

DIGEST



Developing Experts

driver
trett



Welcome to the Driver Trett Digest

Welcome to the Driver Trett Digest. This issue focusses on what it's like to be an Expert

Witness, how to develop your career in that direction, and some of the challenges you have to meet when acting in that capacity.

The single question that I am asked more than any other by staff, job applicants, and even some clients is: "How do I become an expert?"

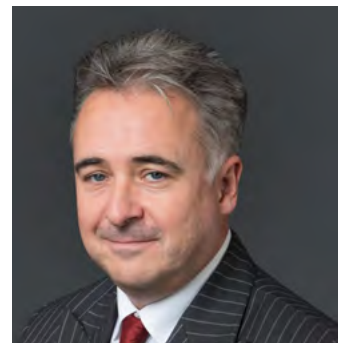
In this issue guidance is provided by Keith Strutt regarding our internal career development process, one of our experts, Kelvin Ng, talks about his personal journey into becoming an expert, and advice for new and potential candidates is set out by the Stuarts (Holdsworth and MacDougald-Denton).

We seem to be operating in a time of change with the UK's exit from the European Union and, at the time of writing, the effects of the Coronavirus are not yet known in economic terms, but appears that it will almost certainly have significant effects not just in China, or South East Asia, but Globally. In challenging times it's more important than ever that we have the basics right.

Keeping accurate records is one such basic step to take. In this issue Craig Palmer takes us through how to keep accurate cost records, advice that could save you a fortune on current and future projects and Mark Blackmore reviews the topic of acceleration. My thanks to Kirsti Olson as well for her article on how to prevent a smash and grab.

I hope that this issue gives our readers an insight into some of

the key topics that we find come up time and again, as well as gaining a sense of what's involved in developing a career through specialising in a particular practice area in order to become an expert in that specialism.



Mark Wheeler
Global Chief Operating Officer

driver
trett



Contents

4

After burn

6

The future is modular

8

Claims that started and finished in the sewer

10

Diales developments

12

It cost me how much?

14

Payment Notices: Heading off the 'smash and grab'

16

My journey to becoming an Expert Witness

18

I'm in control and I think I like it...

20

Through the eyes of a Diales technical expert

23

Disadvantages of Mediation?

25

Becoming

26

What's the rush all about?



After burn

Jeremy Ingham, one of our technical experts summarises how fire damaged buildings can be assessed to allow repair rather than demolition.



Jeremy Ingham
Technical Expert
Diales

Fire-damaged commercial and public buildings are often capable of being repaired rather than being replaced. The option of repair rather than replacement is often preferred by owners and their insurers as it can provide substantial savings in expenditure and permit earlier reoccupation. The decision to repair depends not only on the technical feasibility, but also on factors such as aesthetic appearance and the effect on service life and maintenance of the structure. A fundamental part of understanding the technical feasibility of repair is to engage technical experts to undertake an engineering assessment of the damaged structure.

Commercial fire claims can involve a wide variety of building types including offices, schools, warehouses, residential buildings, and power stations. Other scenarios involve civil engineering structures for example, vehicle fires in car parks, tunnels or underneath bridges. Fires can also occur during construction, when combustible materials present at the construction site such as concrete formwork and

scaffolding boards may provide a source of fuel (Fig.1). In the aftermath of a fire the focus is on immediate measures to ensure the safety and security of the building or structure. Once these immediate concerns have been dealt with, the requirements are generally for an immediate and thorough damage assessment to be carried out.

Assessment of fire damaged structures

In summary, the assessment, design and repair of fire-damaged structures consists of the following stages:

- Preliminary inspection
- General assessment of damage
- Materials testing and detailed damage assessment
- Design of repairs to structural elements
- Implementation of structural repairs

The aftermath of a serious fire can appear to be a scene of apparent devastation to the untrained eye, but this can be misleading. Methodical assessment by technical experts is required to correctly determine the degree of damage and condition of the structure. Guidance for assessment of the effects of fire can be found in the Institution of Structural Engineers publication 'Appraisal of Existing Structures'¹. There are two possible assessment approaches as listed below. These can be used separately, or they can be combined, depending on the nature of the fire and of the structure as follows:

Approach A: Test the fire-damaged material to directly assess the condition

1. Visual inspection and hammer soundings
2. Non-destructive testing
3. Sampling and subsequent laboratory testing

Approach B: Indirect estimation of fire-damaged elements to deduce temperature profiles and calculate residual strength

1. Evaluation of fire severity (debris inspection, numerical evaluation methods, etc)
2. Determination of temperature profiles (by applying numerical methods or simpler calculation techniques)
3. Assessment of residual strength

The deliverable of an assessment is usually a damage classification document, which can then be used in the selection of appropriate repair techniques. The assessment should provide enough information to prepare detailed drawings with instructions on how to repair the structure.

An assessment programme will consist of on-site and off-site work. Initially, all available data relating to cause, fuel source, progression/duration of the fire should be sought off-site, including information regarding how the fire was extinguished. Prior to undertaking on-site inspection, the investigator must be satisfied that the structure is safe to enter. Temporary props may be required to secure individual members and stabilise the structure. The primary on-site investigation technique is visual inspection, which records such features as collapse, distortion, deflections, degree of damage to materials and smoke damage. A site-specific classification scheme for the damage would normally be devised.

Various complementary non-destructive testing (NDT) techniques can be used to assess material strength in-situ². For concrete and masonry these include Schmidt (rebound) hammer, ultrasonic pulse velocity, penetration resistance test and the drilling resistance test. For steel, indentation hardness tests can be used to identify damaged members. In addition, it may be appropriate to remove samples of damaged material (and undamaged references) for laboratory testing. Concrete and masonry samples are typically obtained by diamond drilling of cores, while samples of steel are cut out using an angle grinder or saw. Table 1 provides a summary of the testing options.

As an alternative or addition to inspection and testing, predictive fire engineering tools, such as empirical equations or computer modelling used in design, can be used to assess the fire severity in the structure. These predictions are based on the fire load in the building, ventilation



Fig.1 – The interior of a building that was fire damaged during construction

conditions, compartment size and shape and properties of wall linings.

Based on the findings of the fire damage assessment, decisions regarding any reduced load-bearing capacity to the structure can be made. Instrumented load tests can be used to confirm whether load capacity has been impaired. Load tests can also be used to investigate the effectiveness of repairs in structural terms.

Concrete

Concrete is a poor conductor of heat and incombustible; it offers good fire resistance. However, heating will eventually compromise the load-bearing capacity of concrete elements. In practice, the worst damage is usually confined to the outer surface and even severe fires seldom cause total structural collapse. Experience has shown that following detailed appraisal, fire-damaged concrete structures can usually be reinstated using conventional concrete repair techniques (Fig.2), sometimes combined with replacement of selected structural elements.

Guidance for the assessment of fire-damaged concrete structures is given in Concrete Society Technical Report 68³. The strength of concrete after a fire varies depending on temperature attained, the heating duration, the concrete mix and the applied loading during heating. For temperatures up to 300°C, the strength of concrete is not significantly reduced, while for temperatures greater than 500°C it can be reduced to only a small fraction of its original value. 300°C is normally taken to be the critical temperature above which, concrete is deemed to have been significantly damaged.

Masonry

Masonry structures typically offer good fire resistance as (like concrete) materials such as stone, brick, terracotta and mortar are incombustible and have low thermal conductivity. Nevertheless, masonry structures can still be seriously affected by fires. The types of masonry structures most likely to be subjected to fire include domestic and public buildings and notably, may include buildings of historic and cultural value. In buildings the damage tends to be concentrated around window openings and doorways but may also affect structural masonry. At 600-800°C the

Table 1 – Test method options for assessment of fire-damaged structures.

| Test type | Test method | Test location | Suitable for investigating |
|-----------------------|---------------------------|-------------------------|-----------------------------|
| Non-destructive | Visual inspection | At the project site | Concrete, steel and masonry |
| | Endoscope survey | | Masonry |
| | Hammer soundings | | Concrete, steel and masonry |
| | Rebound hammer | | Concrete and masonry |
| | Ultrasonic testing | | Concrete, steel and masonry |
| | Magnetic particle imaging | | Steel |
| Partially destructive | Breakout/drilling | At a testing laboratory | Concrete and masonry |
| | Load test | | Concrete, steel and masonry |
| | Petrographic examination | | Concrete and masonry |
| | Metallography | | Steel |
| | Hardness test | | Steel |
| | Compressive strength | | Concrete and masonry |
| | Tensile strength | | Steel |

strength of most natural stones and masonry mortars is seriously affected and if thermal shock occurs the stone can disintegrate. Cracking can also be caused by quenching masonry heated by fire with fire-fighting water.

Clay bricks can withstand temperatures in the region of 1000°C or more without damage, but under very severe and prolonged heating the surface of the brick may fuse. Spalling (where the surface falls away) may occur with some types of brick (Fig.3). At low temperatures (250-300°C) damage is usually restricted to colour changes, such as reddening of iron-bearing stones and mortars. Although not structurally significant, as the colour change is non-reversible it may be significant for aesthetic reasons, especially in the case of historic buildings.

Steelwork

Steel has a high thermal conductivity and unprotected steelwork will rapidly increase in temperature during a fire. For this reason, structural steelwork is often protected by insulation (passive fire protection) and the adequacy of this will play an important part in the outcome of a fire. The situation is different for steel reinforcement bars embedded in concrete as the concrete that covers them provides protection, until it has either spalled away in the fire or heat is eventually transmitted through the concrete.

Significant loss of strength and stiffness of steel may occur while the steel is at high

temperature. However, recovery of strength after cooling is generally complete for temperatures up to 450°C for cold worked steel and 600°C for hot rolled steel. Above these temperatures, there will be a permanent loss in strength. In addition to reduction in strength the effects of heating may include distortion (Fig.4), axial shortening of columns, over-stressing of bolts, connections and welds.

Heating of reinforcing steel in concrete eventually causes buckling and residual deflections of the structural element. The effect of high temperature is more critical on prestressing steel than on reinforcing steel. At temperatures of 200-400°C, steel prestressing tendons show considerable loss of strength (>50% loss at about 400°C). To assess fire damage of steel reinforcement in concrete, the visual assessment may be complemented by in-situ strength testing using portable hardness testers. Furthermore, samples may be taken for laboratory testing with the results being compared with the relevant standard for the grade of steel concerned. ■

1 The Institution of Structural Engineers. 2010.

Appraisal of existing structures. Third edition.

2 Ingham, J. P. 2009. Forensic engineering of fire-damaged structures. Proceedings of the Institution of Civil Engineers, Civil Engineering, Vol 162, Special Issue – Forensic Engineering, 12-17.

3 The Concrete Society. 2008. Assessment, design and repair of fire-damaged concrete structures. Technical Report 68. The Concrete Society, Camberley, UK.



Fig.2 – Repair of a fire-damaged reinforced concrete using sprayed concrete



Fig.3 – Spalling of a brick masonry wall caused by fire



Fig.4 – Fire-damaged steelwork showing distortion

The future is modular

Gavin Hughes highlights the benefits of modular constructions and looks at its future.



