

**ICEAA 2016 International Training Symposium**  
**October 17-20, 2016 • Bristol, UK**



## **Blazing the Project Controls Skills Trail**

Shane Forth (PMO Director - Costain and ACostE past Vice - President)

Catherine Lambert (Project Development Manager - ECITB)

---

# Agenda

---

## Introduction and Background

- § Introduction
- § Emergence of Project Controls Skills Gap - Mid-1990s
- § Project Controls Skills Gap Persists Through the 2000s
- § Causes and Determinants of the Project Controls Skills Gap
- § Wake up Call in 2000 and Early Actions
- § 1st Project Control Apprenticeship Launched September 2007
- § UK Government Apprenticeship Reforms

## Trailblazer

- § UK Government Apprenticeship Reforms
- § Introducing Our Employer Led Trailblazer Group
- § End-to-End Process up to 'Go Live'
- § 20% Off the Job Training
- § Developing the Level 3 Standard
- § Level 3 Standard Approved - June 2016
- § End Point Assessment
- § Benefits
- § Next Steps to September 2017 Launch
- § Higher Apprenticeship at Level 5 or 6
- § Project Controls Practitioner Training

---

# Introduction

---

## **ACostE** [www.acoste.org.uk](http://www.acoste.org.uk)

Represent the professional interests of those with responsibility, at all levels, for the prediction, planning and control of resources and cost for activities that involve engineering, manufacturing, and construction. [Read more](#) >. Benefits include professional recognition, networking opportunities, access to knowledge resources and much more. [Read more](#) >

## **Costain** [www.costain.com](http://www.costain.com)

We have a wide-ranging experience and solution offering within the defence sector, particularly in delivering support to nuclear programmes.

Our solutions support our customers in managing programmes as well as delivering design, engineering and construction to support major programmes.

### Our Defence Capability

- Concept studies, engineering research and technology integration
- Business case support including cost modelling and options analysis
- Systems engineering
- Programme management support – risk, cost, scheduling, EVM and information management
- Commercial support - contracts and partnering arrangements
- Engineering, procurement and construction (EPC) projects

## **ECITB** [www.ecitb.org.uk](http://www.ecitb.org.uk)

The Engineering Construction Industry Training Board (ECITB) is a Non-Departmental Public Body accountable to the Department of Education. Established in 1991, the ECITB is the skills, standards and qualifications body with statutory responsibility for the development of the engineering construction workforce of Great Britain through an industrial training levy.

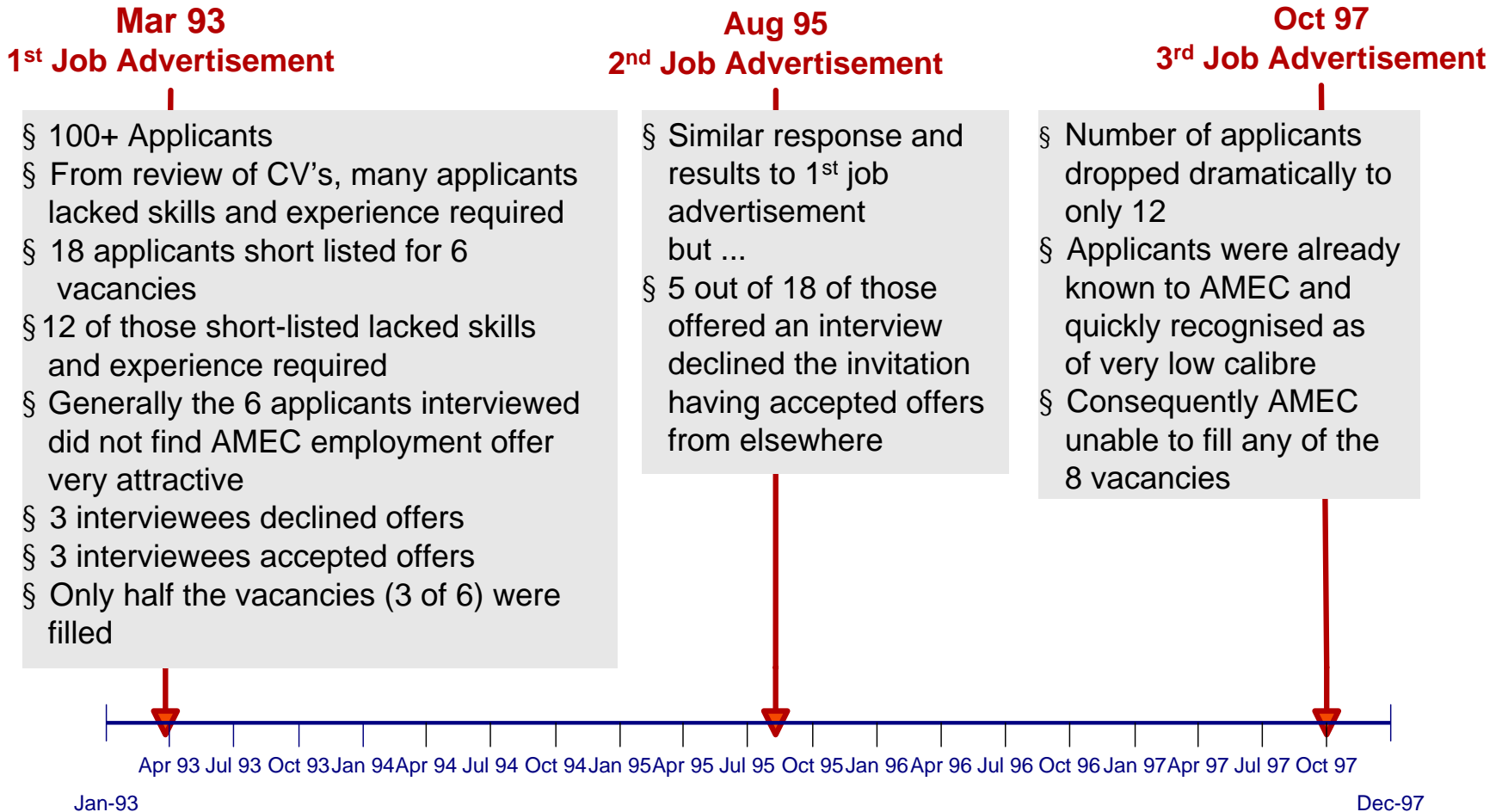
---

## Emergence of Project Controls Skills Gap - Mid-1990s

---

- § In the late 1980s and early 1990s, planning engineers were mostly former construction engineers and used traditional manual methods.
- § Planning engineers were considered as only needed to satisfy the client - not a priority at a time when relationships were very adversarial.
- § Client' had become 'leaner and fitter' - invitations to tender (ITT's) were asking contractors to use computers and project management software **(Cost of this and associated training was £10k per planning engineer)**
- § Uncomfortable with the new technology, management felt that the new and additional cost was expensive, unnecessary and made the business uncompetitive when bidding for work.
- § By the mid 1990s the use of project management software for project planning had been somewhat reluctantly accepted as the norm.
- § A shortage of suitably skilled planning engineers with a mix of the traditional and new skills, and difficulty attracting and retaining them was becoming increasingly evident

# Emergence of Project Controls Skills Gap - Mid-1990s



---

## Project Controls Skills Gap Persists Through the 2000s

---

***Design & Engineering Contractors in the Oil, Gas and Chemical Sector: Research Project Sponsored by Department of Trade and Industry***  
(Minor Richards Associates, 2001)

*'Principal engineers, project leaders and senior planners are valuable resources not readily available' ... 'there is a need for a coherent framework for discussion at National level involving government and industry on strategic issues concerning the national interest'*

