KEY OUTPUT 10: THE FUTURE OF CONSTRUCTION

MULTIDISCIPLINARY STEERING GROUP FOR COST ASSURANCE AND AUDITS ON INFRASTRUCTURE PROJECTS & CONTRACTS

DECEMBER 2022 / JANUARY 2023 EDITION

CONTENTS

1. Introduction 3
2. Forward 4
3. Representation 5
4. Cecelia Fadipe - CFBL Consulting (Chair) 6
5. Imran Akhtar - Turner & Townsend 7
6. Claire R.Smith / C Hughes - Eversheds 8
7. Ian Heaphy - INCC / NEC 9
8. Gary Bone - Blake Newport 10
9. Shy Jackson / Jennifer Varley - BCLP 11
10. Charlotte Edwards - Atkins / SNC Lavalin 12
11. Jim McCluskey - Vinci Construction 13
12. Darren Ward - The Orange Partnership 14
13. David Worsley - Transport for the North 15
14. Elliot Patsanza - Ridge & Partners 16
16. David Sharp - Mott Macdonald 17
17. Michael Bamber - WSP 18

Key Output 10: The Future of Construction

In Key Output 10, our steering group examined the future of construction on infrastructure projects and contracts. We discussed the future of assurance in construction once again from a multi-disciplinary view. We explored the topic from the perspective of clients, contractors, and subcontractors. As well as from the viewpoint of auditors, commercial managers, finance managers, project managers and lawyers on infrastructure projects.

Our multidisciplinary steering group of diverse experts, professionals, and member companies have the required wealth of UK and international expertise on cost assurance and audit on infrastructure projects and construction contracts. Through our CSR and governance initiative, we are working in conjunction with funders, clients, and contractors to drive change and transformation industry-wide.

This output developed by our steering group members includes key themes relating to the future of construction and answers questions raised during the July 2022 conference.

Key Themes

- Alliancing
- Contract for best practice
- Cost control best practice
- Assuring ESG
- Inflationary Pressures
- Cost Intelligence
- Supply chain data
- Audit data access
- Technology
- Training
- People competencies

Our past steering group key outputs and previous CICES articles can be accessed here: https://www.cfbusinesslinks.com/steering-group-csr

Presently there is no global, UK, or industry-wide standard for cost assurance and audits on infrastructure projects or contracts. Data and lessons learned throughout the project lifecycle on past projects are not always fully captured. This means that risks persist for all parties in the construction value and supply chain. Assurance should begin with data-led decisions from reliable cost estimates, budgeting, contract award, cost reporting, competencies, and the right people behaviours to ensure continuous improvements industry-wide.

Multi-disciplinary Steering Group

The multidisciplinary steering group for cost assurance and audits on infrastructure projects and contracts (a CSR initiative) was borne out of the joint agreement by the parties on the need for this. From the onset, we sought to make this a diverse multidisciplinary group of experts because we know from experience that successful projects across sectors consist of experts from diverse backgrounds and professions. The steering group comprises a panel of professionals and representatives from a cross-section of the industry, including lawyers, contract specialists, auditors, engineers, quantity surveyors and consultants.

The objective is to meet quarterly in a setting where lessons learnt and best practices from real-life experiences from projects delivered around the world in various industries and sectors are shared confidentially, creating a common voice of interpretation to help identify and resolve issues quickly and to share knowledge, expertise, and best practice on infrastructure projects. The goal is for the group to deliberate early on emerging issues, key issues and short, medium, or long-term options for resolving these from multiple lenses.

The remit (in volume 1) of the steering group's key outputs discussed and developed quarterly covered fundamental aspects that comprise the following and a future outlook that will form the next steps and volume 2 of the steering group's work:

- Standards & Framework
- Contracts & Key Terms
- Legal Perspective
- People Perspective
- Cost Reporting
- Cost Assurance & Audits
- Technology
- The Future of Assurance
- The Future of Construction

Outputs

The steering group is multidisciplinary, and collaborative and jointly produces quarterly outputs in articles, protocols, documents, best practice guides, communications, and guidance on the latest thought leadership to the broader industry. Technology and sustainability are key fundamental aspects of our remit featured quarterly. These outputs are summary recommendations and the newest thinking from multiple lenses and experts, and we hope the industry finds these beneficial. Our past outputs can be found and downloaded freely here: https://www.cfbusinesslinks.com/steering-group-csr.

Our Members

- Cecelia Fadipe - CFBL Consulting (Chair)
- Imran Akhtar - Turner & Townsend
- Claire Randall-Smith / Charlotte Hughes - Eversheds Sutherland
- Ian Heaphy - INCC / NEC
- Gary Bone - Blake Newport
- Darren Ward - The Orange Partnership
- Tom Leach - Southern Water
- Kathleen Hannon - Scottish Water
- Shy Jackson / Jennifer Varley - BCLP
- Charlotte Edwards - Atkins / SNC Lavalin
- Jim McCluskey - Vinci Construction /CICES
- David Worsley - Transport for the North
- Elliot Patsanza - Ridge & Partners
- David Sharp - Mott Macdonald
- Michael Bamber - WSP
- Chris Richardson - National Highways
- Justice Secheles - Arup
- Chris Leech - Balfour Beatty
- Victoria Hill-Stanford / Lisa O'Toole - Network / HS2

Our Professional Sponsors

- Darrell Smart / Danielle Kenneally - CICES
- Daisy Brooker / Daniel Kirmatzis - IPFA

REPRESENTATION

From employees, professional members and associates of:

Disclaimer

The views, opinions and thoughts expressed by members and contributors to the steering group reflect only the author's views and not that of their employer or professional body.

Key Contributors - KO10

Claire Randall-Smith
Eversheds Sutherland

Cecelia Fadipe
CFBL Consulting

Imran Akhtar
Turner & Townsend

Ian Heaphy
NEC/INC Consulting

Kathleen Hannon
Scottish Water

Gary Bone
Blake Newport

Jim Mcluskey
Vinci

Michael Bamber
WSP

Charlotte Hughes
Eversheds Sutherland

David Worsley
Transport for the North

Darren Ward
The Orange Partnership

David Sharp
Mott Macdonald

Cecelia Fadipe, FCMA
CFBL Consulting

OVERVIEW

The future of infrastructure projects and construction contracts will entail increased internal and external risks. This will result in global environmental complexity, necessitating the need to collaborate and share intelligence early amongst multi-disciplinary professionals in an attempt to resolve industry-wide challenges like data, labour shortages and productivity and unexplained cost escalations.

