

# Welcome to the T Level Engineering & Manufacturing

The webinar will begin shortly

Rob Stott - City & Guilds Industry Manager

Mike Scarrott - Production Specialist



# Engineering & Manufacturing

## T Levels Employer Introduction

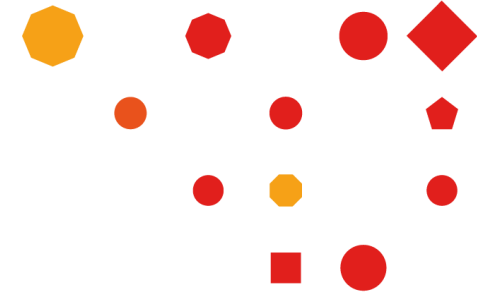
**Rob Stott- City & Guilds Industry Manager**

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# Agenda

1. Background and purpose of today's meeting
2. What are T Levels
3. Pathway breakdown/ content
4. Employer engagement (EIB & T Levels)
5. Milestones
6. Feedback/ Questions
7. Next Steps

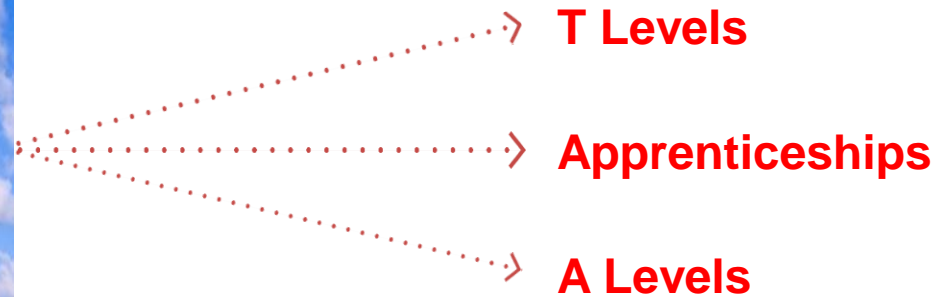




## Background and purpose of today's meeting

- In October C&G won 3 contracts to develop the E&M TQs in D&D, MIR and MPC, in partnership with EAL – 5 year contract.
- Since October we have been working to amplify the outline content, work out the Guided Learning Hours (GLH) and in doing so have come across a number of challenges.
- Eligible providers must be approved by DfE in the first instance.
- Each TQ is based on content developed by an employer panel.
- The Institute are the certificating authority and own the IP not the AO.
- The winning AO is the development and assessment partner and do not produce a certificate for the learner.
- T Levels are a programme not a qualification.
- Feedback and validation from providers and employers (be it positive or negative) is a key part of this development and as part of our contract we are asked to provide the Institute, Ofqual and the DfE with evidence of the feedback and action taken as a result

# What are T Levels?



T Levels will become **1 of 3** major options when a student reaches Level 3

## Key principles

To ensure the skills system responds to the changing labour market, employers, providers and other partners need to be involved in both design and delivery.

**Co-creation:** shaping occupational standards and designing wider T Level content.

**Co-delivery:** employers offering industry placements to T Level students so they can apply the knowledge and skills they have learnt in college.

# Some more detail

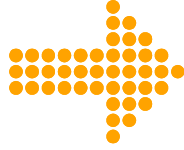


## TQ (Core)

Maybe more than one core

Core must be applicable to all pathways

Assessment of knowledge and core skills. Exam and project



## TQ (OS)

Based on Apprenticeship standard at level 3

Assessment of synoptic/holistic learning



## Industry placement

45 days min

Max of 2 employer businesses

Part time work can be included

Can use RWE for SEND/YO learners (105HRS)

Taster Sessions of 35 Hrs



## Core skills (transferable skills)

Softer skills identified by employers as lacking currently.