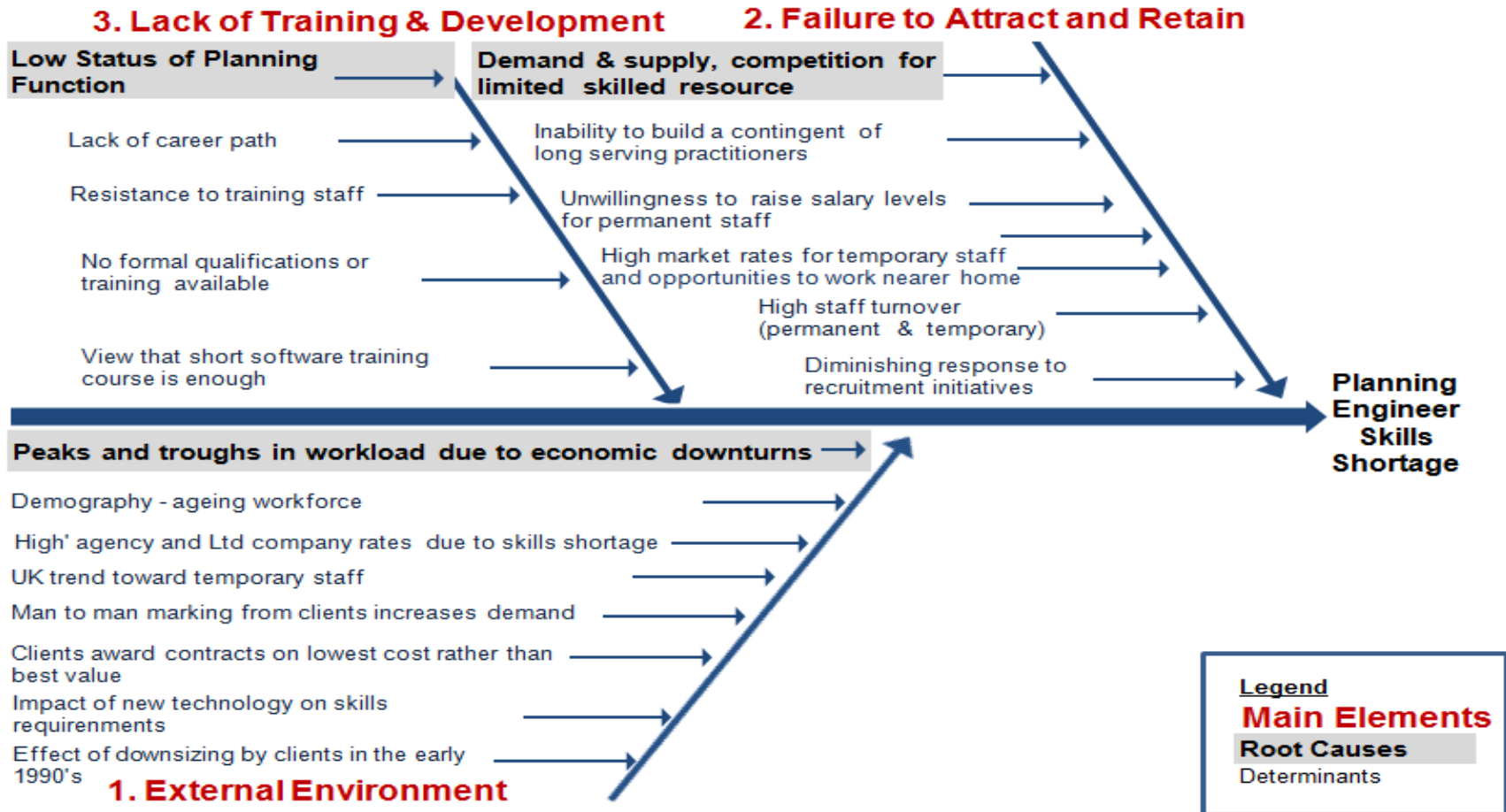
***'Energy Skills, Opportunity and Challenge'***. (Cogent Sector Skills Council et al, 2008)

*'Experienced project planning and control professionals are also in short supply with a shift to self-employed status for these people' ... 'New qualifications and apprenticeship programmes have been developed by the ECITB to address the problem. However, additional investment is needed to build capacity in the training providers more quickly'*

***'Changing to Compete'*** (Gibson, 2009) a review of UK productivity and skills in the Engineering and Construction industry, produced for the UK governments Department of Innovation, Universities and Skills (DIUS)

*'There are, however, concerns about the quality and number of supervisory staff available as well as the availability of some craft trades, experienced planners and project managers'. ... 'current shortages seem particularly to be an issue in project management, planning, engineering design and high quality welding'*

# Causes and Determinants of the Project Controls Skills Gap



# Wake up Call in 2000 and Early Actions



In September 2002, BCECA Project Control Managers Committee was formed at the request of member companies HR departments to find a solution to the shortage of project controls staff and discuss whether a combined effort on training new staff would be useful.

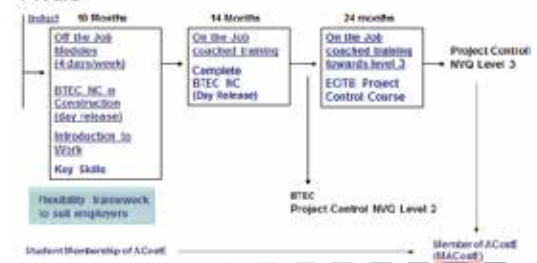


## National Working Group June 2006 to July 2007



- Developed national apprenticeship framework
- Obtained government funding for employers
- Developed support material for in company training at NVQ Level 3 (graduates)
- Unable to source development and delivery "Off the Job" Project Control training in South East

### 4 Years



## North East Working Group March 2007 to July 2008



- Recruitment of apprentices
- Innovative and collaborative approach
- Development of Off the Job training material and review by employers
- Development of On the job training material (project control workbooks) and review by employers
- Training of employers line managers (coaches)
- Specified requirements for development of Foundation Degree (FdSc)
- Publicity including major launch event

Handwritten notes and diagrams related to the training program. Includes a Gantt chart for 'Assignment G2 - scheduling practice' and a list of tasks with durations and dependencies.

Task	Duration	Dependencies
Task 1	1 week	
Task 2	2 weeks	Task 1
Task 3	3 weeks	Task 1, Task 2
Task 4	4 weeks	Task 3
Task 5	5 weeks	Task 4
Task 6	6 weeks	Task 5
Task 7	7 weeks	Task 6
Task 8	8 weeks	Task 7
Task 9	9 weeks	Task 8
Task 10	10 weeks	Task 9
Task 11	11 weeks	Task 10
Task 12	12 weeks	Task 11
Task 13	13 weeks	Task 12
Task 14	14 weeks	Task 13
Task 15	15 weeks	Task 14
Task 16	16 weeks	Task 15
Task 17	17 weeks	Task 16
Task 18	18 weeks	Task 17
Task 19	19 weeks	Task 18
Task 20	20 weeks	Task 19
Task 21	21 weeks	Task 20
Task 22	22 weeks	Task 21
Task 23	23 weeks	Task 22
Task 24	24 weeks	Task 23
Task 25	25 weeks	Task 24
Task 26	26 weeks	Task 25
Task 27	27 weeks	Task 26
Task 28	28 weeks	Task 27
Task 29	29 weeks	Task 28
Task 30	30 weeks	Task 29
Task 31	31 weeks	Task 30
Task 32	32 weeks	Task 31
Task 33	33 weeks	Task 32
Task 34	34 weeks	Task 33
Task 35	35 weeks	Task 34
Task 36	36 weeks	Task 35
Task 37	37 weeks	Task 36
Task 38	38 weeks	Task 37
Task 39	39 weeks	Task 38
Task 40	40 weeks	Task 39
Task 41	41 weeks	Task 40
Task 42	42 weeks	Task 41
Task 43	43 weeks	Task 42
Task 44	44 weeks	Task 43
Task 45	45 weeks	Task 44
Task 46	46 weeks	Task 45
Task 47	47 weeks	Task 46
Task 48	48 weeks	Task 47
Task 49	49 weeks	Task 48
Task 50	50 weeks	Task 49





# 1<sup>st</sup> Project Control Apprenticeship Launched September 2007

## ECITB DEVELOPMENT UPDATE

### MEETING A NEED NEW PROJECT CONTROL QUALIFICATION

The ECITB has launched a pilot Project Control Apprenticeship scheme to advance skills shortages in this area. In September, 25 employed status learners in the North East began working towards their Project Control NVQ Level 2 (the '2' denotes an NVQ) in Project Control Support and a BTEC National Certificate in Construction on the way.

