

nec NEWSLETTER



The NEC-procured 32.5 km long, 3 m diameter cable tunnel was the UK's longest single tunnel contract

NEWS

NEC used for award-winning power tunnel under London, UK

SIMON FULLALOVE EDITOR

NEC has been used to deliver a new 32.5 km award-winning electricity tunnel under south London, UK. NEC Users' Group gold member National Grid let the phase 2 tunnel and shafts package to Hochtief-Murphy joint venture under an NEC4 Engineering and Construction Contract (ECC) Option C (target contract with activity schedule) in December 2019. Despite the challenges of Covid-19 and unexpected ground conditions, the £506 million works were completed to the agreed programme and budget in July 2024, with contract completion in November 2024.

The contract was part of the £1 billion London power tunnels phase 2 project to rewire south London via a 3 m diameter tunnel up to 55 m deep – the UK's longest single tunnel contract. Running from Wimbledon in the west to Crayford in the east, it will replace three existing life-expired transmission circuits when 400 kV and 132 kV cables, substations and shaft headhouses have been installed and commissioned in 2027. The 32 km phase 1 tunnel, from Wimbledon to Hackney in northeast London, was completed in 2018.

The concrete-lined phase 2 tunnel was driven by

three Herrenknecht earth-pressure-balance tunnel boring machines (TBM) and a refurbished open-mode Lovat TBM supplied by Murphy Plant. There were five TBM drives from three of the eight 9–15 m diameter shafts, with ground conditions ranging from chalk to sand, including some contaminated by hydrocarbons.

Project 13 delivery model

Phase 2 is being delivered under the industry-led Project 13 enterprise delivery model, with National Grid's Infrastructure Development and Delivery department acting as integrator and NEC project manager for each package. The integrator and project manager is supported by Mott MacDonald, WSP, Gardiner & Theobald, Mace and Arcadis, each of which is engaged under an NEC4 Professional Service Contract (PSC) Option E (cost reimbursable contract).

The tunnel and shafts contract won the Utility Project of the Year in the 2024 British Construction Industry Awards.

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EDITORIAL

NEC's many successes over the past four years are a credit to all of us



JOHN WELCH NEC USERS' GROUP CHAIR

In my final editorial as NEC Users' Group Chair, I wanted to reflect on what has happened during the four years I have been in the role. At a macro level, we had a global pandemic, which in turn resulted in worldwide supply chain shortages and steep inflation. In the UK, we saw three changes in prime minister, a new Labour government and the Procurement Act 2023, which was finally implemented in February 2025.

Despite the above factors, NEC has continued to perform successfully in many ways. We have hosted some brilliant conferences with great speakers from across the globe, such as Ricky Lau from the Hong Kong Development Bureau, Teck Thak Heng from Singapore Building and Construction Authority and Andrew Jackson from Hinckley Point C.

We have launched the new NEC Users' Group app and hosted a new podcast series with some amazing guests, such as Mark Simister from Sydney Water and behavioural strategist Emma Langman-Maher.

New sectors and countries

We have increased the use of NEC contracts in new sectors like manufacturing and facilities management as well as in new countries like Australia, Belgium and Peru, with more to come. We turned 25 and hosted our first Martin Barnes Awards ceremony, celebrating successes in many categories – including sustainability. We also saw our first NEC Users' Group President, Rudi Klein, step down after leading us for 17 years.

When I accepted the position of NEC Users' Group Chair, my objectives for the role were to increase NECs growth and usage globally as well as in different sectors like manufacturing, and we have certainly done that. A personal objective of mine has been to increase collaboration between all parties to resolve conflict jointly, increase efficiency and ensure projects and programmes succeed as a result.

I am really pleased to have been able to help

'I am really pleased to have been able to help facilitate the partnership between NEC and the Association of Consultant Architects (ACA) to work together using Framework Alliance Contract 1 (FAC-1) with NEC contracts.'

facilitate the partnership between NEC and the Association of Consultant Architects (ACA) to work together using Framework Alliance Contract 1 (FAC-1) with NEC contracts. This goes a long way to show how serious we are about breaking down barriers and working together for the benefit of our industry.

Great NEC people

All that has been achieved is a result of some great people. I would like to personally thank Rekha Thawrani, Cheryl Waterman, Crystal Fan, Sheetal Mistry and Peter Higgins, plus all the backroom staff at NEC who undertake amazing work to help us succeed and deliver. It would be remiss of me not to thank my fantastic team at Crown Commercial Service for supporting me in this role. Lastly, I would like to thank you, the users, who contribute, engage, collaborate, feedback and continue to use NEC and hopefully gain great insight and experience by doing so. Thank you.

There is still plenty more to do to maintain and improve our industry, so I am delighted to welcome Tracey Tulloch, deputy commercial director at the UK

Foreign, Commonwealth and Development Office. Tracey will take over the role of NEC Users' Group Chair from March 2025 and I am confident she will do a brilliant job. That is it from me, I will remain close to NEC and look forward to seeing it going from strength to strength.



Tracey Tulloch of the UK Foreign, Commonwealth and Development Office takes over as NEC Users' Group Chair

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Contract of choice

National Grid Electricity Distribution team manager Ben Davis says NEC was chosen as it is the organisation's contract suite of choice. 'This was reinforced by early market engagement, which informed us it was also the suppliers' preference. In this case ECC Option C was the sensible choice for a risk-based contract, with a fair apportionment of risk for the geotechnical works.'

He says National Grid is an early adopter of the Project 13 infrastructure delivery model. 'We developed an enterprise to collaborate and deliver the overall project using NEC secondary option X12 on multiparty collaboration. The project manager's team undertook early engagement with the contractor across various disciplines to ensure focus and alignment on project outcomes from outset.'

Davis says in line with the NEC requirement to act in a 'spirit of mutual trust and co-operation', there was regular engagement between both teams throughout the contract to manage the works according to the conditions and scope. 'This was underpinned by robust assurance processes that were applied and followed to validate NEC defined costs and the evaluation of NEC compensation events.'

He says including a programme in the NEC contract data part two enabled a baseline for the

project manager's team to measure progress and change. 'The schedule of partners contained in option X12 included incentives for the contractor to increase its share percentage by outperforming across a wide variety of key performance indicators.'

Despite the challenges of the Covid-19 pandemic, Brexit and unexpected ground conditions, Davis says the tunnel and shafts were successfully delivered to the agreed programme and budget in July 2024, and the contract was completed in November 2024.



Five tunnel drives were undertaken from three drive sites using four tunnel boring machines

'Following completion, both teams undertook a joint exercise to identify lessons learnt and capture the positive outputs and opportunities for improvement on future contracts.'

BENEFITS OF USING NEC

- NEC was the client's and supply chain's preferred contract suite and ECC Option C provided a fair apportionment of geotechnical risk.
- NEC requirement to act in a 'spirit of mutual trust and co-operation' ensured regular engagement between both teams to manage the works according to the conditions and scope.
- NEC secondary option X12 on multiparty collaboration enabled a Project 13 enterprise delivery model, with a strong focus and alignment on project outcomes.