OUTLOOK

The objective will be to use digital and data to drive improvements and influence decisions in real-time. This will involve governing the use of technology and leveraging technology to address key construction challenges. This will include the increased use of data analytics in assurance to manage data volume and managing legal complexities of innovating. The objective will be to instil stakeholder confidence, equitable risk sharing and responsible business / environmental practices.

KEY RECOMMENDATIONS ON THE TOPIC

The more successful infrastructure projects will begin with a cost assurance strategy that is aligned with strategic goals and operational objectives that permeates throughout the business and supply chain. This will be governed by legal contracts agreed on protocols and a robust assurance regime that is communicated early and included in a wider more complex work scope. These Protocols will be adhered to from the onset pre-contract, and on the mobilisation of the project and certainly not 3-5 years later or at final accounts which is often what currently happens in practice.

On major projects, the volume and complexity of work, data and risks will be significant. Consequently, the cost-benefit of 100% sampling will mean that the use of technology, a pre-agreed sample and risk sharing will be key. While some still see cost assurance audits as nice to have, the risk of increased cost pressures and legal costs when things go wrong is no doubt influencing changes in behaviour, as is presently being seen on major projects.

"Cecelia has 25 years of experience, a CIMA qualified accountant and cost consultant specialising in infrastructure cost assurance and audits with experience across rail, water and energy sectors. She has undertaken audits of c£2.0bn on HS2, Crossrail, Costain, Skanska, Balfour Beatty & Atkins, implemented protocols and delivered industry-wide training to over 300 professionals".

Cecelia Fadipe
Director CFBL Consulting

Cecelia is a qualified accountant of 25+yrs, and director of CFBL Consulting, a cost and strategy consultancy specialising in independent cost audits on infrastructure projects and strategy advisory. She has worked across commercial, finance and project control functions. A CIMA fellow and member of AICPAs, sustainability and R&D panel. She is a cost consultant and auditor in the rail, technology, defence, renewable energy and electrification sectors and has led audits on major programmes. She is chair of the multi-disciplinary steering group. Her career in construction spans 20 years and she has worked on high-profile projects such as HS2, Hinkley Point C and Crossrail, and as a result brings a wealth of knowledge and experience to this space.

Cost of Global Labour and Raw Material Demand Shortages & Capturing Best Practice on Infrastructure

Given the strong pipeline for infra and high global demand for sector skills and materials, what specific measures does the panel consider that can help local costs can be better managed and driven down through cost assurance throughout the project life cycle?

Secondly - as an industry, how do we capture the benefits of these measures so that they can be widely adopted and become standard approaches / leading best practices?

The challenges of labour shortage since Brexit and raw material shortages since Covid-19 have been worsened by the Ukrainian war which has driven the supply chain crises to an all-time peak. On infrastructure projects, labour on average can account for as much as 60% of costs and materials 20% of costs. Combined these represent 80% of costs and therefore fluctuations in these costs will have significant impacts on cost and assurance. An up-to-date cost programme supported by a proactive forecast of resources instead of a reactive project organisation will help manage labour costs. Material costs over the project lifecycle can in addition to active project lifecycle forecasts be benchmarked to evidence value for money and significant variances flagged for further investigation and audit particularly when the material has been procured with limited competition or without benchmarked rates.

Our steering group comprises multi-disciplinary experts with extensive global expertise, including experience in procuring, auditing and benchmarking labour and material costs. We have in addition produced several key outputs, lessons learnt and best practices on these topics and continue to provide industry-wide guidance and thought leadership. These key outputs are freely available to all parties to download here https://www.cfbusinesslinks.com/steering-group-csr

Role of Independent Cost Assurance Audits in Assuring ESG

Independent Cost Assurance Audits will in the future help govern ESG and carbon costs by providing independence and transparency for stakeholders. This will be done by using reliable data collected during cost audits for the verification of actual costs and hence performance which can be reported in real-time to help prevent greenwashing. Cost auditors are already privy to huge amounts of sensitive cost and confidential ESG data at a granular level such as energy and utility cost data for carbon cost audits and payroll data for gender pay audits.

This learning curve can be leveraged to assure ESG data and actual costs relating to ESG issues and carbon emissions on a project. Increased environmental and social risks have led to an increased need for governance and regulatory reporting. This in turn has resulted in a rise in Greenwashing - a practice where businesses incorrectly portray/report the extent of their green credentials. For the future, this is not sustainable best practice and for many businesses

The challenges- of ESG reporting include obtaining accurate data, particularly scope 3 data from wider supply chains and ecosystems, a lack of expertise, and protocols for consistently reporting on ESG to satisfy investors and stakeholders. Protocols and training will be required to assure ESG and for the correct application and adoption of frameworks e.g., UN SDGs, ISSB, TCFD, or other relevant standards.

Construction alliancing and open-book contracts will build on clauses e.g. NEC Z29 with requirements that environmental costs are captured, reported, and independently verified. The biggest challenge remains sensitive comparable benchmarking data and metrics. Our steering group continues to provide needed guidance and thought leadership on this topic.

Imran Akhtar
Turner & Townsend

OVERVIEW

The growing importance of Cost Assurance is clear in an industry where open book / cost-reimbursable contracts are becoming the standard. This will continue to play an important role in infrastructure and construction projects.

OUTLOOK

The construction industry is playing a key role in helping to get our economy back on track. However, as projects become larger and more complex the need for assurance in the future of construction is clear.

KEY RECOMMENDATIONS ON THE TOPIC

More complex delivery models (e.g., Alliances / Joint Ventures) and supply chains mean that a good assurance framework and approach will recognise and incorporate all levels of defence across organisations to help realise cost optimisation and value-for-money opportunities.