Andy Brown is involved in Project Development & Construction Standards for the ECITB. "There's a definite need to create a clear route to Certification/Chartered status. After the ECITB launched the National Occupational Standards in Project Control and the Level 3 and 4 qualifications last year, the industry requested entry level qualifications. So we did a bit of work to develop the new Project Control Support National Occupational Standards and a Level 2 qualification. Recruitment of the learners is the result of a huge effort and commitment by companies with offices in the North East who have worked together to generate this programme."

"The ECITB's Head of Apprenticeship Programmes, Jim Crowl, said, "This is an excellent example of how the ECITB responds to the needs of the industry. Support within the industry was undoubted."

Apprentices on the pilot scheme are employed by AMEC, also known as Scaevon UK and E Home International, from Yorkshire & Humberside who have committed employees to the programme.

AMEC Project Control Manager Shane North has recently completed three years as Vice President of the Association of Cost Engineers and also sits on the panel of NVQs, so he is fully aware of the benefits of taking on and training school leavers and the need for the continued development of its Project Control Managers. Companies have clearly recognised the need to recruit new, and train and develop existing, project control staff to perform the planning, estimating and cost control functions and help ensure the successful delivery of ongoing and future projects."



### project control

## The North East launch of Project Control support standards and Level 2 NVQs

by Nigel Hibbard\*

The North East launch of the Project Control Level 2 NVQ and associated project support standards took place at Darlington Football Club in October and was enthusiastically attended by around 80 people.

During the stimulating seminar the importance of the Project Control NVQ Levels 2, 3 & 4 qualifications to UK plc became clear when it emerged that the level of expenditure on new plant in the process industry in the North East alone through to 2015 will give rise to 16,000 new jobs, many of which will be in the project control disciplines.

There has been less of an emphasis on science and maths-based subjects in colleges over the last decade, mainly because of the broad-spectrum nature of the process industry big players. This state of affairs has been further compromised by a frequently changing Government funding strategy for further education. The challenge now is to provide people with the skills that are needed by industry.

The general feeling is that the Level 2 & 3 NVQs and similar occupational qualifications are closer to what industry needs, and are a pragmatic way of providing the currently available labour force with the required skills. The big concern now is whether there will be a sufficient uptake in training capacity in time to meet the process industries' urgent needs.

Using the North East position as a yardstick, there will be 40,000 additional jobs required in the UK process industry by 2015, a significant proportion of which will require project control skills.

The launch seminar was chaired by Robin Davidson of Webstition Management Services Ltd who in his introduction highlighted that:



The speakers (left to right): Robin Davidson, Nigel Spencer, Ali Lofthouse, Andy Brown, Richard Dodd, Shane North, Howard Maitland

- all major capital programmes had been controlled using project control methodology for the last 10 to 15 years;
- the methodology had grown up and matured in the oil and gas sector, before branching out into other industries;
- industry now suffers from too many 'grey heads' and it was felt the Level 2 would be a vehicle to attract younger people in order to improve the project control engineer's age profile.

Richard Dodd, ECITB (Standards-setting body) project manager for delivery of the new standards, outlined his feedback from the Level 3 & 4 Launch in 2005 had identified UK industries' requirement to provide a visible career path for the project control profession, with the opportunity to start people straight out of school or convert craft technicians into the profession. This clearly marked career path would encourage people to stay within the profession and develop through to chartered or

certified status. The new Level 2 qualification provides the entry point.

Richard stated how, in the first place, he had to obtain funding from SEDA/OCA, assemble a team of cross-sector project control professionals and representation from the ACostE (the professional body for project control), deliver the standards, gain approval of the standards, and then develop the subsequent qualification package. The qualification gained accreditation in August of last year.

Richard also highlighted a number of observations that could be made of all the NVQ standards and qualification structures and stressed that, whilst ECITB are the custodians of the standards, they and the qualification structure are in the public domain.

The finished Level 2 standards and qualification consist of 13 units. The qualification requires 11 (8 mandatory) to be completed using the assessment of evidence, each unit being made up of Performance, Subject and Knowledge criteria, all of which must be demonstrated by the evidence.

Nigel Spencer, Head of ECITB's



The Project Control apprentices after receiving their ACostE Student Membership Certificate at the North East launch

Engineer status, via the ACostE. What ACostE is trying to do is to build the link between the NVQ programme and Chartered status: this was the focus of Howard's presentation.

Dr Stan Higgins of NPEPC (North East Process Industries Cluster) gave a very upbeat picture of the North East process industries' current status, saying that a forecast of growth for years ago had been hopelessly low, with record turnover occurring this year. Project control people will be needed directly within the industry and in its supply chain. He believes that the NVQ is key to giving the industry the quality of recruits and staff needs but is fearful that, because of the way the education has been delivered over the last decade, it will be too little too late, and could compromise the rate of required growth.

I cautioned Stan to see the apprentices sitting in front row of the seminar, and he saw them as having excellent career opportunities in the North East in their chosen profession. Overall he was convinced the NVQ programme and standards framework is one of the key ways of addressing the skills shortage in the North East and the country as a whole.

The Chairman, Robin Davidson, ended the seminar by conducting a question-and-answer session which is summarised at the beginning of the article. One of the key points Robin made was that anyone who could demonstrate competence across the standards associated with estimating, planning and cost control, would be

able of employment in areas where work permits were hard to get. In this instance, a multi-skilled resource will always be preferred, and if the skills are underpinned using the NVQ framework, it gives real strength and validity to that individual's capability and credibility.

More launch seminars are planned in 2008 in the North West, London and the South and possibly one in Scotland. These will be timed to enable feedback from the Apprenticeship Programme in the North East.

#### Seminar sponsors (in sequence of engagement)

ACostE: the project control learned body. Tel: 01270 764 798. Lea House, 5 Micklewith Road, Sandbach, Cheshire, CW11 1XL. [www.acoste.org.uk](http://www.acoste.org.uk)

PROVOC: the project control NVQ and standards user group, an ACostE SSI, and organiser of the seminar. Tel: 07803 248 427. Contact via the ACostE or [www.provoc.org.uk](http://www.provoc.org.uk)

ECITB Standards and Awards: the sector skills council for the engineering and construction industry. Tel: 01923 260 000. Blue Coat, Kings Langley, Herts. [www.ecitb.org.uk](http://www.ecitb.org.uk)

AMEC Industrial: a major supplier of

\* PROJECT CONTROL PROFESSIONAL February 2008

...training... with suitable prior learning and experience can gain Chartered

PROJECT CONTROL PROFESSIONAL February 2008 11

---

# UK Government Apprenticeship Reforms

---

- § The 2012 Richard Review of Apprenticeships' reviewed how apprenticeships in England can meet the needs of the changing economy.
- § The resulting 'implementation plan' set out the government's approach to changing apprenticeships based on the feedback received from the Richard Review consultation.
- § In what is a major programme of reform, groups of employers (trailblazers) lead the way in carrying out the changes to apprenticeships, working together to design apprenticeship standards and assessment approaches to make them world class
- § From 2017/18, all new apprenticeship starts will be in accordance with the new requirements
- § The Trailblazer programme is committed to reaching three million apprenticeship starts in England by 2020.

