data which may be relevant to disputes. These articles will no doubt touch on issues our readers have encountered – or will encounter – in practice, and offer insight into navigating the landscape of new technologies.

This issue also includes a number of other articles offering perspectives from Australia, Brazil, India and Zambia, as well as a report on the 8th Biennial Conference on Construction Projects from Conception to Completion which took place in Berlin in May.

We thank our contributors for their efforts and hope this edition provides enjoyable and informative reading. As always, we encourage all ICP members to share their experiences by submitting articles to China Irwin at [cirwin@lalive.law](mailto:cirwin@lalive.law). We also take the opportunity to wish everyone a nice summer!

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# FROM THE CO-CHAIRS

Dear ICP Committee members,

By the time you read this, many of you will already be looking forward to the summer holidays, at least in the northern hemisphere. January is only a vague memory, and time seems to travel at the speed of light again, despite the fact that we try to break every hour into small increments in our timesheets.

This first half of 2023 was marked by two magnificent ICP events. In March, the 8th Biennial Conference on Construction Projects From Conception to Completion took place in Berlin, Germany, after it had to be postponed due to the Covid pandemic. This conference had a record number of delegates in its long history, with well over 160 people signing up. We would like to thank not only the sponsors and speakers of this conference, but also Rupert Choat and Rouven Bodenheimer for all their hard work in putting together a great programme. Not only was it a pleasure to see so many familiar faces, but also to meet a lot of new friends. In the past, this conference was sometimes referred to as ‘the young lawyers’ conference’. Although we still wish we could be regarded as the young ones, the truth is that over the years, this conference has attracted fewer younger lawyers than hoped for. In our evaluation we will make plans to reach out to more junior construction lawyers for the 2025 edition of this conference. Compared to the much larger IBA Annual Conference, this conference provides for an excellent opportunity to share experiences and to meet with other professionals in construction law, certainly for younger lawyers.

Our second event was the traditional ICP Working Weekend, which was held on 5–7 May in Mendoza, Argentina. For those of you who are not familiar with this Working Weekend, it is an event where a small group of about 60 ICP members meet to discuss construction law-related topics, during sessions that are prepared by the three ICP subcommittees. This Working Weekend started with a reception on Friday evening, during which we enjoyed an opera performance. The traditional excursion and dinner on Saturday evening took us to a wine tasting at a prestigious winery just outside Mendoza. Being in Mendoza, the wine capital of Argentina, it will not come as a surprise that a wine tasting had to be on the programme. The Working Weekend was concluded with our business meeting on Sunday, during which we discussed ICP-related topics such as how ICP could be more beneficial to its members and what possible topics for the 2024 IBA Annual Conference we could suggest. We hope to share some of the results of this discussion in future editions of *CLInt*. It was a pleasure to see that many ICP members took the effort of traveling all the way to Mendoza for this Working Weekend. We would like to thank our past Co-Chair Ricardo Barreiro-Deymonnaz and his wonderful team for their efforts in making this Working Weekend an unforgettable memory for all participants.

As you may have seen in our email to ICP members inviting them to express their interest in speaking at the IBA Annual Conference in Paris, France, later this year, we are in the midst of preparing the panels for the ICP sessions during this conference. We intend to have all our panels ready by mid-July. The ICP will be leading the following sessions at the Annual Conference: ‘When government and social goals meet the reality of construction contracting’; ‘EPC on trial – does fixed-price EPC deliver the results promised?’; ‘The growing demand for energy transition infrastructure – novel procurement models and dispute resolution regimes’; ‘Economic crisis, unforeseen circumstances and contract rebalancing’; and finally, ‘Breaking up is hard to do? Lessons learned and preparations that can be made to ease the pain of litigation and contract termination’. Further details on these sessions can be found on the IBA website. Of course, we will also have our traditional excursion on Friday and the ICP dinner on Wednesday evening. This year the dinner will be a special one, as we will have our ‘hard hat ceremony’, initiating the incoming ICP Co-Chairs and introducing the new ICP officers for 2024–2026. We do hope to see many ICP members during our sessions and the social functions in Paris.

Before we travel to Paris, however, we wish you all a pleasant vacation and hope that you will be able to enjoy the summer and this new edition of *CLInt*, before the hectic last months of the year begin.



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Construction Projects Committee

## Call for articles: FIDIC Around the World

In 2016, *Construction Law International* initiated a series in which local practitioners answer a standard set of questions about how FIDIC works in their country. To date, *CLInt* has published contributions from Australia, Belgium, Bulgaria, Canada, Chile, China, Denmark, Finland, Germany, Hong Kong, Hungary, India, Ireland, Italy, Kazakhstan, the Netherlands, Nigeria, Norway, Pakistan, Peru, Poland, Russia, Singapore, Switzerland, Tanzania, Thailand, Turkey, the UAE, Ukraine and Zambia.

Please consider providing a contribution concerning your jurisdiction. The questions are:

1. What is your jurisdiction?
2. Are the FIDIC forms of contract used for projects constructed in your jurisdiction? If yes, which of the FIDIC forms are used, and for what types of projects?
3. Do FIDIC produce their forms of contract in the language of your jurisdiction? If no, what language do you use?
4. Are any amendments required in order for the FIDIC Conditions of Contract to be operative in your jurisdiction? If yes, what amendments are required?
5. Are any amendments common in your jurisdiction, albeit not required in order for the FIDIC Conditions of Contract to be operative in your jurisdiction? If yes, what (non-essential) amendments are common in your jurisdiction?
6. Does your jurisdiction treat Sub-Clause 20.2.1 of the 2017 suite of FIDIC contracts as a condition precedent to Employer and Contractor claims?
7. Are dispute boards used as an interim dispute resolution mechanism in your jurisdiction? If yes, how are dispute board decisions enforced in your jurisdiction?
8. Is arbitration used as the final stage for dispute resolution for construction projects in your jurisdiction? If yes, what types of arbitration (ICC, LCIA, AAA, UNCITRAL, bespoke, etc) are used for construction projects? And what seats?
9. Are there any notable local court decisions interpreting FIDIC contracts? If so, please provide a short summary.
10. Is there anything else specific to your jurisdiction and relevant to the use of FIDIC on projects being constructed in your jurisdiction that you would like to share?

References to FIDIC clauses in your responses should be references to clauses in the 2017 Red Book unless otherwise specified.



## INDIA

### India's 2030 goals: a sustainable and technologically sound construction nation

Gagan Anand

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As a developing country with the second largest population in the world, India is arguably highly dependent on construction. According to the submission made by the Ministry of Environment, Forests and Climate Change (MoEFCC) of India to the United Nations Framework Convention on Climate Change (UNFCCC) dated November 2022, the nation's buildings account for 40 per cent of the country's total energy consumption, with such energy use expected to increase at an annual rate of eight per cent. The MoEFCC further predicts the development and construction of over 900 million square metres of residential and commercial space across India over the next few years.

Owing to such substantial figures, the Government of India has shifted its focus towards energy efficiency in all sectors, including particularly the field of construction. While the country has always been supportive of the UNFCCC principles and the terms of the Paris Convention, India's enforcement and promotion has increased to a high degree over the last few years. During the 27th UN Conference of Parties (COP27). The Indian representative

presented its long-term low emission development strategy and confirmed India's intention to reduce greenhouse gases.

It may therefore be evident that, while energy efficiency is a long-term goal, India has started to take steps to attain substantial energy efficiency by the year 2030. In the area of construction, this goal can only be attained by implementing practices of sustainable construction by various methods including adapting to the latest technology.

### Sustainable construction: legal perspective

Sustainable construction, as the name suggests, is a process of adopting resource-efficient construction techniques to conserve essential elements of the ecosystem such as air, water, forests, etc. It promotes the rational use and management of natural building resources to reduce energy consumption and improve the quality of the environment. Benefits of sustainable development practices in the context of India are manifold, including a reduction in greenhouse gases and a substantial increase in the longevity of the ecosystem.

In India, the laws of sustainable construction are based on the three primary principles of environmental law: the Polluter Pays Principle, the Precautionary Principle, and the Intergenerational Equity Principle. In *Lafarge Union Mining (P) Ltd v Union of India*,<sup>1</sup> the Hon'ble Supreme Court of India opined that:

'It cannot be gainsaid that utilisation of the environment and its natural resources has to be in a way that is consistent with the principles of sustainable development and intergenerational equity, but balancing these activities may entail policy choices.'

Furthermore, in the case of *Rajeev Suri v Delhi Development Authority & Ors*,<sup>2</sup> the Hon'ble Court held that:

'The principle of sustainable development and precautionary principle need to be understood in a proper context. The expression "sustainable development" incorporates a wide meaning within its fold. It contemplates that development ought to be sustainable with the idea of preservation of natural environment for present and future generations. It would not be without significance to note that sustainable development is indeed a principle of development – it posits controlled development. The primary requirement underlying this principle is to ensure that every development work is sustainable; and this requirement of sustainability demands that the first attempt of every agency enforcing environmental rule of law in the country ought to be to alleviate environmental concerns by proper mitigating measures.'

In the recent case of *T N Godavarma Thirumulpad v Union of India & Ors*,<sup>3</sup> the Hon'ble Supreme Court held that:

'Adherence to the principle of sustainable development is a constitutional requirement. While applying the principle of sustainable development one must bear in mind that development which meets the needs of the present without compromising the ability of the future generations to meet their own needs. Therefore, Courts are required to balance development needs with the protection of the environment and ecology.'

In addition to these principles guiding all environmental laws, including those concerning construction, the Bureau of Energy Efficiency has developed the Energy Conservation Building Code, 2017 (ECBC), with the primary objective of improving energy efficiency in new commercial buildings. This Code has undergone two revisions, with the most recent one being



in 2021, and has been adopted by the majority of Indian states. The latest adoption of the ECBC was in Tamil Nadu on 29 December 2022, owing to the launch of Tamil Nadu's Climate Action Plan. According to the UNFCCC submission, the countrywide implementation of the Code will lead to a 50 per cent reduction in commercial building energy use by 2030. The ECBC was also recognised in the 2017 UN Global Status Report, which stated that the Code is expected to encourage building designs featuring renewable energy systems.

Other than the Code, construction activities are also currently regulated by various programmes, initiatives and plans which seek to establish an emission-free 'Green India'.

### Construction and technology

In its 'sustainable urbanisation strategy' presented before the UNFCCC, MoEFCC submitted a plan of using new and emergent technologies and materials in building construction, including ICT (information and communication technology) and SCADA (supervisory control and data acquisition) tools for streamlining efficient municipal service delivery, which will in turn reduce costs of the technologies for their use in other sectors. By making use of such modern technologies coupled with the implementation of sustainable methods of construction, India may be able to attain its goal of reducing carbon emissions well in advance of its projected year.

ICT and SCADA are known to be the two most effective methods through which construction can be brought into the world of technology. While the former method merely means the use of certain techniques including drones and 3D modelling, SCADA, on the other hand, is a complex software and hardware system which uses PLCs and

remote terminal units to show real time development in the industrial sector (building site), and to interact with the machines on the construction site. These technologies have the potential to reduce carbon emissions in the construction sector.

Recent developments have also increased the possibility of introducing artificial intelligence in construction practices. Contractors may use machine learning to assess project risks, construction risks as well as environmental risks without spending a substantial amount of capital.

Therefore, while the present investment of the real estate and construction sector in the field of technology is considerably low, even the slightest increase may result in a more sustainable and energy efficient infrastructure and construction development in India.

### Conclusion

Imagination is the genesis of infrastructural development. Without imagination and creativity, it would have been impossible to lay out mesmerising structures in the first place. However, since the construction industry utilises several natural resources, it becomes indirectly responsible for their overuse, misuse or exploitation.

The UN Conference of the Parties (COP27) aimed at encouraging and guiding countries to take effective action to counter climate change and depletion of natural resources. The introduction of the Clean Construction Accelerator during the Conference was a significant improvement aiming to support countries in finding ways to accelerate the shift of the construction sector towards a more sustainable outcome. Owing to the projected increase and India's current share in the global construction sector, its stance during the Conference, followed by various positive steps towards

attaining energy efficiency and reduction of the carbon footprint has provided a positive inference towards sustainable development.

In fact, in view of the recent designation of India's G20 presidency, the nation has emphasised its priority towards climate change mitigation and the technological transformation in infrastructure. India's intention to concentrate on sustainable construction methods has therefore been brought into the spotlight.

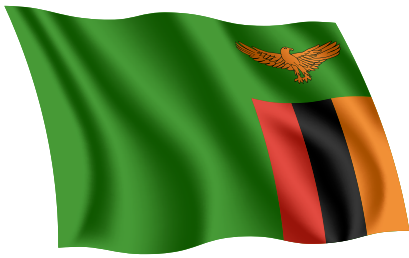
By combining such use of sustainable construction methods with modern technology, India may be able to attain its 2030 goals of decreasing carbon emissions to a significant degree and thereafter attaining its 2070 goal of zero carbon emissions.

Progressive human activities cannot take place without deriving environmental benefits. Similarly, the construction sector uses prominent natural resources such as coal, water and energy, resulting in carbon emissions, waste generation and energy consumption, making it essential to incorporate provisions of sustainability within the framework to conserve and protect the environment, even if this requires keeping up with the latest developments in technology.

### Notes

- 1 *Lafarge Union Mining (P) Ltd v Union of India*, (2011) 7 SCC 338.
- 2 *Rajeev Suri v Delhi Development Authority & Ors*, 2021 SCC Online 7.
- 3 *T N Godavarma Thirumulpad v Union of India & Ors*, (2022) 9 SCC 306.

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## ZAMBIA

### The FIDIC Pink Book and public procurement legislation, Zambia

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This article discusses fundamental implied terms affecting variations, certificates, contract amendment and contract administration obligations imposed on the 'Engineer' under the Pink Book in contracts with public procurement entities which are subject to the laws of the Republic of Zambia.

#### Introduction

The Public Procurement Act No 8 of 2020 (the Act) regulates all public procurement in Zambia through the Zambia Public Procurement Authority (Authority). The Act has to be read in conjunction with delegated or subordinate legislation in the form the Public Procurement Regulations, 2022 (Regulations). The Act mandates all public procurement entities (Employers) to use standard contracts approved by the Attorney-General and issued by the Authority.<sup>1</sup>

The FIDIC Harmonised Edition of the Conditions of Contract for Construction (the 'Pink Book') 2005 version is the approved standard contract for use in international construction works in Zambia.<sup>2</sup> Although the Pink Book is published for use by the Multilateral Development Banks (MDBs) on projects funded by them, it has been adopted for use on public works by the Authority

in Zambia. The Pink Book is part of the FIDIC contract forms which includes the Red Book used for building and engineering works designed by the Employer, on which the Pink Book is based, the Yellow Book for plant design & build and the Silver Book for EPC/turnkey projects.

The Act, with the Regulations, however, implies terms into the Pink Book significantly altering some specific terms and adding to others, resulting in cumbersome contract administration.

#### The basis of implied terms in the Pink Book

Zambia is a common law country. It is a well-known common law principle that legislation will imply mandatory terms within a contract and may change terms of a contract.<sup>3</sup>

The Pink Book, as used by the Authority, departs from the normal practice of stating the governing law in the contract data and states at Sub-Clause 1.4 that 'The Contract shall be governed by the laws of the Republic of Zambia'. The laws of the Republic of Zambia include, inter alia, the Act.

Baker, Ellis et al, in their book, *FIDIC Contracts: Law and Practice* state that the governing law '[...] may imply terms into the contract additional to the express terms.'<sup>4</sup> An extension to this statement is that where a term has been implied into a contract by statute or legislation, but conflicts with the provisions in a contract, the resultant effect is that the incompatible contract term is displaced or altered by the statutory provisions. The Act does not contain any provision allowing parties to contract out of its provisions as is possible in some other statutes.<sup>5</sup> Accordingly, the terms of the Act are implied terms in Pink Book contracts subject to Zambian law.

Furthermore, the provision under Sub-Clause 3.1 of the Pink Book requires the Employer to

'appoint the Engineer who shall carry out the duties assigned to him in the *Contract*',<sup>6</sup> with 'Contract' defined under Sub-Clause 1.1.1.1 as:

'[...] the Contract Agreement, the Letter of Acceptance, the Letter of Tender, *these Conditions*, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.'<sup>7</sup>

The reference to 'these Conditions' refers to the Pink Book 2005, including Sub-Clause 1.4 (Governing Law) provision, which is part of the conditions.

By these provisions the governing law is therefore part of the contract, and the Engineer is obligated to administer the contract taking into account the implied terms under the Act, including its Regulations as well as other legislation which is not a subject of this article.

#### Contract management provisions

The Act requires that for every contract awarded, a Contract Manager be appointed.<sup>8</sup> In terms of the Pink Book, the Contract Manager is the equivalent to the Engineer.<sup>9</sup> The duties of the Contract Manager spelt out in the Act<sup>10</sup> are:

- (a) managing the obligations of the procuring entity (the Employer) specified in the contract; and
- (b) ensuring that the supplier [ie, the Contractor under the Pink Book] performs the contract in accordance with the terms and conditions specified in the contract.'

Regulation 214 (Contract management responsibilities) expands on the duties of the Contract Manager. A number of the duties imposed are standard duties that an Engineer undertakes regularly. However, there are some additional duties which may have an impact on contract administration.

The Regulation states that a contract manager shall be responsible for, inter alia:

‘[...]’  
 (b) ensuring that the supplier [ie, the Contractor] submits all required documentation;  
 (c) ensuring that the procuring entity [ie, the Employer] meets all its payment and other obligations on time and in accordance with the contract;  
 [...]’  
 (e) preparing any required contract variations or change orders and obtaining all required approvals before the issue;  
 [...]’

With regard to (b), it is assumed that the reference to documentation is documentation required for contract administration. It is however impossible for the Engineer to force a Contractor to submit documentation, as this is not under the Engineer’s control. The Engineer can only effect this within the terms of the contract by applying sanctions for failure to provide required documentation, to the extent allowed under the contract.

As for (c), the payment and other Employer obligations under the terms of the contract are not within the Engineer’s authority. Although this an implied term, it is in reality an unworkable term implied into the Contract, as ensuring that the procurement entity meets its payment and other obligations is not within the sphere of control of the Engineer. This is difficult regardless of whether the Engineer is internally or externally procured; however, an Engineer within the procurement entity will undoubtedly find it easier to perform this function because of close proximity.

The provision under (e) requires the Engineer to obtain all required approvals before issuing variations. However, as explained below, the Engineer is limited to preparing a draft or recommending a variation to the Employer. Thereafter the Employer’s internal system takes over with the Employer’s Controlling Officer or CEO

tasked with obtaining approval from the Treasury and Attorney-General. As for provision (c), the Engineer within the procurement entity may find it easier to fulfil this function only because of close proximity.

The Engineer therefore has no control beyond preparing any required contract variations and is not responsible for obtaining approvals. There is consequently a conflict between provisions. Regardless the Engineer cannot be expected to impose itself into the internal procurement entity’s systems even when they are part of the procurement entity.

### Variation and amendments

Section 77 [Amendment or variation of contract] of the Act provides that:

‘(1) An amendment or variation to a contract shall not be effected without the approval of the Treasury and the legal advice of the Attorney-General.

(2) Subject to subsection (1), a proposed amendment or variation to a contract shall not be submitted to the Attorney-General without prior written authorisation of the appropriate approvals authority.

(3) An approvals authority may approve an amendment or variation proposed under subsection (2).