NEWS

Bookings now open for the 2025 NEC annual conference and awards



MARCUS GREENSLADE NEC MARKETING NEC MARKETING

Bookings are now open for the NEC annual conference and awards ceremony taking place on Monday 16 June 2025 at the Institution of Civil Engineers' prestigious headquarters in London.



Entries for this year's Martin Barnes Awards close on 14 March 2025

Last year, we welcomed over 250 global NEC users to the sell-out conference. They benefitted from a day of networking with peers and informative talks on topics such as delivering decarbonisation, using NEC with FAC-1 and adopting modern methods of construction (O'Connor, 2024).

NEC case studies on the UK National Grid's development and the Environment Agency's flood prevention works were also discussed, promoting NEC best practice and highlighting some of the unique challenges these projects had to overcome. This year, we are excited to present more global case studies and engaging workshops.

For the latest information on the conference and to book places, please visit necontract.com/conference2025. Note NEC Users' Group members benefit from free and discounted spaces while event spaces are available, so book early to take advantage of this.

Call for Martin Barnes Awards entries

The 2025 Martin Barnes Awards ceremony will be held alongside this year's annual conference. For those who have not yet entered, please note the submission deadline is Friday 14 March 2025.

Award entrants benefit from recognition for their projects, teams and collaborative efforts on an international stage, and inspire others with their innovative practices and success stories.

For information on the awards and how to enter, please visit necontract.com/awardsentry2025.

Reference

O'Connor L (2024) More than 200 delegates attend NEC annual conference in London. *NEC Newsletter* 132 (July 2024): 3.

NEWS

Constrained budgets bring cost into focus for NEC users in Australia



PETER COLACINO NEC AUSTRALIA AMBASSADOR

With Covid-19 stimulus projects a fading buzz in the Australian infrastructure sector, Infrastructure Australia (2024) reports that the major five-year public infrastructure spending pipeline of AU\$213 billion (£107 billion) is down 8% down in the 2023–2024 financial year from an all-time peak in 2022–2023.

But while the public infrastructure sector is expected to continue to shrink, the renewable energy and defence sectors are both in growth mode. Spurred on by the AUKUS treaty between Australia, the UK and USA, defence spending in particular is expected to balloon, exceeding AU\$100 billion (£50 billion) in the 2030s. This year, Australia will spend a record AU\$56 billion (£28 billion) on defence, up 6% year on year.

However, the new political leadership in the USA and UK, and forthcoming 2025 federal election in Australia, could point to a reset of priorities as well as new pressure on project budgets. The expected result will be an increased focus on cost control and delivery efficiency to meet the expectations of a still ambitious project pipeline.

Effect on NEC projects

With new pressures on the horizon, how are those projects using the NEC contract suite in Australia positioned to respond?

NEC contracts are designed to ensure that effort, risk and costs is fairly shared between client and service provider. The collaborative core of each contract is designed to promote schedule and cost transparency with built-in incentives through the early warning process to identify and mitigate cost pressures and continue with work.

While cost management and control is central to the NEC contract approach, there are four key

aspects to consider in the current conditions: choosing the right main option, understanding market conditions, being clear on defined costs and ensuring transparency.

Choosing the right main options

The first step to managing cost effectively is to recognise that cost and risk are two sides of one coin. Risk transfer, just like cost transfer, cannot take the place of effective management. Without clarity of risk and effective management, contractors must price for a probability the risk will materialise and therefore increase their costs.

While cutting corners to rush projects to market with insufficient planning often occurs, the cost of these shortcuts upfront can often lead to long-term cost pressures. For instance, inadequate geotechnical data resulted in a 9% increase in Australia's total capital spend in the 2023–2024 financial year.

For NEC users it is critical to start with the right main option payment mechanism to ensure risks are allocated to those best able to manage them. Option C (target contract with activity schedule) contracts have been growing in Australia under those settings, with an increased share of risk held by the client when compared to the traditional fixed-price contracts that have dominated the market. Highly complex projects, and projects with imperfect information, are well suited to this approach.

Understanding market conditions

Cost escalation has been a defining characteristic of the Australian infrastructure environment following Covid-19, driven by government stimulus investment, a housing construction boom and constrained supply of materials and skills.

The cooling of some markets, the progress of the

investment peak through design and into construction as well as the rise of investment in alternative sectors has increased labour availability in some markets. Understanding these dynamics and the likely future environment helps to understand the optimal future risk allocation.

Infrastructure Australia (2024) provides an annual insight into the performance of the sector and emerging constraints over a five-year horizon. The latest study gives a baseline perspective of more than 50 resource and labour inputs, providing a foundational understanding that can be complemented with deep dives into critical materials for a project or organisation.

Being clear on defined costs

NEC4 defined costs are predefined costs for performing an activity or provide an outcome that is used to assess payments, compensation events or amounts due in termination. If a cost is not defined, then it is assumed to be included in the fee.

Defined cost is the main basis for assessing the financial impacts of compensation events and, under Options C, D (target contract with bill of quantities) and E (cost-reimbursable contract), as the basis for reimbursing contractors for work done to date.

In some circumstances clients may want to establish greater certainty on key elements of a project. Eight cost components are included in NEC4: people, equipment, plant and materials, charges, manufacture and fabrication, design, and insurance.

Clause 52.1 draws the delineation between defined cost and fee. It can require defined costs not set in the contract data to be 'at open market or competitively tendered prices with deductions for discounts, rebates and recoverable taxes'.

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Ensuring transparency

A fair model of risk sharing requires transparency to determine actual costs. However, in an environment of escalating costs, trust can be under stress. To deliver clarity, inspections are a key tool to draw a better understanding of project realities. Project or service managers are permitted under clauses 50.9 and 52.4 in Options C and E to inspect accounts and records of the defined-cost items claimed.

The cost of staff working on the project can often be a source of uncertainty, however these costs form part of 'people' costs detailed in the schedule of cost

components. To determine these costs, assurance inspection needs to focus on payroll departments and associated payslips, employment contracts, payroll reports and timesheets.

Transparency on costs of labour is often at risk of being overlooked, or met with uncertainty, in planning and therefore sometimes left as a source of future conflict.

Industry collaborations

NEC has recently strengthened its partnerships with some of the pre-eminent Australian infrastructure industry groups to improve commercial

skills and awareness and to promote contracting reform. NEC has established a partnership with Consult Australia, as well as collaborations with the Royal Institution of Chartered Surveyors in Sydney and the Institute of Collaborative Working Australia. ○

Reference

Infrastructure Australia (2024) *Infrastructure Market Capacity Report 2024*. <https://www.infrastructureaustralia.gov.au/2024-infrastructure-market-capacity-report>.