 HM Government

## The Future of Apprenticeships in England

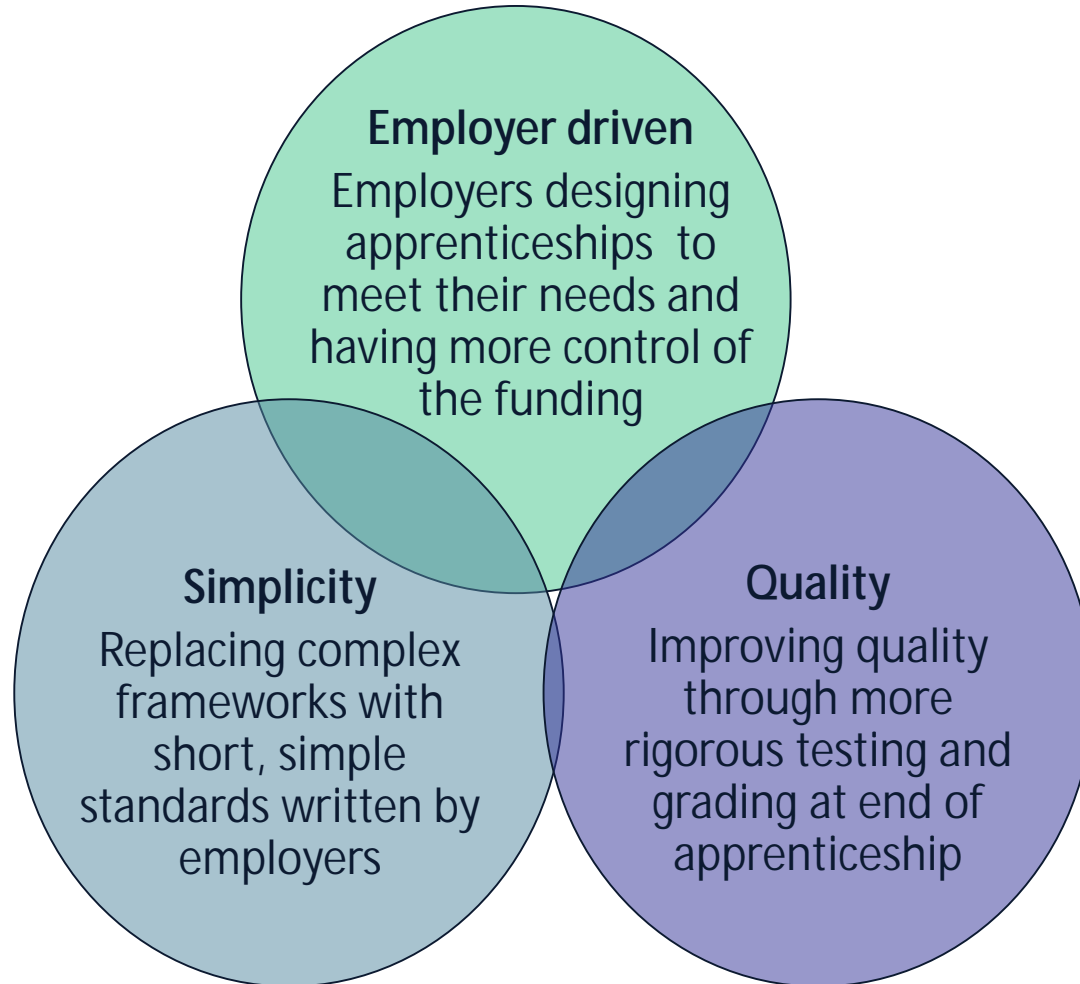
Guidance for Trailblazers – from standards  
to starts

December 2015

---

# UK Government Apprenticeship Reforms

---



---

## Introducing Our Employer Led Trailblazer Group

---

- § Chaired by Costain PMO Director Shane Forth, the employer-led group includes **almost 50 employers** from oil, gas, nuclear, defence, water, highways and rail sectors, as well as professional and sector bodies (including ACostE and ECITB), academia, and training organisations
- § The Project Controls Technician employer-led group satisfies the government requirement for the **need to involve small businesses** in the process (should normally mean at least two employers with fewer than 50 employees)
- § The Project Controls Technician Standard (Level 3) was approved by the Minister on 14 June 2016
- § The End-Point Assessment has been submitted and is approved pending minor modifications
- § Launch of the Level 3 Project Controls Technician Apprenticeship (Level 3) is planned for Q3 2017 or earlier