Gavin Hughes
Technical Director
Diales

Construction today is a modern, technologically advanced industry. It uses integrated 3D computer models (BIM), satellite setting out and materials which comprehensively outperform their historical equivalents. It employs one of the most highly trained skilled workforces in the UK and is more focused on producing cost effective, safer, warmer, longer lasting, sustainable homes for the public than ever before.

In part, this desire stems from the need to innovate and improve construction methods in response to the ever changing demands of modern society. Modular construction and its increased development and usage in the UK looks set to form a part of the next wave of innovative development in the construction industry.

Modular construction is not new, it has been around for over 100 years. In simple terms, modular buildings are constructed off-site in factories to meet or exceed building standards at a lower cost than more traditional construction methods. They are then transported to site and assembled, thereby reducing overall construction time. Early historical examples include "Bailey Bridges", a Second World War invention by the British military, the post-war prefabricated houses and bathroom pods that were provided to those made homeless by the war.

However, it is the phase of complete building

modularisation that is the exciting next step. Complete buildings of hundreds of apartments or entire housing estates are being assembled in factories and then erected in a drastically reduced time period compared to traditional building methods.

Modular construction takes factory-based assembly line systems used in manufacturing and car making and applies them to construction. A typical building is broken down into a number of repetitive boxes (bedrooms, halls, kitchens, etc) that can be constructed as standalone items within their own box frame. Skilled workers in a safe, comfortable work environment then assemble these units. They are then shipped to sites all over the UK and assembled to form new homes.

Benefits

In all construction projects time is the critical factor. It is the one resource that cannot be renewed. By adopting modular construction on a project, an employer typically saves 10%-20% of their overall project programme. This reduces borrowing times, overheads and pressure on resources. Modular construction is also independent of weather and the challenges posed working on site (damage to building materials for example).

Factory assembly also allows greater purchasing power, thereby creating greater cost efficiencies. Instead of negotiating a small saving per unit for bulk buying 100 washing machines, there can be a much larger unit saving if the bulk purchase is for 10,000 washing machines.

Space saving is a knock-on benefit from repetitive designs. The space for MEP services for bathrooms and kitchens in most buildings

is larger than required for their operation. The additional space is usually required for their assembly during construction where man-handling pipes, etc into place requires extra room. In modular construction the factory assembly process allows these services to be fully pre-planned and assembled in sequence to maximise space saving.

Opportunities

Our industry is wide ranging and diverse. We deal with state-of-the-art hospitals, airports, and data centres, all of which require high building standards and limiting service requirements, while at the same time our industry also builds farmyard barns and sheds, which are very basic structures.

As a result, there are large areas where modular construction could play a leading role. Typically, buildings where design repetition can be maximised in fields with strong demand such as housing, prisons or schools are areas that offer great opportunities for its use.

In addition, there are boutique areas such as hospital operating rooms or hotel bedrooms that also offer good markets. These areas have their own time limitations, site access requirements or have highly specialised requirements that mean modular solutions are the best solutions.

Barriers

This is a new area in our industry and there are barriers. Key barriers in achieving and expanding this area are:

- Public perception
- High start-up costs
- Generating long term orders

The general public is conservative and slow to



23 storey modular construction in Croydon, London

respond to new building opportunities. Modular construction has not yet established a strong reputation with their new homes for quality and safety. As a result, demand for these types of homes has yet to be fully appreciated by the public.

There are also high costs initially as an entrepreneur must purchase a factory, equip the factory, purchase raw materials and employ highly skilled staff before they can start to make any units. This means they will have significant start-up costs and need to spread these costs as part of their production cost for their units over a number of years before they can generate profit.

Managing and generating long term orders is key to operating an assembly line. This allows for planning of costs and generation of savings. However, as the industry is new and construction demand varies, the ability to secure long term customers is key.

Process to a Modular Development

- Consider modularisation from Stage 1 RIBA
- Get early involvement from a modular manufacturer
- Fix client requirements before tender
- Understand and share design rules for

development "Playbook Rules"

- Award contract to modular manufacturer
- Manage two project programmes:
 - a) Manufacturing delivery programme
 - b) Onsite construction (drains, roads, landscaping etc)
- Award roles and responsibilities for other construction professionals – Principal Contractor, Architect, and Engineer
- Project manage
- Quality check the deliverables are met

Legal Contracts

There is no standard modular construction contract form in the industry. Generally, there are modified JCT forms of contract or specific manufacturer contracts being used. These contracts cover payment schedules, warranties and programme delivery. There are significant gaps in these forms on claim dispute management, bonds, valuation, notification, practical completion definition, Arbitration, and how to manage the contract.

As the industry grows it will develop a standard contract type with industry knowledge of how to manage the contract. However, at this point a legal firm should be involved in the contract negotiation. This will ensure the

contract not only deals with penalties and liability for works, but also how the contract should be managed and the duties and responsibilities of all the construction team.

Future

There are clear indicators that the future of Modular Construction is strong:

- Government action
- Public perception
- Industry growth

The Home Office has, over the last twenty years and under different administrations, promoted and encouraged "Industrialisation of the Construction Industry". It is clear that they would lead and publicly support modularisation.

The general public has clearly indicated over the last number of years that they would support a solution to the housing market that can demonstrate sustainability, high quality build and cost-effective homes. Modular can deliver all of these.

As modular manufacturers grow, they will reinvest into their industry, leading to greater efficiencies, sustainability, and savings in their manufacturing processes. This will enable them to provide greater quality products with greater adaptability. ■

Claims that started and finished in the sewer

White Constructions v PBS Holdings



John Mullen
Principal Expert
Diales

White was developer of a site in New South Wales. It appointed Cleary Bros (Bombo) Pty Ltd as contractor, Mr Trevor Unicom as project manager, a sewer designer and a water services coordinator. Completion overran by eight months. White blamed the sewer designer and coordinator, and sued them as co-defendants.

The case¹ was heard by Mr Justice Hammerschlag in the New South Wales Supreme Court. Other commentaries on the judgment focus on issues in relation to delay analysis. However, it also provides some lessons in relation to quantum. On both, it is interesting to note what the judge said about the burden of proof. Unsurprisingly, this was on White and on the balance of probabilities. However, significantly he also said:

"This is not the type of subject upon which precise evidence cannot be adduced. It is not a subject which involves the Court having to make an estimation or engage in some kind of guesswork. It is not the kind of case where it is necessary for the Court to do its best, in the absence of evidence which White was capable of adducing."

Delay analysis

White's expert applied an as-planned versus as-built windows analysis. His counterpart criticised this as: not properly considering additional time required to do non-sewer works or delays unrelated to the sewer design; assuming unjustifiable logic links; and factually and analytically flawed.

The defendants' expert applied a collapsed as-built analysis. His counterpart criticised this as: defying common sense; containing unsustainable and unjustified logic links; and hiding the defendants' failures.

The experts reached very different results which could not both be right, but, the judge noted, it was not inevitable that either was right. He described their reports as impenetrable

"to the unschooled". He appointed his own expert, Mr Ian McIntyre, whose evidence was "... invaluable" and demonstrated "that the complexity that has been introduced is a distraction". Mr McIntyre applied a fact-based approach examining what was actually happening - "... the common law common sense approach to causation ...".

The judge noted that the party experts' methods were derived from the SCL Protocol². He followed Mr McIntyre's opinion that the fact of a particular delay analysis method being in the Protocol "did not give it any standing", and vice versa.

For its view of the facts, White relied on the evidence of Cleary's foreman, but the judge considered this "... couched in generalities ..." and "... incapable of founding any specific findings of delay".

The judge preferred Cleary's site diary. Whilst comprehensive and well kept, this was "... more significant for what it does not say than what it does". The court had repeatedly emphasised the importance of such records, but White placed little reliance on this diary, which the judge inferred reflected "... the paucity of relevant entries evidencing relevant delay". Where the diary referred to delay, it did not identify what was being delayed, and recorded significant other problems on site.

The judge concluded that White had not established its case.

Disruption Costs

This claim relied on White's establishing that the project was delayed by the sewer works, but the judge considered it had not established this or that the amounts claimed were linked to relevant delay.

The fact that amounts for disruption had been certified and paid to Cleary did not establish White's entitlement to claim them from the defendants.

Of specific heads of disruption costs claimed by White, he found that:

- A claim for additional work to a road base said to be eroded by longer exposure due to delays, failed to evidence how much erosion would have occurred anyway.
- A claim for repairing kerbs damaged

by machinery carrying out sewer works that should have been installed first, did not establish that damage was caused by the delay or that avoidance steps were not available.

- A claim for 10% addition paid to Cleary to manage the contractor carrying out electrical installations because of "site constraints caused by the delay in sewer approval", did not make clear what this meant or why that contractor did not manage itself.
- A claim for additional costs paid to Cleary for rock excavation valued on dayworks failed to establish Cleary's contractual entitlement to such valuation.
- A claim for modifications to drainage, kerbs and guttering completed out of sequence due to delays to the sewer did not establish that the delay caused such disruption or that it was a necessity or advantageous to change sequence. White had also provided no foundation for an alternative claim on the basis of mitigation.

Prolongation Costs

White claimed \$547,000 paid to Cleary for the overrun, calculated at a daily rate of \$2,500.

White relied upon the evidence of its director that he had agreed to pay Cleary \$175,000 at that rate, with the balance payable once the number of days of delay was known, and which he would pay whatever the outcome of White's claims. The judge did "not believe him". The judge considered the alleged agreement with White uncommercial for Cleary, who had been stood out of its money for two years and who had provided no witness to evidence it. He also noted that Cleary rendered two inconsistent invoices on the same day one year after completion, the second not mentioning delay costs.

Regarding the daily rate, the judge explained that this was in the construction contract as a cap on White's recoveries. Furthermore, rather than Cleary assert a claim for prolongation costs, Unicom had asked Cleary to provide an estimated rate. This was calculated in a letter from Cleary, which the judge stated "... does not prove that any costs were necessarily incurred



or the amount of such costs”.

The judge was “not persuaded that this claim is genuine. I consider it to be a contrivance ...”.

Consultant Fees

The judge described a \$100,000 “Retention fee” paid to Unicomb to not retire but stay on the project through the overrun period as “untenable, and borders on the eccentric”. He considered it not caused by the defendants. He also noted that Unicomb had still not retired at the date of the judgment and worked on other projects for White during the overrun period.

This undermined a further claimed \$102,300 for Unicomb’s services in the overrun period. In addition, the judge considered it difficult to see how the activities described on the period’s invoices would not have been required anyway. He concluded that “It is not the obligation of the Court to sift through these invoices” and that White had not established them as attributable to the sewer delay.

Conclusions

The judge dismissed the case.

