

Assuring Plant and Materials & Equipment Costs Under NEC4 Contracts

Darren Ward & Ian Heaphy

5th November 2025



Agenda

- Introductions
- Contract Requirements
- Inspecting accounts and records
- Q&A

Speakers

Darren Ward Managing Director, The Orange Partnership Limited



Darren Ward is pragmatic, passionate and down to earth, he has vast experience delivering assurance assignments over the last 20 plus years on major capital projects across sectors including rail, aviation, water, rail, nuclear and oil & gas.

He is a Fellow of the Institute of Chartered Accountants in England and Wales, Audit Qualified and “Big 4” trained. He worked for BAA as Head of Supply Chain Commercial Management for 5 years on the Terminal 5 programme.

Since then, Darren has led the scoping and delivery of over 600 assurance assignments on reimbursable style contracts, predominantly NEC based. His unique concentration of expertise combining audit and forensic accountancy skills with an in-depth knowledge on all matters both commercial and contractual in construction means he is able to unpick complex cost and commercial issues quickly.

Darren has training courses and written papers on practical ways to inspect and audit Defined Cost.

DarrenWard@theorangepartnership.co.uk

Ian Heaphy NEC4 Contract Board



Over 25 years of experience in the construction industry, working with clients in the UK, Europe, Middle East, Far East, North America and Australia.

Specialises in the development of innovative procurement strategies with particular expertise around partnering, alliancing and target cost contracts.

Member of the NEC4 Contract Board and directly involved in drafting and shaping the fourth generation of NEC contracts.

Adjudicator, dispute resolver and quantum Expert Witness

Ian.Heaphy@inccons.com

Defined Cost & the Schedule of Cost Components

Structure of the contract

- Use Engineering and Construction Contract (ECC) as an example
- Note: cost reimbursable payment options are present in the following contracts
 - Professional Service Contract
 - Term Service Contract
 - Facilities Management Contract
 - Alliance Contract
 - Design Build Operate Contract



Main Option clauses

- A - Priced contract with activity schedule
- B - Priced contract with bill of quantities
- C - Target contract with activity schedule
- D - Target contract with bill of quantities
- E - Cost reimbursable contract
- F - Management contract

Cost reimbursable
payment options

Defined Cost

Option C, D, E (cl 11.2(24))

- Defined Cost is the cost of the components in the Schedule of Cost Components less Disallowed Cost
- Schedule of Cost Components provides a detailed listing what costs form part of Defined Cost, anything outside of this is deemed to be covered by the Fee
- Costs must be incurred in order to Provide the Works
- Costs can only be claimed under one cost component

Defined Cost

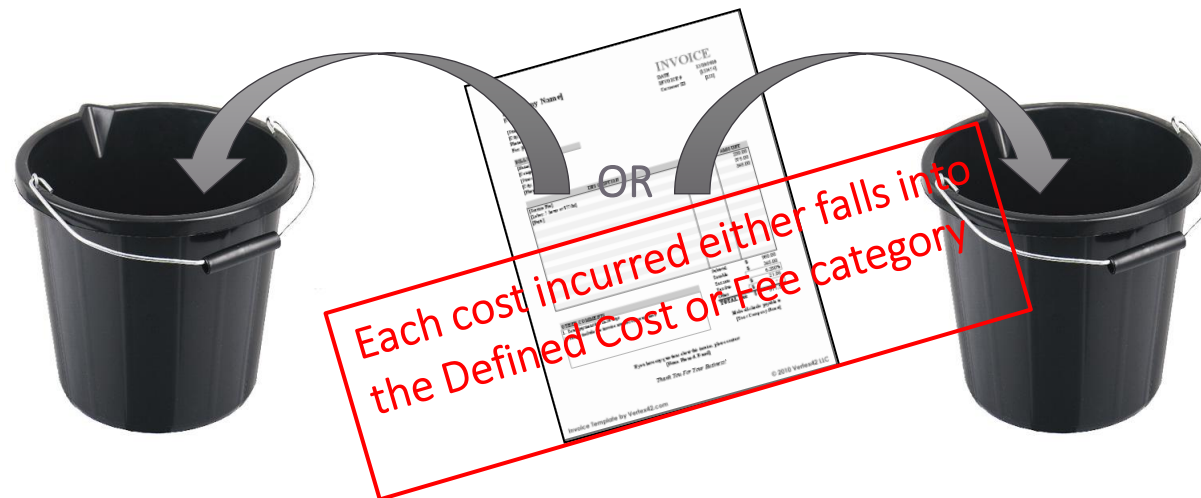
Defined Cost

Only includes

- amounts calculated using rates and percentages stated in the Contract Data, and
- other amounts at open market or competitively tendered prices with deductions for all discounts, rebates and taxes which can be recovered

Fee

All the *Contractor's* costs not included in the Defined Cost are treated as included in the Fee



Schedule of Cost Components

- Equipment v Plant and Materials
 - Equipment is items provided and used by the *Contractor* to Provide the Works and which the Scope does not require the *Contractor* to include in the *works* (11.2(9))
 - Plant and Materials are items intended to be included in the *works* (11.2(14))
- Subcontractors and their equipment and plant and materials are a different cost component (cost component 4)
- Unless included in the equipment hire rates, the cost of operatives is included in the cost of people