# Introducing Our Employer Led Trailblazer Group

## PROJECT CONTROLS TECHNICIAN (LEVEL 3) TRAILBLAZER EMPLOYER GROUP LED BY COSTAIN

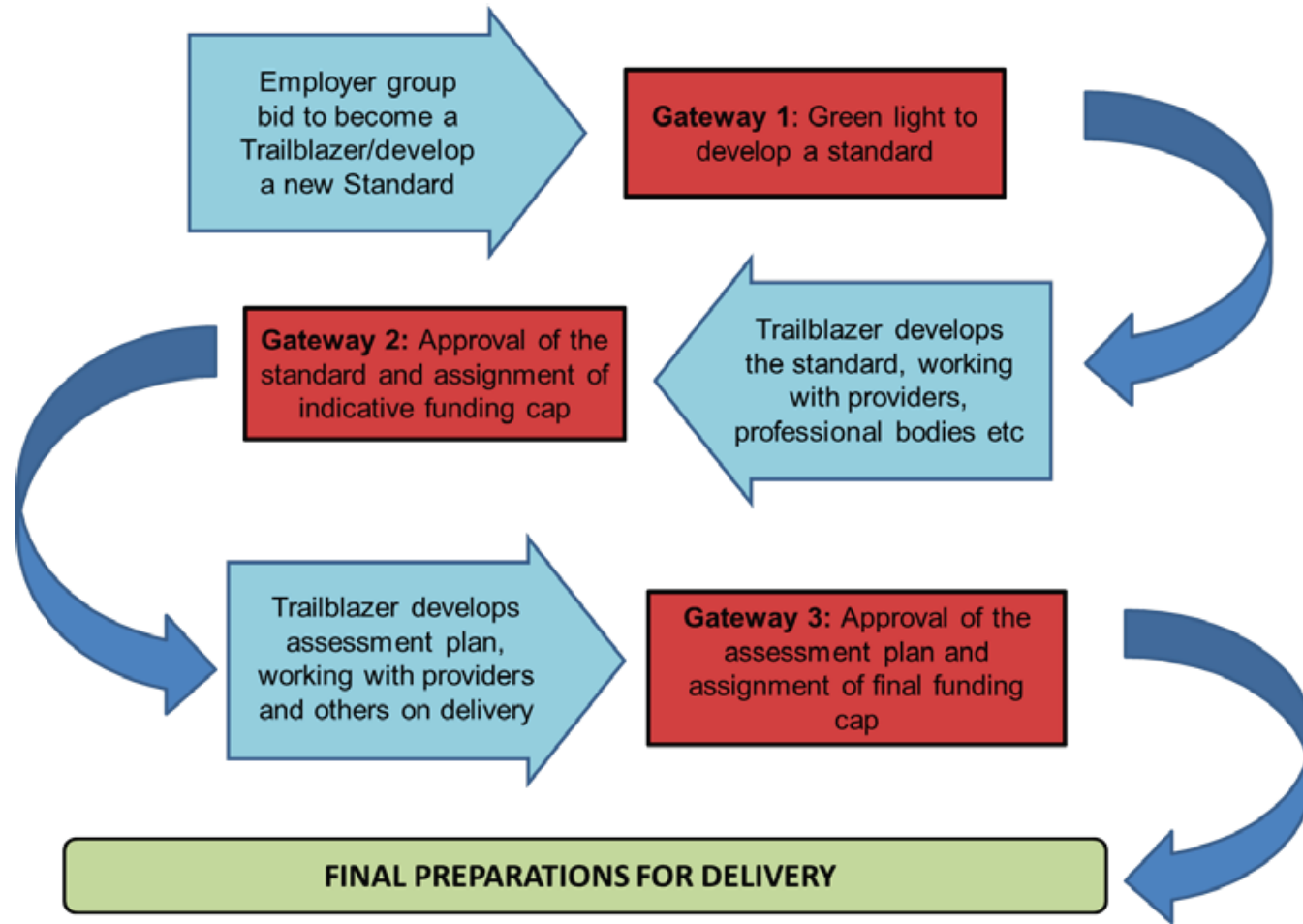
Lead Employer	<b>Costain</b>
Employers	Air Products, Aker Solutions, Alpha Plus, Alstom, AMEC Foster Wheeler, Atkins Global, Balfour Beattie, Bechtel, Bilfinger, Boulting, Cavendish Nuclear, CB&I, CH2MHill, Cordell Group, Crossrail, Decipher Group, Doosan, EDF Energy, Fabricom Engie, Fluor, HS2, Jacobs, KBR, LakerVent, Magnox, MOD, Mustang Engineering, Nichols UK, Petrofac, PJD Ltd, Prima UnO, PruceNewman, Quartzeltec, Scottish Water, Sellafield, Shepley Engineers, Siemens, Singleton Birch, Total, Transport for Greater Manchester, Transport for London, Turner and Townsend, Worley Parsons
Professional and Sector Bodies	ACostE, APM, BCECA, CECES, ECITB, Engineering Construction Institute, GAPPS, IRM, N-SAN, RICS
Academia	University of Manchester, Cumbria University, Leeds University, Loughborough University, Richmond College
Training Organisations	20/20 Business Group, ACSL, Gen2, Monitor Mpower, Project Controls Online, TASC
Consultants	Estimata, First Planner, Pathfinder Planning, Sunbeam
Government	BIS, HMRC



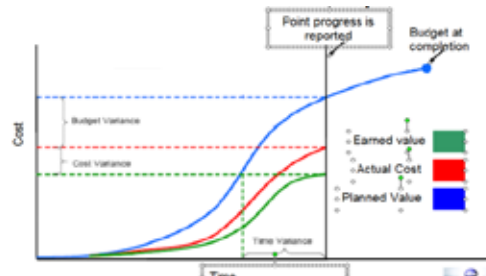
# Introducing Our Employer Led Trailblazer Group



# End-to-End Process up to 'Go Live'



# 20% Off the Job Training



## ESTIMATE OF DIRECT MATERIALS & CONSTRUCTION MANHOURS

Subject: Steel Work

Location: Hutton Community Centre

Code	Materials	Purchased From	Cost per Item	Quantity	Total Cost	Time
2.5	Steel Girders	Cleveland Bridge	£8,491 (Fully Assembled)	4	£33,965	37.5 days
2.2.4	Crane	Wessex Cost Book	£33,000	1	£33,000	37.5 days
	Man Hours	Wessex Cost Book	£5,400	1	£5,400	37.5 days
					<b>£12,365</b>	<b>37.5 days</b>

Crafts	Resource Man Hours				No. of men	Hours per man	Hours per day	Hours per week
	No. of days	No. of weeks	No. of man hours for job					
Earth Works	20	4	840		4	160	8	40
Steel Erection	39	6	1872		6	312	8	40
Brick Laying	30	6	1440		6	240	8	40
Roof	22	5	880		5	176	8	40
Pipe work	23	5	1104		6	184	8	40
Joinery	20	4	720		3	240	8	40
Plumbing	20	4	720		3	240	8	40
Insulation Installation	20	4	840		4	160	8	40
Electrical Insulation	43	9	1376		4	344	8	40
Swimming pool install	65	13	3120		6	520	8	40

Task	Task ID	Task Name	Start Date	End Date	Progress	Responsible
1	1	Site Preparation			✓	Site Prep
2	2	Excavate and lay out			✓	Excavation
3	3	Foundation			✓	Foundation
4	4	Wall construction			✓	Wall Work
5	5	Roof construction			✓	Roof Work
6	6	Roof covering			✓	Roof Covering
7	7	Roof insulation			✓	Roof Insulation
8	8	Roof waterproofing			✓	Roof Waterproofing
9	9	Roof cladding			✓	Roof Cladding
10	10	Roof ventilation			✓	Roof Ventilation
11	11	Roof drainage			✓	Roof Drainage
12	12	Roof finishing			✓	Roof Finishing
13	13	Roof inspection			✓	Roof Inspection
14	14	Roof completion			✓	Roof Completion



# Developing the Level 3 Standard

KNOWLEDGE	SKILLS	BEHAVIOURS
<ul style="list-style-type: none"> <li>■ Project Controls</li> <li>■ Technical information:</li> <li>■ Estimating practice</li> <li>■ Planning and scheduling practice</li> <li>■ Cost engineering practice</li> <li>■ Work breakdown and coding structure</li> <li>■ Tracking data and progress reporting</li> <li>■ Analysis techniques</li> <li>■ Technical, engineering and mathematical principles</li> <li>■ Importance of safety</li> <li>■ Employer organisation, management systems, and procedures</li> <li>■ Commercial matters</li> <li>■ Project Controls related software and IT systems</li> </ul>	<ul style="list-style-type: none"> <li>■ Develop work breakdown and coding structures</li> <li>■ Manage data</li> <li>■ Estimate</li> <li>■ Schedule and plan</li> <li>■ Cost engineer and control</li> <li>■ Monitor progress/ performance and analyse data</li> <li>■ Use computer based technology</li> <li>■ Problem solve</li> <li>■ Effectively communicate</li> <li>■ Input to project closeout</li> <li>■ Observe and apply professional ethics</li> <li>■ Apply safety in the context of the role</li> </ul>	<ul style="list-style-type: none"> <li>■ Strong work ethic, takes personal responsibility for own work, meets deadlines, sets the right example for others and displays honesty and integrity</li> <li>■ Team player that shows sensitivity to others and works collaboratively demonstrating an openness to others' ideas and input</li> <li>■ Positive attitude, constructive thinking and able to adjust to change</li> <li>■ Attention to detail, with an enquiring mind, not afraid to ask questions, seek assistance or challenge</li> <li>■ Committed to advancing own learning and competence, showing a willingness to learn new skills</li> <li>■ Applies and upholds principles of social responsibility, environmental sustainability, equality and diversity</li> </ul>

# Developing the Level 3 Standard - Wider Engagement

An online consultation ran for 4 weeks between December 2015 - January 2016

§ All members on the Working Group list received an initial email in December and a reminder in January

§ 1600 members of the ACostE were emailed and invited to comment

§ The invitation to comment was extended to members of the Project Control Managers' Committee of BCECA (British Chemicals Engineering Contractors' Association)