Many of the heads of claim considered in this

“

The refusal of the court to estimate, guess or do its best in relation to quantification, where the claimant had not satisfied its burden, is notable

”

judgement will be familiar to practitioners. The burden and standard of proof imposed by the judge will be familiar to those in common law jurisdictions. However, the refusal of the court to estimate, guess or do its best in relation to quantification, where the claimant had not satisfied its burden, is notable. As ever, such variables as the express terms of the contract, applicable law, and particular tribunal are important considerations, but the judgement should be of interest to anyone putting claims to tribunals anywhere.

All of the subjects illustrated by this judgment (such as the relevance of the Protocol, different methods of delay analysis and their merits, proving disruption claims, passing on third party costs, and claiming additional consultants’ fees) are considered in much broader detail in the new edition of *Evaluating Contract Claims*³. ■

¹ *White Constructions Pty Ltd v PBS Holdings Pty Ltd* [2019] NSWSC 1166

² *The Society of Construction Law Delay and Disruption Protocol*, second edition (February 2017)

³ *Mullen J and Davison RP (2019) Evaluating Contract Claims. Third Edition. Wiley, Oxford, UK*



Diales developments

In this article Keith Strutt explains how important good experts are, and takes us through the development process that Diales experts go through to ensure they meet expectations and the standards required.



Keith Strutt
Head of Diales Development Group
Diales

Introduction

Diales, the Driver Group's independent expert witness service, is a core activity for the Group and central to the development and growth of the business. The activities of Diales, through its experts, also represents the highest profile work that we carry out; the work is always subject to the closest scrutiny, by the most experienced and high profile people in our industry – solicitors, barristers, judges and the leading experts from our competitors, in fora that is often published into the public domain.

The consequences of poor performance by an expert will expose both the expert, and Diales, to damaging criticism; the reputational

damage that results would take considerable time and effort to repair, and may never be fully repaired for the individual expert.

The need for our experts to be competent, accurate, experienced, and credible is vital.

Consistency and Development

Along with providing a consistent and high standard of expert and service, development for Diales candidates also provides the opportunity to develop the staff members who either wish to become an expert, or work as part of the extensive expert support teams working on complex, high value international disputes.

After review of the requirements and difficulties, both of becoming an expert and practicing as one, it was concluded that the traditional approach, used by many in our industry, of putting candidates through a standardised course – normally lasting one to three days – and expecting them to practice as

an expert on completion, is not fit for purpose.

As part of the development of Diales and to provide a more streamlined and clearer path to joining Diales as an expert, a new process for entry to the Diales team, using a professional competence based approach, has been developed. This entry scrutiny process, as it is based on competence, is also an ideal vehicle to develop individual development and training plans for candidates.

The new approach was introduced in September 2019, with the first candidates progressing to Diales membership in December 2019. If you are part of the Diales Development Group and intend to progress to Diales expert member, then completing the application form and beginning the competency assessment process is essential.

Diales Expert Criteria

The minimum criteria for becoming a Diales

expert are:

1. At least 15 years of technical experience;
2. Suitable technical qualifications along with the appropriate technical professional memberships; and
3. Must have been cross-examined or completed an internal and external cross examination course.

In addition to the above, it is essential that a substantial proportion of the work normally undertaken is as lead assistant to an expert on an expert commission. The assessment of competence is based on the following areas:

- Diales competency criteria
- Ethics and practice
- Academic background
- Professional certification/memberships
- Professional experience
- Expert profile
- The commission
- Communication
- Report drafting
- Expert meetings
- Testifying
- Diales membership interview

Assessment

The ten competencies are sub divided into a range of skills and knowledge items, each ranging from level one to three, demonstrating the attainment of progressively higher standards of experience and competence. The assessment of the candidate against each of the criteria, and the level of competence currently attained, provides the basis for developing a person-specific training programme to reach Diales Membership.

Each Level represents a discrete level of attainment.

“

This entry scrutiny process, as it is based on competence, is also an ideal vehicle to develop individual development and training plans for candidates.

”

Level one shows that the candidate demonstrated knowledge competency: illustrated by the submission of written work or confirmation of knowledge from a senior professional within Diales.

Level two shows a level of practical application of knowledge: demonstrated by evidence of participation in the expert process, with evidence and verification by a Diales expert.

Level three is application of knowledge: leading a live expert appointment or third-party training.

These competencies are summarised into a table, where each competency receives a percentage, which will reflect whether they have met the requirements within the levels of achievement. The level of attainment giving a basis for additional training required to develop fully the expert competency of the candidate to full Diales membership.

The final stage is a mock interview with the Regional Diales Head to test technique in facing an expert selection interview and general competence in the established criteria areas and cross examination. This mock interview is then followed by an interview with the Head of Diales and final confirmation of entry.

The need for competence, consistency in levels of service and performance means that the traditional approach to selecting experts to be put forward by any consultancy is no longer sufficient for the modern expert consultancy world. The reputational and corporate damage possible for failure is high and long lived for both the company and the individual.

The new competency based approach to Diales expert selection not only ensures consistency of performance, but also provides a basis for assessment and training that benefits the individual and strengthens the Diales service to our clients. ■

As part of Oman's 49th National Day Celebrations (18th November 2019), Oman Post issued a stamp featuring the Al Batinah Expressway, a key element of Oman's Infrastructure and the Country's Vision for 2040. To find out more about Driver Trett's involvement in the project visit the news article section of our website, or scan the QR code below with your smartphone to take you there.



It cost me how much?

Craig Palmer's insight into the importance of accurate cost records.



Craig Palmer
Senior Consultant
Driver Trett UK

On large and complex projects, the need for accurate cost records and the ability to clearly and easily monitor and interrogate costs is essential in reducing the risk of cost overruns.

The use of electronic cost recording and monitoring systems on projects has been around for quite some time and has become an essential tool for the contractor's project team, and in certain circumstances employers in accurately controlling the costs incurred. If implemented and used correctly, the use of these systems allows the project team, contractor, and when necessary, employer, undertaking projects to have certainty

in the cost of a project at any point in time.

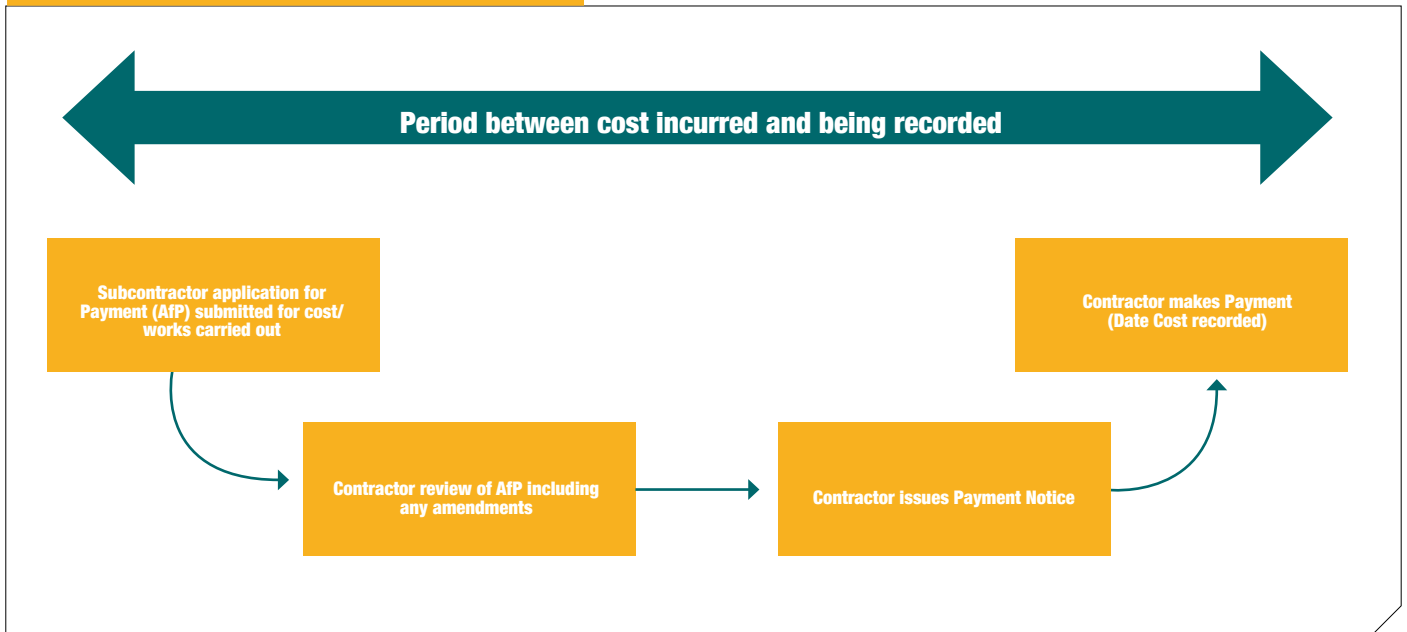
To ensure cost recording is undertaken correctly, the project team would need to be fully engaged with the policies and procedures involved, not an easy task in itself. There needs to be a cost coding structure in place that clearly defines the parts or section of the project, for example Main Building [MB], Ancillary Buildings [AB], Roadways [RW], etc; and the type of work being undertaken, for example Groundworks [GDWK], Substructure [SUBS], Superstructure [SUPS], etc. This level of coding can be used to record costs at a high level; however, the use of task specific and expenditure type codes allows a much more detailed and dynamic breakdown. Examples of task specific codes could be 1000 Preliminaries, 2000 Site Works, 3000 Excavation and Earthworks, etc; and examples of expenditure type codes could be PR1100 Site Offices, LA1200 Labourer, MA1300

Reinforcement, PL1400 Excavators, SC1500 S/C -Pilling, etc.

As with all cost recording and monitoring systems, the defined coding structure must be adhered to strictly to ensure that the costs are allocated correctly and are visible for reporting and interrogation purposes. To this end, the project team would need to be trained to understand the coding structure, how it works, and how to apply it and be confident in the allocation of costs.

The project team should also be made aware that once a cost has been allocated and recorded in the system, it cannot be easily changed or reallocated. Whereas the original recording of a cost is a single step process, reallocating or changing a previously recorded cost, commonly known as a journal entry, is a two-part process (the deduction of the originally recorded cost allocation and then the addition to

Timeline



record the revised cost allocation, both of which will be recorded in the costing system) and is fraught with problems of clarity. Therefore, when making any amendment to an allocated cost, the project team will need to keep clear and detailed records of the amendment to ensure that anyone interrogating the costs in the future understands why the reallocation was made, where it came from and where it went to.

Failing to undertake the basic steps of training the project team on the costing structure, undertaking periodic reviews to ensure the project team are following the cost procedure, correctly using the costing structure, and providing support where needed is essential. The dangers of not keeping journal records, or not having sufficient detail in the journal records will lead to confusion on the part of anyone interrogating and reporting the costs and ultimately leads to uncertainty as to the accuracy of the costs.