CASE STUDY: Facilities Management

New Zealand district council using 10-year NEC4 TSC for £75m infrastructure works

SIMON FULLALOVE EDITOR



New Plymouth District Council in North Island, New Zealand is using NEC to procure NZ\$160 million (£75 million) of minor infrastructure works over 10 years. The council let an NEC4 Term Service Contract (TSC) Option C (target contract with activity schedule) to Downer NZ in April 2019 for road maintenance, minor road improvements and water main and sewer renewals. The council is the NEC service manager.

Known as the New Plymouth Infrastructure Partnership, the contract replaced 20 previous term contracts resulting in significant procurement and staff cost savings. It covers urban and rural road maintenance and resealing, road line marking, road sweeping and street cleaning, central business district cleaning, bus shelter cleaning, emptying bins, water and wastewater renewals and small-to-medium bridge maintenance.

Individual works projects are let as NEC4 TSC task orders with a target cost estimate. The contract also includes a workforce development plan comprising apprenticeships, succession planning and a Māori and Pasifika development framework.

Efficient delivery

Matt Richardson, infrastructure delivery lead at the council, says the benefit of NEC4 TSC Option C is that the price list is already set up with a schedule

of rates, which avoids having to tender each project separately. 'Furthermore, financial risks are shared between the client and the contractor through the pain/gain mechanism. This motivates all parties to plan and deliver the works in the most efficient way.'

He says the NEC requirement to act in a 'spirit of mutual trust and co-operation' ensured the project team adopted a collaborative approach with joint decision making, which has improved efficiency. 'Strong working relationships between the council and Downer staff have built a culture of trust for timely and efficient delivery.'

Richardson says that NEC's early warning process ensures changes are dealt with in an efficient manner and issues are mitigated without delay. 'We use the early warning register on each task order to initiate discussions around potential changes to budget, scope, quality and time. Compensation events are notified when changes came to fruition.'

He cites the recent Belair Avenue and Bayly Road walking and cycling improvements, which were completed on time and budget between April and June 2024 under an NZ\$1.8 million (£0.9 million) task order. 'There were significant time pressures on this project due to New Zealand Transport Authority funding restrictions. The collaborative nature of NEC supported this delivery in a fast, open, efficient and safe manner, with just five compensation events.'

According to Carey Davis, NPDC portfolio manager at Downer, 'The New Plymouth Infrastructure Partnership is arguably the best example of a truly collaborative, co-operative contract I have had the pleasure of working in throughout my career. The client having several staff in the contractor's office holding key positions within the contract team is testament to the focus on continuous improvement and collaborative delivery. Improved efficiencies, greater communication, harmonious relationships, and a true "team" ethos are all by-products of the NEC4 collaborative contract and is something I know both parties enjoy and want to see continued.'

Experienced NEC user

Andrew Barron, manager infrastructure projects at the council, says NEC-procured projects now account for over 90% of the council's annual NZ\$100 million (£50 million) infrastructure spend. 'We started using NEC3 Professional Services Contract in 2016 for a seven-year consultancy contract with WSP and have since rolled out a variety of NEC3 and NEC4 works and term contracts for everything from minor works to major civil engineering schemes.'

One of the first NEC4 Engineering and Construction (ECC) contracts was for the first phase of a water main renewals in the town of Inglewood. The NZ\$2 million (£0.9 million) contract was let to

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Fulton Hogan in November 2018 using NEC4 ECC Option B (target contract with bill of quantities). One of the largest individual contracts to date is an NZ\$19 million (£9 million) NEC4 ECC Option C let to Downer in December 2019 for new water reservoirs at Mountain Road and Henwood Road.



NEC-procured walking and cycling upgrade between Belair Avenue and Bayly Road was finished on time and budget

These were completed on time and below budget in 2022.

Together with Downer's 10-year TSC, the NEC-based procurement approach resulted in the council being highly commended for the 2023 NEC Client of the Year Award. Downer also won the Excellence

in the Maintenance and Management of Assets Award in the 2021 Civil Contractors New Zealand Hirepool Excellence Awards for its work on the TSC. ○

BENEFITS OF USING NEC

- NEC4 TSC Option C price list is already set up with a schedule of rates, which avoids having to tender each project separately.
- NEC pain/gain mechanism means financial risks are shared between the client and the contractor, which has motivated all parties to plan and deliver the works in the most efficient way.
- NEC requirement to act in a 'spirit of mutual trust and co-operation' ensured the project team adopted a collaborative approach with joint decision making, which has improved efficiency.
- NEC's early warning process has ensured changes are dealt with in efficiently and issues are mitigated without delay.

CASE STUDY: *Water*

Hong Kong Drainage Services Department adopts NEC to revitalise Tsui Ping River

SIMON FULLALOVE EDITOR



The restoration included pedestrian walkways, a floating pontoon and landscaped viewing decks

NEC has been used to restore an urban stormwater channel in Kwun Tong, Hong Kong into a vibrant river. The Drainage Services Department (DSD) of the Government of the Hong Kong Special Administrative Region of the People's Republic of China awarded the HK\$1,342 million (£136 million) project to Build King-Richwell Civil Joint Venture under an NEC3 Engineering and Construction Contract (ECC) Option C (target contract with activity schedule) in July 2020. The revitalised 1 km long Tsui Ping River in Kwun Tong was completed on programme and within budget in September 2024.

The project involved installing an automatic bottom-hinged 'smart gate' near the downstream end the river channel where it discharges into Victoria Harbour to optimise water levels according to tides and river flows. Flood capacity was increased by

lowering the riverbed over 800 m by 0.2–0.7 m and building a 1.2 m high flood wall at certain locations along the nullah.

Six pedestrian bridges, a floating pontoon and six landscaped viewing decks were also installed to create a walkable and accessible river corridor, and a series of measures including bird perches, rock pools and ecological walls were implemented to attract wildlife. The NEC project manager was DSD's chief engineer and the supervisor was AtkinsRéalis Asia Limited (formerly Atkins China Ltd).

Standard contract suite

DSD Drainage Projects Division senior engineer Antony Wan says NEC is now the standard contract suite for DSD projects. 'The NEC requirement to act in a "spirit of mutual trust and co-operation" ensured

a collaborative working relationship between the parties and external stakeholders'.

He says DSD chose the ECC Option C target option in this case to help manage and share the risk between the parties. 'This was a complex environmental improvement project within a busy town area and with fluctuating tides and flood flows. It was therefore important that the risks were allocated with the party best able to manage them, together with incentives for the contractor to achieve the best possible project outcome.'

Wan says the NEC processes of early warnings and risk management meetings were actively used by both parties. 'These helped us to identify and mitigate all issues that might affect the programme and cost at the earliest opportunity, thus keeping the project on track and within the budget'.

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He says an example of an early warning was flood risk to construction workers due to limitations of interpreting the 9-day weather forecast from the Hong Kong Observatory. 'To address this, we collaboratively developed an artificial intelligence system to predict water levels in the river more accurately, which gave staff a two-hour warning to evacuate from the worksite safely.'

NEC compensation events were notified and fairly agreed in accordance with NEC processes, and the regularly updated programme provided an accurate indicator of progress. 'Despite the challenges of working through the Covid-19 pandemic, the project was successfully completed to the programme and within the budget in September 2024'.