(4) The cumulative value of contract variation and amendment shall not result in an increment of the total contract price by more than 25 per cent of the original contract price as prescribed, except that where the variation results in an increment exceeding 25 per cent, the contract shall be cancelled and the procurement re-tendered.

An ‘approvals authority’ is ‘the body or individual with authority to grant prior authorisation of the stages in the procurement process specified in accordance with section 34’ of the Act [Procurement authorisation and levels of authority].

With regard to paragraph (3) above, it should be noted that this is an interim or prior approval step before final approval by the Treasury and Attorney-General (paragraph (1)). The procedure under the Regulations below at 217(3) [Contract amendment] clarifies this point.

Paragraph (4) provides that ‘the cumulative value of contract variations and amendments shall not result in an increment of the total contract price by more than 25 per cent of the original contract price’. Where this is exceeded, the contract will automatically be cancelled and retendered. The completion stage of the contract does not seem to matter for this to take effect.

The obvious consequence of such action will be for the contractor to claim damages, as the reason(s) for reaching the threshold cannot be ascribed to the contractor but to the Engineer and the Employer.

It not clear as to whether the contractor affected by the cancellation or termination will be permitted to tender for the balance of the works. It will of course be sensible to negotiate with such a contractor as retendering may be quite expensive, but no such procedure is mentioned.

A question to be asked is what happens to the Engineer’s contract administration agreement with the Employer? Does it survive the cancellation? And what if the cause of reaching the threshold is directly attributable to the Engineer or designer? There are no answers to these questions in the Act, and no known court rulings on these issues.

### Contract amendment procedure

Regulation 217 [Contract amendment] states:

‘(1) A Procurement Unit and contract manager shall, where any change to the terms and conditions of a contract is required, prepare a written amendment to the contract.



(2) An amendment to a contract referred to in sub-regulation (1) shall be valid when signed by authorised representatives of both the procuring entity and the supplier.

(3) A Procurement Unit shall obtain the prior authorisation of the approvals authority, for any contract amendment.

(4) A controlling officer or chief executive officer shall obtain the approval of the Treasury<sup>11</sup> and legal advice of the Attorney-General<sup>12</sup> before effecting any contract amendment.’

The general principles of contract law permit parties to amend a contract as they see fit. The Act, however, removes authority from the parties as it concerns contracts entered into by public procurement entities, and gives it to the Treasury and Attorney-General. Therefore, the provision that an amendment to a contract referred to in sub-regulation (2) shall be valid when signed by authorised representatives of both the procuring entity and the supplier is only a necessary interim process required for further submission to the other authorities. The final authority is the Treasury and the Attorney-General.

### Extension of time and variations

The Pink Book provides for the Engineer to make all determinations of the extension of the time for completion under Sub-Clause 8.4. By implication, an extension of the time for completion is a change to the terms and conditions of a contract, subject to Regulation 217, described above. However, the procedure for contract variations under Regulation 218 [Contract variation] also contains references to extension of time as it states that: ‘(1) A contract may, where appropriate, in order to facilitate adaptations to unanticipated events or changes in requirements, permit –

(a) the contract manager, supervising engineer or other designated official to recommend variations to the statement of requirements for goods, works or services, the price or *the completion date of the contract*; or

(b) defined compensation events to justify variations in the price or *completion date of the contract*.

[...]

(3) A variation to a contract shall only be valid when signed by authorised representatives of both the procuring entity and the supplier.

(4) A Procurement Unit shall obtain the prior authorisation of the approvals authority for any contract variation.

(5) A controlling officer or chief executive officer shall obtain the approval of the Treasury and legal advice of the Attorney-General before effecting any contract variation.

(6) The cumulative value of contract variations and amendments shall not result in an increment of the total contract price by more than 25 per cent of the original contract price.’<sup>13</sup>

Under the Pink Book, the term ‘variation’ is assigned a specific meaning to cover changes to the works,<sup>14</sup> in line with its general use in the construction industry. Generally, the term variation as used in the construction industry has no association with the time for completion, although a variation may lead to an extension to the time for completion or completion date of the contract.

With reference to the validity of the variation under paragraph (3) of Regulation 218, when signed by authorised representatives of both the procuring entity and the supplier, this is not final authority but an interim necessary step. It is designed to ensure that parties to the contract are on board and the issue is not being driven by one party.

Regulation 218(6) must be read in conjunction with Section 77(4) of the Act, discussed above, which provides

the action to be taken if the threshold is reached, that is, termination of contract followed by re-tender.

Under the terms of the Pink Book, authority to issue variations is vested in the Engineer. Sub-Clause 13.1 provides that: ‘Variations may be initiated by the Engineer at any time prior to issuing the Taking over certificate for the works, either by an instruction or by a request for the contractor to submit a proposal. The contractor shall execute and be bound by each variation [...]’.

The sum total of the provisions in the Act and Regulations, is that the Engineer does not have authority to make a final determination with respect to an extension of time or to issue a variation. The Act and Regulations effectively override the contract provisions and put the process into the hands of the procurement unit and the approvals authority with the final authority lying with the Treasury and Attorney-General.<sup>15</sup>

### Certification

Regulation 216 [Acceptance of goods, works and services] states:

‘A contract manager shall, prior to accepting goods, works or services or signing any *interim or completion certificate*, goods received notes or similar documents, ensure that –

- (a) the correct quantity or inputs of goods, works or services have been received;
- (b) the goods, works or services meet the specifications and technical standards defined in the contract;
- (c) the goods, works or services have been delivered or completed on time, or that any delay has been noted;
- (d) all required deliverables have been submitted; and
- (e) all required manuals or documentation have been received.’<sup>16</sup>

This is to be read in conjunction with Section 78 of the Act which provides:

‘(1) A person shall not process final payment of a contract sum where a defects liability certificate or certificate of final completion has not been issued.

(2) The issuance of a defects liability certificate or certificate of final completion is *prima facie* evidence of the completion of works in accordance with the set standards.

(3) A person who contravenes subsection (1) or (2) commits an offence and is liable, on conviction, to a fine not exceeding five hundred thousand penalty units or to imprisonment for a term not exceeding five years, or to both.’

The above should, however, be contrasted with Sub-Clause 14.6 [Interim Payment Certification] under the Pink Book, which provides that: ‘The Engineer may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer’s acceptance, approval, consent or satisfaction.’

In other words, the Contract permits corrections in subsequent certificates for unacceptable works and other adjustments. The issuance by the Engineer of a payment certificate/interim payment certificate defined under Sub-Clauses 1.1.4.7/9 being the equivalent of an interim certificate for progress payment under the Regulations does not mean that the work is to the Engineer’s satisfaction.

However, the language of Regulation 216 leaves no doubt that the issuance of an interim payment certificate is conclusive evidence that:

- (a) the correct quantity works have been received;
- (b) the works meet the specifications and technical standards defined in the contract;
- (c) the works have been delivered or completed on time, or that any delay has been noted;

(d) all required deliverables have been submitted; and

(e) all required manuals or documentation have been received.

Therefore, the Act through its Regulations implies into the contract an impossible provision changing the nature of interim payment certificates as envisaged in the contract from interim to conclusive evidence that the work has met the standards etc. It is simply never possible at many interim certification stages to conclusively meet the listed criteria in the Regulations.

### Offences for non-compliance

Sections 78 and 104–109 of the Act make it an offence to fail to comply with the Act and prescribe sanctions for such offences.<sup>17</sup> The offences affect office holders<sup>18</sup> who are public officials, constitutional office holders, judges or judicial officers and others<sup>19</sup> as well as bidders<sup>20</sup> and suppliers.<sup>21</sup> Suppliers include the Engineer who supplies services to the Employer and who under the Act is referred to as the procurement entity (as will be seen later).

Section 104 of the Act, unlike the other provisions with specific offences, is well worth noting as it is a catch-all provision which states that:

‘(1) A person participating in public procurement of goods, works or services shall –

(a) abide by the obligations under this Act, the contract and other instruments applicable to the person’s conduct and activities related to public procurement; and

(b) not commit or abet corrupt, fraudulent, collusive or coercive practices.’<sup>22</sup>

The term ‘A person’ under subsection (1) above refers to a legal person and includes the Engineer.

The sanction for offences under the Act is a fine of 500,000 penalty units<sup>23</sup> and/or a prison sentence of up to a maximum of five years.<sup>24</sup> Additionally, compensation can be

ordered by a court to ‘compensate a procuring entity for any damage or loss suffered by the procuring entity, if the damage or loss resulted from an offence committed by the person.’<sup>25</sup>

### Conclusion

There are complications in the application or implementation of implied legislative provisions as they are either difficult or impossible to comply with, vary established construction industry practice, or alter established legal interpretation or principles. In addition, some terms in the standard conditions of contract conflict with the provisions in the procurement legislation. As a result of this the Engineer must be alert in order to avoid compromising their position by a failure to adhere to the implied terms.

The erosion of the Engineer’s powers to issue variations and extensions of time is a significant departure from the norm with the result that contract administration will be cumbersome and onerous to the detriment of the works. The likely result will be delays and extra costs to the contractor resulting in claims and disputes.

The escalation under the Act for variations and amendments to be authorised by the Treasury and Attorney-General is likely to lead to delays in implementation, resulting in claims.

### Notes

- 1 A procurement entity is defined under the Act as a government agency or parastatal body carrying out procurement using public funds or any other funds and includes any other body or unit established or mandated by government to carry out procurement using public funds. See s2, Act, Interpretation and s 3(1), Act.
- 2 The other approved standard contract is the World Bank form (2010 version), for use on small works. Both contracts can be found at <https://www.zppa.org.zm/home> accessed 16 April 2023.

- 3 Julian Bailey, *Construction law*, vol 1 (2nd edn, Informa Law 2016) para 3.106. See also other forms of implication at paras 3.86, 3.87, 3.88, 3.90; and Stephen Furst, Vivian Ramsey, *Keating on Construction Contracts* (9th edn, Sweet and Maxwell 2012) paras 3-039, 3-040, 3-041, 3-042, 3-043, 3-044, 3-045.
- 4 Routledge 2009, para 2.128 (emphasis supplied).
- 5 Julian Bailey, *Construction Law*, vol 1 (3rd edn, London Publishing Partnership, 2020) 3.106.
- 6 Emphasis added.
- 7 Emphasis added.
- 8 s76(1), Act.
- 9 reg 218(1)(a).
- 10 s76, Act.
- 11 The Treasury is part of the Ministry of Finance and National Planning. The Secretary to the Treasury is the Ministry's most senior civil servant. See Ministry of Finance and National Planning, [https://www.mofnp.gov.zm/?page\\_id=3880](https://www.mofnp.gov.zm/?page_id=3880) accessed 7 January 2023.
- 12 The Attorney-General is the Chief Legal Advisor to the Government of Zambia under the Ministry of Justice. See Ministry of Justice, [https://www.moj.gov.zm/?page\\_id=1370](https://www.moj.gov.zm/?page_id=1370) accessed 13 January 2023.
- 13 Emphasis added.
- 14 Pink Book Definitions 1.1.6.9.
- 15 Whereas under reg 217(1) the engineer together with the procurement unit is required to prepare a draft or recommendation for an extension to amend a contract for approval, the process under reg 218(1)(a) differs somewhat because under this process the contract manager, supervising engineer or other designated official is required to recommend variations or the completion time of the contract. Thereafter, intermediate bodies: procurement unit, approval authority controlling, or Chief Executive officer take over until approved by the Treasury and Attorney-General

- 16 Emphasis added.
- 17 The Act at s103 provides for a Code of Conduct which refers back to the Act for sanctions. For some reason the code is not available on the Authority's website but can be found at [https://www.moh.gov.zm/?wpfb\\_d1=67](https://www.moh.gov.zm/?wpfb_d1=67) accessed 17 January 2023.
- 18 s2, Act, Interpretation.
- 19 s2, Act, Interpretation, read together with s2, Interpretation, of the Public Finance Management Act, No 1 (2018).
- 20 s2 Interpretation: 'bidder' means a person or group of persons that offers to provide goods, works or services in response to an invitation from a procuring entity and includes, where applicable, a sub-bidder, potential bidder and applicant to pre-qualify.
- 21 s2, Interpretation: 'supplier' means a contractor, consultant, service provider or a natural person or incorporate body that is a party to a contract with a procuring entity for the provision of goods, works or services including a person that has a contract with the supplier in relation to the provision of goods, works or services to a procuring entity.
- 22 Emphasis added.
- 23 To convert to the local currency equivalent to ZMW, multiply the penalty units by a factor of 0.3 = 500,000.00x 0.3=ZMW150,000.00. As of 7 January 2023, the equivalent is US\$8,218.
- 24 s78, s107, s108.
- 25 s109 Act.

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## BRAZIL

### Perspectives for the development of performance bonds in construction contracts in Brazil

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Considering the variety of legal systems around the world, it is not a simple task to establish universal wording for performance bonds, given that there are different mechanisms and contracting models in each jurisdiction. The purpose of performance bonds is easier to identify, regardless of those differences, as they serve as a guarantee to ensure the fulfilment of obligations assumed under a principal contract.

### Introduction

Performance bonds are undergoing a reformulation in Brazilian legislation, and are used as a surety in public and private contracts for construction and service works. Despite the possibility of obtaining performance bonds as security, performance bonds are not a developed market in Brazil, and abandonment of construction works is frequent.

There are two different types of security for performance of contractual obligations available in the Brazilian market: (1) surety bonds; and (2) bank guarantees.



This article will focus on surety bonds in government contracts, especially in agreements for construction of public works.

Brazil is looking for ways to facilitate and attract investments, and the enforceability of contracts for construction works is an important factor in the country's ability to offer legal certainty to potential investors. Performance bonds can therefore contribute to economic growth, especially considering the recent updates in the legislation and regulations and the perspectives for development of this type of security.

### Performance bonds in other countries

In many countries, including both common and civil law jurisdictions, performance bonds are usually issued by banks and are an important mechanism to ensure compliance with contracts. To illustrate some of the differences and similarities, we will look briefly at one example of the use and development of performance bonds from each kind of legal system, taking as references the two largest economies, the United States and China.

Performance bonds have more than a century of history in the US, starting in 1894 with the Heard Act, which made surety bonds mandatory for all construction contracts with the government. The Act's main goal was to transfer the risk of default to the private sector and protect workers, suppliers and the State's interests.

In 1935 the federal Miller Act came into force, enlarging the scope and coverage of surety bonds, and including, at that point, bid bonds and labour and material bonds. Since then, almost all 50 states have enacted similar laws, requiring payment and performance bonds from contractors on state and local construction projects. Performance bonds have consequently been a contributing factor to the economic growth and development of the US.

There are similarities in the constitution and statutes of the states (most of which are common law jurisdictions), but there is no 'national construction law' in the US. Nevertheless, the Associated General Contractors of America and the American Bar Association Forum on Construction Law have created, and annually update, the Construction State Law Matrix as a practice guide.

By contrast, China is a civil law country and legislation is the main source of the law. In China, therefore, the concept of performance bonds is derived from the legislation and regulations governing the construction sector, including: (1) the Civil Code of the People's Republic of China (PRC); (2) the Bidding Law of the PRC (2017 Amendment); (3) the Construction Law of the PRC (2019 Amendment); (4) the Urban and Rural Planning Law of the PRC (2019 Amendment); and (5) the Law of the PRC on Environmental Impact Assessment (2018 Amendment).

The PRC's legislation does not, however, specifically define performance bonds. In fact, Chinese law does not restrict the types of guarantees that may be used, and a variety of guarantees can be found in construction projects, such as performance guarantees, advanced payment guarantees, and retention money guarantees.

Unlike the US, where performance bonds are mandatory for government public works and common in high-value projects in the private sector, performance bonds are not compulsory in China and the parties are free to negotiate the method, amount and submission time of the performance guarantees.

### Performance bonds in Brazilian law

Since Brazil has a civil law system, performance bonds in government construction contracts are governed by legislation and regulations,

especially Federal Law 14.133/2021 (Government Contracting Law) and Circular 662/2022 of the Office of the Superintendent of Private Insurance (SUSEP – *Superintendência de Seguros Privados*).

Unlike other countries in which performance bonds are a bank guarantee, in Brazil the most usual type of bond for construction contracts is a kind of insurance (*seguro-garantia*), contracted directly from an insurance company, with some peculiarities. These include: (1) the insurance contract is a tripartite transaction, involving the insurer, the construction company (as the policyholder), and the owner of the construction work (as the insured party); (2) the insurance contract covers the policyholder's contractual obligations; (3) the policyholder pays the premium; (4) the insurance remains in effect for the term of the policy, even if premiums are not paid; (5) the insurer may request financial guarantees for payment of the premiums from the policyholder; and (6) the term of policy is related to the duration of the project.

SUSEP Circular 662/2022 defines the purpose of surety insurance (Brazil's version of performance bonds) as a guarantee of the policyholder's performance of contractual obligations, and specifies the main features of this type of insurance, including: (1) the distinction between the surety in the public and private sectors (in the first case, the covered contract is governed by the public law and in the second, by the private law); (2) surety insurance covers absolute risk; and (3) the policy will guarantee all the policyholder's obligations under the relevant contract – if the insurance does not cover all obligations, the policy must clearly and objectively state which obligations are covered.

Since performance bonds in Brazil are a type of insurance, Law 10,406/2002 (the Brazilian Civil Code) also applies, because the Civil Code establishes the

main rules governing insurance contracts in general. Consequently, all proposals for insurance must be in writing, as provided by the Brazilian Civil Code, and only legally authorised companies may issue insurance policies.

### **Changes introduced by the Government Contracting Law**

The Government Contracting Law, which came into force in April 2021, updates the rules governing competitive bidding on government contracts and government procurement. The earlier legislation required security in the amount of five per cent of the original contract price, which increased to ten per cent in the case of large-scale construction works.

Among other changes, the new Law provides for security in the amount of five to ten per cent of the contract price, with the possibility of an increase of up to 30 per cent in the case of large-scale construction works and service contracts.

Another important change is the possibility that the insurance company can take over the construction works if the construction company defaults. This scenario had already been provided for in SUSEP's regulations, but has been little used in practice in Brazil.

As its name makes clear, the Government Contracting Law does not apply to performance bonds in private construction contracts, which are governed by SUSEP Circular 662/2022 and the Brazilian Civil Code.

### **The main challenges for performance bonds**

As we have seen in this article, the Brazilian Government Contracting Law is only part of the process of updating the law governing performance bonds in Brazil. There will be challenges to overcome, such as the technical and operational

preparedness of insurance companies, and improvements in project risk analysis, credit analysis, and renewal of existing policies, especially to provide for continuation of works in the case of abandonment.

High transaction costs are also obstacles to the expansion of the performance bond market in Brazil. Nonetheless, the new Government Contracting Law will certainly contribute to the development of this type of security in Brazil and, consequently, to the growth of the economy.

### **Conclusion**

The changes introduced by the recent Government Contracting Law presents challenges, but also offer opportunities to expand the understanding and use of performance bonds in Brazil. Moreover, the study of foreign models can help to develop improvements in this type of security, which has the potential to prevent abandonment of construction works and make government contracts more effective, which are essential to the development of Brazil's construction law and economic growth.

### **Bibliography**

Federal Law 14.133/2021, 1 April 2021, Law of Tenders and Administrative Contracts, [https://www.planalto.gov.br/ccivil\\_03/\\_ato2019-2022/2021/lei/114133.htm](https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2021/lei/114133.htm), accessed 12 March 2023.