Finally, as other factors such as carbon and sustainability become more pressing, the principles and features of a robust cost assurance framework are transferable to these areas and should be developed in conjunction with each party to identify opportunities to enhance project performance on construction projects.

"Imran is an experienced chartered accountant (ACA) providing Cost and Commercial Assurance services to a variety of major infrastructure clients with prior experience in external and statutory audit from working at the U.K National Audit Office. He is currently U.K lead and global SME for Cost Assurance service development and delivery within Turner & Townsend, a global provider of consultancy service within the construction industry".

Turner & Townsend

Imran is an experienced chartered accountant (ACA) providing Cost and Commercial Assurance services to a variety of major infrastructure clients with prior experience in external and statutory audits from working at the U.K National Audit Office. He is currently U.K lead and global SME for Cost Assurance service development and delivery within Turner & Townsend global provider of consultancy services within the construction industry

Imran Akhtar
Turner & Townsend

Alliancing

At the beginning of the session the NEC 4 Alliance contract was mentioned as a more collaborative way of working, does this mean with a partner approach the need for Cost Assurance is removed as all partners work together as one entity with one vision?

In relation to Alliance agreements and standardising approach, are there any plans from NEC to provide recommended templates for processes, e.g. for the AFP?

Alliance contracts define a clear three lines of defence methodology / mentality with the definition of an Alliance Project Team, Alliance Management Team and Alliance Leadership Team. Each layer will have to develop its own assurance and audit protocols, however, the requirement for assurance and audit still exists as the contracts will still be 'open book'. Furthermore, whilst the assurance framework can be more collaboratively developed within an Alliancing environment (across the organisation layers and amongst the Alliance parties) there is still a requirement for the Alliance to demonstrate its performance to external stakeholders (e.g. client funder, government department / agency). As such there is still a clear and defined requirement to have an audit/assurance framework within Alliance contracts.

Technology

What type of data analytic software would you recommend?

Any examples of where the use of data analytics has provided value to a project and how was that value measured?

There are a number of data analytics/visualisation software options available to quickly review big data. A recent development has been the prevalence of Office 365 environments in most professional organisations which means Power BI has become a go-to programme used by businesses to undertake analytics, visualisation and reporting. Power BI has a low barrier to entry with regard to cost and naturally integrates well with other Microsoft products (particularly Excel). Sometimes it is also worth ensuring that the full functionality of Excel is explored as well.

"Power Query, Power Pivot and other features give Excel a surprising amount of functionality to easily and quickly transform and forensically analyse data. A few examples of where data analytics/visualisation could be useful could be (typically required to be done on total data population);

1. Analysing a large data set of people's hours/time to identify outliers/trends (i.e. time booked on weekends, bank holidays, over contractual allowances/caps)

2. Analysing aged accruals 3. Reviewing plant usage and productivity in correlation to labour usage and other site data - Imran Akhtar

Claire Randall Smith
Eversheds Sutherland

Charlotte Hughes
Eversheds Sutherland

OUTLOOK

ALLIANCE CONTRACTS

There has been an increase in the use of alliance contracts whereby parties work together to promote greater cooperation, communication, and cost savings. This can be achieved in two ways. The parties may have separate contracts, like in a traditional design, and build arrangement, but these contracts are overlaid with increased collaboration obligations so that the parties work together towards common aims and objectives. For example, on an NEC contract, this could be achieved by including the partnering obligations in X12 and introducing standardised KPIs.

Alternatively, the parties may have greater integration whereby they are all included within a single contract and work together as one. Alliancing has become more popular because the risk is shared collectively across the whole project team.

This minimises the impact felt by one party and also incentivises the parties to work together to mitigate the effects of any difficulties encountered. These arrangements have also been praised for promoting a "no blame" culture, so that any disputes are dealt with proactively and efficiently, without incurring additional time and costs. The Alliance contract requires complex governance protocols as the alliance team signs up to a single set of terms that include shared rewards and risks of the success or failure of the project.

OVERVIEW

As we continue to work in challenging economic times, construction professionals will have to be more creative and inventive in managing risk. Established practices may no longer be sufficient to create the cost certainty that parties require. Higher standards of cost assurance are required, as there is less flexibility in being able to accommodate price overruns. Upskilling and adopting these increasingly popular methods may help fulfil the need for providing economical and important infrastructure services.

KEY RECOMMENDATIONS ON THE TOPIC

Through strategic polls and Q&As conducted during the conference, it became clear that the future of cost assurance on construction and infrastructure projects needs to take account of more than just the rising cost of materials, supply chain availability and a move towards alliancing and collaborative risk-sharing. Other key themes for the future include: (i) managing sustainability obligations (in particular carbon offsetting); (ii) establishing best practices across non-cost aspects of the project (including ESG and legal), adopting a standardised approach; and (iii) identifying and best-utilising technology across all aspects of the project.

"Claire (a partner at Eversheds Sutherland) and Charlotte are lawyers specialising in construction law, dispute resolution and adjudication working with architects, structural engineers, M&E contractors, quantity surveyors, design & build sub/contractors and insurers".

DATA ANALYTICS

A key component in assessing costs and anticipating any overruns is to ensure that there is good data analytics in a project. Access to this type of information can identify key trends, spot issues before they arise, and provide explanations on where things go wrong to avoid repetition. The collection and analysis of such data require appropriate technology.

This requires financial outlay, upskilling of staff, and changes to everyday working practices. There are also issues in preserving the confidentiality and security of such data and ensuring that the technology remains relevant and up to date. However, the returns on such investment offer perhaps the most tangible benefit towards cost assurance. Having real-time data helps with project management and avoiding disputes by promoting communication, strengthening relationships, and encouraging proactive avoidance and management of any potential risks as they arise.

OPEN BOOK ACCOUNTING

Open book accounting is where a contractor keeps transparent records of the costs it incurred. This can include the number of hours worked, cost of materials, head office costs, and overhead costs. This promotes discussions on what costs can be adjusted or redeployed to allow a global budget to be maintained as far as possible. For example, when considering the cost of insurance, there may be other ways in which such insurance can be procured or shared between the parties to achieve cost savings. As well as facilitating the ability to operate on a reimbursable or target cost contract, it also promotes greater accountability, trust and cooperation between the employer and contractor.