The NEC-procured restoration included an automatic 'smart gate' to optimise upstream water levels

BENEFITS OF USING NEC

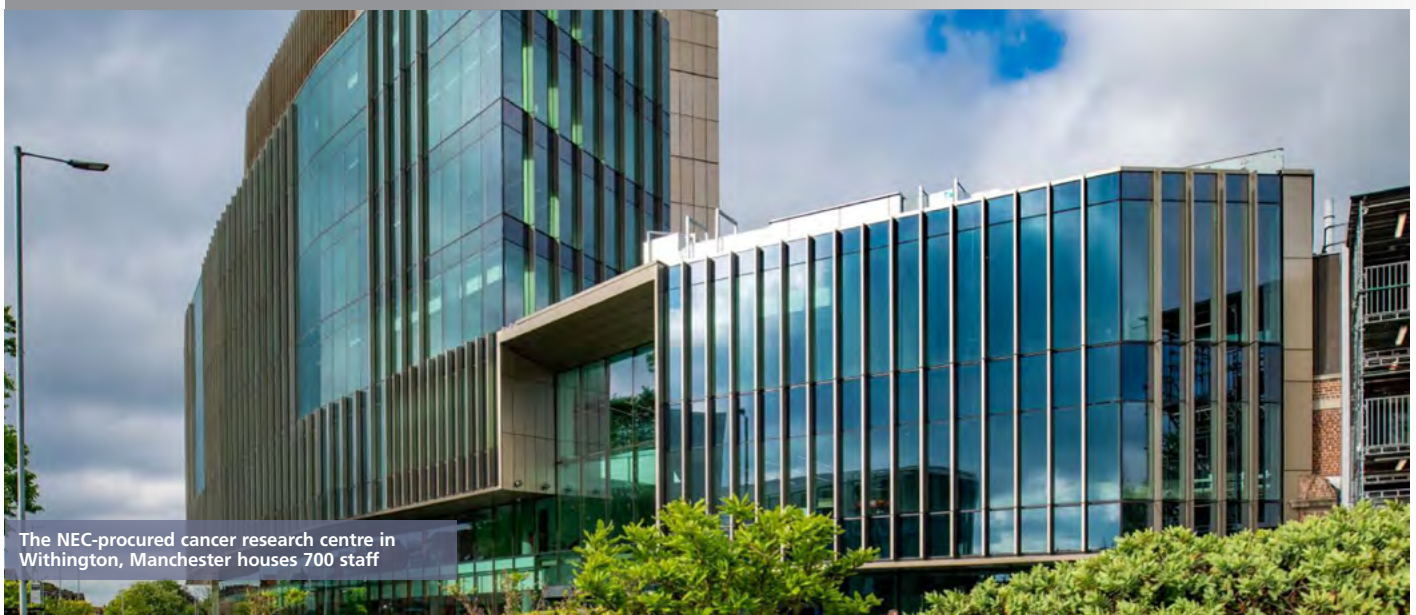
- NEC requirement to act in a 'spirit of mutual trust and co-operation' ensured a collaborative working relationship between the parties and external stakeholders.
- ECC Option C target option ensured risk was allocated to the party best able to manage it and incentivised the contractor to achieve the best possible project outcome.
- NEC early warnings helped to the project team to identify and mitigate all issues that might affect the programme and cost at the earliest opportunity.

CASE STUDY: *Building*



NEC used to deliver world-leading cancer research centre in Manchester, UK

SIMON FULLALOVE EDITOR



The NEC-procured cancer research centre in Withington, Manchester houses 700 staff

The Paterson Building in Manchester, UK is one of the world's leading cancer research centres. Completed in March 2023, the facility is home to 700 scientists, clinicians and operational staff dedicated to improving the lives of people with cancer.

Client the Manchester Cancer Research Centre – a partnership between The Christie NHS Foundation Trust, Cancer Research UK and the University of Manchester – procured the building through the UK government's NEC-based Procure21+ construction framework (now Procure23). Integrated Health Projects (IHP), a joint venture of Vinci Building and Sir Robert McAlpine, was engaged as principal supply chain partner under a £118 million NEC3 Engineering and Construction Contract (ECC) Option C (target contract with activity schedule) in December 2019.

IHP's supply chain partners were architect BDP, structural engineer Arup and services engineer Dalkia

(formerly Imtech), each of which was contracted under an NEC3 Professional Services Contract (PSC). The NEC project manager was Arcadis.

The project involved completion of demolition works and design and construction of a 10-storey, highly serviced building with two basement levels. The reinforced-concrete-frame structure with metal and glass cladding is double the size of the building it replaced, providing 26,614 m² space for state-of-the-art research laboratories and offices. Featuring air-source heat pumps and photovoltaic panels, it achieved a BREEAM sustainability rating of 'very good'.

Despite the challenges of working through the Covid-19 pandemic and subsequent supply chain disruption and high inflation, the building was completed to programme and budget in March 2023. It was highly commended for the Social Infrastructure Project of the Year in the 2024 British Construction Industry Awards and won the 2023

Greater Manchester Building of the Year Award.

Collaborative approach

Stuart Keen, director of capital at The Christie, says the NEC requirement to act in a 'spirit of mutual trust and co-operation' underpinned a fully collaborative approach by the project team from the outset. 'From a client perspective we value the collaboration integrated into NEC, finding it more of a non-contentious and flexible agreement than a contract. As always though, it is a function of the people involved, which is why we target supply partners who share our collaborative approach'.

He says the NEC early warning and risk reduction processes worked well to help identify and mitigate project risks. 'Building a state-of-the-art research centre alongside a fully operational cancer hospital was never going to be completely straightforward, and we also had to deal with the uncertainty that Covid-19 and other global events brought. It was

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not easy, but that makes the fact that we delivered on time and budget even more satisfying.'

Keen says ECC Option C enabled the client and contractor to share project and financial risk in a fully collaborative way. 'The pain/gain share mechanism incentivised both parties to look for cost savings throughout the works. Examples included adopting a cladding finish that supported the planning

requirements and allowing early occupation of parts of the building for installation of specialist laboratory equipment and system validation'.

He concludes, 'Over one million person-hours of construction work and hundreds of people helped to construct the Paterson Building, and I am just one of them. However, being involved in the project was one of the highlights of my career. Over 700 researchers

are now working in a space that's been designed for close collaboration and team science. I'm so proud to have played a part in giving them a cutting-edge space to do that.'



Reception area of the NEC-procured cancer research building features a three-storey high atrium

BENEFITS OF USING NEC

- A fully collaborative approach was ensured by the NEC requirement to act in a 'spirit of mutual trust and co-operation'.
- NEC early warning and risk reduction processes worked well to help identify and mitigate project risks.
- The pain/gain share mechanism in ECC Option C enabled the sharing of project and financial risk in a fully collaborative way and incentivised both parties to look for cost savings.

