DATED

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

and

WJEC CBAC LIMITED

CONTRACT FOR THE PROVISION OF SERVICES IN RELATION TO THE CONSTRUCTION: BUILDING SERVICES ENGINEERING T LEVEL TECHNICAL QUALIFICATION

Contents

THIS CONTRACT is made on

BETWEEN:

(1) **THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION** of Sanctuary Buildings, 20 Great Smith Street, London SW1P 3BT ("**Authority**"); and

(2) **WJEC CBAC LIMITED** a company registered in England and Wales (company registration number: **03150875**), whose registered office is at 245 Western Avenue, Cardiff, South Glamorgan, CF5 2YX ("**Supplier**"),

each a "**Party**" and together the "**Parties**".

BACKGROUND TO THIS CONTRACT:

(A) On **3rd December 2023** the Authority advertised in the Find a Tender Service (FTS) reference **2023/S 000-035661** inviting prospective suppliers to submit proposals for the design development and delivery of the technical education qualification element for the **Building Services Engineering** T Level.

(B) On the basis of the Supplier's response to the advertisement and a subsequent tender process, the Authority selected the Supplier as its preferred supplier of the TQ.

(C) The Parties have agreed to contract with each other in accordance with the terms and conditions set out below. As well as the delivery stage, this Contract covers the Development Phase and a Pre-Delivery Phase.

OPERATIVE TERMS:

1 <u>Contract start, formation and interpretation</u>

1.1 This Contract is legally binding from the Effective Date until it ends in accordance with clause 15 (*Ending or extending this Contract*).

1.2 This Contract is formed by the Core Terms and the Schedules and the Supplier must comply with all of its obligations set out in both the Core Terms and the Schedules, provided always that in the event of any conflict between the provisions of the Core Terms and the Schedules and/or the Annexes, or between any of the Schedules and/or

the Annexes, the conflict shall be resolved according to the following descending order of priority:

1.2.1 the Core Terms, Schedule 1 (*Definitions and Interpretation*), and Schedule 6 (*Pricing Schedule*);

1.2.2 Schedule 2 (*Service Requirements*), Schedule 4 (*Co-operation*) and their respective Annexes; and

1.2.3 the remaining Schedules and their respective Annexes.

1.3 The Parties shall interpret this Contract using Schedule 1 (*Definitions and Interpretation*).

2 Appointment and exclusivity

2.1 The Authority hereby appoints the Supplier as the provider of the Services in relation to the TQ during the Term.

2.2 As part of such appointment, the Supplier has the exclusive right to offer the TQ in England to Students for TQ courses for the Cohort for the Academic Years commencing at each of 1 August 2025, 1 August 2026, 1 August 2027, 1 August 2028, 1 August 2029 and, where the Authority gives written notice to the Supplier to extend this Contract pursuant to clause 15.2 (Ending or extending this Contract), for each of the Cohorts for the Academic Years commencing during an Extension Period, as the case may be, namely 1 August 2030, 1 August 2031, 1 August 2032 (each an "Exclusive Cohort").

2.3 Subject to the Supplier's compliance with the provisions of this Contract, the Authority shall not, during the Term, authorise any third party to provide goods and/or services equivalent to the Services in relation to the whole or any part of an Exclusive Cohort.

2.4 The Supplier acknowledges and agrees that during the Term the Authority may, subject to clause 2.3, authorise a third party to provide goods and/or services equivalent to the Services in relation to the TQ in England to students in cohorts outside the Exclusive Cohort, notwithstanding the continuation of the Services under this Contract in respect of any Exclusive Cohort.

2.5 The Supplier shall, subject to clause 15 (*Ending or extending this Contract*), be responsible for providing the Services to Students who are within an Exclusive Cohort until the later of the end of their TQ and 2 years following the end of the final Academic Year of the TQ for the Exclusive Cohort of which such Student was part.

2.6 Unless otherwise agreed with the Authority in writing, the TQ shall be offered by the Supplier on the basis that teaching of the TQ by Providers for each Exclusive Cohort will commence in September of the relevant Academic Year (accepting that Students may, subject to applicable Supplier and Provider rules, commence their study of the relevant TQ later than the teaching commencement date).

3 How the Services must be supplied

3.1 The Supplier must provide the Services:

3.1.1 in full compliance with the Service Requirements and the Supplier's Response, provided always that:

(i) the fact that the Supplier has complied with the Supplier's Response shall not limit the Supplier's obligation to satisfy the Service Requirements; and

(ii) the fact that the Supplier has satisfied the Service Requirements shall not limit the Supplier's obligation to comply with the Supplier's Response;

3.1.2 to a professional standard;

3.1.3 with reasonable skill and care;

3.1.4 using Good Industry Practice;

3.1.5 in accordance with its own policies, processes and quality control measures to the extent that these do not conflict with this Contract;

3.1.6 in accordance with any agreed timings set out in this Contract;

3.1.7 in accordance with Law;

3.1.8 in accordance with the Conditions of Recognition;

3.1.9 in a manner that ensures that neither it, nor any of the Supplier Staff:

(i) brings the Authority, the Department or the ESFA into disrepute by engaging in any act or omission which is reasonably likely to diminish the trust that the public places in any or all of them; and/or

(ii) engages in any act or omission which is reasonably likely to bring the T Levels Programme into disrepute,

in either case, regardless of whether or not such act or omission is related to the Supplier's obligations under this Contract; and

3.1.10 in accordance with (and in a manner consistent with enabling the Supplier and the T Level Awarding Organisations to achieve the aims set out in) Schedule 4 (*Co-operation*).

3.2 The Supplier must:

3.2.1 co-operate and, where appropriate, consult with the Stakeholders and the Authority's third party suppliers, including but not limited to the Former Supplier, on all aspects connected with the delivery of the Services; and

3.2.2 ensure that Supplier Staff comply with any reasonable instructions of the Authority in relation to the Services.

Ofqual Recognition

3.3 The Supplier must have in place from the Effective Date and maintain throughout the Term, Ofqual Recognition.

3.4 The Supplier must comply with each Condition of Recognition throughout the Term.

Impact of approval by the Authority

3.5 The Supplier agrees and accepts that except for confirmation of a Variation pursuant to clause 28 (*Changing this Contract*), which expressly changes the Supplier's obligations or liabilities or the Authority's rights under this Contract, no review, comment, authorisation to proceed (as contemplated by clause 5.11.1) or approval by the Authority (including any IfATE Approval) in connection with any Product and/or Service (including in respect of the Supplier's Response, the Implementation and

Delivery Plan, the Resource Plan and any documents or information submitted by the Supplier in order to obtain IfATE Approval) shall operate to exclude or limit the Supplier's obligations or liabilities or the Authority's rights under this Contract, and:

3.5.1 the Supplier retains sole responsibility for ensuring that the TQ (including the Products and Services) meets and continues to meet all relevant Service Requirements (as they may be amended from time to time in accordance with this Contract) throughout the Term; and

3.5.2 the Supplier acknowledges and accepts that any review, comment, authorisation to proceed or approval (including any IfATE Approval) do not constitute or imply any warranty from the Authority or Ofqual in respect of the TQ.

4 Pricing and payments

4.1 In exchange for the provision of the Services (including the supply of the Products), the Supplier must invoice:

4.1.1 the Authority for the relevant Charges, which, in the case of:

(i) the Development Charge, shall be invoiced by the Supplier at the time and in the manner set out in clauses 5.11.1(ii), or 5.13.1(ii) (*Developing the TQ and achieving IfATE Approval*) (as applicable));

(ii) that part of the Charges referred to in limb (b) of the definition of Charges, shall, unless otherwise agreed by the Authority, be invoiced by the Supplier on IfATE Approval of the relevant TQ Change; and

(iii) that part of the Charges referred to in limb (c) of the definition of Charges, shall be invoiced by the Supplier as set out in the relevant Variation; and

4.1.2 the Approved Providers for the Fees pursuant to the applicable Provider Contract.

4.2 The Supplier acknowledges and agrees that:

4.2.1 in no circumstances shall the Authority, the Department or ESFA have any liability to the Supplier in respect of the Fees. The Authority is not liable if any Provider (or other third party) fails to pay any fees or other costs (including the Fees) due from them to the Supplier; and

4.2.2 save as permitted by the relevant Provider Contract, the Supplier shall not be entitled to levy any costs and/or charges and/or require any further and/or additional payment in respect of the provision of the Services (including the supply of any Products) to any Approved Provider (and/or any Student) other than the Fees.

4.3 All Fees and Charges:

4.3.1 exclude VAT, which is payable on provision of a valid VAT invoice to the applicable payor; and

4.3.2 include all costs payable by the Authority and/or any Provider (as the case may be) in connection with the Services (including the supply of the Products).

4.4 The Authority must pay the Supplier:

4.4.1 in respect of the Development Charge, the relevant Interim Milestone Payment or the Final Milestone Payment (as the case may be); or

4.4.2 in respect of any other Charges arising under clause 8 (*TQ Changes*) or clause 28 (*Changing this Contract*), the amount of any such Charges due under such clause 8 (*TQ Changes*) or clause 28 (*Changing this Contract*),

in each case, within 30 days of receipt by the Authority of a valid, undisputed invoice, in cleared funds to the account as notified by the Supplier to the Authority.

4.5 A Supplier invoice is only valid if it includes this Contract reference and purchase order number (if any) and other details reasonably requested by the Authority.

4.6 If there is a Dispute between the Parties as to the amount invoiced by the Supplier to the Authority, the Authority must pay the undisputed amount. The Supplier cannot suspend the provision of the Services (including the supply of the Products) unless the Supplier is entitled to terminate this Contract for a failure to pay undisputed sums in

accordance with clause 15.5 (*When the Supplier can end this Contract*). Any disputed amounts shall be resolved through the Dispute Resolution Procedure.

4.7 If a payment of an undisputed amount is not made by the Authority by the due date, then the Authority shall pay the Supplier interest at the interest rate specified in the Late Payment of Commercial Debts (Interest) Act 1998.

4.8 The Supplier can issue a written Reminder Notice to the Authority (in accordance with clauses 29.129.1 and 29.2 (*How to communicate about this Contract*)) if the Authority does not pay an undisputed invoice on time.

4.9 The Authority may retain or set-off payment of any amount owed to it by the Supplier if notice and reasons are provided.

4.10 The Supplier must ensure that all Subcontractors are paid, in full, within 30 days of receipt of a valid, undisputed invoice. If this does not happen, the Authority can publish the details of the late payment or non-payment. The Supplier must also ensure that any Sub-Contract it enters into contains provisions which have the same effect as clauses 4.4, 4.6, 4.7 and this clause 4.10.

4.11 The Supplier has no right of set-off, counterclaim, discount or abatement unless a court orders this.

Indexation of Fees and Rate Card rates

4.12 The Supplier shall be entitled to adjust the Fees and the Rate Card rates which apply in respect of any Academic Year following the Academic Year in which the TQ is launched in accordance with the provisions of clause 4.13 to reflect the impact of inflation.

4.13 Where the Supplier wishes to adjust the Fees and/or Rate Card rates in accordance with clause 4.12:

4.13.1 the Supplier shall notify the Authority in writing of the proposed percentage adjustment in the existing Fees and/or Rate Card rates and the resulting new Fees and/or Rate Card rates by the end of February in the Academic Year prior to the Academic Year in respect of which the adjustment is to apply ("**Calculation Date**");

4.13.2 the proposed percentage adjustment to the relevant then current Fees or Rate Card rates must be no greater than the percentage increase in the preceding 12 months of the UK Consumer Price Index most recently published by the UK Office of National Statistics prior to the Calculation Date; and

4.13.3 the proposed adjustment calculated in accordance with this clause 4.13 shall not operate to adjust the Fees or Rate Card rates for the then current Academic Year, but shall operate to adjust the Fees or Rate Card rates as applicable with effect from the immediately following Academic Year.

4.14 In addition to any changes to the Entry Fee by virtue of clause 4.13, the Entry Fee may be subject to change from time to time, in accordance with the provisions set out in Schedule 6A.

4.15 Except as set out in clause 4.13, neither the Charges, the Fees nor any other costs, expenses, fees or charges shall be adjusted to take account of any inflation, change to exchange rate, change to interest rate or any other factor or element which might otherwise increase the cost to the Supplier or Subcontractors of the performance of their obligations under this Contract.

5 Developing the TQ and achieving IfATE Approval

5.1 The Supplier shall develop the TQ to meet the Service Requirements and in accordance with the terms of this Contract.

Requirement for IfATE Approval

5.2 The Supplier acknowledges and accepts that:

5.2.1 the Supplier shall not make the whole or any part of the Initial TQ Deliverables available to Eligible Providers and/or Approved Providers for delivery to Students until IfATE Approval has been granted; and

5.2.2 the Supplier shall, where possible, (and in each case with the prior written consent of the Authority) share draft versions of the Initial TQ Deliverables and Guide Standard Exemplification Materials, with Eligible Providers and/or Approved Providers to support their preparations to deliver the TQ.

General development obligations

5.3 The Supplier must:

5.3.1 design and develop the TQ in accordance with paragraphs 2.1 and 2.2 of Part 1 of the Service Requirements and in order to meet the Milestones;

5.3.2 consult with:

(i) the Authority, the Department, ESFA and the Route Panels; and

(ii) a representative sample of Providers and Employers,

in the design and development of the TQ (including as contemplated by paragraph 2.1.4 of the Service Requirements);

5.3.3 take into account any input received from the Route Panel, and where applicable, the T Level Panels in the design and development of the TQ, and consult as appropriate with the T Level Panels and/or the Route Panel prior to the first Interim Milestone;

5.3.4 co-operate (as required) and work collaboratively with the Authority to achieve IfATE Approval of the TQ;

5.3.5 take into account the Technical Qualifications Service Requirements Explanatory Note together with any guidance as issued by the Authority from time to time in the design and development of the TQ, and provide input when reasonably requested by the Authority to support the development and updating of such Technical Qualifications Explanatory Note; and

5.3.6 submit to the Authority an updated Implementation and Delivery Plan and Resource Plan within 5 Working Days from the Effective Date.

Development support from the Authority

5.4 The Supplier Authorised Representative and/or senior representatives of the Supplier's development team as appropriate will meet monthly (or more frequently if deemed necessary by the Authority) with the Authority Authorised Representative and/or representatives of the Authority's Commissioning & Development Team, at a time and

location to be advised by the Authority, following the Effective Date until IfATE Approval of the TQ (each a "**TQ Development Meeting**") to review progress on TQ development, address key risks and identify solutions to any barriers to progress. The Authority shall issue an agenda in advance of each TQ Development Meeting. In the event that the development of the TQ is materially delayed against the Milestones and/or the dates given in the Implementation and Delivery Plan, on a written request by the Authority the Supplier's Chief Executive Officer or an equivalently senior individual shall attend the next TQ Development Meeting.

5.5 The Supplier shall:

5.5.1 not less than 5 Working Days prior to each TQ Development Meeting, submit the Development Phase Report to the Authority in respect of the relevant month, together with, without prejudice to paragraph 2.5 of Part 1 of the Service Requirements:

(i) updated versions (meeting all of the requirements of the relevant Product Description) of the following Products:

(A) the Implementation and Delivery Plan;

(B) the Resource Plan;

(C) the Risk Register; and

(D) the Issues Log; and

(ii) as requested by the Authority from time to time, the then current versions of the following:

(A) the TQ Specification;

(B) the Assessment Strategy;

(C) the TQ Specimen Assessment Materials;

(D) the Guide Standard Exemplification Materials;

(E) the Provider Approval Criteria;

(F) the Submission Issues Log;

(G) Employer & Provider Engagement Strategy; and

(H) any draft version of the Key Dates Schedule that the Supplier intends shall (if Approved) become the Key Dates Schedule for the purposes of this Contract from time to time,

it being understood that the Supplier will not be in breach of this clause 5.5.1 if the relevant item is still being developed and the Milestone for its completion has not been reached as at the date of the relevant TQ Development Meeting; and

5.5.2 provide a verbal summary at each such TQ Development Meeting of the progress of development of the TQ as against the Implementation and Delivery Plan and Resource Plan and any identified risks to the on time delivery of the TQ and proposed resolutions.

5.6 The Authority shall provide minutes setting out an accurate summary of each such TQ Development Meeting within 5 Working Days of each such meeting.

Submission process

5.7 The Supplier shall, on or prior to the applicable Submission Date, make all Submissions to the Authority necessary in respect of IfATE Approval in accordance with paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements.

5.8 The Supplier shall ensure that all Submissions made in accordance with clause 5.7 meet all of the requirements for each Submission as set out in paragraph 2.1 of Part 1 and Annex 7 to the Service Requirements. Unless notified otherwise by the Authority in writing, the Supplier shall continue its ongoing work in relation to the Initial TQ Deliverables following each Submission whilst such Submission is being considered by the Authority and/or Ofqual. For the avoidance of doubt, this means that the Supplier, following each Submission for each Interim Milestone, shall not await notification from the Authority in accordance with Clause 5.11 below before continuing work on the Initial TQ Deliverables required for any subsequent Milestone.

5.9 The Supplier shall submit to the Authority for Approval, a final version of the Guide Standard Exemplification Materials in accordance with paragraph 2.1 of Part 1 and Annex 7 to the Service Requirements.

5.10 The Supplier shall respond promptly to the Authority to any requests from the Authority for further information to support any Submission and/or the IfATE Approval process.

5.11 In respect of each Interim Milestone, the Authority and, if relevant, Ofqual will consider each Submission made in accordance with clause 5.7 and 5.8 and, within a timeframe which should allow the TQ to be developed in time for delivery in accordance with this Contract:

5.11.1 if the Authority considers that the Submission (or Re-Submission (as the case may be)) meets all of the requirements of paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements for the relevant Interim Milestone, the Authority shall:

(i) confirm in writing to the Supplier that such requirements have been met; and

(ii) where the relevant Interim Milestone attracts an Interim Milestone Payment, pay to the Supplier (in accordance with clause 4 (*Pricing and payments*)) the applicable Interim Milestone Payment; or

5.11.2 if (1) the Authority does not consider that the Submission (or Re-Submission (as the case may be)) meets all of the requirements of paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements for the relevant Interim Milestone and/or (2) the Supplier has outstanding issues still to be addressed / additional information still to be provided in relation to any previous Interim Milestones (including in relation to any previous Interim Milestones that do not attract an Interim Milestone Payment), the Authority may withhold payment to the Supplier of the applicable Interim Milestone Payment (if any) and shall:

(i) notify the Supplier of the issues that need to be addressed and/or the additional information that needs to be provided (and, acting reasonably, the date by which such issues need to be addressed and/or such information needs to be provided) and whether the

Authority will be withholding payment of the applicable Interim Milestone Payment (if any), and the Supplier shall promptly address such issues and resubmit the relevant documentation and/or provide such additional information (a "**Re-Submission**") to the Authority on or prior to the date notified by the Authority, following which clause 5.11.1 or this clause 5.11.2 will apply to such Re-Submission; or

(ii) notify the Supplier:

(A) that notwithstanding the failure of the Submission (or Re-Submission (as the case may be)) to meet all of the requirements of paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements for the relevant Interim Milestone, the Supplier shall continue with the design and development of the TQ without having to make a Re-Submission, provided that the relevant issues are addressed by any timescales specified by the Authority and in any event no later than by the Final Approval Milestone Date; and

(B) whether the Authority will be withholding payment of the applicable Interim Milestone Payment (if any), following which the Supplier shall promptly address the issues identified / further information required, as part of its ongoing development of the TQ in accordance with the timescales specified by the Authority. If the Authority is withholding payment of any applicable Interim Milestone Payment, subject to the Supplier having addressed the issues identified in accordance with the required timescales (and in any event no later than by the Final Approval Milestone Date), clause 5.11.1(ii) will apply.

5.12 The Supplier acknowledges and agrees that owing to the meeting dates scheduled for the IfATE Approval process, any delay in making the Final Submission to the Authority by the Final Approval Milestone Date may cause a delay of several weeks for IfATE Approval. Accordingly, failure by the Supplier to make the Final Submission in

accordance with clause 5.7 and/or 5.8 by the Final Approval Milestone Date, other than due to a breach of this Contract by the Authority, shall be a Critical Service Failure.

5.13 In respect of the Final Approval Milestone, the Authority and, if relevant, Ofqual will consider the Final Submission made by the Supplier in accordance with clause 5.7 and 5.8 and, within a timeframe which should allow the TQ to be developed in time for delivery in accordance with this Contract:

5.13.1 if the Authority considers that the Final Submission (or Final Re-Submission (as the case may be)) meets the requirements for IfATE Approval, then the Authority shall:

(i) confirm to the Supplier in writing that the TQ has IfATE Approval and that, subject (if applicable) to clause 7.2 (*Interaction with* Providers) and clause 14.3.1 (*What may happen if there are issues with your provision of the Services*), the Supplier is authorised to proceed to make the TQ available to Approved Providers for delivery to Students in accordance with clause 6 (*Operating the TQ*); and

(ii) pay to the Supplier (in accordance with clause 4 (*Pricing and payments*)) the Final Milestone Payment, together with any outstanding Interim Milestone Payments or;

5.13.2 if the Authority considers that the Final Submission (or Final Re-Submission (as the case may be)) does not meet the requirements for IfATE Approval, then the Authority shall either

(i) notify the Supplier in writing of the issues that need to be addressed and/or the additional information that needs to be provided and the Supplier shall within 10 Working Days (or such longer timeframe as is agreed in writing by the Authority) address such issues and resubmit the relevant documentation and/or provide such additional information, following which this clause 5.13 will apply to such Final Re-Submission or

(ii) take any other steps available to it under the contract.

5.14 The Supplier acknowledges and accepts that the Authority will share, as it deems necessary, with Ofqual, the Department, ESFA, and the Route Panel:

5.14.1 all Submissions (including any Final Submission) and/or Re-Submissions (including any Final Re-Submissions) submitted by the Supplier under clause 5.7 and/or clause 5.13;

5.14.2 any information required by the Authority pursuant to clause 5.10;

5.14.3 any information required by Ofqual for the Regulation of the TQ or to perform the statutory functions of Ofqual; and/or

5.14.4 any other information it holds in relation to the Supplier,

and the provisions of clause 19 (*What must be kept confidential*) will not prevent any disclosure or sharing of documentation and/or information by the Authority under this clause 5.14.

6 Operating the TQ

6.1 Following IfATE Approval the Supplier must (subject to clause 7.2 (*Interaction with Providers*) and clause 14.3.1 (*What may happen if there are issues with your provision of the Services*)) make the TQ (including (as applicable) the Products) available to Approved Providers for delivery to Students and provide the Services (other than the Initial Development Services) in accordance with the Service Requirements.

6.2 The Supplier shall meet all KPIs in the delivery of the Services (other than the Initial Development Services).

6.3 The Supplier must comply with the current version of any Key Dates Schedule in respect of the making available of the TQ and the performance of the Services (other than the Initial Development Services).

6.4 The Supplier must provide materials and Student Information to the Authority in accordance with paragraphs 5, 8 and 10 of Part 1 of the Service Requirements to enable the Authority to keep a record in the event such materials and/or information is required for the transfer of Services to a Replacement Supplier.

6.5 The Supplier shall promptly provide to the Authority such materials relating to the TQ and Student Information as are requested in writing by the Authority to enable work by or on behalf of the Authority and/or Ofqual to ensure the ongoing maintenance between Cohorts of the grades and standards of the TQ and the wider T Level Programme.

6.6 The Supplier shall actively promote the TQ to Eligible Providers.

7 Interaction with Providers

7.1 The Supplier shall, in accordance with the requirements set out in paragraph 3 of Part 1 of the Service Requirements, operate a procedure to receive applications for Provider Approval from Eligible Providers that wish to make the TQ available to Students, and where the relevant Provider Approval Criteria are met to grant Provider Approval and notify the Approved Providers accordingly. The Supplier acknowledges and agrees that:

7.1.1 it shall not be entitled or permitted to:

(i) charge any additional costs, charges and/or fees arising out of or in connection with the implementation and operation of such procedure and/or the granting of Provider Approval; and/or

(ii) impose any additional requirements (other than a Provider Contract) on any Eligible Provider and/or Approved Provider (as applicable) as a condition to and/or consequence of the grant of Provider Approval;

7.1.2 only an Eligible Provider shall be eligible to be granted Provider Approval by the Supplier in respect of the TQ; and

7.1.3 subject to clause 7.1.2 and without prejudice to paragraph 3.1.1 of Part 1 of the Service Requirements, the Supplier shall promptly grant Provider Approval to Eligible Providers who meet the Provider Approval Criteria following receipt of their application for Provider Approval.

7.2 The Supplier shall review and assess Approved Providers on an ongoing basis in accordance with paragraph 3.1.2 of Part 1 of the Service Requirements to ensure that they continue to meet the requirements for Provider Approval to make the TQ available

to Students and, subject to the provisions of paragraphs 3.2 to 3.5 (inclusive) of Part 1 of the Service Requirements, where an Approved Provider no longer meets the Provider Approval Criteria, the Supplier shall revoke such Provider Approval.

7.3 The Supplier shall ensure that:

7.3.1 prior to any Eligible Provider making the TQ available to Students:

(i) the Eligible Provider is an Approved Provider;

(ii) a binding Provider Contract is in place with the relevant Approved Provider; and

7.3.2 the Provider Services shall only be provided to an Approved Provider during the term of, and subject to the provisions of, the applicable Provider Contract.

7.4 Without prejudice to paragraph 5 of Part 1 of the Service Requirements, the Supplier shall promptly register a Student for the TQ following receipt by the Supplier of an application for registration of that Student from an Approved Provider.

7.5 The Supplier shall, on written request by the Authority, promptly provide a copy of each Provider Contract to the Authority and to the Department and/or the ESFA.

7.6 The Supplier shall retain copies of all documentation and information in relation to arrangements with Eligible Providers and Approved Providers, including all such documentation and/or information arising out of or in connection with:

7.6.1 the application for and/or the grant of Provider Approval referred to in clause 7.1; and

7.6.2 the ongoing monitoring of Approved Providers by the Supplier referred to in clause 7.2,

and without prejudice to the generality of the definition of IfATE Data, such documentation and information shall form part of the IfATE Data to which the provisions of clause 18 (*Data protection and information*) shall apply.

7.7 The Supplier shall make available the Additional Services and provide the Additional Services on request by Approved Providers in accordance with paragraphs 5, 6, and 9 of Part 1 of the Service Requirements.

7.8 The Supplier shall be permitted to offer and provide additional products and/or services in each case related to the TQ to Approved Providers (and Students), provided always that:

7.8.1 such additional products and services are not identical to, or performing an equivalent function in relation to the TQ to, the whole or any part of the Products and/or the Services (including the Additional Services) and offered and/or provided on alternative terms and/or conditions (including as to timing or quality) to those terms and conditions which would apply pursuant to this Contract to the applicable Products and/or Services;

7.8.2 without prejudice to clause 7.1.1(ii) and the requirements of Schedule 17 (*Provider Contract Requirements*), the Supplier shall not, other than the Provider Contract, impose any condition on any Eligible Provider (including any Approved Provider) and/or Student to purchase such additional products and/or services as a condition to and/or consequence of:

(i) the grant of any Provider Approval; and/or

(ii) the proper performance of any of the Services (and/or the supply of any Products); and

7.8.3 the Supplier shall not (in making available such products and/or services available and/or in respect of the terms on which such products and/or services are made available) favour one Provider and/or group of Providers or one Student and/or group of Students over another.

7.9 The Supplier shall comply with Schedule 17 (*Provider Contract Requirements*) in respect of its contracts with Approved Providers in relation to the TQ.

8 TQ Changes

8.1 The Supplier acknowledges and agrees that the Authority may request changes to the TQ and that the Authority may publish revised Outline Content from time to time.

8.2 The Supplier must ensure that the Approved Initial TQ Deliverables reflect the version of the Former Supplier's TQ Specification as at the Effective Date ("**Initial Content Date**") and that the Approved Initial TQ Deliverables reflect any TQ Change requested by the Authority before IfATE Approval.

8.3 The Supplier must make any TQ Change reasonably requested by the Authority to reflect any changes to the Former Supplier's TQ Specification or ,if relevant, the Outline Content following the Initial Content Date subject to the terms of this clause 8.

8.4 The Authority may carry out annual reviews in each Academic Year where a new Cohort is commencing the TQ in the following Academic Year to identify any potential TQ Changes required by the Authority. The Authority may prepare and submit to the Supplier by the relevant dates prescribed by the TQ Content Updating Schedule in each such Academic Year up to two annual guidance notes setting out the output of the Authority's reviews in relation to Inclusive TQ Changes and Exclusive TQ Changes respectively. Where the Authority identifies any potential TQ Change (in an annual guidance note or otherwise), the Authority shall promptly notify the Supplier in writing of details of the potential TQ Change.

8.5 Without prejudice to paragraphs 2.5 and 2.6 of Part 1 of the Service Requirements which shall apply in addition to any annual review, the Supplier shall carry out an annual review of the TQ once in each Academic Year, taking into account the output of any Authority annual guidance note(s) pursuant to clause 8.4 and any additional updates the Supplier has proposed to the TQ (to the extent that such updates have not otherwise been Approved pursuant to paragraph 2.5 or 2.6 of Part 1 of the Service Requirements), to identify any potential TQ Changes required to ensure ongoing compliance of the TQ with the Service Requirements. Where the Supplier identifies any potential TQ Change, the Supplier shall promptly notify the Authority in writing of details of the potential TQ Change.

8.6 Where a TQ Change is an Exclusive TQ Change, the Parties shall follow the Variation procedure set out in clause 28 (*Changing this Contract*) in respect of the relevant

Exclusive TQ Change. The Charges relating to such Exclusive TQ Change shall be agreed between the Parties as part of the Impact Assessment for the relevant Variation, each Party acting reasonably and promptly, prior to the Supplier commencing work on the Exclusive TQ Change. The relevant Charges shall:

8.6.1 be a reasonable cost for implementing the Exclusive TQ Change in the circumstances;

8.6.2 take into account and be calculated using:

(i) for personnel related costs and other relevant charges which are set out in the Rate Card, the applicable Rate Card rates; and

(ii) reasonable charges for any non-personnel related costs which are not included in the Rate Card and which will be incurred by the Supplier to implement the Exclusive TQ Change; and

8.6.3 be consistent with the costs applicable to any relevant costed change scenario set out in Schedule 6 (*Pricing Schedule*) or, where no costed change scenario for the applicable TQ Change is set out in Schedule 6 (*Pricing Schedule*), be calculated on the same basis and using the same logic and inputs as those which applied to determine the costs for the costed change scenarios, as such logic and inputs may be amended only to the extent as is necessary to reflect the TQ Change in question.

8.7 Where the TQ Change is an Inclusive TQ Change, the Supplier shall implement such Inclusive TQ Change at the cost of the Supplier and there shall be no additional Charges or Fees as a result of such Inclusive TQ Change.

8.8 The Supplier shall obtain the Authority's prior written agreement before implementing any TQ Change which, in the case of an Exclusive TQ Change, shall be in the form of an executed Variation to this Contract. Following such agreement the Supplier shall, unless otherwise agreed with the Authority, implement:

8.8.1 Inclusive TQ Changes such that the updated TQ is ready for teaching to new Students in the next Academic Year following the date of such agreement; and

8.8.2 Exclusive TQ Changes such that the updated TQ is ready for teaching to new Students in the second Academic Year following the date of such agreement,

provided that in each case that the Supplier shall continue to make available the version of the TQ prior to such TQ Change as is necessary to support continuing Students who commenced their studies on such version of the TQ prior to the implementation of such TQ Change.

8.9 The Supplier shall consult with a representative sample of relevant Employers and take into account the output of consultation with such Employers as appropriate in relation to any TQ Change in accordance with the Service Requirements and shall provide the Authority with evidence of such consultation.

8.10 If the Supplier makes any Inclusive TQ Changes, the Supplier must resubmit the TQ documentation including any Products (as amended to reflect the TQ Change in question) to the Authority for agreement by the relevant date prescribed by the TQ Content Updating Schedule, unless otherwise agreed with the Authority, before (where applicable) making the relevant revised version of the TQ available to Approved Providers for delivery to Students.

8.11 If the Supplier makes any Exclusive TQ Changes, the Supplier must resubmit the TQ documentation including any Products (as amended to reflect the TQ Change in question) to the Authority for IfATE Approval by the relevant date prescribed by the TQ Content Updating Schedule, unless otherwise agreed with the Authority, before (where applicable) making the relevant revised version of the TQ available to Approved Providers for delivery to Students and the provisions of clause 5.13 shall apply to such amended TQ documentation as if references to the “Final Submission” (or “Final Re-Submission” (as the case may be)) in that clause 5.13 are references to the “TQ documentation including any Products (as amended to reflect the TQ Change in question)”; reference to the “Final Approval Milestone” is a reference to the “TQ Change in question”; and references to payment refer to payment of any charges agreed in the applicable Variation.

8.12 Unless otherwise agreed with the Authority in writing, any agreed or approved (as the case may be) updates to the TQ must (where applicable) be made available to

Approved Providers by the Supplier by the relevant date prescribed by the TQ Content Updating Schedule.

9 Record keeping, monitoring and reporting

9.1 Without prejudice to clause 5.5 (*Developing the TQ and achieving IfATE Approval*) and clause 7.6 (*Interaction with Providers*), the Supplier shall:

9.1.1 monitor and report (in an Operational Delivery Report) its performance of the Services (other than the Initial Development Services) in accordance with Schedule 15 (*Monitoring of Performance*) and the Parties agree that the provisions of such Schedule 15 (*Monitoring of Performance*) shall apply to determine (amongst other things) the process following (and the outcome of) such monitoring and reporting (including in relation to the carrying out of the Performance Review Meeting and the requirement for and consequences of any KPI Improvement Plan); and

9.1.2 comply with the record keeping and reporting obligations set out in paragraphs 5, 8 and 10 of Part 1 of the Service Requirements.

9.2 The Supplier must allow, and must ensure that any Key Subcontractor allows, any Auditor access to the Supplier's or Key Subcontractor's premises and/or systems (including IT systems), as relevant, to Audit everything to do with this Contract and/or to obtain any information required in relation to any investigation by Ofqual.

9.3 The Supplier must provide, and must ensure that any Key Subcontractor provides, information to the Auditor and reasonable co-operation at the Auditor's request to enable any Audit to be undertaken.

9.4 The Supplier must create and maintain throughout the Term a full and accurate version control log recording all TQ Changes made during the Term.

9.5 The Supplier shall maintain and shall promptly, following a written request by the Authority, provide to the Authority, the following:

9.5.1 the Supplier's detailed and up to date cost model for the provision of the Services under this Contract including a future projection for the remaining Term;

9.5.2 details of the income received by the Supplier through the provision of the Services during the Term to date, including a breakdown by service and customer and a future projection for the remaining Term; and

9.5.3 the Supplier's calculation of the overall level of profit it has achieved during the Term to date through the Services provided under this Contract.

10 Staff Transfer

10.1 The Parties agree that:

10.1.1 where the commencement of the provision of the Services or any part of the Services results in one or more Relevant Transfers, Schedule 21 (Staff Transfer) shall apply; and

10.1.2 Schedule 12 (Exit Management) shall apply on the expiry or termination of the Services or any part of the Services.

11 Supplier Staff and Subcontracting

Supplier Staff

11.1 The Supplier Staff involved in the performance of this Contract must:

11.1.1 be appropriately trained and qualified; and

11.1.2 be vetted using Good Industry Practice and, in the case of Supplier Staff referred to in paragraph 2.2 of Schedule 7 (*Staff (including Key Personnel*)), in accordance with paragraph 2 of Schedule 7 (*Staff (including Key Personnel*)).

11.2 If any default, acts, omissions, negligence and/or statements of any of the Supplier Staff involved in the performance of this Contract result in a Default, the Supplier is liable to the Authority for that Default.

11.3 Where the Authority decides (on reasonable grounds) that one of the Supplier's Staff is not suitable to work on this Contract, the Supplier must, subject to clause 11.1, promptly replace them with a suitably qualified alternative.

11.4 If requested by the Authority, the Supplier must replace any person whose acts or omissions have caused the Supplier to breach clause 31 (*Preventing fraud, bribery and corruption*).

Subcontracting

11.5 The Supplier shall comply with the provisions of Schedule 8 (*Supply Chain (including approved Subcontractors)*) in respect of the appointment (including any proposed appointment) and/or management of any Subcontractor (including any Key Subcontractor).

11.6 Sub-contracting any part of this Contract shall not relieve the Supplier of any obligation or duty attributable to the Supplier under this Contract.

12 Rights and protection

12.1 The Supplier warrants and represents that:

12.1.1 it has full capacity and authority to enter into and to perform this Contract;

12.1.2 this Contract is executed by its authorised representative;

12.1.3 it is a legally valid and existing organisation incorporated in the place it was formed;

12.1.4 there are no known legal or regulatory actions or investigations before any court, administrative body or arbitration tribunal pending or threatened against it or its Affiliates that might affect its ability to perform this Contract;

12.1.5 it maintains all necessary rights, authorisations, licences and consents to perform its obligations under this Contract;

12.1.6 it does not have any contractual obligations which are likely to have a material adverse effect on its ability to perform this Contract;

12.1.7 it is not subject to an Insolvency Event; and

12.1.8 all statements made, and documents submitted, as part of the procurement of the Services (including in the Supplier's Response) are true and accurate.

12.2 The warranties and representations in clause 12.1 are repeated each time the Supplier provides the Services and/or supplies any Products under this Contract.

12.3 The Supplier indemnifies the Authority in full against all Losses suffered or incurred by the Authority arising out of or in connection with third party claims that result from the provision of the Services including the supply of the Products.

12.4 All claims indemnified under this Contract (including for the avoidance of doubt any indemnified IPR Claim) must use the process set out in clause 30 (*Dealing with claims*).

12.5 The Authority can, even if it has made a claim in respect of the breach, still terminate this Contract for breach of any warranty or indemnity where it is entitled to do so.

12.6 If the Supplier becomes aware of a representation or warranty that becomes untrue or misleading, it must immediately notify the Authority.

13 Intellectual Property Rights

Vesting, ownership and licences of rights in TQ materials

13.1 The Supplier agrees to deliver such materials, and to assign or licence all IPR in such materials, as it creates, identifies for use, or uses as part of or for the Operation of the TQ to which the Authority and/or a Replacement Supplier with Relevant Competence would reasonably require access:

13.1.1 for the Authority to carry out its activities in relation to the T Level and TQ, including the approval, oversight and maintaining the integrity of the T Level and TQ;

13.1.2 for the transfer of the Operation of the TQ to a Replacement Supplier; and

13.1.3 for the Replacement Supplier to Operate (including maintaining the integrity of, modifying and developing) the TQ,

in a seamless, Transparent manner; and

13.1.4 to compete openly and effectively any future competition or tender for the Operation of the TQ or a Replacement TQ.