Schedule of Cost Components : Equipment

- Equipment which is used within the Working Areas - Working Areas are the Site and designated areas that are necessary for Providing the Works and used only for work in the contract (cl 11.2(20))
 - Equipment not owned by the *Contractor* or the *Contractor's* ultimate holding company or a company with the same ultimate holding company – actual hire or rental cost (21)
 - Equipment owned by the *Contractor* – at open market rates (22)
 - Equipment which is purchased – depreciation cost (purchase cost, less residual value, plus time-related on cost charge stated in Contract Data part two) (23)
 - Special Equipment – pre-agreed rates in Contract Data part two (24)
 - Equipment which is consumed – purchase cost (25)

Schedule of Cost Components : Plant and Materials

- Payments for
 - Purchasing Plant and Materials
 - Delivery to and removal from Working Area
 - Providing and removing packaging
 - Samples and tests
 - Cost is credited with payments received for disposal of Plant and Material unless the cost is disallowed

Disallowed Cost

<u>Option</u>	<u>Disallowed Cost</u>
C to E 11.2(26)	For example, cost • not justified by the <i>Contractor's</i> accounts and records • of Plant and Materials not used to Provide the Works (after allowing for reasonable wastage) • of resources not used to Provide the Works (after allowing for reasonable availability and utilisation)



**THE ORANGE
PARTNERSHIP**

Inspecting accounts
and records

Darren Ward

WHAT I WILL COVER

- Scope requirements and Z clauses
- Rates and Schedule of Cost Components (SoCC)
- Inspections and understanding the control environment
- Data analysis and visualisation
- Evaluation and reporting
- Summary

Inspecting records – why it is important?

PAY WHAT IS CONTRACTUALLY CORRECT

- Defined Cost - accurate, transparent and well controlled
- And “right first time”
- Basically, good open book principles
- Whether you are PM, CM, Auditor, Contractor
- Aim of today is to increase awareness, provide tips re plant, material and equipment cost, whichever side of the fence
- Shouldn't be any games here
- Aim of inspections - gaining confidence
- Often high volume/low value – some inspections need to be considered!



Never leave inspection to the end

Think three lines of defence (LOD)

- Line 1 Contractor
- Line 2 PM/CM
- Line 3 Independent Auditor

Scope requirements and Z clause amendments

WHY AMEND?

- Client/Employer taking risk in Defined Cost options (albeit some protection in Target scenarios)
- Want suppliers to “look after our money as if it was their own”
- As value of contracts increase, expectations on “rules and records” increase
- Client/Employer turn to scope/Z clauses to amend



Be practical in amendments you add to scope/Z clause

Look to “Allows to inspect” better than “shall supply all” re accounts and records (there was never ever the intent to audit/inspect 100% under NEC)

Scope requirements and Z clause amendments

DO WE SEE MUCH AMENDED FOR PLANT, MATERIALS AND EQUIPMENT?

- Plant and materials - not really
- Equipment - occasionally. Additional acceptances and procurement procedures, e.g.:
 - References to “open market rates”. E.g. obtaining a minimum number of prices from suppliers
 - Competitive tender requirements above a minimum value (can be plant and materials too)
 - Specific hire versus buy checks
 - Expectations re telematics reports to evidence utilisation
- Extra rule clarifications regarding use of Associated Companies and ‘fee on fee’. Common with inter-company equipment
- Over riding (21) or (22) using industry recognised price lists e.g. CECA in Contract Data



Some of these may be excellent suggestions on bigger projects

Evidencing equipment productivity is always beneficial – seen as effective anti-fraud measure

Remember know the reimbursement rules of contract before inspecting!

Rates or SoCC

RATE BASED APPROACH (CECA ADOPTION OR PRE-APPROVED INTERNAL RATES)

PROS:

- Simple - Rate x hours
- Rates there in CD for all to see/use
- Overrides need to agree “open market” rates on vast volume of equipment types (CECA coverage good)
- Overrides any internal company ‘fee on fee’ or ‘cross hire’ issues
- Get to evaluate at tender (align across bidders/CECA +/- %), can be VFM

CONS:

- Might not get full coverage on all equipment types, then what?
- Need to think about inflation, if longer duration projects
- Time to produce for contractor significant – actual quantities v look up (clean data)
- Ledger costs still there for all to see. So internal costs are based on supplier invoices or internal plant hire charges, which may be different to the Contract Data rates (over-or-under recovery for one party!)



If prefer rates for equipment insist on:

1. Request at tender stage (whilst bidders competing)
- and
2. Expect time charging clarifications (hire per hour, day, week, including/excluding fuel, transport etc)

Under (22) SoCC – how do you agree a market rate?

Clause 52.1 requires open market or competitively tendered rates

	A Plant Hire Ltd	B Plant Hire Ltd	C Plant Hire Ltd	Average
Price from Nov 2022	£701	£868	£1,306	£958
Price from Jun 2023	£835	£1,200	£1,410	£1,148
Price from Nov 2024	£1,192	£909	£1,785	£1,295

- Here contractor requested prices from 3 local suppliers. Is the open market rate the lowest or average? Aim is to price what the market will offer at that point of time (assuming supplier can honour order (quality/delivery is key too...like for like)). Lowest seems reasonable
- And right to do periodic checks with market to ensure inter-company equipment continues to prove value
- KEY: Get inter company prices pre contract! Know what they are willing to offer from outset. Ideally what you want to pay (with it proving to be lower than lowest price above!) Contentious though.

Inspections - understanding the control environment

GOOD PROJECT CONTROL LOWERS RISK OF ERROR

- Discussed contract rules - know basis of charging for plant, materials and equipment
- Review the AFP - get a feel for cost data (by supplier, item type, per date/month etc)

Then “see in practice”

- Familiarise yourself with the cost data on project - visit site
- Understand day-to-day processes re equipment management (on/off-hire/equipment yard) and plant and materials (ordering/delivery/storage). Speak to Contractor’s staff
- Find out what other key information/reports are produced? Finance staff? More useful than what supports cost in AFP?
- Good 1st line of defence?