PRACTICE

Assuring equipment costs on NEC4 Option C and E contracts

DARREN WARD ORANGE PARTNERSHIP



KEY POINTS

- NEC4 ECC Option C and E contracts allow the project manager to check the contractor's records that ultimately support defined cost payments.
- NEC4 ECC contracts define what can be charged as equipment based on different scenarios shown in the schedule of cost components.
- This article provides guidance on what to look for when auditing equipment costs on NEC4 Option C and E contracts.

The NEC4 Engineering and Construction Contract (ECC) Option C (target contract with activity schedule) and E (cost reimbursable contract) are commonly used for procuring high-risk infrastructure projects in the UK. The basic clauses allow project managers to inspect accounts and records of their choice in relation to defined cost items claimed.

In issue 129 I provided guidance on the audit of directly employed staff costs (Ward 2024a) and in issue 131 we covered labour agency costs (Ward 2024b). This article looks at equipment costs. NEC terminology differs from that of the wider industry where the term 'plant' is used.

Definitions

In NEC terms, equipment refers specifically to items used by the contractor to provide the works, whereas plant and materials are intended to be incorporated into the works themselves.

NEC4 ECC contracts define what can be charged as equipment based on different scenarios shown in the schedule of cost components. Typically, these include equipment that is listed in the contract data, owned by the contractor, hired from a group company or cross-hired from third-party plant-hire suppliers. There is also the proviso that it is used within the working areas. Which scenario applies will be determined by the contractor's procurement and asset management strategy. There will also be certain projects which require the sourcing of special equipment, which will need referencing in the contract data.

Before reviewing equipment costs, NEC4 auditors should check if an initial equipment budget and resource plan exist to understand expected equipment

types, durations and supply sources. Demonstrating equipment costs can be complex due to it often being represented via numerous low-value transactions. Effective data visualisation is therefore essential.

For third-party equipment, auditors should expect accounts and records documentation to be based on purchase orders, hire terms, invoices and payment proof. For contractor-owned equipment costs, auditors should expect benchmarking to show market rates (core clause 52.1). Additional records, as outlined in the scope (core clause 52.2), may include monthly plant reports with utilisation data and site records confirming equipment needs and timings.

Read the contract

Equipment is one of the few cost components that does not get heavily amended, but auditors should still check the contract in all the usual places (schedule of cost components, Z clauses and scope information) for potential amendments.

Under the standard schedule of cost components, third-party equipment should have traditional invoices while contractor-owned equipment should show either an internal charge rate (via an established internal price list) or inter-company invoice. These costs should align with market rates for value for money assurance.

There may also be equipment bought specifically for the project. If so, it should be listed in the contract data with the contract charge being the effective diminution of value, whether sold after use or assessed at its post-project market value.

There is also special equipment, which needs to be listed in contract data too. It has a value in use but cannot easily be supported by accounting records. A

reason for this might be the rarity or age of the item, such as a specific size of tower crane.

Auditors should carefully review contract rules on equipment cost management, including requirements for hire versus buy decisions, utilisation data, monthly plans, condition reports and budget analysis with variance explanations. These principles also apply to equipment on key reimbursable subcontract packages, especially if contract terms flow down the supply chain.

Understand the environment

Auditors should understand the importance of how equipment costs are prepared, controlled and reported in the project as this heavily influences mis-charging risk. They should do the following:

- Understand the project context: visit the site, equipment yard, and speak with the equipment manager to understand equipment handling, inspection and daily management.
- Explore data sources: identify any additional equipment data beyond the basic cost ledger.
- Assess equipment allocation: check if the contractor is sharing equipment across projects, posing a risk of duplicate charges.
- Review equipment account: evaluate the progression and review history of the equipment account. Confirm any idle periods, withheld or disallowed costs (clause 11.2 (26)) and the contractor's response.
- Check for embedded costs: ensure equipment is not included in other rates, such as vehicles or information technology included in pre-agreed people rates.
- Understand audit scope: clarify if your audit supports routine application-for-payment assessments or has final assessment implications (clause 50.9).

Visualise data and design tests

Equipment data is often the most challenging cost ledger dataset to interpret and sample, making the above guidance crucial for understanding the hiring process and identifying additional data and reports to understand and clarify equipment charges.

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With a solid dataset, including accounting and site records, equipment analysis can cover fields like supplier, type, units and rates. Auditors should start by tackling data volume with a simple monthly spend graph. This should align with core labour activity, showing peaks with high-use equipment, such as earth movers, and lower spend at the start and end phases. Further breakdowns by equipment type reveal major cost areas, which are essential for market rate checks.

Analysing one busy month can highlight repetitive charge patterns. For example, in a recent review of 5,000 transactions, a few quick graphs identified only 35 large assets that made up most of the costs. Smaller items generated high entry volumes but minimal cost impact, allowing for a focused inspection on key assets.

Further data analysis for equipment is possible, including the following:

- Spend per supplier, which is useful for assessing rebate potential and use of internal companies
- Spend versus budget at a work breakdown structure
- Spend per asset type and lower-level description, such as hire, transport, maintenance and damage
- Aged equipment accruals if accounting system picks up initial liabilities before invoice matching
- Operated equipment hire misaligned to labour hire or cost
- Operated equipment hire during site closures
- Operated equipment cost versus telematics usage
- Retrospective hire versus buy analysis
- Frequency of equipment booking, such as high or low hours and overtime patterns

Adding site records such as allocation sheets, site diaries, telematics and cabin closed-circuit television can quickly verify the necessity, accuracy and value for money of larger assets used on the project. Figures 1 and 2 are examples of simple graphs which show what analysis is possible.

A thorough understanding of the environment, plus good data analysis should help shape where costs may be mis-charged against the identified rules. It is important to consider or link all the rules back to specific tests. This should identify individual equipment items or trends and patterns of interest for further inspection.

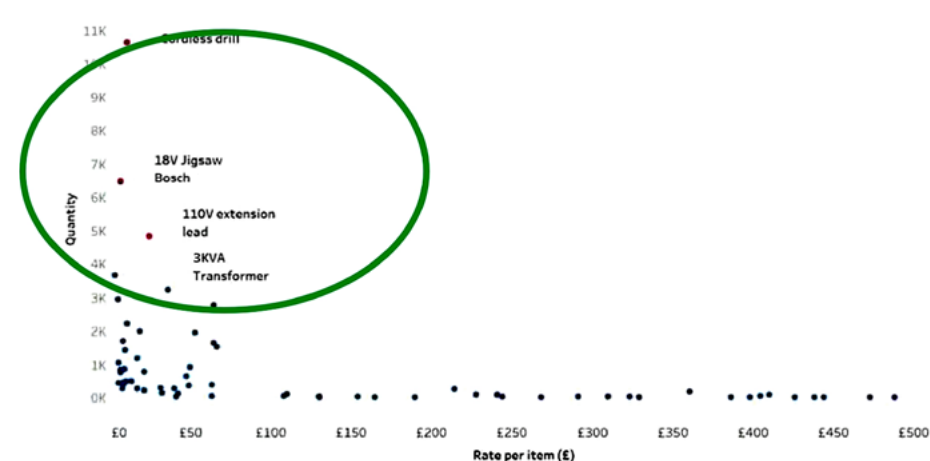
Evaluate records and report

Auditors should design a practical sampling strategy for risk-based and key transactions, ensuring adequate assurance coverage. They should focus on high-risk assets and scenarios, such as contract compliance for special equipment and verifying damaged equipment costs against hire conditions and contract rules.