IDENTIFYING AND MANAGING RISK

A continued theme in managing cost is a clearly communicated strategy and risk-based methodology to identify and manage cost risk. The ability to do this comes from experience. At present, there are some difficulties in making sure that the current labour market has the necessary skills and knowledge to be able to proactively respond to these issues. Upskilling staff, putting in place appropriate management cascades and making sure that each person has clarity on their role and responsibilities are really important. This can ensure that the individuals working on projects have the expertise to respond to issues in real time and reduce their potential costs.

"Claire (a partner at Eversheds Sutherland) and Charlotte are lawyers specialising in construction law, dispute resolution and adjudication working with architects, structural engineers, M&E contractors, quantity surveyors, design & build sub/contractors and insurers".

Claire Randall-Smith
Partner Eversheds Sutherland

Claire is a lawyer specialising in construction and engineering disputes with experience in litigation, adjudication, mediation, and domestic and international arbitration. Claire acts for employers, contractors, and subcontractors across a wide range of projects including large-scale infrastructure projects, energy, utility, oil, and gas supply projects. Our global teams operate seamlessly to deliver the commercial know-how and strategic alignment that clients need from their advisers to help further their business interests. We shape our advice to the unique circumstances and challenges of each project and ensure the right people are in the right places to offer insight and certainty every time – from the day-to-day to the most complex, multi-jurisdictional transactions.

Change of Contract form, Best Practice, and Audit Trail

The Fundamental issue is that this contract was originally tendered as an Option A submission, but along the line, we had some negotiations and had to settle with a CA for Option E due to programme delivery requirements from the client. We are currently developing the auditing mechanics of the contract, however, I have noticed the Client is trying to rewrite the requirements as if it had been tendered as an Option E, where we have not only had to submit our actual cost but are requiring substantiation for all of the lines (1000+ odd), where we thought that a randomised auditing process would be utilised. My question is, in this situation, what should be an ideal list of substantiation for Subcontractor Costs, Material Costs, Equipment Costs, and People costs?

Option A and Option E are fundamentally different contracts with different approaches to assessing and valuing work done. The question would indicate Option E has been agreed and so the fact it was tendered on Option A is unlikely to be relevant to the substantiation now required. For context:

- **Option A is a priced lump sum-based contract with an activity schedule where interim payments are made upon completion of activities (without defects). The Prices are lump sum prices for the activities. Substantiation of work done is therefore less onerous since the contractor carries the pricing risk (subject to any change to activities that amount to a compensation event). As such, save for proving work and activities have been completed, there is unlikely to be scrutiny about cost. That said with Option A, 'Defined Cost' is used for assessing compensation events and is as stated in the Short Schedule of Cost Components (as to which see below).**

- **Option E is a cost-reimbursable contract, whereby works are paid on an open book basis. Under this option, the contractor is paid all of their incurred 'Defined Costs' with an agreed overhead and profit percentage. The terms within the Contract should therefore set out clearly what is and isn't to be reimbursed to the contractor. The contractor's application for payment should include details of how the amount has been assessed and provide the substantiation of each part of the Defined Cost bearing in mind, Defined Cost in Option E includes a provision for Disallowed Cost which provides for deductions for works not substantiated by accounts and records.**

As such, a contractor ought to be prepared to substantiate for:

(i) Option A, its forecast or assessment of each of the parts of the Defined Cost for the assessment of a compensation event

(ii) Option E all parts of Defined Cost for all costs incurred. The level of scrutiny and audit of Defined Costs will inevitably differ between Client/ Employer and that is not prescribed by the Contract – as such it should be agreed at the outset but if in doubt where operating on an Option E maintain all records in respect of Defined Cost i.e. 1. people, 2. equipment, 3. plant and materials, 4. subcontractors, 5. charges, 6. manufacture and fabrication, 7. design, and 8. insurance as it is the only way a Client can monitor and value works and sits with the open book approach.

"The 'ideal list' of substantiation would be as much as possible to prove the cost incurred, evidencing each of the parts of Defined Cost. On a practical level, however, People, Plant, Equipment, and Subcontractors are where we see the most challenge and are subject to proving actual money/costs incurred as opposed to say costs based on tendered rates or percentages. By way of example with People, the level of substantiation would include names/positions/rates/salary/time spent / project name and proof of such with real-time data collection whether electronic/hard copy timesheets. With the burden on the contractor, there is no way around this. Similar levels of information are required for Plant and Equipment and Subcontractors." - Claire Randall- Smith

Charlotte Hughes
Eversheds Sutherland

Charlotte is a Senior Associate in the Construction and Engineering team at Eversheds Sutherland specialising in contentious construction and engineering matters for national and international Employer and Contractor clients. Acts on behalf of claimants and defendants across numerous dispute resolutions. Her Experience includes delay, prolongation, and breach old contracts claims, defects liability claims, concurrent delay, payment disputes, and termination and insolvency advice about construction contracts, often involving complex technical and contractual issues and multiple parties across numerous jurisdictions.

Reporting Assuring and Auditing Environment Social and Governance (ESG) Cost Data

How do we address ESG costs assurance?

The importance of environment, social, and governance concerns is ever-growing, with companies facing criticism for recognising ESG (and wider CSR) responsibilities, but failing to act on them. A tangible and cost-effective way to track and monitor ESG matters at present (and prevent overkill or underperformance) is to align them with the company's KPIs and ensure such KPIs are in line with the company's unique values.

As with other methods of reporting, standardised approaches often assist with streamlining what could otherwise be an arduous process. Setting clear parameters and goals, and ensuring flow down from the board and management level will help support consistent implementation. That said, at present, we are not seeing cost implications attached to a failure to implement ESG objectives/KPIs. Until then, we question how much focus will be placed on such KPIs /objectives.

"It seems inevitable that ESG matters will become mandatory and regulated within construction projects which will lead to auditable data and reports, all of which will come at a cost and will circle back to KPIs/ obligations linked to paid performance. Data and information will become open to scrutiny and therefore have to become more accurate.