13.2 Without limiting the generality of clause 13.1:

13.2.1 the Supplier agrees to assign to the Authority all IPR in the Key Materials (including in Products) in accordance with the TQ Assignment and Licence;

13.2.2 the Supplier agrees to licence the Authority, with the right to sublicense, all IPR in the Ancillary Materials, in accordance with the TQ Assignment and Licence; and

13.2.3 in respect of any IPR in Key Materials, to the extent that the same are not at the relevant time vested absolutely in the Authority, the Supplier agrees to license the Authority, with the right to sublicense, such IPR in Key Materials, in accordance with the TQ Assignment and Licence.

13.3 Except as set out above or otherwise expressly provided in this Contract:

13.3.1 the Authority shall not by virtue of this Contract acquire title to or rights in any Background IPR owned by the Supplier or any third party; and

13.3.2 the Supplier shall not by virtue of this Contract acquire title to or rights in any Background IPR owned by the Authority or licensed by any third party to the Authority.

13.4 Without prejudice to the other provisions of this Contract, the assignments and licences referred to in clause 13.2 shall be subject to the terms of the TQ Assignment and Licence (during and after the Term), including the warranties and representations set out in the TQ Assignment and Licence. The Authority and the Supplier will enter into the TQ Assignment and Licence in the form set out in Schedule 14 (*Form of Assignment and Licence*) on the Effective Date.

Rights granted to the Supplier

13.5 The Authority hereby grants to the Supplier a non-exclusive worldwide, royalty free licence with the right to sublicense, subject to, and in accordance with, the terms of this Contract, to use:

13.5.1 the Former Supplier's TQ Specification and, if relevant, the Outline Content;

13.5.2 the IfATE Data; and

13.5.3 any Authority Background IPR in other materials specifically identified for use in the provision of the Services in accordance with this sub-clause,

during the Term, solely in relation to the provision of the Services.

13.6 The Authority hereby grants to the Supplier, in so far as any relevant Intellectual Property Rights have been assigned to the Authority or are otherwise at the time vested in the Authority in accordance with clause 13.2 a worldwide, royalty free licence, with the right to sublicense, to use and exploit the IPR in the Key Materials during the Term in relation to the TQ subject to, and in accordance with, the relevant terms of this Contract.

13.7 Subject to clause 13.8, the licence to the Supplier under clause 13.6 shall be exclusive during the Term solely in respect of use of the Key Materials for the provision of the Services in respect of the Exclusive Cohorts.

Rights retained by the Authority for its activities related to the provision of the Services

13.8 The Authority will retain:

13.8.1 (for the avoidance of doubt) the non-exclusive right to use the Key Materials in its administration, approval and oversight of the TQ and other T Level technical education qualifications and to make the same available to others (such as Ofqual) to do the same; and

13.8.2 the right to use the Key Materials, and for any Future Supplier or potential Future Supplier to use the Key Materials:

(i) for competing or tendering for the delivery and Operation of the TQ and/or any Replacement TQ, where such competition or tender is for such delivery and Operation during any Transition Period and/or following expiry or termination of this Contract (ie the End Date); and

(ii) to deliver and Operate the TQ and/or any Replacement TQ, during any Transition Period; and

13.8.3 the right to sub-license others to exercise the rights set out in this clause 13.8.

Confirmation of rights, marking and branding of Materials

13.9 The Supplier shall, on any copy of any materials in which copyright belongs to the Authority, prominently mark such material with a notice saying: “Copyright in this [DOCUMENT/section of DOCUMENT] belongs to, and is used under licence from, the Institute for Apprenticeships and Technical Education [DATE]” or such other notice as the Authority may reasonably require by notice to the Supplier from time to time. Without prejudice to any rights granted to the Authority under this Contract, in the case of each Deliverable the Supplier shall deliver a certificate in the form annexed to the TQ Assignment and Licence confirming that ownership in the IPR in that Deliverable is vested in the Authority, or where it asserts that IPR in the Deliverable or certain parts of it do not vest in the Authority, identifying specifically those parts and the scope of rights it asserts the Supplier has in respect of the same.

13.10 The Supplier may use its name, logos, trade marks and/or other signs which refer to the Supplier on Key Materials and Ancillary Materials and other materials used in the Operation of the TQ or to promote the TQ which are of the type set out in the T Level Branding Guidelines, provided that any such use shall be strictly as set out in the T Level Branding Guidelines. Without prejudice to the last sentence, the Supplier shall, on notice from the Authority, provide representative samples of all such use, and, if the notice so requests, provide such samples a reasonable period in advance of any proposed such use together with a period (not being less than 7 Working Days) for comment. The Authority may notify the Supplier within such period of any comments, including any requirements it has in respect of such use, and, the Supplier shall take reasonable account of any such comments and comply with any reasonable requirements of the Authority so notified.

13.11 The Supplier shall not use its name, logos, trade marks and/or other signs which refer to the Supplier, in a trade mark manner or as any designation of origin, on any material referred to in clause 13.10 or otherwise in connection with its Operation of T Levels or T Level technical education qualifications (including the TQ), except as provided in clause 13.10 or otherwise with the specific Approval of the Authority; and in any event any use of its name, logos, trade marks and/or other signs which refer to the Supplier in connection with the T Level or T Level technical education qualifications (including

the TQ) shall not be such as to make, suggest or imply any connection between the Authority or any T Levels or any T Level technical education qualifications and the Supplier, or endorsement by the Authority or the Department, other than as arises under this Contract or any other contract for the supply of T Level technical education qualifications.

13.12 The Supplier shall:

13.12.1 apply to all Key Materials and Ancillary Materials provided to any third party, the Authority's name and logo in such manner as is reasonably prescribed from time to time in writing by the Authority; and

13.12.2 use in respect of the TQ, including, unless otherwise agreed with the Authority, on all Key Materials and Ancillary Materials, such descriptive name (for example in the form: "[technical qualification] in Construction") as is determined by the Authority or proposed by the Supplier and agreed by the Authority,

provided that such use shall at all times be in strict accordance with the other provisions of this Contract, the T Level Trade Mark Licence, and any style guides or other instructions issued from time to time by the Authority.

Supplier's operation of other qualifications

13.13 The Supplier shall not, within or outside England, offer or promote any qualification other than the TQ as:

13.13.1 being the TQ (or any other technical qualification forming part of a T Level) or T Level (or part of a T Level);

13.13.2 being identical in terms of content and assessment requirements to the TQ (or any other technical qualification forming part of a T Level) or T Level and/or including identical components to the TQ (or any other technical qualification forming part of a T Level) or T Level; or

13.13.3 demonstrating the same level of occupational competence as the TQ (or any other technical qualification forming part of a T Level) or T Level,

provided always that nothing in this Contract shall prevent the Supplier from offering or promoting the technical qualification element of a T Level under a separate contract with the Authority in connection with the making available of that technical qualification.

13.14 The Supplier may only re-use the whole of the TQ in an un-amended or materially un-amended form, other than as part of the Services during the Term, as follows:

13.14.1 in the Operation of qualifications for any of the Devolved Administrations, with the specific Approval of the Authority;

13.14.2 in the Operation of qualifications in England intended for and only marketed to students who are not in the category known as "16 to 19 year old", with the specific Approval of the Authority; and

13.14.3 in the Operation of qualifications outside the UK, save in any jurisdictions the Authority excludes by notice to the Supplier,

provided in each case that the name "T Level" is not used in the qualification or any marketing or promotion of the qualification, and that it is at all times clear and made clear to students and other third parties that the qualification does not form and cannot be used as any part of a T Level.

13.15 Subject to clauses 13.13 and 13.14, nothing in this Contract or the TQ Assignment and Licence shall restrict or prevent the Supplier from continuing to offer and update its existing qualifications (including technical qualifications), from offering new technical qualifications, or from using elements of the Key Materials in the operation of qualifications other than the TQ.

Dealing with intellectual property claims

13.16 If there is an IPR Claim, the Supplier indemnifies the Authority against all Losses suffered or incurred by the Authority as a result.

13.17 Where a Party acquires ownership of IPR incorrectly under this Contract it must do everything reasonably necessary to complete a transfer in writing assigning the IPR to the other Party on request and at its own cost.

13.18 Clause 13.16 shall not apply to the extent that the IPR Claim is caused by the Authority's use of the relevant IPR in breach of the terms of this Contract.

13.19 In the event that any Third Party IPR is included in the Key Materials, Ancillary Materials, or other Deliverables under this Contract, the Supplier shall ensure that it has or acquires sufficient rights to any such Third Party IPR to enable it to enter into any applicable assignments and to grant any applicable licences under this Contract.

Portability of the TQ

13.20 The Supplier shall, where possible, ensure that its design and development of the TQ enables the transfer of the materials described in clause 13.1 to a Future Supplier without requiring use by such Future Supplier of any underlying proprietary system or platform which does not form part of the Key Materials or Ancillary Materials.

14 What may happen if there are issues with your provision of the Services

14.1 The Supplier must notify the Authority promptly in writing if:

14.1.1 it becomes aware of any problem or complaint from any individual or organisation in relation to the making available and/or operation of the TQ;

14.1.2 it makes any changes to its management, governance, organisational and/or operational structure or capacity from that which is set out in the Supplier's Tender which shall or may be material to the provision of the Services;

14.1.3 it undergoes or proposes to undergo (or, without prejudice to clause 15.7 (*When Sub-Contracts can be ended*) becomes aware that a Subcontractor has undergone or proposes to undergo) a change of Control;

14.1.4 there is a material adverse change in the financial circumstances of the Supplier, the Supplier becomes aware of a material adverse change in the financial circumstances of the Key Subcontractors, or the Supplier has (or anticipates that it may have) insufficient funding to adequately resource its obligations under this Contract;

14.1.5 it becomes aware of any circumstances relating to the Supplier or any Subcontractor which shall or may bring into disrepute and/or diminish the trust that the public places in the Authority, the Department or the ESFA and/or the T Levels Programme (including any Conflict of Interest (as

contemplated by clause 36 (*Conflict of interest*)) and/or any child protection and/or data handling issues and/or incidents);

14.1.6 it becomes aware of any issue which shall or may have an adverse impact on Students studying for the TQ;

14.1.7 it is required, pursuant to the Conditions of Recognition, to notify Ofqual of any event that has occurred (or is likely to occur) which it has cause to believe could have an "Adverse Effect" (as defined in the Conditions of Recognition);

14.1.8 any of the circumstances in clause 15.7 (*Ending or extending this Contract*) occur; or

14.1.9 a Critical Service Failure occurs.

14.2 If:

14.2.1 the Supplier has failed to make the Submission for the relevant Interim Milestone on or prior to the Submission Date for that relevant Interim Milestone;

14.2.2 the Authority reasonably believes that:

(i) the Supplier is not likely to achieve IfATE Approval by the Final Approval Milestone Date;

(ii) the Authority is likely to need to withdraw IfATE Approval;

(iii) Ofqual is likely to need to withdraw Ofqual Recognition;

14.2.3 the Authority has obtained information giving rise to reasonable concerns about the ability of the Supplier to deliver the Services and the Authority has provided such information to the Supplier and given the Supplier a reasonable opportunity (in the circumstances) to respond to such information and any such response fails to address such concerns to the satisfaction of the Authority;

14.2.4 the Supplier fails, in the opinion of Ofqual, to comply with any Condition of Recognition;

14.2.5 the Supplier is under investigation and/or subject to regulatory enforcement by Ofqual or has had any direction issued by Ofqual in respect of it;

14.2.6 the Supplier fails to comply with and/or implement (as the case may be) the whole or any part of the Implementation and Delivery Plan in any material respect;

14.2.7 the Supplier fails to deliver the Services in accordance with the Resource Plan in any material respect;

14.2.8 the circumstances referred to in paragraph 2.3.2 of Schedule 15 (*Monitoring of Performance*) occur;

14.2.9 a Supplier Termination Event has occurred; and/or

14.2.10 any act or omission of the Supplier in relation to the TQ in breach of this Contract occurs which shall or may have a material adverse impact on Students and/or the TQ including any such act or omission which:

(i) gives rise to prejudice to Students or potential Students; or

(ii) adversely affects:

(A) the ability of the Supplier to undertake the development, delivery or award of the TQ in accordance with its Conditions of Recognition;

(B) the standards of the TQ which the Supplier makes available or proposes to make available; or

(C) public confidence in the TQ,

the Authority may issue written notification of Designated Action to the Supplier, following which the Supplier shall comply with the Designated Action in accordance with any timeframe stated in such notification. In the event that, for any reason, the Supplier is unable to comply with the Designated Action notification, the Supplier shall promptly notify the Authority and shall explain the reason why it is unable to so comply.

14.3 In the event of a Critical Service Failure, in addition to the rights of the Authority under clause 14.2 (*What may happen if there are issues with your provision of the Services*)

and 15.3 (*Ending or extending this Contract*), the Authority may by serving written notice on the Supplier:

14.3.1 suspend and/or restrict any elements (in full or part) of the Services for the remainder of the Term, including a permanent prohibition or restriction on the Supplier from providing the Services (including making the TQ and/or any Products available to Approved Providers):

(i) to Cohorts (including any Exclusive Cohort) in respect of which Students are already registered for the TQ; and/or

(ii) in respect of any further Cohorts (including any Exclusive Cohort);

14.3.2 reduce the Term by one or more periods of 12 months as specified in such notice and accordingly remove one or more Cohorts from the Exclusive Cohorts; and/or

14.3.3 require the Supplier to comply with specified performance improvement conditions in relation to the Services, failing which the Term will reduce by one or more periods of 12 months as specified in such notice and the final Cohort will then be removed from the Exclusive Cohorts.

14.4 Nothing in this Contract (and no action by the Authority) shall be construed so as to limit or restrict the ability of Ofqual to take action under its statutory powers and in the event of any Dispute arising out of or in connection with Ofqual Recognition and/or any Condition of Recognition the provisions of clause 38.7 (*Resolving disputes*) will apply.

14.5 The Supplier shall provide (and shall procure that its Subcontractors provide) all information and cooperation as is required by the Authority to enable the Authority to investigate any alleged breach by the Supplier of its obligations under this Contract.

14.6 The Authority may withdraw IfATE Approval by notice in writing to the Supplier in circumstances where the requirements for IfATE Approval are no longer met by the Supplier. The Authority shall notify the Supplier in advance in writing of its proposal to withdraw IfATE Approval and shall provide a reasonable opportunity for the Supplier to make representations in relation to such proposal, and the Authority shall take such representations into account in determining whether to proceed to withdraw IfATE Approval.

15 Ending or extending this Contract

15.1 This Contract ends on the End Date.

Extending this Contract

15.2 The Authority can extend this Contract for an Extension Period by giving the Supplier written notice prior to the start of the Academic Year in which the final Exclusive Cohort commences the TQ.

When the Authority can end this Contract

15.3 If a Supplier Termination Event occurs, the Authority has the right to immediately terminate this Contract by issuing a Termination Notice to the Supplier, unless the Supplier Termination Event occurs as a result of a breach of this Contract by the Authority, but only insofar as the Authority's breach is not itself caused by a breach by the Supplier of the Supplier's obligations under this Contract.

15.4 Nothing in Clause 38 (Resolving Disputes) shall prevent or restrict the Authority from exercising its rights under clause 15.3.

What happens if this Contract ends

15.5 Where the Authority terminates this Contract, all of the following apply:

15.5.1 the Supplier shall apply to Ofqual, in accordance with the instructions of the Authority, for its Ofqual Recognition in respect of the TQ to be withdrawn;

15.5.2 the accumulated rights of the Authority are not affected;

15.5.3 the Authority grants to the Supplier a non-exclusive worldwide, royalty free irrevocable licence to use the IfATE Data solely to the extent that such IfATE Data consists of: (i) information relating to the identities of Providers and persons engaged by them, which it shall be entitled to use for any purpose; and (ii) Student Related Data provided that no individual Student can be identified from such Student Related Data, which it shall be entitled to use for research purposes in order to develop or improve upon any Supplier qualification (including material prepared, and training provided, in support of such qualification);

15.5.4 the Supplier must promptly return (or, where required by the Authority, delete) the IfATE Data except where required to retain copies by Law, the Conditions of Recognition, or for the purposes of exercising its rights under the licence granted under clause 15.4.3;

15.5.5 the Supplier must promptly return any of the Authority's property provided to it under this Contract;

15.5.6 the Supplier must at no cost to the Authority reasonably co-operate in the re-procurement and/or handover of the Services (including to a Replacement Supplier);

15.5.7 the Supplier must comply with the relevant provisions of Schedule 12 (*Exit Management*); and

15.5.8 this clause 15.4 and the following clauses survive the termination of this Contract: clauses 9, 12.3, 13, 16, 18, 19, 20, 22, 38 and 39 and any clauses and/or Schedules which are expressly or by implication intended to continue.

When the Supplier can end this Contract

15.6 The Supplier can terminate this Contract by issuing a Termination Notice if the Authority fails to pay any Charges which have fallen due under this Contract and which are directly payable by the Authority within 30 days of the date of a Reminder Notice issued by the Supplier in respect of such sum.

15.7 If the Supplier terminates this Contract under clause 15.5:

15.7.1 the Authority must promptly pay all outstanding Charges referred to in clause 15.5 to the Supplier; and

15.7.2 clauses 15.4.1 to 15.4.8 shall apply.

When Sub-Contracts can be ended

15.8 At the Authority's request, the Supplier must terminate (or procure the termination of (as the case may be)) any Sub-Contracts in any of the following events:

15.8.1 there is a change of Control of the relevant Subcontractor which is not pre-approved in writing by the Authority and which the Authority believes shall or may have an adverse impact on the Services;

15.8.2 the acts or omissions of the relevant Subcontractor have caused or materially contributed to a right of the Authority to terminate this Contract;

15.8.3 a Supplier Termination Event is caused or contributed to by the relevant Subcontractor or where any analogous events referred to in limbs (b), (d), (e), (f), (g), (h), (j) or (l) of the definition of Supplier Termination Event occurs in respect of the Subcontractor; or

15.8.4 the relevant Subcontractor sub-contracts any of its obligations in relation to the Services in breach of the requirements of this Contract.

16 How much each Party can be held responsible for

16.1 Subject to the following provisions of this clause 16 each Party's total aggregate liability under this Contract (whether in tort, contract or otherwise) for each claim or series of connected claims is no more than £1,000,000.

16.2 No Party is liable to the other for:

16.2.1 any indirect, special or consequential Loss; or

16.2.2 loss of profits, turnover, savings, business opportunities or damage to goodwill (in each case whether direct or indirect), provided always that, subject to clause 16.1, the Supplier acknowledges that the Authority may, amongst other things, recover from the Supplier the following Losses incurred by the Authority, the Department and/or the ESFA, to the extent that they arise as a result of a Default by the Supplier:

(i) any additional operational and/or administrative costs and expenses, including costs relating to time spent by or on behalf of the Authority in dealing with the consequences of the Default;

(ii) any wasted expenditure or charges;

(iii) the additional cost of procuring Replacement Services for the remainder of the Contract Period, which shall include any incremental costs associated with such Replacement Services above those which would have been payable under this Contract;

(iv) any compensation or interest paid to a third party by the Authority; and

(v) any fine or penalty pursuant to Law and any costs in defending any proceedings which result in such fine or penalty.

16.3 The Authority does not give any warranty or undertaking as to the relevance, completeness, accuracy or fitness for purpose of any data information and/or documentation disclosed by or on behalf of the Authority prior to or after the Effective Date and neither the Authority nor any of its employees or agents shall be liable (howsoever arising) for any inaccuracy, omission, unfitness for purpose or inadequacy of any kind whatsoever in any such data information and/or documentation.

16.4 Nothing in this Contract shall operate to exclude or limit the liability of either Party in relation to the following:

16.4.1 its liability for death or personal injury caused by its negligence, or that of its employees, agents or subcontractors;

16.4.2 bribery or fraud or fraudulent misrepresentation by it or its employees; or

16.4.3 any liability that cannot be excluded or limited by Law.

16.5 Each Party must use its reasonable endeavours to mitigate any Losses which it suffers under or in connection with this Contract, including where any such Losses are covered by an indemnity.

16.6 When calculating the Supplier's liability under clause 16.1, Losses covered by Required Insurances will not be taken into consideration.

17 Insurance

17.1 Without prejudice to its obligations to the Authority under this Contract, including its indemnity obligations, the Supplier shall take out and maintain at its own cost, or

procure the taking out and maintenance of, the Required Insurances. The Supplier shall ensure that each of the Required Insurances is effective no later than the date on which the relevant risk commences.

17.2 The Required Insurances shall be maintained in accordance with Good Industry Practice and (so far as is reasonably practicable) on terms no less favourable than those generally available to a prudent contractor in respect of risks insured in the international insurance market from time to time.

17.3 The Required Insurances shall be taken out and maintained with insurers who are: (a) of good financial standing; (b) appropriately regulated; and (c) of good repute in the international insurance market.

17.4 The Supplier shall not take any action or fail to take any action or (insofar as is reasonably within its power) permit anything to occur in relation to it which would entitle any insurer to refuse to pay any claim under any of the Required Insurances.

17.5 Where the Supplier has failed to purchase any of the Required Insurances or maintain any of the Required Insurances in full force and effect, the Authority may elect (but shall not be obliged) following written notice to the Supplier to purchase the relevant Required Insurances, and the Authority shall be entitled to recover the reasonable premium and other reasonable costs incurred in connection therewith as a debt due from the Supplier.

17.6 The Supplier shall upon the Effective Date and within 15 Working Days after the renewal or replacement of each of the Required Insurances, provide evidence, in a form satisfactory to the Authority, that the Required Insurances are in full force and effect and meet in full the requirements of this clause 17. Receipt of such evidence by the Authority shall not in itself constitute acceptance by the Authority or relieve the Supplier of any of its liabilities and obligations under this Contract.

17.7 The Supplier shall ensure that the public and products liability policy forming part of the Required Insurances shall contain an indemnity to principals clause under which the Authority shall be indemnified in respect of claims made against the Authority in respect of death or bodily injury or third party property damage arising out of or in connection with the Services and for which the Supplier is legally liable.

18 Data protection and information

18.1 Each Party shall comply with the Data Protection Legislation.

18.2 The Supplier must ensure that Personal Data is Processed in accordance with Schedule 9 (*Data Handling and Security Management*).

18.3 The Supplier must not remove any ownership or security notices in or relating to the IfATE Data.

18.4 The Supplier must make accessible back-ups of all IfATE Data, stored in an agreed off-site location. The Supplier must send the Authority copies every six Months of the Ancillary Materials and the Key Materials (in each case to the extent that these have not already been provided to the Authority), and any further information falling within the definition of IfATE Data as may be requested by the Authority in writing from time to time.

18.5 The Supplier must ensure that any Supplier system holding any IfATE Data, including back-up data, is a secure system that complies with the Security Policy and the relevant provisions of Schedule 9 (*Data Handling and Security Management*).

18.6 If at any time the Supplier suspects or has reason to believe that the IfATE Data provided or generated under this Contract is corrupted, lost or sufficiently degraded, then the Supplier must notify the Authority and immediately suggest remedial action.

18.7 If the IfATE Data is corrupted, lost or sufficiently degraded so as to be unusable the Authority may either or both:

18.7.1 tell the Supplier to restore or get restored IfATE Data as soon as practical but no later than 5 Working Days from the date that the Authority receives notice, or the Supplier finds out about the issue, whichever is earlier; and/or

18.7.2 restore the IfATE Data itself or using a third party.

18.8 The Supplier must pay each Party's reasonable costs of complying with clause 18.7 unless the Authority is at fault.

18.9 The Supplier:

18.9.1 must provide the Authority with all IfATE Data in an agreed open format within 10 Working Days of a written request;

18.9.2 must have documented processes to guarantee prompt availability of IfATE Data if the Supplier stops trading;

18.9.3 must securely destroy all Storage Media that has held IfATE Data at the end of life of that media using Good Industry Practice;

18.9.4 must securely erase all IfATE Data and any copies it holds when asked to do so by the Authority unless required by Law to retain it; and

18.9.5 indemnifies the Authority against any and all Losses suffered or incurred by the Authority if the Supplier and/or any Key Subcontractor breaches this clause 18 and/or any Data Protection Legislation.

19 What must be kept confidential

Confidential Information

19.1 Each Party must, subject to the following provisions of this clause 19;

19.1.1 keep all Confidential Information it receives confidential and secure;

19.1.2 not disclose, use or exploit the Confidential Information disclosed by the Disclosing Party without the Disclosing Party's prior written consent, except for the purposes anticipated under this Contract; and

19.1.3 immediately notify the Disclosing Party if it suspects unauthorised access, copying, use or disclosure of the Confidential Information.

19.2 Notwithstanding clause 19.1, a Party may disclose Confidential Information which it receives from the Disclosing Party in any of the following instances:

19.2.1 where disclosure is required by applicable Law or by a court with the required jurisdiction, if the Recipient Party (to the extent that it is permitted to do so by such applicable Law or by such court) notifies the Disclosing Party in advance of disclosure of the full circumstances, the affected Confidential Information and extent of the disclosure;

19.2.2 if the Recipient Party already had the information without obligation of confidentiality before it was disclosed to it by the Disclosing Party;

19.2.3 if the information was given to it by a third party without obligation of confidentiality;

19.2.4 if the information was in the public domain at the time of the disclosure;

19.2.5 if the information was independently developed without access to the Confidential Information of the Disclosing Party;

19.2.6 to its auditors or for the purposes of regulatory requirements;

19.2.7 on a confidential basis, to its professional advisers on a need-to-know basis;

19.2.8 to the Serious Fraud Office where the Recipient Party has reasonable grounds to believe that the Disclosing Party is involved in activity that may be a criminal offence under the Bribery Act 2010; and/or

19.2.9 where disclosure is permitted in accordance with Schedule 4 (*Co-operation*).

19.3 The Supplier may disclose Confidential Information on a confidential basis to Supplier Staff on a need-to-know basis to allow the Supplier to meet its obligations under this Contract. The Supplier must ensure that the Supplier Staff enter into a direct confidentiality agreement with the Authority at the Authority's request.

19.4 The Authority may disclose Confidential Information in any of the following cases:

19.4.1 on a confidential basis to the employees, agents, consultants and contractors of the Authority;

19.4.2 on a confidential basis to any Crown Body, any successor body to a Crown Body or any company that the Authority transfers or proposes to transfer all or any part of its business to;

19.4.3 where permitted by the Apprenticeships, Skills, Children and Learning Act 2009, (including to the Department, ESFA or Ofqual and as contemplated by clause 5.15 (*Developing the TQ and achieving IfATE Approval*);

19.4.4 if the Authority (acting reasonably) considers disclosure necessary or appropriate to carry out its public functions;

19.4.5 where requested by Parliament;

19.4.6 under clauses 4.10 (*Pricing and payments*) and 20 (*When information can be shared*); or

19.4.7 save for Exit Information, where the information was generated as part of the provision of the Services.

19.5 For the purposes of clauses 19.2 to 19.4 references to disclosure on a confidential basis means disclosure under a confidentiality agreement or arrangement including terms as strict as those required in this clause 19.

Student Related Data

19.6 The Supplier must:

19.6.1 keep all Student Related Data confidential and secure;

19.6.2 immediately notify the Authority if it suspects unauthorised access, copying, use or disclosure of the Student Related Data.

19.7 The Supplier shall not store, copy, disclose, or use the Student Related Data except as necessary for the performance by the Supplier of its obligations under this Contract or as otherwise expressly authorised in writing by the Authority.

Transparency Information and other disclosures

19.8 Transparency Information and any information which is exempt from disclosure by clause 20 (*When information can be shared*) is not Confidential Information.

19.9 The Supplier must not make any press announcement or publicise this Contract or the output of the Services (including the Student Related Data) without the prior written consent of the Authority and must take all reasonable steps to ensure that Supplier Staff do not either.

20 When information can be shared

20.1 The Supplier acknowledges that:

20.1.1 the Transparency Reports; and

20.1.2 the content of this Contract, including any changes to this Contract agreed during the Term, except for (i) any information which is exempt from disclosure in accordance with the provisions of the FOIA, which shall be determined by the Authority; and (ii) Commercially Sensitive Information,

(together the "**Transparency Information**") is not Confidential Information.

20.2 The Supplier must tell the Authority within 48 hours if it receives a Request For Information.

20.3 Within the timescales required by the Authority, the Supplier must give the Authority full co-operation and information needed so the Authority can:

20.3.1 publish the Transparency Information; and

20.3.2 comply with any Request for Information.

20.4 The Supplier acknowledges that the Authority may be required under the FOIA and EIRs to disclose information (including Confidential Information and Commercially Sensitive Information) without consulting or obtaining consent from the Supplier. However, to the extent that it is permitted to do so (in accordance with the Secretary of State's section 45 Code of Practice on the Discharge of the Functions of Public Authorities under Part 1 of the FOIA), the Authority shall, in relation to any Request for Information relating to Confidential Information or Commercially Sensitive Information of the Supplier:

20.4.1 notify the Supplier of such Request for Information as soon as is reasonably practicable; and

20.4.2 allow the Supplier to make representations in relation to any exemptions the Supplier considers may apply to the disclosure of its information under the Request for Information and take such representations into account when making its decision of what it will disclose.

20.5 Notwithstanding any other provision in this Contract, the Authority shall be responsible for determining in its absolute discretion whether any Commercially Sensitive Information and/or any other information is exempt from disclosure in accordance with the FOIA and/or the EIRs.

21 Invalid parts of this Contract

If any part of this Contract is held to be void or otherwise unenforceable by any court of competent jurisdiction, such part shall to the extent necessary to ensure that the remaining provisions of this Contract are not void or unenforceable be deemed to be deleted and the validity and/or enforceability of the remaining provisions of this Contract shall not be affected.

22 No other terms apply

The provisions incorporated into this Contract are the entire agreement between the Parties. This Contract replaces all previous statements and agreements whether written or oral. No other provisions apply.

23 Other people's rights in this Contract

23.1 The Department may enforce any of the Authority's rights under this Contract in relation to which the Department is to benefit. The Department's consent is not required to amend this Contract.

23.2 Save as provided in clause 23.1 or expressly stated in this Contract, no third parties shall be entitled to enforce any term of this Contract.

24 Circumstances beyond either Party's control

24.1 Any Party affected by a Force Majeure Event is excused from performing its obligations under this Contract while the inability to perform continues, if it both:

24.1.1 provides a Force Majeure Notice to the other Party; and

24.1.2 uses all reasonable measures to reduce the impact of the Force Majeure Event.

24.2 The Authority can terminate this Contract if the provision of the Services is materially affected by a Force Majeure Event which lasts for 90 days continuously.

24.3 Where the Authority terminates under clause 24.2:

24.3.1 each Party must cover its own Losses; and

24.3.2 subject to clause 24.3.1, clause 15.4 applies.

24.4 Neither Party can rely on clause 24.1 where the inability to perform its obligations arises, directing or indirectly, due to the exit from the European Union by the United Kingdom.

24.5 The Supplier may not rely on clause 24.1 to the extent that the inability to perform its obligations arises directly or indirectly out of a failure by the Supplier to comply with its Business Continuity Plan.

25 Relationships created by this Contract

25.1 This Contract does not create a partnership, joint venture or employment relationship. The Supplier must represent itself accordingly and ensure the Supplier Staff do so.

26 Giving up contract rights

26.1 A partial or full waiver or relaxation of the terms of this Contract by one Party is only valid if it is stated to be a waiver in writing to the other Party.

27 Transferring responsibilities

27.1 The Supplier must not assign, transfer or otherwise dispose of its rights, obligations and/or liabilities under the whole or any part of this Contract without Approval.

27.2 The Authority can assign, novate or transfer this Contract or any part of it to any Crown Body, public sector body or private sector body which performs the functions of the Authority.

27.3 The Supplier must enter into a novation agreement in the form that the Authority specifies where the Authority wishes to exercise its rights under clause 27.2.

27.4 The Supplier can terminate this Contract novated under clause 27.2 to a private sector body where an Insolvency Event occurs in respect of that private sector body.

27.5 The Supplier remains responsible for all acts and omissions of the Supplier Staff as if they were its own.

28 Changing this Contract

28.1 If any change is required which is an Inclusive TQ Change, clause 8 (*TQ Changes*) shall apply in relation to such change, and this clause 28 shall not apply to any Inclusive TQ Change.

28.2 Either Party can request a Variation to this Contract, including the addition or removal of one or more Occupational Specialist Components.

28.3 The Supplier cannot unreasonably withhold or delay their consent to a Variation to this Contract.

28.4 The Supplier must provide an Impact Assessment either:

28.4.1 with the Variation Form, where the Supplier requests the Variation; or

28.4.2 within the time limits included in a Variation Form where the Authority requests the Variation.

28.5 If the Variation cannot be agreed or resolved by the Parties, the Authority can either:

28.5.1 agree that this Contract continues without the Variation; or

28.5.2 treat such failure as a Dispute which shall be addressed through the Dispute Resolution Procedure.

28.6 A Variation of this Contract is only effective if agreed in writing and signed by both Parties.

28.7 If there is a General Change in Law, the Supplier must bear the risk of the change and is not entitled to ask for an increase to the Charges and/or the Fees in respect of that change.

28.8 If there is a Specific Change in Law or one is likely to happen during the Contract Period, the Supplier must give the Authority notice of the likely effects of the Specific Change in Law as soon as reasonably practical. The Supplier must also say if it thinks

any Variation is needed either to the Services, the Products and/or this Contract and provide evidence:

28.8.1 that the Supplier has kept costs as low as possible and/or maximised any cost savings (as the case may be) including any Subcontractor costs; and

28.8.2 of how it has affected or will affect the Supplier's costs and/or those of any Subcontractor.

28.9 Any Variation because of a Specific Change in Law must be implemented using clauses 28.1 to 28.6.

28.10 If another awarding organisation has a contract with the Authority for the provision of services similar to the Services to deliver a different technical qualification as part of the T Levels Programme and that other awarding organisation suffers a Supplier Termination Event following which its contract with the Authority is terminated or the relevant contract is otherwise lawfully terminated, the Supplier agrees that the Authority shall have the option to request that the Supplier takes over the delivery of that different technical qualification and any related services as a Variation, which will be implemented using clauses 28.1 to 28.6. The Charges and Fees relating to such a Variation shall be agreed between the Parties as part of the Impact Assessment for the relevant Variation, each Party acting reasonably and promptly, prior to the Supplier commencing work on the Variation. The relevant Charges and Fees shall:

28.10.1 be a reasonable cost for implementing the Variation in the circumstances;

28.10.2 take into account the charges and fees that the other awarding organisation was charging in relation to that different technical qualification prior to suffering the Supplier Termination Event; and

28.10.3 take into account and be calculated using:

(i) for personnel related costs and other relevant charges which are set out in the Rate Card, the applicable Rate Card rates; and

(ii) reasonable charges for any non-personnel related costs which are not included in the Rate Card and which will be incurred by the Supplier to implement the Variation; and

(iii) the same basis and the same logic used by the Supplier to determine the relevant costs, Charges and Fees for the Services.

29 How to communicate about this Contract

29.1 All notices under this Contract must be in writing and are considered effective on the Working Day of delivery as long as delivered before 5:00 pm on a Working Day. Otherwise, the notice is effective on the next Working Day. Unless expressly stated in this Contract or otherwise communicated in writing by the Authority, an email is not effective notice unless also sent by post or delivered by hand on the same day. For the avoidance of doubt, this clause 29.1 does not apply to a Variation, which must be implemented in accordance with clauses 28.2 to 28.6.

29.2 Subject to clause 29.1, notices to the Authority must be sent to the Authority Authorised Representative's address and email address, and all notices must be copied to the Authority's Head of Commercial Delivery Management [redacted] and the Authority's Head of Legal [redacted].

29.3 Subject to clause 29.1, notices to the Supplier must be sent to the Supplier Authorised Representative's address and email address.

29.4 This clause does not apply to the service of legal proceedings or any documents in any legal action, arbitration or dispute resolution.

30 Dealing with claims

30.1 If a Beneficiary is notified of or otherwise becomes aware of a Claim then it must notify the Indemnifier as soon as reasonably practical and no later than 10 Working Days after such notification or date of first awareness.

30.2 At the Indemnifier's cost the Beneficiary must both:

30.2.1 allow the Indemnifier to conduct all negotiations and proceedings to do with a Claim; and

30.2.2 give the Indemnifier reasonable assistance with the Claim if requested.

30.3 The Beneficiary must not make admissions about the Claim or enter into any agreement or compromise in relation to the Claim without the prior written consent of the Indemnifier which cannot be unreasonably withheld or delayed.

30.4 The Indemnifier must consider and defend the Claim diligently using competent legal advisors and in a way that does not damage the Beneficiary's reputation (or, in the case of the Authority as a Beneficiary, the reputation of the Authority, the Department and/or the ESFA or the wider T Levels Programme).

30.5 The Indemnifier must not settle or compromise any Claim without the Beneficiary's prior written consent which it must not unreasonably withhold or delay.

30.6 Each Beneficiary must take all reasonable steps to minimise and mitigate any losses that it suffers because of the Claim.

30.7 If the Indemnifier pays the Beneficiary money under an indemnity and the Beneficiary later recovers money which is directly related to the relevant Claim, the Beneficiary must immediately repay the Indemnifier the lesser of either:

30.7.1 the sum recovered minus any legitimate amount spent by the Beneficiary when recovering this money; or

30.7.2 the amount the Indemnifier paid the Beneficiary for the Claim.

31 Preventing fraud, bribery and corruption

31.1 The Supplier must not during the Term:

31.1.1 commit a Prohibited Act or any other criminal offence in regulations 38(8), 38(9) and/or 38(10) of the Regulations; and/or

31.1.2 do or allow anything which would cause the Authority, including any of its employees, consultants, contractors, subcontractors or agents to breach any of the Relevant Requirements or incur any liability under them.

31.2 The Supplier must during the Term:

31.2.1 create, maintain and enforce adequate policies and procedures to ensure it complies with the Relevant Requirements to prevent a Prohibited Act and require its Subcontractors to do the same;

31.2.2 keep full records to show it has complied with its obligations under this clause 31 and give copies to the Authority on request; and

31.2.3 if required by the Authority, within 20 Working Days of the Effective Date, and then annually, certify in writing to the Authority, that it has complied with this clause 31, including compliance of Supplier Staff, and provide reasonable supporting evidence of this on request, including its policies and procedures.