These core skills may differ per TQ

Types of skills needed:  
communication, team work, problem solving, research



## English & Maths

For those who have not achieved level 2 GCSE they is a requirement to complete:

GCSE in English & maths or FS



## Progression/outcomes:

Potential to progress:  
into a job

Onto an apprenticeship

Into Higher education

# T Level programme composition

1400-1800 GLH hours over two years. Achievement of T Level must include all components. UCAS points will be attached and will be equivalent to 3 A levels.



## CORE

50% Total TQ time

**Graded A\* - E**

**Core 1** Concepts & theories

**Core 2** Transferable/Core skills

Assessment:

- External exam
- Substantial employer set project

## OCCUPATIONAL SPECIALISM

50% Total TQ time

**Graded Pass/merit/distinction**

Based on occupational maps

No less than 50% of the total qualification planned time

Assessment:

- practical assignment(s)

**WORK  
PLACEMENT**  
315-420 hours  
Min 45-60 days

**Maths, English and  
digital skills**  
GCSE or Functional  
Skills Level 2

**Enrichment  
– tutorial**



# Technical Qualification overview for Engineering:

Engineering Core Component

Pathway Core Component

Pathways:

Design & Development for  
Engineering & Manufacturing

Maintenance, Installation &  
Repair for Engineering &  
Manufacturing

Engineering, Manufacturing, Processing  
and Control

**Learners must complete:**

- Engineering Core
- 1 Pathway Core
- 1 Occupational specialism within a pathway



# Route: Engineering and Manufacturing

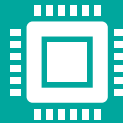
## PATHWAY - Design and Development

### Occupational Specialisms

Mechanical  
Engineering



Electrical &  
Electronic  
Engineering



Control &  
Instrumentation  
Engineering



Structural  
Engineering

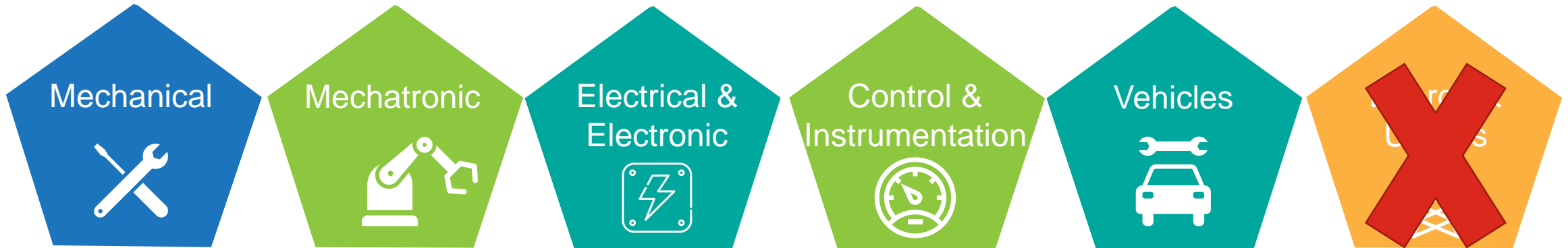


# Proposed TQ overview for MIR pathway:

## Route: Engineering and Manufacturing

### PATHWAY - Maintenance, Installation and Repair

#### Occupational Specialisms





## Route: Engineering and Manufacturing

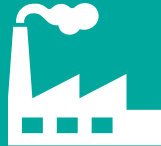
### PATHWAY - Manufacturing, Processing and Control

#### Occupational Specialisms

Production  
technologies



Manufacturing  
technologies



Processing  
technologies



Materials  
technologies





## Guided Learning Hours

### Review of Core and OS content

Engineering and Manufacturing								
Design and Development			Maintenance, Installation and Repair			Manufacturing, Processing and Control		
Core Content (GLH)	Pathway Core (GLH)	Occupational Specialism (GLH)	Core Content (GLH)	Pathway Core (GLH)	Occupational Specialism (GLH)	Core Content (GLH)	Pathway Core (GLH)	Occupational Specialism (GLH)
900 – 1100	150	540 – 600	900 – 1100	150	540 – 600	900 – 1100	250	800 – 1000
1590 - 1850			1590 - 1850			1950 - 2350		