Ian Heaphy
NEC/INC Consulting

OVERVIEW

Global trends in procurement continue to see a move to more collaborative engagement models and alliancing approaches. The NEC has always required the parties to a contract to act in a spirit of mutual trust and cooperation and allows for collaboration between multiple parties through the use of X12 multi-party collaboration or the Alliance Contract (ALC). The NEC4 ALC is designed for use on major projects or programmes of work where longer-term collaborative ways of working are to be created

OUTLOOK

Another trend we are seeing is greater risk sharing through the use of target cost contracts for complex, high value or high-risk projects. This is often linked to clients wanting to understand the real cost of the work being delivered. The target cost and cost-based options in the NEC are:

- ***Main Option C target cost contracts with activity schedule/price list***
- ***Main Option D target cost contract with bill of quantities***
- ***Main Option E cost reimbursable***

KEY RECOMMENDATIONS ON THE TOPIC

The NEC4 is a suite of contracts that can be used anywhere globally for work, services, and supplies. The contracts are used in locations such as the UK, Netherlands, Belgium, South Africa, India, United Arab Emirates, Peru, Hong Kong, New Zealand, and Australia. The NEC4 suite continues to evolve to meet the needs of users and in 2021 introduced a set of facilities management contracts (FM contracts) developed in conjunction with the Institute of Facilities and Workplace Management, IWFM. These allow for the engagement of key suppliers on consistent terms enabling them to be used by clients and suppliers for the different contracting strategies that are employed in the provision of both hard and soft FM. Of particular importance in respect of cost assurance is that the Facilities Management Contract & Subcontract feature target cost and cost-reimbursable main Options (C & E).

"Ian is an expert in procurement, contracts, and dispute resolution. A member of the NEC4 Contract Board with over 20 years of experience in oil and gas/LNG, Petrochemical, rail, water, aviation, highways, and building infrastructure. Ian has worked with clients, governments, and contractors in the UK, Middle East, Far East, and North America. He specialises in the implementation of procurement strategies with expertise in EPC / EPC frameworks, partnering / alliance agreements, and target cost / cost reimbursable contracts for major programmes".

Ian Heaphy
NEC/INC Consulting

Ian is a director of IN Construction Consulting a niche construction consultancy company which offers expert advice about procurement, contracts, and dispute resolution He is a member of the NEC4 Contract Board and is part of the team responsible for developing and drafting the next generation of NEC contracts with over 20 years experience including oil & gas/LNG, petrochemical, rail, water, aviation, highways, and building. Ian has worked with major clients across the UK, Middle East, Far East, and North America including government bodies, private employers, and international contractors. Ian specialises in the development and implementation of innovative procurement strategies with particular expertise in EPC / EPCM frameworks, partnering / alliance agreements, and target cost / cost-reimbursable contracts for major programmes

Self Assurance, External Independent Assurance, and Alliancing

At the beginning of the session the NEC 4 Alliance contract was mentioned as a more collaborative way of working, does this mean with a partner approach the need for Cost Assurance is removed as all partners work together as one entity with one vision?

The NEC4 Alliance Contract (ALC) should remove the need for an external assurance function, as the Alliance should be self-assured with each member of the Alliance relying on the other members to account for their costs correctly and/or challenge where they feel this is not occurring. There may, however, be a requirement for the Client to engage in some form of external assurance function to comply with internal or external governance issues.

NEC Standardised Alliancing Approach and Cost Assurance Templates

Question 6b: About Alliance agreements and standardising approach, are there any plans from NEC to provide recommended templates for processes, e.g. for the AFP?

There are currently no plans for the NEC to provide any templates for use as part of the cost assurance process as this will commonly be specific to the needs of the Alliance and the Client.

Gary Bone
Blake Newport

OVERVIEW

The technology exists but in my experience in major infrastructure projects, it is not being used to the extent it should be on the projects that should be using it. I do hope though that it is on the cusp of being used more widely.

OUTLOOK

I'm ***involved in a very large infrastructure project with a considerable budget and a very long programme. Projects like this should be the ideal testing ground for employing new technologies to make the task of cost assurance and allocation less laborious and more accurate. However, I'm not seeing much (with my own eyes at least) that would be considered ground-breaking. It's as if not much has changed in the last 15 years.***

KEY RECOMMENDATIONS ON THE TOPIC

The technology is there to make good inroads into what plant is on site. QR codes on the plant can link to an automated system of recording when it comes through the gate or enters the working area and then when it leaves. Biometric systems can do similar things for people each day. That satisfies the resource that was there. More lateral thinking can be employed to show whether these resources are actually providing the work, perhaps infrared imagery and satellite technology. This information can populate the relevant part of the payment application if using a cost-reimbursable contract and then can then automatically link to an auto-generated project bank account access code.

The same systems can link with supplier invoice systems to auto-generate the invoices. The audit function is then to check that the systems are working properly rather than checking financial transactions. The project probably has thousands of individual pieces of equipment and hundreds of people on site each day. Yet fairly traditional labour and plant returns are being produced. Is it a case of 'if it ain't broke don't fix it', or is changing traditional practices taking a lot longer than one might think?

"Gary is an experienced construction, and commercial consultant. His specialism includes, dispute resolution, quantum and delay analysis, contract administration, construction law, subcontract management, reporting, change management and cost control".

Gary is an experienced construction, and commercial consultant. His specialism includes dispute resolution, Quantum, and Delay analysis, Contract Administration, Construction Law, Subcontract Management, Reporting, Cost Control, and Change Management.

Gary Bone
Blake Newport

Digital QS As an Industry Game Changer

In the Technology space - Digital QS is looking like a topic of discussion for the future and potentially an industry game changer... what are your thoughts on this?

It could be a game-changer. The technology exists to automate the monthly cycles and routines of a commercial team, but the industry is too slow to implement them and make them commonplace. This will be a step-change in terms of mindset to take away certain monthly manual/semi-manual activities such as timesheet reviews and allocations, plant returns, collating a payment application to reflect completed work, processing payments, monthly reporting, and cost forecasting. Much of this can auto-populate from intelligent first instance records which can themselves be completed via biometric and GPS data for example. Instead, commercial teams can focus on matters which require judgment and brain-power like procurement, contractual matters, and ensuring change is agreed upon promptly.