Always seek out key controls you can rely on - who checks what each week, each month contractor side?

How is it evidenced?

(1 LOD/ RFT AFP)

What additional day to day tools and reports help manage plant, materials and equipment cost?

Understanding the control environment

TAKE STOCK - RECAP

- Built an understanding of:
 - Contract
 - Site
 - Key cost items/types
 - Day to day operations and controls re cost type
- Scribble it down (matchstick men/plant and materials/equipment) - regardless of project/contract size
- Chat “observations” through with a colleague
- Seem logical? Good control?
- Start to think what could go wrong i.e. identify mischarging risks
- Do this all pre-inspection!



Industry in danger of
over auditing and
inspecting

Not in right areas
either.....too much
repetition.....sampling
same equipment month
in month out (portacabin
structure example)

Contract Cost Ledger - Data example

SPECIFIC TO UNDERLYING SYSTEM (ORACLE/SAP/COINS/SAGE ETC)

Contract	Cost Code	Analysis	Cost Head Description	Standard Description	Led	Type	Tax Date	Amount	Supplier Code	Supplier Ref	Internal R
3VS166	10CFUPP20	Plant	Days S3-Van Park-Fuel Pip	21t Track Operated	PL	PINV	12-Dec-10	250.00	H2353	5470	110108725
3VS166	10CFUPP20	Plant	Days S3-Van Park-Fuel Pip	21t Track Operated	PL	PINV	12-Dec-10	80.00	H2353	5470	110108725
3VS166	10CSLAP01	Plant	Days S3-Van Pk-Concrete S	21t Track Operated	PL	PINV	12-Dec-10	110.25	H2353	5470	110108725
3VS166	10CDRCP01	Plant	Days S3-Van Pk-Drainage M	21t Track Operated	PL	PINV	12-Dec-10	94.50	H2353	5470	110108725
3VS166	10P3XXP09	Plant	Days Site Offices WasteDisp	SEPTIC WASTE REMOVAL	PL	PINV	12-Dec-10	140.00	C1356	cc037581	110106476
3VS166	10P3XXP09	Plant	Days Site Offices WasteDisp	SEPTIC WASTE REMOVAL	PL	PINV	12-Dec-10	140.00	C1356	cc037581	110106476
3VS166	10P2XXP27	Plant	Days Site Servicing SafetyEqui	P13 Cat & Genny - Nov10 - follow service locators.	GL	JNL	13-Dec-10	38.41		P13 Cat & Genny - Nov10	
3VS166	15P2XXP20	Plant	Days - Wet time Site Servicing	PN05 OGB Tipper inv P9006174	GL	JNL	13-Dec-10	252.09		PN05 OGB Tipper inv P9006174	
3VS166	10P2XXP20	Plant	Days Site Servicing Transport	PN05 OGB Tipper inv P9006174	GL	JNL	13-Dec-10	355.23		PN05 OGB Tipper inv P9006174	
3VS166	10BFUPP01	Plant	Days S2- Fuel Pip	Suction Excavator	PL	PINV	13-Dec-10	2,200.00	F1071	9010-119	110108425
3VS166	10BCLRP20	Plant	Days S2-Site Clea	YJ57 WEA Tipper inv P9006174	GL	JNL	13-Dec-10	378.77		YJ57 WEA Tipper inv P9006174	

- Understand this data (N.B. this is actual equipment data – raw from the system)
- Each column – shows valid information/data entry point
- Where key information is missing ask for more – enables better data sets to be built. Aids inspection
- Highlighting rows for inspection not SMART but often “go to” approach!

Contract Cost Ledger – specific equipment type

A HIGH VOLUME LOW VALUE EXAMPLE



Accommodation - £60-£100 a week unit (LHS). 48 units on RHS (£50 per week per unit).

£2,400 a week, £124,800 a year, £499,200 in total (4 year programme).

Open book – 48 weekly costed rows x 52 weeks x 4 years, plus 96 month end accruals (in/reverse) for 48 months

14,592 records in cost ledger supporting a claim for £499,200. How many would you inspect?

Yellow highlight each month? 10%? PO/Delivery Notes/Invoices/Proof of payment too?

Formal audit guidance lacking across industry. Teams learn from next door neighbour or an audit guide lifted from another project! Use common sense!

N.B. Different accounting system = 96 rows (one invoice per month for 48 accommodation units) – less time spent, same risk



- Competitively tendered
 - Data transparent (descriptions/supplier)
 - Data consistent (value/volume per month)
- Equipment known (sit there every day)
 - Very low risk
 - On budget

Building the data - accounting

AFP COST LEDGER DATA CAN BE “USER/AUDIT” UNFRIENDLY

- Difficult to fully identify Plant and Material descriptions or quantities in the AFP cost data (value per supplier typically at item level)?
- May not identify/reference GRN/PO information?
- Poor visibility of accruals and what has been invoiced/paid?
- Equipment costs may lack detail of on-hire/off-hire dates?
- May not identify equipment that is not owned by the internal company and ‘cross-hired’ from third parties?
- Poor visibility on quantities, rates, equipment type and IDs (asset numbers/reg plates)
- Date information might limit analysis - Separate xx/xx/xxxx dates into year and month



Your supplier “does what it does”
- standard to how its internal accounting systems are set up. They are not being awkward if it doesn’t “easily” align to the contract or give you detail you expect

Work with them not against them to get extra granularity required – plant location and material order analysis reports typically. Key to this is discussing processes/reporting with Site and Head Office Finance