31.3 The Supplier must immediately notify the Authority if it becomes aware of any breach of clauses 31.1 or 31.2, or has any reason to think that it, or any of the Supplier Staff, has either:

31.3.1 been investigated or prosecuted for an alleged Prohibited Act;

31.3.2 been debarred, suspended, proposed for suspension or debarment, or is otherwise ineligible to take part in procurement programmes or contracts because of a Prohibited Act by any Crown Body;

31.3.3 received a request or demand for any undue financial or other advantage of any kind related to this Contract; or

31.3.4 suspected that any person or Party directly or indirectly related to this Contract has committed or attempted to commit a Prohibited Act.

31.4 If the Supplier notifies the Authority as required by clause 31.3, the Supplier must respond promptly to the Authority's further enquiries, co-operate with any investigation and allow the Audit of any relevant books, records and documentation.

31.5 In any notice the Supplier gives under clause 31.4 it must specify the:

31.5.1 Prohibited Act;

31.5.2 identity of the party who it thinks has committed the Prohibited Act; and

31.5.3 action it has decided to take.

32 Equality, diversity, human rights and modern slavery

32.1 The Supplier must perform its obligations under this Contract (including those in relation to the Services), in accordance with:

32.1.1 all applicable equality Law (whether in relation to race, sex, gender reassignment, religion or belief, disability, sexual orientation, pregnancy, maternity, age or otherwise); and

32.1.2 any other requirements and instructions which the Authority reasonably imposes related to equality Law.

32.2 The Supplier must perform its obligations under this Contract (including those in relation to the Services) giving consideration to the Authority's Equity, Diversity and Inclusion toolkit as published on the Authority's website or provided to the Supplier from time to time.

32.3 The Supplier must take all necessary steps, and inform the Authority of the steps taken, to prevent anything that is considered to be unlawful discrimination by any court or tribunal, or the Equality and Human Rights Commission (or any successor organisation) when working on this Contract.

32.4 The Supplier must use Good Industry Practice to ensure that there is no slavery or human trafficking in its supply chains and must notify the Authority immediately if it becomes aware of any actual or suspected incidents of slavery or human trafficking in its supply chains.

32.5 The Supplier must at all times conduct its business in a manner that is consistent with any anti-slavery policy of the Authority and shall provide to the Authority any reports or other information that the Authority may request as evidence of the Supplier's compliance with this clause 32.4 and/or as may be requested or otherwise required by the Authority in accordance with any Authority anti-slavery policy.

33 Health and safety

33.1 The Supplier must perform its obligations meeting the requirements of:

33.1.1 all applicable Law regarding health and safety;

33.1.2 the Authority's current health and safety policy, as provided to the Supplier, to the extent that Supplier Staff are located at any Authority premises in the course of performing the Services under this Contract.

34 Environment

34.1 The Supplier must ensure that Supplier Staff are aware of and comply with the Environmental Policy.

35 Tax

35.1 The Supplier must not breach any tax or social security obligations and must enter into a binding agreement to pay any late contributions due, including where applicable, any interest or any fines.

35.2 Where the Supplier or any Supplier Staff are liable to be taxed or to pay National Insurance contributions in the UK relating to payment received under this Contract, the Supplier must both:

35.2.1 comply with the Income Tax (Earnings and Pensions) Act 2003 and all other statutes and regulations relating to income tax, the Social Security Contributions and Benefits Act 1992 (including IR35) and National Insurance contributions; and

35.2.2 indemnify the Authority against any Income Tax, National Insurance and social security contributions and any other liability, deduction, contribution, assessment or claim arising from or made during or after the Term in connection with the provision of the Services by the Supplier or any Supplier Staff.

36 Conflict of interest

36.1 The Supplier must take action to ensure that neither the Supplier nor the Supplier Staff are placed in the position of an actual or potential Conflict of Interest.

36.2 The Supplier must promptly notify and provide details to the Authority if a Conflict of Interest happens or is expected to happen.

36.3 The Authority can terminate this Contract immediately by giving notice in writing to the Supplier or take any steps it thinks are necessary where there is or may be an actual or potential Conflict of Interest.

37 Reporting a breach of this Contract

37.1 As soon as it is aware of it, the Supplier and Supplier Staff must report to the Authority any actual or suspected breach of:

37.1.1 Law; or

37.1.2 clauses 31 to 36 (inclusive).

37.2 The Supplier must not retaliate against any of the Supplier Staff who in good faith report a breach listed in clause 37.1 to the Authority or a Prescribed Person.

38 Resolving disputes

38.1 If there is a Dispute, nominated senior representatives of each Party who have authority to settle the Dispute will, within 28 days of a written request from the other Party, meet in good faith to resolve the Dispute.

38.2 If the Dispute is not resolved at that meeting, the Parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the Parties cannot agree on a mediator, the mediator will be nominated by CEDR. If either Party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute, the Dispute must be resolved using clauses 38.3 to 38.5.

38.3 Unless the Authority refers the Dispute to arbitration using clause 38.4, the Parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction to:

38.3.1 determine the Dispute; and/or

38.3.2 grant interim remedies, or any other provisional or protective relief.

38.4 The Supplier agrees that the Authority has the exclusive right to refer any Dispute to be finally resolved by arbitration under the London Court of International Arbitration

Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

38.5 The Authority has the right to refer a Dispute to arbitration even if the Supplier has started or has attempted to start court proceedings under clause 38.3, unless the Authority has agreed to the court proceedings or participated in them. Even if court proceedings have started, the Parties must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under clause 38.4.

38.6 The Supplier cannot suspend the performance of this Contract during any Dispute.

38.7 To the extent that a Dispute relates to whether or not the Supplier has complied with a Condition of Recognition and/or requirement of Ofqual Recognition, the Parties agree that they shall request that Ofqual shall make the final decision as to whether the requirements of that Condition of Recognition and/or Ofqual Recognition have been met and any such decision by Ofqual shall be binding on both Parties.

39 Which law applies

This Contract and any issues arising out of, or connected to it, are governed by English law.

Signed by

WJEC CBAC LIMITED

[redacted] [redacted]

Signature: [redacted]

Signed by

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

[redacted] [redacted]

Signature: [redacted]

Schedule 1

Definitions and Interpretation

1 Interpretation

1.1 In this Contract, unless the context otherwise requires, capitalised expressions shall have the meanings set out in this Schedule 1 (*Definitions and Interpretation*) or the relevant Schedule in which that capitalised expression appears.

1.2 If a capitalised expression does not have an interpretation in this Schedule or any other Schedule, it shall, in the first instance, be interpreted in accordance with the common interpretation within the relevant market sector where appropriate. Otherwise, it shall be interpreted in accordance with the dictionary meaning.

1.3 In this Contract, unless the context otherwise requires:

1.3.1 the singular includes the plural and vice versa;

1.3.2 reference to a gender includes the other gender and the neuter;

1.3.3 references to a person include an individual, company, body corporate, corporation, unincorporated association, firm, partnership or other legal entity or Crown Body;

1.3.4 references to a legal entity (other than the Supplier) shall include unless otherwise expressly stated any statutory successor to such entity and/or the relevant functions of such entity, and references to the Department shall include, where relevant, the ESFA;

1.3.5 a reference to any Law includes a reference to that Law as amended, extended, consolidated or re-enacted from time to time;

1.3.6 any reference to this Contract or to any other document shall include any variation, amendment or supplement to such document;

1.3.7 the words "**including**", "**other**", "**in particular**", "**for example**" and similar words shall not limit the generality of the preceding words and shall be construed as if they were immediately followed by the words "**without limitation**";

1.3.8 references to "**writing**" include typing, printing, lithography, photography, display on a screen, electronic and facsimile transmission and other modes of representing or reproducing words in a visible form, and expressions referring to writing shall be construed accordingly;

1.3.9 references to "**clauses**" and "**Schedules**" are, unless otherwise provided, references to the clauses of and schedules to the Core Terms and references in any Schedule to parts, paragraphs, annexes and tables are, unless otherwise provided, references to the parts, paragraphs, annexes and tables of the Schedule in which these references appear;

1.3.10 references to "**paragraphs**" are, unless otherwise provided, references to the paragraph of the appropriate Schedules unless otherwise provided; and

1.3.11 the headings in this Contract are for ease of reference only and shall not affect the interpretation or construction of this Contract.

2 Definitions

2.1 In this Contract, unless the context otherwise requires, the following words shall have the following meanings:

"Academic Year" means 1 August to 31 July in the following calendar year;

"Additional Service" means each additional service listed in Schedule 6 (*Pricing Schedule*) and detailed in Annex 10 to the Service Requirements;

"Affected Party" means the party seeking to claim relief in respect of a Force Majeure Event;

"Affiliates" means in relation to a body corporate, any other entity which directly or indirectly Controls, is Controlled by, or is under direct or indirect common Control of that body corporate from time to time;

"**Ancillary Materials**" means all information and materials (other than Key Materials) to which the Authority and/or a Future Supplier would require access for use for the Portability Purposes, and any other materials which would be required on or to facilitate succession to a Future Supplier in a seamless manner in relation to the TQ offered or Operated by the Supplier. Ancillary Materials shall include, without limitation:

(a) Student results including grades;

(b) statistical analysis for grading (excludes the systems supporting the analysis);

(c) lists of Providers;

(d) marked Student evidence (with moderation outcomes);

(e) documentation which provides an overview or analysis of Student performance (including chief examiner and chief moderator reports), which include but are not limited to, examples of student responses to assessment questions and/or tasks as well as narrative explaining why students did well/ less well on individual items/ components/ subcomponents);

(f) data on Student credits;

g) data on Student appeals;

(h) data on special considerations for Students;

(i) the Assessment Strategy;

(j) Student registrations;

(k) draft materials in preparation for forthcoming assessments;

(l) the Key Dates Schedule (in respect of forthcoming assessments);

(m) lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ;

(n) materials from completed assessments, such as completed Students' examination answer booklets; and

(o) TQ Live Assessment Materials

"Approval" means the prior written consent of the Authority and "Approve" and "Approved" shall be construed accordingly;

"Approved Assessment Strategy" shall have the meaning given in Schedule 2 (*Service Requirements*);

"**Approved Initial TQ Deliverables**" means the Initial TQ Deliverables approved by the Authority in accordance with clause 5.13 **(***Developing the TQ and achieving IfATE Approval*) or clause 8.10 or 8.11 (*TQ Changes*) (as the case may be) as such deliverables are reviewed and updated in accordance with this Contract;

"Approved Provider" means an Eligible Provider that has been granted Provider Approval in accordance with clause 7.1 (*Interaction with Providers*) and in respect of which such Provider Approval has not been revoked pursuant to clause 7.2 (*Interaction with Providers*);

“Approved Provider’s Quality Assurance Process” means the quality assurance process referred to in, and meeting the requirements of, the relevant part of the Product Description for the TQ Specification;

“Approved TQ Specification” means the TQ Specification approved by the Authority in accordance with clause 5.13 (*Developing the TQ and achieving IfATE Approval*) or clause 8.10 or 8.11 (*TQ Changes*) (as the case may be);

“Assessment Strategy” means the assessment strategy referred to in, and meeting the requirements of, the Product Description for the Assessment Strategy, which unless otherwise agreed in writing with the Authority must be consistent with the relevant details forming part of the Supplier’s Response;

“**Assessors**” means any assessor appointed by the Supplier to assess performance by Students in respect of the TQ Live Assessment Materials;

“Audit” means the Authority's right to:

(a) verify the accuracy of the Charges and any other amounts payable by the Authority (including proposed or actual variations to them in accordance with this Contract);

(b) verify the costs of the Supplier (including the costs of all Subcontractors and any third party suppliers) in connection with the provision of the Services (including the supply of the Products);

(c) verify the Supplier's and each Subcontractor's compliance with the applicable Law;

(d) identify or investigate actual or suspected breach of clauses 31 to **Error! Unknown switch argument.**, impropriety or accounting mistakes or any breach or threatened breach of security and in these circumstances the Authority shall have no obligation to inform the Supplier of the purpose or objective of its investigations;

(e) verify the Supplier’s compliance with Schedule 9 (*Data Handling and Security Management*);

(f) identify or investigate any circumstances which may impact upon the financial stability of the Supplier, /or any Subcontractors and/or its or their ability to provide the Services including to supply the Products;

(g) obtain such information as is necessary to fulfil the Authority's obligations to supply information for Parliamentary, ministerial, judicial or administrative

purposes including the supply of information to the Comptroller and Auditor General;

(h) review any books of account and the internal contract management accounts kept by the Supplier in connection with this Contract;

(i) carry out the Authority's internal and statutory audits and to prepare, examine and/or certify the Authority's annual and interim reports and accounts;

(j) enable the National Audit Office to carry out an examination pursuant to Section 6(1) of the National Audit Act 1983 of the economy, efficiency and effectiveness with which the Authority has used its resources;

(k) verify the accuracy and completeness of any Management Information delivered or required by this Contract; and/or

(l) obtain such information as is necessary to undertake a review and/or assessment of the performance of the whole or any part of the T Levels Programme;

"Auditor" means any, or any combination, of:

(a) the Authority's internal and external auditors;

(b) the Authority's statutory or regulatory auditors;

(c) the Comptroller and Auditor General, its staff and/or any appointed representatives of the National Audit Office;

(d) HM Treasury or the Cabinet Office;

(e) any party formally appointed by the Authority to carry out audit or similar review functions; and

(f) successors or assigns of any of the above;

"Authority Authorised Representative" means the person referred to in Schedule 20 as such or the representative appointed by the Authority from time to time in relation to this Contract as notified in writing (which may, in the case of this specific notification, be by email only) to the Supplier;

"**Authority Procedural Review**" means the Authority's procedural review process as published on the Authority's web site from time to time;

"Awarding Organisation" means a body recognised by Ofqual as a provider of certain qualifications;

"Background IPR" means any IPR owned by a party prior to the Effective Date or created or developed by a party independently of this Contract, but does not include IPR in Key Materials;

"Beneficiary" means a Party having (or claiming to have) the benefit of an indemnity under this Contract;

"Breach of Security" means the occurrence of:

(a) any unauthorised access to or use of the Services and/or the Products, the sites from which the Services are delivered (and/or where the Products are developed, and/or stored) and/or any information and communication technology, information or data (including the Confidential Information and the IfATE Data) used by the Authority and/or the Supplier in connection with this Contract; and/or

(b) the loss and/or unauthorised disclosure of any information or data (including the Confidential Information and the IfATE Data), including any copies of such information or data, used by the Authority and/or the Supplier in connection with this Contract,

in either case as may be more particularly set out in the Security Policy;

"Business Continuity Plan" means the business continuity and disaster recovery plan relating to this Contract, as set out in Schedule 10 (*Business Continuity*);

"Cabinet Office Statement" means the Cabinet Office Statement of Practice – Staff Transfers in the Public Sector 2000 (as revised 2013) as may be amended or replaced;

"Change in Law" means any change in Law which impacts on the provision of the Services (including the supply of the Products) and/or the performance of this Contract which comes into force after the Effective Date;

"Charges" means:

(a) the Development Charge payable to the Supplier by the Authority in accordance with clause 4.1.1 (*Pricing and payments*);

(b) in respect of any Exclusive TQ Change, the amount (exclusive of any applicable VAT) agreed or determined in respect of such Exclusive TQ Change in accordance with clause 8.6 (*TQ Changes*); and

(c) in respect of any other Variation, the amount agreed pursuant to clause 28 (*Changing this Contract*) in respect of such Variation;

“Claim” means any claim for which it appears that a Beneficiary is, or may become, entitled to indemnification under this Contract;

“Cohort” means a group of Students who are registered by an Approved Provider with the Supplier to commence the TQ in the relevant Academic Year;

“Commercially Sensitive Information” means the Confidential Information listed in Schedule 18 (*Commercially Sensitive Information*) comprising of commercially sensitive information relating to the Supplier, its IPR or its business which the Supplier has indicated to the Authority that, if disclosed by the Authority, would cause the Supplier significant commercial disadvantage or material financial loss;

“**Comparable Supply**” means the supply of services to the Authority or another customer or client of the Supplier that are the same as or similar to the Services (including the supply of products that are the same as or similar to the Products) including services relating to qualifications in England outside the T Levels Programme;

“**Conditions of Recognition**” means the conditions of Ofqual Recognition imposed on the Supplier by Ofqual including any general level conditions, qualification level conditions, subject level conditions and special conditions;

“**Confidential Information**” means, subject to clause 19.8 (*What must be kept confidential*), any information, however it is conveyed, that relates to the business, affairs, developments, trade secrets, Know-How, personnel and suppliers of the Authority or the Supplier, including IPRs, together with information derived from the above, and any other information clearly designated as being confidential (whether or not it is marked as “**confidential**”) or which ought reasonably to be considered to be confidential. Confidential Information shall not include Student Related Data;

“**Conflict of Interest**” means a conflict between the financial or personal duties of the Supplier or the Supplier Staff and the duties owed to the Authority under this Contract, in the reasonable opinion of the Authority. This includes where:

(a) the Supplier’s interests in any activity undertaken by the Supplier, on its behalf, or by an Affiliate of the Supplier have the potential to lead the Supplier to act contrary to the Supplier’s interests in the development, delivery and award of the TQ in accordance with the Conditions of Recognition;

(b) a person who is connected to the development, delivery or award of the TQ by the Supplier has interests in any other activity which have the potential to lead that person to act contrary to his or her interests in that development, delivery or award in accordance with the Conditions of Recognition; or

(c) an informed and reasonable observer would conclude that either of these situations was the case;

"**Continuing Activities**" means activities of the Supplier under this Contract in relation to the TQ which continue following the end of the second Academic Year for the final Exclusive Cohort, such as retakes, appeals, and ongoing records management;

"**Contract**" means this contract;

"**Contract Month"** means each calendar month, provided that:

(a) the first Contract Month shall commence on and from the Effective Date and shall end on the last day of the calendar month in which the Effective Date occurs; and

(b) the last Contract Month shall commence on and from the first day of the calendar month in which the End Date occurs and shall end on the End Date;

"Contract Period" means the period for which this Contract would remain in force (taking into account any current Extension Period) if not terminated earlier;

"**Control"** means the possession by a person, directly or indirectly, of the power to direct or cause the direction of the management and/or policies of the other person (whether through the ownership of voting shares, by contract or otherwise) and "**Controlled**" shall be construed accordingly;

"Controller" has the same meaning as in the GDPR;

"Core Terms" means the terms set out in the main body of this Contract;

"Critical Service Failure" means:

(a) the Ofqual Recognition of the Supplier to make the TQ available to Approved Providers for delivery to Students is withdrawn;

(b) a failure by the Supplier to make the Final Submission by the Final Approval Milestone Date or the failure of any Final Submission (or Final Re-Submission) to meet the requirements necessary to achieve IfATE Approval (in each case other than where such failure results from a breach of this Contract by the Authority);

(c) a failure by the Supplier to make a Final Re-Submission within the time period required by clause 5.13.2(*Developing the TQ and achieving IfATE Approval*) (other than where such failure results from a breach of this Contract by the Authority);

(d) the Authority withdraws IfATE Approval (having previously awarded IfATE Approval) in accordance with this Contract;

(e) any failure by the Supplier to perform a Designated Action within the specified timeframe for that Designated Action (other than where such failure results from a breach of this Contract by the Authority);

(f) any Supplier Termination Event which has occurred in respect of the Supplier in its role as an Awarding Organisation for any part of the T Levels Programme outside this Contract;

(g) any Breach of Security which either (i) results in material personal data being lost or compromised or shared without authorisation; or (ii) is not notified to the Authority promptly (and in any event within one Working Day);

(h) the Supplier breaches its obligations relating to the confidentiality of assessment papers (prior to the relevant assessment date) and/or Student results (prior to the relevant publication date); and

(i) any other event, matter or circumstance which is expressed to be (or deemed to be) a Critical Service Failure in this Contract;

"Crown Body" means the government of the United Kingdom (including the Northern Ireland Assembly and Executive Committee, the Scottish Executive and the National Assembly for Wales), including government ministers and government departments and bodies, persons, commissions or agencies from time to time carrying out functions on its behalf;

"Data Protection Legislation" means:

(a) the GDPR;

(b) the Data Protection Act 2018 to the extent that it relates to processing of personal data and privacy; and

(c) all applicable Law about the processing of personal data and privacy;

"Default" means any breach of the obligations of the Supplier (including abandonment of this Contract in breach of its terms) or any other default (including material default), act, omission, negligence or statement of the Supplier, of its Subcontractors or any Supplier Staff howsoever arising in connection with or in relation to the subject-matter of this Contract and in respect of which the Supplier is liable to the Authority;

"Deliverable" means all information and data the Supplier creates, identifies for use, or uses as part of or for the Operation of the TQ, including Products and Management Information;

"Department" means the Secretary of State for Education;

"Designated Action" means an action which the Authority requires the Supplier to take within a specified timeframe to obtain and/or maintain IfATE Approval and/or to ensure ongoing compliance of the Supplier with the terms of this Contract and such action may include:

(a) working in a prescribed way with Authority personnel and/or a third party appointed by the Authority to achieve certain specified performance and/or progress improvements;

(b) taking appropriate remedial actions in the event that any Initial Development Services and/or interim Products provided during the Development Phase are not in line with the trajectory set out in the Implementation and Delivery Plan;

(c) temporarily suspending and/or restricting any elements (in full or part) of the Services (including the supply of any Products);

(d) complying with increased performance monitoring, provision of information and/or increased audit;

(e) complying with any reasonable instructions of the Authority to help to mitigate actual and/or potential risks associated with delivery of the T Levels Programme; and/or

(f) providing reasonable cooperation to other Awarding Organisations and third party suppliers of the Authority appointed in connection with the T Levels Programme;

"Development Charge" means the amount (exclusive of any applicable VAT) referred to as the "Qualification development charge" in Schedule 6 (*Pricing Schedule*);

"Development Phase" – The period between commencement of the Contract and the Approval of the TQ, being the period during which the TQ is developed by the Supplier.

"Development Phase Report" means the report referred to in the second row of the first column in the Table in Annex 9 to the Service Requirements and containing the information set out in the second row of the second column of that Table;

"Devolved Administration" means the government of Scotland, Northern Ireland and/or Wales;

"Disclosing Party" means the Party directly or indirectly providing Confidential Information to the other Party in accordance with clause 19 (*What must be kept confidential*);

"Dispute" means any claim, dispute or difference which arises out of or in connection with this Contract or in connection with the negotiation, existence, legal validity, enforceability or termination of this Contract, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts;

"Dispute Resolution Procedure" means the dispute resolution procedure set out in clause 38 (*Resolving disputes*);

"Documentation" means descriptions of the Services (including the Products) and KPIs, technical specifications, user manuals, training manuals, operating manuals, process definitions and procedures, system environment descriptions and all such other documentation (whether in hardcopy or electronic form) that is required to be supplied by the Supplier to the Authority under this Contract as:

(a) would reasonably be required by a competent third party capable of Good Industry Practice contracted by the Authority to develop, configure, build, deploy, run, maintain, upgrade and test the individual systems that are utilised to supply the Services or Products;
(b) is required by the Supplier in order to supply the Services or Products; and/or
(c) has been or shall be generated for the purpose of supplying the Services or Products;

"Early Exit" means any termination of this Contract that occurs prior to the Supplier achieving IfATE Approval;

"Effective Date" means the date on which the last Party to sign has signed this Contract;

"Effective Date of Variation" means the date on which the Variation Form comes into effect;

"EIRs" means the Environmental Information Regulations 2004;

"Eligible Provider" means any Provider referred to in the list referenced in Part 1 of Annex 8 to the Service Requirements in respect of the relevant Cohort, as such list may be updated from time to time by the Authority, or notified in writing to the Supplier in accordance with Part 2 of Annex 8 to the Service Requirements;

"Emergency Exit" means any termination of this Contract other than an Early Exit that is a:

(a) termination of the whole or part of this Contract prior to the Expiry Date (as extended by any Extension Period); or

(b) wrongful termination or repudiation of this Contract by either Party;

"Employee Liability" means all claims, actions, proceedings, orders, demands, complaints, investigations (save for any claims for personal injury which are covered by insurance) and any award, compensation, damages, tribunal awards, fine, loss, order, penalty, disbursement, payment made by way of settlement and costs, expenses and legal costs reasonably incurred in connection with a claim or investigation including in relation to the following:

(a) redundancy payments including contractual or enhanced redundancy costs, termination costs and notice payments;

(b) unfair, wrongful or constructive dismissal compensation;

(c) a failure to comply with TUPE;

(d) compensation for discrimination on grounds of sex, race, disability, age, religion or belief, gender reassignment, marriage or civil partnership, pregnancy and maternity or sexual orientation or claims for equal pay;

(e) compensation for less favourable treatment of part-time workers or fixed term employees;

(f) outstanding debts and unlawful deduction of wages including any PAYE and National Insurance in relation to payments made by the Authority or the Replacement Supplier to a Transferring Supplier Employee which would have been payable by the Supplier or the Subcontractor if such payment should have been made prior to the Service Transfer Date and also including any payments arising in respect of pensions;

(g) claims whether in tort, contract or statute or otherwise;

(h) any investigation by the Equality and Human Rights Commission or other enforcement, regulatory or supervisory body and of implementing any requirements which may arise from such investigation;

"Employer" means any employer who has or is likely to employ Students who have successfully obtained a T Level qualification;

"Employer and Provider Engagement Strategy" means a clear and detailed strategy detailing the approach to engaging with Employers and Providers in relation to the design,

development, delivery, validation and update of the TQ and the Services, including the approach to sharing early and/or amended drafts of the Initial TQ Deliverables and TQ Deliverables with Employers and Providers (as applicable);

"Employer Set Project Grade Exemplar Responses" means actual marked examples of Students' assessment evidence, selected after awarding, as referred to in Service Requirement 5.1, which; meet the requirements for grade A and grade E; are produced (and reviewed each Academic Year) in consultation with Employers; and are accompanied by an explanatory commentary;

"**Employer Set Project Guide Exemplar Responses**" means indicative guide examples of Students' assessment evidence as referred to in Service Requirement 5.1, which; the Supplier judges would be likely to meet the minimum requirements for grade A and grade E; are produced in consultation with Employers; and are accompanied by an explanatory commentary;

"End Date" means the earlier of:

(a) the Expiry Date (as extended by any Extension Period implemented by the Authority under clause 15 (*Ending or extending this Contract*) or as reduced by the Authority in accordance with clause 14.3.2 (*What may happen if there are issues with your provision of the Services*); or

(b) if this Contract is terminated before the date specified in (a) above, the date of termination of this Contract;

"Enhanced Entry Fee" shall have the meaning given in paragraph 2.3 of Schedule 6A (Adaptive Pricing);

"Entry Fee" shall have the meaning as referred to at subsection (a) of the definition of Fees;

"Entry Transition Period" means the period from the Effective Date of this Contract to the End Date of the Authority's Contract with the Former Supplier, eg from the point when the Supplier has been awarded a contract for provision of the TQ, but a contract with the Former Supplier remains in place for existing Students;

"Entry Transition Plan" means the plan produced as part of the Supplier's Tender, and included in Schedule 5 (Supplier's Response), where relevant, and updated by the Supplier as contemplated by Schedule 4 (*Co-Operation*);

"Environmental Policy" means to conserve energy, water, wood, paper and other resources, reduce waste and phase out the use of ozone depleting substances and minimise the release of greenhouse gases, volatile organic compounds and other substances damaging to health and the environment, including any written environmental policy of the Authority;

"Equality and Human Rights Commission" means the UK Government body named as such as may be renamed or replaced by an equivalent body from time to time;

"ESFA" means the Education and Skills Funding Agency;

"Exclusive Cohort" has the meaning given in clause 2.2 (*Appointment and exclusivity*);

"**Exclusive TQ Change**" means:

(a) the addition of one or more new Occupational Specialist Component(s) which are to be added to the TQ following the Initial Content Date; and/or

(b) the removal of one or more Occupational Specialist Component(s); and/or

(c) a TQ Change which is requested by the Authority as a result of revision to a relevant Standard arising out of a statutory review of such Standard by the Authority under section A2D3 of the Apprenticeships, Skills, Children and Learning Act 2009;

"**Exemplification Materials"** means the Guide Standard Exemplification Materials and the Grade Standard Exemplification Materials;

"Exit Information" has the meaning given to it in paragraph 3.2 of Schedule 12 (*Exit Management*);

"Exit Plan" means the plan produced and updated by the Supplier during the Term in accordance with paragraphs 1 and 2 of Schedule 12 (*Exit Management*);

"Expiry Date" means 2 years following expiry of the final Academic Year for the final Exclusive Cohort;

"Extension Entry Fee" shall have the meaning given in paragraph 3.1.2 of Schedule 6A (Adaptive Pricing);

"Extension Period" means a period equal to that required to provide the Services (including the supply of any Products) to extend the contract –

(a) for one further Cohort, such period to commence at the start of the Academic Year immediately following the end of the Academic Year in which the fifth Exclusive Cohort commences the TQ; and, at the Authority's discretion;

(b) for a second further Cohort, such period to commence at the start of the Academic Year immediately following the end of the Academic Year in which the sixth Exclusive Cohort commences the TQ; and at the Authority's discretion;

(c) for a third further Cohort, such a period to commence at the start of the Academic Year immediately following the end of the Academic Year in which the seventh Exclusive Cohort commences the TQ;

"Extension Review" shall have the meaning given in paragraph 1.1.2 of Schedule 6A (Adaptive Pricing);

"**Fees**" means:

(a) in respect of the provision of the Provider Services (other than the Additional Services), the amount (exclusive of any applicable VAT) referred to as "Entry fee" in Schedule 6 (*Pricing Schedule*) payable per registered Student to the Supplier by the Approved Providers in accordance with clause 4.1.2 (*Pricing and payments*); and

(b) the Additional Services, the amount (exclusive of any applicable VAT) applicable to the relevant Additional Service as set against that Additional Service in Schedule 6 (*Pricing Schedule*) payable to the Supplier by the Approved Providers in accordance with clause 4.1.2 (*Pricing and payments*);

(c) in each case, as such fees are adjusted in accordance with clauses 4.12 and 4.13 (*Pricing and payments*);

"First Extension" shall have the meaning given in paragraph 3.1 of Schedule 6A (Adaptive Pricing);

"Final Approval Milestone" means the Milestone set out in the third row of the Table in Annex 7 to the Service Requirements;

"Final Approval Milestone Date" means the date set out against the Final Approval Milestone in the second column of the Table at Annex 7 to the Service Requirements;

"Final Milestone Payment" means an amount equal to 30% of the Development Charge;

“Final Re-Submission” means the relevant documentation and/or additional information that the Supplier is required to re-submit in accordance with clause 5.13.2 (*Developing the TQ and achieving IfATE Approval*);

“Final Submission” means the Submission applicable to the Final Approval Milestone;

“Final Updated Projection” shall have the meaning given in paragraph 3.1.1 of Schedule 6A (Adaptive Pricing);

“FOIA” means the Freedom of Information Act 2000 as amended from time to time and any subordinate legislation made under that Act from time to time together with any guidance and/or codes of practice issued by the Information Commissioner or relevant Government department in relation to such legislation;

“Force Majeure Event” means, subject to clause 24.4 (*Circumstances beyond either Party’s control*), any event outside the reasonable control of either Party affecting its performance of its obligations under this Contract arising from acts, events, omissions, happenings or non-happenings beyond its reasonable control and which are not attributable to any wilful act, neglect or failure to take reasonable preventative action by that Party, including acts of God, riots, war or armed conflict, acts of terrorism, acts of government, local government or regulatory bodies, fire, flood, storm or earthquake, or disaster but excluding any industrial dispute relating to the Supplier or the Supplier Staff or any other failure in the Supplier’s or a Subcontractor’s supply chain;

“Force Majeure Notice” means a written notice served by the Affected Party on the other Party stating that the Affected Party believes that there is a Force Majeure Event;

“**Former Supplier**” means the Awarding Organisation that is operating or operated the T Level technical education qualification under the Original Contract;

"Former Supplier’s TQ" means a technical education qualification forming part of the T Levels Programme which is replaced by the TQ which is the subject of this Contract;

"Former Supplier’s TQ Specification" means the Specification of Content, the Scheme of Assessment and the Approved Provider’s Quality Assurance Process, designed, developed and delivered by a Former Supplier that meets all of the requirements of the Product Description for the TQ Specification; including any TQ Changes required by the Authority notified to the Former Supplier;

“Future Supplier” means any Awarding Organisation appointed, at any point in the future and including any Replacement Supplier, to operate one or more T Level technical education qualifications by or at the direction of the Authority from time to time, and where the Authority is operating a T Level technical education qualification, shall also include the Authority;

“GDPR” means the General Data Protection Regulation (Regulation (EU) 2016/679);

“General Change in Law” means a Change in Law where the change is of a general legislative nature (including taxation or duties of any sort affecting the Supplier) or which also affects and/or relates to a Comparable Supply;

“Good Industry Practice” means standards, practices, methods and procedures conforming to the Law and the exercise of the degree of skill and care, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced person or body engaged within the relevant industry or business sector;

“Grade Standard Exemplification Materials” means the exemplification materials referred to in, and meeting the requirements of, the relevant part of the Product Description for the Exemplification Materials;

“**Guide Standard Exemplification Materials”** means the exemplification materials referred to in, and meeting the requirements of, the relevant part of the Product Description for the Exemplification Materials and Approved by the Authority;

“IfATE Approval” means approval by the Authority pursuant to section -A2D3 of the Apprenticeships, Skills, Children and Learning Act 2009 for the TQ to be made available to Approved Providers and/or Students based on the TQ meeting the requirements of paragraph 2.1 or 2.3 of Part 1 of the Services Requirements as applicable to the satisfaction of the Authority;

“IfATE Data” means:

(a) the data, text, drawings, diagrams, images or sounds (together with any database made up of any of these) which are embodied in any electronic, magnetic, optical or tangible media, including any of the Authority's Confidential Information, and which:

(i) are supplied to the Supplier by or on behalf of the Authority; or

(ii) the Supplier is required to generate, process, store or transmit pursuant to this Contract;

(b) any Personal Data for which the Authority is the Controller; or

(c) Student Related Data;

"**Impact Assessment**" means an assessment of the impact of a Variation request completed in good faith, including:

(b) details of the impact of the proposed Variation on the Services (including the supply of the Products) and the Supplier's ability to meet its other obligations under this Contract;

(c) details of the cost of implementing the proposed Variation;

(d) details of the ongoing costs required by the proposed Variation when implemented, including any increase or decrease in the Charges and/or the Fees (as applicable), any alteration in the resources and/or expenditure required by either Party and any alteration to the working practices of either Party;

(e) a timetable for the implementation, together with any proposals for the testing of, the Variation; and

(f) such other information as the Authority may reasonably request in (or in response to) the Variation request;

"Implementation and Delivery Plan" means the outline Implementation and Delivery Plan prepared by the Supplier as part of the Supplier's Response for implementation of the Services and supply of the Products (including to meet the Milestones) and which, as at the Effective Date, is set out in Schedule 3 (*Implementatio*n), as such plan is, subject to paragraph 2.5 of Part 1 of the Service Requirements, developed and amended from time to time to fully meet the requirements of the Product Description for the "Implementation and Delivery Plan";

"Inclusive TQ Change" means any TQ Change that is not an Exclusive TQ Change;

"Indemnifier" means a Party from whom an indemnity is sought under this Contract;

"Information Commissioner" means the UK's independent authority which deals with ensuring information relating to rights in the public interest and data privacy for individuals is met, whilst promoting openness by public bodies;

"Initial Content Date" has the meaning given in clause 8.2 (*TQ Changes*);

"**Initial Development Services**" shall have the meaning given in paragraph 2.1 of Part 1 of the Service Requirements;

“Initial Projection” shall have the meaning given in paragraph 2.3 of Schedule 6A (Adaptive Pricing);

“**Initial TQ Deliverables”** means each of:

(g) The TQ Specification;

(h) TQ Specimen Assessment Materials;

(i) the Provider Approval Criteria; and

(j) the Assessment Strategy;

“Insolvency Event” means:

(a) in respect of a company:

(i) a proposal is made for a voluntary arrangement within Part I of the Insolvency Act 1986 or of any other composition scheme or arrangement with, or assignment for the benefit of, its creditors; or

(ii) a shareholders' meeting is convened for the purpose of considering a resolution that it be wound up or a resolution for its winding-up is passed (other than as part of, and exclusively for the purpose of, a bona fide reconstruction or amalgamation); or

(iii) a petition is presented for its winding up (which is not dismissed within fourteen (14) Working Days of its service) or an application is made for the appointment of a provisional liquidator or a creditors' meeting is convened pursuant to section 98 of the Insolvency Act 1986; or

(iv) a receiver, administrative receiver or similar officer is appointed over the whole or any part of its business or assets; or

(v) an application order is made either for the appointment of an administrator or for an administration order, an administrator is appointed, or notice of intention to appoint an administrator is given; or

(vi) it is or becomes insolvent within the meaning of section 123 of the Insolvency Act 1986; or

(vii) being a “small company” within the meaning of section 382(3) of the Companies Act 2006, a moratorium comes into force pursuant to Schedule A1 of the Insolvency Act 1986; or

(b) in respect of an individual or partnership, any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs in relation to that individual or partnership; or

(c) any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs under the law of any other jurisdiction;

"Intellectual Property Rights" or "IPR" means:

(i) copyright, rights related to or affording protection similar to copyright, rights in databases, patents and rights in inventions, semi-conductor topography rights, trade marks, rights in internet domain names and website addresses and other rights in trade or business names, goodwill, designs, Know-How, trade secrets and other rights in Confidential Information;

(ii) applications for registration, and the right to apply for registration, for any of the rights listed at (a) that are capable of being registered in any country or jurisdiction; and

(iii) all other rights having equivalent or similar effect in any country or jurisdiction;

"Interim Milestone" means each of the interim Milestones specified in the Table in Annex 7 to the Service Requirements;

"Interim Milestone Payment" means:

(i) in respect of Interim Milestone 1, an amount equal to 30% of the Development Charge;

(ii) in respect of the Interim Milestone 2, an amount equal to 40% of the Development Charge;

"IPR Claim" means any claim of infringement or alleged infringement (including the defence of such infringement or alleged infringement) of any IPR, used to provide the Services and/or supply the Products or otherwise provided and/or licensed by the Supplier (or to which the Supplier has provided access) to the Authority in the fulfilment of its obligations under this Contract;

"**Issues Log**" means the issues log referred to in, and meeting the requirements of, the Product Description for the Issues Log;

"**Key Dates Schedule**" means a schedule of key dates in relation to the roll-out and operation of the TQ and other technical education qualifications across the T Levels Programme including registration dates and deadlines, assessment dates, and dates for publication of results, which is based on the indicative key dates schedule in Annex 5 to the Service

Requirements and is agreed in relation to the T Levels Programme between Awarding Organisations pursuant to Schedule 4 (*Co-operation*) and Approved by the Authority;

"**Key Materials**" means materials the IPR in which the Authority reasonably requires ownership of for the Portability Purposes. Examples of where the Authority may reasonably require ownership of the IPR include because the Authority or a Future Supplier (or, where relevant, a potential Future Supplier) may need to copy or otherwise reproduce such materials (in whole or in part), to supply or communicate the same, or to be able control the use (in whole or in part) of such materials by third parties, or to authorise others to do so.