- To put this into context:
  - 3 x A Levels = 1080 hours, with three 1.5 to 2.5 hrs exams assessing 360 hours of content for each
  - There is currently too much content for the manageable delivery and assessment of the T Level based on GLH and breadth of content

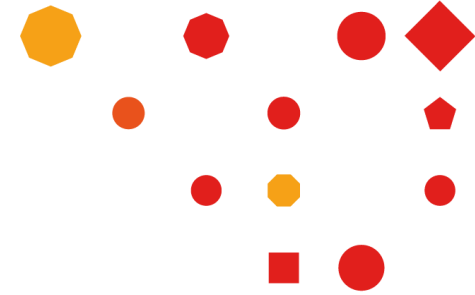


## Guided Learning Hours

### New Proposal for Core and OS content

Engineering and Manufacturing					
Design and Development		Maintenance, Installation and Repair		Manufacturing, Processing and Control	
Core Content (GLH)	Occupational Specialism (GLH)	Core Content (GLH)	Occupational Specialism (GLH)	Core Content (GLH)	Occupational Specialism (GLH)
720	400 – 500	720	360– 570	720	1290 – 1736
1120-1220		1080 - 1290		2010 - 2456	

- To put this into context:
  - 3 x A Levels = 1080 hours, with three 1.5 to 2.5 hrs exams assessing 360 hours of content for each
  - There is still currently too much content for the manageable delivery and assessment of the T Level based on GLH and breadth of content.



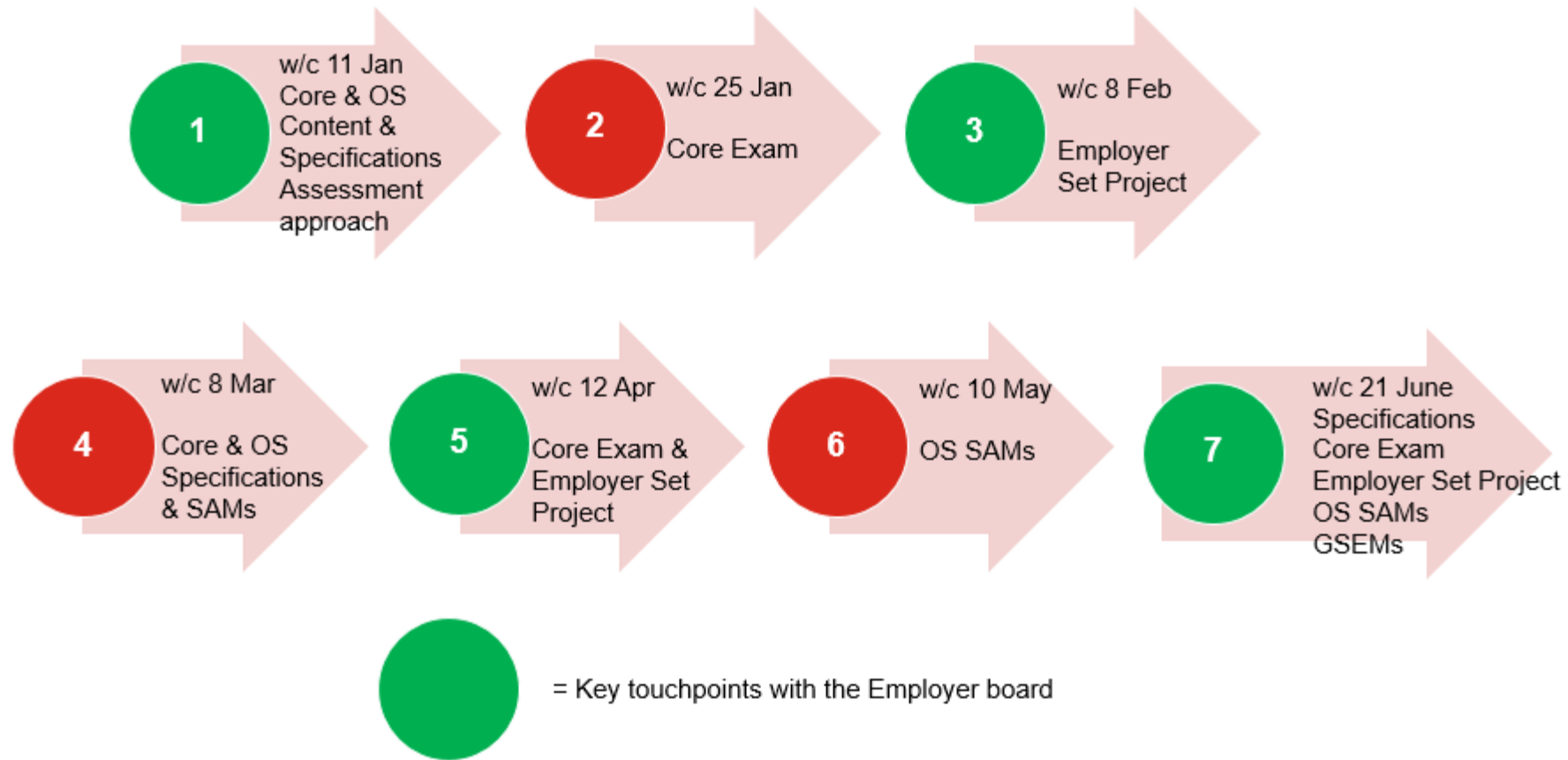
## Guided Learning Hours: Sequence of Delivery