This will allow you to build better data sets to visualise data and ultimately sample

Building the data - records

OTHER DATA SETS YOU MIGHT WANT TO BRING IN TO HELP INSPECTIONS

Depending on the contract rules, you might need to look at other data sets (not just core “accounting cost” data support in AFPs). Think:

- **Equipment reports** - location (GPS), usage (telematics)
- **Operator timesheet reports** – useful to compare equipment charging to. Note: unless included in the equipment rate, the cost of operatives should be included in the cost of people (SoCC item 28)
- **Site diaries and programmes**
- **Weighbridge data**
- **Security data**
- **Lidar survey data**
- **As built records**



Be sensible and think of why that data is produced – its purpose

It might be more site record related and not accounting data (but very useful to help evidence validity re Providing the Works)

Visualise and interrogate the data

DATA PATTERNS (CORE)

Once a good data set developed, start with the simple and obvious ones:

- **Descriptions** – Analyse into main types of Plant and Materials and Equipment used
- **Costs/quantities over time** (per day/week/month) - Month usually best initially
- **Ins/outs** – Understand posting patterns/accruals (reversing?)/journals
- **Any periods look unusual?** High volumes etc
- **Does that data hang together with works?**
- **Check against programme/performance reports/known issues** (site closed)
- **Align with budgets/forecast?**



Need some basic excel formulae/pivot skills

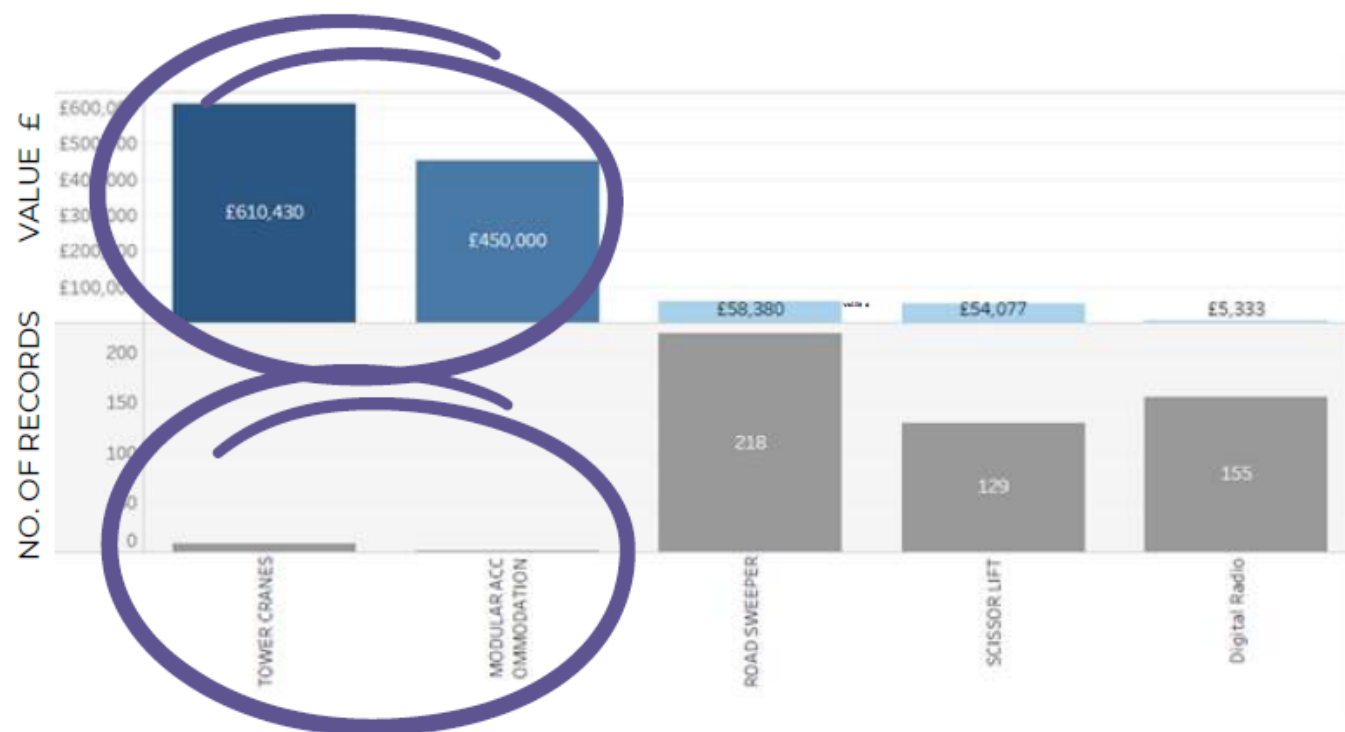
Develop these and a core set of tables/graphs to visualise for yourself going forward

Will give you an 80:20 feel for where money spent

Visualise and interrogate the data

GRAPH 1 – EQUIPMENT BY TYPE

HIGH VALUE LOW VOLUME COMPARED TO HIGH VOLUME ITEMS



A small number of items accounted for the majority of costs - therefore allowing us to focus our audit activity.



Bring the Excel data to life!