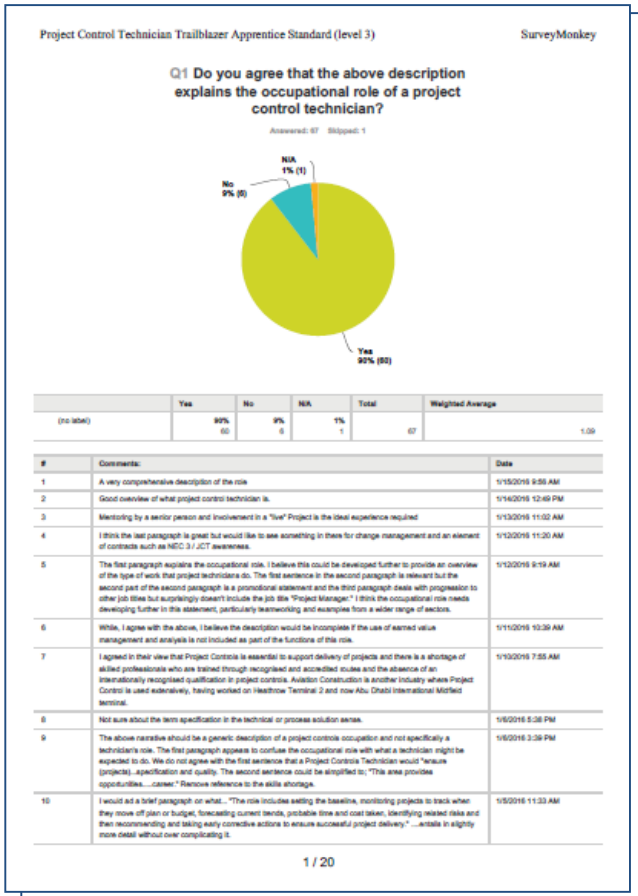
§ The survey was promoted via LinkedIn through Shane Forth (Costain) and ECITB regional networks

§ 68 responses were received from 60 employers.

§ 25% of respondents employed less than 250 people

§ 88% of respondents directly employ project controllers.

§ The working group (employers plus representatives of the main Professional Institutes) met on 19<sup>th</sup> January 2016 to review the feedback and comments and updated the draft Standard



# Level 3 Standard Approved - June 2016

## Apprenticeship standard for Project Controls Technician

### 1. Occupation(s)

A Project Controls Technician controls, monitors and systematically analyses progress and performance data on engineering, manufacturing, construction and infrastructure projects. They require strong analytical skills and a practical approach to interpret technical information. They use specific, complex software tools to undertake a wide range of project controls tasks, including: identifying the right data for **analysing** progress; setting baseline targets; tracking progress and performance; forecasting trends; identifying, modelling and anticipating deviations from baseline; assessing the impact of design/construction changes; and using insight to recommend early preventative and remedial actions.

Project Controls includes the technical disciplines of estimating, planning, scheduling and cost engineering for which this apprenticeship gives a comprehensive grounding leading to roles such as project controller, estimator, planner, scheduler and cost engineer. Typically job holders work in large project teams on complex projects in sectors such as construction, manufacturing, engineering, energy and infrastructure – where detailed progress /performance tracking, and an understanding of on-site hazards, health and safety requirements and compliance is critical. This hands-on role is crucial to ensuring the successful delivery of complex projects and a shortage of skilled professionals provides opportunities for a secure, fulfilling long-term career.

2. Progression: With additional training the Project Controls Technician could also progress to more specialist roles in areas such as project controls, planning, scheduling, estimating, cost control, risk and quality and ultimately a role as project controls manager or director.

3. Suggested Entry Requirements: Set by individual employers, entry requirements will typically include a minimum of 5 GCSE grades A\* - C (or equivalent qualifications), including mathematics; English (Language).

4. Technical knowledge – the Project Controls Technician requires an understanding of:

- Project controls: the project life-cycle, breakdown structures, the relationship between time and cost, quality and risk, how project controls is critical to successful project delivery
- Technical information: how to review and interpret technical information from different sources e.g. engineering drawings, manufacturing plans or construction plans to develop the scope for control
- Estimating practice: classes of estimate, how to interpret technical requirements and specifications to develop the estimate, techniques for estimate development such as parametric, analogous, bottom-up.
- Planning and scheduling practice: difference between planning and scheduling, key terms and processes used to produce control schedules, how to interpret the technical requirements to produce a workable control schedule including development of logic networks, dependencies, critical paths, resource management, levelling and smoothing and impact of uncertainty and risk
- Cost engineering practice: key terms and processes related to preparing control budgets, cash flow, cost control and cost engineering relationships
- Work breakdown and coding structures: their purpose, how to create, use and interpret them to enable accurate control and the need for flexibility
- Tracking data and progress reporting: collection, validation and monitoring of data against plan, reviewing accuracy of reporting, how to tailor the presentation of data for understanding and buy-in
- Analysis techniques: how to identify trends and variances using techniques such as earned value analysis, forecasting, critical path analysis and risk analysis
- Technical, engineering and mathematical principles: what these are and how to apply them to support effective project controls within the context of the role
- Importance of safety: relevant engineering, construction and infrastructure specific knowledge including related national and industrial health, safety and environmental standards and legislation
- Employer organisation, management systems, and procedures: related governance including quality, change control, data management and security, configuration management, version control, risk analysis and management, and document control
- Commercial matters: how they impact on the role, the basics of contract and supply chain management
- Project controls related software and IT systems: attributes, limitations and systems used, in-house and proprietary applications used for: planning and scheduling, cost and risk analysis, estimating and progress and performance monitoring.

### 5. Technical skills - the Project Controls Technician is able to:

- Develop work breakdown and coding structures to meet the scope laid out in the projects' technical information and specification, ensuring that the controls will monitor project progress and performance accurately
- Manage data: source, retrieve, check, edit, format, record and **analyse** data – using it to create relevant time, cost and resource reports
- Estimate: develop cost estimates for defined scopes of work, create appropriate benchmarks, **analyse** quotes from sub-contractors and suppliers, and input to tenders and the early stages of projects
- Schedule and plan: break down the scope into activities to create a logical linked control schedule to input to the development of outline and integrated plans and baseline schedules; identify critical milestones; gather accurate progress data for controlling the schedule; and monitor progress
- Cost engineer and control: prepare control budgets, carry out cost control activities, gather and interpret cost data, monitor progress on a regular basis, interpret trends and forecasts; keep in line with contractual requirements, maintain baselines; ensure accurate reporting and control
- Monitor progress/performance and **analyse** data: associated with milestones, schedules, progress, manpower, resource and costs; undertake earned value analysis, create progress reports and identify variances from plan and likely consequences if no corrective action is taken
- Use computer based technology: model potential trends and resource use etc. using the right software package for the right task
- Problem solve: recommend early corrective actions to reduce variances, identify issues and risks, present and maintain related action plans and contingencies
- Effectively communicate: with good interpersonal skills and share the right information with the right people in an appropriate format to enable effective project control
- Input to project closeout: generate key benchmarks and outcomes including lessons learnt
- Observe and apply professional ethics, and maintain a duty of care
- Apply safety in the context of the role: comply with relevant national and international health, safety and environmental requirements
- Work in accordance with company management systems, policies and procedures: especially those relating to quality, data security, risk, change and document management.

### 6. Behaviours

- Strong work ethic, takes personal responsibility for own work, meets deadlines, sets the right example for others and displays honesty and integrity
- Team player that shows sensitivity to others and works collaboratively demonstrating an openness to others' ideas and input
- Positive attitude, constructive thinking and able to adjust to change
- Attention to detail, with an enquiring mind, not afraid to ask questions, seek assistance or challenge
- Committed to advancing own learning and competence, showing a willingness to learn new skills
- Applies and upholds principles of social responsibility, environmental sustainability, equality and diversity.