Another requirement of the process is ensuring the costs are recorded in the correct time period. In the normal course of a project, directly employed resources such as labour, materials and plant can be recorded as the cost is incurred. However, the accurate recording of when costs are incurred is especially important when a project is predominantly undertaken by subcontractors. The works undertaken by directly employed labour, generally, would be recorded through the use of timesheets and daily allocation sheets which feeds into the payroll system resulting, in a best-case scenario, in the cost being allocated on a daily basis as they are actually incurred. Directly procured materials, generally, would be delivered to the project accompanied by delivery tickets (or some other form of documentation) recording the date of the delivery enabling the cost to be recorded

“

To ensure cost recording is undertaken correctly, the project team would need to be fully engaged with the policies and procedures involved, not an easy task in itself.

”

Are these costs correctly allocated?

Invoice from Seeker Site Services for 60 pigtails. This cost was allocated to Preliminaries as costs for catering to the site offices. Is this correct? **[No]**

Invoice from AIM Readymix for 20m³ of concrete delivered to a completed road structure with kerb installation works ongoing prior to surfacing works being undertake. This cost was allocated to the Structure. Is this correct? **[No]**

Invoice from HiT Plant Hire for the hire of a Sheepsfoot. This cost was allocated to Roadworks as costs for earthworks. Is this correct? **[Yes]**

when it was actually incurred. The recording of directly employed plant (either owned or hired) would be recorded on a similar basis to directly employed labour and, generally, would be recorded on plant records and daily allocation sheets with the cost again being recorded when it was actually incurred. Costs associated with the works undertaken by subcontractors can present a problem due to the varying agreed payment terms and how the subcontract works are recorded. Generally, subcontractors provide applications for payment on a monthly basis which is reviewed and amended if required, a payment notice is then issued with payment following in due course. The protracted subcontractor payment process can make the accurate time recording of subcontractor costs difficult as shown above.

These points can be very problematic, especially when the contractor is utilising cost records as a means of supporting recovery of amount included for variations and/or when the project is suffering from delays and cost overruns and the contractor is using cost records to support a claim for additional monies from the employer.

As part of our project cost monitoring and forensic analysis work, we have, in the past, had to deal with numerous examples of cost uncertainty due to poor cost record keeping, inaccurate cost allocations, and insufficient detail when interrogating complex journals undertaking multiple reallocations. If the costs are incorrectly allocated, there are significant risks to credibility and the potential under recovery of the actual cost incurred. Further, there will be unrecoverable expense in time and cost associated with fixing issues of inaccurate cost allocation and insufficient journal details. ■

Payment Notices: Heading off the 'smash and grab'

A look at why it is crucial to ensure payment and pay less notices are served correctly.



Kirsti Olson
Partner
Dentons UK and Middle East LLP

Whether, when and how payment and pay less notices are served is an issue that we all in the construction industry grapple with regularly. The consequences of getting the timing or content of these notices wrong or of failing to comply with the relevant requirements for service can be severe. There is also the added difficulty that sometimes what needs to be done is not clear, either from the terms of the contract or the way in which the parties have behaved. Guidance from the courts is therefore always welcome.

Content

The courts in England and Scotland take a pragmatic approach to the content of payment notices and pay less notices.

In the Scottish case of *Muir Construction Limited v. Kapital Residential Limited* [2017] CSOH 132, Lord Bannatyne decided that a pay less notice, simply stating that zero was due, was inadequate. It was not possible from any of the information provided for the reasonable recipient to work out the basis on which the zero sum figure was calculated.

In *C Spencer Limited v. M W High Tech Project UK Limited* [2019] EWHC 2547, the contract was a hybrid covering construction and non-construction operations. In the TCC, O'Farrell J found that a payment notice did not need to separately identify the sum due for construction operations. However, she also confirmed that a negative valuation in a payment notice cannot be relied upon as a pay less notice for the purposes

of set-off or a counterclaim. A pay less notice will still be required.

In *Grove Developments Limited v. S & T (UK) Limited* [2018] EWHC 123, guidance from the court was sought on a number of issues, including whether a pay less notice was valid. In that case, the pay less notice cross-referred to another document, which set out the basis upon which the sum due was calculated, that the contractor had received earlier.

At first instance, Coulson J decided that the pay less notice was valid. The Court of Appeal agreed (*S&T (UK) Ltd v. Grove Developments Ltd* [2018] EWCA Civ 2448). It is therefore permissible to cross refer in a pay less notice to another document for the calculation of the basis of the sum due. However, whether such notices are sufficient will always be a question of fact and degree. There is also the risk that a document referred to in a notice may not have been received in the first place.

At first instance in *Grove*, Coulson J offered the following general guidance (at paragraph 26): "A pay less notice will be construed by reference to its background, in order to see how a reasonable recipient would have understood it. The court will be unimpressed by nice points of textual analysis, or arguments which seek to condemn the notice on an artificial or contrived basis. One way of testing to see whether the contents of the notice are adequate is to see if the notice provides an adequate agenda for a dispute about valuation and/or any cross claims available to the employer".

The judge was of the view that this approach should apply equally to payment notices and pay less notices.

Timing

Whether a payment notice or a pay less notice is served on time will depend on what the contract requires. A point often forgotten is that many time-related words and phrases used in construction contracts (such as "before", "after", "from", "within", "not less than", "by", "not earlier than", "not later than", "at", "at least" and "on") have a specific legal meaning (and sometimes that is different between jurisdictions).

Section 116 of the 1996 Act gives guidance on the calculation of time periods when the

words "within", "after" and "from" are used. It also confirms that certain days will be excluded from the calculation of periods of time.

The parties to a contract should also be mindful of deemed receipt provisions.

Service

Ideally, payment notices and pay less notices will be served strictly in accordance with the terms of the contract. But that does not always happen.

However, failure to follow the service requirements for notices in a contract will not always be fatal.

In the Scottish case of *Hoe International Limited v. Andersen and Aykroyd* [2017] CSIH 9, a notice under a share purchase agreement, which should have been served by recorded delivery, first class post or by hand, was sent by DX. The court found that the notice had been validly served. The court was of the view that the requirements of a notices clause should be interpreted in a practical and reasonable manner. Provided the notice is received by a responsible person, with authority to act on behalf of the recipient, the means of delivery is of no real significance. Absence of material prejudice on the part of the recipient was also considered to be a key factor.

In England, the leading case on notices is the decision of the House of Lords in *Mannai Investment Co Ltd v. Eagle Star Life Assurance Co Ltd* [1997] UKHL 19. Although the basic rule is that the notice requirements of a contract should be strictly complied with, minor defects will not necessarily invalidate the notice if the reasonable recipient, with knowledge of the relevant factual background to the notice and its context, would have understood it.

When can you get the money back?

In the absence of a payment notice, a higher sum than the contractor has applied for may become due for payment. If a pay less notice is not then served, the payer will be exposed to the risk of a smash and grab adjudication. This is emotive terminology used to describe a situation where a contractor takes advantage of a failure to serve a pay less notice and seeks an order from an adjudicator for payment of the



“

A contractor takes advantage of a failure to serve a pay less notice and seeks an order from an adjudicator for payment of the sum he has applied for

”

sum he has applied for.

Assuming that the process breaks down in this way and a contractor becomes entitled to be paid more than the true value of the work, the final key question is when a separate adjudication can be commenced to get the money back.

In the Grove case (mentioned earlier) which concerned an interim payment application, Grove was found to be entitled to commence a second "true value" adjudication as soon as payment of the sum due in the first adjudication had been made.

This was contrary to the approach previously taken in the TCC in the cases of *ISG Construction Limited v. Seevic College* [2014] EWHC 4007 and *Galliford Try Building Limited v. Estura Limited* [2015] EWHC 412 (where failure to serve an adequate pay less notice was deemed to be agreement by the employer that the amount applied for was the "true value").

M Davenport Builders Ltd v. Greer & another [2019] EWHC 318 concerned a final payment

application. Mr and Mrs Greer (who had lost a smash and grab adjudication) started a "true value" adjudication without making payment first. They then tried to rely on the second adjudicator's decision to defend enforcement proceedings. The judge in the TCC applied Grove and enforced the first adjudicator's decision.

If payment has to be made following a first adjudication before a "true value" adjudication can take place, clearly there is an insolvency risk.

Payers should therefore be extra vigilant about ensuring that payment notices and pay less notices contain the right information, are properly served on time and are in the correct form, in order to avoid a smash and grab adjudication happening in the first place.

Interestingly, the judge in Davenport did suggest that in limited circumstances it might be possible for the paying party to start a "true value" adjudication before making payment. But the judge did not elaborate further. So, it is not clear yet in what circumstances that will be possible. We will have to wait and see what happens next. ■

My journey to becoming an Expert Witness

Kelvin Ng takes us through his career, experiences, and training enabling him to become a Diales Expert.



Kelvin Ng
Delay Expert
Diales

My name is Kelvin Ng and I am a Diales Delay Expert based in Sydney, Australia. Diales is a dedicated brand of Driver Group, which provide Expert Witness services in Quantum, Delay Analysis, or a Technical discipline. I have had the honour to have recently joined the Diales team in the field of delay analysis and I have written this article to share the competency requirement of a Diales Expert Witness, my career journey, and how it leads me to becoming a Delay Expert.

I graduated with a Bachelor of Science degree in Civil Engineering from Purdue University (USA). I then joined one of the largest transportation (e.g., highway, bridges and rail) contractors in the USA. I held the role of a project engineer to an assistant project manager in preparing, monitoring, benchmarking, and managing the cost reports and construction programmes of highway and bridge projects in San Diego, Chicago, and Indianapolis.

Subsequently, I joined the URS (an AECOM company) Southwest US dispute resolution team as a construction claims analyst, preparing and responding to claims and disputes in the area of delay, quantum, and the standard duty of care in the construction industry. This role was referred to me by a professional in the construction dispute resolution industry. I had had no prior knowledge of this line of work. I had always taken on a front-end role as a contractor. As a contractor, we had self-performed most of the claims. Additionally, construction disputes were not as common in the Midwest (USA).

I was quickly attracted to the attributes of the claims and dispute works in the construction

industry: the work was short but intense, skills required were specialised (compared to more general and broader skillsets required by most general contractor employers in the USA), and the critical forensic skills were essential in re-constructing the 'stories' retrospectively. The claims and dispute works have since aligned well with my career aspiration.

In URS, I was an assistant and the lead assistant to the expert witnesses on matters relating to California Department of Transportation projects in Southern California, three hospitals in Los Angeles and San Francisco Bay Area, a wastewater treatment plant in Phoenix Arizona, a regional justice centre in Las Vegas, a concert hall and a high rise residential in Southern California.

In 2009, I decided to relocate to Australia to be closer to my family members in Australia and Asia. I was also drawn to the booming construction market in the Asia Pacific region. Since then, I have held the role of a construction planning consultant, delay analyst, 'shadow' delay expert and Delay Expert on matters in Australia, New Zealand, Asia, the Netherlands, Middle East, and West Africa. I gained experience working on transportation infrastructure matters (e.g., metro, light rail, rail, motorway, road, and tunnel projects), defence (air-base), renewable and non-renewable power plants, power transmission structures, process plants, oil and gas, desalination, water treatment plants, mining, marine/port structures, government and commercial building projects.