Key Materials shall include:

(i) specifications of content for each TQ including core and all specialist components;
(ii) assessment guidelines (for Providers);
(iii) quality assurance requirements (for Providers);
(iv) specimen assessment materials;
(v) standards exemplification materials;
(vi) supplementary specimen assessment materials;
(vii) employer set project guide exemplar responses;
(viii) employer set project grade exemplar responses;
(ix) updates or redevelopments of specifications of content;
(x) updates and redevelopments of any Key Materials; and
(xi) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes;

Key Materials shall not include:

1. Support Materials, insofar as they are not part of any of the expressly included items listed above;
2. question banks, insofar as they are not part of any of the expressly included items listed above and are not developed for the TQ; and
3. any systems and platforms used to support the delivery of the TQ, provided that the relevant TQ content or data held in or processed by such systems and/or platforms can be extracted without requiring further processing post-extraction (and the Supplier can demonstrate that they can be so extracted) to enable use of the relevant content and/or data by a Skilled Future Supplier in

conjunction with a non-proprietary or generally commercially available system or platform;

"Key Personnel" means the individuals identified as such in the Annex to Schedule 7 (*Staff (including Key Personnel*)) as at the Effective Date or as amended from time to time in accordance with paragraph 1.2 of Schedule 7 (*Staff (including Key Personnel)*);

"Key Roles" means the roles stated in the Annex to Schedule 7 (*Staff (including Key Personnel*)) as at the Effective Date or as amended from time to time in accordance with paragraph 1.2 of Schedule 7 (*Staff (including Key Personnel)*);

"Key Sub-Contract" means each Sub-Contract with a Key Subcontractor;

"Key Subcontractor" means any Subcontractor:

(a) which is relied upon to deliver any material part of the Services (including to supply any Products); and/or

(b) which, in the opinion of the Authority performs (or would perform if appointed) a critical role in the provision of all or any part of the Services (including the supply of any Products),

and which, as at the Effective Date, are listed in Annex 1 to Schedule 8 (*Supply Chain (including approved Subcontractors)*);

"Know-How" means all ideas, concepts, schemes, information, knowledge, techniques, methodology, and anything else in the nature of know-how relating to the Services and/or the Products;

"**KPI**" means a key performance indicator applicable to the provision of the Services (including the supply of the Products), as set out in the first column of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"**KPI Improvement Plan"** shall have the meaning given in paragraph 2.2 of Schedule 15 (*Monitoring of Performance*);

"Law" means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Supplier is bound to comply;

"Losses" means all losses, liabilities, damages, costs, expenses (including reasonable legal fees), disbursements, costs of investigation, litigation, settlement, judgment, interest and penalties whether arising in contract, tort (including negligence), breach of statutory duty, misrepresentation or otherwise and "**Loss**" shall be interpreted accordingly;

"Management Information" means the management information to be delivered to the Authority by the Supplier, as set out or referred to in Annex 9 to the Service Requirements;

"Mid-term Review" shall have the meaning given in paragraph 1.1.1 of Schedule 6A (Adaptive Pricing);

"Milestone" means an event or task to be performed as part of the provision of the Services (and/or the supply of the Products) by a specific date as described in the first column of the Table in Annex 7 to the Service Requirements;

"Moderation" means the Supplier assessment process designed to ensure that, where Approved Provider marking is undertaken in accordance with the Approved Assessment Strategy, such marking is scrutinised by a Moderator to ensure that it is in line with expected standards and Students' marks are adjusted where necessary; and "**Moderate**" will be construed accordingly;

"Moderator" means a moderator, external to the Approved Provider, employed or engaged by the Supplier to moderate marking undertaken by assessors employed or engaged by the Approved Provider of Students' performance in respect of the TQ Live Assessment Materials;

"Month" means a calendar month and "**Monthly**" shall be interpreted accordingly;

"National Insurance" means contributions required by the National Insurance Contributions Regulations 2012 (SI 2012/1868) made under section 132A of the Social Security Administration Act 1992;

"Notified Sub-contractor" means a Sub-contractor to whom Transferring Former Supplier Employees will transfer on a Relevant Transfer Date;

"**Occupation**" means a set of jobs where the main tasks and duties are characterised by a high degree of similarity, where a "job" is a role connected to a specific employment contract in a workplace;

"**Occupational Map"** means, for each Route, a map which groups Occupations according to where there is a requirement for shared technical knowledge, skills, and behaviours, and identifies the Occupations for which Standards exist;

"Occupational Standard" means the description of the Occupation and the outcomes (knowledge, skills and behaviours) which a Student will be expected to attain to successfully achieve competence in that Occupation, as approved and published by the Authority;

"**Occupational Specialist Component**" means each occupational specialist component of the TQ as referred to in the Former Supplier's TQ Specification and/or if relevant, the Outline Content;

"**Ofqual"** means the Office of Qualifications and Examinations Regulation, a statutory body created under the Apprenticeships, Skills, Children and Learning Act 2009, as amended by the Education Act 2011, to regulate qualifications, examinations and assessments in England;

"Ofqual Recognition" means recognition of the Supplier by Ofqual in respect of the TQ under section 132 of the Apprenticeships, Skills, Children and Learning Act 2009;

"**Ongoing Development Services"** shall have the meaning given in paragraph 2.3 of Part 1 of the Service Requirements;

"Operate" in relation to a qualification means to provide the Services or a material part of the Services, or services replacing the Services or a material part of the Services, or of an equivalent character to the Services or a material part of the Services in relation to any other qualification (whether a TQ or not); and "Operation" and other cognate terms shall have a corresponding meaning;

"Operational Delivery Report" means the report referred to in the third row of the first column in the Table in Annex 9 to the Service Requirements and containing the information set out in the third row of the second column of that Table;

"**Ordinary Exit**" means any termination of this Contract (other than an Early Exit) that occurs as a result of the expiry of the Contract on the Expiry Date (as extended by any Extension Period);

"Original Contract" means the contract entered into between the Authority and the Former Supplier for the provision of Services (including the supply of any Products) for the TQ prior to

the Effective Date of this Contract and remains in place until the end of the Entry Transition Period;

"Outline Content" means the outline content developed for the TQ by the Authority;

"Parliament" takes its natural meaning as interpreted by Law;

"Party" means the Authority or the Supplier and "**Parties**" means both of them where the context permits;

"Pathway" means a sub-set of a Route, which groups common sets of Occupations into a number of occupational clusters together;

"**Performance Monitoring Methodology**" means the required evidence and measurement methodology that is to be applied by the Supplier to assess its performance of the relevant part of the Services (including the supply of any Products) to which the KPI in question relates, as such evidence and measurement methodology are set out in the fifth and sixth columns (respectively) of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"**Performance Monitoring Period**" means the period set out against the relevant KPI in the fourth column of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"**Performance Review Meeting"** shall have the meaning given in paragraph 3.2 of Schedule 15 (*Monitoring of Performance*);

"Personal Data" means "personal data" (as defined in the GDPR) that are processed under this Contract;

"**Portability Purposes"** means in order:

a) to secure a smooth transition to a Skilled Future Supplier;
b) to enable the Authority to procure a Skilled Future Supplier (including inviting competition and/or tenders), and for a potential Skilled Future Supplier to compete openly and effectively in any future competition or tender for, delivery and/or Operation of the TQ currently delivered by the Supplier and/or a Replacement TQ;
c) to enable a Skilled Future Supplier to deliver and/or Operate the TQ and/or a Replacement TQ; to enable the Authority and/or any Skilled Future Supplier to carry out or have carried out any Continuing Activities; and/or

d) to enable a Skilled Future Supplier to supply, to Providers, the TQ and/or Replacement TQ and sufficient information and materials (including Support Materials) for Providers to deliver the TQ in a Transparent manner;

"Post-Results Services" means the Services described in and/or provided pursuant to paragraph 9 of Part 1 of the Service Requirements, including the Additional Services;

"**Pre-Delivery Phase**" means the period between the Approval of the TQ and the first teaching of the TQ by Providers, being the period during which Supplier and Providers prepare for delivery;

"Prescribed Person" means a legal adviser, an MP or an appropriate body which a whistle-blower may make a disclosure to as detailed in 'Whistleblowing: list of prescribed people and bodies', 5 October 2019, available online at:

https://www.gov.uk/government/publications/blowing-the-whistle-list-of-prescribed-people-and-bodies--2/whistleblowing-list-of-prescribed-people-and-bodies;

"Processor" has the same meaning as in the GDPR and "**Processing**"; and "**Processed**" shall be interpreted accordingly;

"**Product**" means each product listed in the first column of the Table in Part 3 of the Service Requirements;

"**Product Description"** means the description of the Authority's minimum requirement for the relevant Product set out in the second column of the Table in Part 3 of the Service Requirements, together with such further information, data and/or content as should reasonably be expected by the Supplier having regard to the Authority's requirements under this Contract and the Supplier's obligations under clause 3.1 (*How the Services must be supplied*);

"Prohibited Acts" means:

(k) to directly or indirectly offer, promise or give any person working for or engaged by the Authority or any other public body a financial or other advantage to:

(i) induce that person to perform improperly a relevant function or activity; or

(ii) reward that person for improper performance of a relevant function or activity;

(l) to directly or indirectly request, agree to receive or accept any financial or other advantage as an inducement or a reward for improper performance of a relevant function or activity in connection with this Contract; or

(m) committing any offence:

(i) under the Bribery Act 2010 (or any legislation repealed or revoked by such Act); or

(ii) under legislation or common law concerning fraudulent acts; or

(iii) defrauding, attempting to defraud or conspiring to defraud the Authority or other public body; or

(n) any activity, practice or conduct which would constitute one of the offences listed under (c) above if such activity, practice or conduct had been carried out in the UK;

"Provider" means an organisation that has a grant agreement and/or a contract in place with the ESFA to provide qualifications to Students or that provides such services on a privately funded basis;

"Provider Approval" means approval of the Eligible Provider in accordance with clause 7.1 (*Interaction with Providers*);

"Provider Approval Criteria" means the approval criteria referred to in, and meeting the requirements of, the Product Description for the Provider Approval Criteria;

"Provider Contract" means a contract between an Approved Provider and the Supplier in respect of the TQ meeting the requirements set out in Schedule 17 (*Provider Contract requirements*);

"Provider Services" means the Services, other than the Initial Development Services and the Ongoing Development Services;

"Rate Card" means the Supplier's rate card as set out in Schedule 6 (*Pricing Schedule*)*;*

"Reasonable Adjustments" shall have the meaning given in SR 2.4 of Service Requirement 2 (as defined in the Service Requirements);

"Recipient Party" means the Party which receives or obtains directly or indirectly Confidential Information;

"Reduced Entry Fee" shall have the meaning given in paragraph 2.4 of Schedule 6A (Adaptive Pricing);

"Reduced Extension Entry Fee" shall have the meaning given in paragraph 3.3 of Schedule 6A (Adaptive Pricing);

"Regulated" means the regulation by Ofqual of a qualification which has been Accredited and "**Regulation**" shall be authorised accordingly;

"Regulations" means the Concession Contracts Regulations 2016;

"Relevant Competence" means being a reasonably skilled and competent Awarding Organisation with access to appropriate tools, systems and platforms to operate technical qualifications;

"Relevant Employees" means those employees whose contracts of employment transfer with effect from the Relevant Transfer Date to the Authority or a Replacement Supplier by virtue of the application of TUPE;

"Relevant Requirements" means all applicable Law relating to bribery, corruption and fraud, including the Bribery Act 2010 and any guidance issued by the Secretary of State for Justice pursuant to section 9 of the Bribery Act 2010;

"Relevant Transfer" means a transfer of employment to which TUPE applies;

"Relevant Transfer Date" means in relation to a Relevant Transfer, the date upon which the Relevant Transfer takes place;

"Reminder Notice" means a written notice sent in accordance with clause 4.8 (*Pricing and payments*) given by the Supplier to the Authority providing notification that payment has not been received on time, which must be addressed to the Authority Authorised Representative, must set out the sum due, must reference this Contract and clause 4 (*Pricing and payments*) and attach a copy of the relevant valid invoice;

"Replacement Subcontractor" means a Subcontractor of the Replacement Supplier to whom Transferring Supplier Employees will transfer on a Service Transfer Date (or any Subcontractor of any such Subcontractor);

“Replacement Services” means any services (including the supply of products) which are the same as or substantially similar to any of the Services and which the Authority receives in substitution for any of the Services following the expiry or termination or Partial Termination of this Contract, whether those services are provided by the Authority internally and/or by any third party;

“Replacement Supplier” means any third party provider of Replacement Services appointed by or at the direction of the Authority from time to time, or where the Authority is providing Replacement Services on its own account, shall also include the Authority;

“Replacement TQ” means a technical education qualification forming part of the T Levels Programme to replace either: (i) the TQ which is the subject of this Contract; or (ii) the equivalent technical qualification which is the subject of a contract with a Future Supplier;

“Request for Information” means a request for information or an apparent request for information relating to this Contract or an apparent request for such information under the FOIA or the EIRs;

“Required Insurances” means the insurances that must be held by the Supplier as required by the Authority meeting the requirements set out in Schedule 19 (*Required Insurances*);

“Resource Plan” means the Resource Plan prepared by the Supplier as part of the Supplier’s Response in relation to the Supplier Staff that shall be utilised (and the manner in which such Supplier Staff shall be utilised) by the Supplier in the performance of the Services and which, as at the Effective Date, is set out in Schedule 3 (*Implementatio*n), as such plan is, subject to paragraph 2.5 of Part 1 of the Service Requirements, developed and amended from time to time to fully meet the requirements of the Product Description for the “Resource Plan”;

“Re-Submission” shall have the meaning given in clause 5.11.2(i) (*Developing the TQ and achieving IfATE Approval*);

“**Risk Register”** means the risk register referred to in, and meeting the requirements of, the Product Description for the Risk Register;

“Route” means the broadest category of Occupations in an Occupational Map, typically covering an industrial area;

“Route Panel” means the Authority’s panel responsible for managing the development of the TQ Specification, details of which can be found at:

https://www.gov.uk/government/publications/t-level-panels-membership;

“**Scheme of Assessment”** means the scheme of assessment referred to in, and meeting the requirements of, the relevant part of the Product Description for the TQ Specification;

“Security Policy” means the Authority's security policy, in force as at the Effective Date (a copy of which has been supplied to the Supplier), as updated from time to time and notified to the Supplier;

“Serious Fraud Office” means the UK Government body named as such as may be renamed or replaced by an equivalent body from time to time;

“Services” means the services as described in the Service Requirements (including the Additional Services);

“**Service Failure”** shall have the meaning given in paragraph 2.2 of Schedule 15 (*Monitoring of Performance*);

“Service Requirements” means the Authority’s requirements for the Services (including the supply of the Products) as set out in Schedule 2 (*Service Requirements*);

“Service Transfer” means any transfer of the Services (or any part of the Services), for whatever reason, from the Supplier or any Subcontractor to a Replacement Supplier or a Replacement Subcontractor;

“Service Transfer Date” means the date of a Service Transfer;

“Skilled Future Supplier” means a Future Supplier with Relevant Competence;

“Social Value” means the additional social benefits that can be achieved in the delivery of the Contract, set out in the Supplier’s Response and/or Supplier’s Tender;

“Special Consideration” shall have the meaning given in SR 2.5 of Service Requirement 2 (as defined in the Service Requirements);

“Specific Change in Law” means a Change in Law that relates specifically to the business of the Authority and which would not affect a Comparable Supply where the effect of that

Specific Change in Law on the Services and/or the Products and/or the performance of this Contract is not reasonably foreseeable at the Effective Date. Any change in any Condition of Recognition shall not be a Specific Change in Law;

"**Specification of Content"** means the specification of the content referred to in, and meeting the requirements of, the relevant part of the Product Description for the TQ Specification;

"Staffing Information" means in relation to all persons identified on the Supplier's Provisional Supplier Personnel List or Supplier's Final Supplier Personnel List, as the case may be, such information as the Authority may reasonably request (subject to all applicable provisions of the Data Protection Legislation), but including in an anonymised format:

(o) their ages, dates of commencement of employment or engagement, gender and place of work;

(p) details of whether they are employed, self-employed contractors or consultants, agency workers or otherwise;

(q) the identity of the employer or relevant contracting Party;

(r) their relevant contractual notice periods and any other terms relating to termination of employment, including redundancy procedures, and redundancy payments;

(s) their wages, salaries, bonuses and profit sharing arrangements as applicable;

(t) details of other employment-related benefits, including (without limitation) medical insurance, life assurance, pension or other retirement benefit schemes, share option schemes and company car schedules applicable to them;

(u) any outstanding or potential contractual, statutory or other liabilities in respect of such individuals (including in respect of personal injury claims);

(v) details of any such individuals on long term sickness absence, parental leave, maternity leave or other authorised long term absence;

(w) copies of all relevant documents and materials relating to such information, including copies of relevant contracts of employment (or relevant standard contracts if applied generally in respect of such employees); and

(x) any other Employee Liability Information" as such term is defined in regulation 11 of TUPE;

"Stakeholders" means the Authority, the Department, ESFA, Ofqual, Providers, Employers and members of the Route Panels;

"Standards" means the Occupational Standards, consisting of a description of the Occupation and the outcomes (knowledge, skills and behaviours) which a Student will be

expected to attain to successfully achieve competence in that Occupation, as approved and published by the Authority;

"Storage Media" means the part of any device that is capable of storing and retrieving data;

"Student" means an individual undertaking (or who wishes to undertake) a formal programme of study with an Approved Provider for the T Level of which the TQ forms part;

"Student Information" means information or data relating to an individual Student whether or not the Student can be identified from that information or data;

"Student Related Data" means any information or data relating to Students (including any Student Information) and/or any Provider which is generated and/or acquired by and/or otherwise comes into the possession of the Supplier and/or any Supplier Staff as a result of the performance of the Supplier's obligations under this Contract;

"Sub-Contract" means any contract or agreement (or proposed contract or agreement), pursuant to which a third party:

(y) provides the Services and/or supplies any Products (or any part of them) and/or performs the whole or any part of this Contract;

(z) provides facilities or services necessary for the provision of the Services and/or the supply of any Products (or any part of them) and/or the performs the whole or any part of this Contract; and/or

(aa) is responsible for the management, direction or control of the provision of the Services and/or supply of any Products (or any part of them) and/or the performance of the whole or any part of this Contract;

"Subcontractor" means any person other than the Supplier (and/or an Assessor who is self-employed or who provides services to the Supplier through that Assessor's own personal service company), who is a party to a Sub-Contract and the servants or agents of that person;

"Submission" means, in respect of the relevant Milestone, the Products set out against that Milestone in the third column of the Table in Annex 7 to the Service Requirements;

"Submission Date" means, in respect of the relevant Milestone, the date set out against that Milestone in the second column of the Table in Annex 7 to the Service Requirements;

“Submission Issues Log” means the issues log referred to in, and meeting the requirements of, the Product Description for the Submission Issues Log;

“Subsequent Transfer” has the meaning given in paragraph 8.1 of Schedule 12 (*Exit Management*);

"Supplementary Specimen Assessment Materials" means a full suite of sample questions and tasks for the Core Component and Occupational Specialist Component(s) (in addition to the TQ Specimen Assessment Materials), as referred to in Service Requirement 5.1;

“**Supplier Authorised Representative”** means the person referred to in Schedule 20 as such or the representative appointed by the Supplier from time to time in relation to this Contract as notified in writing (which may, in the case of this specific notification, be by email only) to the Authority;

“Supplier Personnel” means all employees of the Supplier (and any subcontractor) who are wholly or mainly engaged in or assigned to the provision of the Services or any relevant part of the Services including the development of the Products;

“Supplier Staff” means all directors, officers, employees, agents, consultants and contractors of the Supplier (including any Assessor who is self-employed or who provides services to the Supplier through that Assessor’s own personal service company), any Subcontractor engaged in the performance of the Supplier's obligations under this Contract and any company or organisation noted in the Supplier’s Tender as forming part of the consortium which submitted the Supplier’s Tender (“**Consortium Member**”) and all directors, officers, employees, agents, consultants and contractors of any such Subcontractor and/or any such Consortium Member engaged in the performance of the Supplier's obligations under this Contract;

“Supplier's Final Supplier Personnel List” means a list provided by the Supplier of all Supplier Personnel whose will transfer under TUPE on the Service Transfer Date;

“Supplier’s Provisional Supplier Personnel List” means a list prepared and updated by the Supplier of all Supplier Personnel who are at the date of the list wholly or mainly engaged in or assigned to the provision of the Services or any relevant part of the Services which it is envisaged as at the date of such list will no longer be provided by the Supplier;

“Supplier’s Response” means that part of the Supplier’s Tender (including any method statements) which is at Schedule 5 (*Supplier’s Response*);

"Supplier's Tender" means the Supplier's selection questionnaire and tender responses submitted in response to the Authority's advertisement in the Find a Tender Service (as referred to in the Recitals to this Contract) for a provider of the Services and supplier of the Products, as clarified in writing by the Supplier to the Authority prior to the date of this Contract in response to any request for clarification issued by the Authority;

"Supplier Termination Event" means:

(a) the Supplier (i) commits a material Default which is irremediable; or (ii) commits a material Default which is capable of remedy, but which has not been remedied by the Supplier within 30 days of being notified in writing to do so by the Authority;

(b) a Conflict of Interest arises in connection with the delivery of the Services (and/or the supply of the Products) to which no mitigation acceptable to the Authority can be promptly identified;

(c) where a right of termination is expressly reserved in this Contract;

(d) the Supplier is in material Default in respect of any data handling and/or security requirements set out in clauses 13, 18, 19 or Schedule 9 (*Data Handling and Security Management*) (where applicable);

(e) an Insolvency Event occurring in respect of the Supplier

(f) a change of Control of the Supplier;

(i) the Authority has given its prior written consent (not to be unreasonably withheld or conditioned) to the particular change of Control, which subsequently takes place as proposed; or

(ii) the Authority has not served its notice of objection within 6 months of the later of the date on which the change of Control took place or the date on which the Authority was given notice of the change of Control;

(g) a material failure by the Supplier to comply with legal obligations in the fields of environmental, social or labour law;

(h) the departure from the Supplier of any of its senior officers or Key Personnel where the Authority has reasonable grounds to believe that such departure will impact or could potentially impact the delivery of the Services and/or the supply of any Products unless the Authority has not served its notice of objection within 6 months of the date on which the Authority was informed by the Supplier of such departure;

(i) the Supplier assigns, transfers or otherwise disposes of its rights, obligations and/or liabilities or seeks to assign, transfer or otherwise dispose of its rights, obligations and/or liabilities under the whole or any part of this Contract to a third party in breach

of the terms of this Contract (including in breach of the requirements of paragraph 1 of Schedule 8 (*Supply Chain (including approved Subcontractors)*);

(j) the Supplier is in Default under clause 31.1 (*Preventing Fraud, Bribery and Corruption*);

(k) the Supplier provided incorrect or misleading information as part of the Supplier's Tender;

(l) the Supplier or any Subcontractor or Affiliate through its act or omission brings the Authority, the Department and/or the ESFA and/or the T Levels Programme into disrepute and/or diminishes the trust the public places in the Authority, the Department and/or the ESFA;

(m) Not used

(n) an occurrence of any of the circumstances in regulations 44(1) (a) to (c) of the Regulations;

(o) this Contract has been substantially modified in breach of regulation 43(10) of the Regulations;

(p) the Authority discovers that the Supplier was in one of the situations in regulations 38(8) to 38(10) of the Regulations at the time this Contract was awarded;

(q) the Court of Justice of the European Union uses Article 258 of the Treaty on the Functioning of the European Union ("**TFEU**") to declare that this Contract should not have been awarded to the Supplier because of a serious breach of the TFEU or the Regulations;

(r) a Critical Service Failure occurs; or

(s) the Supplier fails to comply with clause 35.2 (*Tax*) or fails to provide details of steps being taken and mitigating factors pursuant to clause 35.2 (*Tax*) which in the reasonable opinion of the Authority are acceptable;

"**Support Materials**" means teaching support materials intended for a Provider or Student audience, such as textbooks, and any other materials which the Authority agrees in writing to be Support Materials;

"**Target Service Level**" means the target performance level set out against the relevant KPI in the third column of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"Technical Qualifications Explanatory Note" means an explanation of TQs, their purpose and how they are delivered;

"Term" means the period commencing on the Effective Date and ending on the End Date;

"Termination Notice" means a written notice of termination given by one Party to the other, notifying the Party receiving the notice of the intention of the Party giving the notice to terminate this Contract on a specified date and setting out the grounds for termination;

"Third Party" means any supplier of services fundamentally the same as the Services (either in whole or in part) immediately before the Effective Date;

"Third Party IPR" means Intellectual Property Rights owned by a third party which is or will be used by the Supplier for the purpose of providing the Services and/or supplying the Products;

"Transferring Former Supplier Employees" means those employees of the Former Supplier to whom TUPE will apply on a Relevant Transfer Date;

"TQ" means the technical education qualification element of the T Level in respect of the Pathway that is (amongst other things) designed, developed and delivered under this Contract;

"TQ Assignment and Licence" means the assignment and licence in respect of certain Intellectual Property Rights in relation to the TQ in the form set out in Schedule 14 (*Form of Assignment and Licence*);

"TQ Change" means any change or variation to the content of the TQ;

"**TQ Content Updating Schedule**" means the schedule of dates set out in Annex 6 to the Service Requirements (or such other dates as may be agreed by the Authority from time to time) applicable to the relevant Inclusive TQ Change or Exclusive TQ Change (as the case may be);

"**TQ Core Component**" means the core component of the TQ referred to in the Former Supplier's TQ Specification and/or if relevant, the Outline Content;

"**TQ Deliverables"** means:

(a) in the period prior to the Supplier making available the Grade Standard Exemplification Materials referred to in paragraph 6.2.2 of Part 1 of the Service Requirements, the Approved Initial TQ Deliverables and the Approved Guide Standard Exemplification Materials; and

(b) in the period following the Supplier making available the Grade Standard Exemplification Materials referred to in paragraph 6.2.2 of Part 1 of the Service Requirements:

(i) the Approved Initial TQ Deliverables; and

(ii) the Grade Standard Exemplification Materials,

in each case, as amended in accordance with this Contract;

"TQ Development Meeting" shall have the meaning given in clause 5.4 (*Developing the TQ and achieving IfATE Approval*);

"TQ Live Assessment Materials" shall have the meaning given in Schedule 2 (*Service Requirements*);

"TQ Specification" means the Specification of Content, the Scheme of Assessment and the Approved Provider's Quality Assurance Process;

"TQ Specimen Assessment Materials" means the specimen assessment materials referred to in, and meeting the requirements of, the Product Description for the TQ Specimen Assessment Materials;

"T Level" means the technical study programme known as a "T Level";

"T Level Awarding Organisations" shall have the meaning given in paragraph 1.1 of Schedule 4 (*Co-operation*);

"T Level Branding Guidelines" means the Authority's written guidelines prescribing the permitted form and manner in which the trade marks (the "*Mark*" as defined within the T Level Trade Mark Licence) may be used and setting out how the Supplier branding may be used in relation to materials used in the operation of the TQ or to promote the TQ, a copy of which is set out in the document entitled T Level Branding Guidelines, including any amendments or additions notified by the Authority to the Supplier from time to time, provided that the Authority shall where possible provide reasonable notice in writing to the Supplier of any proposed amendments or additions to such guidelines;

"**T Level Panel"** means the group of Employers, professionals and practitioners appointed to advise on the content of the T Level of which the TQ forms part;

“T Level Trade Mark Licence” means the trade mark licence granted pursuant to Schedule 16 (*Logos and Trademarks – T Level Trade Mark Licence*);

“T Levels Programme” means the programme of technical education in England managed by the Authority and known as “T Levels”;

“Transferable Contracts” means Sub-Contracts, or other agreements which are necessary to enable the Authority or any Replacement Supplier to provide the Services and/or develop, maintain or supply the Products or the Replacement Services, including all relevant Documentation;

“Transferring Supplier Employee” means those employees whose contract of employment will be transferred to the Authority or a Replacement Supplier pursuant to TUPE on expiry or termination of this Contract;

“Transition Period” means the period from a Replacement Supplier or Future Supplier commencing any aspects of development or delivery of the TQ to the End Date, eg from the point when the Replacement Supplier or Future Supplier has been awarded a contract for provision of the TQ, but while this Contract remains in place for existing Students;

“Transparency Information” has the meaning given to it in clause 20 (*When information can be shared);*

“Transparency Reports” means: (i) the Management Information relating to the Services and performance of this Contract which the Supplier is required to provide to the Authority in accordance with the reporting requirements set out in the Service Requirements; and (ii) the output of any survey commissioned by the Authority in connection with the performance of the Supplier under this Contract;

“Transparent” means that Students and Employers will regard the TQ delivered by a Future Supplier as materially the same as the TQ delivered and operated by the (existing) Supplier;

“TUPE” means the Transfer of Undertakings (Protection of Employment) Regulations 2006 (2006/246) and/or any other regulations or other legislation enacted for the purpose of implementing or transposing the Acquired Rights Directive (77/187/EEC, as amended by Directive 98/50 EC and consolidated in 2001/23/EC) into English law;

“TUPE Information” has the meaning given in paragraph 8.5 of Schedule 12 (*Exit Management*);

“Updated Projection” shall have the meaning given in paragraph 2.1 of Schedule 6A (Adaptive Pricing);

“Variation” means any variation or change to this Contract which is not an Inclusive TQ Change;

“Variation Form” means the form set out in Schedule 11 (*Change Management*);

“VAT” means value added tax in accordance with the provisions of the Value Added Tax Act 1994; and

“Working Day” means any day other than a Saturday or Sunday or public holiday in England and Wales.

Schedule 2

Service Requirements

The content for this Schedule is contained in separate files at;

S2_GEN2W1_BSE_Service_Requirements

S2_A3_GEN2W1_BSE_TQ_Spec

Schedule 2

Service Requirements

S2_GEN2W1_BSE_Service_Requirements

Schedule 2

Service Requirements

Definitions

In this Service Requirements, the following terms shall have the following meanings:

"**Appeal**" shall have the meaning given in SR 8.2 in Service Requirement 8;

"**Approved Assessment Strategy**" means the Assessment Strategy approved by the Authority in accordance with clause 5.13 (*Developing the TQ and achieving IfATE Approval*) or clause 8 (*TQ Changes*) (as the case may be), subject to paragraph 2.6 of Part 1 of the Service Requirements, as amended from time to time in accordance with this Contract;

"**Approved Guide Standard Exemplification Materials**" means the Guide Standard Exemplification Materials approved by the Authority in accordance with clause 5.13 (*Developing the TQ and achieving IfATE Approval*) subject to paragraph 2.6 of Part 1 of the Service Requirements, as amended from time to time in accordance with this Contract;

"**Component**" means the TQ Core Component or any Occupational Specialist Component (as the case may be) and "**Components**" shall mean both or all of them (as the context may require);

"**Employer Set Project"** means a project set collaboratively between the Supplier and Employers, as more particularly referred to in Service Requirement 2;

"**External Examination"** means each assessment by examination which is:

(a) set by the Supplier;

(b) designed to be taken simultaneously by all Students taking the relevant assessment at a time (subject to compliance with the requirements of the Key Dates Schedule for the relevant Academic Year) determined by the Supplier;

(c) taken under conditions specified by the Supplier (including conditions relating to the supervision of Students taking the relevant assessment and the duration of the assessment); and

(d) marked by the Supplier.

"**First Teach Cohort**" means the first group of Students to be assessed on the TQ;

"**Guided Learning**" means the activity of a Student being taught or instructed by, or otherwise participating in education or training under the immediate guidance or supervision of a lecturer, supervisor, tutor or other appropriate provider of education or training. For these purposes the activity of 'participating in education or training' shall be treated as including the activity of being assessed if the assessment takes place under the immediate guidance or supervision of a lecturer, supervisor, tutor or other appropriate provider of education or training;

"**Occupational Entry Competence**" means that level of competence that:

(a) signifies that a Student is well-placed to develop full occupational competence, with further support and development, once in employment;

(b) is as close to full occupational competence as can be reasonably expected of a Student studying the TQ in a classroom-based setting (e.g. in the classroom, workshops simulated working and (where appropriate) supervised working environments); and

(c) signifies that a Student has achieved the level for a pass in relation to the relevant Occupational Specialist Component;

"**Qualification Purpose**" means the purpose of the TQ set out in Annex 1 of this Service Requirements;

"**Service Definition Table**" means the Table set out in Part 2 of this Service Requirements;

"**Service Requirement 1**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 1: Designing, developing and managing TQ Content" in the Service Definition Table;

"**Service Requirement 2**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 2: Assessment Design and Delivery" in the Service Definition Table;

"**Service Requirement 3**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 3: Grading and Awarding" in the Service Definition Table;

"**Service Requirement 4**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 4: Provider Approval" in the Service Definition Table;

"**Service Requirement 5**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 5: Provider Support" in the Service Definition Table;

"**Service Requirement 6**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 6: Student registration and Student entry" in the Service Definition Table;

"**Service Requirement 7**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 7: TQ Results" in the Service Definition Table;

"**Service Requirement 8**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 8: TQ Post-Results Services" in the Service Definition Table;

"**Service Requirement 9**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 9: Reporting" in the Service Definition Table;

"**TQ Critical Path Diagram**" means the diagram setting out the critical path for the design, development and delivery of the TQ attached at Annex 4 to the Service Requirements;

“**TQ Live Assessment Materials**” means the live assessment materials referred to in, and meeting the requirements of, the Product Description for the TQ Live Assessment Materials.

Part 1 – Overview of the Service Requirements

1 Introduction

1.1 This Part 1 of this Service Requirements sets out:

1.1.1 at paragraph 2, that part of the Services relating to the design, development and delivery of the Initial TQ Deliverables and Guide Standard Exemplification Materials and the review and update of such Initial TQ Deliverables and/or the TQ Deliverables (as the case may be), including the Initial Development Services and the Ongoing Development Services;

1.1.2 at paragraph 3, that part of the Services relating to the Provider Approval and monitoring services (as detailed in that paragraph 3);

1.1.3 at paragraph 4, that part of the Services relating to the support to be provided to Eligible Providers and Approved Providers (as detailed in that paragraph 4);

1.1.4 at paragraph 5, that part of the Services relating to Student registration and Student assessment entry (including Additional Services) (as detailed in that paragraph 5);

1.1.5 at paragraph 6, that part of the Services relating to the design and delivery of the TQ Live Assessment Materials (as detailed in that paragraph 6);

1.1.6 at paragraph 7, that part of the Services relating to grading and awarding in respect of each Student's performance in respect of the TQ Live Assessment Materials (as detailed in that paragraph 7);

1.1.7 at paragraph 8, that part of the Services relating to the provision of results (as detailed in that paragraph 8);

1.1.8 at paragraph 9, that part of the Services relating to the provision of Post-Results Services (including Additional Services) (as detailed in that paragraph 9);

1.1.9 at paragraph 10, that part of the Services relating to the reporting of Management Information (as detailed in that paragraph 10); and

1.1.10 at paragraph 11, such other services as may be necessary to support and/or are associated with the provision of the Services (as detailed in that paragraph 11).

1.2 Paragraphs 2 (*Initial TQ Deliverables and development services*) to 9 (*TQ Post-Results Services*) shall be read in conjunction with the TQ Critical Path Diagram.

1.3 The Supplier shall design, develop, obtain IfATE Approval for, and deliver to Approved Providers in England, the technical qualification element of the T Level for the relevant Pathway under this Contract, including, without prejudice to its obligations in clause 3.1.8 (*How the Services must be supplied*), performing all of the Services set out in this Service Requirements.

1.4 Unless otherwise stated in this Service Requirements, the Supplier shall organise and deliver the Services:

1.4.1 to ensure that the activities contemplated by the Key Dates Schedule for the relevant Academic Year and/or the TQ Content Updating Schedule (and which rely on the performance of the whole or any part of the Services) can be carried out and completed in accordance with such Key Dates Schedule and/or the TQ Content Updating Schedule (as the case may be);

1.4.2 in accordance with the Implementation and Delivery Plan;

1.4.3 in accordance with the Resource Plan;

1.4.4 in accordance with the Approved Assessment Strategy; and

1.4.5 (at all times) taking into account the aims of the Qualification Purpose.

1.5 The Supplier shall, subject to paragraphs 2.5 and 2.6 (*Initial TQ Deliverables and development services*) and paragraph 6.3 (*TQ live assessment design and delivery*) and without prejudice to paragraph 2.1 to 2.4 (*Initial TQ Deliverables and development services*) (inclusive), provide a copy of any Products that are developed, amended, updated and/or supplemented from time to time by the Supplier in accordance with this Contract to the Authority as soon as reasonably practicable following such development, amendment, update and/or supplement.

1.6 If there is any conflict and/or inconsistency between the provisions of this Service Requirements and the Conditions of Recognition, the Conditions of Recognition shall prevail.

1.7 Without prejudice to paragraph 1.4.1, the Supplier shall organise and deliver the Services to ensure that all applicable parts of the Services are provided at such times and in such manner as shall be necessary to facilitate the delivery of the number of assessment series for the TQ as shall be contemplated by the Key Dates Schedule for the relevant Academic Year, subject always to the provisions of paragraphs 1.8 to 1.10 (inclusive).

1.8 The Supplier shall ensure that there shall be at least one, but not more than two, assessment series in each Academic Year in respect of each of the assessments for:

1.8.1 the TQ Core Component (comprising the External Examination and the Employer Set Project); and

1.8.2 the Occupational Specialist Components.