Assessment in series						
		Winter Series		Spring Series		Summer Series
Year 1	Term 1	Christmas	Term 2	Easter	Term 3	Summer
Delivery	Core		Core		Core	
Placement	Core		Placement		Placement	
Assessment					ESP Window	Core exams
Year 2	Term 1	Christmas	Term 2	Easter	Term 3	Summer
Delivery	OS		OS			
Placement	Placement		Placement			
Assessment	ESP Window resit	Core Exams resit		OS assignment		

- Feasible delivery
- Space for resit opportunities
- Guided learning hours rationalised
- To deliver the programme in the 2 year window the assessments will need to be approximately sequenced in this way.

# T-LEVELS

## Key Milestones for TQ Development





# Exemplar Specifications

To achieve the **T Level Technical Qualification in Engineering and Manufacturing: Maintenance, Installation and Repair (Level 3)** (delivered by City & Guilds) learners must complete the **three** components of the Technical qualification. These are known as the core component and the occupational specialism:

- (300) plus one from (311 – 316)

T Level Technical Qualification in Engineering and Manufacturing: Maintenance, Installation and Repair (Level 3)			
City & Guilds component number	Component title	Component level	GLH
<b>Mandatory</b>			
300	Engineering common core	3	720
<b>Choose one standalone occupational specialism</b>			
<b>Standalone</b>			
311	Maintenance engineering technologies: Mechanical	3	520
312	Maintenance engineering technologies: Mechatronic	3	570
313	Maintenance engineering technologies: Electrical and Electronic	3	520
314	Maintenance engineering technologies: Control and Instrumentation	3	360
315	Vehicles	3	340
316	Energy and Utilities Technologies	3	570

## Technical qualification scheme of assessment overview

### Core Component – Learners must complete **all** assessment components

Assessment component	Method	Duration	Marks	Weighting	Marking	Grading
Exam paper 1	Externally set exam	2 hours	102	35%	Externally marked	This component will be awarded on the grade scale A* - E
Exam paper 2	Externally set exam	2 hours	102	35%	Externally marked	
Employer-set project	Externally set project	21 hours	100	30%	Externally marked	