After acting as an assistant and the lead assistant over a number of years, I was inspired to pursue a career as an Expert in 2012. The pathway to becoming a Delay Expert has not always been well defined in the industry. There are several ways to become a Delay Expert. Generally, most Delay Experts would agree, to become a Delay Expert, one shall possess the specialist knowledge and experience in planning and delay analysis. Besides gaining the working experience as a planner and delay analyst, I have



gained the specialist knowledge to be a certified AACE International Planning and Scheduling Professional (AACEi-PSP) in September 2008, and a certified Project Management Institute Scheduling Professional (PMI-SP) in August 2012.

Next, I undertook the relevant training to better understand the role and responsibility of an expert, the requirement set out for an expert report and the joint expert report, and the procedure and role of an expert in court. In May 2016, I attended expert witness training organised by the Royal Institution of Chartered Surveyors (RICS) in Sydney Australia, during which I was cross-examined by a barrister. I am a RICS accredited expert witness. I also attended expert witness training administered by The Academy of Experts in November 2019, also during which I was cross-examined by a barrister.

To become a Delay Expert, the understanding of law concerning construction dispute is

essential. Therefore, I obtained a Master of Laws (LLM) degree in Construction Law and Arbitration in 2019.

I am a member of the Chartered Institute of Arbitrators (CIArb), Society of Construction Australia, and Project Management Institute (PMI). To date, I have been involved in excess of 50 construction projects (including over 45 planning or forensic planning assignments) ranging in size from tens of thousands to billions of dollars. My recent 'shadow' delay expert and Delay Expert appointments include, but are not limited to:

1. Delay Expert appointment in relation to an insurance matter, between the D&C contractor JV and the insurance underwriters, in a A\$4.3b motorway construction in Sydney.
2. Delay Expert appointment in relation to A\$60m EOT claims, between the D&C contractor and the principal, in a

Sydney Metro project involving tunnelling, substructure steel support and pedestrian access works.

3. 'Shadow' delay expert appointment in Notice of Dispute, between the EPC contractor and the principal, in relation to a 255MW solar power plant.
4. Delay Expert appointments in two separate adjudication proceedings, between the EPC contractor and the principal, in relation to a solar power plant.
5. Programming Expert appointment in the NSW Supreme Court proceeding, between the contractor and a city council, in relation to a demolition and construction of an aquatic centre.
6. Delay Expert appointment in an adjudication proceeding, between the contractor and the developer, in relation to a mixed-use development in NSW, Australia. ■



I'm in control and I think I like it...

Michael Neill looks at common challenges encountered by contractors when dealing with change on construction projects.



Michael Neill
Senior Consultant
Driver Trett UK

The management of change can be challenging for all parties involved in the construction process.

Sadly, unlike other sectors, such as the automotive industry, the bespoke nature of construction creates an environment where it would be considered peculiar for the design to remain unaltered throughout the life of a project.

Dealing with the effect of change can often result in the expenditure of significant time and resource and lead to the creation of sizable disputes.

This article considers common challenges encountered by contractors when dealing with the control of change on construction projects.

Types of Change

Whilst change can take various forms, they typically arise from the following:

- Change in client requirements;
- Change in statutory requirements;
- Change in quantities;
- Design development;
- Change in working environment (weather, unforeseen impediments, delayed access, etc).

Clearly, it is in the interests of all Parties to be fully aware of the likely impact that changes will have upon the profitability of the project. Or in the Client's case, the impact upon their financial outlay.

Standard Forms

Many standard forms of contract, are amended to include a 'change control' procedure (if not

included in the standard form).

Typically, this is to allow the Client the opportunity to seek quotations from Contractors to assist the decision-making process prior to Instruction.

The idea being that the cost (and time) implications of potential changes are assessed and agreed prior to Instruction. In theory this should also aide the final account process by removing the need for protracted negotiations at the end of the project.

The NEC takes this approach further with a detailed and prescriptive approach to change control.

Common Issues

Clients often place cost certainty high on their list of requirements and the desire to manage and control change is entirely sensible and should be encouraged.

Cost certainty is also highly desirable for

Contractors. However, in our experience, issues that commonly arise, include:

- Contractors being used as pricing or budgeting service;
- Contracts being awarded based on limited design leading to large volume of change;
- Insufficient resource to comply with Change Control Requirements;
- Reluctance of parties to agree costs up front;
- Disputes regarding the inclusion of risk allowances or contingency;
- Stringent timescales;
- Finality (Inclusion of loss and expense).

Burden placed upon Main Contractors

Clients can often, particularly on design and build projects, seek to limit the scope of services of its advisers once a project enters the construction phase.

The cost consultant's obligations are often limited to the valuation and certification of payments as Clients do not wish to incur additional fees for the exploration of potential variations.

Further, we also often see that the client often does not want to incur any additional design fees relative to proposed changes.

The result of this can be that there is an expectation that Contractors are required to provide detailed cost estimates for proposed changes that are:

1. Extremely sketchy from a design perspective; and
2. Are not accompanied by Bills of Materials or schedules to aid the pricing process.

It is also common for amended contracts to place stringent timescales on the turnaround of these quotations. This places pressure on the project team and can lead to strained relationships with the client if quotes are not submitted on time or in full. If the project is not suitably resourced to deal with a large volume of requested change, then inevitably issues will arise.

“

it is in the interests of all Parties to be fully aware of the likely impact that changes will have upon the profitability of the project.

”

Reluctance of either party to agree costs up front

The goal of achieving early cost certainty on a construction project is not without difficulty.

The Contractors must consider whether they have included for all matters relative to the Instruction such as prelims, allowances for any loss and expense, and risk. This will inevitably involve various assumptions to be made and elements of risk to be included.

Conversely, the Employer is faced with the dilemma of agreeing to the Contractor's quotation when they have suspicions that the Contractor may have overstated the valuation.

Ultimately, what usually ends up happening is that the works are instructed, both parties adopt a 'wait and see' approach and end up slugging it out at the end of the project which in many ways defeats the purpose of having a change control process in the first place.

Practical Considerations

For Contractors engaging in projects with change control obligations, the following steps should be considered:

- Be aware of contractual requirements (timescales & implications);
- Be aware of the quality of design information

you will be getting;

- Make provision (time and cost) for getting proposed work designed to a mutually acceptable stage;
- State assumptions and list provisional items which cannot be committed to; Make provision (time and cost) for getting proposed work quantified (especially if client cost consultants are not instructed to take an active role in preparation of documents);
- Allow enough time for dialogue;
- Ensure any time restrictions are stepped down to Sub-Contracts;
- Seek suitable extensions where reasonable (seek amended wording to cater for extensions);
- Be clear about what elements can be revisited and on what basis;
- Encourage client to engage its own consultants to play a positive role in the process (it's about teamwork);
- Consider resource requirements if there is likely to be a large amount of change control requests. It can often be a full-time job in itself, never mind the various other commercial functions required on a large project;
- On D&B projects, project managers, designers, and planners should all feed into this process;
- For significant large change control (millions of pounds) internal management sign off may be required depending on level of risk (or at least meeting to de-risk should be considered).

Summary

It is unlikely that perfection will be achieved when administering a change control process, but it is certainly desirable to have mechanisms in place to manage change.

However, for any system to work as well and efficiently as it possibly can it is essential that Contractors and Clients implement a system that is realistic and manageable to allow it to achieve its intended purpose. ■

When is a notice, not a notice?

Driver Trett are delighted to announce this year's UK Spring Seminar Series. This seminar will look at:

Scenarios exploring the dangers and pitfalls of failing to issue correct and compliant notices and certificates, and will look at practical approaches to resolving these issues.

It will be delivered at various locations across the UK and you can find out more information, and book, by visiting the Driver Trett knowledge page of our website or scanning the QR code below with your smartphone camera.



Through the eyes of a Diales technical expert

Two of our experts talk to us about what it's like to be a Diales technical expert and give some tips and advice for new potential experts.



**Messrs Stuart Holdsworth
and Stuart Macdougald-
Denton**

The Diales technical department has been in existence for just over five years and helps complement Diales comprehensive portfolio of quantum and delay expert services. The technical department works internationally and currently comprises fourteen experts and four associates, with experience in the many facets of construction work including: offshore, power, natural resources and the built environment, and related industries. Our technical experts are assisted by three full-time researchers. The experts have recourse to a technical library, an extensive suite of design software, and other resources to help with the analysis, interpretation and explanation.

Those of us who have been through the inception and growth of the technical expert department have enjoyed the relative freedom offered by Diales that has allowed the technical experts to develop specific and targeted methodologies, systems, tools, and training which, in turn, has allowed our considerable growth to occur.

Where the matters in dispute concern (sometimes complex and interwoven) technical issues, the Diales technical experts assist the court, arbitrators, and other decision makers to understanding these issues.

The experts are encouraged to remain engaged and up to date with their respective discipline and industry by undertaking commissioned work (e.g. design work), to retain a currency of contemporary knowledge.

This work is often of signature status and has merited awards.

The quality of all work output is constantly reviewed and evaluated. A continual process of feedback and improvement is in place to ensure that the quality of the work is fully focussed on the client's requirements.

The close-knit technical department work as a co-ordinated team, scaled to suit the task at hand. Researchers are an important and valued part of the Diales technical experts' team, ensuring consistency in the team members outputs, reducing the overall costs of the work to the client by undertaking work that does not require expert consideration, and can therefore be delegated to the researcher under the expert's direction and control. Researchers are lay members of the team, in that the researcher does not have the technical education of the expert, which benefits the quality of the expert's work by ensuring that it can be read and understood by a lay audience, and is suited to the purposes of the courts and other decision making fora. The researchers will also help to organise the evidence and ensure the report is formatted correctly with the appropriate content.

The expert team also includes associates familiar with the work and competent in the expert's technical discipline. The associates help to filter the relevant detail from received documentation and undertake mathematical evaluations for the expert, to assist the expert in developing their views. Associates are tomorrow's experts in training.

For the most part, the work of the Diales technical experts is to undertake investigations and provide expert opinion for the purposes of litigation. The intention of such commissions is to provide an independent analysis of the issues in dispute so that a court, arbitrator, or other

decision makers can apportion responsibility or liability. The nature of the commissions is varied and may relate to a failure of a system, component or structure, or the alleged failure of a consultant or contractor to perform in accordance with its contractual and tortious obligations.

The Diales expert will work in different countries with different legal systems. Diales sets minimum standards for its experts, to ensure the independence of the expert is beyond reasonable question, irrespective of the legal system and jurisdiction in which the expert is operating. The performance of the experts is constantly reviewed and assessed to ensure that the required high standards are maintained.

Given the depth of support and quality of the assistance available to a Diales technical expert, it is likely that working in the Diales technical team is as good a place for an expert to work as is possible. There is certainly a sense of 'esprit de corps' within Diales and a mutual pride in the range and developing quality of the work undertaken.