1.9 The Supplier acknowledges that the assessments in each Academic Year for the TQ Core Component and the Occupational Specialist Components referred to in paragraph 1.8 may be, but are not required to be, held in the same assessment series and so therefore can be for example:

1.9.1 provided in a single assessment series (encompassing both such assessments for the TQ Core Component and the Occupational Specialist Components); or

1.9.2 provided in two assessment series (for each of such assessments for the TQ Core Component and the Occupational Specialist Components) being a total of four assessment series.

1.10 The Supplier shall ensure that:

1.10.1 each Student takes all of the assessments for the TQ Core Component referred to in paragraph 1.8.1;

1.10.2 each Student takes all of the assessments for each individual Occupational Specialist Component referred to in paragraph 1.8.2 in the same assessment series;

1.10.3 a Student may, subject to paragraphs 1.10.1 and 1.10.2, take the assessments for the TQ Core Component and the Occupational Specialist Components referred to in paragraph 1.8 in different assessment series (including assessment series in different Academic Years); and

1.10.4 its approach to the scheduling of the assessments shall be set out in its Assessment Strategy.

2 Initial TQ Deliverables and development services

Initial Development Services

2.1 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and clause 5 (*Developing the TQ and achieving IfATE Approval*), the Supplier shall design, develop and deliver the Initial TQ Deliverables in accordance with (and meeting all of the requirements of):

2.1.1 the Product Description for each item forming part of the Initial TQ Deliverables;

2.1.2 the Former Supplier's TQ Specification and/or ,if relevant, the Outline Content;

2.1.3 the requirements set out in the third column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4;

2.1.4 the Implementation and Delivery Plan (including the Supplier's obligation to work with and consult (and take into account the outcome of such working with and consultation of) a representative sample of Providers and Employers (as required by that Implementation and Delivery Plan);

2.1.5 the Resource Plan;

2.1.6 the Assessment Strategy; and

2.1.7 Annex 7 (*Initial Development Milestones*) to this Service Requirements,

and, in each case, to ensure the delivery of a high quality technical education qualification element of the T Level for the relevant Pathway and that the outcomes referred to in the first column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4 are achieved (the "**Initial Development Services**").

2.2 The Supplier shall procure that, without prejudice to its obligations in clause 5.13.2 (*Developing the TQ and achieving IfATE Approval*), the Initial TQ Deliverables

(meeting all of the requirements of paragraph 2.1) shall be delivered to the Authority on or prior to the Final Approval Milestone Date.

Ongoing Development Services

2.3 The Supplier shall procure that (without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and clause 5.3 (*Developing the TQ and achieving IfATE Approval*) and notwithstanding the achievement of IfATE Approval in respect of the Initial TQ Deliverables) throughout the Term the TQ Deliverables meet (and continue to meet) all of the requirements of:

2.3.1 the Product Description for each item forming part of the TQ Deliverables;

2.3.2 the Former Supplier's TQ Specification and, if relevant, the Outline Content;

2.3.3 the requirements set out in the third column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4;

2.3.4 the Implementation and Delivery Plan (including the Supplier's obligation to work with and consult (and take into account the outcome of such working with and consultation of) a representative sample of Providers and Employers (as required by that Implementation and Delivery Plan));

2.3.5 the Resource Plan;

2.3.6 the Approved Assessment Strategy; and

2.3.7 clause 8 (*TQ Changes*) and Annex 6 (*TQ Content Updating Schedule*) to this Service Requirements,

and in each case, to ensure the continued delivery of a high quality technical education qualification element for the T Level for the relevant Pathway and that the outcomes referred to in the first column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4 are achieved (the "**Ongoing Development Services**").

2.4 The Supplier shall procure that the TQ Deliverables (as amended, supplemented or replaced in accordance with clause 8 (*TQ Changes*) and Annex 6 (*TQ Content Updating Schedule*) to this Service Requirements) shall be delivered to the Authority

on or prior to the applicable date specified on the Key Dates Schedule for the relevant Academic Year or TQ Content Updating Schedule (as applicable).

Updating the Implementation and Delivery Plan and the Resource Plan

2.5 Subject to the provisions of paragraph 3 *(Key Personnel)* of Schedule 7 *(Staff including Key Personnel)*, the Parties acknowledge and agree that the Implementation and Delivery Plan and the Resource Plan are intended to be live documents that may need to flex from time to time to ensure the continued successful delivery of the Services to the standards required by this Contract and the Supplier shall, throughout the Term, review, amend and update (as necessary) each of the Implementation and Delivery Plan and the Resource Plan to ensure that such Implementation and Delivery Plan and Resource Plan takes into account (and (where applicable) mitigates the effects of) all relevant factors that have impacted or may impact upon the successful delivery of the Services to the standards required by this Contract, provided always that where any such review, amendment and/or update would (or is reasonably likely to) operate to reduce and/or otherwise diminish the Authority's rights and/or remedies and/or the Supplier's liabilities contemplated by this Contract (including where, but for such review, amendment and/or update, the Supplier would (or would be reasonably likely to) be in Default under this Contract), the Supplier shall:

2.5.1 submit such proposed reviewed, amended and/or updated Implementation and Delivery Plan and/or Resource Plan (as the case may be) to the Authority for Approval; and

2.5.2 where the Supplier does not obtain such Approval, the Implementation and Delivery Plan and/or Resource Plan (as the case may be) shall be deemed not to have been so reviewed, amended and/or updated to the extent that such review, amendment and/or update would (or would be reasonably likely to) operate to so reduce the Authority's rights and/or remedies and/or the Supplier's liabilities under this Contract.

Updating the Approved Initial TQ Deliverables and TQ Deliverables

2.6 The Supplier shall, notwithstanding the achievement of IfATE Approval in relation to the Initial TQ Deliverables and subject to the provisions of clauses 8.4 and 8.5 (*TQ Changes*) and Annex 6 (*TQ Content Updating Schedule*) to this Service Requirements (which shall apply in respect of the annual review referred to in such clauses 8.4 and 8.5 (*TQ Changes*)), be required to keep under review, and entitled to amend and update, the Approved Initial TQ Deliverables and the TQ Deliverables throughout the

Term to ensure that the Supplier continues to meet its obligations under paragraph 2.3, provided always that the Supplier shall:

2.6.1 notify the Authority (as part of the Operational Delivery Report) of any proposed amendments and/or updates to such Approved Initial TQ Deliverables and/or TQ Deliverables; and

2.6.2 comply with the applicable requirements of clauses 8.10 and 8.11 (*TQ Changes*) prior to making available any such amended and/or updated Approved Initial TQ Deliverables and/or TQ Deliverables to Approved Providers and provided further that the words "*by the relevant date prescribed by the TQ Content Updating Schedule*" in such clauses 8.10 and 8.11 shall be deemed to be deleted for the purposes of this paragraph 2.6.

3 TQ Provider Approval and monitoring services

3.1 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*), the Supplier shall, following IfATE Approval:

3.1.1 provide that part of the Services referred to in the third column of Service Requirement 4 to ensure that the outcomes referred to in the first column of Service Requirement 4 are achieved; and

3.1.2 monitor the delivery by Approved Providers of the TQ (and the Approved Provider's continuing satisfaction of all of the requirements of the Provider Approval Criteria) in accordance with the monitoring arrangements set out in the Approved Assessment Strategy.[1]

3.2 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and paragraph 10.1 (*Reporting*) below, the Supplier shall notify the Authority (and provide full details of the circumstances) as soon as reasonably practicable where:

3.2.1 it reasonably believes that an Eligible Provider may not become an Approved Provider;

3.2.2 an Eligible Provider does not become an Approved Provider;

[1] These proposed arrangements should form part of the Supplier Response.

3.2.3 it reasonably believes that an Approved Provider may cease to be an Approved Provider;

3.2.4 an Approved Provider ceases to be an Approved Provider; and/or

3.2.5 the monitoring referred to in paragraph 3.1.2 reveals (and/or the Supplier otherwise becomes aware of):

(i) any failure by the Approved Provider to comply with the Approved Provider's Quality Assurance Process in the applicable Provider Contract;

(ii) any event, matter or circumstance which has had (or is reasonably likely to have) an adverse impact on Students (including as a result of an Appeal referred to in Service Requirement 8) and/or shall or may bring the T Level Programme into disrepute; and/or

(iii) any malpractice and/or maladministration on the part of the Approved Provider (including where any confidential TQ Live Assessment Materials (and/or the content of or information about such TQ Live Assessment Materials) is lost, stolen or transmitted).

3.3 The Supplier shall, as soon as reasonably practicable following the occurrence or identification of any matter referred to in paragraph 3.2, notify the Eligible Provider or Approved Provider (as the case may be) of any steps that are necessary to be taken by such Eligible Provider or Approved Provider (as the case may be) to remedy such matters and/or such failure and shall (as soon as reasonably practicable) notify the Authority (and provide full details) of such steps, together with details of the action that the Supplier will be taking to:

3.3.1 procure that the Eligible Provider or Approved Provider (as the case may be) takes such steps; and/or

3.3.2 mitigate the effects of such failure and/or matters.

3.4 The Supplier shall:

3.4.1 use all reasonable endeavours to procure that the Eligible Provider or Approved Provider (as the case may be) takes the steps referred to in paragraph 3.3; and

3.4.2 take the action referred to in paragraph 3.3,

together with, in either case, such further steps and/or action as the Authority may reasonably require following the notification referred to in paragraph 3.3.

3.5 The Supplier shall (in such manner (including as to timing) as the Authority may reasonably require) keep the Authority updated as to:

3.5.1 the progress by the Eligible Provider or Approved Provider (as the case may be) with the taking of the steps referred to in paragraph 3.3 (including (where applicable) whether the event, matter or circumstance giving rise to the requirement for the taking of such steps has been (or is reasonably likely to be) remedied); and

3.5.2 the action that the Supplier is taking and has taken in accordance with paragraph 3.4,

provided always that where the Supplier fails to comply with its obligations in paragraphs 3.2 to 3.4 (inclusive), such failure shall (notwithstanding the provisions of clauses 14.2.1 to 14.2.10 (*What may happen if there are issues with your provision of the Services*)) be deemed to give rise to a right for the Authority to issue written notification of Designated Action to the Supplier, to which the provisions this Contract (including clause 14.2 (*What may happen if there are issues with your provision of the Services*)) shall apply.

4 TQ Provider support services

4.1 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and Schedule 4 (*Co-operation*), the Supplier shall, throughout the Term, provide that part of the Services referred to in, and in accordance with, the third column of Service Requirement 5 to:

4.1.1 ensure that the outcomes referred to in the first column of Service Requirement 5 are achieved; and

4.1.2 following achievement of IfATE Approval, facilitate the implementation by Providers of the TQ in accordance with the Approved TQ Specification.

4.2 The Supplier shall, subject always to clause 4.12 and 4.13 (*Pricing and payments*), in respect of:

4.3 the Fees for the first Academic Year for the first Exclusive Cohort, make available details of the Fees to Eligible Providers and Approved Providers as soon as reasonably practicable;

4.4 the Fees for the second Academic Year, make available details of the Fees to Eligible Providers and Approved Providers no later than 30 April prior to the start of the second Academic Year; and

4.5 the third and each subsequent Academic Year, publish details of the Fees to Approved Providers no later than 30 April prior to the start of the relevant Academic Year.

5 Student registration and Student entry

5.1 The Supplier shall procure that Approved Providers have processes in place (and implement such processes) to ensure that, on or prior to the relevant date specified on the Key Dates Schedule for the relevant Academic Year, each Student is correctly registered for the TQ and in the manner contemplated by Service Requirement 6.

5.2 The Supplier shall procure that Approved Providers have processes in place (and implement such processes) to ensure that, on or prior to the relevant date specified on the Key Dates Schedule for the relevant Academic Year, each Student is correctly entered for assessment in respect of:

5.2.1 the TQ Core Component; and

5.2.2 each Occupational Specialist Component,

for which they are undertaking assessment.

5.3 The Supplier shall, following a request from an Approved Provider, provide the Additional Services referred to as “Late entry or entry amendment”, “Late registration or registration amendment”, “Very late entry or entry amendment” or “Very late registration or registration amendment” (as the case may be) in accordance with the applicable requirements set out against that Additional Service in Annex 10 (*Additional Services*) to this Service Requirements.

5.4 Without prejudice to the Supplier’s obligations in clause 3.1 (*How the Services must be supplied*) and paragraph 10.1 (*Reporting)* below, the Supplier shall ensure that, following IfATE Approval and (as applicable) in each Contract Month throughout the remainder of the Term, details of the registrations and assessment entries referred to in paragraph 5.1 and 5.2 are reported to the Authority in the Management Information

that is provided in respect of the Contract Month in which such registrations and/or entries are made, such reports to meet the requirements set out in the third column of each of Service Requirement 6 and Service Requirement 9 to ensure that the outcomes referred to in the first column of each of Service Requirement 6 and Service Requirement 9 are achieved.

5.5 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and elsewhere in this Service Requirements, the Supplier shall, as soon as reasonably practicable after:

5.5.1 becoming aware of any Approved Provider that is not registering any Students for the TQ (as contemplated by paragraph 5.1) and/or not entering Students for assessment (as contemplated by paragraph 5.2); and/or

5.5.2 becoming concerned as to the number of Students being registered for the TQ and/or being entered for assessment,

notify the Authority (together with full details) of such matter and/or concern.

6 TQ live assessment design and delivery

6.1 The Supplier shall (without prejudice to its obligations in clause 3.1 (*How the Services must be supplied*)):

6.1.1 on or prior to the relevant date specified on the Key Dates Schedule for the relevant Academic Year, design, develop and make available to Approved Providers the TQ Live Assessment Materials;

6.1.2 during the period specified on the Key Dates Schedule for the relevant Academic Year, administer the delivery by the Approved Providers of the TQ Live Assessment Materials and mark (or (where applicable) procure the marking and/or Moderation of) Student assessment evidence generated by the application and/or use (as the case may be) of such TQ Live Assessment Materials; and

6.1.3 during the period specified on the Key Dates Schedule for the relevant Academic Year and following a request from an Approved Provider, administer the delivery by that Approved Provider of the TQ Live Assessment Materials in respect of the Additional Services referred to as "Retakes" in accordance with the applicable requirements set out against that Additional Service in Annex 10 (*Additional Services*) of this Service

Requirements and mark (or (where applicable) procure the marking and/or Moderation of) Student assessment evidence generated by the application and/or use (as the case may be) of such TQ Live Assessment Materials,

in each case, in accordance with the then current Approved Assessment Strategy, subject to paragraph 6.2, the then current Approved Guide Standard Exemplification Materials or Grade Standard Exemplification Materials (as the case may be) and the requirements set out in the third column of Service Requirement 2 so as to ensure that the outcomes referred to in the first column of Service Requirement 2 are achieved.

6.2 The Supplier shall:

6.2.1 in respect of the First Teach Cohort for the relevant element of the Occupational Specialist Component, require the implementation and use by Approved Providers (including any assessors employed or engaged by any such Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy) and Assessors of the Approved Guide Standard Exemplification Materials for the purposes of assessing each Student's performance in respect of the TQ Live Assessment Materials; and

6.2.2 following grading of Student performance in respect of the TQ Live Assessment Materials undertaken by the First Teach Cohort of the relevant element of the Occupational Specialist Component and for each subsequent Cohort, develop, make available and require the implementation and use by Approved Providers (including any assessors employed or engaged by any such Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy) and Assessors of the Grade Standard Exemplification Materials.

6.3 The Supplier shall provide a copy of the TQ Live Assessment Materials to the Authority as soon as reasonably practicable following the date on which such TQ Live Assessment Materials are first made available to Students.

7 TQ grade awarding

7.1 Following completion of the live assessments referred to in paragraphs 6.1.2 and 6.1.3 (*TQ live assessment design and delivery*) in the relevant Academic Year, the Supplier shall (as soon as reasonably practicable but not later than the date specified on the Key Dates Schedule for the relevant Academic Year for such live assessments for that

Academic Year) assign a grade to each Student (to reflect the relevant marks awarded to each such Student) in respect of their performance in the assessment for the TQ Core Component and each Occupational Specialist Component that each such Student has undertaken in accordance with the requirements set out in the third column of Service Requirement 3 and so as to ensure that the outcomes referred to in the first column of Service Requirement 3 are achieved.

8 TQ results

8.1 The Supplier shall (as soon as reasonably practicable following completion of its obligations in paragraph 7.1 (*TQ grade awarding*), but not later than the date specified on the Key Dates Schedule for the relevant Academic Year), provide the results for each Student in the Cohort to the Authority or to the Authority's nominee (as notified by the Authority to the Supplier from time to time) in accordance with paragraph 8.2, such results to include details of:

8.1.1 the mark and grade awarded for the TQ Core Component;

8.1.2 the mark and grade awarded for each Occupational Specialist Component; and

8.1.3 such information and/or data as is required (including grade boundaries) by the Authority to award an overall grade for the T Level,

in each case, in respect of each TQ assessment that the relevant Student has undertaken.

8.2 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and paragraph 10.1 (*Reporting*) below, the Supplier shall ensure that the results referred to in paragraph 8.1 are provided to the Authority or to the Authority's nominee (as notified by the Authority to the Supplier from time to time) and reported to the Authority in the Management Information that is provided in respect of the Contract Month in which such results are required to be provided in accordance with paragraph 8.1, such results and report to meet the requirements set out in the third column of each of Service Requirement 7 and Service Requirement 9 to ensure that the outcomes referred to in the first column of each of Service Requirement 7 and Service Requirement 9 are achieved.

8.3 The Supplier shall (on the date specified on the Key Dates Schedule for the relevant Academic Year) provide to the Approved Provider a breakdown of attainment to allow

any Approved Provider and/or Student to make informed decisions about applications for (amongst other things) marking reviews and/or appeals (including a Review of Marking and/or Appeal as referred to in Annex 10 (*Additional Services*) to this Service Requirements), such breakdown (subject always to the provisions of clauses 13.10 to 13.12 (*Intellectual Property Rights*) (inclusive)) to be presented in such manner and/or format as shall not be capable of being regarded, interpreted and/or represented as a formal qualification certificate or statement of achievement.

9 TQ Post-Results Services

9.1 The Supplier shall, following the provision of the results referred to in paragraph 8.1 (*TQ results*) and, in respect of each Cohort, for a period expiring at the end of 2 Academic Years following the end of the final Academic Year for each such Cohort:

9.1.1 respond to enquiries about results; and

9.1.2 following a request from an Approved Provider made in accordance with the applicable Key Dates Schedule(s) referred to in paragraph 9.2, provide the relevant Additional Services requested by that Approved Provider (other than the Additional Services referred to in paragraph 5.3 (*Student registration and Student entry*) and 6.1.3 (*TQ live assessment design and delivery*), to which the provisions of those paragraphs shall apply) in accordance with the applicable requirements set out against the relevant Additional Services in Annex 10 (*Additional Services*) to this Service Requirements, (including as referred to in, and in accordance with, the third column of Service Requirement 8 to ensure that the outcomes referred to in the first column of Service Requirement 8 are achieved).

9.2 The Parties acknowledge and agree that the time period within which an Approved Provider may request the provision of the Additional Services referred to in paragraph 9.1.2 in relation to a Student that has undertaken an assessment (including an assessment that is a "Retake", as referred to in Annex 10 (*Additional Services*)) in an assessment series (the "**Relevant Assessment Series**") shall be as set out in the Key Dates Schedule(s) for the relevant Academic Year(s) applicable to the Relevant Assessment Series (including any Key Dates Schedule applicable to and/or regulating the provision of Additional Services in respect of assessments undertaken in the Relevant Assessment Series), provided always that nothing in this paragraph 9.2 shall operate to:

9.2.1 prevent or restrict (or be deemed to give rise to a right of the Supplier to prevent or restrict) any "Retakes" from being undertaken (or from being requested to be undertaken) in accordance with paragraph 6.1.3; and/or

9.2.2 extend the period referred to in paragraph 9.1.

10 Reporting

10.1 The Supplier shall (without prejudice to its obligations in clause 3.1 (*How the Services must be supplied*)) in each Contract Month throughout the Term, report to the Authority in accordance with (and provide such information as is required by) the requirements set out in the third column of Service Requirement 9 to ensure that the outcomes referred to in the first column of Service Requirement 9 are achieved.

11 Overarching services

11.1 The Supplier shall:

11.1.1 maintain, update and provide to the Authority (as required by clause 5.5.1 and paragraph 3.1 of Schedule 15 (*Monitoring of Performance*)) each of the Risk Register and the Issues Log;

11.1.2 implement, carry out and complete such steps (and within such time) as the Authority shall reasonably require arising out of the review of the Risk Register and/or the Issues Log pursuant to clause 5.5.1 (*Developing the TQ and achieving IfATE Approval*) and paragraph 3.1 of Schedule 15, (*Monitoring of Performance*) provided always that where the Supplier fails to implement, carry out and complete such steps in accordance with such requirements (including within such time), such failure shall (notwithstanding the provisions of clauses 14.2.1 to 14.2.10 (*What may happen if there are issues with your provision of the Services*)) be deemed to give rise to a right for the Authority to issue written notification of Designated Action to the Supplier, to which the provisions of this Contract (including clause 14.2 (*What may happen if there are issues with your provision of the Services*)) shall apply.

11.2 The Supplier shall provide all of the back-office systems and business processes necessary to enable the delivery of the Services, including IT systems, data security systems, accounting and administrative services.

11.3 The Supplier shall:

11.3.1 actively promote the T Level for which it is the TQ provider, coordinated in partnership with, and with the Approval of, the Authority; and

11.3.2 adhere to the Authority's guidelines in respect of all publicity and marketing material produced by the Supplier (or its Subcontractors) in relation to the T Level for which it is the TQ provider.

11.4 The Supplier shall, following any reasonable request from the Authority:

11.4.1 participate in and support any promotional activities intended to increase the uptake of T Levels by Providers and/or Students; and

11.4.2 without prejudice to its obligations in Schedule 4 (*Co-operation*) and Schedule 15 (*Monitoring of Performance*), attend and participate in any such meetings as the Authority may reasonably convene from time to time in connection with the T Levels Programme.

12 Efficiency

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13 Social Value Commitments

13.1 The Supplier must ensure it takes reasonable measures to meets its Social Value commitments, in full compliance with its response to Q9.6 of the Award Questionnaire in their tender submission.

Part 2 - Service Definition Table

This Part 2 sets out the outcomes each Service must deliver and the minimum requirements the Supplier must meet when delivering each Service.

Service Requirement 1: Designing, developing and managing TQ content		
Outcomes The Specification of Content is sufficiently clear and appropriately detailed to ensure Approved Providers can properly prepare Students for the TQ assessments. The knowledge, understanding, skills and behaviours specified in the Former Supplier's TQ Specification and, if relevant, the Outline Content in relation to the TQ Core Component are up-to-date and have been validated by employers to ensure that the TQ has continued currency among	**SR1.1** Maintenance of the Specification of Content	1 **During the Initial Development, any removal of TQ Specification material from the Specification of Content must be justified and validated by a sufficient and representative sample of Employers.** Where the Supplier considers that it is necessary to remove content present in the existing TQ Specification, it shall provide a clear and detailed rationale as part of its Assessment Strategy included with the Submission for Interim Milestone 1 (and any subsequent milestones) to the Authority. Evidence from a representative sample of employers relevant to the sector must also be provided to support any proposals to remove any TQ Specification material from the Specification of Content. The Authority shall consider whether such content may be removed from the Specification of Content, provided always that the Authority's decision as to whether such content may be removed from the Specification of Content shall be final. 2 **During the Initial Development, the inclusion of additional material must be justified and validated by a sufficient and representative sample of Employers as agreed by the Authority.** The Supplier shall ensure that the Specification of Content does not include entirely new content, as distinct from updated content, that is not included in the existing TQ Specification, unless otherwise agreed by the Authority. Where the Supplier considers that it is necessary to include entirely new content, it shall provide a clear and detailed rationale as part of its Assessment Strategy included with the Submission for Interim Milestone 1 (and any subsequent milestones) to the Authority. Evidence from a representative sample of employers relevant to the sector must also be provided to support any proposals to remove any TQ Specification material from the Specification of Content. The Authority shall consider whether such new content may be included as part of the Specification of Content, provided always that the Authority's decision as to whether such new content may be included as part of the Specification of Content shall be final. The Supplier must show that new content must be covered at an appropriate depth for a level 3 qualification.

Employers and other end-users (including higher education providers). The knowledge, understanding, skills and behaviours specified in the Former Supplier's TQ Specification and, if relevant, the Outline Content in relation to each Occupational Specialist Component are up-to-date and ensure that the TQ has continued currency among Employers and other end-users (including higher education providers).		3 **During the delivery period the Supplier must ensure that the Specification of Content :** (a) enables accurate interpretation of the Specification of Content by Approved Providers (including to facilitate a clear and consistent understanding by Approved Providers of what is required to be taught and assessed for the TQ and to enable Approved Providers to determine (i) the level of competence required for staff who assess learning and (ii) any other physical requirements (such as facilities and hardware) integral to successful learning for the TQ); (b) supports Student progression and adaptability; (c) enables Students to achieve Occupational Entry Competence in relation to each Occupational Specialist Component; and (d) ensures that English, mathematics and digital content is integrated within the rest of the content in such manner as shall ensure such content is delivered and assessed in appropriate occupationally specific contexts. 4 **Components should follow the same structure as set out in the existing TQ Specification.** The Supplier shall not move elements of the existing TQ Specification which relate to one Component into another Component, unless otherwise agreed by the Authority. Where the Supplier considers that it is necessary to move content from one Component to another, it shall provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 to the Authority and the Authority shall consider whether such content may be moved, provided always that the Authority's decision as to whether such content may be moved shall be final. 5 **The TQ has two types of Component.** The Supplier shall ensure that: (e) the TQ has only two types of Component and is **not** unitised any further, such that only the TQ Core Component and each Occupational Specialist Component are formally graded;

		(f) the **TQ Core Component** clearly assesses the core knowledge, understanding, skills and behaviours relevant to all occupations within the T Level; and (g) each **Occupational Specialist Component** clearly assesses the occupationally specific knowledge, understanding, skills and behaviours relevant to the occupations within the T Level. 6 **The TQ must not be biased towards any Occupational Specialist Component.** Where there is more than one Occupational Specialist Component for the TQ, the Supplier shall ensure that the TQ Core Component is not biased towards any particular Occupational Specialist Component. This is to ensure fairness for all Students, to support learning in their chosen Occupational Specialist Component. 7 **The TQ and its Components must be appropriately titled**. The Supplier shall ensure that the TQ and the Components reflect the titling conventions in the Former Supplier's TQ Specification and, if relevant, the Outline Content. The Supplier shall agree any amendments to the titling conventions of the TQ with the Authority and shall then use only this agreed title to refer to the TQ. 8 **The Specification of Content must support fair access to attainment, including for Students with special educational needs and/or disabilities.** Without prejudice to the Supplier's obligations in clause 3.1.7 (*How the Services must be supplied*) and clause 32 (*Equality, diversity, human rights and anti-slavery*), the Supplier shall comply with all applicable Law and shall ensure that the Specification of Content is inclusive, including providing for Reasonable Adjustments and Special Consideration (as defined in SR 2.4 and SR 2.5 (respectively) below). The Supplier shall provide evidence that it has considered and addressed all such applicable Law relating to delivery of fair access to the TQ. 9 **Set recommended Guided Learning hours for each part of each Component.** The Supplier shall ensure that the Specification of Content details the recommended Guided Learning hours for each part of the TQ Core Component and each Occupational Specialist Component, including the recommended Guided Learning hours for both delivery and assessment of each such part of each such Component, provided that (i) such recommended hours are between a minimum of 900 hours and a maximum of 1400 hours and (ii) the maximum number of hours within the recommended range for the TQ Core Component are no more than 50%, and no

			less than 20%, of the overall time for the TQ. The Supplier shall provide a clear and detailed rationale for such recommended Guided Learning hours as part of its Assessment Strategy included with the Submission for the Final Approval Milestone to the Authority, or earlier at the Authority's request, and the Authority shall consider whether such proposed recommended Guided Learning hours may be included as part of the Specification of Content, provided always that the Authority's decision as to whether such recommended Guided Learning hours may be included as part of the Specification of Content shall be final. 10 **Combination of Occupational Specialist Components.** Where a T Level features more than one Occupational Specialist Component these should be specified as options from which a Student will typically select one Occupational Specialist Component. Where a Student is required to study two Occupational Specialist Components, the Supplier shall specify any prohibited combinations of Occupational Specialist Components, for example where there is overlap between the Occupational Specialist Component content or where there would be insufficient time to study a particular combination. The Supplier shall make it clear that Approved Providers can select the Occupational Specialist Component(s) they wish to deliver within these rules. Where rules of combination are given, the Supplier shall provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 which explains how any combinations are compatible and achievable within the duration of the TQ. 11 Where, in exceptional circumstances, the Supplier proposes to give Students the option to study more than two Occupational Specialist Components, it must provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 to the Authority and the Authority shall consider whether such rules of combination are appropriate, provided always that the Authority's decision as to whether such rules of combination are appropriate shall be final.
Service Requirement 2: Assessment design and delivery			
Outcomes The TQ provides for optimal assessment and reliable evidence	**SR 2.1** Assessment quality	1	The Supplier shall ensure that: (a) the Scheme of Assessment, the TQ Specimen Assessment Materials and the TQ Live Assessment Materials provide the optimum balance of the assessment principles set out below; and

of a Student's attainment in relation to the knowledge, understanding, skills and behaviours specified in the Former Supplier's Specification of Content and, if relevant, the Outline Content. The TQ supports fair access to attainment for all Students who take the TQ.		(b) the Assessment Strategy sets out a detailed rationale to explain how the TQ Specification, the TQ Specimen Assessment Materials and the TQ Live Assessment Materials meet these assessment principles. **Assessment principles** 1 **Validity.** The extent to which the TQ assessments (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) effectively measure what they are intended to measure. This includes the extent to which TQ assessments (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) allow Students to produce assessment evidence for the TQ that clearly corresponds to the Specification of Content and ensures the Specification of Content is not under-represented or misrepresented. 2 **Reliability.** This is about consistency and so concerns the extent to which the various stages in the TQ assessment process generate outcomes that would be replicated were the assessment repeated. The reliability of an assessment is affected by a range of factors, such as the sampling of assessment tasks and inconsistency in marking by human assessors. Reliability is critical to ensuring standards of attainment are equivalent over time (comparable performance). 3 **Comparable performance.** The extent to which the same grade for a Component with the same title indicates a comparable level of Student performance across Approved Providers (nationally) and over time. 4 **Minimising bias.** Ensuring that a TQ assessment (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) does not produce unreasonably adverse outcomes for Students who share a particular characteristic. The Supplier should seek to ensure all Students are treated fairly and the assessment (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) complies with all applicable Law. 5 **Minimising malpractice.** Ensuring the TQ design (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) and processes relating to the delivery of the TQ assessments limit malpractice, including attempts by candidates to communicate with each

		other during an assessment and failures by Provider staff to comply with Supplier instructions regarding storage of Student assessment evidence. 6 **Appropriate demand.** This relates to the level of difficulty of a TQ assessment task (including within the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) and the requirements of the relevant part of the Specification of Content which is to be assessed and any expectations of performance at specified grades. Demand should be appropriate to a level 3 qualification. 7 **Manageability.** The feasibility of carrying out the TQ assessment processes. A manageable assessment process is one that has reasonable expectations of Students, Approved Providers and (where appropriate) Employers. This will be based on the impact of the assessment process on Students, Approved Providers and (where appropriate) Employers as against the usefulness of the outcomes.
	SR 2.2 General assessment delivery requirements	The Supplier shall: 1 specify when the TQ assessments can be undertaken during the relevant Academic Year (taking into account any dates prescribed by the Key Dates Schedule for the relevant Academic Year) so that Students have sufficient time to generate assessment evidence and/or demonstrate the required knowledge, understanding, skills and behaviours; 2 notwithstanding the number of Assessors (and Moderators where permitted in accordance with the Approved Assessment Strategy) identified in the Implementation and Delivery Plan and/or the Resource Plan, ensure a sufficient number of qualified and trained Assessors (and such Moderators) are available to assess Students' assessment evidence for the TQ; 3 train Assessors (and Moderators where permitted in accordance with the Approved Assessment Strategy) so that their judgements in relation to the TQ assessments are consistent and accurate and applied in line with the standards defined by or through such training;

		4 sample the marking of live TQ assessments (to ensure accuracy and consistency) and, where such marking is not accurate and/or consistent, take all such steps as are necessary to ensure that such marking is accurate and consistent; 5 ensure the TQ Live Assessment Materials are made available to Approved Providers in English (online and/or in hard copy (as applicable)); 6 ensure the TQ Live Assessment Materials are available at the right time (online and/or in hard copy (as applicable)) in accordance with this Contract; 7 ensure that TQ Live Assessment Materials are free from errors and where any errors are identified in the TQ Live Assessment Materials they are dealt with appropriately, including through the issue of an erratum and by taking all such actions as are necessary to ensure that Students are not disadvantaged as a result of such errors; 8 where Student assessment evidence for the TQ is required to be generated under supervised conditions: (a) ensure that the nature of the supervised conditions and the hours for such supervised conditions are detailed in the TQ Specification; and (b) provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 4 to the Authority and the Authority shall consider whether such hours are appropriate, provided always that the Authority's decision as to whether such hours are appropriate shall be final; 9 ensure that Approved Providers comply with the Approved Provider's Quality Assurance Process, including: (a) keeping Students' assessment evidence for the TQ secure during and after assessment; and (b) verifying that a Student's assessment evidence for the TQ has been solely produced by that Student;

		10 following IfATE Approval, monitor the delivery of the TQ to identify any feature which could disadvantage a group of Students who share a particular characteristic and shall, as soon as reasonably practicable following identification of such a feature, take such steps as are necessary to minimise the feature being an unnecessary barrier to Student attainment; 11 monitor and investigate instances of malpractice and/or maladministration relating to the TQ in accordance with paragraph 3 (TQ Provider Approval and monitoring services) of Part 1 of this Service Requirements; 12 ensure final marks awarded by Assessors (and Moderator final marks and/or judgements, where permitted in accordance with the Approved Assessment Strategy) in relation to the TQ are collected for each Student and checked for accuracy by the relevant date specified in the Implementation and Delivery Plan; and 13 where marking is to be applied to Student assessment evidence for the TQ by Assessors (and/or by assessors employed or engaged by Approved Providers and/or Moderation is to be undertaken in relation to such marking (in circumstances where the Approved Assessment Strategy allows for use of assessors employed or engaged by the Approved Provider)), ensure: (a) such Assessors (and assessors and Moderators) are appropriately trained and competent; (b) such Assessors (and Moderators) have no personal interest in the outcome of the marking; and (c) marking and Moderation is conducted in a way which secures the accuracy of marking and a consistent approach to marking, provided always that where the Supplier determines that such marking and/or Moderation is not being undertaken accurately and consistently, it shall correct any inaccuracies and/or inconsistencies and shall take (or shall (where necessary) procure that the relevant Approved Provider and/or Moderator shall take (as the case may be)) all necessary steps to prevent any future recurrence of such inaccuracy and/or inconsistency.
	SR 2.3	1 The Supplier shall ensure that it has all necessary processes in place to ensure that, where TQ Live Assessment Materials are confidential (including the content of or information about

	Confidentiality of TQ Live Assessment Materials	such TQ Live Assessment Materials), all such TQ Live Assessment Materials remain confidential. 2 If, notwithstanding the processes referred to above, a breach of confidentiality in relation to the TQ Live Assessment Materials does occur (including through the loss, theft or transmission of confidential TQ Live Assessment Materials) or is either suspected by the Supplier or alleged by any other person (and where there are reasonable grounds for that suspicion or allegation), such matter shall be notified to the Authority in accordance with paragraph 3.2 of Part 1 of this Service Requirements and the provisions of paragraphs 3.3 to 3.5 (inclusive) of such Part 1 of this Service Requirements shall apply.
	SR2.4 Reasonable Adjustments	"**Reasonable Adjustments**" means such adjustments to and/or exemptions from the TQ Live Assessment Materials (as applicable) as are necessary and reasonable (in the context of what is being assessed) to enable a Student with special educational needs and/or disabilities to demonstrate his or her knowledge, understanding, skills and behaviours to the level of attainment required. The Supplier shall: 1 have in place clear arrangements for making Reasonable Adjustments; 2 explain (in the Assessment Strategy) how Reasonable Adjustments will be made to support fair access to attainment; and 3 provide details of such arrangements to Approved Providers, in each case, taking into account and (where applicable) implementing the process, approach and/or system agreed between the T Level Awarding Organisations pursuant to paragraph 2.1.8 of Schedule 4 (Co-operation).
	SR2.5 Special Consideration	"**Special Consideration**" means consideration to be given to a Student who has experienced a temporary illness, injury or other event outside of the Student's control and which has had, or is reasonably likely to have had, a material effect on that Student's ability to take a TQ assessment or demonstrate his or her level of attainment in a TQ assessment. The Supplier shall:

		1 have in place clear arrangements for Special Consideration; 2 explain (in the Assessment Strategy) how Special Considerations will be applied to support fair access to attainment; and 3 provide details to Approved Providers of how to request such Special Consideration, in each case, taking into account and (where applicable) implementing the process, approach and/or system agreed between the T Level Awarding Organisations pursuant to paragraph 2.1.8 of Schedule 4 (*Co-operation*).
	SR 2.6 TQ Core Component assessment design and delivery	1 **The TQ assessments must be appropriately weighted.** Where there is more than one Occupational Specialist Component for the TQ, the Supplier shall not weight the assessment of the TQ Core Component more heavily towards any one Occupational Specialist Component. This is to ensure fairness for all Students, to support learning in their chosen Occupational Specialist Component. 2 The Supplier shall assess the TQ Core Component using two distinct methods, as follows: (a) the core knowledge and understanding shall be assessed using an External Examination; and (b) the core skills and relevant aspects of core knowledge shall be assessed through the Employer Set Project in accordance with paragraph 3 below, in each case, as referred to in the Specification of Content. 3 Evidence generated by a Student in assessments of the Employer Set Project should be marked by an Assessor. However, in very exceptional circumstances set out in the Approved Assessment Strategy, an Approved Provider may be permitted to mark assessment evidence generated by a Student only where the Supplier: (i) puts in place robust arrangements which ensure that such marking achieves valid and reliable outcomes; (ii) uses an approach that is as close to complete independence as possible (such arrangements and approach to be

		detailed in the Approved Assessment Strategy); and (iii) procures that all such marking is subject to Moderation.[2] 4 **Assessment objectives.** The Supplier shall: (a) set out the assessment objectives for each of the External Examination and the Employer Set Project; and (b) specify the relevant weightings as between the External Examination and the Employer Set Project, in each case, in the Scheme of Assessment. 5 **Minimum performance requirements for the TQ Core Component must be clearly defined.** The Supplier shall ensure that: (a) the External Examination and the Employer Set Project are each assessed using compensatory assessment methods, such that high performance in one part of the TQ Core Component assessment compensates for lower performance in another; and (b) the minimum performance requirements for each judgemental grade required for the TQ Core Component shall reference each of the External Examination and the Employer Set Project. 6 **Devise the External Examination to assess the full range of knowledge and understanding outlined in the TQ Core Component.** The Supplier shall ensure that: (a) the External Examination will sample from the full breadth of relevant parts of the Specification of Content; and (b) an indicative sampling grid for the Term is included within the Assessment Strategy.