Zheyuan Jin et al, *Global Practice Guides: China Law and Practice*, Chambers, 2022.

Túlio Henrique Moreira Marques, Mario Henrique Ogasavara and Frederico Araújo Turolla, 'Surety Bond in Infrastructure in Brazil: Transaction Costs and Agency Theory Perspectives', *Revista de Administração Contemporânea* v.26, 2022.

Nóbrega, Marcos and Oliveira Netto, Pedro Dias de., *O seguro-garantia na nova Lei de Licitação e os problemas de seleção adversa e risco moral*, *Revista De Direito Administrativo*, 281(1), 2022.

SUSEP Circular 662/2022, see <https://www.susep.gov.br/safe/scripts/bnweb/bnmapi.exe?router=upload/25882> accessed 12 March 2023.

Chad Therio et al, *Global Practice Guides: USA Law and Practice*, Chambers, 2022.

Araújo, Aldem Johnston Barbosa, Saraiva, Leonardo, *Obras Públicas e Serviços de Engenharia na Nova Lei de Licitações e Contratos*, Rio de Janeiro: Lumen Juris, 2021; Dabus, André. *Seguros e Garantias no ambiente da Lei 14.133/21, Licitações e Contratos Administrativos*.

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# CONFERENCE REPORT



Berlin skyline. Credit: JFL Photography/Adobe Stock

## 8th Biennial Conference on Construction Projects from Conception to Completion

16–18 March 2023

Hotel de Rome, Berlin, Germany

China Irwin

LALIVE, Geneva

IBA International Construction Projects Committee members gathered in Berlin from 16–18 March 2023 for the eighth Biennial Conference on Construction Projects from Conception to Completion which took place at the Hotel de Rome. In addition to the instructive sessions described below, conference goers attended a lively welcome reception at the Hotel on Thursday evening and an entertaining dinner on Friday night at the Solar Sky Bar and Restaurant, with views of the city.

As explained below, the sessions were grouped to address the three main phases of international construction projects: project establishment, project execution, and the dispute resolution phase. Here's a brief summary of the sessions.

Many thanks to the ICP Co-Chairs, Joseph Moore and Jean-Pierre van Eijck and to the conference organisers Rouven Bodenheimer and Rupert Choat for putting together this great event.

### Project establishment sessions

The first three sessions addressed issues relevant at the project establishment phase, including potential amendments to FIDIC standard form contracts, how to draft the 'perfect' variations clause, and ways to head off construction arbitrations before they start.

Friday 17 March

Session One

### Amending FIDIC conditions

*Session Chair*

Aisha Nadar *Advokatfirman Runeland, Stockholm*

*Panellists*

Frédéric Gillion *Pinsent Masons, Singapore*

Jarrod Gutsa *Vinson & Elkins, London*  
Stephen Hibbert *Independent Arbitrator & Mediator, Dubai*

Ulrich Kugler *Andritz Hydro GmbH, Ravensburg*

There is plenty of advice against amending tried-and-true standard forms. However, the reality is that parties cannot resist amendments, particularly as amendments may be required by funders or to address aspects of the applicable law. The panellists of this session examined

the pros and cons of amendments to FIDIC conditions, discussing examples they've seen in real-life projects.

The session chair, Aisha Nadar presented the FIDIC 'Golden Principles' meant to be upheld notwithstanding any amendments to the FIDIC conditions. She pointed out that the label should match what's inside and that parties must fully understand the FIDIC system before they can successfully tailor it to individual projects through amendments. The panellists then discussed the circumstances in which parties may wish to amend FIDIC contracts, or other standard contract forms, and gave concrete examples, including amendments introduced in the Qatar Rail project. One particular type of amendment which led to a lively debate among the panellists concerned the role and authority of the 'Engineer', with the suggestion being made that the Engineer's powers could be more limited in order to increase the employer's direct involvement in a project, bringing the employer into the room with the contractor.

#### Session Two

### The perfect variations clause

#### Session Chair

Ricardo Barreiro-Deymonnaz  
*Barreiro Oliva De Luca Jaca Nicastro,*  
*Buenos Aires*

#### Panellists

Ian de Vaz  
*WongPartnership, Singapore*  
Melis Mani *Strabag, Vienna*  
Shane O'Neil *Arthur Cox, Dublin*

This panel considered the 'perfect' variations clause, that is, what should be included and what considerations must be taken into account when drafting and whether a perfect variations clause is even possible.

To begin with, the panellists noted that perfection is the enemy of good. Or, in the Spanish version

of the saying, perfection is the enemy of the possible. However, the panellists agreed that the ideal (if not perfect) clause must communicate a clear message on the timing and communication of variations; who is authorised to instruct/request a variation; what constitutes a variation; and the means of valuation. Drafters must do their homework and look carefully at the contract as a whole, as well as local legislation. Drafters must also walk the tightrope of avoiding ambiguity while avoiding over-engineering the contract by defining too many terms.

As to the valuation of a variation, the panellists noted that robust contracts often provide a tiered approach to valuation, for example, the parties first attempt to agree; if no agreement is reached, the parties consider work of a similar nature; if the variation does not concern works of a similar nature to other work contemplated in the contract, the parties apply fair market rates and prices. The panellists also considered the issue of instructions to omit, which should be expressly addressed in the ideal variations clause.

#### Session Three

### Avoiding construction arbitrations

#### Session Chair

Christopher Seppälä *White & Case,*  
*Paris*

#### Panellists

Alexandra Cunliffe  
*Bechtel Corporation, London*  
Stefan Leupertz  
*Arbitrator, Adjudicator and Mediator,*  
*Cologne*  
James Perry *PS Consulting, Paris*

In contrast to much of the discussion at the conference, which considered issues in the dispute context, this panel considered the best ways of *avoiding* arbitration in the first place, discussing

procurement methods and contractual provisions which may be effective in heading off disputes. Among the options discussed was the use of dispute resolution boards, in particular the Dispute Avoidance/Adjudication Boards (DAABs) in the 2017 FIDIC suite of contracts. The DAAB can engage with the parties in many different ways, including for example sitting down together to discuss the meaning and application of a contract clause. The panel also considered the option of having legal experts on standby during a project, to give parties the benefit of hearing what a true neutral thinks about contractual and legal issues, whether through the format of conciliation and adjudication or moderation (as opposed to classic mediation). Lastly, the panel discussed the need for greater focus and time spent on genuine pre-contract alignment, putting egos aside and treating the project – and contract preparation – as a true joint effort. This includes, for example, putting the focus on the best and clearest contractual solutions rather than approaching negotiating the drafting of a contract as a competition.

### Project execution sessions

The next three sessions considered issues relevant to the project execution phase, including the impact of the applicable law on common issues arising during execution, how to address constructive acceleration and the process of defending against on-demand bonds.

#### Session One

### The importance of the applicable law: how far do lawyers from civil law and common law backgrounds view the same construction law issues differently?



### Session Chair

Rupert Choat KC *Atkin Chambers, London*

### Panellists

Katherine Bell *Schellenberg Wittmer, Zurich*

Jesse Gardner *Singleton Urquhart Reynolds Vogel, Toronto, Ontario*

Xingyu Huang *Zhong Lun Law Firm, Hong Kong*

David Hume *Shearman & Sterling, Abu Dhabi*

Following the popularity of this session at previous conferences, the panellists worked through a new case study, explaining how certain common construction law issues would be approached in different jurisdictions/under different legal systems. Issues discussed included allocation of risk with respect to matters outside of either party's control (eg, adverse weather events), contractual allocation of risk to the contractor of a matter which the employer might have controlled (eg, an error in the Employer's Requirements), and the effect of exclusion of liability in cases of gross negligence. The panellists' focus was on Mainland China, Hong Kong, Canada, Switzerland and the UAE, but conference delegates also weighed in on the results of the hypotheticals posed in various other jurisdictions. As in previous editions of this session, the results of the hypotheticals were not all that dissimilar under the jurisdictions considered, albeit the legal routes to get there varied.

### Session Two

#### Constructive acceleration

##### Session Chair

Albert Bates Jr  
*Troutman Pepper Hamilton Sanders, Pittsburgh, Pennsylvania*

##### Panellists

Tony Dymond *Debevoise & Plimpton, London*

Daewoong Lee *Kim & Chang, Seoul*  
Anamaria Popescu *Berkeley Research Group, Pine, Colorado*

This panel examined the challenges to successfully pursuing a claim for the costs of accelerating where an employer has denied a valid request for an extension of time or been late in granting an extension. The panellists offered perspectives under English law, in the US and in South Korea. While it is usually said that English law does not generally recognise constructive acceleration, claims based on constructive acceleration or analogous doctrines are occasionally recognised under English Law and more frequently in other common law jurisdictions. As to the US, the legal doctrine of constructive acceleration is firmly established, yet remains difficult to prove in practice. In South Korea, while there is no specific doctrine, the courts have awarded contractor's costs for acceleration works.

The panellists also offered recommendations for successful cost recovery in cases of acceleration, including creating and maintaining viable baseline schedule completing and schedule updates with valid critical paths, adherence to notice provisions, providing narrative explaining the acceleration efforts being employed and time periods, coding indirect and direct person-hours/costs to specific acceleration cost codes, and creating and maintaining an issue database to reinforce solid causation documentation for delay and the need for acceleration efforts.

### Session Three

#### Jurisdictions of interest when defending calls against on-demand bonds

##### Session Chair

Michael Valo  
*Glaholt Bowles, Toronto, Ontario*

##### Panellists

Thaís Fernandes Chebatt *Pinheiro Neto Advogados, São Paulo*

Akihiro Hironaka *Nishimura & Asahi, Tokyo*

Andrew McKenzie *DLA Piper, Dubai*  
Vishrov Mukerjee *Trilegal, New Delhi, Delhi*

This panel considered the situation of a call on a demand guarantee (or an 'on demand bond') being anticipated or in fact made and compared the approaches taken in Canada, Brazil, Japan, the UAE and India, among other jurisdictions, working through the options available to defend against a call, be it seeking an injunction against the issuer from making payment or against the beneficiary from calling the bond. One question relevant in all the jurisdictions discussed was whether the autonomy principle – that is, that the issuing bank's obligation to honour a draft on a credit when it is accompanied by documents in accordance with the terms and conditions of the credit, on their face, independent of the performance of the underlying contract – creates opportunities for abuse. In Canada, for example, the only established exception to the autonomy principle is in the case of a strong *prima facie* case of fraud (whether a party is seeking to enjoin a draw on a guarantee against the issuer or the beneficiary). The consensus seemed to be that 'pay first, litigate later' remains the spirit of an on-demand bond.

#### Dispute resolutions sessions

The final three sessions focused specifically on dispute resolution, considering expert evidence in arbitration, addressing high volumes of low value claims, and allowing panellists and delegates to share 'war stories' of arbitrations gone awry.

Saturday 18 March

Session One

**Reinvigorating independence in expert evidence**

*Session Chair*

Alexis Mourre *Mourre Gutierrez Chessa Arbitration, Paris*

*Panellists*

Lynette Chew *CMS Singapore, Singapore*

Peter Fogh *Plesner, Copenhagen*

Kristoffer Löf

*Mannheimer Swartling, Stockholm*

Graham Lovett *Akin Gump Strauss Hauer & Feld, Dubai*

The panellists in this session – with extensive audience participation – engaged in a very lively debate as to whether the perception among arbitration users that party-appointed experts do not always give independent and impartial evidence is well-founded and what measures are in place to ensure independence and impartiality. The measures discussed included the so-called ‘Sachs proposal’, proposed by Dr Klaus Sachs at an International Council for Commercial Arbitration (ICCA) conference, which combines elements of both party and tribunal expert appointments. The expert delegates in the audience vehemently protested at the idea that party-appointed experts (as opposed to tribunal-appointed experts) see themselves as ‘hired guns’. There seemed to be agreement that counsel instructions are a crucial issue, and that counsel must develop their approach based on the experts’ independent assessment, not vice versa.

Session Two

**Addressing high volumes of low value claims in construction arbitration**

*Session Chair*

Bernd Ehle *LALIVE, Geneva*

*Panellists*

Nils Brammer

*Standardkessel Baumgarte, Mülheim*

Jane Davies Evans

*3 Verulam Buildings, London*

Matei Purice *Freshfields, Paris*

This panel considered available options for addressing low value, but often complex, claims in construction disputes, aimed at avoiding incurring disproportionate costs. Options discussed included sampling and extrapolation, active case management, and the use of Scott Schedules, among others. As to sampling, the panellists explained that English courts have historically been sympathetic to non-statistical sampling, albeit samples must be selected in a credible manner. In the Middle East, however, judges will generally need to look at claims separately, irrespective of value.

Before even starting arbitration or court proceedings, parties should critically evaluate the claims to be pursued, carrying out a thorough claim plausibility analysis and considering whether it is worthwhile to pursue all claims, even if previously included as part of the pre-arbitration or pre-litigation steps.

Once in arbitration proceedings, there are multiple options available, provided the parties consent. Such options may be tribunal-driven, expert-driven, or party-driven methods. For example, parties may agree not to cross-examine witnesses or experts on claims below a threshold monetary value. Or, parties could theoretically agree for the tribunal to determine the low-value claims without providing reasoned decisions for each individual claim.

Session Three

**When it all ends in disaster...**

*Session Chair*

Virginie Colaiuta

*LMS Legal, London*

*Panellists*

James Doe *Herbert Smith Freehills, London*

Jonathan Taunton *Squire Patton Boggs, Atlanta, Georgia*

Alfredo Yañez *Matesanz Acciona, Madrid*

In the final session of the conference, the chair, panellists and delegates shared colourful ‘war stories’ from their own vast personal experience concerning fact witness testimony, expert testimony, and cross-examination. While this informal session was – as intended – entertaining, the stories shared also provided important common lessons, including the importance of due diligence on witnesses’ and experts’ backgrounds and thinking long and hard about whether they may do more harm than good.



# Sample amendments to the Indemnities and Limitation of liability provisions of the FIDIC Yellow Book 1999

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**T**he FIDIC Yellow Book concept implies a ‘general contractor’ who is at a single point of responsibility for all project works. The indemnity and liability scheme applied in the FIDIC Yellow Book is based on such a concept. In case a Yellow Book contract is used as a basis for works that are not supposed to be carried out by a general contractor (or its sub-contractors) but in parallel to the works of other contractors working on the same project (tendering in different lots), the perspective changes and many clauses of the FIDIC Conditions of Contract need to be adjusted to fit for

such a new perspective. Many changes will depend on the specific scope so they will need to be bespoke. Indemnities and limitations of liability would seem to follow a more general approach. Therefore, a Yellow Book Contract needs certain modifications in case the Employer desires to structure the tendering process in separate lot-by-lot contracts.

The following recommendations are just an example how to deal with the issue at hand and are not to be taken as specific legal advice. The particular project may make different modifications necessary.

Sub-Clause	Amended wording	Reason
17.1 Indemnities	<p>Always subject to Sub-Clause 17.6 and to the extent attributable to any negligence, wilful act or breach of the Contract by the Contractor, the Contractor's Personnel or any of their respective agents the Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including reasonable legal fees and expenses) in respect of:</p> <p>(a) bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the design, execution and completion of the Works and the remedying of any defects, <del>unless attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents;</del> and</p> <p>(b) damage to or loss of any tangible property, real or personal (other than the Works and the Employer's Property at Site), to the extent that such damage or loss:</p> <p>(i) arises out of or in the course of or by reason of the design, execution and completion of the Works and the remedying of any defects; <del>and</del></p> <p>(ii) <del>is attributable to any negligence, wilful act or breach of the Contract by the Contractor, the Contractor's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.</del></p> <p>Always subject to Sub-Clause 17.6 the Employer shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including reasonable legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in subparagraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [Insurance Against Injury to Persons and Damage to Property].</p> <p>To the extent a Party is obliged to indemnify and hold harmless another Party, the indemnifying Party may (at the indemnifying Party's cost) assume overall responsibility for negotiating the settlement of the claim, and/or any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and the Contractor's Personnel or the Employer's Personnel, as the case may be) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to promptly assume overall responsibility for the conduct of any negotiations, litigation or arbitration after being requested to do so by the other Party.</p>	<p>Discussions have been going on whether the limitation of liability of Sub-Clause 17.6 extends to the indemnities placed in different parts of the contract. Therefore, the FIDIC drafters in the 2017 Yellow Book changed the concept and put the limitation of liability in the front of the contract conditions (Sub-Clause 1.15).</p> <p>The original wording only makes indemnity for property damage contingent on attributability but not personal injury. Under a greenfield, general contractor scheme, such risk allocation may be adequate as the general contractor is overall responsible for all works taking place at site and the Employer would not want to get directed to any of the Contractor's sub-contractors. That allocation would lead to inadequate results in case several contractors work on the same project in parallel. Liability insurers will usually not cover personal injury damages without the insured having acted at least negligently.</p> <p>As property damage includes damages to intangible property, eg, drop of good will, company value or share price, which from a contractor's perspective is closely connected to the Employer's business and as such is of a similar risk as loss of profit, loss of revenue or loss of contracts.</p> <p>In a greenfield, general contractor scheme, the 'Works' cover everything that is going to be built, excluding the land and adjacent property, as well as Employer's Equipment. In a project separated into lots, all works performed by another contractor, all existing structure on the project site fall outside the 'Works' and any damages to them would get carved-out from the limitation of liability.</p> <p>The indemnities need to carry with them an entitlement and a duty of the indemnifying party to undertake defence activities.</p>



<p>17.5 Intellectual and Industrial Property Rights</p>	<p>In this Sub-Clause, 'infringement' means an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and "claim" means a claim (or proceedings pursuing a claim) alleging an infringement.</p> <p>Whenever a Party <b>does not receives a claim but fails to give notice to</b> the other Party of any claim within 28 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.</p> <p><b>Always subject to Sub-Clause 17.6</b> the Employer shall indemnify and hold the Contractor harmless against and from any <b>third-party</b> claim alleging an infringement which is or was:</p> <ul style="list-style-type: none"> <li>(a) an unavoidable result of the Contractor's compliance with the Employer's Requirements, or</li> <li>(b) a result of any Works being used by the Employer: <ul style="list-style-type: none"> <li>(i) for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or</li> <li>(ii) in conjunction with anything not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.</li> </ul> </li> </ul> <p><b>Always subject to Sub-Clause 17.6</b> the Contractor shall indemnify and hold the Employer harmless against and from any other third-party claim which arises out of or in relation to (i) the Contractor's design, manufacture, construction or execution of the Works, (ii) the use of Contractor's Equipment, or (iii) the proper use of the Works.</p> <p>If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.</p>	<p>Clarification</p> <p>Discussions have been going on whether the limitation of liability of Sub-Clause 17.6 extends to the indemnities placed in different parts of the contract. Therefore, the FIDIC drafters in the 2017 Yellow Book changed the concept and put the limitation of liability in the front of the contract conditions (Sub-Clause 1.15).</p> <p>As the IP indemnity cuts through both limitations of liability, it needs to be restricted to third-party claims an Employer is exposed to due to an infringement of the Contractor for the same reason for which the contract generally excludes 'consequentials'.</p>
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<p>17.6 Limitation of Liability</p>	<p>To the extent permitted by any applicable Law and irrespective of whether arising in contract, tort, delict, strict liability, negligence, statutory law, indemnity or otherwise, neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract, loss of production, loss of revenue or of any business opportunity, erasure and corruption of operational data or the link to such data, loss of interest (excluding the agreed or statutory interest for delayed payments) or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than under Sub-Clause 16.4 [payment on Termination] and in respect of any liability relating to a third-party claim (or proceedings pursuing a third-party claim) under Sub-Clause 17.1 [Indemnities].</p> <p>The total liability of the Contractor to the Employer, under or in connection with the Contract and irrespective of whether arising in contract, tort, delict, strict liability, negligence, statutory law, indemnity or otherwise, other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], in respect of any liability relating to a third party claim (or proceedings pursuing a third-party claim) under Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum stated in the Particular Conditions or (if a sum is not so stated) the Accepted Contract Amount.</p> <p>The Employer shall not be entitled to bring a claim against the Contractor under or in connection with this Contract or the Works for any loss or damage or any defect after [...] years after the Works or in case taking over of a Section applies after the Section(s) have been taken over or are deemed to have been taken over.</p> <p>This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.</p>	<p>Carving out a Contractor's indemnity obligation for third-party claims from the limitation of liability finds a certain justification in the fact that a Contractor cannot contractually limit its liability to a third party and therefore, it may not seem adequate that the Contractor can limit such liability in case the third-party does not directly claim from the Contractor but claims from the Employer and the Employer then seeks indemnification by the Contractor. However, loss of use, profit etc an Employer suffers due to the Contractor having caused third-party damages should not be carved back in, for example, loss of production of the Employer as it was unable to operate the Permanent Works by reason of a third-party restraining order. Usually, Contractors will not take a risk the sheer size of which predominantly depends on the Employer's general business model. For that reason, loss of use and all the other 'consequential' are excluded in the first place. Carving such risk back into the Contractor's responsibility would make projects unreasonably expensive for every Contractor and sub-contractor would then need to calculate certain reserves for such tremendously higher (volume) risk.</p> <p>Drafting to make enforcement of the limitation more likely.</p> <p>Sunset clause when each and every Contractor's liability in connection with the Contract or the Works expires.</p>
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# Are standard form construction contracts fit for the 'Smart Infrastructure' of the future?