7. Duration: The duration of this apprenticeship is typically 36-42 months.

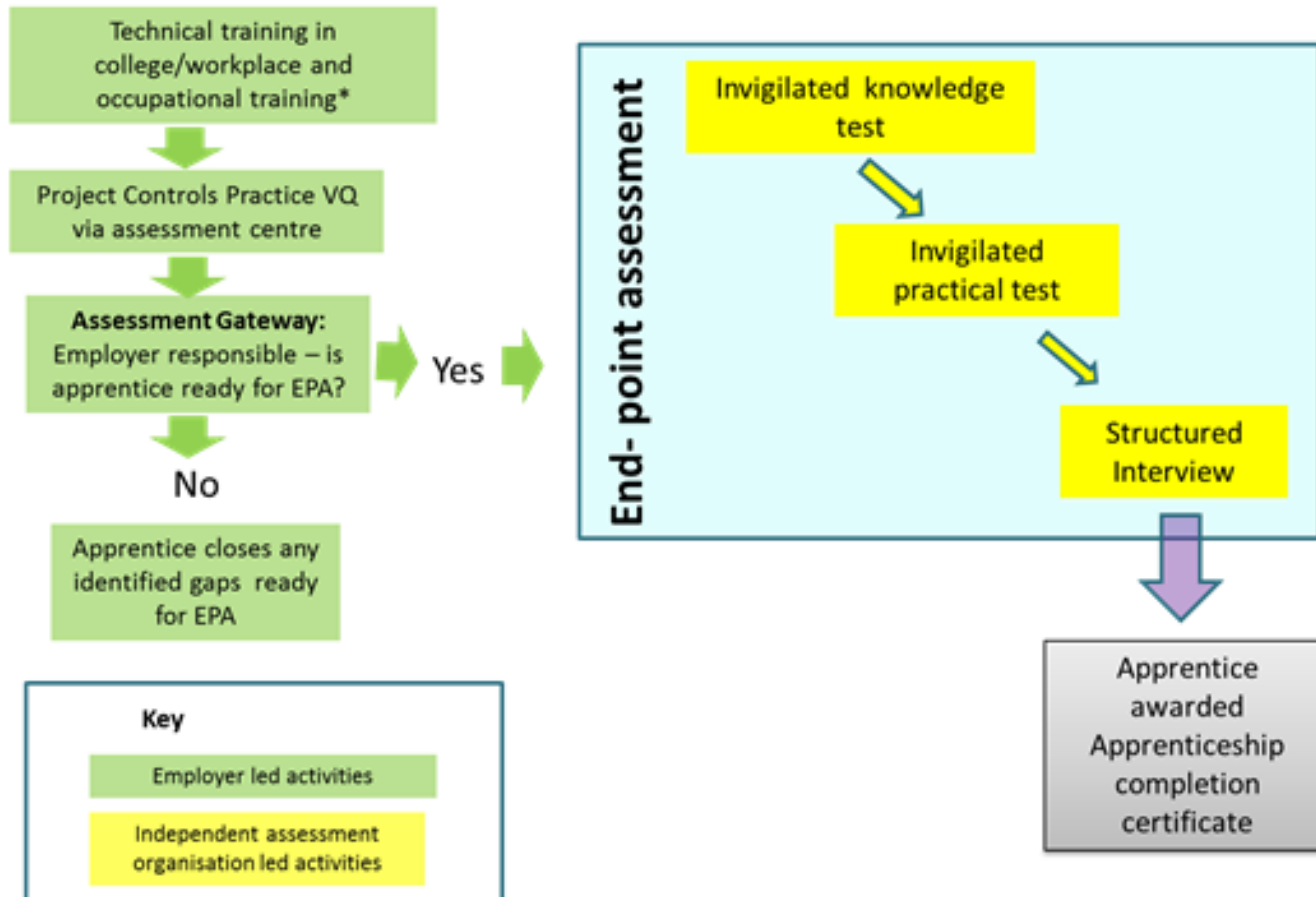
8. Qualifications: Prior to taking the end-point assessment candidates must achieve level 2 English and maths and must attain a Level 3 Diploma in project control practice.

9. Level and Professional registration: This is a level 3 apprenticeship. On completion the apprentice can choose to apply for membership of the Association of Cost Engineers (ACoSE) as a Graduate Member. This standard is also designed to meet the professional standards of the Engineering Council for registration as an Engineering Technician (EngTech), gaining EngTech is subject to candidates having suitable engineering experience and undergoing a professional review process.

With further training following on from the apprenticeship, individuals may choose to specialise in specific sectors or related roles which could lead to membership of other related professional bodies.

10. Review date: This apprentice standard will be reviewed in 3 years.

# End Point Assessment



\* including achievement of L2 English and maths

# End Point Assessment

## EPA grading

**Knowledge test:** awarded a passmark and grade. 25% weighting

**Practical test:** awarded a passmark and grade. 50% weighting

**Structured interview:** awarded a passmark and grade. 25% weighting

**Final grade calculation** = passmarks x weighting = final mark  
= mark and grading rules applied = final grade

## Final grade awarded

Fail

Less than  
65%

Pass

>65%

Must pass all 3  
elements as a  
minimum

Merit

>75%

Must have a  
merit in the  
practical

Distinction

>85%

Must have a  
distinction in  
the practical

# End Point Assessment

## Knowledge test

Technical knowledge

Multiple choice, simple and complex

Online, invigilated, controlled environment, closed book

90 mins max

25% of overall grade

## Practical test

Technical skills

Analysis, interpretation and communication of data

Written, invigilated, controlled environment, closed book

120 mins

50% of overall grade

## Structured interview

Technical KSBs

Application of KSBs and understanding of PCT occupation

Face to face, minimum 2 independent assessors, optional Employer rep

60-80 mins

25% of overall grade

---

# Benefits

---

## § Company

- Key measure to resolve shortage of competent project controllers
- Growing our own, engagement with the business, building loyalty
- Bringing more balance and diversity to the organisation
- Skill levels accredited against National Occupational Standards
- “Can Do” requirements of VQ’s prove they can do the job (competence)
- Development of rounded Project Controllers (Estimating/Planning/Cost) rather than single discipline
- Project Control apprentices have no baggage so readily learn, accept and apply key principles and procedures
- Another route to Project Management
- Contributes to the building of our Project Management Army
- Enhanced career development framework and succession planning

## § Employees

- Job satisfaction and security
- Formal career path with continued measure of success
- Focus on self development
- Able to compare oneself with peers
- Recognition, Promotion, Reward

# Benefits

*On every level, they pay back the investment we made in them.*

*They are unique and enviable by the competition.*

*A gift for our industry to be proud of.*

*The apprenticeship has produced Project Controllers that can be placed on projects **in** place of expensive agency resources.*

*How else could we have got 5 Project Control engineers?*

*has resulted in expert Project Control resources previously impossible to find.*

*It's an easy way of identifying useful and valuable people for making us money on projects.*

*It's an ideal feeder for potential future Project Management.*

*Right signals given to clients regarding in house training, p. o. o. s. can be added to bid score.*

*Improves our competitiveness.*

*A legacy for our industry to be proud of.*

*Produced very confident Project controllers.*




---

## Next Steps Towards September 2017 Launch

---

COSTAIN


Resubmit Assessment plan incorporating minor comments from DfE




Once approved **published** with standard online.