[2] These proposed arrangements should form part of the Supplier's Response.

		7 **Assessment of core skills and relevant aspects of knowledge through Employer Set Project.** The Supplier shall develop briefs for Employer Set Projects and shall ensure that: (a) such briefs are developed in collaboration with Employers; (b) each such brief enables a Student to demonstrate core skills and relevant aspects of core knowledge in an occupationally relevant context; and (c) the Assessment Strategy outlines how such briefs will continue to be relevant to the TQ Core Component throughout the Term and how the Supplier will ensure that such Employer Set Projects do not become predictable and how they will keep pace with the needs of industry, in each case, so that new briefs for Employer Set Projects are made available by the Supplier in each Academic Year. 8 **Engage with relevant Employers to set clear project briefs**. The Supplier shall: (a) engage with Employers to ensure that sufficient project brief(s) is/are made available to enable Students to demonstrate skills across the breadth of the available Occupational Specialist Component(s), provided always that where the Supplier proposes to make available only one project brief in respect of the TQ to Students and/or proposes to utilise a project brief in respect of more than one Occupational Specialist Component, then: (i) the Supplier shall provide a detailed rationale for such proposals as part of its Assessment Strategy included with the Submission for Interim Milestone 1 to the Authority; (ii) the Authority shall consider whether such proposals are acceptable; and (iii) the Authority's decision as to whether such proposals are acceptable shall be final; (b) engage with Employers to ensure that each project brief:

		(i) has clear objectives, which align with the Specification of Content and which aim to motivate Students; (ii) requires Students to solve a real world problem; (iii) enables Students to generate sufficient assessment evidence to meet the objectives referred to in (i) immediately above; (iv) clearly sets out the arrangements and restrictions for Approved Providers to support Students in carrying out and completing the Employer Set Project; and (v) allows sufficient time to enable Students to generate sufficient assessment evidence; and (c) obtain evidence of validation from each Employer involved in setting the brief(s) that they approve such brief(s) (and the Supplier shall make available to the Authority a copy of such evidence). Evidence of employer validation must include, but is not limited to, details of the questions asked of Employers, Employer responses and how the AO addressed Employer feedback.
	SR 2.7 Occupational Specialist Component assessment design and delivery	1 **Assessment of performance outcomes**. The Supplier shall ensure that: (a) the assessment materials for each Occupational Specialist Component assess all performance outcomes detailed in the Specification of Content for that Occupational Specialist Component; and (b) so far as is reasonably practicable, each assessment is synoptic to reflect how knowledge, understanding, skills and behaviours are drawn together and implemented to develop meaningful occupationally relevant Student assessment evidence, which attests to Occupational Entry Competence, provided always that where the Supplier reasonably determines that it is not possible to assess performance outcomes synoptically, the Supplier shall provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 to the Authority and the Authority shall consider whether it is acceptable not to assess performance outcomes

		synoptically, provided always that the Authority's decision as to whether such approach is appropriate shall be final. 2 Evidence generated by a Student in assessments of each Occupational Specialist Component should be marked by an Assessor. However, in very exceptional circumstances set out in the Approved Assessment Strategy, an Approved Provider may be permitted to mark assessment evidence generated by a Student only where the Supplier: (i) puts in place robust arrangements which ensure that such marking achieves valid and reliable outcomes; (ii) uses an approach that is as close to complete independence as possible (such arrangements and approach to be detailed in the Approved Assessment Strategy); and (iii) procures that all such marking is subject to Moderation.[3] 3 **Exemplifying the expected standards of attainment**. The Supplier shall, for each Occupational Specialist Component, produce Guide Standard Exemplification Materials (which shall be validated by sufficient and representative sample of Employers and Providers as agreed by the Authority)) for the purposes of IfATE Approval and for the First Teach Cohort and, for each Academic Year following grade awarding for the First Teach Cohort, produce Grade Standard Exemplification Materials (which shall be validated by Employers before results are issued) and submitted to the Authority for agreement by no later than the end of September and published by the end of October of that Academic Year, unless otherwise agreed in writing by the Authority.
Service Requirement 3: Grading and Awarding		
Outcomes Grades awarded for the TQ Core Component and each Occupational Specialist Component	**SR 3.1**	1 The Supplier shall undertake grading and awarding in accordance with the relevant part of the Approved Assessment Strategy.

[3] These proposed arrangements should form part of the Supplier's Response.

are reliable and allow Employers and other end-users (including higher education providers) to accurately identify a Student's level of attainment and effectively differentiate their performance. The TQ supports fair access to attainment for all Students who take the TQ. The minimum pass grade standard for each Occupational Specialist Component attests to Occupational Entry Competence, meets Employer expectations, and is as close to full occupational competence as possible.		
Service Requirement 4: Provider Approval		
Outcomes Approved Providers are capable of	**SR4.1**	1 The Supplier shall receive and process applications from Eligible Providers to become Approved Providers in accordance with the relevant part of the Approved Assessment Strategy.

delivering the TQ to meet the required standards and expectations.		2 The Supplier shall (within 30 Working Days) following receipt of an application for Provider Approval from an Eligible Provider: (a) assess that Eligible Provider against the Provider Approval Criteria to determine whether such Eligible Provider satisfies all of the requirements of the Provider Approval Criteria; (b) notify that Eligible Provider of the outcome of its application; and (c) where the Eligible Provider satisfies all of the requirements of the Provider Approval Criteria, grant Provider Approval in respect of such Eligible Provider.
Service Requirement 5: Provider Support		
Outcomes Approved Providers are fully supported to plan and deliver (including to properly prepare Students for assessment) the TQ to meet the required standards and expectations.	**SR 5.1**	The Supplier shall ensure that Approved Providers are fully supported to promote, plan and deliver the TQ, including: 1 setting out in the TQ Specification and Assessment Guidance for Providers any guidance and support available to the Approved Provider in respect of the TQ, which may include guidance as to sequencing of assessment of any Component; 2 providing a telephone, email and internet facility and ensuring that sufficient, suitably trained contact staff are available to: (a) answer Approved Providers' queries regarding the Provider Services and/or the TQ (including enquiries and/or queries about results); (b) deal with complaints in relation to the Provider Services and/or the TQ; and (c) ensure that such queries and/or complaints (and any queries about the T Level Programme, including different programme elements and work placements) are directed to the relevant individual at the Supplier, the Authority or other Stakeholder (as applicable);

		3 ensuring that such training, resources and other information relating to the TQ, as is necessary to assist Approved Providers' administration and examination officers, is available, including in relation to: (a) key dates for administration of the TQ; (b) how to use any systems to upload materials; and (c) which forms should be used to enable Approved Providers to claim completion of the TQ by the relevant Student; 4 ensuring that such training, resources and other information relating to the TQ, as is necessary to assist Approved Providers' teaching and learning, is available to ensure the requirements of the TQ are clear and Students can be well prepared for assessment for the TQ, including: (a) exemplifying (through the provision of and training in relation to the application of the Guide Standard Exemplification Materials) the expected standards of performance for the TQ for the First Teach Cohort, so that the Approved Providers are able to design effective courses and have a clear understanding of the quality and standards their Students need to achieve; and (b) the development in accordance with Annex 11 to the Service Requirements, of (i) Supplementary Specimen Assessment Materials; (ii) Employer Set Project Guide Exemplar Responses; (iii) Employer Set Project Grade Exemplar Responses; and (iv) Accompanying Assessment Guidance for Providers; all of which must be suitable to be used by Approved Providers to prepare Students effectively for live TQ assessments; and (c) exemplifying (through the provision of documentation, including chief examiner and chief moderator reports, which provides an overview or analysis of Student performance and includes but is not limited to, examples of student responses to assessment questions and/or tasks) the expected standards of performance for the TQ,

		so that Approved Providers are supported in understanding how students performed at item, sub-component and component level to support future teaching and learning. 5 undertaking intermittent reviews to ensure that the support remains fit for purpose, taking account of feedback from Approved Providers and amending the support packages as necessary; 6 having in place systems and processes to monitor and report to the Authority details of Approved Provider uptake of the TQ Deliverables (and any other Products and/or documents associated with the TQ), ensuring each and every Approved Provider has accessed and is using the current version of the relevant TQ Deliverable. 7 aligning training and resources with any wider FE Professional Readiness to Deliver T Levels training and support offered by the Authority; and 8 supporting Approved Providers on agreed promotional activity, as appropriate following any reasonable request from the Authority.
Service Requirement 6: Student registration and Student entry		
Outcomes Unique identification of Students	**SR 6.1**	The Supplier shall procure that Approved Providers register each Student undertaking the TQ in a way that permits the Student to be clearly and uniquely identified.
Service Requirement 7: TQ Results		
Outcomes Accurate and complete results	**SR 7.1**	The Supplier shall ensure that all results which it issues are accurate and complete and reflect the outcome of the awarding process.

Service Requirement 8: TQ Post-Results Services		
Outcomes The TQ provides for optimal assessment and reliable evidence of a Student's attainment in relation to the knowledge, understanding, skills and behaviours specified in the Former Supplier's TQ Specification and, if relevant the Outline Content. The TQ supports fair access to attainment for all Students who take the TQ.	**SR 8.1** Assessment Review	The Supplier shall ensure a transparent and effective process for review of marks (or (where applicable) Review of Moderation (as defined in Annex 10 (*Additional Services*) to this Service Requirements) for each Component.[4]
	SR 8.2 Appeals Process	1 The Supplier shall operate an appeals process, which enables Approved Providers to appeal: (a) the results of TQ assessments undertaken by Students or (in the case of an appeal in respect of an individual Student) results of TQ assessments undertaken by that Student (including in either case the outcome of a Review of Marking and/or Review of Moderation);

[4] The proposed process should form part of the Supplier Response. This requirement will simply link to the proper implementation of that process.

		(b) any decisions regarding Reasonable Adjustments and/or Special Consideration for Students or (in the case of an appeal in respect of an individual Student) decisions regarding Reasonable Adjustments and/or Special Consideration for that Student; and (c) decisions which have resulted in action taken against that Approved Provider or (in the case of an appeal in respect of an individual Student) that Student in relation to the TQ, in either case, following an investigation into malpractice or maladministration,[5] (together or individually (as the case may be) an "Appeal"). 2 Where, as a result of an Appeal, the Supplier identifies that there is or was (as the case may be) a failure in its TQ assessment process affecting more than one Student, it shall: (a) notify the Authority of such failure (including full details of the impact of such failure); (b) identify all Students who have (or who may reasonably be expected to have) been affected by the failure; (c) correct or, where it cannot be corrected, mitigate as far as possible the effect of the failure; and (d) take all such steps as are necessary to ensure that such failure does not recur in the future, and the provisions of paragraphs 3.2 to 3.5 (inclusive) of Part 1 of this Service Requirements shall apply in respect of such failure.
Service Requirement 9: Reporting		
Outcomes Accurate and timely information and data is	**SR 9.1**	The Supplier shall ensure that the Management Information is provided to the Authority as follows. In the case of:

[5] The proposed appeals process should form part of the Supplier Responses. This requirement will simply link to the proper implementation of that process.

available throughout the Term		1	the Development Phase Report, in accordance with clause 5.5 (*Developing the TQ and achieving IfATE Approval*);
		2	the Operational Delivery Report, in accordance with paragraph 3.1 of Schedule 15 (*Monitoring of Performance*);
		3	the information and data generated pursuant to paragraph 5 of Part 1 of this Service Requirements, in accordance with paragraph 5.4 of Part 1 of this Service Requirements;
		4	the information and data generated pursuant to paragraph 8 of Part 1 of this Service Requirements, in accordance with paragraph 8.2 of Part 1 of this Service Requirements;
		5	the information and data relating to the delivery of the Additional Services in accordance with paragraphs 5.3, 6.1.3 and 9.1.2 of Part 1 of this Service Requirements, in each Contract Month; and
		6	the information and data relating to adjustment to the Fees pursuant to clauses 4.12 and 4.13 (*Pricing and payments*), in accordance with clause 4.13.1 (*Pricing and payments*).
		7	the information and data relating to the delivery of the Social Value commitments in accordance with paragraph 13.1 *(Social Value Commitments)*

Part 3 – Product Descriptions

This Part 3 sets out the Product Description for each Product.

Product	Description
Assessment Strategy	A clear and detailed explanation for how the TQ meets the outcomes/overall measures and requirements for each Service. In relation to the **design** of the TQ, the Assessment Strategy shall include details of and a clear and detailed rationale for: • how the design of the TQ will ensure compliance (including ongoing compliance) with all relevant requirements of this Service Requirements; • (i) individual assessment time for each TQ assessment, for example in terms of covering the required part of the Specification of Content effectively and balancing reliability and manageability, and (ii) combined assessment time for the different TQ assessments; • the number of marks for each individual TQ assessment, for example in terms of covering the required part of the Specification of Content effectively and balancing reliability and manageability; • how the design of the TQ will ensure appropriate compensation taking into account the requirements of SR 2.6 (5) (a) of Service Requirement 2; • the approach to differentiating for the available grade range in each case; • how Students' interests will be protected if there are changes to the Specification of Content; • the Guided Learning hours for each Component, taking into account the requirements of SR 1.1 (9) of Service Requirement 1;

Product	Description
	• if applicable, why Students have been given the option to study more than two Occupational Specialist Components; • the approach to how assessments will be structured, for example in terms of covering the required part of the Specification of Content effectively and achieving the optimum balance of the assessment principles set out in SR 2.1 of Service Requirement 2, including: o the number of tasks and assessments in the External Examination; o the number of tasks and assessments in the Employer Set Project; o the relative weightings of the External Examination and the Employer Set Project; o the number of tasks and assessments for each Occupational Specialist Component; o for Occupational Specialist Components, why it is not possible to assess performance outcomes synoptically (if applicable); and o how the Former Supplier's TQ Specification and, if relevant, the Outline Content will be covered over the life of the Contract including any proposed approach to sampling. • in very exceptional circumstances where the Supplier considers that there is justification for any assessments in relation to the Employer Set Project and/or the Occupational Specialist Components to be marked by an Approved Provider and not externally marked by an Assessor, a detailed rationale which explains why this is necessary in terms of achieving an optimum balance of the assessment principles set out in SR 2.1 of Service Requirement 2 and a detailed explanation of the approach to Moderation. Exceptional circumstances shall include the following factors: o where the assessment evidence generated by Students is likely to arise spontaneously and/or be ephemeral in nature and where this may lead to significant or insurmountable logistical difficulties in terms of the Supplier arranging to be present for every assessment; o where the assessment would require repeat measurement over an extended period of time, potentially including measurement of multiple aspects across multiple Students, rather than measurement on a single occasion and where this may lead to significant or insurmountable logistical difficulties in terms of the Supplier being present for the whole period of the assessment; o where the presence of an Assessor could significantly affect the assessment, for example because it may place undue pressure on Students and therefore undermine fairness, or could require the assessment to be designed and/or completed in an artificial way which would undermine validity; and

Product	Description
	○ where the presence of an Assessor is not possible owing to issues of sensitivity and/or confidentiality with respect to individuals required to participate in the assessment(s), provided always that the factor(s) giving rise to a claim by the Supplier of the existence of any exceptional circumstances are relevant to the content of the TQ, the risks to the validity or manageability of the assessment arising as a result of such factor(s) are significant and such factor(s) and/or risk(s) cannot be managed or mitigated without marking being undertaken by an Approved Provider; • the approach to coverage of the Former Supplier's TQ Specification and, if relevant the Outline Content, including: ○ how the Former Supplier's TQ Specification and, if relevant the Outline Content has been covered overall and in each TQ assessment; ○ how the Former Supplier's TQ Specification and, if relevant the Outline Content has been elaborated on where necessary; ○ if applicable, why it is necessary to move elements of the Former Supplier's TQ Specification and, if relevant, the Outline Content which relate to one Component into another Component; and ○ if applicable, why it is necessary to include entirely new content that is not included in the Former Supplier's TQ Specification and, if relevant, the Outline Content into the Specification of Content; • the approach to: ○ mapping of the Specification of Content in TQ Specimen Assessment Materials; ○ coverage of the Specification of Content over time; and ○ ensuring the assessments for the TQ Core Component and each Occupational Specialist Component support fair access to attainment, including the approach to Reasonable Adjustments and Special Consideration; • the assessment objectives and weightings for the External Examination and the Employer Set Project; • the approach to targeting assessment objectives in the External Examination and the Employer Set Project, and to targeting performance outcomes in each Occupational Specialist Component; • the approach to each TQ assessment, including: ○ an explanation of:

Product	Description
	▪ the range of task types to be used (e.g. multiple-choice, short answer, extended response, practical assignment) and how these will support valid assessment of the Specification of Content; and ▪ the approach to mark scheme and assessment criteria design, including for different task types, and an explanation of how resulting mark schemes and assessment criteria will support reliable application by Assessors (and any assessors employed or engaged by any Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy); o sample question/tasks which may be from the TQ Specimen Assessment Materials, and associated mark schemes and assessment criteria, representing the range to be used in each such TQ assessment, with commentaries explaining the approaches; o an indicative sampling grid for the External Examination; and o how the requirements of SR 2.6 (7) and SR 2.6(8) of Service Requirement 2 have been taken into account. • the approach to availability of TQ assessments, including: o when assessments will be scheduled for the External Examination, the Employer Set Project and each Occupational Specialist Component; o how the approach is appropriate, including consideration of: the amount and weight of material to be covered; the extent to which different aspects would be covered sequentially or concurrently; how coherence with the overall T Level Programme will be promoted; the need to ensure that enough time is available for sufficient learning to have taken place (including how Approved Providers will be supported so that they enter Students for a Component's assessments in an appropriate Academic Year and in an appropriate assessment series within that Academic Year, in each case, within the two-year programme for the T Level); and how the approach will support standard setting; o when the first assessment cycle will be held for the First Teach Cohort, taking into account the need to ensure that standards are set appropriately in the first Academic Year so they are appropriate to be carried forward to future assessment cycles; o arrangements for Students to retake, in full, any or all of the External Examination, the Employer Set Project and each Occupational Specialist Component; and o the type of assessment (e.g. online and/or paper-based) for the External Examination, Employer Set Project and each Occupational Specialist Component; and

Product	Description
	• quality assuring the design and development of the TQ and its component assessments in line with the requirements set out in the Service Requirements and in line with the Assessment Strategy. Taking into account the approach to availability of TQ assessments, the Assessment Strategy shall include a clear and detailed explanation of any risks that have been identified, how these will be mitigated, and how particular challenges will be addressed, including: • ensuring comparability of assessments; • minimising predictability of assessments; • ensuring security and confidentiality of assessments; and • in relation to the Employer Set Project, how the Employer Set Projects will continue to be relevant to the TQ Core Component throughout the Term and how they will not become predictable and will keep pace with the needs of industry. In relation to the **delivery** of the TQ, the Assessment Strategy shall include: • details of and a clear and detailed rationale for how the delivery of the TQ will ensure ongoing compliance with all relevant requirements of this Service Requirements; • clear details of the process for developing TQ assessment materials (including TQ Specimen Assessment Materials and TQ Live Assessment Materials), including different stages and Supplier Staff involved, how evidence regarding functioning of previous assessments is used, any differences by assessment type and item setting arrangements; • clear details of the approach to training individuals who will be responsible for setting TQ assessments and/or items, including ensuring security and mitigating any conflicts of interest; • details of the nature of and number of hours of supervised conditions that will be required to deliver the TQ; • clear details of the approach to training and standardising the approach of Assessors (and any assessors employed or engaged by any Approved Provider and any Moderators where permitted in accordance with

Product	Description
	the Approved Assessment Strategy), together with details of standardisation procedures and any wider training; • a clear and detailed explanation of how the marking processes for Student assessment evidence for the TQ will operate, including any variation between the External Examination, the Employer Set Project and each Occupational Specialist Component; • a clear and detailed explanation of the process that will be in place: o to monitor accuracy and consistency of marking by Assessors (and Moderation by Moderators where permitted in accordance with the Approved Assessment Strategy) and issuing of results, and o to take remedial action where such process does not deliver accuracy and consistency of marking (and/or Moderation by Moderators where permitted in accordance with the Approved Assessment Strategy) and/or issuing of results; • a clear and detailed explanation of how malpractice will be minimised and addressed and the approach to maintaining security and confidentiality of TQ assessments, including any differences by assessment; • a clear and detailed explanation as to how live issues during assessments for the TQ will be dealt with (i.e. where the design/delivery mitigations have failed); • a clear and detailed explanation as to how results data for each Component and the TQ will be provided to the Authority in line with the Key Dates Schedule for the relevant Academic Year; and • a clear and detailed explanation as to how each Post-Results Service (referred to in paragraph 9 (*TQ Post-Results Services*) of Part 1 of this Service Requirements) will be delivered.[6] In relation to **Eligible Providers and Approved Providers**, the Assessment Strategy shall include a summary of the proposed approach to ensuring that Approved Providers are able to prepare for and undertake the TQ assessments, together with a clear and detailed explanation of:

[6] The Supplier Response should detail the Supplier's proposals for the Additional Services. This requirement will link to the proper implementation of that part of the Supplier Response.

Product	Description
	• the approach to approving Eligible Providers as Approved Providers, in line with the Provider Approval Criteria; • the approach to ensuring that all Approved Providers have appropriate and consistent quality assurance measures in place for the delivery of the TQ and ensuring that such Approved Providers maintain ongoing compliance with those quality assurance measures; • the approach to the provision of guidance and training to Approved Providers in connection with the delivery of the TQ assessments for the Employer Set Project and the Occupational Specialist Components; • the approach to monitoring Approved Providers in relation to TQ assessments for the Employer Set Project and the Occupational Specialist Components, including how this approach will ensure that such assessments remain fit for purpose on delivery; • how Guide Standard Exemplification Materials will be produced, with input from and validated by a sufficient and representative sample of Employers and Providers as agreed by the Authority; and • how Grade Standard Exemplification Materials will be produced, and kept under review, with input from validated by a sufficient and representative sample of Employers as agreed by the Authority. In relation to **awarding**, the Assessment Strategy shall include a clear and detailed explanation of: • the technical methodology employed in the awarding process, including the Supplier Staff involved and their roles; • how the decisions from the awarding process are approved within the Supplier and the Supplier Staff involved in this; • how comparability between different versions of assessments and different types of assessment (e.g. online vs paper-based) is ensured, both where these are available at the same time and on an ongoing basis;

Product	Description
	• how comparability between any options in the TQ will be ensured; • how any evidence in relation to the comparability of the TQ with the technical education qualification element for other applicable T Levels within the same Route (including those offered by other T Level Awarding Organisations) will be used to inform decisions on standard setting; • how grades are calculated, including judgemental and arithmetic grade boundaries, aggregation of marks between the External Examination and Employer Set Project, and the use of any conversion scales; and • the approach to and range of qualitative and quantitative evidence used to inform grading and awarding decisions and the weight given to different sources, together with: o a rationale for this approach in the light of the TQ design and Cohort make-up; and o details of how this approach will be kept under review and may be adjusted, including any variation between initial standard setting and maintenance of standards, and in relation to such qualitative and quantitative evidence: o qualitative evidence shall include (for the TQ Core Component and each Occupational Specialist Component as a whole and for each TQ assessment): ▪ views of senior examiners about the quality of Student assessment evidence for the TQ; ▪ views of senior examiners about the demand of TQ assessments; ▪ performance descriptions informed by Employer views; ▪ Guide Standard Exemplification Materials and Grade Standard Exemplification Materials informed by Employer views; ▪ archive Student assessment evidence for the TQ from previous series (where applicable); and ▪ if necessary, cognate Student assessment evidence for the TQ, for example from related qualifications; and o quantitative evidence shall include (for the TQ Core Component and each Occupational Specialist Component as a whole and for each TQ assessment): ▪ mark distribution; ▪ mean mark; ▪ standard deviation;

Product	Description
	▪ item-level data, such as facility and discrimination indices; ▪ percentage of Students achieving each grade in previous series; and ▪ information about Students' prior/concurrent attainment. The Assessment Strategy shall also include an explanation as to how innovation will be appropriately tested before implementation to secure on-going compliance by the Supplier with its obligations under this Service Requirements.
Employer and Provider Engagement Strategy	A clear and detailed strategy describing the approach to engaging with, and where applicable training, Employers and Providers in relation to the design, content, delivery, assessment, validation and update of the TQ and the Services, including the approach to sharing early and/or amended drafts of all Initial TQ Deliverables and TQ Deliverables with Employers and Providers (as applicable).
TQ Specification	**Specification of Content** The Specification of Content shall set out the knowledge, understanding, skills and behaviours that Students need to learn for the TQ Core Component and each Occupational Specialist Component. The Specification of Content for the TQ Core Component and each Occupational Specialist Component must be clear and unambiguous and adequately cover (and where necessary build on) the Former Supplier's TQ Specification and, if relevant, the Outline Content (and not simply replicate it). The Specification of Content shall detail the recommended Guided Learning hours for each Component (including recommended Guided Learning hours for both delivery and assessment of each Component), taking into account the requirements of SR 1.1 (9) of Service Requirement 1. The TQ Specification will be validated by a sufficient and representative number of Employers as agreed by the Authority. **Scheme of Assessment** *TQ Core Component – External Examination – knowledge and understanding* The Scheme of Assessment shall clearly set out (in relation to the External Examination) an explanation for Approved Providers of:

Product	Description
	• the assessment objectives and their weightings; • the method and number of assessments (if more than one); • the duration of the/each assessment; • the number of marks in the/each assessment; • how and when the/each assessment will be made available; • the grades available for the TQ Core Component and that these grades are for the External Examination and the Employer Set Project in combination; and • any relevant design features for the External Examination, such as the range of different question types that will be used and any access there will be to stimulus/pre-release materials. *TQ Core Component – Employer Set Project* The Scheme of Assessment shall clearly set out (in relation to the Employer Set Project) an explanation for Approved Providers of: • the assessment objectives and their weightings; • the assessment tasks available, i.e. options; • the duration of the assessment; • the number of marks for the assessment; • how and when the assessment will be made available; • the assessment criteria that will be applied (including, in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the Employer Set Project are to be marked by an Approved Provider and not externally marked by an Assessor, details of how marks should be allocated); • the conditions under which assessment evidence must be generated; • the forms of assessment evidence that must be retained by the Approved Provider and the expectations around this; • the grades available for the TQ Core Component and that these grades are for the External Examination and Employer Set Project in combination; and • (in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the Employer Set Project are to be marked by an Approved Provider and not externally marked by an Assessor) details of how Moderation will be conducted.

Product	Description
	The Scheme of Assessment shall also: • specify the relevant weightings as between the External Examination and the Employer Set Project; and • outline the minimum performance requirements for each judgemental grade required for the TQ Core Component (and each judgemental grade shall reference both the External Examination and Employer Set Project). *Occupational Specialist Components* The Scheme of Assessment shall clearly set out (in relation to each Occupational Specialist Component) an explanation for Approved Providers of: • the performance outcomes and how these are mapped to the Former Supplier's Specification of Content and, if relevant, the Outline Content; • the assessment task(s) for the relevant Occupational Specialist Component; • the duration of the assessment; • the number of marks for the assessment; • how and when the TQ Live Assessment Materials will be made available; • the assessment criteria that will be applied (including, in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the relevant Occupational Specialist Component are to be marked by an Approved Provider and not externally marked by an Assessor, details of how marks should be allocated); • the conditions under which Student assessment evidence must be generated; • the forms of Student assessment evidence that must be retained by the Approved Provider and the expectations around this; • any permissions/prohibitions with respect to different Occupational Specialist Components being taken in combination; • the grades available for the relevant Occupational Specialist Component; and • (in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the relevant Occupational Specialist Component are to be marked by an Approved Provider and not externally marked by an Assessor) details of how Moderation will be conducted.

Product	Description
	Approved Provider's Quality Assurance Process This part of the TQ Specification shall set out details of the Approved Provider's role in quality assuring the TQ assessments, to ensure compliance by the Supplier with its quality assurance obligations in the relevant part of the Supplier Response[7], for example: • authentication – ensuring Students' assessment evidence is their own; • malpractice – for example during controlled conditions; and • any other activity required of Approved Providers by the Supplier to ensure regulatory/contractual requirements are met. **Additional Information for Approved Providers** The TQ Specification shall also clearly set out: • the Qualification Purpose; and • the prior learning requirements for the TQ (if applicable). The TQ Specification shall also clearly set out, or provide appropriate links to, information regarding: • calculating grades (e.g. aggregation and scaling); • submitting general queries; • access arrangements, Reasonable Adjustments and Special Consideration; • enquiries about results and Appeals; • retakes; and • any guidance in relation to delivery of the TQ.

[7] The proposed assurance arrangements should form part of the Supplier Response.

Product	Description
TQ Specimen Assessment Materials	The TQ Specimen Assessment Materials shall comprise examples of assessments that are representative of the approach the Assessment Strategy proposes is used in live operation and shall be produced to the same quality standard. The TQ Specimen Assessment Materials shall cover each of the following: • TQ Core Component – External Examination – sample question paper and mark scheme for the/each assessment, together with mapping to the Former Supplier's Specification of Content and, if relevant, the Outline Content and sampling approach proposed; • TQ Core Component – Employer Set Project – assessment tasks/requirements for each available option and assessment criteria; and • Occupational Specialist Component – practical assessment tasks/requirements and assessment criteria for each Occupational Specialist Component. TQ Specimen Assessment Materials for all components of the TQ will be validated by a sufficient and representative number of Employers as agreed by the Authority.
TQ Live Assessment Materials	The live assessment materials (modelled on the TQ Specimen Assessment Materials and taking into account (as applicable) performance demonstrated by previous TQ Live Assessment Materials) that are to form the basis of assessment for the TQ for the relevant Academic Year.
Exemplification Materials	**Guide Standard Exemplification Materials** Guide Standard Exemplification Materials shall include indicative 'guide' examples of Student assessment evidence which the Supplier judges would be likely to meet the minimum requirements for Occupational Entry Competence and higher grades in each Occupational Specialist Component. Guide Standard Exemplification Materials will be produced in consultation with and validated by Employers. Guide Standard Exemplification Materials must accurately portray student assessment evidence and may include, but is not limited to, the use of photographic, audio or video evidence accompanied by an explanatory commentary. **Grade Standard Exemplification Materials** Grade Standard Exemplification Materials shall include actual marked examples of Students' assessment evidence, selected after awarding, which:

Product	Description
	• have met the minimum requirements for Occupational Entry Competence and higher grades in each Occupational Specialist Component; • are produced (and reviewed on an ongoing basis) in consultation with and validated by Employers; • may be used to train Assessors (and any assessors employed or engaged by an Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy) to ensure that Student assessment evidence is assessed to the correct standard consistently, provided always that if the materials are used to train such Assessors (and any assessors and Moderators), the Supplier shall ensure that the spread of marks covered by the materials (including the Grade Standard Exemplification Materials) that are used for such training shall not be restricted to the grade boundaries but shall include material at a range of other marks; and • meet the requirements of SR 2.7(3) of Service Requirement 2. Student assessment evidence may include, but is not limited to, the use of photographic, audio or video evidence accompanied by an explanatory commentary.
Implementation and Delivery Plan	A detailed explanation of the Supplier's proposed approach to successfully designing, developing and delivering the TQ throughout the Term (the level of detail in respect of the whole (and each relevant part of such Term) being commensurate with the level of detail that can reasonably be expected to be known by and/or available to the Supplier from time to time in respect of such whole or part of the Term), including evidence of the achievability of the proposed approach against the TQ Critical Path Diagram. It shall present a clear and achievable overall timetable for the delivery of all of the Services. The Implementation and Delivery Plan shall include information about the Supplier's: • programme and project management approach and project expertise to develop the design, content, assessment and delivery of the TQ, including details of delivery risks and plan to mitigate such risks; • financial modelling on cost of design, development and delivery of the TQ and delivery of the Services;

Product	Description
	• approach to working with Stakeholders (including, if relevant, the T Level Panel up to Interim Milestone 1) in relation to the design, development delivery and ongoing update of the TQ and the Services (including consultation with Eligible Providers to ensure the quality of the Initial TQ Deliverables at each Milestone); • approach to working with Stakeholders and organisations associated with and/or providing advice and/or guidance in relation to Students with special educational needs and disabilities in the design, development, delivery and update of the TQ and the Services, including a process for regularly reporting on progress; • approach to sharing early and/or amended drafts of the Initial TQ Deliverables and TQ Deliverables with Eligible Providers and/or Approved Providers (as applicable), including how such documents will be shared and when; • capacity to scale up in relation to demand and in response to delivery challenges to ensure overall delivery remains on track; • ability to develop and implement innovative solutions; • approach to ensuring that Management Information is interoperable with the Authority's systems and processes during the design, development and live operation of the TQ; • proposals for efficiently supporting Providers to deliver the TQ and to answer related enquiries and address related complaints (including Post-Result Services) made by telephone, by post and by other electronic correspondence efficiently and effectively; • process for raising delays or concerns; and • details of proposed joint working between T Level Awarding Organisations (as contemplated by Schedule 4 (*Co-operation*)) to support (amongst other things) the effective and efficient delivery of the T Level Programme and to streamline administration relating to the T Levels Programme in the interests of Students and Providers. The Implementation and Delivery Plan shall evidence that the Supplier has, or will have: • IT infrastructure and systems to support the design, development, delivery and award of the TQ; • secured any relevant third party contracts to support delivery of the TQ; and • processes for the design, development, delivery and award of the TQ.
Resource Plan	A detailed explanation of the Supplier's proposed approach to resourcing to ensure performance of the Services, and the successful design, development and delivery of the TQ, which shall be in the format of the template Resource Plan issued by the Authority as part of the procurement process leading to the award of this Contract.

Product	Description
	The Resource Plan shall include detail about: • all types of resources required for delivery of the Services, including a distinction between those that will be dedicated to the TQ and those that will be used for other qualifications or business areas; • the resources that will be internal and those that will be external; • the skills and experience profiles for the required resources; • any existing skills or knowledge gaps that may exist with resources already in place and how and when additional resources will be recruited, mobilised, trained and managed; • the number of resources required (including the number of Assessors (and any Moderators where permitted in accordance with the Approved Assessment Strategy) required); • what the resources would be required to deliver and by when; • how long the relevant resources would be engaged; • processes, measures and strategies that will ensure proper, effective and resilient resourcing so that the TQ will at all times operate in accordance with the Service Requirements; • processes for keeping resource requirements under review; • the proposed approach to the recruitment (including the timescales for and number) of Assessors (and any Moderators where permitted in accordance with the Approved Assessment Strategy) which have recent relevant industry experience, including the trajectory that will be required to be maintained to meet the requirements for the provision of Assessors (and (where applicable) Moderators) under this Service Requirements; • the proposed approach to the training (including the timescales) of Assessors (and any Moderators where permitted in accordance with the Approved Assessment Strategy) which have recent relevant industry experience, including the trajectory that will be required to be maintained to meet the requirements for the provision of Assessors (and (where applicable) Moderators) under this Service Requirements; • the assessment expertise, which will be used to deliver assessment design and processes set out in the Assessment Strategy; and • the occupationally specific subject expertise needed to devise and assess Occupational Specialist Components.
Submission Issues Log	The log of issues raised by the Authority in respect of the Initial TQ Deliverables following a Submission and the Supplier's detailed description of how each such issue has been resolved.

Product	Description
Risk Register	The Supplier's register detailing any events, matters and/or circumstances which it reasonably foresees (acting in accordance with Good Industry Practice) may impact upon and/or risk the successful performance of the Services by the Supplier in accordance with this Contract (or, where the Supplier has failed to create, maintain and/or update such register, such register as would detail such events, matters and/or circumstances if the Supplier was complying with its obligations under this Contract).
Issues Log	The Supplier's log detailing any events, matters and/or circumstances which have occurred and which may impact (or have impacted) upon and/or risk the successful performance of the Services by the Supplier in accordance with this Contract (or, where the Supplier has failed to create, maintain and/or update such log, such log as would detail such events, matters and/or circumstances if the Supplier was complying with its obligations under this Contract).
Provider Approval Criteria	The Supplier's criteria for the approval of Eligible Providers to deliver the TQ which shall: • ensure that the Eligible Provider's ability to deliver the TQ to the required standards and expectations is assessed and verified; • ensure that the expertise of the Eligible Provider to deliver the TQ to the required standards and expectations is assessed and verified; • ensure that resources available to the Eligible Provider to deliver the TQ in line with the required standards and expectations is assessed and verified; • promote accessibility of the TQ to all Eligible Providers; • not impose any undue and/or overburdensome administrative, financial and/or operational requirements and/or require any change in the existing administrative, financial and/or operational aspects of an Eligible Provider's business and/or operations, in either case, which could not reasonably be expected by an Eligible Provider as being strictly necessary to deliver the TQ (having regard to the administrative, financial and/or operational aspects of the business and/or operations within which Providers (operating in the same or substantially similar business and/or operations as the Eligible Provider) operate; and • not be inconsistent with and/or lead to a breach of the requirements of clause 7.1 (*Interaction with Providers*).
Assessment Guidance for Providers	Assessment Guidance shall be produced **along with** the specimen assessment materials (SAMs) and will

Product	Description
	include guidance to ensure that Providers are fully supported to prepare students for assessment. This guidance must include information relating to each component, task or similar activity. Guidance must also include but is not limited to, information on how to prepare for and administer assessments and where applicable, how to submit assessment evidence, guidance on marking and moderation as well as any other information that is required to ensure that students and Providers are fully prepared for assessments. The content must be tailored for each series and identify and expand on the guidance given for all practical assessments. Assessment Guidance must be produced in consultation with a sufficient and representative sample of Providers.