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This article considers whether our current standard form construction contracts are fit for the Smart Infrastructure of the future. We suggest some preliminary answers to whether the standard forms are fit for the future, and if not, how they should be adapted.

Over the past decade, we have all seen an increase in the presence of digital technology in and around construction sites. Contractors are increasingly using digital technology to carry out their works, for example through the use of online platforms

to manage contracts, robots to monitor progress and digital twins to model and record the as-built works.

But there is a more significant technological change on the horizon for the construction sector. Industry commentators

are heralding the arrival of so-called ‘Smart Infrastructure’. Examples include a recent University of Cambridge report titled *Smart Infrastructure: getting more from strategic assets*, in which the term ‘Smart Infrastructure’ is defined as ‘the result of combining physical infrastructure with digital infrastructure, providing improved information to enable better decision making, faster and cheaper’.

If these commentators are correct, Smart Infrastructure will mean more digital technology not just in and around construction sites, but within the as-built works themselves. Contractors will not only be constructing physical infrastructure, but digital infrastructure as well: sensors and other pieces of digital technology will be built into facilities, creating an internet of things whose data can be monitored to improve operation of the physical asset, all being monitored and controlled through software.

It therefore seems likely that in the years ahead, employers will increasingly be looking to contractors to engineer, procure and construct both physical and digital infrastructure under the same contract, to build the Smart Infrastructure (both the hardware and software) of the future.

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### *Industry commentators are heralding the arrival of so-called ‘Smart Infrastructure’*

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This raises the question: are our current standard form construction contracts fit for the Smart Infrastructure of the future, and if not, how should they be adapted?

We are conscious that we are still in the foothills of this debate. The analysis in this article focuses primarily on how a small number of provisions of the FIDIC Yellow Book 2017 (FIDIC Yellow Book) may need to be adapted based on our review of a selection of large IT outsourcing contracts and IT systems implementation contracts, but it could apply equally, in whole or in part, to other standard form construction contracts. We therefore hope our analysis will spark further debate as to how construction contracts more generally should adapt to keep pace with the technological change in our industry and become fit for the future.

### **Are current standard form construction contracts fit for Smart Infrastructure?**

In our view, the answer is no. As we see it, including digital infrastructure within physical infrastructure to build a piece of Smart Infrastructure is likely to enhance the risk profile of the project in three respects. We will look at each of these respects, which we refer to as: (1) enhanced collaboration risk; (2) enhanced time and cost risk; and (3) enhanced business continuity risk.

#### *Enhanced collaboration risk*

We believe that a Smart Infrastructure project has enhanced collaboration risk because, in essence, it is likely to require more collaboration between the employer and the contractor than a physical infrastructure-only project.

Physical infrastructure projects already involve a significant degree of collaboration between employers and contractors, in particular at the beginning and end of the project. Employers spend time developing their requirements and collaborating with potential bidders to explain their requirements to them. Bidders and the eventual contractor then spend time producing increasingly detailed design drawings to meet those requirements and collaborating with the employer or its consultants to have them approved. Both the employer or its consultants and the contractor also collaborate considerably during the handover, testing and acceptance process.

Even despite these processes being in place, collaboration risk of course still manifests itself in physical infrastructure projects. The employer’s requirements may prove to be incomplete, or the contractor’s designs inadequate.

However, adding digital infrastructure arguably heightens the collaboration risk further.

In a project involving both physical and digital infrastructure, both have to be specified and designed. While it may seem that these two processes could be combined and the associated risks could be managed together, it may not be that simple.

In our observation, the development of digital infrastructure, both hardware and software, is often more iterative than the development of physical infrastructure.



It is therefore likely to require more hands-on involvement from the employer consistently throughout the course of the project than a physical infrastructure project. The employer's end users of the infrastructure are likely to need to be in frequent communication with the contractor's team not only at the outset of the project to specify their requirements and during the testing and acceptance process, as is normal for a physical infrastructure project, but also for longer periods during the design development process, to ensure the functionality of the digital infrastructure develops in accordance with their requirements. The collaboration involved in capturing and designing software requirements are notoriously difficult to manage. Many large-scale software-only contracts go wrong and suffer from significant delay, and there is no reason to suppose that this would be less likely to happen if a large-scale software project was proceeding as an integral part of a Smart Infrastructure project. The added complexity is more likely to exacerbate the usual difficulties.

Accordingly, there is an enhanced risk that a failure to communicate and collaborate adequately between the employer and contractor leads to changes to the contractor's scope of work when building Smart Infrastructure as compared to physical infrastructure-only projects and enhanced risk of delay or derailment owing to the software elements of a Smart Infrastructure project.

### *Enhanced cost/time risk*

Estimating the effort and time required for software projects is notoriously difficult. We therefore understand that, when the construction industry is at the 'bleeding edge' of implementing Smart Infrastructure projects, estimating the costs and time implications of any proposed changes to the contractor's scope of works will be similarly difficult.

Physical infrastructure-only projects are of course prone to delays and cost overruns as a result of the employer's requirements changing over time, or the contractor not having taken into account all of the employer's requirements in its designs.

However, in a physical infrastructure-only project, the employer (or its consultants) and the contractor are perhaps both likely to have experience of the parts of a physical infrastructure project liable to delay. They

are therefore also likely to have a feel for the time and cost consequences associated with the engineering being deployed and any changes to the contractor's scope of works made during the course of the project.

However, we consider that, in particular when parties are breaking new ground in the deployment of digital infrastructure within physical infrastructure, the employer and contractor may struggle to assess the extent of delay, disruption and cost overruns associated with making a particular change to the digital infrastructure. This may be an oversimplification but, to put it bluntly, parties may for a while yet be better at assessing the impact of reconfiguring a building or plant layout than adding extra functionality to a piece of hardware or software.

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*when parties are breaking new ground in the deployment of digital infrastructure within physical infrastructure, the employer and contractor may struggle to assess the extent of delay, disruption and cost overruns associated with making a particular change to the digital infrastructure*

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We therefore think that there is likely to be an enhanced risk of unforeseen cost and time overruns on projects to construct Smart Infrastructure.

### *Enhanced project continuity risk*

We also think that Smart Infrastructure projects are more susceptible to project continuity risk, because of the nature of the infrastructure being developed.

A key project continuity risk associated with a physical infrastructure project is what happens after termination. In that scenario, the employer may find it difficult to engage a replacement contractor willing to pick up where the previous contractor left off, unless the employer pays a premium or takes the risk of the previous contractor's work. Sometimes, it is not possible to find a replacement contractor at all.

However, we foresee added difficulties for employers trying to find a replacement contractor for a project involving the development of both physical and digital infrastructure.

Imagine if an employer were to terminate its contract with its contractor

and find itself left with a half built piece of Smart Infrastructure. In that scenario, the employer might not be able to find a replacement contractor to complete its project not for the reasons outlined above, but because no contractor would be able or willing to continue developing a rival's digital technology over its own. This could be because the potential replacement contractor is not permitted to access the rival contractor's source code, is not given sufficient rights to use its rival's intellectual property (IP), or refuses to implement any digital infrastructure except its own proprietary technology. Alternatively, it may be that no contractor is prepared to take on the risk of finishing another contractor's partially documented and incomplete software work-in-progress.

While a replacement contractor may be reluctant to adopt an existing set of design drawings to complete a physical infrastructure-only project, the additional complexities associated with software development in particular create a comparatively greater project continuity risk for Smart Infrastructure projects.

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### *IT contracts tend to provide for a more complicated and collaborative approach to project management*

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In our view, therefore, an important reason why the current standard form construction contracts are probably not fit for the Smart Infrastructure of the future is that they do not take into account these changes to the contracting risk profile for such projects.

#### **How should standard form construction contracts be adapted?**

In light of the three areas of enhanced risk outlined above, it seems to us that there are three key areas in which the provisions of the standard form construction contracts may need to be adapted to deal with the increased presence of digital infrastructure in infrastructure projects. These are: (1) the role of the engineer; (2) the change control mechanism; and (3) the use of IP.

In the analysis below, we discuss our preliminary views as to the ways in which these provisions could be adapted. The starting point for our discussion in each case is a comparative analysis of the relevant

provisions of the FIDIC Yellow Book and the equivalent provisions commonly found in large IT outsourcing contracts, or IT systems implementation contracts. In our analysis below we use the term 'IT contract'. As there are no standard forms for such contracts, this phrase is necessarily a generalisation.

#### ***The role of the engineer***

In the FIDIC Yellow Book, it is the engineer, as the agent of the employer, who has the key role in the management and implementation of the contract. The role of the contractor's representative exists pursuant to Sub-Clause 4.3, but its incumbent does not have powers equivalent to those of the engineer. While the engineer and the contractor's representative can each require the other to attend a management meeting under Sub-Clause 3.8, this is the extent of the parties' contractual obligations to be met.

By contrast, IT contracts tend not to have a role equivalent to the FIDIC Yellow Book engineer. Instead, they commonly prescribe a more detailed contract management system comprising a hierarchy of boards and committees, each made up of representatives from both parties. A common approach is to have a three-tier governance structure: an executive management board, a management board and then an operational board which is split into different sub-committees according to the specific needs of the project.

In addition, IT contracts often envisage both parties appointing a programme manager. These individuals' primary purpose is to facilitate communication between the parties. While they may have some delegated authority to make decisions, more authority is held by the executive management board.

It therefore seems clear that IT contracts tend to provide for a more complicated and collaborative approach to project management. Contracts have a greater focus on the parties discussing progress and making decisions together rather than giving the ultimate decision-making authority to a third party engineer, who under the FIDIC Yellow Book either exercises his authority independently or neutrally (as eg, when seeking agreement or making a determination under Sub-Clause 3.7) or otherwise is deemed to act for the employer.

The difference in approach between the FIDIC Yellow Book and IT contracts could simply reflect the historical origins of the two types of contract, including the fact that IT contracts are more likely to have been negotiated in a supplier friendly environment. And of course while there is no more than a suggestion, as opposed to an obligation, to have a planned timetable of meetings in Sub-Clause 3.8 of the FIDIC Yellow Book, parties to FIDIC Yellow Book contracts do of course typically meet to discuss progress.

However, another possible explanation for the difference is that the work done under IT contracts requires a more collaborative approach to project management and decision-making than that done under construction contracts. For example, the development of digital technology may be more iterative and therefore require more ongoing collaboration to ensure that the technology (and particularly software functionality) meets the employer's requirements than a standard construction project suited to a FIDIC Yellow Book. Indeed, as described above, a key risk which faces parties when implementing an IT project is collaboration risk: the potential for a mismatch between the employer's expectations and the contractor's work product due to poor communication and collaboration between the parties.

Accordingly, it may be appropriate that IT contracts provide for more significant and structured cooperation between the parties than envisaged under the FIDIC Yellow Book, in order precisely to try to avoid or mitigate this risk.

This raises the question: should the management structures of IT contracts be incorporated into the FIDIC Yellow Book in the future?

It is hard to imagine that all employers would be willing to forgo having an engineer. Done well, the role of the engineer can help ensure that the contractor's progress with the works does not get overly delayed by discussions and disagreement between the parties.

However, the role of the engineer as currently provided for in the FIDIC Yellow Book may not be so appropriate, as more and more digital infrastructure is incorporated into the contractor's works. It may be that the parties need

to have a more detailed discussion between themselves as to the employer's requirements as solutions evolve through iteration, or it may be that the engineer simply lacks the technical expertise to make an appropriate determination. This latter problem could in principle be resolved by engaging a panel of engineers of different technical disciplines and/or specifying that the engineer should have certain IT qualifications. However, that in turn could cause governance difficulties and would in any event not resolve the question of whether the certifying engineer is an appropriate model for a software project.

Perhaps, therefore, the FIDIC Yellow Book of the future will provide for a hybrid system consisting of both the engineer and a hierarchy of management boards and committees, to facilitate collaborative working between the parties in the areas where it is required, while retaining a strong decision-making figure to administer the works overall.

### *Change control mechanisms*

In Clause 13 of the FIDIC Yellow Book, the engineer holds the key role in the change control or variation mechanisms. It is usually only the engineer who can initiate the variation procedure. Under Sub-Clause 13.3, this can either be by direct instruction or by first requesting a proposal from the contractor describing the practical consequences of such a variation. The contractor is then only able to object on the basis of a few specified grounds in Sub-Clause 13.1 and through provision of a notice.

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*the role of the engineer as currently provided for in the FIDIC Yellow Book may not be so appropriate, as more and more digital infrastructure is incorporated into the contractor's works*

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By contrast however, IT contracts tend to have more flexible change control provisions. The change control procedure can usually be initiated by either party and it may even provide that one party's change can proceed only with the other party's consent (even when initiated by the employer or purchaser), with occasional stipulations that this consent should not be unreasonably withheld. The hierarchy of management boards and committees

described above enables changes to be discussed and approved at whichever level has the relevant specialist knowledge.

In addition, there is also usually scope for the change control process to be expedited. For example, in situations such as when a systemic weakness is identified or a data breach occurs, it is common for IT contracts to provide for there to be a fast-track system for changes.

Again, it is clear that IT contracts tend to favour a balanced and collaborative approach between the parties, as opposed to the more employer-friendly and engineer-led provisions of the FIDIC Yellow Book.

A possible explanation for this difference could again be IT contracts having developed in a more supplier-friendly market.

But again, the difference may instead reflect the specific needs of a digital technology implementation project. The approach adopted in IT contracts may be appropriate when contractors and employers are at the very forefront of deploying digital infrastructure within physical infrastructure. As referred to above, it may be that in these scenarios, both the employer and perhaps even the contractor may lack the experience or knowledge to analyse the feasibility and the disruption consequences of a specific change. Or it may prove to be the case that the employer's requested change relates to part of the digital infrastructure which the contractor procures from a third party and which it is impossible or disproportionately costly and/or disruptive for the contractor to change.

A change instructed through the standard FIDIC Yellow Book approach in these circumstances, without giving the contractor the chance to discuss it in detail with the employer, may therefore lead to enhanced time and cost risk. As we all know from traditional infrastructure projects, poorly managed changes can lead to a rapid deterioration of the employer-contractor relationship or, in extreme scenarios, its permanent breakdown.

This, again raises the question: should the FIDIC Yellow Book incorporate the more collaborative and balanced change control provisions commonly seen in IT contracts?

The current system in FIDIC Yellow Book enables the employer to drive forward their agenda with minimal scope for resistance from the contractor. Those on the employer side may therefore be hostile to amendments which weaken its

position in this regard. They may also argue that contractors in physical infrastructure projects can also underestimate the time and cost implication of changes, but that is a risk borne by the contractor nevertheless and that should also remain the position for Smart Infrastructure projects.

Nevertheless, perhaps employers will have to retreat from this position somewhat for the purposes of Smart Infrastructure. First, it seems eminently sensible to permit a fast-track change management process in the kinds of emergency security issues referred to above. Second, in the short term at least, contractors who can build Smart Infrastructure may have good arguments to insist on a different approach to change management, one in which the employer and the contractor share the risk associated with the implementation of new technologies for the reasons set out above. Contractors may have the bargaining power too, due to the specialist nature of their services, to insist on a more collaborative and balanced approach to change control.

### *The use of IP*

In the FIDIC Yellow Book, provisions relating to the use of IP are brief, with just a couple of general provisions relating to the matter, primarily in Sub-Clauses 1.10 and 1.11. While Sub-Clause 1.10 of the FIDIC Yellow Book describes the IP licence as being 'transferable', no restrictions on this transfer are given. The notes on special provisions for Sub-Clause 1.10 in the FIDIC Yellow Book acknowledge that additional assignment provisions could be required but no template wording is provided and the IP-related indemnities in Sub-Clause 17.3 are relatively uncomplicated. By contrast, but perhaps unsurprisingly, IT contracts contain a much more comprehensive set of provisions relating to IP.

The approach to the treatment of IP is more nuanced and there are frequent attempts to distinguish between different forms of IP such as between that held by the parties before the contract and that developed for the purposes of the project; and there is often a need to distinguish between contractor-owned IP and third party IP that has been licensed in, and a need to consider risks associated with IP infringement actions and open source software. Comprehensive clauses on assignment, transfer and sub-licensing of IP are also very common.



Control over IP in a termination scenario is further provided for by the existence of ‘deliver-up’ provisions in most IT contracts. These clauses compel the IT supplier to ‘deliver up’ its source code to its customer when leaving the project in certain conditions, enabling the employer to continue to use the source code after termination.

IP is clearly more rigorously provided for in IT contracts than in the FIDIC Yellow Book. However, it seems just as clear to us that the FIDIC Yellow Book of the future should contain a more comprehensive set of IP provisions similar to those found in IT contracts.

The light-touch IP provisions of the FIDIC Yellow Book may have been sufficient until now. But the introduction of digital infrastructure surely necessitates consideration being given to their development.

Just as in IT contracts, it seems inevitable that Smart Infrastructure projects will involve the collaborative development of digital technologies and, consequently, blurred lines of ownership between the employer and contractor. Accordingly, without contractual provisions delineating which IP which belongs to the contractor and the employer respectively, the parties are likely to end up in a dispute over ownership and use.

Similarly, without appropriate ‘deliver-up’ provisions in the contract, an employer terminating a Smart Infrastructure contract could be left with a system which it is unable to understand, operate or salvage. As discussed above, this poses a considerable business continuity risk to the employer.