Some tips for new experts

It is important that any expert is well supported and can seek counsel and challenge from fellow experts on controversial or difficult matters. This support is doubly important for any new expert. Any expert, however new, must be proficient in their discipline. It is also important that the technical argument and issues are understood, well researched, clearly explained, and relevant to the issue being considered. Any contrary factors to the opinion expressed must be given or where a range of opinion is possible this must be explained.

A new expert is most likely to require assistance in developing clear and relevant



reports and require support and training to ensure that they are ready before being put on the stand and cross-examined. The new expert may also need help with the organisation and digestion of mountains of documents to be researched for evidence. There is nothing so frustrating as finding relevant evidence only to lose it because the provenance and the document from which the evidence was derived was not properly recorded.

There are boundaries that experts must

not cross, most of which are included within the critical summary of the expert's role by Mr Justice Cresswell in the case of the "Ikarian Reefer." The new expert will also need to be familiar with the standards applied to the consideration of negligent actions by Lord President Clyde in "Hunter v Hanley" and Lord Hoffman in "South Australia Asset Corporation v York Montague" and give opinion that is measured to meet these standards.

The onerous standards that condition an

expert's work must be achieved within court or client-imposed timescales and costs. The report must include a statement of truth and the expert needs to be familiar with the means for caveating a report that may be limited because of insufficient time or a lack of available information.

The characteristics of a good expert witness have been widely discussed and written about. There is a consensus that an expert requires certain characteristics, other than being

proficient and up to date with their trade, some of which are as follows:

1) Confidence and resilience

Confidence matters. An expert must be confident as to the quality of the advice and opinion they give. Experts may be cross-examined in court to test their opinion and therefore they need to have the confidence and ability to withstand detailed questioning during cross-examination. Confidence comes from experience, knowledge, and having thoroughly examined and researched the facts of a case before having advanced an opinion, or reached a conclusion. This should not be confused with arrogance or the blind defence of the indefensible.

2) Rigour

It is the rigour and diligence of the investigative work that is the bedrock of the expert's work. Organisation, systems of work, and quality checks all help to achieve the precision, objectivity, and an attention to detail that is the hallmark of a competent expert's work.

3) Consistency

There must be a uniformity and dependability in the work of the expert. The views expressed, and the conclusions reached, must be clearly supported.

The work that a forensic expert and expert witness undertake during the court process must be truthful, concise, objective, well-argued and logical, based upon the facts and evidence of the case. It must consider all of the relevant material, be balanced, well-reasoned, narrow the issues and inform, such that the instructing solicitor can properly consider the management and the merits of its client's case.

4) Attention to detail, thoroughness, and open-mindedness

Attention to detail matters. An expert must carefully and thoroughly consider the issues and diligently and open-mindedly consider the details of a case before rendering an opinion.

5) Trustworthiness, honesty, truthfulness, and independence

The opinions of an expert will be relied upon by their client and advocates. The reputation of the expert is at stake whenever they give an opinion. An expert being examined, or giving an opinion, can only speak with confidence if knowledgeable and familiar with the subject matter of the case. This also includes a willingness to consider and include the favourable and unfavourable facts. Reputation matters. Experts should avoid rendering ill-formed opinions that will damage their credibility. Learned sources and recognised standards supporting the expressed opinion and views of the expert should be sought wherever possible.

The expert must be independent, uninfluenced by past appointments or the



It is important that any expert is well supported and can seek counsel and challenge from fellow experts on controversial or difficult matters.



demands of the legal process. Where there is the possibility that the independence of the expert may have been compromised, the commission should be declined.

6) Experience and proficiency

Expert witnesses must have a recognised level of experience in the matters on which they are offering an expert opinion. Whilst relevant professional experience is always a requirement, additional experience such as public speaking, or teaching, can help when testifying. All expert witnesses will have a detailed curriculum vitae that outlines their educational background and professional experience, qualifications, publications, etc., that the expert has received and written. Experience of expert meetings, the court process, and of being cross-examined is invaluable and helps ensure that the expert is proficient. There are many traps and pitfalls that can befall an expert; in the preparation of expert reports, at expert meetings, and when being cross examined, such as referring to privileged information.

7) Effective communication and clarity of expression

Expert witnesses need to be good communicators and understand the technical language of the profession and be able to render this into lay terms. To communicate is also to write, talk, listen, and consider. The expert must be able to understand, and answer, questions posed when examined in court as well as those requiring written communication with lawyers. An expert is required to narrow the issues of a case and summarise complex technical issues and facts concisely and in a manner that a judge or jury will understand.

8) Quality

One of the most important functions of an expert witness is the preparation of a detailed written report including their opinion and conclusions. The facts and evidence relied upon are to be shared with the court and opposing experts. Reports should follow a clear format

that suits the court, or legal process being undertaken. The written work should be free of typographical errors and written in clear and concise language. Any authorities, journals, or sources relied upon should be stated and relevant documents and passages included.

Experts are required to review all the relevant evidence, to read in, and to research before writing a report. The writing of a report is often undertaken to a tight deadline and will require careful planning and management. Systems and staff able to deal rapidly with lots of documentation, ensure the quality of the output, and test the opinions and conclusions of the expert, are essential. It is helpful that those staff engaged with the expert are encouraged to challenge the expert whilst the expert is developing an opinion by using a process of creative dissonance in discussions, to ensure that the opinion of the expert is tested and is robust, has considered all the various possible alternatives and fully identifies the weaknesses or areas that may be contentious, and considers the opposing pleaded case with equal merit.

9) Knowledge of the court process

An expert must have a proper understanding of the court process within the jurisdiction in which the litigation is taking place. The expert must be familiar with the requirements and duties imposed by the court process and how this is to be reflected in the expert's work for the court. Familiarity with requirements of the UK's Civil Procedure Rules Part 35, its Directions and Guidance, the Ikarian Reefer decision, and other directions given by the courts is essential.

The expert will also need to be familiar with the standards applied to negligent actions to ensure that any opinion given is measured to meet these standards. The expert must consider that with acts of negligence, the expert must be capable of proving and understanding what is accepted as normal competent practice, prove that these standards were not adopted or adhered to, and explain why the practice adopted was never likely to be considered as acceptable by the majority of their fellow practitioners.

The expert must also understand that in cross-examination any flaws or weaknesses in the logic and methodology used when coming to a view or conclusion will likely be exposed. There may be areas of the case which the expert has not properly considered in which knowledge of the expert and familiarity with the subject and case will be essential in order to answer convincingly.

Few, if any, new experts will be capable of developing these additional necessary skills unsupported. Joining a company such as Diales will give this valuable support and training and assist a new expert in maximising their potential. Working alongside fellow experts and experienced support staff, the organisation, presentation, focus and clarity required to be a proficient expert can be instilled such that this becomes second nature. ■



Disadvantages of Mediation?

David Wileman deciphers the downsides to mediation, and whether there actually are any...



I was recently asked to write an article on the disadvantages of mediation. I must admit this came as American's would say as "a bit of a curve ball" as normally people always want to know about the advantages of mediation. This request brought two immediate thoughts to mind, firstly "What are the disadvantages of Mediation?" and secondly "Are there any disadvantages of mediating?"

It is a difficult question as I have long been a fan of mediation. In order to fulfil the brief therefore I thought that I should firstly consider what mediation is from two points of view. Those in favour of mediation describe it as a dynamic, structured process where an impartial third party, the mediator, assists the parties in understanding the merits of each other's case in order to narrow the differences and assist a negotiated settlement.

Those who dislike mediation describe it as a talking shop, a waste of money and a pointless expenditure of time where the other side does not listen and the whole process becomes an exercise in futility. Who is correct?

In my experience both points of view gain

some traction to a greater or lesser extent. The problem is, as a slightly politically incorrect Project Manager of mine used to say "You can take a Hippo to water, but you can't make him wash."

Some parties arrive at the mediation kicking and screaming only turning up on the day because they do not want to be criticised by a judge further down the dispute process. I have attended a mediation like this, and it is not fun. One party is setting out its case and the other party is just watching the clocks turn determined to say nothing, agree nothing and generally pour scorn on the proceedings. Whilst this is frustrating would you call it a disadvantage?

It all depends on your point of view. Even if you feel that the other party to a dispute will turn up to the mediation in this manner it is always worth preparing and turning up with a confident smile. Set out your case and listen to the deafening silence coming back from across the table. Reach the end of the day and walk away in the knowledge or hope that some of your words, statements or even PowerPoint slides may have hit the mark. They may not have responded in the mediation, but it would be a foolish person who does not consider the weight of evidence against them when it is presented to them in a prepared and structured manner.

It may have seemed like a complete waste of

time and money but there is always hope that the penny may have dropped. Mediations of this type are always a good time to get your experts to set out why their assessment is correct. The opposition will hopefully note the well-structured and supported assessment set before it. Who cares if they fail to respond likewise on the day? It was a relatively cheap day when you consider the ultimate costs of an Arbitration or Court Case.

Therefore, attending a mediation ensures that even an unwilling Party is made to sit and listen to the strengths of the other side's case.

Parties also arrive at mediation willing to engage but ill prepared and unwilling to budge. A lack of preparation occasionally allows a party to attend a mediation in full denial that it has any points to concede.

The failure to prepare generally makes parties dig their respective heels in and consequently the mediation becomes (almost) a bit of a waste of time. The reason I say "almost" is that even if a party arrives ill prepared, the mediator will still give the prepared party the chance to state its position and to lay out why it is confident of its entitlement.

Therefore, even an ill prepared party is made to sit and listen to the strengths of the other side's case.

Parties that do engage, in my experience, do narrow the gaps and test each other's relative strengths and weaknesses. The chance of this improves when both sides attend with their experts. The experts are often sent off into side meetings, sometimes with lawyers and clients and sometimes without lawyers and clients but in all cases, in my experience, with the mediator. Whoever attends the side meetings is generally irrelevant as it allows truly independent experts

“

Therefore, attending a mediation ensures that even an unwilling Party is made to sit and listen to the strengths of the other side's case.

”

to get the chance to dig and probe into the positions and then take away that information for dissemination with the Clients.

From the point of view of a party appointing an expert, it is also a good time to listen to what your own expert is saying when faced with the opposing points of the other expert. It has been known for experts, who have not read their duties under CPR35 and have never heard of the Ikarian Reefer, to hide its instructing side's own problems up his or her respective jumper. This is not sensible as invariably any problems generally come home to roost and the last thing a Client wants is these 'culpable' issues coming out during a very expensive court case.

At the end of the day, however the mediation has proceeded, each party is then able to sit down in a quiet room and discuss what they have learned from the day. This is especially important when it comes down to mediating disputes which relate to delay. More often than not the delay analysis is based on some form

of an as-planned vs as-built / collapsed as-built / as-built longest path assessment. The reason for this is that the majority of delay disputes that are mediated relate to projects that are complete and were impacted by many possible competing delays. Disputes which relate to single delays and the like don't often need to go to mediation.

Delay and critical or near critical paths can turn on the missing or addition of one logical link or one piece of contemporaneous evidence and are therefore quite often subject to differing points of view between the instructed experts. The benefit of mediating a dispute related delay case is that the parties are allowed to test each other's cases and throw the proverbial hand grenade into the mix to see if the other side recognises its weakness. The earlier any weaknesses in a case are determined the less likely significant costs will be spent pursuing unsupported claims.