ANNEX 1 – QUALIFICATION PURPOSE

The purpose of the level 3 TQ is to ensure Students have the knowledge, skills and behaviours needed to progress into skilled employment or higher level technical training relevant to the T Level.[8]

To achieve this, each level 3 TQ must:

- provide reliable evidence of Students' attainment in relation to:
    - the core knowledge and skills relevant to the Route and Occupational Specialist Component(s) covered by the TQ; and
    - the knowledge, skills and behaviours required for at least one Occupational Specialist Component relevant to the TQ;
- be up-to-date, ensuring the knowledge, skills and behaviours needed for the Occupations have continued currency among Employers and other end-users;
- ensure maths, English and digital skills continue to be applied where they are essential to achieve occupationally relevant outcomes;
- ensure the minimum pass grade standard for Occupational Specialist Components attests to Occupational Entry Competence, meets employer expectations, and is as close to full occupational competence as possible;
- allow end users to accurately identify Students' level of attainment and effectively differentiate their performance;
- provide a clear and coherent basis for development of suitably demanding high-quality level 3 courses, which enable Students to realise their potential;
- provide Students with the opportunity to manage and improve their own performance; and
- support fair access to attainment for all Students who take the TQ, including those with special educational needs and disabilities.

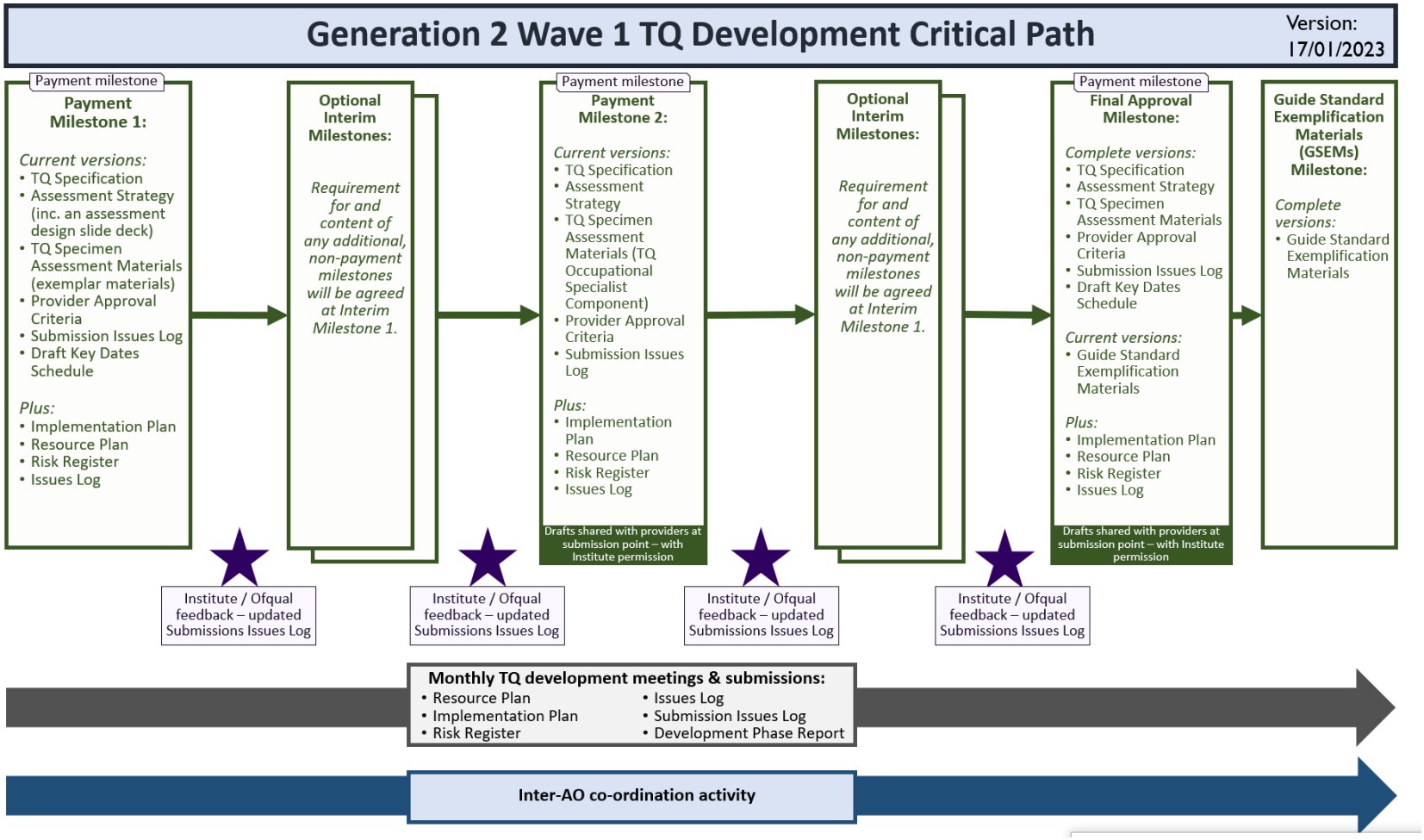
[8] The Authority may only grant IfATE Approval of the qualification "if satisfied that by obtaining the qualification a person demonstrates that he or she has attained as many of the outcomes set out in the standards as may reasonably be expected to be attained by undertaking a course of education" (sA2DA(3) of the 2009 Act).

ANNEX 2 – INTENTIONALLY BLANK

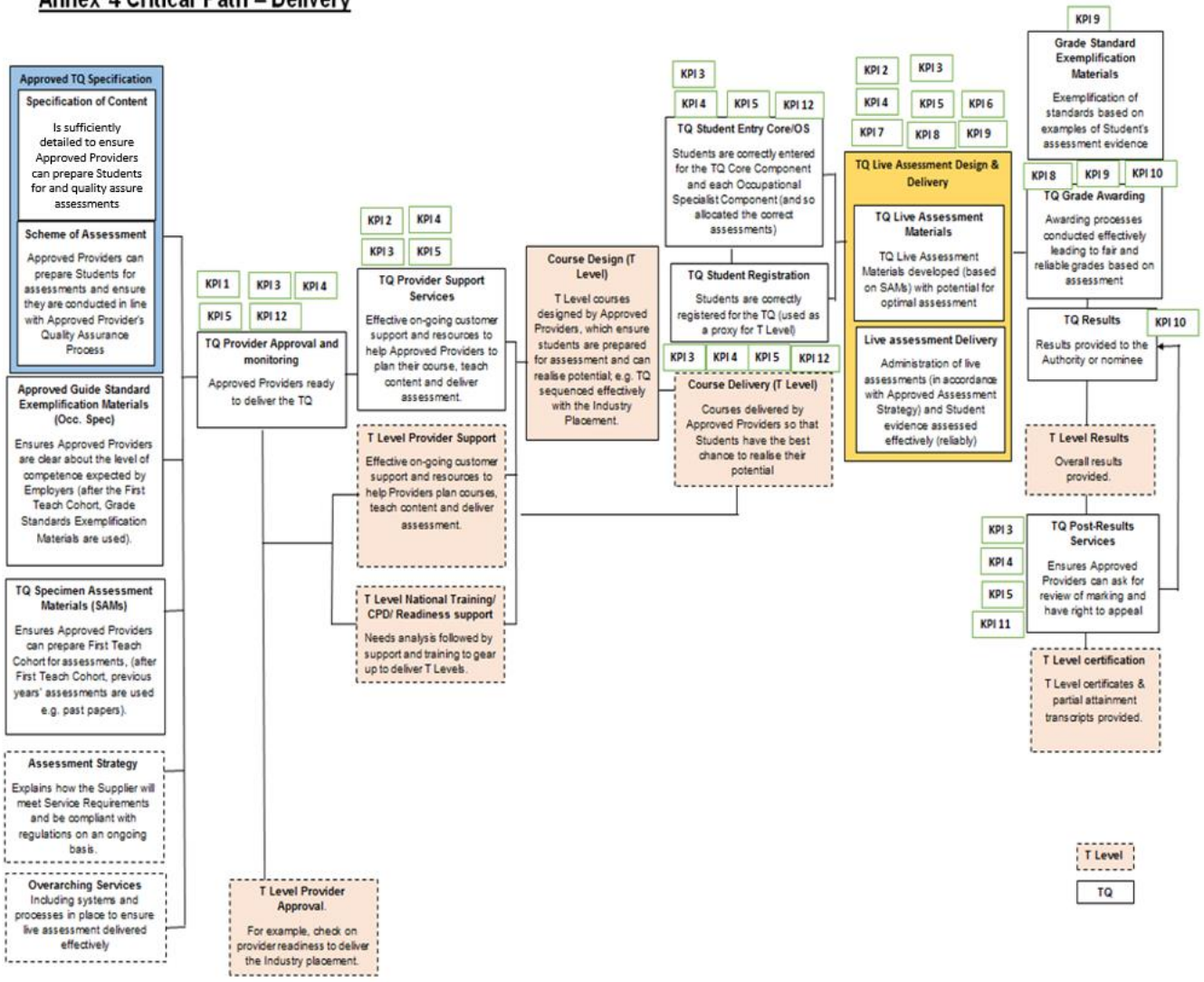
ANNEX 3 – FORMER SUPPLIER'S TQ SPECIFICATION

The TQ Specification content for this Annex is contained in a separate folder - at GEN2W1_ITT_Attachment_11_TQ_Specs

ANNEX 4 – TQ CRITICAL PATH DIAGRAM



Annex 4 Critical Path – Delivery



ANNEX 5 – INDICATIVE KEY DATES SCHEDULE[9]

To meet the requirements of Schedule 4 (*Co-operation*) the Supplier, working with other T Level Awarding Organisations, will need to produce a Key Dates Schedule, which secures the efficient and effective delivery of each assessment series for the TQ. Within the Key Dates Schedule, the deadline for submitting TQ Student registration data to the Authority must be in November in the first year of study. For a summer assessment series results must be issued on or no later than the date A level results are issued.

For a summer assessment series the key dates could include but are not restricted to:

Key Date	**Description**	**Assessment series**
November (Yr1)	Deadline for submitting TQ Student registration data to the Authority	All
3rd week Feb	Deadline for entries for assessments by Approved Providers	June
3rd week Feb	Final date for submitting Reasonable Adjustment requests to the Supplier by Approved Providers	June
4th week Feb	Assessment timetable issued	June
2nd week May	First date for submitting Special Consideration requests to the Supplier	June
2nd week May-3rd week June	Assessments take place	June
3rd week August	Restricted release of T Level results to Approved Providers by the Authority	June
3rd week August	Release of results to Students by the Authority	June

[9] This is an indicative Key Dates Schedule. Exact dates and further key dates will need to be agreed between the Supplier and other T Level Awarding Organisations through Schedule 4 (*Co-operation*) and the resulting Key Dates Schedule must be Approved by the Authority.

Key Date	Description	Assessment series
3rd week August	Release of more detailed TQ results data from the Supplier	June
3rd week September	Appeals and assessment review requests made	June
4th week Nov	T Level certificates and statements of achievement issued by the Department (or the function may be delegated to the Authority)	All

ANNEX 6 – TQ CONTENT UPDATING SCHEDULE

TQ Content Updating Schedule: Inclusive TQ Changes

Schedule Date	Activity
By end November (Academic Year X[10]-1)	Where the Authority carries out an annual review contemplated by clause 8.4, the Authority shall (where the Authority considers that the outcome of that review gives rise to any one or more Inclusive TQ Changes that the Authority requires to be implemented in accordance with this TQ Content Updating Schedule) submit to the Supplier an annual guidance note setting out such Inclusive TQ Changes.
December to February (Academic Year X-1)	The Supplier shall reflect any Inclusive TQ Changes arising out of the relevant annual guidance note (and any additional updates the Supplier proposes should be included as part of the annual review) in the Approved Initial TQ Deliverables or the TQ Deliverables (as the case may be) and/or any other Products and/or documents associated with the TQ (as applicable).
By end February (Academic Year X-1)	The Supplier shall submit the relevant Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents (as the case may be) as amended to reflect the Inclusive TQ Changes in question to the Authority for agreement.
March (Academic Year X-1)	(a) The Authority shall either: • confirm to the Supplier its agreement to the relevant amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents; or • notify the Supplier that the whole or part of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents are not agreed (and provide details of the comments and/or objections that the Authority has in relation to such documents). (b) The Supplier shall (as soon as reasonably practicable following receipt of the Authority's notice) make such amendments to the whole or relevant part (as the case may be) of the Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents as are necessary to address any comments and/or objections

[10] Where Academic Year X shall be the Academic Year in which the agreed amended documents reflecting the relevant Inclusive TQ Changes shall (where applicable) be implemented by Approved Providers for the new Cohort of Students.

	of the Authority and resubmit such amended documents to the Authority for agreement, to which the provisions of paragraph (a) (immediately above) shall apply.
The earlier of the end of March (Academic Year X-1) and (where applicable) the date of agreement by the Authority to the relevant amended documents	The Supplier shall make available any agreed amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents to Approved Providers and facilitate the implementation by Approved Providers of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents, provided always that where part of any such amended document is subject to further amendment (as required by the Authority pursuant to paragraph (a) above), the Supplier shall not (unless otherwise agreed with the Authority) make any part of that relevant Approved Initial TQ Deliverable, TQ Deliverable, Product or document available to Approved Providers until the Supplier has made such amendments as are necessary to address the comments and/or objections of the Authority referred to in paragraph (a) above and the Authority has either confirmed its agreement to the resubmitted document or notified the Supplier that such document (containing only those amendments that have been agreed by the Authority) may be made available to Approved Providers.
September (Academic Year X)	Any agreed amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents shall be implemented by Approved Providers for the new Cohort of Students.

TQ Content Updating Schedule: Exclusive TQ Changes

Schedule Date	**Activity**
End May (Academic Year X[11]-2)	Where the Authority carries out an annual review contemplated by clause 8.4, the Authority shall (where the Authority considers that the outcome of that review gives rise to any one or more Exclusive TQ Changes that the Authority requires to be implemented in accordance with this TQ Content Updating Schedule) submit to the Supplier an annual guidance note setting out such Exclusive TQ Changes.
June (Academic Year X-2) to September (Academic Year X-1)	The Supplier shall reflect any Exclusive TQ Changes arising out of the relevant annual guidance note in the Approved Initial TQ Deliverables or the TQ Deliverables (as the case may be) and/or any other Products and/or documents associated with the TQ (as applicable).

[11] Where Academic Year X shall be the Academic Year in which the agreed amended documents reflecting the relevant Exclusive TQ Changes shall (where applicable) be implemented by Approved Providers for the new Cohort of Students.

By End September (Academic Year X-1)	The Supplier shall submit the relevant Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents (as the case may be) as amended to reflect the Exclusive TQ Changes in question to the Authority for IfATE Approval.
October to November (Academic Year X-1)	(a) The Authority shall either: • confirm to the Supplier that the relevant amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents meet the requirements for IfATE Approval; or • notify the Supplier that the whole or part of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents do not meet the requirements for IfATE Approval (and provide details of the comments and/or objections that the Authority has in relation to such documents). (b) The Supplier shall (as soon as reasonably practicable following receipt of the Authority's notice) make such amendments to the whole or relevant part (as the case may be) of the Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents as are necessary to address any comments and/or objections of the Authority and resubmit such amended documents to the Authority for IfATE Approval, to which the provisions of paragraph (a) (immediately above) shall apply.
The earlier of the beginning of December (Academic Year X-1) and (where applicable) the date of IfATE Approval being achieved in relation to the relevant amended documents	The Supplier shall make available any amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents that have achieved IfATE Approval to Approved Providers and facilitate the implementation by Approved Providers of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents, provided always that where part of any such amended document is subject to further amendment (as required by the Authority pursuant to paragraph (a) above), the Supplier shall not (unless otherwise agreed with the Authority) make any part of that relevant Approved Initial TQ Deliverable, TQ Deliverable, Product or document available to Approved Providers until the Supplier has made such amendments as are necessary to address the comments and/or objections of the Authority referred to in paragraph (a) above and the Authority has either confirmed that such amended resubmitted document has achieved IfATE Approval or notified the Supplier that such document (containing only those amendments on which the Authority would be prepared to award IfATE Approval) may be made available to Approved Providers.

September (Academic Year X)	Any amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents that have achieved IfATE Approval shall be implemented by Approved Providers for the new Cohort of Students.

ANNEX 7 – INITIAL DEVELOPMENT MILESTONES

This Annex sets out the submission requirements for the three Milestones at which the Authority will render initial, interim and final payments of the Development Charge.

Further interim submission Milestones may be added to this timetable where these are agreed as part of the agreement at Interim Milestone 1. This decision will be influenced by the quantum of change to the TQ that is approved by the Authority at that initial Milestone.

In the event of any conflict and/or inconsistency between the provisions of this Annex 7 and the provisions of Annex 4 (*TQ Critical Path Diagram*) to this Service Requirements, the provisions of this Annex 7 shall prevail.

Milestone	**Submission Date**	**Submission**
Interim Milestone 1	18 November 2024 (indicative)	**TQ Specification.** A draft version of the complete TQ Specification, which takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting, and which includes: (a) a complete Specification of Content for all Components which fully covers the Former Supplier's TQ Specification and, if relevant, the Outline Content and any proposed changes to the Former Supplier's Specification of Content; (b) the proposed Guided Learning hours for each Component; (c) a draft of the Scheme of Assessment which: (i) specifies the assessment objectives for each part of the TQ Core Component;

Milestone	Submission Date	Submission
		(ii) defines each assessment method to be used for each Component; (iii) specifies indicative weightings for the assessments within the Components. **TQ Specimen Assessment Materials.** Sample indicative assessment tasks, and assessment criteria/mark schemes which takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting for: (a) each part of the TQ Core Component; and (b) at least one Occupational Specialist Component. The submission must support the exemplification of the proposals within the assessment design walkthrough and include as a minimum the following: (c) exemplar questions that cover the variety of questions types and accompanying mark scheme including indicative content; (d) exemplar tasks for one example of an Employer Set Project together with an exemplar mark scheme and indicative content; and (e) exemplar tasks for one Occupational Specialist Component Assignment together with an exemplar mark scheme including indicative content.

Milestone	Submission Date	Submission
		Assessment Strategy. A draft of the Assessment Strategy, which contains a clear explanation of the structure of the assessment design and strategy for example, the proposed number of assessments and/or assessment tasks, the duration of each and the conditions under which each would be taken. For the Employer Set Project and the Occupational Specialisms, the draft of the Assessment Strategy should also set out the proposed approach to marking and how students' application of skills and knowledge will be assessed. The draft of the Assessment Strategy shall meet (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Assessment Strategy and take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. The Submission must include an: **Assessment design slide deck.** A slide deck which contains a clear explanation of the structure of the assessment design and explanation of the design decision rationale for the TQ Core Component and Occupational Specialist Component. The slide deck must contain the structural elements and rationale in accordance with any guidance on the Service Requirements issued by the Authority and take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. The assessment design slide deck will be used to facilitate a walkthrough with the Authority shortly following the submission. **Implementation and Delivery Plan.** A complete version of the Implementation and Delivery Plan, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Implementation and Delivery Plan and which also takes in account any comments, objections, recommendations

Milestone	Submission Date	Submission
		and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting **Resource Plan.** A complete version of the Resource Plan, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Resource Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Provider Approval Criteria.** A complete version of the Provider Approval Criteria, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Provider Approval Criteria and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Risk Register and Issues Log.** An updated and complete version of each of the Risk Register and the Issues Log which meet all of the requirements of the Product Description for the Risk Register or Issues Log (as applicable) and which take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Submission Issues Log.** An updated Submission Issues Log which meets all of the requirements of the Product Description for the Submission Issues Log, and which explains how each issue raised by the Authority to date has been dealt with in this Submission.

Milestone	Submission Date	Submission
		Employer and Provider Engagement Strategy. A complete version of the Employer and Provider Engagement Strategy, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Employer and Provider Engagement Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting.
Interim Milestone 2	13 January 2025 (indicative)	**TQ Specification.** a complete version of the TQ Specification, which meets all of the requirements of the Product Description for the TQ Specification and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **TQ Specimen Assessment Materials and accompanying Assessment Guidance for Providers.** A complete version of the TQ Occupational Specialist Component and each part of the TQ Core Component, and accompanying Assessment Guidance for Providers which meet all of the requirements of the Product Descriptions and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Assessment Strategy.** A complete version of the Assessment Strategy, which meets all of the requirements of the Product Description for the Assessment Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting.

Milestone	Submission Date	Submission
		Implementation and Delivery Plan. A complete version of the Implementation and Delivery Plan, which meets all of the requirements of the Product Description for the Implementation and Delivery Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Resource Plan.** A complete version of the Resource Plan, which meets all of the requirements of the Product Description for the Resource Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Provider Approval Criteria.** A complete version of the Provider Approval Criteria which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 4) all of the requirements of the Product Description for the Provider Approval Criteria and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Risk Register and Issues Log.** A complete version of each of the Risk Register and the Issues Log which meet all of the requirements of the Product Description for the Risk Register or Issues Log (as applicable) and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Submission Issues Log.** An updated Submission Issues Log which meets all of the

Milestone	Submission Date	Submission
		requirements of the Product Description for the Submission Issues Log, and which explains how each issue raised by the Authority to date has been dealt with in this Submission. **Employer and Provider Engagement Strategy.** A complete version of the Employer and Provider Engagement Strategy, which meets all of the requirements of the Product Description for the Employer and Provider Engagement Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting.
Final Approval Milestone	24 March 2025 (indicative)	**TQ Specification**. A complete version of the TQ Specification, which meets all of the requirements of the Product Description for the TQ Specification and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **TQ Specimen Assessment Materials and accompanying Assessment Guidance for Providers.** A complete version of the TQ Specimen Assessment Materials, and accompanying Assessment Guidance for Providers which meet all of the requirements of the Product Descriptions and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Assessment Strategy.** A complete version of the Assessment Strategy, which meets all of the requirements of the Product Description for the Assessment Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in

Milestone	Submission Date	Submission
		connection with the submission of such Product at any previous TQ Development Meeting. **Implementation and Delivery Plan.** A complete version of the Implementation and Delivery Plan, which meets all of the requirements of the Product Description for the Implementation and Delivery Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Resource Plan.** A complete version of the Resource Plan, which meets all of the requirements of the Product Description for the Resource Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Provider Approval Criteria**. A complete version of the Provider Approval Criteria, which meets all of the requirements of the Product Description for the Provider Approval Criteria and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Risk Register and Issues Log.** A complete version of each of the Risk Register and the Issues Log which meet all of the requirements of the Product Description for the Risk Register or Issues Log (as applicable) and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting.

Milestone	Submission Date	Submission
		Submission Issues Log. An updated Submission Issues Log which meets all of the requirements of the Product Description for the Submission Issues Log, and which explains how each issue raised by the Authority to date has been dealt with in this Submission. **Employer and Provider Engagement Strategy.** A complete version of the Employer and Provider Engagement Strategy, which meets all of the requirements of the Product Description for the Employer and Provider Engagement Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Draft Key Dates Schedule.** An updated version of the Key Dates Schedule.
Guide Standard Exemplification Materials	February 2025 (Indicative)	**Exemplification Materials.** A complete version of the Guide Standard Exemplification Materials for each Occupational Specialist Component, which meet all of the requirements of the Product Description for the Guide Standard Exemplification Materials and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting or any other feedback.

ANNEX 8 – ELIGIBLE PROVIDERS

Part 1 – Eligible Providers 2025 Cohort

The Eligible Providers for the Academic Year commencing 2025 are published on the Gov.uk website here:

https://www.gov.uk/government/publications/providers-selected-to-deliver-t-levels

Part 2 – Eligible Providers Subsequent Cohorts

The Authority shall, not later than 12 months prior to the commencement of the relevant Academic Year, notify the Supplier of the Eligible Providers for such Academic Year.

ANNEX 9 – MANAGEMENT INFORMATION

Information/ report	Description
Development Phase Report	In the period prior to IfATE Approval, the Supplier shall prepare and provide a dashboard report (in such form as the Authority may specify from time to time) summarising: • the Supplier's progress against and compliance (to date) with the Implementation and Delivery Plan (including progress against any milestones (including any Milestones)) and the Resource Plan; • how the Supplier is managing any risks and issues identified in the updated Risk Register and/or Issues Log, including the Supplier's progress against any steps required by the Authority to be carried out by the Supplier in accordance with paragraph 11.1.2 of Part 1 of this Service Requirements; • how Employers (and other end users, including higher education providers) have been consulted in relation to the design of the TQ; and • such other information as the Authority may reasonably require from time to time.

Operational Delivery Report	**Monthly Performance Report**
	
	The Supplier shall prepare and provide a dashboard report (in such form as the Authority may specify from time to time) summarising:
	
	• the Supplier's progress against and compliance (to date) with the Implementation and Delivery Plan, the Resource Plan and the Key Dates Schedule for the relevant Academic Year;
	• how the Supplier is managing any risks and issues identified in the updated Risk Register and/or Issues Log, including the Supplier's progress against any steps required by the Authority to be carried out by the Supplier in accordance with paragraph 11.1.2 of Part 1 of this Service Requirements;
	• for each KPI in respect of which the Performance Monitoring Period ends in that Contract Month:
	  ○ the actual performance achieved by the Supplier for that KPI during that Performance Monitoring Period; and
	  ○ details of any Service Failure that occurred in respect of that KPI, together with the proposed KPI Improvement Plan;

Information/ report	Description
	• details of the Supplier's progress against each KPI Improvement Plan that the Supplier is (or should be, if it was complying with its obligations under this Contract) carrying out and/or completing during the relevant Contract Month; • the Supplier's progress in carrying out any Designated Action notified by the Authority pursuant to clause 14.2 (*What may happen if there are issues with your provision of the Services*); • without prejudice to clause 14.1 (*What may happen if there are issues with your provision of the Services*), any Critical Service Failures occurring in the relevant Contract Month; • any areas of the Services (and/or the performance of the Services) where the Supplier reasonably considers that there could be innovations and/or improvements in the delivery and/or performance of the Services, including key risks and potential benefits; • progress in implementing, and the actual impact of, any innovations and/or improvements previously notified by the Supplier; • evidence demonstrating that the Supplier is achieving the overarching outcomes for each element of the Services, as set out in the first column of the Service Definitions Table; • the monitoring undertaken by the Supplier in accordance with paragraph 3.1.2 of Part 1 of this Service Requirements in the relevant Contract Month to include reporting on Provider usage of training, resources and other support materials made available by the Supplier; • any events, matters and/or circumstances referred to in paragraph 3.2 of Part 1 of this Service Requirements occurring in the relevant Contract Month, together with the progress (during the relevant Contract Month) of the Eligible Provider or Approved Provider (as the case may be) and the Supplier in taking the steps and/or actions referred to in paragraphs 3.3 and 3.4 of Part 1 of this Service Requirements; and • such other information as the Authority may reasonably require from time to time having regard to, amongst other things, the period in the Academic Year within which the relevant Contract Month falls. In relation to the assessment of the Supplier's performance against each KPI, the Supplier shall submit all such evidence as is referred to in the fifth column of the Table set out in Annex 1 to Schedule 15 (*Monitoring of Performance*), other than where such evidence is stated to be obtained via a survey. Notwithstanding the evidence that the Supplier is required to provide (referred to in the fifth column of the Table set out in Annex 1 to Schedule 15 (*Monitoring of Performance*)) to enable

Information/ report	Description

	the assessment of the Supplier's performance against each KPI, the Supplier shall also include within this Monthly Performance Report the following data and information (broken down by KPI):
	
	• KPI 1 (Provider approval and monitoring):
	  ○ the number of Eligible Providers applying to become Approved Providers, broken down into those Eligible Providers that are seeking a full approval and those Eligible Providers that are seeking to extend an existing approval;
	  ○ the number and details of Eligible Providers that have submitted an application to become an Approved Provider and who have (i) not become an Approved Provider and (ii) become an Approved Provider;
	  ○ the number and details of Eligible Providers that are awaiting a decision on their application to become an Approved Provider;
	  ○ the number and details of Eligible Providers in respect of which a decision has been made within 30 Working Days of receipt by the Supplier of the relevant application; and
	  ○ details of the actual monitoring of Approved Providers undertaken by the Supplier in the relevant Contract Month.
	• KPI 2 (Approved Provider preparedness).[12]
	• KPI 3 (Queries from Eligible Providers and Approved Providers):
	  ○ the number of letters and other forms of electronic correspondence received (broken down by letter and each other form of electronic correspondence) and number of telephone calls received, in each case, in the relevant Contract Month;
	  ○ a summary of key topics or queries being asked;
	  ○ details of the percentage of such queries being resolved within the Target Service Level (broken down by letter (and each other form of electronic correspondence) and telephone calls); and
	  ○ details of any repeat queries (including where any such queries have been raised and/or resolved in any previous Contract Month).
	• KPI 4 (Complaints):
	  ○ the number of complaints received in the relevant Contract Month;
	  ○ a summary of the nature of each such complaint;
	  ○ details of the percentage of such complaints being resolved within the applicable Target Service Level;

[12] To be measured by a survey undertaken or commissioned by the Authority.

Information/ report	Description
	○ details of why any complaints that have not been resolved within the applicable Target Service Level have not been so resolved; and ○ details of any repeat complaints or further complaints linked to a previous complaint (including where any such complaints have been made and/or resolved in any previous Contract Month). • KPI 5 (Provider satisfaction).[13] • KPI 6 (Numbers of appropriately qualified and trained Assessors (and (where applicable) Moderators)): ○ details of the actual number of Assessors (and (where applicable) Moderators) that have been recruited, trained and retained in the relevant Contract Month; and ○ details of the number of Assessors (and (where applicable) Moderators) contemplated by the relevant Contract Month (or in line with the trajectory (as the case may be)) as set out in the then current Implementation and Delivery Plan and/or Resource Plan. The Authority may require the Supplier to provide this data more frequently than monthly during the key assessment delivery period. • KPI 7 (Quality of TQ Live Assessment Materials): ○ a summary of activities completed in the relevant Contract Month relating to the development of the TQ Live Assessment Materials, as contemplated in the Assessment Strategy and/or the Implementation Plan; ○ a summary of the actual quality assurance activity undertaken by the Supplier in the relevant Contract Month; ○ a summary of the quality assurance activity (if any) that is contemplated in the Assessment Strategy as being undertaken by the Supplier in or during (as the case may be) the relevant Contract Month; and ○ details of any errors reported in the TQ Live Assessment Materials in the relevant Contract Month. • KPI 8 (Student assessment evidence assessed and processed): ○ a summary of the actual quality assurance activity undertaken by the Supplier to verify the quality of the processing of Student assessment evidence for awarding in the relevant Contract Month, together with evidence that such

[13] To be measured by a survey undertaken or commissioned by the Authority.

Information/ report	Description
	processing has been undertaken accurately and consistently; ○ a summary of the quality assurance activity (if any) that is contemplated in the Assessment Strategy as being undertaken by the Supplier to verify the quality of the processing of Student assessment evidence for awarding in or during (as the case may be) the relevant Contract Month; ○ details of the cumulative volume and percentages of Student assessment evidence processed (broken down to the TQ Core Component and each Occupational Specialist Component) by the end of the relevant Contract Month, as against the planned trajectory and dates in the Implementation and Delivery Plan applicable to that Contract Month; and ○ details of any errors, inaccuracies and/or inconsistencies identified in any processed Student assessment evidence in the relevant Contract Month. • KPI 9 (Validation of Grade Standard Exemplification Materials):[14] For each Occupational Specialism: ○ a summary of the employer validation activity undertaken to validate Grade Standard Exemplification Materials ○ the number of employers who have been involved in the validation process; including details as to whether they have been involved in the panel prior to each validation exercise ○ evidence of validation from at least 5 different Employers relevant to the Occupational Specialism that validate the Grade Standard Exemplification Materials. ○ evidence of validation from at least 5 different Employers relevant to the Occupational Specialism that the Grade Standard Exemplification Materials are comparable to the Approved Guide Standard Exemplification Materials. • KPI 10 (Student assessment results submitted by relevant date): ○ details of the cumulative volume and percentages of Student results submitted by the Supplier to the Authority (or the Authority's nominee (as applicable)) by the end of the relevant Contract Month; and

[14] To be assessed by the receipt and review by the Authority of evidence of validation from Employers in the relevant Contract Month.

Information/ report	Description
	○ details of the cumulative volume and percentages of Student results envisaged in the Implementation and Delivery Plan to be submitted by the Supplier to the Authority (or the Authority's nominee (as the case may be)) by the end of the relevant Contract Month. • KPI 11 (Post-Results Services): ○ the total volume of Post-Results Services (broken down by service) and percentage of each Post-Results Service (as against total Post-Results Services) undertaken by the Supplier in the relevant Contract Month; ○ detail of the timing of delivery of Post-Results Services against the applicable timeframes in Annex 10 (*Additional Services*) of this Service Requirements as contemplated by the Supplier's Response; and ○ detail of the proportion of remarks and Appeals which have resulted in grade increases or decreases (and summary of key reasons for any changes made). • KPI 12 (Submission of information): ○ details of the Management Information, required or requested Products including Key Materials and/ or Ancillary Materials submitted in respect of the relevant Contract Month; ○ details of the Management Information, required or requested Products including Key Materials and/ or Ancillary Materials anticipated to be submitted in respect of the relevant Contract Month; and ○ details of any errors, inaccuracies and/or inconsistencies identified in any Management Information, required or requested Products including Key Materials and/ or Ancillary Materials submitted in respect of the relevant Contract Month (and/or any previous Contract Month). **Ongoing Development Services Report** A dashboard report (in such form as the Authority may specify from time to time) summarising: • the Supplier's progress against and compliance (to date) with the TQ Content Updating Schedule (including progress against any milestones); • any proposed amendments and/or updates made to any Product during the relevant Contract Month pursuant to paragraphs 2.5 and/or 2.6 of Part 1 of this Service Requirements; and

Information/ report	Description
	• such other information as the Authority may reasonably require from time to time. **Annual Services Report** By the end of August each year, a high level overview of the Supplier's assessment of its performance during that Academic Year, summarising: • the key successes and areas for improvement in the delivery of the Services and/or the TQ; • in respect of the assessment cycles in that Academic Year, what important lessons were learned and how these will be addressed in following assessment cycles; • the key issues for the next following Academic Year; • how Employers have been consulted in relation to (and been involved in the design and delivery of) TQ assessment; • performance against the Social Value commitments under paragraph 13.1 (*Social Value Commitments*); and • (where appropriate), the preparations for handover at the end of the Term. The Supplier shall also provide an updated Exit Plan in accordance with paragraph 2 of Schedule 12 (*Exit Management*). **Annual Penetration Testing Report** By the end of August each year, a summary of: • the Supplier's findings of independent penetration testing undertaken to test the security of any IT systems and hosting environments that are used to handle, store or process IfATE Data; and • details of any necessary remedial works required as a result of such penetration testing.
Student registrations and Student entries (as referred to in paragraph 5 of Part 1 of this Service Requirements)	In relation to the Supplier's obligations in paragraph 5.4 of Part 1 of this Service Requirements, the Supplier shall report the following information and data (in a spreadsheet but in such form as the Authority may specify from time to time): • the number of Students registered for the TQ by Approved Provider (including late registrations and/or registration amendments and very late registrations and/or registration amendments (each as referred to in Annex 10 to this Service Requirements)):

Information/ report	Description
	○ in the current Academic Year; and ○ in aggregate (including for the current Academic Year) during the Term to date; • the number of Student entries by Approved Provider (including late entries and/or entry amendments and very late entries and/or entry amendments (each as referred to in Annex 10 to this Service Requirement)) in the relevant Academic Year for: ○ the TQ Core Component; and ○ each Occupational Specialist Component, together with the number of such entries in aggregate (including for the current Academic Year) for each of the TQ Core Component and each Occupational Specialist Component for all Academic Years during the Term to date; • the number of withdrawn entries in the relevant Academic Year (by Approved Provider) for: ○ the TQ Core Component; and ○ each Occupational Specialist Component, together with the number of such withdrawals in aggregate (including for the current Academic Year) for each of the TQ Core Component and each Occupational Specialist Component for all Academic Years during the Term to date; and • such other information as the Authority may reasonably require from time to time.
TQ results (as referred to in paragraph 8 of Part 1 of this Service Requirements)	In relation to the Supplier's obligations in paragraph 8.2 of Part 1 of this Service Requirements, the Supplier shall report the following information and data (in such form as the Authority may specify from time to time) to the Authority (or the Authority's nominee (as applicable)): • results for each Student for the TQ Core Component and each Occupational Specialist Component that such Student has undertaken including: ○ Unique Learner Number; ○ name of Approved Provider; ○ Supplier name; ○ details of the TQ achieved; ○ the grade awarded for each Component; ○ date of achievement; • the outcome of any Appeals, Clerical Check, Expedited Review of Marking, Review of Marking, and/or Review of Moderation (each as referred to in Annex 10 (*Additional Services*) to this Service Requirements)), including

Information/ report	Description
	details of the nature of the Appeal and a summary of the grounds for the Appeal; and • such other information as the Authority may reasonably require from time to time, to enable, amongst other things, the aggregation for T Level certification and inclusion in any Provider performance tables.
Additional Services	Data and information on the volume and nature of Additional Services being delivered to Approved Providers in the relevant Contract Month, in aggregate for the Academic Year to date and in aggregate (including for the current Academic Year) for all Academic Years during the Term to date (in spreadsheet format and in such form as the Authority may specify from time to time).
Adjustments to Fees	In advance of its publication and availability to Approved Providers and in accordance with clause 4.13 (*Pricing and payments*), proposed adjustments to the Fees for the following Academic Year. In accordance with clause 4.13 (*Pricing and payments*), proposed adjustments to the Rate Card for the following Academic Year. The information for each of the proposed adjustments to the Fees and the proposed adjustments to the Rate Card will be submitted separately in a spreadsheet format (in such form as the Authority may specify from time to time) and will include any proposed annual percentage change in each proposed Fee and each proposed rate in the Rate Card, as such proposed change shall be calculated in accordance with clauses 4.12 and 4.13 (*Pricing and payments*).