### Occupational Specialism Component - Learners must complete **one** assessment component

Assessment component	Method	Duration	Marks	Weighting	Marking	Grading
Maintenance engineering technologies: Mechanical	Externally set assignment	tbc	tbc	tbc	Externally moderated	All occupational specialism components will be awarded on the grade scale P, M, D
Maintenance engineering technologies: Mechatronic	Externally set assignment	tbc	tbc	tbc	Externally moderated	
Maintenance engineering technologies: Electrical and Electronic	Externally set assignment	tbc	tbc	tbc	Externally moderated	
Maintenance engineering technologies: Control and Instrumentation	Externally set assignment	tbc	tbc	tbc	Externally moderated	
Vehicles	Externally set assignment	tbc	tbc	tbc	Externally moderated	
Energy and Utilities Technologies	Externally set assignment	tbc	tbc	tbc	Externally moderated	





# Exemplar Core Examinations

## Multi-mark questions

### Question

A crane is holding a crate of mass 200 kg a height of 9 m above the floor.

- Calculate the potential energy of the crate. (2 marks)
- The crate is dropped by the crane. Calculate its velocity ~~at the moment~~ it is about to hit the floor. (4 marks)

Additional information: The value of gravity is  $9.8 \text{ m s}^{-2}$ .

### Mark Scheme

a.  $PE = mgh = 200 \times 9.8 \times 9$  [1] = 17640 J [1]

b.  $KE = \frac{1}{2}mv^2$  [1]

From the principle of conservation of energy  $KE = PE = 17640 \text{ J}$  [1]

Rearranging the formula for KE,  $v = \sqrt{(2 \times KE) / m} = \sqrt{(2 \times 17640) / 200}$  [1]

$v = 9.39 \text{ m s}^{-1}$  [1]

Total marks	6
AO	AO1 = 0 AO2 = 2 (for a) + 4 (for b) AO3 = 0
Qual spec reference	Common core 7.2
Lines	a: 4 lines b: 8 lines

## Paper 2: Engineering in Context

### Example question types

## Single-mark questions

### Question

What is the main requirement of the Regulatory Reform Fire Safety Order 2005? (1 mark)

### Mark Scheme

1 mark for any of the following:

- Eliminate or reduce the risk of fire as far as is reasonably practical.
- Provide general fire precautions to deal with any risk.
- Take additional measures to ensure fire safety where flammable or explosive materials are used or stored.
- Create a plan to deal with any emergency and where necessary record any findings.

Accept any other appropriate response.

Total marks	1
AO	AO1 = 1 AO2 = 0 AO3 = 0
Qual spec reference	Common core 12.1
Lines	2 lines

## Exemplar Employer Set Project

### Design specification

#### Performance requirements for the bollard

Train Express Limited wish to develop a bespoke bollard to be sited in public realm spaces outside their stations across the UK (refer to Photograph 1). The company wish to 're-engineer' the standard self-righting internally illuminated bollard (refer to Photograph 2) used frequently in streetscapes across the UK. The new bollard is also required to monitor the number of people using a station and should be energy efficient. The specific performance requirements of the bollard are:

- The bollard shall have an overall height of 1000 mm and width of 300mm.
- Each bollard needs to be able to sustain an impact loading from a vehicle. The force applied to the barrier should be calculated in accordance with BS EN 1991-1-1:2002 (refer to Table 1).
- The bollard is to be manufactured from a recycled or sustainable material.
- The bollard is to be fitted with technology that is able to count human presence.
- The bollard is to be lit by a low energy lighting source.
- The bollard is to have an internal light source like the original, which ensures that it is highly conspicuous from all sides.
- The overall aesthetic design of the bollard is to be modern and reflect the intended siting outside a railway station.
- The bollard shell should be able to withstand a minor vehicle impact and be easily replaceable.
- Train Express Limited wish to limit or eliminate any mains power source to the bollard.
- The bollard should be designed as far as possible to be vandal proof.

Table 1: Loading applied to the bollard

The horizontal characteristic force  $F$  (in kN) should be equal to that delivered by the impact of a vehicle given by:

$$F = \frac{0.5 m v^2}{\partial c + \partial b}$$

Where:

$m$  is the gross mass of the vehicle in (kg)

$v$  is the velocity of the vehicle (in m/s) normal to the barrier.