While an immediate and wholesale incorporation of the IP provisions commonly found in IT contracts into the FIDIC Yellow Book may be excessive, the size of the discrepancy between the provisions in the two contracts should surely be narrowed. Any lacuna could of course be filled by bespoke amendments, but it seems sensible to us that, at the very least, provisions relating to IP ownership and the delivery up of source code should be considered for the FIDIC Yellow Book of the future, to reduce the time and cost parties expend on negotiations.

## Conclusion

This article set out to consider whether our current standard form construction contracts are fit for the Smart Infrastructure

of the future, and if not, how they should be adapted. We have done this by reference to a relatively small subset of provisions within the FIDIC Yellow Book. In addition to the provisions discussed, there are many other provisions which are ripe for similar analysis, such as those relating to payment, termination, the standard of performance and warranties. As stated above, however, the analysis in this article is intended merely as the start, rather than the end, of discussion about how the construction industry’s contracts need to adapt to cope with ever increasing computer software and hardware content within our infrastructure.

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*The light-touch IP provisions of the FIDIC Yellow Book may have been sufficient until now. But the introduction of digital infrastructure surely necessitates consideration being given to their development*

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In many circumstances, the standard form construction contracts may be adequate, especially with the addition of carefully considered particular conditions. However, as the technology content of infrastructure increases, that approach is unlikely to be the best solution, and perhaps not a satisfactory one. Even if historically the provisions of IT contracts and construction contracts have developed relatively independently, the increasing inclusion of technology, both software and hardware, in construction projects seems to be forcing these two worlds to collide. The approach that has evolved in one world is not optimised for the other. Therefore, to avoid fallout from the collision, compromise and assimilation seem advisable.

### Note

- \* The authors would like to express our gratitude to Matthew Lavy of 4 Pump Court for casting his eye over a draft of this article.

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# Technology contracts for construction and infrastructure projects – and how we can do them so much better

This article provides an overview of some of the key problems associated with addressing risk in technology contracts for construction and infrastructure projects. These issues are often rooted in the different risk profiles for technology versus construction projects and the tendency of construction contractors to disregard these differences and contract technology projects as though they were typical construction projects.

## Introduction

The delivery and integration of technology systems is a key element of the scope of modern infrastructure and large construction projects. A toll road requires a tolling system, a railway requires a signalling system, a football stadium requires a communication system, an office building requires a building management system, and so on.

As these technology systems form an integral part of the overall infrastructure being constructed, they are generally included in the scope of the head construction contractor responsible for the design and construction of the infrastructure and are therefore procured and delivered by that head contractor. In addition to these reasons of ‘natural’ scope boundaries, there are usually compelling commercial and contractual reasons for including critical technology components of a larger infrastructure project within the scope of the overall head contractor for the project. These reasons usually boil down to ensuring that the customer has ‘a single throat to choke’. To be sure – and to stretch further our linguistic flourish – there are usually many ‘hairs’ on such an approach, but it is often also the best compromise available to the customer procuring the overall project, and is a common approach as a result.

Many of the technology systems included within the scope of a construction head contractor are commodities, available from the open market on a competitive basis, and so the associated design, implementation, commissioning, and support activities are similarly themselves commoditised. There are therefore many structural similarities between such technology systems and traditional markets for construction goods and services, and as a result they can generally be treated similarly. Experienced infrastructure head contractors are familiar with the delivery of such systems as part of their design and construction scope.

A much greater challenge is posed by those technology systems procured and delivered by an infrastructure or construction head contractor as part of a large construction project that are proprietary to a single supplier rather than commoditised, for which there is no competitive market for the complete technology system life cycle of design, implementation, and operational support services, and consequently for which

suppliers, once appointed, are not easily substitutable. Many, if not most, modern infrastructure and large construction projects have a number of these specialist systems. They frequently present risks to the success of the overall project that are out of all proportion to their size relative to the overall project. Even highly experienced infrastructure and construction head contractors frequently procure and deliver these specialist systems as though they were fully commoditised technology components or even standard construction goods and services and run into myriad avoidable problems as a direct result.

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By way of contrast, we are not referring to technology projects, whether specialist or commoditised, that are procured directly by their ultimate customer, other than to contrast these standalone projects with the scenarios where similar technology projects are procured by a construction head contractor as part of a larger design and construction scope of work. Direct procurement by the end customer is the normal method of delivery for a standalone technology project, and there are a myriad of great articles, books and every other type of resource available on how to procure and deliver these projects successfully (even if these principles are often ignored). It is useful, however, to explore the differences between standalone technology projects and infrastructure technology projects, what works well in both cases and what needs to be changed for construction head contractors to deliver project-critical technology projects successfully.

It is also important to differentiate between commoditised markets, where comparable products compete on price and quality and it is possible to procure functionally equivalent products competitively from multiple capable suppliers, and commoditised products, where it is possible to procure the same products competitively from multiple capable suppliers. The former includes markets for proprietary technology systems where the procurement activity is competitive but once a particular product has been



selected there is only a single supplier that is capable of delivering it – and, crucially, of supporting and maintaining it once it is delivered. The global market for electronic tolling systems is a classic example of such a market. Commoditised products include markets for proprietary systems where not only the procurement activity is competitive but also once a particular product has been selected there are multiple suppliers capable of delivering it. The global market for communications networks design and implementation is a very common example of this type of market. The risks involved in successfully delivering a technology project in a commoditised market are significantly different from the delivery of a technology project comprising commoditised products; not only is the balance of bargaining power between the contracting parties fundamentally different on execution of a contract but so are the parties' options for recovering the delivery project if it runs into serious difficulties. Similarly, the customer's options for continuing to reliably operate a technology system for its full design life if its original supplier is no longer willing or able to support or maintain it are fundamentally different when there is only a single supplier that has the necessary expertise, not to mention the proprietary intellectual property rights that are required to actually carry out the necessary support and maintenance activities to operate the system successfully for the duration of its intended life.

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*The good news is that, in contrast to the usual zero-sum outcomes which are so common in large construction projects, these risks can frequently be improved for all parties*

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Many standard approaches to dealing with the risk of technology projects involve bringing the customer and its technology contractor closer together, to establish the appropriate scope, to minimise misunderstandings and mismatched expectations, improve communication and joint ownership of the project and its intended outcomes, and ultimately speed up identification of risks and issues and optimise their resolution. This greater level of engagement and collaboration is a direct consequence of the increased level of complexity that is typical of a technology project relative to a

construction or infrastructure project of similar size and value.

However, it is frequently not possible to deploy these approaches fully in an infrastructure project, and often it is not practically possible to deploy some of them at all. When contracting parties for an infrastructure project enter into a technology delivery subcontract expecting to deliver the project as they would for a standard procurement, where the technology subcontractor is directly engaged by the ultimate customer, they very quickly run into problems for which they are unprepared and often ill equipped to resolve.

As there are many different threads to this very tangled ball of twine, and exploring them all would take a book, not an article, these problems, and how to avoid them, are the subject of a forthcoming book, *Technology Contracts for Infrastructure and Construction Projects*, to be published by Routledge in 2024. The book explores the nature and sources of these problems, and how current approaches to the delivery of complex technology sub-projects in infrastructure and construction projects exacerbate the risks faced by their overall infrastructure projects, and consequently the risks to every stakeholder in these projects. The authors' experience covers the complete infrastructure project lifecycle of procurement, contracting, design, delivery, operation – and dispute avoidance and ultimately resolution – of complex technology systems in very large infrastructure environments.

The good news is that, in contrast to the usual zero-sum outcomes which are so common in large construction projects, these risks can frequently be improved for all parties, without resorting to the normal construction contracting approach to risk of simply attempting to transfer it to another party. Often this requires coordination between two or even all of the affected parties, but because it frequently produces benefits for all parties the typical zero-sum commercial calculus need not apply and the largest challenges are ones of awareness, timing, and coordination, rather than raw commercial leverage. The solutions generally involve changes in the approach to the delivery of technology sub-projects when there is a construction head contractor involved, including but not limited to changes to the way these sub-projects are contracted.

This article is an overview of some of the key problems, and what you can start doing about them in your infrastructure project.



### The contract: necessary, but not sufficient

The challenges facing the infrastructure sector worldwide are well known. When discussing them, a refrain to be increasingly heard from infrastructure and major projects lawyers in recent times goes something like, ‘I’m starting to think that the contract isn’t the solution!’. The almost inevitable response from construction and technology professionals that don’t make their living by preparing ever more sophisticated contracts is usually, ‘Who on Earth thought that it ever was?’

As always, reality is somewhere in between.

Modern infrastructure projects are incredibly complicated commercial, logistical, and engineering undertakings that comprise many disparate parties with similarly disparate – and frequently conflicting – objectives and constraints. Attempting to deliver such an undertaking without some form of common agreement between each party that has a significant interface with each other would be the height of folly, of each of the commercial, the logistical and the engineering kinds. As modern projects grow increasingly complex, suitably sophisticated contracts are an absolute necessity to help ensure that each party has a common, and enforceable, understanding of their mutual obligations and their expectations to and from each other.

Sophisticated and experienced project delivery experts understand, however, that there is no level of contract sophistication that will actually *solve* complex project delivery challenges, and to expect, or worse, rely on a contract suite as a substitute for project delivery expertise working constructively to address these challenges is to doom a project to early and likely catastrophic failure. This is only one step down from the common approach to construction contracting globally, which is to rely on construction contract suites to resolve the complex disputes which arise when the complex project delivery challenges are not successfully solved.

Suitably sophisticated contract documents are necessary, but not sufficient, for the successful procurement, delivery, and operation of complex infrastructure projects.

By the same logic, inappropriate contracting regimes can, and do, introduce unnecessary risk at all levels: technical, delivery, schedule, and cost. Addressing the mismatches between the construction

contract suites commonly used to deliver complex technology sub-projects in large infrastructure projects and the actual, intrinsic risks and requirements of their underlying technology projects can directly reduce the technical, delivery, schedule, and cost risks of those projects.

### Contractual frameworks, and mandatory flow-downs

Technology projects usually involve delivery of a system: a set of things (hardware and software) working together as parts of a mechanism or an interconnecting (and often variable) network, which is a complex whole. By contrast, physical infrastructure is often delivered as a set of components that only interact with each other in more limited, static and generally well-understood ways.

The technology systems we are discussing are fundamentally important to the success of their overall infrastructure project. This is most obvious where the technology system delivers the revenue stream to the infrastructure project Customer, such as in a toll road. Although less obvious, it is equally relevant for the cashflow on a social infrastructure project, such as a prison or hospital, where ProjectCo will only be entitled to full payment for services rendered if the technology system is available, fit for purpose and achieving its contractually required performance levels.

In an infrastructure project, the Customer generally enters into a design and construct contract with a construction Head Contractor that includes a requirement to build the physical infrastructure including the Technology System. Construction Head Contractors rarely have the specialist expertise and technology licences necessary to be able to deliver the Technology Systems themselves, and the intention of all the parties is that this aspect of the scope will be subcontracted to a Technology Subcontractor.

Although the Head Contractor has the task of negotiating and entering into technology subcontracts for the delivery of the required Technology Systems, the Head Contractor must work within the framework imposed by the Customer. That is because the Head Contractor’s design and construct contract with the Customer often nominates certain technology subcontracts as Key Subcontracts, meaning the Customer imposes mandatory requirements for

various terms and conditions that must appear in such technology subcontracts. Such mandatory terms may also be driven by other project stakeholders, such as the Project financiers. The consent of the Customer (and the Project financiers) to proposed technology subcontracts is often also required; indeed, a tripartite agreement with financiers is sometimes a mandatory requirement. It is important for Technology Subcontractors to be aware that infrastructure Head Contractors generally do not have discretion regarding mandatory terms and must work within the framework imposed by the Customer – that is, the Head Contract and any subcontracts entered into by the Head Contractor must comply with the mandatory flow down requirements, which are often driven by the Customer’s internal and external sources of finance.

Such Technology System Subcontracts sit within a wider framework of project contracts, including long-term support agreements for the Technology Systems during the infrastructure assets’ operations phase, which may stretch decades into the future. The interaction with these other contracts is relevant to understanding the likely restrictions to a Technology Subcontractor’s ability to negotiate changes to the mandatory flow down requirements in a draft Technology System Subcontract.

### **Bankability**

Technology Subcontractors also need to be aware of the commercial drivers at play in any infrastructure or construction project, and particularly in projects which are delivered via Public Private Partnerships (PPPs). These commercial drivers can often be traced back to bankability. They involve the fundamentally different perspectives of the project’s financiers relative to all the project’s other stakeholders with respect to risk and opportunity.

In this context, bankability refers to the infrastructure Project’s ability to support – in other words, to repay – the use of project financing to fund the build and operational phases of the Project. That is, having regard to the Project’s cashflow forecasts and the risks attaching to the Project, whether financiers can reasonably expect the Project to be able to repay the full amount of the finance it requires to construct the infrastructure, on a limited recourse basis and before the Project has any assets beyond its foundational

contractual agreements. Limited recourse means the financier’s recourse is limited to the Project revenues and assets and (possibly) a capped equity contribution from the ProjectCo’s equity investors. During the design and construction phase of the Project financiers will focus on risk which may influence the start of cash flow and how a delay to the start of cash flow will affect the Project’s ability to service debt. Financiers will also want to understand how delay and poor performance may affect underlying agreements. For example, financiers will be focused on mitigation of any risk that delay may trigger termination of the agreement granting ProjectCo a 50-year concession to operate the toll road and earn a reliable revenue stream as a result.

Financiers lend against a certain project profile that has been subject to extensive due diligence and modelling. The due diligence and modelling are intended to check that the Project is sufficiently funded to ensure that in all the likely downside scenarios the Project can achieve completion and financier’s collateral will still have sufficient value, with a margin for safety. The size of the required margin for safety will directly depend on the projected risk profile of the Project. One of these likely downside scenarios involves the possibility that the Technology System is delivered late and this delays the start of the cash flow required to service the project’s debt.

It is important to bear in mind that none of the potential upsides of delivering a successful Project benefit its lenders beyond the repayment of their loans. That is, none of the benefits that result from a Project that is delivered early, or under budget, or that exceeds the contractual performance requirements accrue to its financiers. In stark contrast, the downside risk of a Project that is delivered late, or over budget, or that fails to achieve the required level of quality, can and usually does directly affect the Project’s ability to repay its financiers. As a result of this asymmetrical allocation of upside benefits versus downside risk, project financiers are focused entirely on the Project’s ability to repay its loan within their agreed terms, to the exclusion of everything else. This is a fundamentally different perspective from most of the Project’s other stakeholders, all of whom can generally benefit in some way from at least one of the potential upsides of a well-delivered project.

To secure a change to any mandatory flow down requirement (or any other requirement) in a draft Technology System Subcontract, it will be necessary for the Technology Subcontract procurement process to be entered into early enough that the prospective Technology Subcontractor(s) can review the proposed approach and put forward drafting that clearly identifies the change that is desired so the Head Contractor can seek consent from the Customer and the Customer can seek consent from the financiers.

### Complexity

During the 2000s a number of significant road infrastructure projects in Australia, particularly those requiring extensive tunnels or particularly long stretches of motorway, were delivered as PPPs, often with ProjectCo taking the demand risk for traffic for the completed project. In many if not all of these projects, the development, integration and commissioning of the tolling system proved to be a substantial risk to the success of the overall project, out of all proportion to the size of the tolling system contracts relative to the overall cost of the project. As a result, tolling systems developed a well-deserved reputation for posing out-sized risk to road infrastructure projects, and in subsequent projects received extremely close attention from every major stakeholder in the project, from the state down and from the commencement of procurement all the way through until the point of successful project completion.

This additional and intense focus on tolling system risk resulted in significant improvements to the rate of success of tolling systems subcontracts through the 2010s, as each new project strove to procure recognised tolling systems, rather than ‘innovating’ (which itself became a dirty word), and then carefully avoided specifying functions or modes of operation that were outside existing, and therefore proven, functionality.

As a result, the level of development risk in most tolling systems projects in the 2010s was actively reduced to the absolute minimum necessary to deliver the project.

Software and hardware development risk is all too often not under the direct control of the project parties, as development usually takes place in specialist groups inside the

vendor and usually according to a product roadmap already developed by the vendor. Although this roadmap takes into account the changing needs of the vendor’s markets, by definition it is also subject to the needs of multiple customers and projects at the same time, resulting in competition for attention that is usually solved by selecting either the loudest, nearest, or otherwise most important projects first. This is often not your project at the time when you really need it the most, and therefore adds to the risk factors for your project the risk factors for all the other projects it is currently behind in the vendor’s priority list as well.

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The significant reduction of development risk, which is generally outside of the project parties’ control in any event, allowed the project parties to 2010s road infrastructure projects to focus on the integration and commissioning risks posed by their tolling systems sub-contracts, which generally are under the project parties’ control.

Several other factors which reduced the risk of tolling systems projects in the 2010s relative to the previous decade – not least being the commoditisation of computing power, data storage and communications networks’ bandwidth and latency, which resulted in the ability to solve complex software problems through the quick, simple and reliable means of simply throwing hardware at it. Nevertheless, the all-but-elimination of development risk also meant that these other improvements were less necessary to get the job done than they had previously been. This resulted in greater certainty of time and cost for all project parties, which results in improved margins for all the project contractors up the contracting chain and improved certainty of delivery for the customer that commissioned the project.

This approach to minimising or even eliminating development risk can almost always be applied more aggressively than first instincts suggest. As a customer, you are always faced with the choice of modifying the system that you’re procuring to meet the needs of your organisation or modifying your organisation to align with the way that

system already operates. Sometimes this choice will be best served by modifying the system, especially if it's core to the operation of your entire business and you have a very large business, but rarely do you not have the choice of choosing a more optimum point on this spectrum, at least from a risk perspective.

### Intellectual property

Because all modern Technology Systems comprise critical components and sub-systems that are provided by global third parties who are not willing to accept infrastructure-style risk allocations, it is unlikely that the standard intellectual property rights provisions that govern the rest of an infrastructure project will be effective if applied unchanged to its Technology Subcontracts. Ensuring that there is an intellectual property rights regime for key Technology Subcontracts, that is successfully and effectively aligned from the Project Deed all the way down to those key subcontracts, is an effective way of ensuring that the Project stakeholders really do receive both the rights and the obligations that they require to complete the asset and then operate it over its lifetime.

### Time

Another powerful mitigant to technology delivery risk is simply time. It is employed by scheduling the project activities such that the delivery team has the greatest possible chance of uncovering issues as early as possible, so that they can be resolved in time to complete the Project by the contracted dates. Technology delivery teams understand this intimately, and a mature Technology Project delivery team's schedule will invariably reflect it. Conversely, one of the greatest risks to the successful delivery of a Technology Subcontract in an infrastructure project is frequently the Head Construction Contractor's disregard of that schedule, and the consequent creation of delay risk where none previously existed. Of all the risks discussed in this article, this is the easiest for the Head Contractor to solve. It is also the most difficult for the Technology Subcontractor to manage.

### Market power

Construction Contractors inherently work with and deliver physical inputs and outputs, and consequently are almost always local, even when they form part of a much larger regional or global organisation. Technology Contractors, on the other hand, work largely with digital inputs and outputs, and as a result are able to deliver their goods and services to Customers worldwide; often, their only local resources, if any, are their sales teams. Technology Contractors and Subcontractors frequently have a correspondingly less parochial outlook than Construction Contractors.