Figure 1. A small number of items account for the majority of costs, allowing inspection activity to be focused



Figure 2. A high frequency of low-value equipment on site shows the importance of obtaining detailed reports on individual pieces of equipment and to review items on a cumulative not just monthly basis



Auditors should concentrate core testing on major third-party and internal hires, keeping sampling manageable and representative of the broader dataset. Request records, review thoroughly and, if issues arise, investigate root causes, considering whether broader sampling may be needed to understand any control weaknesses or isolated errors.

Finally, auditors should document the work thoroughly as others may need to access it later. Too often, equipment reviews conclude as 'all OK' with little recorded detail. At best, partial reconciliations

between cost ledgers and hire reports are noted, often dismissed as too complex due to data volume.

References

- Ward D (2024a) Assuring staff costs on NEC4 Option C and E contracts. *NEC Newsletter* 129 (January 2024): 9–10.
- Ward D (2024b) Assuring labour and agency costs on NEC4 Option C and E contracts. *NEC Newsletter* 131 (May 2024): 9–10.

PRACTICE

Understanding NEC4 option X4 on parent company guarantees



ROB MILLS GVE COMMERCIAL SOLUTIONS

KEY POINTS

- NEC4 option X4 on ultimate holding company guarantees provides the client with a potentially valuable form of contract security.
- Option X4 may provide assurance in the event of specific breaches of contract and enhance trust between the parties.
- Holding or parent company guarantees are a specialist form of document that require particular expertise when drafting.

Option X4 on ultimate holding company guarantees in the NEC4 Engineering and Construction Contract (ECC) and other NEC4 contracts (except short forms) is an optional procedure which enables parties to use a parent company guarantee (PCG) as a form of contract security. The wording is the same across the NEC4 suite except for the different parties and named roles. However, the Facilities Management Contract (FMC), Facilities Management Subcontract (FMS) and Alliance Contract (ALC) include

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provision for a performance bond, which is addressed under option X13 in other NEC4 forms.

Option X4 comprises two clauses, X4.1 and X4.2. The wording in NEC4 ECC is:

X4.1: If the *Contractor* is a subsidiary of another company, the *Contractor* gives to the *Client* a guarantee of the *Contractor's* performance from the ultimate holding company of the *Contractor* in the form set out in the Scope. If the guarantee was not given by the Contract Date, it is given to the *Client* within four weeks of the Contract Date.

X4.2: The *Contractor* may propose an alternative guarantor who is also owned by the ultimate holding company for acceptance by the *Project Manager*. A reason for not accepting the guarantor is that its commercial position is not strong enough to carry the guarantee.

It amends the previous NEC3 wording to clarify that in the event a guarantee is required, this does not necessarily need to come from the ultimate parent company. Instead, the guarantee may be provided by an intermediate holding company where its commercial position is strong enough to carry the guarantee, which more accurately reflects real-world scenarios involving PCGs.

Benefits of guarantees

A PCG is a form of security where the parent company of a contractor (or subcontractor, consultant, service provider or supplier) provides certain guarantees, which may be either performance

or financial, in relation to the contractual obligations of its subsidiary. The wording of the PCG determines what the parent company may be required to do with the form stated in the scope.

There may be various benefits of implementing option X4, including the following:

- Risk management – a primary purpose of option X4 is to mitigate the risk of contractor default providing an additional layer of assurance to the client.
- Financial security – in the event the subsidiary contractor faces financial difficulties or insolvency, the parent company may be legally obligated to step in.
- Enhanced trust – including a PCG within the contract can lead to enhanced trust and co-operation between the contracting parties.

Drafting considerations

Discussions often occur during the pre-contract stage (usually decided by the client) to propose the forms of contract security and assurance level required. This may include discussions as to the necessity of a PCG and the specific terms under which it will be provided. Considerations may include the scope of the guarantee, the obligations of the parent company and any conditions or limitations.

Due to the nature and importance of the document, a PCG should be prepared by a specialist to ensure it is enforceable and aligns with both parties' interests. The guarantee will usually be signed as a deed by the relevant parties. While option X4

may provide significant benefits, there are important considerations to keep in mind, as follows:

- Parent company viability – the effectiveness of a PCG relies upon the financial integrity and stability of the parent company. Good practice for clients may involve undertaking due diligence to assess the parent company.
- Scope and limitations – the scope of the guarantee should be clearly defined including specifying which obligations are covered and any exclusions or limitations.
- Jurisdictional issues – a potential issue may be where the parent company is based in a different jurisdiction. The PCG should align with the law of the contract.
- Costs to draft – NEC contracts do not provide a standard template for PCGs although many clients have their own standard form for use. Where any bespoke amendments are required, additional legal costs may be incurred.

Conclusions

NEC4 option X4 can be a useful tool for managing risk and ensuring project continuity in the event of specific contractor defaults. A PCG provides for an additional layer of assurance for the client in relation to the contractor's performance.

However, careful consideration and meticulous drafting in conjunction with specialist professionals are essential to maximise its effectiveness and mitigate potential legal complications. When properly implemented, option X4 can serve as a valuable mechanism to safeguard project interests. ○

LEGAL

Avoid a battle of the forms by using a single set of terms and conditions

SHY JACKSON BRYAN CAVE LEIGHTON PAISNER



KEY POINTS

- 'Battle of the forms' means dispute about which party's terms and conditions apply to their contract. The winner is often the party firing the 'last shot', but not always.
- In a recent Scottish case, the parties each used their own standard terms and conditions for NEC3 FC work packages, leading to a dispute over which court had jurisdiction.
- To avoid unnecessary disputes, NEC4 FC work orders should ideally be let under other NEC4 contracts and include the same contract data.

The term 'battle of the forms' is used to describe a dispute about which party's terms and conditions apply to their contract. It is often said that the winner is the party firing the last shot, but that is not always the case.

In *Magnetic Shields v. Vacuum And Atmosphere Services* [2024] EWHC 2260 (TCC), a quotation was provided with minimal reference to contract conditions. The client's purchase order made reference in each page to terms and conditions available on its website or on request. The purchase order was responded to by three emails sent over 10 minutes and the judge said it was the second email that resulted in an offer being accepted. This meant the 'last shot', the third email, was irrelevant as by then a contract had come into existence.

In *Caledonia Water Alliance v. Electrosteel Castings* [2024], the contract between the parties related to an overarching NEC3 Framework Contract (FC) for supplies. In that case, both parties referred to their own terms and conditions but the FC prevailed.