Tom is the Head of Commercial Management at Southern Water. He is a chartered surveyor and manager of commercial, contract, and audit teams for large infrastructure clients and contractors. Specialising in the commercial management of construction contracts, claims, and disputes, He demonstrates a solid track record in infrastructure markets with experience in major energy, water, aviation, transport, and communications networks.

Tom Leach
Southern Water

Cost Overruns, Assurance and Forecasting

If costs continue to increase without assurance with all the cost overruns and delays being experienced on infrastructure projects, does that mean that we in the industry are unable to forecast costs effectively or correctly foresee any future cost increases to the project?

I do see that forecasting skills can be improved, especially when it comes to risk allowances. I feel that programmes are often delivery focused and act as a target rather than a realistic plan, hence a resultant forecast will be set up for failure. However, off the back of Brexit, Covid 19, the Ukrainian War, and the resultant excessive inflation that the industry has experienced, there is an element to which these matters have produced unforeseen increases.

/nflation and Business Case

In a period of high inflationary background, we can expect costs to increase. As projects vary, how do you separate material and labour costs to their components and apply inflation percentages to produce the business case?

Inflation approach generally: Further down the supply change the more precarious is the business solvency, therefore when tier 2-3 subcontractors price in inflation, they will rightly cover themselves for the risk of additional inflation to specific commodities - otherwise they risk 'losing their shirt'. This can lead to uneconomical pricing. It may be more economical to break out the cost of certain LPM components, and for the parties up the supply chain (probably the Client) to take the risk of price fluctuation on specific components. *For example, the project may forecast specific pressures on its labour force, thresholds could be set for the daily rates of labour with the Client taking the risk above specified thresholds.*

Kathleen Hannon
Scottish Water

Katy is an experienced Quantity Surveyor with a demonstrated history of working in construction/ contractor/client-held roles within the construction industry. Skilled in Negotiation, Tender Optioneering, Value Engineering, Contract Drafting and Administration (NEC & JCT), Change Control, Dispute Resolution, Auditing Cost and Commercial Compliance, and other aspects of Commercial Management. Chartered Surveyor working towards an LLM in Construction Law from the University of Strathclyde to reinforce existing experience and knowledge

Industry Standard and Professional Qualifications

How likely are we to see an industry-recognised standard and qualification for cost assurance practitioners?

As the industry moves and develops we expect training and qualifications to be updated to reflect the industry's requirements. This can take time to flow through with a need being highlighted and communicated to professional bodies, universities, etc. With regards to cost and commercial assurance, the skillsets are likely available through Quantity Surveying and Accounting personnel, however, it may be that this space develops to include other areas and skill sets such as carbon and data capture, etc. Some training may be available via professional bodies however different client requirements, stakeholder behaviours and systems can require a different approach so standardising training which provides specific structured and tailored advice out-with at the company level may be challenging at this point in time. Our steering group aims to provide outputs to give stakeholders guidance as to areas to consider in their cost/commercial assurance/audit strategies and contains a broad spectrum of client, consultant, contractor, legal and professional bodies to try and give a balanced view of what good practice should look like.

Shy Jackson
BCLP

Jennifer Varley
BCLP

OUTLOOK

Technology means different things to different people. so, we must be clear on the context recognising that we can only cover part of what is a very broad topic that is constantly developing and evolving. Importantly, it is key to emphasise that technology should not be seen as only having a positive impact.

OVERVIEW

Technology that is operated correctly should help avoid and reduce the traditional causes of construction disputes. An example is the use of a private blockchain by Walmart Canada for managing its extensive supply chain and following introduction increased certainty of suppliers' performance, to the extent that the percentage of invoices requiring reconciliation fell from 70% to 1%. In the future, such technologies will be used in infrastructure and construction projects.

KEY RECOMMENDATIONS ON THE TOPIC

For example, BIM systems should provide greater certainty as to how the design was developed and by which party, which will help reduce disputes as to which party made design changes, when design information was delivered, and whether it was late. Similarly, electronic site records and site cameras will provide certainty as to which work phases progressed daily, and whether there was in fact delay or disruption. Reducing the need to analyse a large number of paper allocation sheets.

Indeed, software systems are currently available that can use AI to analyse a large amount of data available and provide reliable information on what was the position at any given time. Another aspect of technology is that modern methods of construction should result in fewer defects and the need for re-work, which should reduce cost-related disputes. A good example is the increasing use of modular off-site manufacturing, which should reduce work on site and therefore defects and delays related to remediation costs. Similarly, using BIM and other systems that ensure that design data is the most updated and correct version, as opposed to paper-based drawings, should reduce mistakes that require costly remediation.

Shy is a partner at BCLP who specialise in advising in construction, and engineering projects and acting in disputes related to UK and international projects. Jenifer specialises in advising on construction and engineering projects and acting in disputes related to K and international projects.

Shy specialises in construction and engineering law and his practice covers project advice and acting in a dispute related to UK and international projects. His experience covers litigation, arbitration, adjudication, and ADR and he has advised on all main forms of contract, including NEC, JCT, and FIDIC. He is a fellow of the Chartered Institution of Civil Engineering Surveyors. He is a visiting lecturer at King's College London and the University of Stuttgart, a member of the NEC Contract Board, and a council member of the UK Society of Construction Law.

Shy Jackson
BCLP

Supply Chain Data Quality and Transparency

70/80% of Cost Assurance is undertaken to utilise Supply Chain data, how do you see us overcoming the challenge of poor data quality/transparency at this level ?

To start with, technology and electronic record keeping should help improve the quality of records. If in the past it was necessary to process large numbers of handwritten allocation sheets of varying quality, moving to electronic systems which keep good records of who is working on any given day and the ability to tag that information with a site location or activity, as well as adding a few photos should help make a big difference – one can see a simple app being developed for that purpose.