$\partial c$  is the deformation of the vehicle (in mm)

$\partial b$  is the deformation of the bollard (in mm)

#### Photographs



Photograph 1: Typical area outside a Train Express Limited Station

(Source of image: Shutterstock)

## Support and Guidance

Ready to Support eligible providers and stakeholder engagement

- New Webpages for T Levels
- Timelines
- Webinar for eligible providers
- Provider focus groups
- Employer Industry Boards
- E-bulletins
- Draft specification
- Dedicated technical advisors

City & Guilds: [cityandguilds.com/tlevels/engineering](https://cityandguilds.com/tlevels/engineering)  
EAL: [eal.org.uk/T-Levels](https://eal.org.uk/T-Levels)

### Engineering and Manufacturing T Levels timeline 2020-2022

[www.eal.org.uk/t-levels](https://www.eal.org.uk/t-levels)  
[www.cityandguilds.com/tlevels](https://www.cityandguilds.com/tlevels)



2020				2021	
September	October	November	December	January	February
	<b>News update wave 1</b> T Levels bid announcement (England only)	<b>Launch webinar</b> Providers webinar	<b>Technical Qualification development</b> TQ development phase – employer and provider validation panels	<b>Provider webinar</b> Content review webinar for first draft documents	<b>Factbooks</b> T Levels assessment activities for providers, learners and parents
	<b>What you need to know now</b> Customer support helpdesk Frequently asked questions (FAQs) Checklist of activities and timelines	<b>Start development of Technical Qualifications</b> Technical Qualification (TQ) development phase – employer and provider content amplification		<b>Newsletter</b> Quarterly e-bulletin	<b>Technical Qualification development</b> TQ development phase – employer and provider validation panels
				<b>Technical Qualification development</b> TQ development phase – employer and provider validation panels	
2021					
March	April	May	June	July	August
<b>Webinar</b> Feedback on the TQs in Engineering and Manufacturing	<b>Technical Qualifications development</b> TQ development phase – Draft documents shared with providers	<b>Quality approval preparation</b> Providers webinar – to support approval process	<b>Update events</b> Provider support networks – delivered by technical experts and industry partners	<b>Update events</b> Provider support networks – delivered by technical experts and industry partners	<b>Quality approval</b> Providers webinar – to support approval process
<b>Technical Qualification development</b> TQ development phase – employer and provider validation panels	<b>Newsletter</b> Quarterly e-bulletin	<b>Technical Qualification development</b> TQ development phase – employer and provider validation panels	<b>Technical Qualifications development</b> TQ development phase – final employer and provider validation panels	<b>Newsletter</b> Quarterly e-bulletin	
				<b>Technical Qualification submission to Ofqual/MATE</b> Final stage of TQ submission	

## Get Involved - Makes a difference.

- **Employer Industry Board (EIB)**

We have a quarterly meeting with all panel members to discuss industry matters. Some of these can include; apprenticeships, FE, HE, T Levels, new developments (standards, qualifications), new technology AOB

- **T Level Project**

It is critical for the success of T levels that we ensure the TQ is fit for purpose, aligns to employer needs and allows a young person to make informed choices about their future.

We have regular meetings to review key documentation for the T Levels. These can include; specifications, exams, specialist content. Sessions are skill specific and generally for 1 hr.

- **You can get involved in:** Writing content, Developing assessment materials , Reviewing , Validation

We can be flexible with dates and means of communicating, we just want to ensure your input is gained. (*Under current circumstances our development is completed virtually.* )

- Get in touch, send an email to:

- [qualdevelopment@cityandguilds.com](mailto:qualdevelopment@cityandguilds.com)
- [product.query@eal.org.uk](mailto:product.query@eal.org.uk)

# **T-LEVELS**

**Any questions**

**Please complete the feedback  
form**

# **Thank you!**

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