£1.18m of equipment costs

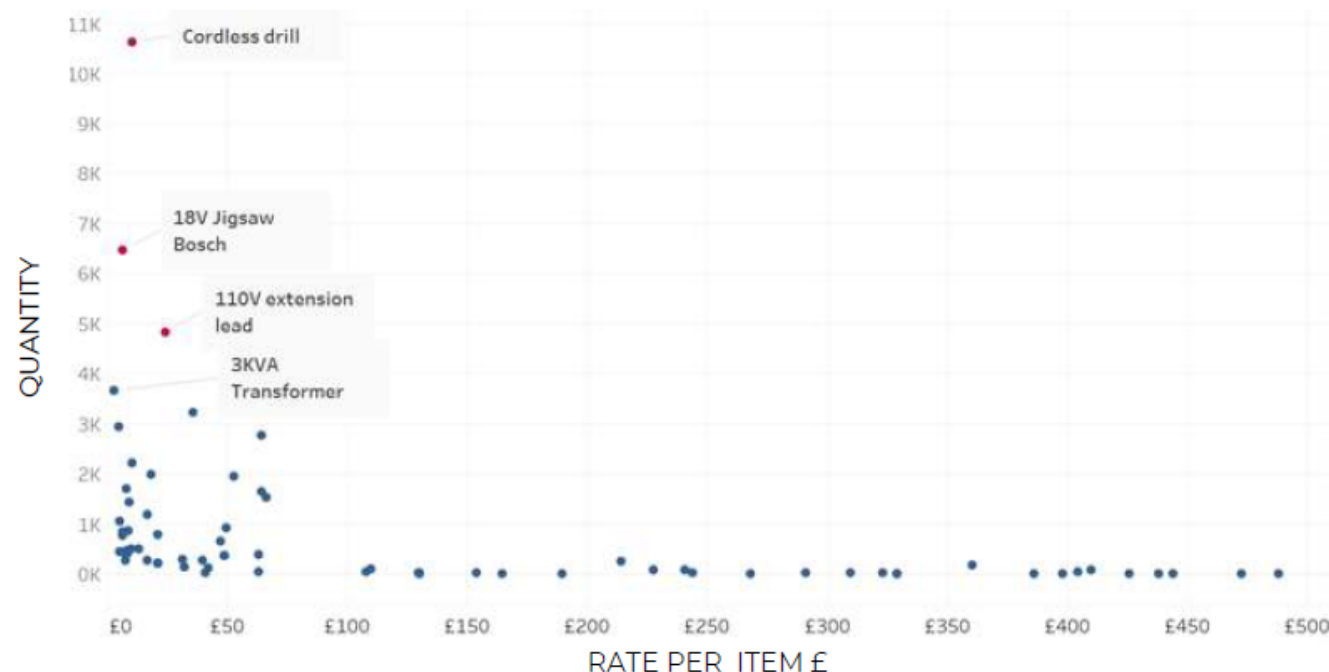
527 rows of cost in excel

Simple stacked graph shows where focus needs to be – see circled data

Visualise and interrogate the data

GRAPH 2 – EQUIPMENT COST BY TYPE AND RECORD VOLUME

HIRE VERSUS BUY ANALYSIS: IDENTIFIES A HIGH FREQUENCY OF LOW VALUE EQUIPMENT ON SITE



This graph highlights the importance of making sure you obtain detailed reports on individual pieces of equipment, their units, rates and quantities in order to carry out an effective analytical review. Also that you review items on a cumulative, not just monthly basis.



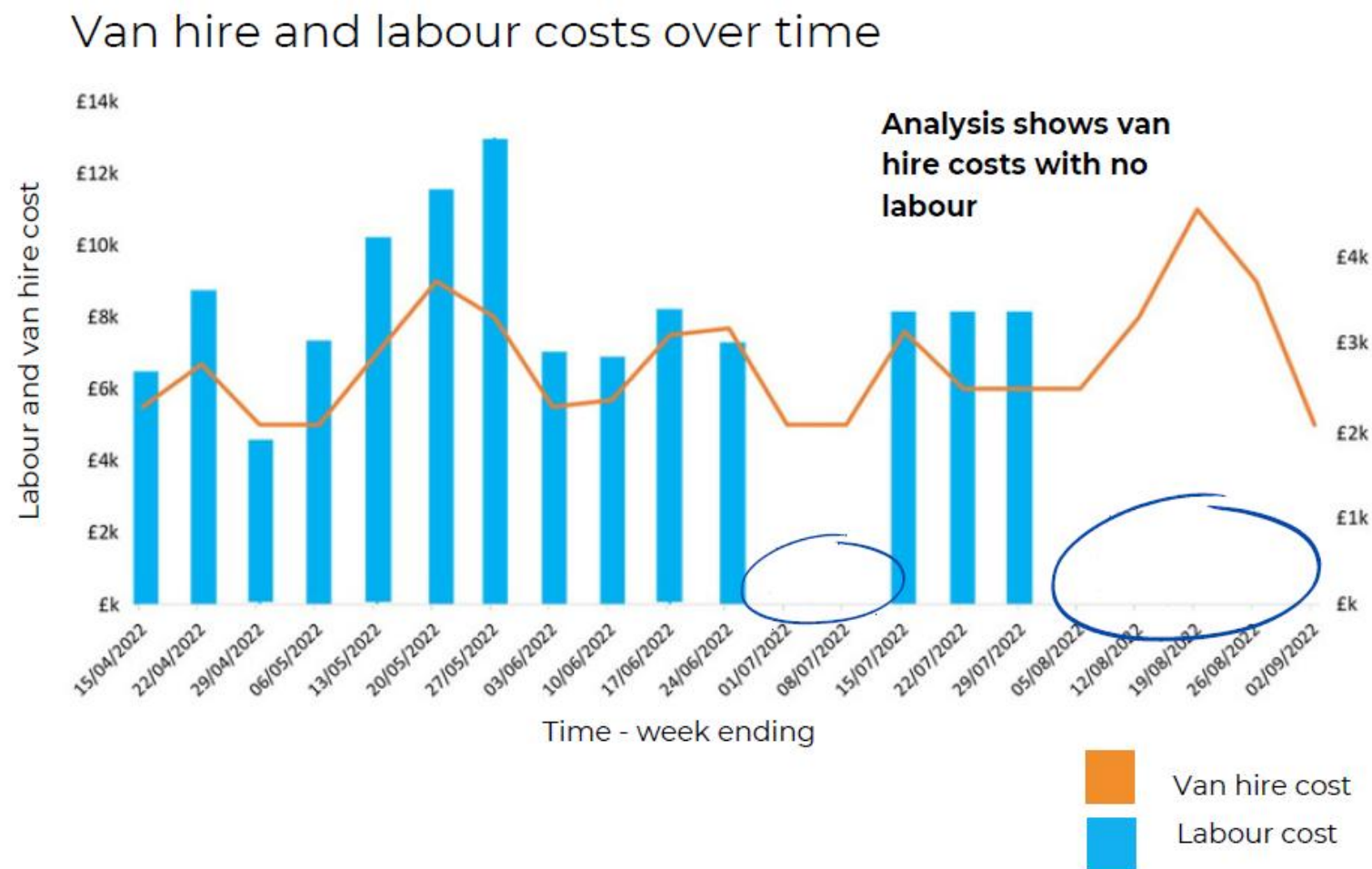
**11,000 individual weekly
hires of cordless drills at
£20 a week**