But to ensure such systems are used fully and properly it is also important to make it clear to the supply chain why good record keeping is crucial and why it serves their interest to do so. In addition to simply having such obligations, which need to be realistic and achievable, as a contractual obligation, it is worth considering using KPIs, which can be linked to incentives, and regular monitoring of the quality of records. If that is done from day one, rather than late in the day when issues arise (and by which time it may be too late), that is more likely to embed good quality habits with regard to record keeping.

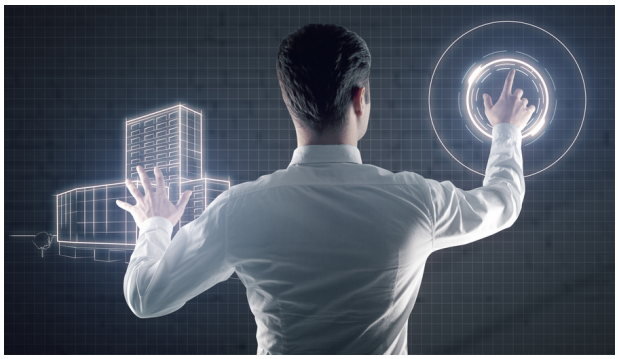
Charlotte Edwards
Atkins - SNC Lavalin

OVERVIEW

I have worked on a very successful Alliance project for the past 10 months. I have been impressed by the collaboration between the NOPs and OPs, the project performance, and the team ethos. The project truly comes first. However, being a QS on traditional NEC contracts for the past 15 years, I am still left with questions and a feeling, "is this too good to be true".

OUTLOOK

When it comes to risks, change, and disputes, the Alliance Contract has the desire to resolve disputes within the Alliance Leadership Team (ALT). The ALT agrees with scope variations quickly, easily and at the lowest level.



KEY RECOMMENDATIONS ON THE TOPIC

NEC will shortly be introducing the New Alliance Contract which requires the client and key members of the supply chain to form an agreement with a multi-party contract and shared objectives. The owner participants (OPs) and non-owner participants (NOPs) work together truly collaboratively, sharing staff, supply chains, buying knowledge, construction skills and self-assurance. The owner representative is fully immersed in the team and involved in the day-to-day decision-making. An Alliance contract provides the project with the right people for the tasks. With the prime focus being on what works best for the project.

What happens when things go wrong, and will the collaboration benefits become the Alliance Contract's downfall? Do Alliance contracts and the no-blame culture, result in the commercial team behaving like the client or owner participant? Would the consultant / principal contractor acting more like the owner participant be a bad thing?

Charlotte is a Commercial Manager at Atkins SNC Lavalin with 15 years of industry experience on complex major civil projects, working for contractor organisations such as Costain, Bam, Kier, Mace and Atkins.

Charlotte is a Commercial Manager at Atkins SNC Lavalin with 15 years of industry experience on complex major civil projects, working for contractor organisations such as Costain, Bam, Kier, Mace, and Atkins. She has worked as both an estimator and a commercial manager and brings with her experience significant contributions to the steering group. She is currently working on the East-West rail Alliance as the Atkins commercial lead.

Charlotte Edwards
Atkins - SNC Lavalin

Does Alliancing Eliminate the Requirement for Independent Cost Assurance

At the beginning of the session the NEC 4 Alliance contract was mentioned as a more collaborative way of working, does this mean with a partner approach the need for Cost Assurance is removed as all partners work together as one entity with one vision?

Alliance Contracts don't remove the requirement for Cost Assurance, periodic reporting, independent verifications, benchmarking, hand-back, and close-out requirements all remain with the Alliance Contract. The Alliance Contract requires all parties' commercial deliverables to be reviewed by the partnering NOPs and the OP, providing additional checks and scrutiny. "The ALT reviews enable change to happen quicker, the blame culture is removed for a collaborative "best for the interest of the project approach, and Cost Assurance remains a key requirement.

Jim Mcluskey
Vinci

Jim is a Qualified and experienced Commercial Manager and Chartered Quantity Surveyor specialising in large value complex major infrastructure projects. He has been Specialising in major infrastructure projects since 1995. Negotiation and resolution of final accounts. He is driven by the challenge of complex infrastructure projects and solving contractual problems. He manages commercial teams on large scale providing mentoring and leadership to assist staff development. Jim has Significant procurement experience on major £ multi-projects. He is Result focused and driven to deliver commercial objectives with high integrity. He has an experience as a contractor and client organisation with a track record of working closely with clients to achieve mutual objectives.

ESG

How do we address ESG costs assurance?

With the widespread use of NEC Option C target cost-based contracts cost assurance including cost verification has become a necessary step in the process to provide the transparency and assurance required by Employers, Clients, Project Managers

The steering group chaired by Cecilia Fadipe has prepared a number of outputs from assembled groups of like-minded professionals which have looked in detail at the various key aspect.

Darren Ward
The Orange Partnership

Darren has worked in and around the commercial management of major construction programmes for more than twenty-five years. Over that time he has created a unique concentration of expertise combining his forensic audit and accountancy skills with in-depth knowledge of all matters both commercial and contractual in construction. He also has personal experience auditing over 80% of the top 20 UK Contractors. At the £ 4.2 billion T5 programme, he headed up the Supply Chain Commercial Team, developing open book contracts and agreeing to commercial relationships with all the major suppliers. He created new and innovative ways to provide T5 with the assurance that it was receiving value for money from its cost verification spend and ultimately drove the strategy which recovered £ 75 million as part of the final account process. He established The Orange Partnership (TOP) in 2004.

Change of contract form / best practice audit trail

The Fundamental issue is that this contract was originally tendered as an Option A submission, but along the line, we had some negotiations and had to settle with a CA for Option E due to programme delivery requirements from the client. We are currently developing the auditing mechanics of the contract, however, I have noticed the Client is trying to rewrite the requirements as if it had been tendered as an Option E, where we have not only had to submit our actual cost but are requiring substantiation for all of the lines (1000+ odd), where we believed that a randomised auditing process would be utilised. My question is, in this situation, what should be an ideal list of substantiation for Subcontractor Costs, Material Costs, Equipment Costs, and People Costs?

Under the NEC4 ECC main Options C to F, the Contractor is required to make records available for inspection by the Project Manager as opposed to providing copies of these records.