You will see from the above that I am a fan of mediation. If the mediation is run well by an experienced mediator with opposing well prepared sides, it can be a rewarding day that narrows the issues and brings the parties that little bit closer to a negotiated settlement.

The main disadvantage that I can see relates to parties that have very (very) good cases. Sometimes parties can be drawn into a horse trade when, by way of example, if the claimant had stood its ground and proceeded to a third-party dispute resolution determination it would have walked away with a significant win and a large portion of its costs.

In summary, mediation can be frustrating, annoying, wholly negative, enlightening and a wholly positive experience. Advantages many, disadvantages few! ■

**driver
trett**

Are you the person we are looking for?

Visit www.driver-group.com/global/careers-current-vacancies



Becoming

Mark Wheeler talks about why the journey is just as important when it comes to being an expert.



Mark Wheeler
Global Chief Operating Officer

There is one question that I get asked more than any other. Simply summarised, it is "How do I get to become an expert?". Each year, new hires ask this, website visitors ask this, social media enquiries ask this. Even some clients ask this.

I always respond by asking why they would want to do such a thing. For many, they see it as a big step in career development. Others believe that it will be highly financially rewarding, for many it is a mark of prestige that they want to gain. Nobody has ever said "...I want to work all the hours God sends in the run up to a trial, under enormous pressure and stress, constantly dealing with queries from all sides, before being tested on my report by a QC who can cross examine me in the witness box for days if he wants...". If that ever happens, do I hire them, or have them committed?

It's also a common misconception that being an expert is a career. I have always been troubled by this. It certainly is the case that many who work almost entirely on expert commissions have reached that stage, but it's very important to have knowledge of current industry practice. Keeping in touch with developments can be hard, if you are

no longer practising in your primary field of expertise. Working in a larger firm that allows project involvement is very helpful, as is active participation in industry organisations and professional bodies. The best expert quantity surveyor is one who, when asked what he does for a living says "I'm a quantity surveyor", not "I'm an expert".

I was recently reading Michelle Obama's book, titled 'Becoming'. The structure is interesting, divided not just into chapters, but sections; Becoming me, Becoming us, Becoming more. It struck me that when considering the process of becoming an expert, it is important not to ignore the journey that will have gone before.

Become qualified, Become a specialist, Become experienced, all must come first. So, the first step in even considering taking on an expert commission, is determining the level of expertise that you have in what subject matter and assessing if this is a suitable basis for becoming an expert witness.

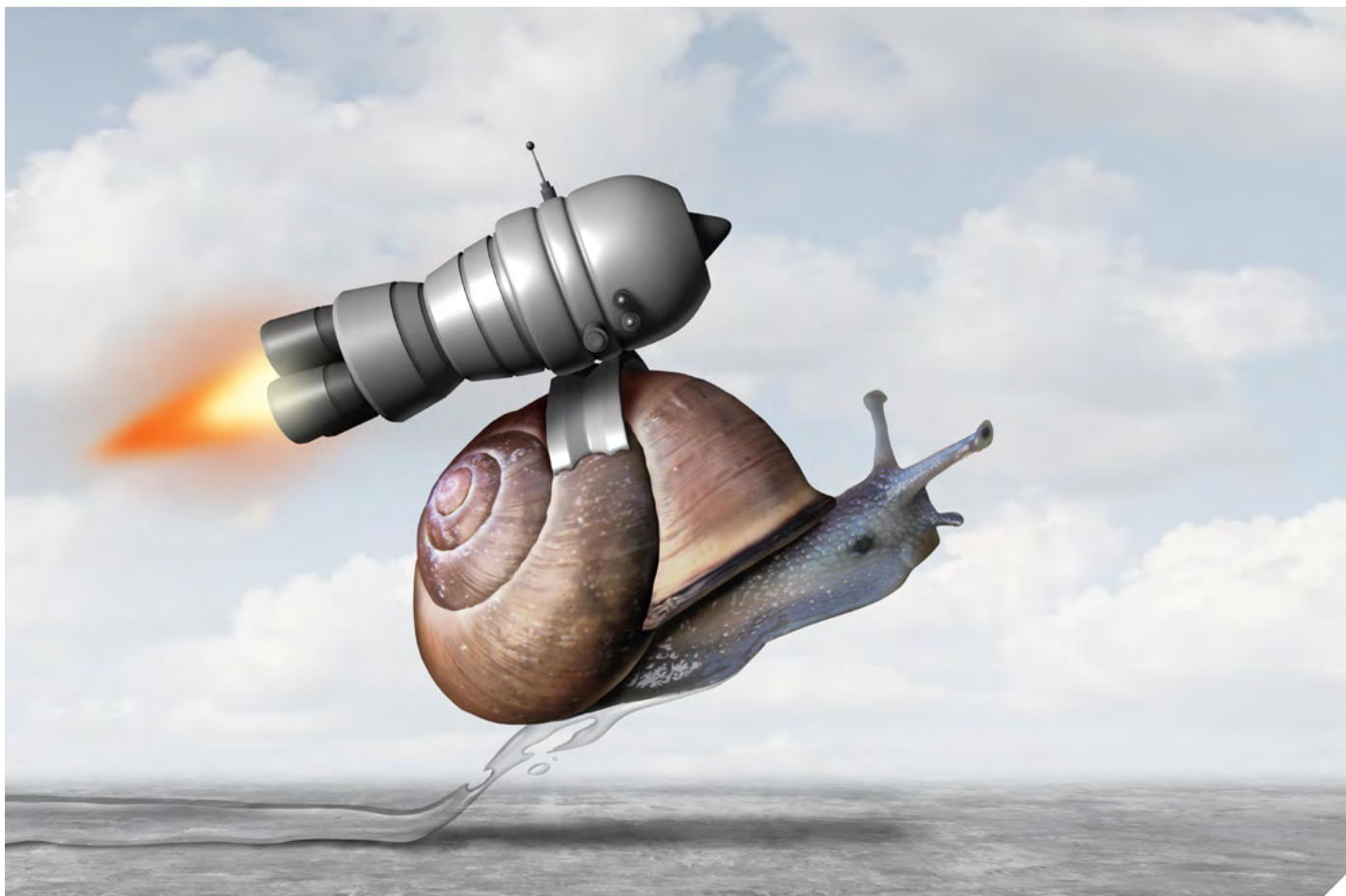
When an applicant comes to us, wanting to join the team, we have a well-defined process for assessing their ability and suitability to be an expert. But the assessment does not start with the last report they wrote, it starts by looking back further. How long has this person been in the industry? What project experience do they have? How detailed and practical are they? Most people in the team have a real passion for their professional discipline, have reached the top of that career and are looking for something

more challenging.

Having satisfied ourselves that they have become qualified and become specialists in their field, the next step is to ensure they have, or can, become experts. Training and mentoring are part of the process, and then there is a final assessment interview. Not everyone who applies passes; the current pass rate into Diales is around 45% of first-time applicants. One of the key requirements has to be understanding what you don't know, and being open and accepting of it. Some struggle with this, feeling that they should be expert at everything. This is a dangerous attitude and won't get someone in our team through to expert status.

The interview is important, because people can repeat the text book answers to questions about duty to the court, independence, etc., but real testing of those principles is achieved in mentoring and peer review, and a tough interview to make sure they really understand how the principles define our culture and make us the best expert team to turn to.

This final stage in becoming a Diales expert cannot be defined in terms of timescale, it cannot be short cut or accelerated. It's not about the process. It's about the outcome. Those that pass through the process get to work on some of the world's most complex and interesting projects and disputes. The journey is therefore well worth the effort. If you have already become a qualified specialist in your field, perhaps it's time to contact us and become something more... ■



What's the rush all about?

To accelerate, or not? That is the question.



Mark Blackmore
Senior Consultant
Driver Trett UK

During a construction contract, there will inevitably be delays to the regular progress of works. These delays may be culpable issues of the Contractor, instructions issued by the Client, or external factors such as statutory authority works and weather.

Notwithstanding that the Contractor has incurred culpable delays, their obligation remains to complete the works within the period contained within the Contract, or such other extended period; it must attempt to mitigate these delays and take any actions reasonably required to achieve the completion date. Any costs incurred in undertaking this mitigation are the sole responsibility of the Contractor.

Regardless of delay responsibility, it is generally beneficial for all Parties that the works complete within the contracted period. The Client may need to move into the building on

a specific date, where the occupation will be dependent on term or opening times. In this instance, the Client may not want to grant any extension of time and will likely insist that the works are completed within the contract period.

This could be deemed as an implied instruction to accelerate from the Client. If the Contractor acts to accelerate the works, in the belief that additional costs incurred will be reimbursed, he does so at risk and places trust in the Client honouring the perceived agreement to pay for any additional costs.

The Contractor may also choose to accelerate if the Client or Contract Administrator is reluctant, or refusing, to award an extension of time as this will reduce or remove its exposure to damages being levied.

To minimise this risk, it is always recommended that the Contractor seeks agreement from the Client to ensure there is no misunderstanding as to what is being requested. This will also provide an opportunity to give an indication of the projected costs of accelerating the works.

The more commonly used standard forms of Contract include the following provisions for

acceleration:

- JCT Standard Building Contract With Quantities (SBC/Q) 2016 (Schedule 2 Clause 2)
- NEC3 Engineering and Construction Contract April 2013 (Clause 36)
- NEC4 Engineering and Construction Contract June 2017 (Clause 36)

The process under SBC/Q 2016 is as follows: If the Employer wishes to investigate the possibility of achieving practical completion before the Completion Date, he shall invite proposals from the Contractor. The Contractor shall either:

- Provide an Acceleration Quotation, identifying the amount of time that can be saved and the adjustment to the Contract Sum; or
- Explain why it would be impracticable to achieve practical completion earlier than the Completion Date.

The Contractor's quotation shall be generally submitted within 21 days, and remain open for acceptance for not less than 7 days.

If the Employer wishes to accept an Acceleration Quotation, the Architect or Contract Administrator shall confirm an instruction, stating the adjustment to the Contract Sum, the adjustment to the time required for completion and any conditions upon which the quotation was submitted.

If the Acceleration Quotation is not accepted, a fair and reasonable amount shall be added to the Contract Sum in respect of the cost of its preparation provided that it has been prepared on a fair and reasonable basis.

Under both NEC3 and NEC4, the Contractor and the Project Manager may propose to the other an acceleration to achieve Completion before the Completion Date. If the Project Manager and Contractor are prepared to consider the proposed change, the Project Manager instructs the Contractor to provide a quotation.

A quotation for an acceleration comprises proposed changes to the Prices and a revised programme showing the earlier Completion Date and any changes to Key Dates.

The Project Manager replies to the quotation within three weeks with either:

- A notification that the quotation is accepted; or
- A notification that the quotation is not accepted and that the Completion Dates and Key Dates are not changed.