Assessment organisations come forward to offer assessment against the plan through the **Register of Apprentice Assessment Organisations**.



Assessment organisations develop **assessment tools** (supporting materials)



**Employers select** assessment provider.

---

---

## Higher Apprenticeship at Level 5 or 6

COSTAIN

- § At the 6th meeting of our employer-led group in October 2016, we agreed prepare a higher level project controls trailblazer
- § Using a core and options approach, the higher apprenticeship will be for project control managers supervising multi-disciplined project controls teams or for specialist practitioners in planning, cost estimating, cost control etc.
- § A proposal will be submitted to DfE for the higher apprenticeship in Q1 2017



---

# Project Controls Practitioner Training: courses

The logo for COSTAIN, consisting of the word "COSTAIN" in white capital letters on a blue rectangular background.

---

## ESTIMATING METHODOLOGY & PRACTICE

The course has been designed to provide an overview of the principles and practices of estimating and how the role is linked to all activities company wide. The breadth of skills and knowledge extend to a range of interpersonal skills as well as the technical abilities associated with preparing an estimate. Learning outcomes include; preparing a cash flow for the design, procure, and construct phases of a project; operate an estimate documentation and version control system; and understand the principles involved in the use of capital and operating cost estimates together with revenue estimation to carry out economic evaluation using net present value and other methods.

**Audience:** New to estimating and current practitioners

**Duration:** 3 days

## MANAGING RISK AS PART OF A PROJECT TEAM

This introductory one day workshop is designed for anyone who works in or with a project team who need to develop their understanding of risk management. The course introduces delegates to risk terminology, the risk management process, the practical implementation of a risk management plan, and the tools and techniques commonly used in best practice project management.

**Audience:** New to project controls and project team members

**Duration:** 1 day

---

---

# Project Controls Practitioner Training: qualifications



---

## VOCATIONAL QUALIFICATIONS

Nationally recognised QCF diplomas that give evidence of your competence and knowledge. Developed jointly with companies, these vocational qualifications test an employee's performance, application of knowledge and understanding of their occupation in the workplace. There are several qualifications available:

**Level 2** Diploma in Project Control, Estimating, Planning and Cost Engineering.

**Level 3** Diploma in Project Control Practice,  
**Level 3** Diploma in Estimating Practice,

**Level 3** Diploma in Cost Engineering Practice,  
**Level 3** Diploma in Planning Practice.

**Level 5** Diploma in Project Control Practice,  
**Level 5** Diploma in Estimating Practice,

**Level 5** Diploma in Cost Engineering Practice,  
**Level 5** Diploma in Planning Practice.

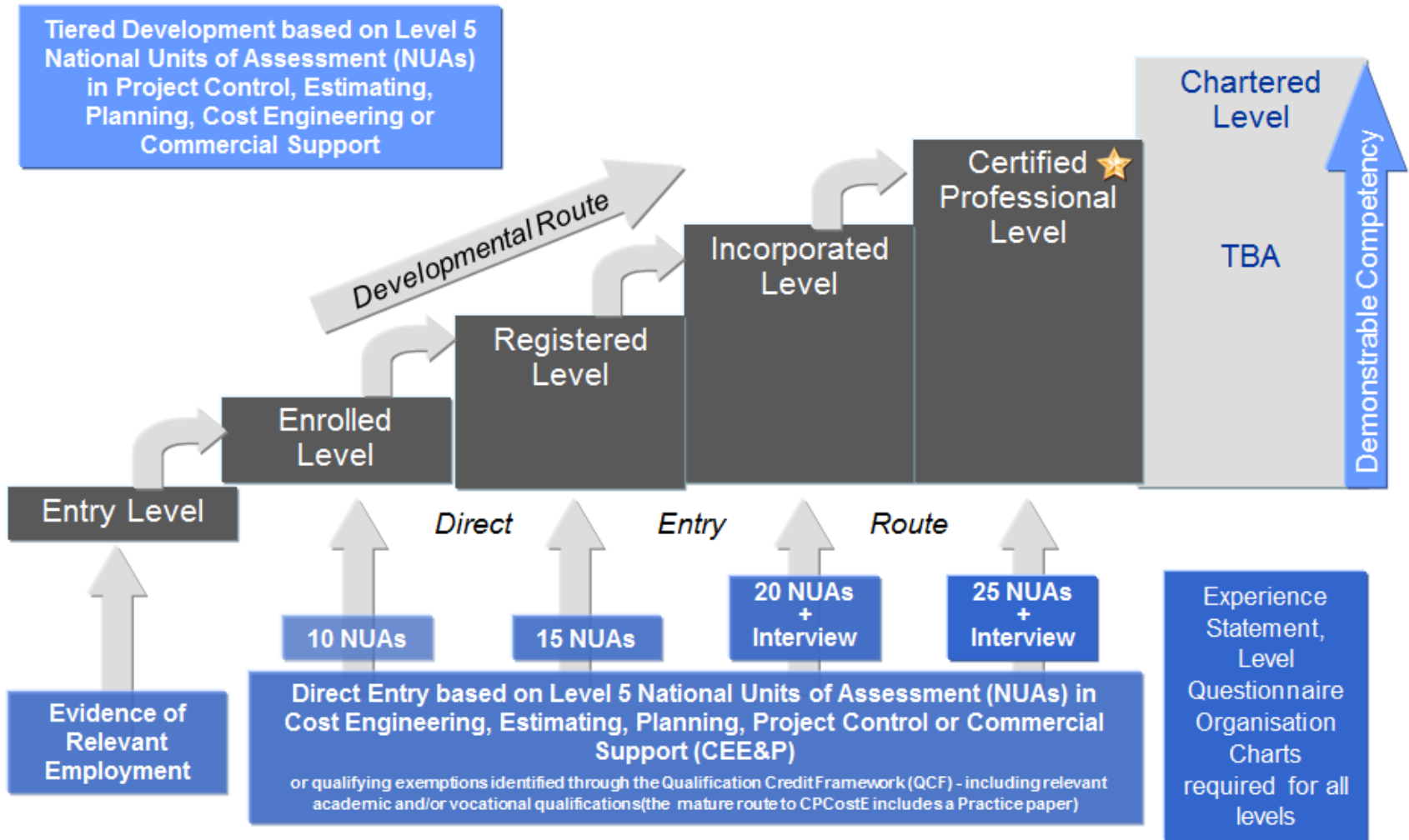
**Audience:** Newcomers, existing and experienced project controllers

**Duration:** 12 months+

---

# Project Controls Practitioner Training

COSTAIN



---

# Project Controls Practitioner Training

---

The logo for COSTAIN, consisting of the word "COSTAIN" in white capital letters on a blue rectangular background.

## ECITB TRAINING STANDARDS: PROJECT CONTROLS, ESTIMATING, PLANNING AND COST ENGINEERING

The industry-led Project Controls Working Group have developed a set of agreed industry training standards to ensure consistent, high quality training which meets their needs. Companies and approved training providers can use the standards to develop their own bespoke training and be confident that this training will meet industry requirements. Courses developed from the standards can be submitted to ECITB to gain the seal of quality approval for the course. Each training standard links to the existing vocational qualifications and details the training necessary to develop the skills needed from trainee project controller up to competent senior project controller or technical lead (i.e. Lead estimator, lead planner, lead scheduler, lead cost engineer).

**Audience:** Project controls training managers and Approved training providers

---

---

Thank you for listening

---



Any questions or further information

- Shane Forth: [shane.forth@costain.com](mailto:shane.forth@costain.com)
  - Catherine Lambert: [catherine.lambert@ecitb.org.uk](mailto:catherine.lambert@ecitb.org.uk)
-