£220k charged

**Suggests a VFM risk
perhaps and something to
investigate further**

Visualise and interrogate the data

GRAPH 3 – VANS VERSUS LABOUR

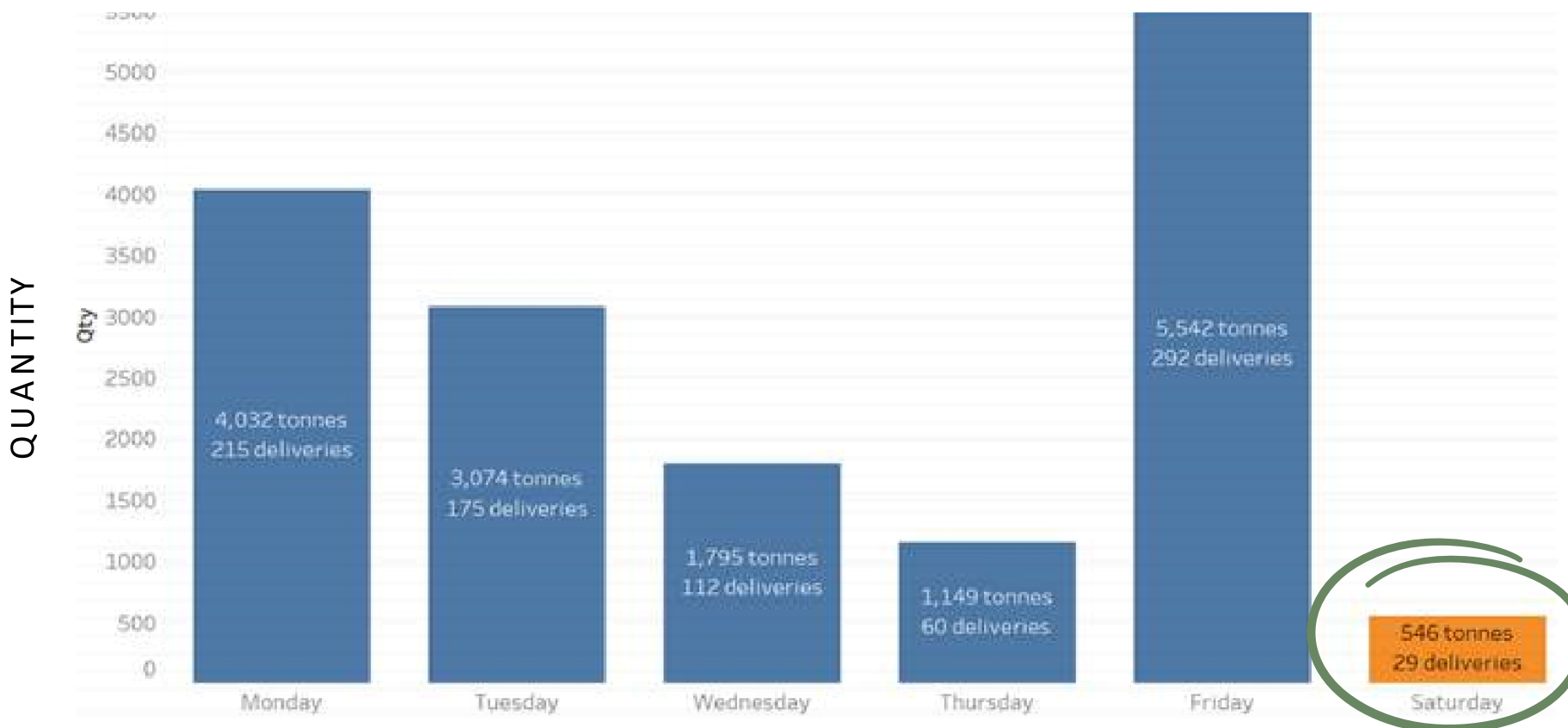


Bringing in a
complementary data set
to equipment

Shows a clear concern –
slow off-hire

Visualise and interrogate the data

GRAPH 4 – TYPE 1 MATERIAL DELIVERIES BY WEEKDAY ON PROJECT “1”