The risk under the NEC form of Contract, is that there is the potential to lose further time whilst the formalities are taking place. This could severely impact any potential benefits of accelerating the works. If the project has become time critical, then it would be advisable to push for earlier agreements.

What happens if acceleration measures are instructed and implemented, but the revised



Regardless of delay responsibility, it is generally beneficial for all Parties that the works complete within the contracted period.



Completion Date of the works is not achieved?

The standard forms do not address this situation. They detail the procedures to follow for an acceleration agreement to be made, but not who carries the risk if the earlier completion date is not achieved.

There may be valid reasons why acceleration measures may not work. There could also be other contributory factors that further delay the works after the acceleration agreement is implemented.

Great care is needed when entering into an acceleration agreement. If the Employer wants the Contractor to provide a warranty that the acceleration measures will be successful, it must make this clear to the Contractor when requesting the quotation.

If the Employer is unwilling to accept the cost for the Contractor carrying the risk of acceleration succeeding, then he needs to ensure that the proposed acceleration measures have a high chance of succeeding and that the proposals can be monitored.

In this case, it would be beneficial for greater detail and costs for each and every proposed change to achieve the acceleration, rather than just submitting a lump sum quotation.

To achieve acceleration there are a number of measures that can be adopted. These might include:

- Extended working hours;
- Increased resources;
- Alterations to programme;
- Introduction of temporary works;
- Changes to working methods;
- Changes to design or specification;
- Work scope changes.

There are pros and cons to each of these measures, and careful consideration should be given to each in order to assess the potential benefits to the project against the additional costs, and negative effects, that could be encountered.

Extending working hours should perceivably increase productivity and progress of the works. However, this will come at an additional cost in the form of incentive payments or overtime. It is also widely acknowledged that extending

working hours is not a sustainable solution, which could eventually lead to a reduction in productivity. Site working conditions, health and safety, and planning restrictions may also impact on the effectiveness of longer working hours.

Increasing resources would ordinarily be expected to improve productivity on site. However, there is a finite number of workers that can carry out productive work within a set area. The right level of additional resources needs to be utilised, ensuring that there is enough work to be completed. Productivity could otherwise remain static or, in the worst case, reduce.

Changes to the programme may be considered the simplest option to accelerate the works, as altering the sequencing is relatively simple and may not incur additional costs. However, it may also be one of the least effective methods. An experienced Contractor is likely to have already planned the original works to achieve optimal efficiency, so any change to this sequence is unlikely to achieve significant improvements.

An example of temporary works, such as commencing internal works before the building is fully weather-tight, a temporary roof and elevation sheeting could be proposed, effectively providing an envelope around the building. This solution is rarely 100% effective in the event of bad weather and could have the adverse effect of remedial works being required in the event of water ingress to the building. Any alterations to the external scaffolding may also be disrupted by the temporary sheeting, and may cause additional delays rather than the expected programme acceleration.

Attempting to change working methods, such as installing heaters, dehumidifiers, etc to speed up the drying of internal finishes can lead to cracking and additional snagging works for the Contractor to complete. Careful consideration should be taken before attempting this method of acceleration.

The drawback to changing the design or specification could be that the Employer receives an alternative product that was not its first choice and also pays additional costs. This may cause resentment or regret once the works are completed, meaning the Client is not 100% happy with the finished building, albeit the completion date was improved.

Changing the work scope to omit sections of work, or to postpone works until after Practical Completion rarely works. Returning to a completed building risks damaging furniture and finishes to carry out the remaining works, along with the disruption and interruption to the operation of the building. If work sections are omitted, the Contractor may make a claim for loss of profit, if the works are subsequently awarded to another Contractor.

In conclusion, the decision whether to accelerate during the progress of the works needs to be made after consideration of several of the points raised above. There is no simple solution and each project should be viewed individually. ■

BYTE

THE EVOLUTION OF THE FESTIVAL TENT

On the theme of evolution and becoming, and with festival season fast approaching, this article reflects on the development of tensile structures over the past twenty five years to provide shelter for events, and the operation of these structures, including causes of failures that have occurred and how such failures can be mitigated.

To read the BYTE you can visit <https://www.driver-group.com/europe/news/evolution-of-the-festival-tent> or scan the QR code with your smartphone camera.



Contact Driver Trett Worldwide

AFRICA

SOUTH AFRICA

+27 11 315 9913

AMERICAS

CANADA

Calgary

+1 587 952 6228

Toronto

+1 416 639 2177

Vancouver

+1 604 692 1151

UNITED STATES

+1 646 571 2242

ASIA PACIFIC

AUSTRALIA

Brisbane

+61 7 3184 9171

Melbourne

+61 3 9935 2900

Perth

+61 8 6316 4572

Sydney

+61 2 9248 0100

HONG KONG

+852 3460 7900

MALAYSIA

+603 2273 8098

SINGAPORE

+65 6226 4317

EUROPE

FRANCE

+33 1 73 79 58 68

GERMANY

+49 89 208 039 535

THE NETHERLANDS

+31 113 246 400

UNITED KINGDOM

Bristol

+44 1454 275 010

Coventry

+44 2476 697 977

Glasgow

+44 141 442 0300

Haslingden

+44 1706 223 999

Liverpool

Tel: +44 151 665 0665

London

Tel: +44 20 7377 0005

Reading

Tel: +44 1189 311 684

Teesside

Tel: +44 1740 665 466

MIDDLE EAST

KSA

+966 11 834 6340

KUWAIT

+965 2267 5050

OMAN

+968 2 461 3361

QATAR

+974 4 435 8663

UNITED ARAB EMIRATES

Abu Dhabi

+971 2 4410 112

Dubai

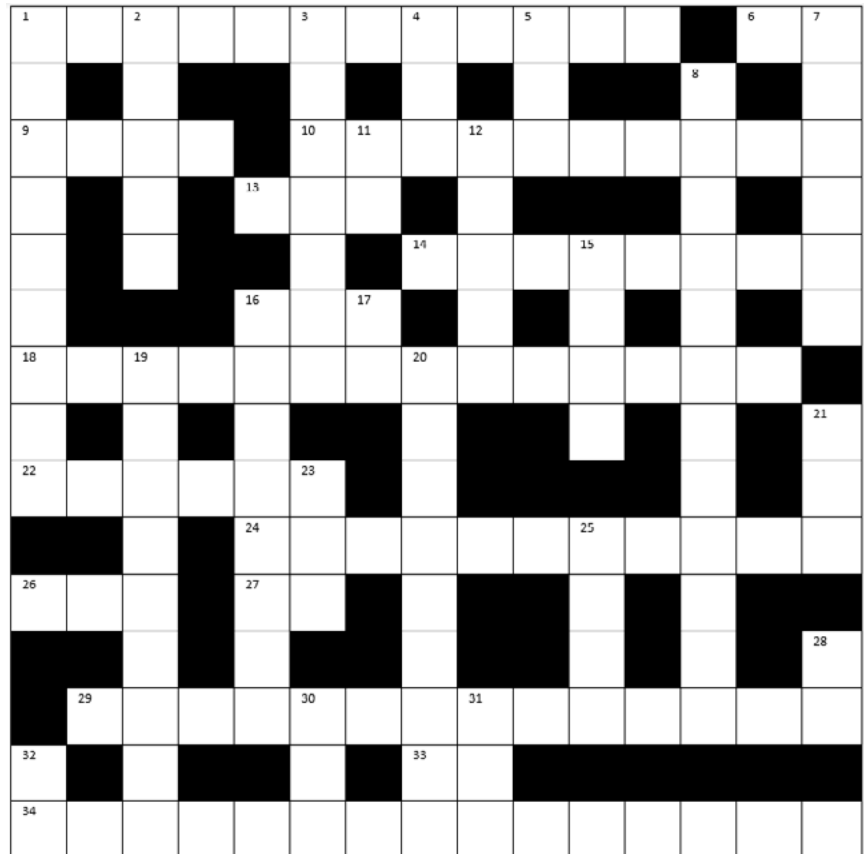
+971 4 453 9031

FOR MORE INFORMATION VISIT WWW.DRIVERTRETT.COM OR EMAIL MARKETING@DRIVERTRETT.COM

COMPETITION

CROSSWORD

For your chance to win a signed copy of Evaluating Claims, Third edition by John Mullen and R Peter Davison, send a picture of your completed entry to marketing@driver-group.com by March 31st 2020.



Across

- 1 Supports not short before Tonia writhes for overrun (12)
- 6 Constant requirement when measuring curved structures (2)
- 9 Not every design office openings provide formulae (1,1,1)
- 10 Shot to hell, a case of mitigation (3,7)
- 13 Information system returns at heart of African state (1,1,1)
- 14 In pop art is a need for independence (8)
- 16 Natural habitat of 10 (3)
- 18 Organisation follows red light into new conditions (14)
- 22 Project finance in good shape (1-5)
- 24 It sounds like spindle was fifth class, but got there early (11)
- 26 Soapy Cotton suggests how to add some delays (3)
- 27 Works predecessor in old standards (1,1)
- 29 Inquisitive Python leads alteration to a radical rethink (8,6)
- 33 Irregular forces and accessory initially (1,1)
- 34 6 deliveries before the hour lead Geordie monarch into the evening (8,7)

Down

- 1 Sanctions are the result of disruption to Palestine (9)
- 2 Speaker requiring a change? (5)
- 3 Warnings that they are unfrozen? (7)
- 4 Expert, responsible for 18? (3)
- 5 Episode concealing standards (1,1,1)
- 7 A letter for those under canvas? (6)
- 8 Truncated 6 precedes disturbance to field (12)
- 11 Tax man starts in centring on arithmetic (1,1)
- 12 Might this military slang sum up many a construction project? (1,1,1,1)
- 15 First part of the party of the first part that needed time records (4)
- 16 Rescued old prisoner confused for recovered materials (8)
- 17 Initial method of accelerated materials deliveries (1,1)
- 19 When costs do this, 9 might help you (9)
- 20 A second attempt to resolve a repair project? (9)
- 21 Was this the preferred book of the Chairman? (3)
- 23 Contract considered somewhat eccentric at first (1,1,1)
- 25 High-cement mixture within trichrome structure (4)
- 28 For some 8th May might be a good day for systematic improvement (1,1)
- 30 With whom Bovis had a global argument (1,1,1)
- 31 Rule in the middle of building levels we hear (3)
- 32 Something to do for a change (1,1)

SEND A PICTURE OF YOUR COMPLETED ENTRY TO MARKETING@DRIVER-GROUP.COM



FIND YOUR IDEAL CONSTRUCTION EXPERT WITNESS, FAST, WITH THE DIALES APP!

Search by expertise and then narrow your search by contract, region, sector or years of experience.

Download the free app by visiting our website **www.diales.com** or by scanning the QR code with your smartphone camera.



For more information about our experts and services visit **www.diales.com** or email **info@diales.com**

EXPERT WITNESS SUPPORT
SERVICES FOR INTERNATIONAL
ENGINEERING AND CONSTRUCTION

a member of the Driver Group of companies