One of the most fundamental differences to customers arising from these different postures is the need for Construction Contractors to work within the constraints of their local markets – that is, to be willing to accept market-standard contractual arrangements when they are not able to negotiate a better outcome.

By contrast, Technology Subcontractors are far more able and willing to mandate contractual arrangements on a largely 'take it or leave it' basis, as they are able to enter and leave local markets according to whether those markets align with the Technology Subcontractor's preferred risk profile far more easily than Construction Contractors. The extent to which a Technology Subcontractor delivers a digital product that can be delivered remotely (eg, a cloud project management software service) as opposed to a human service that must be delivered locally (eg, the integration of such a project management system into a customer organisation) directly affects their power in this regard.

Today, almost every Technology System is itself built on complex third-party sub-systems, which are often themselves also provided by global suppliers. This results in limited opportunity to control the direction of feature development, not to mention the correction of defects, in the myriad third-party sub-systems that Technology Projects depend on. This similarly often limits the opportunity for customising those sub-systems to the extent necessary to fully meet the Customer's specific requirements for any given Project, and it almost always completely eliminates any opportunity to pass down risk and/or liability to the third-party provider.



## Integration

Technology Projects often involve the integration of multiple discrete systems, each of which has been designed and developed individually and without regard to the specific other systems with which the Project requires that they integrate. Usually, some of the systems are being delivered through the Project, and some are existing systems with which the new ones must integrate. This divide alone can create complicated interactions of responsibility (which sits with the parties responsible for delivering the Project) versus capability (which exists only in the third parties with the capability to make the necessary amendments to the existing systems), further complicating the overall project risk profile.

These factors lead to very high levels of interface points – and consequently requirements for integration – in Technology Projects, even before external interfaces are considered. By contrast, although the number of interfaces in a typical construction scope may be similarly large, they use standard interface specifications and protocols, such as those found in every construction project's Issued for Construction drawings. The technology sphere innovates far too quickly, and product cycles are far too short, for more than a tiny subset of interface points to become industry-wide standards. Indeed, technology vendors often deliberately avoid standardising interface points, unless the standard that is accepted is that vendor's own specification, as a key plank in the tech market's infamous 'vendor lock-in' market acquisition and protection strategy.

As a result of these factors, design, delivery and integration of bespoke systems requires a level of verification, and subsequent defect identification, analysis and correction, which is not normal in well-delivered construction projects but common even in successful Technology Projects. The 'V'-model of systems engineering is widely used in successful Technology Projects and is an approach that can also help tackle the increasing complexity of construction and infrastructure projects.

These differences in complexity result in dramatic differences in the respective risk profiles of technology and construction projects, and drive significant differences in how their risks are, or should be, treated. Risk mitigation strategies that are frequently used to manage construction risk effectively

can be futile when applied to risks commonly encountered in the delivery of Technology Systems. Attempts to use traditional construction D&C contract risk allocations and mitigations to manage the technology risks in a construction project, often result not only in an inefficient risk allocation but also an ineffective one.

## Practical completion and defects

In an infrastructure project Completion is binary. The infrastructure asset is either complete, in the sense that it meets the prescribed specifications, or it is not. In a Technology Project Completion can be much more elusive for a number of reasons. A first point of departure is that the specifications in an infrastructure project remain largely static, whereas in a Technology Project they can remain in flux and evolve considerably over time as the Technology System is developed to fit the Project, on the one hand, and the Customer understands the implications of its own requirements and adjusts them accordingly, on the other hand. Completion as it's contemplated on signing of the contract is very likely not to be the same as Completion in its eventual form in a Technology Project.

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Extensive use of globalised, third-party components contributes to both these challenges: the first, to correct defects in third-party components; the second, to respond to end-of-life and other major changes in direction in those third-party components which in turn necessitate updates to the primary first-party deliverables.

Bridging these very different sets of expectations requires a general understanding of the demands and limitations operating on each side and developing concepts of Completion which cater for the rigor required by infrastructure projects while maintaining the commercial and practical flexibility demanded by the technology component of the project.

## Operations and maintenance versus support and maintenance

The ongoing operation and maintenance of a Technology System often requires more active maintenance than construction professionals anticipate, not least because it often requires many more specialised skills and external organisations, and because technology product and service obsolescence cycles are considerably shorter than for infrastructure assets. Accordingly, the support and maintenance of a Technology System has very different considerations from the operations and maintenance of physical infrastructure.

Although the operations and maintenance of infrastructure are often contracted separately, it is also common for them to be contracted as a combined scope to an Operations and Maintenance (O&M) Contractor. This is in large part because there is a large market of service providers offering both operations and maintenance capability and capacity, and there are efficiencies in both cost and quality of outcome to be had by contracting both to the same service provider. O&M Contractors are specialists in subcontracting the disparate skills (and capacity) to deliver the broad operations and maintenance scope for a large infrastructure asset.

In contrast, the operation of specialist technology systems is more commonly contracted separately from their support and maintenance, as the former can be contracted to more commodity suppliers whilst the latter often requires specialist expertise. The market for specialist expertise is both more limited in capacity

and more expensive in offerings, and consequently better value for the Customer can often be obtained by contracting them separately. Indeed, the support and maintenance of specialist technology systems often requires proprietary knowledge and expertise that the supplier of the system does not licence to any other service provider, limiting the market for support and maintenance service providers for that system to only that supplier.

## Conclusion

This article provides an outline of how to procure and successfully deliver complicated, project-critical Technology Systems from specialist Technology Sub-contractors, within the scope of infrastructure and construction projects. It explores common issues which contracting parties run into, and how to minimise or even avoid them. It is about how infrastructure customers, construction head contractors, and technology sub-contractors can reduce the risk on their projects and deliver the complex technology systems required by today's infrastructure projects on time, with lower risk, higher quality, and lower overall cost.

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## ‘What’s all the buzz?’ Drones in the construction industry

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The use of drones in the construction industry is not a recent development, but the increasing frequency of use and rapid changes to technology continue to give rise to legal risks for users. This article sets out some of the core uses of drones in construction, the legal risks and considerations of drone use in the UK and thoughts on the future of drone use and its potential future impact on construction projects.

## Introduction

Over the past decade, drones have transformed from being a rarely used curiosity to a necessary cost-saving innovation and powerful tool which is deployed almost as standard practice across a number of industries, including in particular, the construction, energy and infrastructure sectors. Today, drones are used regularly by construction companies at all stages in the project cycle: from digitising construction sites for the purposes of improving planning and design, operations and recording progress on projects,<sup>1</sup> to performing contractual obligations during Covid-19 lockdowns and *force majeure* situations, to virtual site visits and visual aids in formal proceedings. For example:

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*One of the key areas in which drones can be used, both by employers and contractors, is in the pre-construction planning stage of a project*

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- In July 2022, the Balfour Beatty and Vinci joint venture (BBV) estimated that it would save £50,000 a year by carrying out faster and cheaper site surveys using drones.<sup>2</sup> The BBV has been tasked with designing and building the largest section of the first phase of the new HS2 high speed rail line in the UK, being the largest infrastructure project in Europe and the most important economic and social regeneration project in decades. The savings estimate has since been updated, forecasting even greater savings by using drones of £5m over five years.<sup>3</sup>
- According to DroneDeploy's 2022 *State of the Drone Industry* survey, 69 per cent of construction respondents planned to expand their use of drones beyond aerial mapping, and 54 per cent considered drones would become increasingly common by 2024.<sup>4</sup>
- By 2030, drone use in the UK construction and manufacturing sector is projected to result in costs savings of £1.6bn, with the full impact of drone adoption in the sector projected to result in an uplift of £2.8bn in GDP.<sup>5</sup>

The increasing frequency and more diverse applications for using drones, combined with the acceleration in technology and potential changes in regulation, mean that drone-users must navigate a minefield of

legal risks. This article will discuss these uses as well as the legal risks and considerations which drone-users should be aware of.

## Core uses of drones in construction

It is evident that the use of drones is on the rise, but what are the key areas in which drones are currently used in construction?

### *Pre-construction planning*

One of the key areas in which drones can be used, both by employers and contractors, is in the pre-construction planning stage of a project. Employers may be able to use aerial images and data captured by drones to map out the site (or sites) for a potential project before even taking the step of allocating land. Traditionally, this has been used by state or state-owned employers, who have access to a wider range of options for situating their projects. However, such data could also be used by any employer in assessing the layout of a project within the footprint of a specific site, or choosing between competing site options. In due course, it may be that such data is included as part of the package of survey information provided in a tender process, thereby mitigating the cost and time spent with competing teams of tenderers visiting the proposed site to collect data and identify key areas of concern. Clearly, the use of drones is unlikely to be a complete substitute for a site visit and/or conducting site surveys in most projects, particularly where bidders are being asked to assume the risk for ground conditions and/or owners accept no responsibility for the accuracy of the surveys and other information provided to the bidders. In such cases, bidders would be well advised to obtain more specific information from samples and other 'on the ground' data in order to be able to verify the information that has been provided and price the risks. However, the use of drones may nevertheless help to cut costs by reducing the size of the team required to attend. The use of drones therefore has the potential to create a more level playing field and/or encourage more tenderers to submit bids in projects where the costs of conducting such surveys and collecting the necessary information to be able to prepare an informed bid may otherwise have become prohibitive.



Similarly, a preferred bidder and/or the ultimately successful contractor may later use drones for more detailed planning ahead of construction, particularly for linear projects covering large distances (such as roads and railways) or projects in remote and less accessible environments. For example, the contractor may use drone data to construct maps of the project site, including 3D plans, topographic mapping overlay and layout mapping. In addition, drone data may assist with estimating the volume of available materials if used with comprehensive sampling, by comparing area size (including vertical measurements) to samples taken within the set area that was measured, mapping the distances for construction (such as for haulage roads), and identifying risk zones within the project site. This may allow for a more accurate assessment of costs, reducing the need for a large mitigation pot of costs and providing for wider financing options.

### *Monitoring progress*

Once construction commences, drones have typically been used to monitor progress at the site. For example, drone data could be used to map out actual progress of construction over pre-prepared site drawings to ensure that the work is being completed in accordance with the original plan and agreed layout. If progress shows that the construction has gone off plan, the contractor will have a chance to promptly address this and assess why the planned construction has changed.

Drones may also allow contractors to spot errors more quickly, particularly in harder to reach areas (including elevated site locations and deep foundations where issues such as honeycombing may occur), and ensure they can be rectified before costs escalate too much or the errors become irremediable. The contractor may also use drones to monitor and map out repairs contemporaneously and design the remedial schedule in a way to minimise delays to completion. The use of drones may also save on the costs of additional scaffolding (which workers would otherwise rely on to monitor hard to reach areas), manpower for review that can be deployed on other parts of the project, and the costs of other equipment for monitoring.

Employers may also use drone data to maintain their own records, particularly

if there are concerns about a dispute over performance or delay. Keeping clear and accurate records not only provides evidence in the event of a dispute but may also help to prevent the dispute escalating, in view of the multiple viewpoints that can be captured in drone imagery and date/time-stamps for accuracy, which may be persuasive to the other party.

### *Security and safety*

Finally, drones may play a part in increasing security and safety at the project site. Common site accidents for personnel are falls, and, as noted above, the use of drones may replace the need for personnel to monitor and inspect areas that carry more risk at the site. Similarly, the use of thermal drones may be used to monitor equipment for overheating or keep a keen eye on any other risk of fire that may break out at the site. This will allow a quicker response time to incidents, and in time drones may be used for quick deployment of safety resources in the event of fire or accident. This will be particularly beneficial in remote or difficult terrain where road transport is more perilous or a slower route to get to the incident site.

Drones may be used to monitor the location and state of equipment on the project. At all sites, but particularly large sites, monitoring the location of various pieces equipment can be a time consuming task. Cross-tracking the location of equipment via drones against a database of equipment being used on the project can assist in quickly locating equipment. This not only allows for easier and more efficient management of equipment, but may also allow teams to rapidly review the condition of the equipment for required repairs or permanent removal. In addition, using drones to regularly monitor equipment could discourage, and assist with solving issues relating to equipment theft.

### **Legal risks and considerations**

While considerable benefits can be reaped from using drones on construction projects, drone users should bear in mind the legal risks and considerations which come with such use.

First, data privacy and confidentiality issues are likely to come into play where drones

are equipped with cameras or sensors to take photographs, record video footage or otherwise capture data over a certain geographical area (eg, as part of layout mapping) or over a working site (eg, to monitor works progress during construction). The use of such drones, particularly where they are operating from a high vantage point and in populated areas, is likely to result in the inadvertent collection of data from individuals who are not the intended focus, which may infringe on their right to privacy and other rights relating to personal data.<sup>6</sup>

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*While considerable benefits can be reaped from using drones on construction projects, drone users should bear in mind the legal risks and considerations which come with such use*

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Crucially, the data may include personal data which may result in individuals being identified. This could include, for example, images of vehicle licence number plates, video footage showing recognisable clothing and body language of an individual (even where their face is not visible), or audio, such as a recording of their voice. Such data is more likely to be subject to strict regulation. Certainly in the UK and in the EU, the GDPR (and its British equivalent) applies where personal data is collected or processed. In the US, data privacy regimes differ across state lines and will need to be considered by state.

In many jurisdictions, it will therefore be important to assess how best to mitigate the risks of interfering with data protection rights or privacy, for example by providing a privacy notice accessible to individuals in the relevant area informing them that a drone is in use, and adjusting the flight path taken by the drone and the height at which it is flown. Drone operators will also want to conduct a data protection impact assessment and consider: the equipment and technology used on the drone; the quality of the data being recorded; the extent to which the image or sound resolution is necessary for the purpose of the task in hand; whether the recording can be stopped and started mid-flight; and, how such data is stored and managed.

As with any other electronically stored data, data stored on drones is susceptible to being hacked (electronically) or stolen (physically). Any drone operator should

therefore ensure there are appropriate physical and cyber security measures in place to protect such data. Otherwise any hacked or stolen data might not only compromise confidential information but also potentially expose the drone operator to liability (eg, if personal data or trade secrets belonging to a third party are leaked). Any data breach will take on particular significance when the drone footage or recordings contain personal data, particularly in jurisdictions such as the UK and the EU where the party in control of the drone will be subject to a stringent data privacy regime.

The use of drones over or near residential areas may also lead to tortious claims for trespass or nuisance. It is therefore important to conduct assessments prior to planning any drone flight to ensure minimal interference with third-party properties and relevant airspace. To mitigate the risks of such claims, drone operators could seek first to obtain permission from neighbouring landowners before flying over their land; navigate the drones firmly within the boundaries of the relevant site where possible; or program or pilot the drone to avoid unnecessarily taking photographs or otherwise capturing data in relation to neighbouring properties and their residents.

It is therefore important to ensure that the pilots responsible for carrying out the drone flights are well-trained to have regard to the above considerations. This is in addition to being properly authorised to operate a drone in accordance with the relevant national or regional requirements (eg, in the UK, drone pilots must be registered with the Civil Aviation Authority (CAA)). This is key to avoid falling foul of local legislation as well as minimising the risk of negligent piloting or accidents which could give rise to liability for drone operators (eg, property damage or personal injury to third parties).

As commercial drone use is a relatively new development and the law regarding drones and other unmanned aircraft systems continues to be updated regularly, it is important to keep up to date with the latest regulations. Contractors and employers who are prepared to use drones should further ensure that they have thoroughly checked local regulations and all applicable legislation before operating any drone flights to avoid any unintended breaches of the law, and carry out the appropriate risk assessments (including any required under data privacy regulations).

Looking ahead

A key trend we expect to increase is the combination of drone use with other technology. This can already be seen in, for example, the overlay of CAD drawings over drone created maps of the site. However, other industries are developing technologies that may be replicated. One key example is Amazon’s use of drones alongside driverless vehicles for delivery. The construction industry may see a combination of drone use alongside automated equipment to carry out site tasks, particularly to assist with more dangerous works, with risk to operators and for tasks that need to be completed in areas with difficult access routes.

Another example of a trend we may see is the replacement of cross-site road transportation of smaller equipment and materials by drones. This is likely to be used for journeys involving treacherous terrain, steep slopes, higher ground, or other hard to reach site locations. Drone use not only saves on fuel costs but is also arguably more environmentally friendly, assisting the construction industry in reducing its carbon footprint. However, any technology used will need thorough testing in a variety of environments to ensure there is no risk of accident when heavy equipment or materials are being carried airborne over the site. Any mishaps may have severe consequences including worker injury and potentially significant property damage, for example if any items were dropped on explosive materials.

Finally, we expect to see an increase in the regulation of drones both in the UK and abroad, as incidence and diversity of drone use increases. We also look forward to greater clarity in respect of the interpretation of existing legislation as the body of case law develops. A key consideration for all drone operators will be to keep abreast of changes to regulations, particularly in light of the differences in approach depending on jurisdiction. Given the rapid and continuing adoption of drones for use on

construction projects today, a clear and coherent approach in addressing privacy and safety concerns specifically with respect to drones will be welcomed by employers and contractors alike.

Notes

- 1 94 per cent of respondents use drones as their primary tool for digitising their job site, with 71 per cent naming ‘improved planning/design’ as their main objective, followed by ‘improved operation’ at 59 per cent, then ‘improved documentation’ at 58 per cent. See DroneDeploy, ‘DroneDeploy’s State of the Drone Industry Report 2022’, available at <https://www.dronedeploy.com/resources/ebooks/state-of-the-drone-industry-report-2022> accessed 16 April 2023.
- 2 Tiya Thomas-Alexander, ‘Drone tech saves Balfour JV £50,000 a year on HS2’, *Construction News*, 6 July 2022, <https://www.constructionnews.co.uk/contractors/balfour-beatty/drone-tech-saves-balfour-jv-50000-a-year-on-hs2-06-07-2022> accessed 16 April 2023.
- 3 Anthony Davis, ‘Balfour Beatty VINCI saves £5 million on HS2 development using DJI Drones’, *Highways Today*, 8 March 2023, <https://highways.today/2023/03/08/balfour-beatty-hs2-dji> accessed 16 April 2023.
- 4 DroneDeploy, see n1, above.
- 5 Note these figures are expressed in 2021 prices. See PWC ‘Skies Without Limits v 2.0’ 2022, <https://www.pwc.co.uk/intelligent-digital/drones/skies-without-limits-2022.pdf> accessed 16 April 2023.
- 6 These include the rights recognised by the UK GDPR (the right to be informed, the right of access, the right of rectification, the right to erasure, the right to restrict processing, the right to data portability, the right to object and rights in relation to automated decision making and profiling).

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Credit: kossmoss

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## Big data arrives in the construction industry, and it's only getting bigger

Conflicts in the construction industry are being shaped by new and growing sources of data.

Be sure your hands are on the controls.

This article considers big data in the construction industry and the tools which businesses will use to generate process efficiencies and cost effectiveness against the backdrop of the risks associated with storing and maintaining the data.

**L**ike many sectors, the construction industry has seen a tremendous increase in the use of technology in recent years for health and safety, project planning and management, progress monitoring, contract maintenance and management, and cost control. Two common threads have evolved as a result. First, these technologies generate electronic data – lots of it. Second, this electronic data

has the potential to become an increasingly critical area of focus in conflicts regarding such issues as construction delays and cost overruns caused by delays and other factors. Where these issues occur, legal disputes are potentially quick to follow. The construction industry, and legal advisors, are increasingly aware that where advanced technologies gather and maintain their data, the question



is increasingly being posed to them as to whether or not they understand what is held in their electronic data and how best to use it in their own favour. The electronic data will contain a dizzying volume of useful and not so useful information that will need to be analysed by experts and presented in an arbitration or a courtroom where there is a dispute. Inevitably, this data will become a key factor in disputes that could be worth millions or even hundreds of millions of dollars.