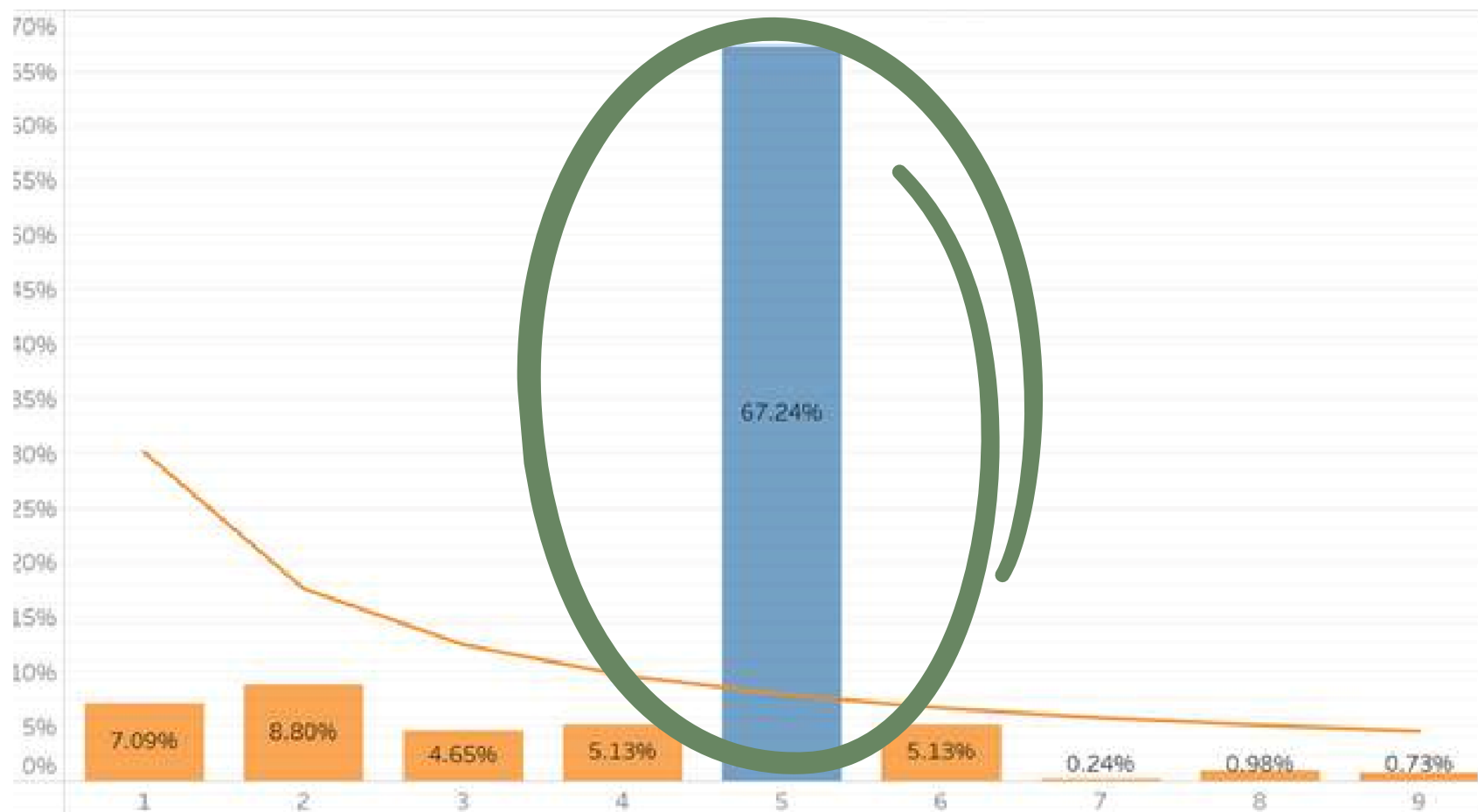
Shows a concern on why deliveries were being made on Saturdays when the site for project “1” was closed.

Reason: Goods Received Notes processed for project “2” by a shared resource – finance thought that resource was 100% project “1” and assumed all deliveries would be too