Contracts and dispute over jurisdiction

In 2015 Caledonia Water Alliance (CWA), a joint venture, entered into an alliance agreement with Scottish Water. CWA was obliged under the alliance to obtain plant, material and services from suppliers with which Scottish Water had a contract under an overarching NEC3 FC. This was to enable Scottish Water, or anyone acting on its behalf, to order the supply of items on agreed terms.

In 2016, Electrosteel Castings (UK) Limited signed the NEC3 FC with Scottish Water. CWA, which was replacing a substantial amount of pipework as part of the South Edinburgh Resilience Scheme, placed over 60 orders with Electrosteel between June 2018 to May 2022 for the supply of pipework.

CWA argued that the supply contracts were based on the Scottish Water's NEC FC and were therefore subject to Scottish Water's terms and conditions.

These provided that the contract was governed by Scottish law and subject to the Scottish courts. Electrosteel argued it had entered into contract with Morrison Water Services, one of the CWA joint venture members, based on its own terms and conditions, which provided for English law.

Court's decision

The court began by looking at the main documents exchanged, but then considered evidence from witnesses, who explained the background to the dealings between the parties and how matters developed. The parties agreed that the correct approach was to carry out an objective consideration of what has been communicated by words and action. Both parties suggested that there should be limits on what the court could look at in terms of what was reasonably available to the parties, but the court's view was that it should not take a narrow approach to that question.

Looking at the evidence, Lord Richardson found it was clear from the outset to the parties that their relationship would be governed by Scottish Water's terms and conditions in the NEC3 FC. This was based on what the witnesses said, on the fact that both parties knew and had access to these terms and that the terms were referred to in the supplier guide prepared by Electrosteel.

The judge however then had to address what the contractual documents exchanged by the parties stated. The purchase orders issued by Morrison were template documents that attached Morrison's

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standard terms and condition. This was followed by Electrosteel's order confirmations, which were similar standard documents that stated the transactions were subject to Electrosteel's attached standard terms and conditions.

The issue for the judge was therefore whether the express words used by both parties to refer to their own terms and conditions could be ignored if it could be inferred from the evidence that the parties agreed to ignore such wording. The judge noted Lord Justice Dyson's view in *Tekdata v. Amphenol* [2009] EWCA Civ 1209 that ignoring the express wording required a high hurdle to be surmounted. In this case, judge held that the evidence was strong enough to show the parties intended their own terms and conditions to be ignored. This meant Scots law applied, as set out in the NEC3 FC.

Conclusions

The decision highlights the uncertainty and unnecessary disputes that can arise where contracts are entered into on the basis of an exchange of a number of documents, instead of a single contract which determines the applicable terms and conditions.

Here both parties referred to their own terms and conditions. They also accepted in court that the correct approach was an objective interpretation and that the 'last shot' usually determined the outcome. In this case however, it was the use of the NEC3 FC that determined the terms of the contract between the parties.

Like the NEC3 FC, the NEC4 FC provides that work orders (work packages in NEC3 FC) follow an

instruction and the intention is that an appropriate NEC4 form is then used and the contract data identifies what will apply to the work orders.

In this case, it seemed clear that both parties recognised the effect of the NEC3 FC and acted on that basis. This emphasises the need to ensure that the contractual documents exchanged, in this case the purchase order and order confirmation, should acknowledge the contractual terms that both parties expected.

Using standard template documents which refer to a party's own terms and conditions when this is not the case will add to the uncertainty. As noted above, it is always important to recognise the contractual framework and record correctly what terms apply. ○

LEGAL

NEC4 option Z for additional contract conditions: clarity or curse?



NICOLA ELLIS K&L GATES

KEY POINTS

- NEC4 option Z allows users to include additional conditions of contract, but they are frequently over-used or incorrectly used.
- Reasons to include Z clauses are to meet specific governance requirements of the parties and to meet specific project requirements.
- Users should ensure Z clauses are kept to a minimum, do not conflict with NEC standard conditions and processes, and do not alter risk allocation.

NEC contracts are frequently accompanied by pages of option Z additional conditions of contract. However, guidance from NEC on so-called 'Z clauses' is clear, that they should be kept to a minimum and used where necessary for project-specific requirements.

The flexibility of NEC contracts, with the ability to choose payment option and select from pre-drafted secondary option clauses, is intended to suit particular procurement routes where other standard form contracts would need amendment. But option Z is often over-used or incorrectly used.

Reasons to include Z clauses

One argument for using Z clauses is that more clarity is needed as NEC contracts are relatively untested in the courts. However, many NEC disputes are decided in adjudications. But it may be that some additional conditions are valid where there has been experience of a standard clause being interpreted in an unintended way.

Another reason to include Z clauses is if there are company-specific clauses or processes, such as a requirement for an invoice to be provided, or to cover the parties' governance requirements for anti-bribery, modern slavery or sanctions standard wording to be included in all contracts.

Indeed, NEC has published public-sector Z clauses addressing the Official Secrets Act, confidentiality obligations and site security. Crown Commercial Services (CCS) also has 'boilerplate' Z clauses covering admittance to site, anti-bribery and corruption, freedom of information, building information modelling, data protection and cyber risk. CCS took these clauses from a wide selection of government NEC contracts and consulted with the Infrastructure and Projects Authority to achieve a fair balance in risk allocation.

Project-specific Z clauses, including reference to other agreements or external processes that need to be complied with, are also likely to be needed, particularly on larger projects. However, processes that describe how the works are to be done should be included in the scope and not the conditions.

Common issues

A common issue is that there are too many Z clauses and they are not tailored to the project or the parties – they are simply a copy and paste of standard additional clauses without any thought as to whether they are appropriate. Any key provisions are lost in the sheer number of Z clauses and the contract becomes so unwieldy that it becomes difficult for the parties to comply.

Another issue is inconsistent use of language in Z clauses, such as introducing capitalised defined terms for terms that should be italicised and detailed in the contract data, and using a combination of the two. This creates ambiguity and uncertainty.

Including Z clauses that ignore the existing NEC core clauses and selected secondary option clauses, or matters included in the contract data or scope, can lead to repetition and conflict or inconsistency.

Z clauses can also result in substantial changes to risk allocation. This can have particularly adverse effects on either party, which may well not be able to take on such risks or may take them on without fully appreciating the extent of such risk. This leaves gaps in coverage and potentially an unreasonably excessive amount of risk on the party least able to manage it.

Bringing clarity

Examples of Z clauses commonly seen as attempts to bring greater clarity to the existing NEC provisions include boilerplate clauses such as severability,

survival after termination and no waiver. These clauses are well-established and are likely to be useful in interpretation of the contract, as long as they are not duplicating an existing clause.

It is still common to see Z clauses for issues such as assignment, confidentiality, collateral warranties and intellectual property rights that were not previously included under NEC3 contracts. However, since clauses to deal with these issues were introduced in NEC4 contracts, care should be taken in applying the same Z clauses to ensure consistency with NEC4 provisions.