The records should already be in existence as the Contractor has to produce its own accounts."- Darren Ward

In our experience there are many client and contractor organisations out there who are:

- ***planning assurance works poorly***
- ***using ineffective audit techniques to deliver assurance***
- ***needlessly spending money on expensive cost assurance***

There is no best practice in the construction industry regarding cost assurance, as the work carried out isn't regulated. Our steering group allows experts from a vast range of sectors to discuss the shortfalls in current approaches and offer well-considered guidance. One example is access to records that should already be in existence on cost capture and financial systems for accounting and reporting purposes.

David Worsley
Transport for the North

David has worked in the field of transport infrastructure since 2002. His specialism is in strategic planning. business case preparation, project risk management, and value management. My professional achievements include representing Network Rail on High Speed 2, Working with public and private-sector clients, ranging from property developers and local authorities to the European Bank for Reconstruction and Development. He is a member of the institution of Mathematics and its Applications, the Association for Project Management, the Chartered Management, and I am a fellow of the Institute of Risk Management and the Strategic Planning Society

Unexplained Cost Increases and Cost Overruns

If costs continue to increase without assurance with all the cost overruns and delays experience on infrastructure projects does that mean that the industry is unable to forecast cost effectively or foresee any future cost of the project?

There has been a difficult-to-explain increase in the cost of rail infrastructure projects. The scale of increase is larger than accounted for by increasing risk and optimism bias. We do not fully understand the reason why estimates for infrastructure investments have increased so much in recent years. *We are currently looking into this and appealing for more research into the subject, and we are not making any sort of claim about the abilities or motivations of people in the rail industry; we just do not fully understand or know enough right now.*

Elliot Patsanza
Ridge & Partners

Elliot has over 30 years of experience providing specialist pre and post-contract commercial and project management support services in the built environment across multiple sectors that include: infrastructure, residential, office, leisure, and mixed-use development projects. His pre-contract areas of specialism include development due diligence and feasibility assessment, value-engineering, cost planning, procurement strategy development, contract form selection and contract drafting. Post Contract: - I have in-depth and proven experience in leading large project and commercial management teams to deliver high-value, key complex programmes.

Technology

In the Technology space - Digital QS is looking like a topic of discussion for the future and potentially an industry game changer... what are your thoughts on this?

In the short term- 3year horizon we will see an increase in the use of Computer-aided Take off software, which will eventually integrate with BIM models and design software.

The Qs function is likely to transition and be more focused on value-adding activities moving away from low-value repetitive activities such as taking off and quantifying as these will be taken over by digital bots. The QS role will remain vital to provide clients with strategic advice such as procurement routes selection, value engineering, forecasting and financial reporting accompanied by insightful commentary.

David Sharp
Mott Macdonald

David had significant cost management and extensive commercial assurance experience using NEC, IChemE, and FIDIC contracts associated with complex civil, mechanical, and electrical projects within the utilities, rail, and transportation sectors accomplished over the past fifteen years. Competent in providing contractual cost compliance to ensure cost clarity, by recognising non-compliant processes, identifying inappropriate costs, assuring commercial performance, and ascertaining opportunities for improvement. Possesses strong commercial interpretative skills gained working across the multi-global sectors of Mott MacDonald, bolstering a financial skillset, and has considerable experience in post-contract programme delivery through alliance and partnering arrangement

Training/people competency

How likely are we to see an industry-recognised standard and qualification for cost assurance practitioners?

Firstly it's worth noting that many organisations now use the term Cost Assurance and this has different meanings, so to clarify, my answer is based on the cost audit function of cost assurance. Unfortunately I doubt we will ever see any recognised industry or qualification specifically for cost assurance, purely based on the fact that cost audit is a very niche discipline making it unviable.

Mind there are already industry-recognised standards and qualifications for the multitude of disciplines required for cost audit, for instance, auditor (IIA, AIA), commercial / QS (RICS), Contract Management (NEC accreditation) and then there are many accounting qualifications.

Michael Bamber
WSP

Michael is a chartered construction professional with 25+ years of experience across the construction, development, and transportation industries. I have undertaken lead roles as a project manager, cost consultant, and procurement adviser on projects within the rail, aviation, and highways sectors. His experience encompasses roles for clients, consultants, and contractors. He built and led successful teams often on large and complex projects, delivering transformative benefits to clients and wider stakeholders. His varied background across projects for key clients provides detailed insights and an understanding of factors that inhibit and enable successful project delivery. More recently I have been instrumental in leading bids for and winning new commissions. He is an NEC 3 & 4 accredited projects manager. I am a qualified PRINCE2 practitioner. I have been at MRICS for over 20 years

Inflation / Cost intelligence

In a high inflationary background, costs are expected to increase. As projects vary, do you separate the material and labour costs into their components and apply inflation percentages to produce the business case?

The current inflationary environment is having a significant impact on the outturn costs of projects and is presenting a challenge to industry professionals in estimating and forecasting final costs with consequent impacts on confidence in business case projections. Because of the unique nature and mix of inputs that go into capital projects, a singular index based upon the increase in general prices, such as CPI, does not necessarily reflect the nature of the inflationary pressures that a particular project will be subject to.

Even forecasts from construction-related indices may not reflect the genuine inflationary risks a particular project faces. Construction requires the procurement of large quantities of particular materials, the cost of which may be severely impacted by energy prices, transportation bottlenecks, and supply chain disruptions; labour and plant markets are subject to the vagaries of local and national demand and supply influences.

Breaking down a project's initial cost plan into the various labour and materials components provides more granularity and enables the development of more refined cost output predictions and a better understanding of the risks a project faces in this respect. Materials and components particularly susceptible to inflationary pressures such as energy-intensive products – e.g. steel – or oil derivative products – e.g. bituminous materials – can be isolated, a range of potential cost scenarios assessed, and mitigation plans established.

Relevant indices and forecasts are available from sources such as ONS and relevant trade associations. Undertaking this more granular analysis will deliver more foresight and confidence to funders and sponsors at the business case stage and enables clients and contractors to exercise better decision-making and control throughout the project.

SPECIAL APPRECIATION TO ALL CONTRIBUTORS