Visualise and interrogate the data

GRAPH 5 – BENFORDS LAW CAN BE USED TO IDENTIFY UNUSUAL PATTERNS

FREQUENCY OF LEADING DIGIT



LEADING DIGIT OF MATERIALS TRANSACTIONS



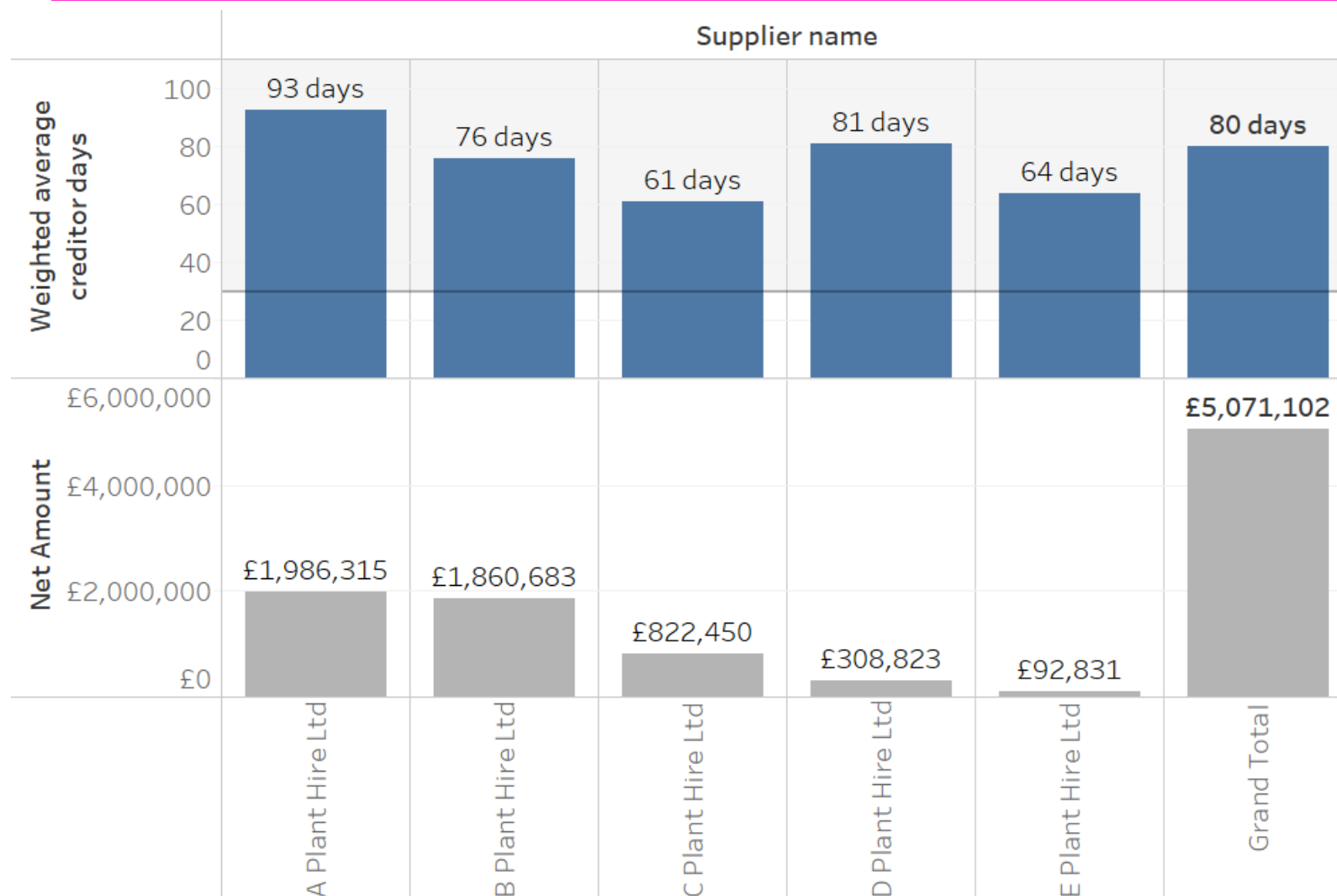
We expect only 8% of transactions to start with the digit 5.

However, in the example above, over 67% of materials costs started with number 5

All stock issued on a project from a store cupboard at £50 a unit (done for simplicity). True cost under audit was £23.

Visualise and interrogate the data

GRAPH 6 – AVERAGE PAYMENT DAYS ANALYSIS



Price for Work Done to Date is the total Defined Cost forecast to be paid before the next assessment date.

By building a data set with actual payment info, we identified an average of 80 days between invoice and payment. In addition, the Contractor applied for costs not invoiced, and included other forecasts

Evaluate the records and report

EVALUATING RESULTS

- Records results - keep on top of
- Records may not initially support Defined Costs claimed
- Ask suppliers why, work with them to understand better
- Easy to miss something - jump to wrong conclusion
- Root cause understanding always key
- Better approach than disallowing/with-holding



If samples are indicative of wider population, you will draw sensible conclusions

Written records of your tests
- prevents
duplicate/triplicate reviews,
gets the project fit for clause
50.9 close out

Start early - better to get
confidence early and test
less at end

Disallowed cost

COMMON ISSUES: NOT JUSTIFIED BY ACCOUNTS AND RECORDS

- **Rebates and discounts** – clause 52.1
- **Accruals/provisions** - proof invoiced and paid
- **SoCC** - not recoverable costs, repairs, damages, lost and stolen items
- **Duplicates** – weak processes - applications for payment reveal duplicates in underlying accounts/manual spreadsheets
- **Operatives included in internal equipment charges**
- **Rates** – not at open market or competitively tendered
- **Internal equipment costs** – ‘fee on fee’ issues
- **Equipment** – not off-hired, and ‘hire’ versus ‘buy’.
- **Wastage/utilisation** – identifying what’s “not reasonable”
- **Correcting Defects** - Contractor not complying with a constraint on how it will deliver the Works



Lots of areas to look into

Many again relate to high
volume low value
transactions

Remain focussed

Cost of investigating/
inspecting may cost more
than value you disallow

Summary

EFFECTIVE INSPECTIONS OF PIANT, MATERIALS AND EQUIPMENT COSTS

- **Pre-contract** - amend pragmatically
- **Visit site** - helps you visualise in/out access points and site logistics
- **Post contract** - read and understand charging rules
- **Post contract** - 1) audit rates from Contract Data (if that is route chosen) 2) pay particular attention to open market rates and internal companies
- **Build good data sets** - speak to site and finance teams to understand the process and wider cost reports
- **Audit** - design tests specific for the contract/sample population sets
- **Reporting** - write up results/root cause key if things aren't supported



THE **O**RANGE
PARTNERSHIP

Q&A

NEC Digital

- NEC Digital is now live
- The Digital Future of Collaborative Contracting
- Find out more and book a demo
necontract.com/digital



The home of collaborative contracting



NEC Contracts has gone digital

Designed by contract experts for contract professionals, our new online drafting tool will transform the way users interact with NEC Contracts.



The home of collaborative contracting

Find out more and book a demonstration
at necontract.com/digital