A common Z clause is the 'order-of-priority' clause, which lists out the documents forming the contract in order of the priority in which they should be read in the event of a conflict. For example, this might establish that the conditions take precedence over the scope (or vice versa), or multiple documents forming the scope may be listed in order of priority.

The reality of putting together a contract, particularly on larger projects, is it can be difficult to be certain there are no contradictory items within the contract documents, and an order-of-priority clause gives comfort. However, care should be taken in relation to clause 63.10, which allows compensation events to resolve ambiguities or inconsistencies to be assessed using the interpretation most favourable to the party that did not write the scope.

But clause 63.10 and an order-of-priority clause may not provide much assistance where there is no direct conflict, as the courts will read the contract as a whole. They will assume as far as possible that the contract documents are construed as complementing each other, as was the case in *RWE Npower Renewables Ltd v. JN Bentley Ltd* [2014] EWCA Civ 150.

Reducing clarity

It may be argued that some Z clauses actually reduce clarity under the contract. Parties should be particularly wary of Z clauses that attempt to change the risk allocation and make the contract more one-sided. This can mean that the mechanisms included by NEC to avoid expensive, lengthy disputes are removed from the contract, such as the following:

- Additional grounds for the project manager to withhold acceptance, making the project manager's rights much broader and causing delays to acceptance.

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PRACTICE

FAQs



ROBERT GERRARD
NEC USERS' GROUP SECRETARY

This is a selection of recent questions to the NEC Users' Group helpline and answers given. In all cases it is assumed there are no amendments that materially affect the standard NEC3 or NEC4 contract referred to.

Contract data document compiler's statements

Question

We are a client using NEC contracts. From time to time, we have received queries from our staff during the tender stage regarding the first sentence of the contract data which says, 'Completion of the data in full, according to the Options chosen, is essential to create a complete contract'. We are uncertain about the meaning of 'in full', as it seems that entries are only filled in by us when necessary, meaning the contract data would not always be completed in full. Additionally, we seek clarification on what is meant by 'complete contract'. Would it be advisable for us to remove 'in full' and 'complete'?

Answer

The note you highlight is intended only to guide the document compiler at tender stage. It should be deleted prior to tender, along with all the 'If...applies' notes found in the generic contract data. Look at how the NEC4 Engineering and Construction Short Contract (ECSC) deals with this as it puts such notes in boxes and explains these are not part of the contract.

The note is just highlighting the importance of filling in the contract data correctly. For example, if you select option X6 in the opening part of the contract data, make sure you correctly complete the associated X6 entries correctly found a few pages later. The contract would be incomplete if you stated option X6 applies then did not add in the daily bonus at the appropriate part of the contract data.

It is not necessary to change the wording, but perhaps this is not as clear as in the ECSC. It is perhaps best either to delete these guidance-type comments when going to tender or include them as non-contractual statements.

Flowing down terms in a subcontract

Question

We are the contractor on an NEC3 Term Service Contract (TSC). We are engaging a subcontractor to provide logistics services for the project. We wish to ensure our TSC obligations properly flow down in the subcontract. Would the NEC4 Term Service Subcontract (TSS) be best suited for this purpose? Also, if the original contract is a signed NEC3 contract, does that affect the provisions of the new NEC4 contract or do they still flow down as if they are both the same version?

Answer

There is complete flexibility over what contract you use to engage your subcontractor. You just need to get acceptance from the TSC service manager of the name of the proposed subcontractor and the proposed subcontract conditions in accordance with clauses 26.2 and 26.3 of the TSC. In respect of accepting the proposed subcontract conditions, this will be subject to the exceptions stated in clause 26.3.

You could choose to use an NEC3 or NEC4 form of contract as the subcontract, depending on the nature of the service to be subcontracted. The NEC3 suite of contracts did not contain a TSS but one was introduced into the NEC4 suite. The NEC3 suite did however contain an Engineering and Construction Subcontract (ECS) and Engineering and Construction Short Subcontract (ECSS) that could be used if the part of the service being subcontracted was primarily construction.

'There is complete flexibility over what contract you use to engage your subcontractor. You just need to get acceptance from the TSC service manager of the name of the proposed subcontractor.'

There is also the possibility under both NEC3 and NEC4 to consider the Term Service Short Contract (TSSC) as the basis of the subcontract if the service to be subcontracted is of low risk and complexity. Whichever contract you select, it may need to be added to or amended to capture any flow-down requirements included in your TSC.

If you were to choose to use the NEC4 TSS, you will need to consider changes in terminology and processes in the NEC4 contracts as opposed to the NEC3 contracts. If you were to choose to use an NEC3 TSC as the subcontract, then you will need to consider amendments to this to reflect that it will be used as a subcontract as opposed to a main contract.

Change in national insurance contributions

Question

We are a project manager using an NEC4 Engineering and Construction Contract (ECC). Does a compensation event occur for the increase in national insurance contributions announced in the UK 2024 Autumn Budget?

Answer

If the site is in the UK and option X2 has been included in the contract, the answer is yes, assuming the increase in national insurance contributions becomes law. However, the effect on the prices, if any, will be dependent on the main option selected.

In terms of people costs the effect across the main options will be as follows. In target-cost Options C and D, it will lead to a change in the prices, calculated by the impact of the event on cost component 13 item (i).

In the priced Options A and B, there will be no change to the prices as people costs are covered by the people rates, which are fixed for the duration of the contract. In Option E (cost-reimbursable contract), the change to the prices would be automatic in that the defined cost payable will increase due to an increase in cost component 13 item (i).

In Option F (management contract), there would be no change to the prices as, if the contractor is to do any work itself, this is paid for using the prices included in contract data part two that will be fixed for the duration of the contract.

In all main options there may be an increase in other cost components as result of the change in law leading to higher prices for plant and materials, subcontractors and so on. This will need to be demonstrated by the contractor via compensation events, changes to the supply contracts and so on as agreed by the contractor in accordance with the supplier's contract. ○

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- Deleting actions and time bars for the project manager and/or contractor in relation to compensation event provisions, meaning claims are likely to be saved up until the end rather than dealt with contemporaneously, as intended by the contract.
- Deleting 'deemed acceptance' following a failure to respond within the required times by the project manager (e.g. clauses 61.4, 62.6, 64.4). This can make the compensation event procedure open-ended and again may increase

the burden of the parties at the end of the project.

Conclusions

NEC users will find it difficult in practice to avoid Z clauses. There will always be some additional clauses considered necessary or inevitable, particularly to tailor the contract to a specific project.

The key is clarity. Z clauses should be project-specific and carefully drafted in line with NEC style and language. Users should read the whole contract,

making sure there are no conflicts with existing clauses or the scope created by inserting Z clauses.

Users can of course look at previously drafted Z clauses, but they should not just copy and paste them into the current contract – they need to make sure the clauses are appropriate to the project.

Finally, users need to think carefully before changing the risk allocation in the standard NEC contract. This could create additional costs and disputes in the longer term, or may even result in a higher contract price at the outset. ○