The collection, processing, and hosting of electronic data in the event of a dispute (eDiscovery) is a relatively mature global industry and for many years has been focused on more traditional office document types such as word documents and spreadsheets, as well as communications data (predominantly email). In recent times, the growth of different technologies producing non-text data has seen the available technology adapt to deal with the resulting requirements. In construction in particular, a new crop of automated or automatic electronic data-collectors that have proved themselves valuable in project management are also producing data which could become relevant in a dispute scenario, and therefore should be taken into account when planning for an eDiscovery exercise. For example, drones are being used to survey construction sites, with video transmitted to stakeholders anywhere in the world.<sup>1</sup> These videos can capture not only what's happening at a given moment, but allow comparisons over time to help in monitoring progress. In future, we are likely to see an increase in advanced drone capabilities such as thermal imaging and site mapping, both adding to the types of data that may be demonstrative in a conflict. Wearables such as hardhats are now no longer just providing physical protection to the wearer.<sup>2</sup> 'Smart hardhats' are now being used to monitor employee location and productivity, as well as safety applications with their ability to alert managers or emergency responders in the event of an accident or other incident and provide employees' exact locations. Advanced robotics increasingly play a role, too.<sup>3</sup> Robots can be used for physical building processes such as laying bricks and other repetitive tasks, and also for site monitoring: a robot can 'walk' an entire site, relaying detailed video and progress information back to head office without the need for a human companion. ID card and other access-related technologies keep track of who comes and goes on a jobsite.

Data collected by technologies like these can answer questions like: Were there enough workers on a task? Who were they? Were they doing what they were supposed to be doing? Did they have the right equipment and materials? These questions and others – answerable by data collected and maintained – can provide information on delays and increased costs valuable to either side in presenting their case in a dispute.

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*Businesses must begin to think in terms of this data being used in ways that could either save or cost them millions*

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Looking towards the near future, we expect these new and diverse types of electronic data to be aggregated in existing common data environments (a platform that centralises data from different sources) for ease of maintenance, security, and analysis. When a party makes requests for documents, data from these technologies will need to be considered alongside the more traditional data sources when litigation is anticipated, a litigation 'hold' may be requested, with potential litigants expected to comply. This means that appropriate data security, storage, and chain-of-custody rules will apply. The point is that it is no longer enough for construction businesses to use these new tools to generate process efficiencies and cost effectiveness; the cleverest businesses will understand that their electronic data is not something to be left and forgotten. If it is mismanaged and/or neglected, it will lead to negative outcomes. Instead, this data and its contents should open whole new methods to gain a key or critical advantage when disputes occur. Businesses must begin to think in terms of this data being used in ways that could either save or cost them millions.

### **Benefits of embracing new technologies**

Whilst there are considerations to be aware of when embracing these new technologies, the examples of benefits can bring critical value.

#### *Increased productivity*

Modern technology can automate repetitive and sometimes dangerous physical tasks,

freeing up time for employees to focus on project management and strategy. While this can be a change in team structure, it can drive greater efficiency, safety, and improved morale.

### *Improved health and safety*

Many of these technologies are designed with health and safety front of mind, with other benefits presenting themselves as useful side effects.

### *Pre-empting potential issues*

Harnessing the data generated by new technologies and applying technology such as machine learning and Artificial Intelligence (AI) can help you to identify patterns that may be missed by humans. Recent examples we have seen include patterns and frequency around email communications that shed light on unusual and illicit comms traffic to outside players and manufactured invoicing benefitting individuals at the detriment of the client. We have also seen the technology cast a spotlight on purchasing inefficiencies that included us demonstrating that the client had a number of automated repeat orders, at great expense, for items that were no longer being used in their service offerings. This technology, when used in the correct way, can be extremely powerful and will help spot potential issues before they become problems and allow for proactive solutions to be put in place, avoiding delays and reducing overall cost.

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*It is important to be conscious of how any data generated is stored and maintained – not only for resolving a future conflict, but for analysis by experts who can use the data as a basis for their evaluation*

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### *Improving decision-making*

Modern site technology can provide real-time data and insights, allowing for more informed decision-making.

### *Competitive advantage*

The move to new technologies is gathering pace, and slow adopters risk getting left

behind by their competitors. As highlighted throughout this article, the data generated from these technologies can be extremely beneficial both for the success of a project, and in the event of a dispute.

### *Improved work-life balance*

In some roles, this technology can enable remote working, flexible schedules, and other benefits that can improve employees' work-life balance. This can lead to greater job satisfaction, lower stress levels, and improved mental health.

### **Considerations on data storage and management**

It is important to be conscious of how any data generated is stored and maintained – not only for resolving a future conflict, but for analysis by experts who can use the data as a basis for their evaluation. The following points are not unique to the data generated by construction technology, but are worthy of consideration.

#### *Data integrity*

Data should be stored in a secure manner to ensure that the information is accurate, complete, and reliable. This includes proper backup procedures, version control, and access controls to ensure that only authorised personnel can make changes. Additionally, are there logs or audits that contain details of the physical device assets?

#### *Data retention*

The retention policy for the data should be established and followed to ensure that data is kept for the required length of time in compliance with legal and regulatory requirements. In my experience, this point can often be neglected. Too frequently, business or IT policies are not adhered to or maintained because of many reasons. It is frequently the neglected sibling to other policies, processes and/or business needs that are deemed more pressing or important when it comes to time or resource allocation. This is a mistake that always has negative effects on dispute resolution.

### *Metadata*

Metadata provides information about the data, including when it was created, who created it, and any modifications made to it. Traditional information sources can be critical in establishing the authenticity and integrity of the data in a legal dispute. As newer technologies develop in the construction space there are likely to be new types of metadata to consider which will create an interesting challenge.

### *Access controls*

Access to the data should be restricted to authorised personnel, and appropriate access controls should be in place to ensure that the data is only accessed for authorised purposes. This includes access to the physical storage media and access to the data through software systems. It is important to remember also that the data collected may be considered individuals' personal information and therefore subject to data privacy regulations. Know what those regulations are and what compliance protocols should be adhered to.

### *Data backup and recovery*

Regular backups of the data should be performed to ensure that the data can be recovered in case of loss or corruption. The backup process should be designed to preserve the integrity of the data and provide a complete and accurate copy of the data. This is another area where we often encounter neglect when collecting and analysing clients' data. Again, this only leads to negative outcomes if the data is not correctly backed up and stored with its future integrity in mind.

### *Preservation of evidence*

The data should be stored in a manner that preserves its evidentiary value. This includes preserving metadata, ensuring the integrity of the data, and protecting the data from alteration or destruction. In a dispute scenario, a legal hold may need to be placed on data to ensure it is not deleted as part of normal data management procedures.

### *Documentation*

Proper documentation should be maintained to provide a clear and complete record of the data, including its source, processing, and any analysis performed. This documentation can be critical in establishing the reliability and validity of the data in a legal dispute or analysis.

### **Change is continuous**

Expect continual changes in the technology that will provide even more complex data in the future, and with those changes will come more complex regulation and requirements placed on its users.

As the use of technology in the construction industry continues to mature, we should expect continual changes which will provide even more complex data in the future. As technology continues to advance, new types of data will emerge, and existing data sources will become even more complex. Being nimble in recognising these new complex data types will be key.

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*Navigating these complex regulations and requirements will require businesses to invest in robust data governance policies and procedures*

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The more 'smart' and online devices become, the more data they will generate. This data will be more diverse and complex than before, creating new challenges for eDiscovery and other data professionals.

As a result, we can also expect complex regulation and requirements to be placed on users of these technologies. Governments are already introducing new regulations to protect personal data (such as GDPR and CCPA), and these regulations are likely to become even more complex as new data sources emerge.

Navigating these complex regulations and requirements will require businesses to invest in robust data governance policies and procedures. This will require a deep understanding of the data they collect, where it is stored, and who has access to it. It will also require ongoing training and education to ensure that employees are aware of their responsibilities and obligations when it comes to data privacy and security.

## It can pay to be proactive

There are experts in construction technology and law who may be able to help you establish practices to ensure data security in all areas of your business. Being proactive about your data governance and security can save you time and money when a dispute happens.

Establishing practices and policies around good data hygiene and security is paramount for businesses to ensure that all relevant data is properly preserved and accessible in the event of a legal dispute. This can help avoid the costs and delays associated with data discovery and the engagement of experts and lawyers.

In an ideal world, risks can be identified and mitigated before a dispute happens; having a robust data governance and security programme is a key part of achieving this aim. By implementing best practices for data management, businesses can reduce the risk of legal disputes, improve their overall operations, and save time and money.

That said, even with the best data governance and security practices in place, legal disputes can and will still arise. In such cases, having a solid understanding of the data that is relevant to the dispute and the ability to access that data quickly and accurately can be critical.

It is obviously true that data is crucial in all areas of business, and this is increasingly true for the construction industry. While data security is critical for construction firms, those firms that have moved on from merely ensuring their data's integrity, software/hardware maintenance and correct procedures around governance, and into how best to extract the key facets of their data are primed to see the benefits of this work during a dispute.

## Conclusion

The construction industry is not immune to the technological change taking place across business and society, and in fact in some ways is playing catch up. The accelerating adoption

of technology to improve health and safety, speed, and efficiency should be embraced, as should the value of the data created by it.

The creation of this data brings its own challenges. It needs to be stored and managed correctly and securely, data privacy needs to be carefully considered, and it could now play a major role in the outcome of any project disputes.

In my view, however, the benefits outweigh the risks, and I look forward to seeing continued adoption growth as an increasing number of technologies appear.

### Notes

- 1 Jacqueline DeCamara and Daniel D McMillan, 'Use of Drones on Construction Projects: Legal and Contractual Considerations' (American Bar Association, 9 December 2019), see [https://www.americanbar.org/groups/construction\\_industry/publications/under\\_construction/2019/winter2019/use-of-drones-on-construction-projects](https://www.americanbar.org/groups/construction_industry/publications/under_construction/2019/winter2019/use-of-drones-on-construction-projects) accessed 16 April 2023.
- 2 John Biggs, 'The Smart Hard Hat is Doing More than Keeping Workers Safe' (Procore, 15 March 2021), see <https://www.procore.com/jobsite/the-smart-hard-hat-is-doing-more-than-keeping-workers-safe> accessed 16 April 2023.
- 3 See, eg, 'Spot for Construction: Automate on-site data capture with Spot, the agile mobile robot' (Boston Dynamics) [https://www.bostondynamics.com/solutions/construction?utm\\_term=construction%20site%20monitoring&utm\\_campaign=LMG\\_NonBranded\\_Industries\\_Construction&utm\\_source=adwords&utm\\_medium=ppc&hsa\\_acc=2933450915&hsa\\_cam=14547854157&hsa\\_grp=128555047564&hsa\\_ad=544237769933&hsa\\_src=g&hsa\\_tgt=kwd-295875414849&hsa\\_kw=construction%20site%20monitoring&hsa\\_mt=b&hsa\\_net=adwords&hsa\\_ver=3&gclid=Cj0KCQiAorKfBhC0ARIsAHDzlsiQqcbzleP9bmsiqTBSoh8h9MohP-CA7fVp5ZBptOREWs1dIzibFgaAsNwEALw\\_wcB](https://www.bostondynamics.com/solutions/construction?utm_term=construction%20site%20monitoring&utm_campaign=LMG_NonBranded_Industries_Construction&utm_source=adwords&utm_medium=ppc&hsa_acc=2933450915&hsa_cam=14547854157&hsa_grp=128555047564&hsa_ad=544237769933&hsa_src=g&hsa_tgt=kwd-295875414849&hsa_kw=construction%20site%20monitoring&hsa_mt=b&hsa_net=adwords&hsa_ver=3&gclid=Cj0KCQiAorKfBhC0ARIsAHDzlsiQqcbzleP9bmsiqTBSoh8h9MohP-CA7fVp5ZBptOREWs1dIzibFgaAsNwEALw_wcB) accessed 16 April 2023.

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# Dispute boards and the Olympic Games: a tried and tested method of dispute avoidance

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The Olympic Games is an economical, logistical and legal feat which tests a nation's ability to deliver quality infrastructure in a timely manner on the world stage. A host city is uniquely placed under immense pressure to have all the necessary facilities, venues and other associated construction work completed on time for the sporting events to commence. Delay is not an option and every government decision is openly scrutinised in the public eye. However, as all in the construction industry know, undertaking major projects is rife with risk in terms of delay, defects, cost blowouts and a raft of other unexpected consequences. For a host city, it is imperative that the suite of contracts it enters into to build the venues, facilities, and infrastructure contain appropriate dispute avoidance and resolution mechanisms to manage the risks, and inevitable disputes, as and when they arise. Based on a history of success, this article proposes that dispute boards, in whichever form, are most appropriate for the avoidance of disputes. They are also useful for resolving disputes that cannot be avoided without the need have recourse to formal dispute resolution processes such as public litigation or arbitration.

## Introduction

In Australia and internationally, dispute boards (DBs) have been used successfully on a number of construction projects. DBs, in their various forms, are an alternative to the standard dispute resolution processes that parties often include in their construction contracts. Although used less frequently, DBs when established and utilised appropriately, are a highly effective mechanism for avoiding (and where necessary resolving) disputes, providing a project with the optimal chance of successful completion within time and budget.

Importantly, DBs are a creature of contract. The contract prescribes the number of neutral third party members on the panel, the rules and procedures the panel will apply and follow, and the scope of their role during the project's lifetime.<sup>1</sup> In general, members of a DB meet to review the project's progress, provide recommendations to resolve issues (often in an interim and non-binding manner) and proactively assist the parties to avoid formal disputes. As discussed later in this article, the effectiveness of a DB hinges on, among other things, careful consideration of the structure of the DB, the parties trusting and investing in the DB, and appropriately skilled members being selected to the panel.

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### *The use of DBs in London and Rio, and the success achieved, is an appropriate platform against which to consider their continued and future use in the 2032 Brisbane Olympic Games*

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An array of different construction projects have used DBs. According to the Dispute Resolution Board Foundation (DRBF), there have been 107 projects totalling AUD59.2bn (approx. US\$39.71bn) in Australia since 1987 that have used a DB in some format.<sup>2</sup> Within Australia, use of DBs has increased significantly in the past decade, particularly in New South Wales and Queensland. Internationally, given the popularity of the International Federation of Consulting Engineers (FIDIC) contracts, which have DBs in its standard terms, DBs are more commonplace.<sup>3</sup>

Relevantly, for the purpose of this article, DBs were used in the contracts for the London and Rio Olympic Games in 2012 and 2016 respectively. The third part of this article details how DBs functioned at

those Olympic Games and the unique way that they were designed to be most effective. The use of DBs in London and Rio, and the success achieved, is an appropriate platform against which to consider their continued and future use in the 2032 Brisbane Olympic Games.

Since the International Olympic Committee named Brisbane as the host of the 2032 Olympic and Paralympic Games in July 2021, Queensland has and continues to carry out significant work in preparation. An Olympic Infrastructure Agency is expected to oversee the developments that include rebuilding and improving existing stadiums, and constructing five new stadiums. It is estimated that most of the capital investment will occur in the second half of this decade, averaging AUD800m to AUD1.1bn annually between 2027 and 2030.<sup>4</sup> On its own, the city's major stadium, the Gabba, will cost AUD1bn to be rebuilt so that it is ready for the opening and closing ceremonies.<sup>5</sup> Work is also already underway on the Brisbane Metro – a fully electric, high-capacity train network linking the city to the suburbs to make it easier to connect people with the sporting venues hosting each event.<sup>6</sup> Victoria Park is also expected to be transformed, and a number of 'Green Bridges' will be constructed to improve access and enhance movement around the city.<sup>7</sup> Ultimately, the Brisbane 2032 Masterplan will require cooperation from all levels of government and the private sector to ensure a successful Olympics.

Cooperation, collaboration and dispute avoidance in Olympic Games projects is crucial. The Olympic Games is uniquely challenging. There is an immovable deadline, an inordinate number of people and contractors are required to ensure completion, and the projects are scrutinised globally.<sup>8</sup> The challenge for Brisbane in 2032 is further heightened by the current climate of the construction industry, which is plagued by global supply chain issues and the rising costs of materials and resources. It is in that context that the developments in Brisbane are primed for disputation.

Accordingly, the final part of this paper explores the use of DBs as a principal mechanism for dispute avoidance, and where necessary, resolution in the 2032 Olympic Games in the various contracts with the contractors that will ultimately be delivering the projects on the ground.



## A snapshot of DBs: the 'what', the 'why' and the 'how'

### *What are DBs?*

A DB is a contractual mechanism for real-time dispute avoidance and rapid dispute resolution. Professor Paula Gerber refers to DBs as a kind of dispute avoidance process, which fundamentally act as a 'circuit breaker to prevent escalation of conflicts'.<sup>9</sup>

There are various forms of DBs, including Dispute Resolution Boards, Dispute Avoidance Boards (DABs), Dispute Adjudication Boards and FIDICs Dispute Avoidance Adjudication Boards to name a few. This article refers to the general umbrella term of DBs throughout.

A customary DB comprises a panel, usually three, of neutral third party experts appointed by the parties at the outset of the contract. The DB members meet regularly during the course of the project, irrespective of whether any dispute has been referred to them, to review project progress and facilitate early resolution of issues as and when they arise before escalation into formal disputes.<sup>10</sup>

Depending on the nature of the role of the DB stipulated in the contract, the parties can request the DB to provide informal decisions during the project. The DB can also be available to provide more formal recommendations, or decisions, on the likely outcome of any dispute. The preference in Australia is for DBs to provide interim binding decisions.<sup>11</sup>

Significantly, a DB's primary focus is on dispute avoidance, which is in contrast to processes such as mediation, expert determination, arbitration, litigation and other forms of Alternative Dispute Resolution (ADR); each of these is reactive in nature and deal with the resolution of crystallised disputes.

### *Why are DBs used?*

The principal benefit to be gained from a DB is the avoidance of formal disputes on a project through rapid real-time decision making thereby maintaining project relationships and progress of the works.<sup>12</sup> It is believed that DBs have a positive impact on project budget and timely project completion.<sup>13</sup> This is particularly important on high profile construction and infrastructure projects such as the Olympic Games that have an immovable end date and budgetary constraints.

The DB process may be considered akin to mediation (save for the crystallisation of a dispute) in that the panel members aim to assist the parties in a 'without prejudice' manner to find 'best for project' outcomes.<sup>14</sup> DBs are advantageous in that they can enhance more productive communication between the parties and promote the early resolution of issues before each side becomes entrenched in their positions. The evidence indicates that in the majority of cases, projects with DBs have been completed under budget, finished on or ahead of time, and avoided litigation or arbitration costs.<sup>15</sup>

### *How can DBs be used most effectively?*

The incorporation of a DB on a construction project must be done by carefully considering the nature, size and location of the project, and the parties involved. Only once the specific needs of the project and parties are identified can a DB be properly designed.

In particular, the choice of panel members is often one of the critical factors in a DB's success. It is imperative that the parties have confidence, faith and respect in the panel members and the DB procedures. In order for the DB to have the highest chance of success, all parties must also put any adversarial tendencies to one side and adopt a cooperative approach at the outset.<sup>16</sup>

Depending on where the project is located, it may be necessary for the panel members to have had experience in the particular region and understand the local laws. Moreover, panel members may require specific legal or technical skills depending on the nature of the project and the potential issues the parties anticipate may arise.

Accordingly, for a DB to be most effective, the parties must tailor the processes to meet the needs of the individual project.

## **Use of DBs on previous Olympic Games projects**

### *2012 London Olympic and Paralympic Games*

The 2012 London Olympic and Paralympic Games (London Olympics) involved multiple large scale projects, comprising venues (including the Olympic stadium, aquatics centre, velodrome and velopark),

transport improvements (including utilities, structures, bridges and highways), and broadcasting and media. In total, the 55 major projects for the London Olympics were completed pursuant to over 100 contracts and a budget of £9.3bn.<sup>17</sup>

The chosen form of contract was the New Engineering Contract (NEC3). The dispute resolution provisions provided a stepped process which included two DBs in the form of an Independent Dispute Avoidance Panel (IDAP) and an adjudication panel (Adjudication Panel). There were two separate panels due to concerns around an adjudicator's jurisdiction under the UK's statutory adjudication legislation and issues of enforcement. The Institution of Civil Engineers, and other bodies assisted with appointing the DBs. The standing panels were funded as a project cost, and the contractors covered the remaining costs associated with formal referrals.<sup>18</sup> If challenged, the final decision making tribunal was the Technology and Construction Court of England and Wales.<sup>19</sup>

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*the informal nature of the Adjudication Panel process, inclusion of early warning procedures and real-time decision-making were credited as reasons for the London Olympics' success*

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IDAP comprised eleven construction professionals (including the chair, Dr Martin Barnes)<sup>20</sup> all with experience in major projects, but with a breadth of varied expertise and skills to address any type of issue.<sup>21</sup> The members were designated to specific projects in which they would dedicate particular attention. IDAP's focus was on finding practical and logical solutions to problems as they arose before they became time-consuming and costly disputes.<sup>22</sup> Regular meetings were held and there was monitoring of the various projects. The DB process was designed to be flexible so that it could be adapted to suit any particular dispute and there were limited procedural rules. At the time of implementing the IDAP for the London Olympics, Dr Barnes stated that:<sup>23</sup>

'The innovative approach of avoiding rather than resolving disputes is essential given the unique challenges that the [Olympic Delivery Authority] and its contractors face in delivering the London

2012 infrastructure and venues, particularly the immovable end date.'

Disputes not capable of resolution through the IDAP consultation process could be referred to the dedicated Adjudication Panel.<sup>24</sup> There were 12 members (including the chair, Peter Chapman) and the Adjudication Panel was required to comply with the UK statutory adjudication legislation.

It is reported that the DB process on the London Olympics worked exceptionally well and was an effective vehicle for avoiding the majority of disputes.<sup>25</sup> Only two disputes required adjudication, no court actions were commenced, and overall the London Olympic venues were delivered on specification, ahead of time and within budget. It was observed that having a dual panel system was particularly effective so that conflict avoidance could be prioritised and left unencumbered by the separate adjudication process.<sup>26</sup> Furthermore, the informal nature of the Adjudication Panel process, inclusion of early warning procedures and real-time decision-making were credited as reasons for the London Olympics' success.

From the London Olympics experience, three trademarks of an effective DB were identified:<sup>27</sup>

- the client's leadership;
- the establishment of two panels beyond reproach, each with a set criteria to operate; and
- a proper risk sharing based on appropriate principles.

Ultimately, the success of DBs in the London Olympics justified their subsequent use in the construction contracts for the Rio Olympic Games in 2016.<sup>28</sup>

### *2016 Rio Olympic and Paralympic Games*

Similarly to the London Olympics, the 2016 Rio Olympic and Paralympic Games (Rio Olympics) implemented a DB panel for dispute avoidance and resolution across some 35 contracts. The primary justification for embracing DBs for the Rio Olympics was to safeguard the timely completion of installations.<sup>29</sup>

Brazil's government was responsible for the delivery of city bid commitments, being the main venues and infrastructure, and Rio 2016 was responsible for delivery of the Games,



including what are described as the ‘overlay’ contracts.<sup>30</sup> The DB panel was introduced for the Rio 2016 contracts.

Experience in the implementation and use of DBs in Brazil was limited at this time and importantly there was no established list of local trained DB members. The DRBF was therefore involved in assisting Rio 2016 in the formation and mechanics of the DB. The DRBF created two panels, a panel of DB members from which each party could select one DB member (the third was chosen by the party-selected DB members), and a panel of DB chairs who would chair the three-person DBs.

Bespoke DB rules were drafted based on principles from ConsensusDocs 200.4 and 200.5 and were consistent with local laws. These bespoke rules formed part of the contract between Rio 2016 and the individual contractors.

Key features of the DB panels were:<sup>31</sup>

- A separate DB was established for each contract, which could be permanent or ad hoc with one or three members. The preference was a permanent or standing DB with three members.<sup>32</sup>
- Party-selected DB members were chosen from a list of trained and certified local members. The DB members were required to have undergone training under the Rio 2016 DAB Training Programme (run by the DRBF), be properly certified, and be fluent in Portuguese or Spanish. Either party had the right to reject a party selected member, although grounds for rejection were limited in scope.
- DB chairs were also to be selected from the DB members list. DB members were chosen based on their familiarity with local law, geographic proximity to the Rio Olympics, previous DB experience and fluency in Portuguese or Spanish and English.
- Short timetables were in place to accord with the short programmes for the procurement of the Rio 2016 projects to ensure that construction timelines were met. This included appointing the DBs at the outset of the contract, setting frequent DB site visits, and requiring rapid delivery of the DB’s opinions and decisions.
- The DBs had the power to provide written advisory opinions when jointly requested. A formal referral of a dispute could be made to the DBs to obtain a binding decision. DB decisions were binding until overturned by arbitration.

- Operational assistance was provided by a DB Programme Manager to help the parties in the initial establishment of the DBs, and thereafter procedural operation of the DBs. This was important given the short timetables and to provide consistency across the 35 DBs.
- Remuneration rates for the DBs were fixed as a daily rate and monthly retainer. DB fees were split equally between the parties and included administration charges and the DB Programme Manager fee.

The use of DBs in the Rio Olympics was regarded as successful. Ultimately the DBs were rarely used, however, the existence of the DBs motivated the parties to resolve their issues as they arose. Accordingly, the aim of dispute avoidance was realised.<sup>33</sup> By also incorporating a degree of expediency into the process, it gave the Rio Olympics the greatest chance of avoiding delays in construction.

Significantly, use of DBs on the Rio Olympics raised the profile of DBs in Brazil and has been regarded as the catalyst for adoption of DBs into public works contracts.

### Key issues for the 2032 Brisbane Olympic and Paralympic Games

The 2032 Brisbane Olympic and Paralympic Games (Brisbane Olympics) are less than ten years away. As with any Olympic Games projects, the focus is on building a legacy of success and creating a lasting impact in Queensland following conclusion of the Brisbane Olympics.

An issue that should be of utmost importance during the planning and strategic procurement phase is how disputes should be dealt with. Disputes, as we all know too well, have the ability to cause significant cost overruns and project delays. This is of particular importance in the context of an Olympics project involving substantial infrastructure and construction works over numerous contracts, with an immovable end date (extensions of time beyond that date are not an option) and a limited budget funded from the public purse.

It is against this backdrop that focus should be directed towards dispute *avoidance* in the first instance. It is evident from the discussion above regarding the London and Rio Olympics, that the DBs established on these projects contributed to their successful completion through limiting disputation.

It is suggested that establishing a DB for the Brisbane Olympics could offer similar substantial benefits.

If the Brisbane Olympics is to follow suit and engage a DB, there are a number of factors that will require careful deliberation:

### *DB format*

Two separate panels were established for the London Olympics, one to deal with dispute avoidance and the other for determining formal disputes.<sup>34</sup> In comparison, in the Rio Olympics the established panel had the dual function of dispute avoidance and determination. There are significant benefits to be gained by a DB adopting a dual function, including expedited high quality decision making given the DB's intimate knowledge of the project and an element of satisfaction in any DB decisions given the professional relationship, and trust built between the parties and the DB members during the course of the project.

There is also the issue of whether a three-person standing DB is preferred, or whether one-person ad hoc DBs may be suitable for smaller contracts. Except in circumstances where disputes are of limited complexity and value, the preference should lean towards three-person standing DBs.

### *DB skills and experience*

This is a key characteristic in determining the success of a DB. It is imperative that the appointed DB members have the necessary technical and legal skills coupled with practical DB experience. This is vital so that the DB can carry out its duties to a high standard, and that the parties can trust the DB members in their analysis and decision making.

The DRBF is well established and actively involved in Queensland. The DRBF has an established list of experienced DB members from which suitable members could be drawn. This is in contrast to the Rio Olympics where there was a lack of DB experienced candidates in the first instance.

### *Commitment to the DB process*

The Rio Olympics DB process applied to all underlay contracts. In the London Olympics use of the IDAP was recommended, but not

mandatory, for all contracts. To facilitate the full potential of the DB, it is important to secure buy-in and participation to the DB process from the key project participants early on. Moreover, the parties must be confident in the DB and ensure that it has an ongoing working knowledge of the various projects and maintains a detailed understanding of progress and potential issues.<sup>35</sup>

### *Applicable DB rules*

The applicable DB rules will require careful consideration and where appropriate should be modified to suit the specifics of the Brisbane Olympics. Standard DB rules are often based on the FIDIC suite of contracts or the International Chamber of Commerce DB Rules. The DB rules on the Rio Olympics were specially tailored to suit the requirements of local laws.

### *Early DB involvement*

DBs are ordinarily established on execution of the contract. Consideration should be given to whether early appointment/involvement of the DB (or at least some members of the DB) would be beneficial. This may assist in developing the DB rules and the mechanics for the processes to be written into the various contracts.

### *Form of contract*

The London Olympics chose to use NEC3 as its standard form contract. NEC3 has a focus on early resolution of issues and early contractor involvement. Potential options for the Brisbane Olympics could include NEC4 ECC Option W3 which allows for a DAB, or alternatively a bespoke contract.

### **Conclusion**

Olympic Games projects are often described as accelerated regeneration projects involving complex construction and infrastructure contracts. Given that it is highly likely that disputes will necessarily arise, focus should be directed towards avoiding disputes before they crystallise and the parties become entrenched in their positions. Drawing from the London

and Rio Olympics experience, it is clear that DBs are a vital element of the dispute avoidance framework to prevent disputes derailing the building and construction work required for the Olympic Games.

However, the inclusion of a DB must be done on a project-specific basis. The success of any DB depends on the quality of the members, location, nature and size of the project, the parties involved, the degree of familiarity with DB processes and the particular contractual procedures governing the DB. For the Brisbane Olympics, assistance from local bodies such as the DRBF is likely to be critical for the effective setup and operation of a DB.

In addition to DBs, it is also essential that contracts are set up properly at the outset in terms of commercial risk being owned by the most appropriate party, early engagement of the supply chain and a commitment to fostering a collaborative culture.

Notes

- 1 Andrew Stephenson and Lucy Goldsmith, ‘Time for Australia to embrace Dispute Resolution Boards?’, (Corrs Chambers Westgarth, 22 June 2021) see <https://www.corrs.com.au/insights/time-for-australia-to-embrace-dispute-resolution-boards> accessed 16 April 2023.
- 2 Henry Joyce, ‘Projects – Australia’, (Dispute Resolution Board Foundation ), see <https://www.drbbf.org.au/projects-members/australia> accessed 16 April 2023.
- 3 Donald Charrett, ‘Dispute Boards and Dispute Resolution’ (2013) 25(3) *Australian Construction Law Bulletin* 59, 61.
- 4 Editorial Desk, ‘Brisbane Olympics 2032: Development and Infrastructure Guide’ (The Urban Developer, 12 August 2021), see <https://www.theurbandeveloper.com/articles/brisbane-olympics-2032-development-infrastructure-projects> accessed 16 April 2023.
- 5 *Ibid.*
- 6 Brisbane City Council, ‘Brisbane 2032’ (Brisbane 2032), see <https://www.brisbane.qld.gov.au/about-council/news-and-publications/brisbane-2032#masterplan> accessed 16 April 2023.
- 7 *Ibid.*
- 8 Paula Gerber and Brennan Ong, *Best Practice in Construction Disputes: Avoidance, Management and Resolution* (LexisNexis Butterworths, 2013) 198.
- 9 Paula Gerber and Brennan Ong, ‘Best Practice in Construction Disputes’ (2014) 80(3) *Arbitration* 346, 347.
- 10 Christopher Miers, ‘Real Time Dispute Resolution in Rio de Janeiro ... since you cannot delay the Olympic Games’ (2015) 31(7) *Construction Law Journal* 399.
- 11 Eg, the decision would be binding unless challenged by a party within 30 days of the DB’s decision.
- 12 See n1, above.
- 13 Henry Joyce, ‘Concepts’, (Dispute Resolution Board Foundation), see <https://www.drbbf.org.au/concept> accessed 16 April 2023.
- 14 Donald Charrett, ‘Dispute Boards and Dispute Resolution’ (2013) 25(3) *Australian Construction Law Bulletin* 59.
- 15 See n1, above.
- 16 *Ibid.*
- 17 Paula Gerber and Brennan Ong, *Best Practice in Construction Disputes: Avoidance, Management and Resolution* (LexisNexis Butterworths, 2013) 197.
- 18 Wolf von Kumberg, ‘The Use of Conflict Avoidance Boards in Green Projects: A Conflict Avoidance Blueprint for Global Environmental Sustainability’ (2022) 23(1) *Business Law International* 45, 54 and 55; Richard McLaren, ‘2012 London Olympics: Dispute Resolution in a Commercial Context’ (2012) 13(2) *Business Law International* 123, 135.
- 19 Richard McLaren, ‘2012 London Olympics: Dispute Resolution in a Commercial Context’ (2012) 13(2) *Business Law International* 123, 135–6.
- 20 President of the Association for Project Management and the original author of the NEC.
- 21 Paula Gerber and Brennan Ong, *Best Practice in Construction Disputes: Avoidance, Management and Resolution* (LexisNexis Butterworths, 2013) 200.
- 22 Nael Bunni, ‘What has History Taught us in ADR? Avoidance of Dispute!’ (2015) 81(2) *Arbitration* 176, 179.
- 23 Richard McLaren, ‘2012 London Olympics: Dispute resolution in a commercial context’ (2012) 13(2) *Business Law International* 123, 135.
- 24 Nael Bunni, ‘What has History Taught us in ADR? Avoidance of Dispute!’ (2015) 81(2) *Arbitration* 176, 179.
- 25 Peter Roshier, ‘The Application of Dispute Boards in the Field of Satellite Projects’ (2016) 2 *International Business Law Journal* 119; Murray Armes, ‘Everybody has Won and all must have Prizes: How the Dispute Board process could improve UK adjudication’ (2011) 27(7) *Construction Law Journal* 552, 557; Nael Bunni, ‘What has History Taught us in ADR? Avoidance of Dispute!’ (2015) 81(2) *Arbitration* 176, 179.
- 26 Wolf von Kumberg, ‘The Use of Conflict Avoidance Boards in Green Projects: A Conflict Avoidance Blueprint for Global Environmental Sustainability’ (2022) 23(1) *Business Law International* 45, 56.
- 27 Nael Bunni, ‘What has History Taught us in ADR? Avoidance of Dispute!’ (2015) 81(2) *Arbitration* 176, 179.
- 28 Peter Roshier, ‘The Application of Dispute Boards in the Field of Satellite Projects’ (2016) 2 *International Business Law Journal* 119.
- 29 Dante Figueroa, ‘Dispute Boards for Infrastructure Projects in Latin America: A New Kid on the Block’ (2017) 11(2) *Dispute Resolution International* 151, 167.
- 30 Christopher Miers, ‘Real Time Dispute Resolution in Rio de Janeiro ... since you cannot delay the Olympic Games’ (2015) 31(7) *Construction Law Journal* 399, 400. The overlay contracts for the delivery of the games were mostly temporary constructions such as the media building, pools, an arena, ramps and decking, barriers, lighting and signage, bridges, cranes, water and waste treatment, stands and seating.
- 31 Augusto Figueiredo, ‘Session 6: Evolution of Dispute Board Practices’ (Conference PowerPoint, DRBF Annual International Conference, 22–23 May 2015);

Dante Figueroa, 'Dispute Boards for Infrastructure Projects in Latin America: A New Kid on the Block' (2017) 11(2) *Dispute Resolution International* 151, 167; Christopher Miers, 'Real Time Dispute Resolution in Rio de Janeiro ... since you cannot delay the Olympic Games' (2015) 31(7) *Construction Law Journal* 399, 401.

- 32 Ultimately budget cuts meant that there was a shift from a standing panel to ad hoc DBs.
- 33 Ann Russo, 'The Use of DABs for Olympics and Major Sporting Events' (Conference PowerPoint, DRBF Regional Conference, Brisbane, 3 November 2022).
- 34 This was primarily due to issues around compliance with statutory adjudication provisions but is reported to have worked effectively.
- 35 Paula Gerber and Brennan Ong, *Best Practice in Construction Disputes: Avoidance, Management and Resolution* (LexisNexis Butterworths, 2013) 203.

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# International Bar Association



# EVENTS 2023

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4 – 7 July, King's College London, London, England

**Asia Pacific Mergers & Acquisitions Conference**  
10 – 11 July, The Peninsula Tokyo, Tokyo, Japan

**The 2nd IBA Litigation and ADR Symposium - the changing landscape of litigation and arbitration in India**  
18 August, Le Meridien New Delhi, Delhi, India

**A review of emerging themes in ADR (2023 version)**  
1 September, Singapore

**Metaverse; Artificial Intelligence; and Web3.0 Technology**  
7 – 8 September, Stockholm, Sweden

**The Laws of Sports: fast and furious or stable and reliable?**  
13 – 14 September, The St Regis Marsa Arabia Island, Doha, Qatar



**Building the Law Firm of the Future**  
30 November, The Law Society, London, England

**8th Annual Corporate Governance Conference**  
7 – 8 December, JW Marriott Hotel Frankfurt, Frankfurt, Germany

**IBA Asset Recovery Conference**  
7 – 8 December, Vienna, Austria

**IBA Human Rights Conference: Dignity, Freedom and Justice for All**  
8 – 9 December, Singapore, Singapore

## Webinars



**'The New Wave' – a comparative analysis of global fintech and crypto regulation**  
6 July, 1300 – 1400 BST

**Spotlight on the practice of debt enhancement in financial restructuring proceedings**  
11 July, 1300 – 1400 BST

**IP: practical ways to protect your IP globally**  
13 July, 1300 – 1400 BST

**Government prescription drug pricing policy and the interplay with investment in life sciences**  
13 July, 1500 – 1600 BST

**Should I stay or should I merge? Law firm merger do's and don'ts**  
18 July, 1330 – 1430 BST

**M&A: share or asset acquisition trends in cross-border transactions**  
20 July, 1300 – 1400 BST

**I want to become a partner: insights on how to get there**  
27 July, 1300 – 1400 BST

**Comparison of Basic Insolvency Schemes in Asia**  
24 August, 0600 – 0700 BST

**IBA Professional Wellbeing Commission Webinar Series: What are the key elements to develop a positive workplace culture in law?**  
5 September, 0900 – 1000 BST



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