ANNEX 10 – ADDITIONAL SERVICES

Additional Service	Additional Service Requirements
Access to Student assessment evidence	The Supplier shall within 10 Working Days following receipt of a request from the relevant Approved Provider, send (in such form as such Approved Provider shall request) to that Approved Provider a copy (including, as applicable, a PDF copy) of the relevant original marked Student assessment evidence or the whole or the relevant part (as the case may be) of the original TQ Live Assessment Materials to which the Student assessment evidence relates, to help the Approved Provider (or relevant Student (as the case may be)) decide whether to request a Review of Marking or Review of Moderation (each as defined below).
Additional Approved Provider support visit	The Supplier shall, as soon as reasonably practicable following receipt of a request from an Approved Provider, attend such Approved Provider's premises and provide such additional support as such Approved Provider reasonably requires, such as support in relation to misinterpretation of the TQ Specification.
Appeal	The Supplier shall: (i) within 20 Working Days following receipt of a request from an Approved Provider for an Appeal, undertake a detailed review of all information, data and/or documents relating to the Appeal, including the assessment evidence relating to the whole or the relevant part of a Cohort or an individual Student (as the case may be); and (ii) within 20 Working Days following receipt of a request from an Approved Provider for an Appeal hearing, hold an Appeal hearing in which the Approved Provider or its representative(s) can make submissions in relation to the Appeal, including (where applicable) explaining its dissatisfaction with any grade(s) awarded in relation to the whole or any part of a Cohort or an individual Student (as the case may be), following which the Supplier shall notify the Approved Provider of the outcome of such Appeal and, where necessary, adjust the marks awarded to the whole or any part of a Cohort or an individual Student (as the case may be) and issue new results to the Authority (or its nominee (as the case may be)), provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the determination of such Appeal, the Approved Provider is not successful in the Appeal.
Clerical Check	The Supplier within 10 Working Days following receipt of a request from an Approved Provider, undertake a detailed review of the relevant Student's assessment evidence and recount all of

Additional Service	Additional Service Requirements
	the marks that such Student has been awarded to ensure that the total number of marks awarded to such Student (leading to the award of the relevant grade(s)) equal the number of marks that should have been awarded to such Student and, where necessary, adjust the marks awarded to the Student, notify the Approved Provider of such adjustment and issue new results to the Authority (or its nominee (as the case may be)).
Expedited Review of Marking	The Supplier shall within 10 Working Days following receipt of a request from an Approved Provider, undertake an expedited Review of Marking (as defined below), provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the carrying out and completion of such an expedited Review of Marking, the grade(s) awarded to such Student is not changed.
Late entry or entry amendment	Where, following the entry deadline for the TQ Core Component and/or relevant Occupational Specialist Component specified in the Key Dates Schedule for the relevant Academic Year until the very late entry deadline for the TQ Core Component and/or relevant Occupational Specialist Component specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be entered for the TQ Core Component and/or relevant Occupational Specialist Component and/or an existing entry for a Student to be amended, the Supplier shall following receipt of a request from an Approved Provider no later than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, enter that Student for the TQ Core Component and/or relevant Occupational Specialist Component or amend that Student's entry for the TQ Core Component and/or relevant Occupational Specialist Component (as the case may be).
Late registration or registration amendment	Where, following the registration deadline for the TQ specified in the Key Dates Schedule for the relevant Academic Year until the very late registration deadline for the TQ specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be registered for the TQ and/or an existing registration for a Student to be amended, the Supplier shall following receipt of a request from an Approved Provider no later than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, register that Student for the TQ or amend that Student's registration for the TQ (as the case may be).
Retake	Where, in the period following the publication of the TQ results in accordance with paragraph 8 of Part 1 of this Service Requirements until two years after the end of the final Academic Year for the Cohort within which the relevant Student is included,

Additional Service	Additional Service Requirements
	an Approved Provider requests that a Student wishes to retake all or any of the assessments for: • the TQ Core Component - External Examination; • the TQ Core Component - Employer Set Project; and/or • an Occupational Specialist Component, the Supplier shall carry out and complete its obligations in paragraphs 6.1.3 (*TQ live assessment and delivery*), 7 (*TQ grade awarding*), 8 (*TQ Results*) and 9 (*TQ Post Results Services*) (save to the extent that compliance with such obligations in that paragraph 9 (*TQ Post Results Services*) would otherwise require the performance of a further Additional Service and in respect of which the provisions applicable to that further Additional Service shall apply) in each case of Part 1 of this Service Requirements in respect of such Student.
Review of Marking	The Supplier shall within 25 Working Days following receipt of a request from an Approved Provider, undertake a detailed review of the relevant Student's assessment evidence alongside the TQ Live Assessment Materials applicable to such assessment evidence to ensure that the marking scheme has been complied with in full in relation to the marking of that Student's assessment evidence, provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the carrying out and completion of such review, the grade(s) awarded to such Student is not changed.
Review of Moderation	The Supplier shall within 25 Working Days following receipt of a request from an Approved Provider, undertake a detailed review of the relevant Cohort's assessment evidence alongside the assessment criteria within the Scheme of Assessment to ensure that the assessment criteria has been complied with in full in relation to the marking of that Cohort's assessment evidence, provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the carrying out and completion of such Review of Moderation, the grade(s) awarded to any Student is not changed.
Very late entry or entry amendment	Where, following the very late entry deadline for the TQ Core Component and/or relevant Occupational Specialist Component specified in the Key Dates Schedule for the relevant Academic Year until the date on which entries or amendments to entries finally closes for the TQ Core Component and/or relevant Occupational Specialist Component as specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be entered for the TQ Core Component and/or relevant Occupational Specialist Component and/or an existing entry for a Student to be amended, the Supplier shall (where reasonably practicable having regard to the nature of the assessment) following receipt of a request from an Approved

Additional Service	Additional Service Requirements
	Provider within the period not greater than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, enter that Student for the TQ Core Component and/or relevant Occupational Specialist Component or amend that Student's entry for the TQ Core Component and/or relevant Occupational Specialist Component (as the case may be).
Very late registration or registration amendment	Where, following the very late registration deadline for the TQ specified in the Key Dates Schedule for the relevant Academic Year until the date on which registration for the TQ finally closes as specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be registered for the TQ and/or an existing registration for a Student to be amended, the Supplier shall (where reasonably practicable having regard to the nature of the assessment), following receipt of a request from an Approved Provider within the period not greater than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, register that Student for the TQ or amend that Student's registration for the TQ (as the case may be).

ANNEX 11 –

Schedule for the submission of; Supplementary Specimen Assessment Materials; Employer Set Project Guide Exemplar Responses; and Employer Set Project Grade Exemplar Responses

Product	Description	Authority Submission Date	Publication date	Review point
Core Component	Supplementary Specimen Assessment Materials covering the TQ Core Component in full (comprising the External Examination and the Employer Set Project)	By the end of August prior to the first Academic Year of teaching	By end of October during the first Academic Year	Commencing during the second Academic Year of teaching, to be reviewed by the Supplier each and every Academic Year and re-submitted to the Authority to agree any changes by the end of October, for re-publication by the end of December.
Occupational Specialist Component(s)	Supplementary Specimen Assessment Materials covering the Occupational Specialist Component(s) in full	By the end of March during the first Academic Year of teaching	By end of July during the first Academic Year	Commencing during the second Academic Year of teaching, to be reviewed by the Supplier each and every Academic Year and re-submitted to the Authority to agree any changes by the end of July, for re-publication by the end of October in the following Academic Year.
Employer Set Project Guide Exemplar Responses	Employer Set Project Guide Exemplar Responses covering the Employer Set Project, produced at grade A and grade E for each Employer Set Project, in consultation with Employers and accompanied by an explanatory commentary.	By the end of August prior to the first Academic Year of teaching	By end of October during the first Academic Year	
Employer Set Project Grade Exemplar Responses	Employer Set Project Grade Exemplar Responses covering the Employer Set Project, consisting of actual marked examples of Students' assessment evidence, selected after awarding, produced at grade A and grade E, for each Employer	By the end of October during the second Academic Year of teaching	By end of December during the second Academic Year	Commencing during the third Academic Year of teaching, to be reviewed by the Supplier each and every Academic Year and re-submitted to the Authority to agree any changes by the start of

	Set Project, in consultation with Employers and accompanied by an explanatory commentary.			September, for re-publication by the end of October.

* Where no students have sat an ESP, or no students have achieved a pass at grades A or E, on agreement with the Authority the Supplier may defer production of the Employer Set Project Grade Exemplar Responses to the next Academic Year.

Schedule 2 Annex 3

TQ Spec

S2_A2_GEN2W1_BSE_TQ_Spec

T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Building Services Engineering for Construction

Specification

First teaching from September 2022
Version 1.3

City & Guilds 1999 | eal

Qualification at a glance

T Level route	Construction
T Level pathway	Building Services Engineering
City & Guilds number	8710
Age group approved	16-19
Entry requirements	Formal entry requirements are not set by City & Guilds. However, it is expected that Learners have the appropriate attainment at Level 2 before commencing their studies.
Assessment	Core - knowledge tests are externally assessed Core – employer-set project is externally assessed Occupational specialisms are externally moderated
First registration	September 2021

Title and level	City & Guilds number	Qualification number (QN)
T Level Technical Qualification in Building Services Engineering for Construction	8710	603/6911/5

Version and date	Change detail	Section
1.1 Feb 2021	Updated age ranges	Qualification at a glance
	Assessment dates updated in availability of assessments	Scheme of Assessment
	Provider and Technical Qualification approval criteria	Centre requirements
	Update qualification title	What is this qualification about
	Transfer of attainment added	Delivering the technical qualification
1.2 May 2022	How does the technical qualification work within the T Level?	What is this qualification about Pg 8
	Requirements of the T Level	T Level Structure Pg 12
	Approval information	Centre Requirements Pg 15
	Definition of threshold competence	Technical qualification grading and result reporting Pg 46
	Contribution of occupational specialism grade when two occupational specialisms are taken	Technical qualification grading and result reporting – T Level Grading Pg 47
	Sources of general information updated for currency	Appendix 1: Sources of general information Pg 403
	Additional contact details added	Get in Touch Pg 406
1.3 Feb 2023	Alignment of text in relation to ESP Assessment Objective (AO3) with assessment materials	Core Component Scheme of assessment Pg 33
	Centre staffing requirement wording	Resource requirements - Centre staffing Pg 16
	Transfer of attainment section updated	Delivering the technical qualification Pg 21
	Permitted assessment materials for Core exams added	Core component scheme of assessment Pg 31
	Amendments to terminology in assessment availability table	Availability of assessments Pg 41
	Core grading table inserted	Core grading Pg 36
	T Level grading table	T Level grading Pg 48

We would like to take this opportunity to thank all the employers, trade associations, professional bodies, providers, subject matter experts and consultants who have worked tirelessly alongside us on the development of the TQ. A special thank you to our Employer Industry Board who have dedicated time to review and validate the specifications and TQ documentation. This collaborative work is to ensure that a student studying the Building Services Engineering T level has the best opportunities available to them as they progress through their career with a solid base as a starting point.

- Balfour Beatty
- Barlows Electrical
- Blueflame Associates
- CIPHE
- Convections
- Corgi Technical Services
- Daikin UK
- Electrical Services & Projects Ltd
- Elekta
- Energy Rating Services
- Engineering Forensics
- F-Cold
- Heat Engineer Software Ltd
- Herts Cooling Ltd
- Hoare Lee / CIBSE Representative
- Interserve
- MG Plumber
- National Grid
- NET (National Electrotechnical Training)
- NG Bailey
- Paddeco
- Partner Troup Bywaters
- Pitkin & Ruddock Ltd
- Salamander Pumps
- Stanley Products and Solutions
- TGB Mechanical Services

The Outline Content for the T Level Technical Qualification Building Services Engineering for Construction has been produced by T Level panels of employers, professional bodies based on the same standards as those used for Apprenticeships. The outline content can be found on the institute website: **https://www.instituteforapprenticeships.org/t-levels/approved-t-level-technical-qualifications-and-final-outline-content/**

City & Guilds has amplified the Outline Content to create the Technical Qualification specifications.

Contents

1 Introduction

What is this qualification about?

The following purpose statement relates to the **T Level Technical Qualification in Building Services Engineering for Construction.**

Area	Description
OVERVIEW	
What is a T Level?	T Levels are new courses which will follow GCSEs and will be equivalent to three A Levels. These two-year courses have been developed in collaboration with employers and businesses so that the content meets the needs of industry and prepares learners for work. T levels are one of three post 16 options for young people which are: • A Levels • Apprenticeships • T Level
How does the Technical Qualification work within the T Level?	This Technical Qualification specification contains all the required information you need to deliver the qualification in the T Level in Construction: Building Services Engineering. The Technical Qualification forms a significant part of the T Level in Construction: Building Services Engineering (BSE). City & Guilds are responsible for the development and ongoing operational delivery of this Technical Qualification. All other parts of the T Level as listed below will need to be achieved by a Learner for the Department for Education to award the successful completion of this T Level. It is important to note that City & Guilds do not have responsibility of delivery for the other parts of the T Level but will continue to support centres where they can on all aspects of T Level delivery. Additional mandatory parts of the T Level that need to be achieved: • A 315-hour minimum industry placement.
Who is this qualification for?	This qualification is for you if you are a 16-19-year-old learner, who wishes to work within the Building Services Engineering Industry. It has been designed to deliver a high level of knowledge about the BSE industry as well as the occupational skills required to enter the industry (known as 'threshold competence'). A learner who completes this qualification is

	well placed to develop to full occupational competence with the correct support and training.
What does this qualification cover?	The qualification will help you gain an understanding of the BSE industry and the sector and you will cover topics such as: Health and Safety, construction science principles, sustainability in the construction industry and building services engineering systems. A learner will have the choice of studying one standalone occupational specialism or a combination of specialisms as listed below. Standalone: • Electrotechnical engineering • Electrical and electronic equipment engineering • Protection systems engineering • Gas engineering Combinations: • Plumbing engineering and Heating engineering • Heating engineering and Ventilation • Air conditioning engineering and Refrigeration engineering Centres and providers work with local employers who will contribute to the knowledge and delivery of training. Employers will provide demonstrations and talks on the industry and where possible work placements will also be provided by the employers.

WHAT COULD THIS QUALIFICATION LEAD TO?	
Will the qualification lead to employment, and if so, in which job role and at what level?	This qualification focuses on the development of knowledge and skills needed for working in the BSE industry, which will prepare learners to enter the industry through employment or as an Apprentice. Furthermore, the completion of this qualification gives the learner the opportunity to progress onto higher education courses and training.
Why choose this qualification?	This qualification will suit someone who is not yet employed or looking to enter the industry post mainstream education. The structure of the qualification is designed to give learners the breadth of knowledge and understanding across the BSE industry but also equips them with necessary occupational and core skills to enter the industry. This qualification is designed to support fair access and allows learners to manage and improve their own performance.
WHO SUPPORTS THIS QUALIFICATION?	
Employer route panels	The content of this qualification is outlined by a representative panel of employers from across the industry sector. It therefore prescribes the minimum knowledge and skills required to enter the industry. The content in this specification is approved by the Institute for Apprenticeships and Technical Education.

Key information

Below is a summary of the key information provided to centres to support delivery of this technical qualification.

Guided learning hour (GLH) value

Values for GLH are calculated by considering the duration needed for the activities that a typical learner would need to complete to be able to demonstrate the knowledge and skills across the qualification content. This includes contact with tutors, trainers or facilitators as part of the learning process, and includes formal learning such as classes, training sessions, coaching, seminars and tutorials. This value also includes the time taken to prepare for, and complete, the assessments for the TQ qualification.

Centres should be aware that when planning programmes of study around the GLH that the GLH is based on a typical learner for this qualification. However, learners progress and develop at a different pace that is unique to the individual learner, and learners will have different qualification relevant experience. To accommodate this centres must be aware that some learners will not need the full GLH to develop and demonstrate the required knowledge and skills and some learners will need slightly longer than the proposed GLH to develop and demonstrate the knowledge and skills required. Therefore, centres should plan the flexibility within their programmes of study to reflect and support the needs of all learners.

Total Qualification Time (TQT) value

This is the total amount of time, in hours, expected to be spent by a learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

Criteria

This section of the specification outlines the subject or topic that needs to be delivered and assessed. Criteria are often supported by **'range'** which provides the detail of the information required to be delivered as part of that topic. For example, with BSE systems as the topic, the range would list the systems that would need to be covered in delivery and assessment.

What do learners need to learn?

The primary purpose of these sections is to support the delivery of the content in the criteria. These sections provide context in relation to the depth and breadth to which a subject or topic needs to be taught.

Skills

This section provides a mapping reference to the core, maths, English and digital skills that are embedded within the technical qualification content.

Example

3.3 Role of different **disciplines** involved in design.

Range:

Disciplines - Contractors and all operatives, architects and all professional occupations, planners and building inspectors, manufacturers

What do learners need to learn?

A basic knowledge of key job roles within construction design including the responsibilities and reporting lines/lines of escalation within roles. The key activities aligned to the disciplines with an appreciation of potential career progression routes.

T Level Structure

To achieve the T Level learners must meet all requirements of the T Level framework of which the technical qualification is one part. Learners have to successfully complete an industry placement and any other requirements set by the Institute for Apprenticeships and Technical Education such as licence to practice qualifications.

Supplementary Requirement for Building Services Engineering for Construction

Providers offering the **Refrigeration Engineering and Air Conditioning Engineering** Occupational Specialism should familiarise themselves with the **Supplementary Requirement** related to this specialism. Providers should consider offering the Category 1 FGas Certificate to T Level learners before learners undertake their Industry Placement, in order to allow the widest possible choice of placement.

Technical Qualification Structure

The technical qualification is made up of two components, both of which need to be successfully achieved to attain the T Level Technical Qualification Building Services Engineering for Construction.

The Core Component:
The core content is designed to offer sufficient breadth of knowledge and skills for the learner to apply in a variety of contexts related to the industry and those occupational specialisms linked to this T Level.

The core content is the building blocks of knowledge and skills that will give a learner a broad understanding of the industry and job roles. At the same time, it will develop the core skills they will need to apply when working within the industry.

Occupational Specialisms:
Occupational specialisms develop the knowledge, skills and behaviours necessary to achieve threshold competence in an occupation. Threshold competence is defined as when a learner's attainment against the knowledge, skills and behaviours is of a standard for them to enter the occupation and industry. They must also demonstrate the ability to achieve occupational competence over time with the correct support and training.

To achieve the **T Level Technical Qualification in Building Services Engineering for Construction** learners must complete the two components of the Technical qualification. These are known as the core component and the occupational specialism:

- Building services engineering core component (350)
- Plus, **two** occupational specialism components that **must** be (351 & 358) or (355 & 359) or (356 & 355) or **one** occupational specialism component that must be (353) or (354) or (357) or (352).
- Learners must be registered on the mandatory POS and one other POS covering the occupational specialisms.

T Level Technical Qualification for Building Services Engineering in Construction

Programme of study (POS)	City & Guilds component number	Component title	Component level	GLH	TQT
Mandatory					
8710-30	350	Building services engineering core content	Level 3	520	650
Choose one standalone occupational specialism or one combination of occupational specialisms.					
Standalone					
8710-33	353	Electrotechnical engineering	Level 3	650	820
8710-32	352	Electrical and electronic equipment engineering	Level 3	570	740
8710-37	357	Protection systems engineering	Level 3	570	720
8710-34	354	Gas engineering	Level 3	650	735
Combinations					
8710-36	356 355	Plumbing engineering & Heating engineering	Level 3	840	975
8710-35	355 359	Heating engineering & Ventilation	Level 3	765	880
8710-38	351	Air conditioning engineering	Level 3	700	850

358	& Refrigeration engineering

2 Centre requirements

Approval

All eligible providers must obtain Full Provider Approval with City & Guilds prior to delivering any T Level Technical Qualification (TQ).

Provider approval is not equivalent to centre approval; any provider which is already an existing City & Guilds approved centre must still obtain Full Provider Approval in the first instance. There is no fast-track approval for these qualifications.

Once successfully approved, providers can apply for additional TQs or apply to add additional occupational specialisms (OS) during each approval window.

The approval application consists of a comprehensive set of approval criteria agreed with the Institute to ensure an eligible provider is fit and ready to deliver T Level Technical Qualifications.

These criteria seek to ensure the integrity of the qualifications for both City & Guilds and the Institute. They must be adhered to throughout the delivery of the TQ and will be reviewed at the annual self-assessment.

Criteria A Management Systems
Criteria B Industry placement
Criteria C Resources
Criteria D Delivery
Criteria E Assessment and standardisation plan
Criteria F Secure live assessment and administration
Criteria G Conflicts of Interest (COI)

Please refer to our published provider approval and quality assurance information document available on our website **here**. This document includes information around the approval process, criteria for approval and the timeline for the relevant academic year.

Resource requirements

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- If the learner has any specific learning or training needs
- support and guidance they may need when working towards their qualification
- the appropriate type and level of qualification

We recommend that centres provide an introduction so that learners fully understand the requirements of the qualification, their responsibilities as a learner, and the responsibilities of the centre.

Centre staffing

Staff delivering and assessing these qualifications must be able to demonstrate that they meet the following requirements:

- be occupationally competent and qualified at or above the level they are delivering
- have maths and English at Level 2 or be working towards this level of qualification
- be able to deliver across the breadth and depth of the content of the qualification being taught
- have recent relevant teaching and assessment experience in the specific area they will be teaching, or be working towards this
- demonstrate continuing CPD
- have experience or training in the following to support the delivery of this technical qualification:
    - delivering project-based qualifications
    - preparation for exam-based assessments.

BSE core

Staff who are familiar with L3 Construction/BSE qualifications will be able to teach the core subjects.

Occupational specialisms specific requirements

Electrotechnical engineering

Hold an NVQ level 3 in Electrical Installations or equivalent qualification and have an AM2 qualification **or** have current JIB or ECS Gold card registration.

Gas engineering

Hold a Level 3 Diploma in Gas Utilisation or equivalent qualification including relevant CPD that demonstrates the qualification standards and requirements.

Protection systems engineering

Hold an NVQ L3 in Electronic Security and Emergency systems or a suitable L3 Electrical or Electronic engineering qualification or equivalent qualification. Relevant CPD that demonstrates experience of working with the range of electronic security systems included in this qualification.

Electrical and electronic equipment engineering

Hold an NVQ L3 or equivalent in Electrical and Electronic engineering or equivalent qualification and relevant CPD that demonstrates experience of working with the range of systems included in this qualification.

Plumbing and Heating

Hold an NVQ level 3 in Plumbing and Heating Engineering or equivalent qualification including relevant CPD that demonstrates the qualification standards and requirements.

Heating and ventilation

Hold an NVQ level 3 in Heating and ventilation or equivalent qualification including relevant CPD that demonstrates the qualification standards and requirements.

Air conditioning and refrigeration engineering

Hold a relevant NVQ Level 3 Air conditioning or Refrigeration engineering qualification or industry experience of a minimum of five years. Must hold an F-Gas qualification.

Staff assessing these qualifications must meet the above requirements and hold or be working towards a relevant recognised assessor qualification such as a Level 3 Certificate in Assessing Vocational Achievement and continue to practise to that standard. Assessors who hold earlier qualifications (D32, D33 or TQFE/TQSE) should have CPD evidence that meets current standards. Assessors must also hold a relevant trade qualification and/or have registration with a relevant trade organisation as 'Approved Tradesperson' or have 'Eng-Tech' status

Physical resources

Centres must be able to demonstrate that they have access to the equipment and technical resources required to deliver this qualification and its assessment.

Electrotechnical engineering

Standard test rig equipment including:

- Resistors
- Luminaires
- Motors
- Wiring/cabling - Single or multicore cable
- Cable enclosures
- Switches
- Power and lighting accessories
- Boiler/water heater

Electrical and electronic equipment

- Broadband router (either 4G sim router or network connection)
- Data cabinet
- Patch panel
- Network switch
- Tablet (iPad or similar) for setting up app-based equipment
- Smart equipment (e.g. Hive)
- Wi-Fi extender units
- HDMI-enabled monitors/TVs
- Speaker/PA system
- Amplifier
- Smart internet-based TV box

Protection systems engineering

- 230 V AC voltage indicator and proving unit
- 230 V AC mains isolation and lock-off kit
- Digital multimeter (DMM)
- RJ-45 crimping tool
- RJ-45 Krone tool
- CAT5e/CAT6e cable tester
- BNC crimp tool
- RJ-45 connectors; wall sockets/plugs
- RG-59 BNC crimp connectors
- Range of cables – 8-core 0.22 mm^2 alarm, FP200, RG-59 co-axial, CAT5e

Air conditioning and Refrigeration engineering

- Specialist refrigeration tools (tube cutters, pipe benders, swaging tools, etc)
- Suitable refrigeration-grade soft-rolled copper pipe and electrical cable
- Brazing equipment and consumables
- Nitrogen pressure testing and purging equipment
- Vacuum pump and vacuum gauge
- Refrigerant and charging equipment
- Test equipment (multimeter, thermometers, etc)

- PPE
- Manufacturer's instructions for all equipment must be available
- Condensing units and matched coolers
- 2–3 kW split heat pump systems
- Cold room of 6 m^3 minimum and suitable for -20°C operation

Plumbing engineering

- Specialist plumbing tools (soldering equipment, pipe benders, adjustable spanners, etc)
- Pipe (copper, LCS, plastic)
- Sanitary appliances
- Selection of fittings and fixings
- Jointing materials
- Measuring equipment
- Commissioning equipment
- PPE
- Manufacturer's instructions for all equipment must be available
- Making-good materials (filler, paint, sandpaper, etc)
- Plumbing systems (direct and indirect cold water, boosted cold water, hot water etc)
- Plumbing components (WC, WHB, drain valves, etc)

Heating engineering

- Heating specialist tools (soldering equipment, pipe benders, adjustable spanners, etc)
- Pipe (copper, LCS, plastic)
- Selection of fittings and fixings
- Jointing materials
- Measuring equipment
- Commissioning equipment
- PPE
- Manufacturer's instructions for all equipment must be available
- Making good materials (filler, paint, sandpaper, etc)
- Thermal insulation materials
- Heating systems (fully pumped, 3x two-port valves (S-Plan Plus))
- Heating appliances (boilers)
- Heat-emitting devices and associated seals (radiators, underfloor heating, etc)
- Heating components (safety controls, diverter valves, etc)
- Heating controls (thermostats, zone valves, etc)

Gas engineering

- Specialist gas tools (blowtorch, pipe cutters, spanners, etc)
- Specialist gas equipment (pressure gauges, combustion performance analyser, etc)
- Pipe (copper, steel, pliable corrugated)
- Selection of fixtures
- Jointing materials
- Measuring equipment
- Gas testing equipment
- Commissioning equipment
- PPE
- Manufacturer's instructions for all equipment must be available

- Making-good materials (filler, paint, sandpaper, etc)
- Gas systems (natural gas (NG), liquefied petroleum gas (LPG))
- Gas appliances (cookers, water heaters, space heaters, etc)
- Gas components (fans, thermistors, etc)
- Flues (open flues, room-sealed flues, etc)

Ventilation

- Specialist ventilation tools (power tools, hand tools, etc)
- Specialist ventilation equipment (anemometer, flow meter, etc)
- Ductwork materials (rigid, semi-rigid, flexible, etc)
- Selection of fittings and fixings
- Measuring equipment
- Ventilation testing equipment
- Commissioning equipment
- PPE
- Manufacturer's instructions for all equipment must be available
- Ventilation systems (mechanical, natural, mixed mode, etc)
- Ventilation components (fans, dampers, diffusers, etc)
- Electrotechnical components (inverters, actuators, sensors, etc)

Internal quality assurance

Internal quality assurance is key to ensuring accuracy and consistency of tutors and markers. Internal Quality Assurers (IQAs) monitor the work of all tutors involved with a qualification to ensure they are applying standards consistently throughout assessment activities. IQAs must have, and maintain, an appropriate level of technical competence and be qualified to make both marking and quality assurance decisions through a teaching qualification or recent, relevant experience.

Learner entry requirements

Centres must ensure that all learners have the opportunity to gain the qualification through appropriate study and training, and that any prerequisites stated in the **What is this qualification about?** section are met when registering for this qualification.

Formal entry requirements are not set by City & Guilds, but it is expected that learners will have qualifications at Level 2 or equivalent. This may include:

- GCSEs at grade 4 or above, including English and maths
- Level 2 vocational qualification or equivalent in a related subject, e.g. construction and the built environment

3 Delivering the technical qualification

Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- if the learner has any specific training needs
- support and guidance they may need when working towards their qualification
- the appropriate type and level of qualification.

City & Guilds recommends that centres provide an introduction so that learners fully understand the requirements of the qualification, their responsibilities as learners, and the responsibilities of the centre. This information can be recorded on a learning contract.

Programme delivery

The technical qualification should be delivered through approaches that meet the needs of learners. City & Guilds recommends using a variety of delivery methods, including in classrooms and real work environments. Learners may benefit from both direct instruction in more formal learning environments and taking part in investigative projects, e-learning and their own study and learning through indirect approaches to delivery.

Transfer of attainment

We fully expect some students to switch between T Levels, particularly in the early weeks, as happens currently with many post-16 courses. Some providers may co-teach some T Level groups for some classes where these are within the same route and where much of the core content is the same. This may well result in students switching to a different T Level, as they discover more about the content, including the range of occupational specialisms. Depending on the point at which a student switches, they may need some additional support to catch up any other pathway-specific learning they have missed. During Year 1, providers should consider the degree of overlap between two T Levels, and the remaining time pre-assessment, to determine which transfers should be permitted. For funding purposes, it is important that students have made a decision about their T Level and registered for their occupational specialism by the end of the first year. However, once an assessment has been taken, switching may become more difficult. T Level core assessments will vary in terms of content coverage, duration, and method, and therefore attainment from one T Level cannot count towards another.

4. Competency frameworks

The technical qualification has been developed to include competency frameworks for T Levels, which demonstrate an array of competencies across maths, English and digital skills as well as four key core skills that have been mapped on to the core content. This can be seen in the skills section for each criterion.

Core skills

In the design, delivery and assessment of the technical qualification the following core skills are fundamental in the development of the required knowledge, skills and behaviours that learners will need to use when they progress onwards from completing their T Level. These core skills have been mapped on to the design of the qualification content and developed in consultation with the industry and providers. The mapping identifies opportunities where these core skills can be developed and embedded into teaching and learning. It is not expected that all criteria will develop core skills, but where these skills exist in the core content it has been referenced to support centres.

- **Core skill A (CSA)** Applying a logical approach to solving problems, identifying issues and proposing solutions, e.g. through setting criteria for successful implementation of a system, using cost/benefit analysis of the introduction of new procedures or equipment:

    - Advantages and disadvantages of system selection, and their application in various settings
    - The various components that make up both pipework and ducting systems, and how they affect BSE systems
    - Produce risk assessments, method statements and safe systems of works
    - Key stages of the design process
    - Different types of sustainable solutions listed in the range, and how they are used to inform the building process
    - Different insulation materials, controls and building monitoring systems (BMS) used to improve energy efficiency in buildings
    - Use of both manufacturer instructions and technical guidance to solve problems
    - Complying with data storage requirements in relation to security and protection
    - Use of technology connected to the internet of things, and its role in the construction industry to assist in just-in-time and asset management
    - Use of digital engineering techniques in the construction industry and where to apply them
    - Utilising benchmarking, KPIs and target setting when measuring business success
    - Ensuring key requirements of the building regulations and Approved Documents are implemented within projects
    - Applying a logical approach to maintenance activities

- **Core skill B (CSB)** Primary research e.g. obtaining measurements related to a design and / or customer requirement

    - Collecting information on BSE systems
    - Researching the various components that make up BSE systems
    - Researching health and safety requirements to produce risk assessments, method statements and safe systems of work
    - Researching construction materials to ascertain their properties and suitability
    - Researching construction design job roles
    - Structure of the construction industry, including business types
    - Role and importance of CPD
    - Sustainable construction solutions
    - Researching the techniques aimed at maximising value and minimising waste within the industry
    - Researching the requirements of current UK building regulations to ensure compliance
    - Procedures and processes for penetrating building structure, as detailed in the building regulations
    - Standards regulation and guidance used to maintain good practice within the construction industry
    - Researching corporate social responsibility principles for a range of organisations
    - Using current UK and international standards (BS EN)

- **Core skill C (CSC)** Communication e.g. providing information and advice to customers and / or wider stakeholders on the potential risks of a change to an industrial system, or making a presentation to a stakeholder on the implications of change.

    - Presenting installation plans to key stakeholders or the client
    - Presenting risk assessments, method statements and safe systems of work to enable safe working
    - Communicating with the end user when safely isolating services/systems
    - Communicating when unsafe situations occur in the workplace following the current HSE reporting requirements
    - Communicating the potential implications of poor design to the different parties affected in the construction chain
    - Explaining the benefits to contractors and the client/customer of profitability and project success, detailing the implications of not having accurate measurements
    - Communicating information and data sources for construction projects
    - Communicating using building information modelling (BIM) and workflow software packages
    - Promoting good customer service, providing information and advice to customers
    - Implementing change requests from various parties, including clients
    - Communicating using technology connected to the internet of things, and understanding its role in the construction industry to assist in just-in-time and asset management
    - Setting clear project goals and objectives, defining roles, setting realistic milestones and understanding constraints on cost and time

- Communicating BSE system maintenance requirements with end users

- **Core skill D (CSD)** Working collaboratively with other team members and stakeholders e.g. to develop content to bid for a construction project:

  - Taking part in group discussions and presentations, collating information in response to a specification or client brief
  - Following the correct procedures for reporting an incident or near miss in the workplace
  - Reporting lines/lines of escalation within construction roles
  - Integration of all partners in the supply chain
  - BIM and the effect it has on real-time project delivery and collaboration
  - Working collaboratively with the different types of stakeholders, e.g. client, team and end user
  - Collaborative approach to project delivery and reporting, and how this is applied in practice with the use of BIM and workflow software packages
  - Working with a range of individuals, applying equality and diversity legislation
  - Use of conflict management techniques
  - Behaving in an ethical way towards other team members and stakeholders
  - Fundamental business values and commitment to customers, and collaborative working with others
  - Working collaboratively to ensure quality management systems are completed
  - Ensuring team members and stakeholders know the key requirements of building regulations and Approved Documents

Maths, English and digital skills

Maths, English and digital skills have been mapped across the core content and each of the occupational specialisms. The lists below identify the core competencies which can be found in the skills section of each performance criteria.

General English competencies

The general English competencies outline a framework of six general digital competencies, with no prioritisation or interpretation of order intended:

EC1 – Convey technical information to different audiences
EC2 – Present information and ideas
EC3 – Create texts for different purposes and audiences
EC4 – Summarise information/ideas
EC5 – Synthesise information
EC6 – Take part in/lead discussions

General mathematical competencies

The general mathematical competencies outline a framework of ten general mathematical competencies, with no prioritisation or interpretation of order intended:

MC1 – Measuring with precision
MC2 – Estimating, calculating and error spotting
MC3 – Working with proportion
MC4 – Using rules and formulae
MC5 – Processing data
MC6 – Understanding data and risk
MC7 – Interpreting and representing with mathematical diagrams
MC8 – Communicating using mathematics
MC9 – Costing a project
MC10 – Optimising work processes

General digital competencies

The following outlines a framework of six general digital competencies, with no prioritisation or interpretation of order intended:

DC1 – Use digital technology and media effectively
DC2 – Design, create and edit documents and digital media
DC3 – Communicate and collaborate
DC4 – Process and analyse numerical data
DC5 – Be safe and responsible online
DC6 – Controlling digital functions

5 Scheme of Assessment

Assessment methods

Learners must complete:

Two externally set exams covering knowledge from the building services engineering core (component 350)

The exams provide sufficient sampling of the content and consist of a mixture of short answer questions (SAQs), some of which will be structured, and extended response. The balance of questions in assessing across assessment objectives (AOs) 1, 2 and 3 will allow for the appropriate differentiation of learners to support the reliable setting of boundaries.

One employer-set project covering knowledge and skills from the building services engineering core (component 350)

The employer-set project will consist of a well-defined, real industry-style brief. The brief will be complex and non-routine, and will require the use of relevant maths, English and digital skills. The brief will provide a valid context for the Level 3 learner to demonstrate their knowledge and understanding of the core content and their core skills to solve occupationally relevant situations and/or problems.

And

Two occupational specialisms from (351 & 358) or (355 & 359) or (356 & 355)

Or

One occupational specialism from (353) or (354) or (357) or (352)

These assessments will feature a considerable practical element and are composed of a series of holistic practical tasks relating to the specialism at hand. They will take place over a period of time, scheduled at the provider's preference within an approximate three-month assessment window. By nature of the considerable practical elements, the tasks will generate significant ephemeral evidence and be heavily reliant on Internal Assessor observation notes and records for validation.

Grading and marking

The building services engineering core (component 350) is graded overall A*–E plus ungraded (U).

The occupational specialisms (components 351–359) are graded overall Distinction, Merit, Pass and Ungraded. Each occupational specialism achieved will receive a grade.*

*Although it is mandatory for some specialisms to be taken within a combination, this is only for delivery purposes. Each occupational specialism with have its own practical assignment that will attest to threshold competence. As an example, if a learner decided to take Plumbing and heating as a combination, they would need to complete an assignment for both specialisms. If a learner decided to take Electrotechnical engineering, only one practical assignment would need to be taken.

Technical qualification scheme of assessment overview

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

Assessment component (number)	Method	Duration	Marks	Weighting	Marking	Grading
Exam paper 1 (031)	Externally set exam	2.5 hours	110	35%	Externally marked	This component will be awarded on the grade scale A* - E
Exam paper 2 (032)	Externally set exam	2.5 hours	110	35%	Externally marked	
Employer-set project (033)	Externally set project	17 hours	100	30%	Externally marked	

Occupational Specialism Component - Learners must complete one assessment component from the below

Assessment component (number)	Method	Duration	Marks	Weighting	Marking	Grading
Electrotechnical engineering (353)	Externally set assignment	24 hours	90	100%	Externally moderated	All occupational specialism components will be awarded on the grade scale P, M, D
Electrical and electronic equipment (352)	Externally set assignment	16 hours	90	100%	Externally moderated	
Protection systems engineering (357)	Externally set assignment	15 hours	90	100%	Externally moderated	
Gas engineering (354)	Externally set assignment	24 hours	90	100%	Externally moderated	

Occupational Specialism Component* – Learners must complete both assessment components from one of the combinations below						
Assessment component	**Method**	**Duration**	**Marks**	**Weighting**	**Marking**	**Grading**
Plumbing and Heating engineering						
Plumbing engineering (356)	Externally set assignment	21 hours	90	100%	Externally moderated	All occupational specialism components will be awarded on the grade scale P, M, D
Heating engineering (355)	Externally set assignment	20 hours	90	100%	Externally moderated	
Heating engineering and Ventilation						
Ventilation (359)	Externally set assignment	20 hours	90	100%	Externally moderated	All occupational specialism components will be awarded on the grade scale P, M, D
Heating engineering (355)	Externally set assignment	20 hours	90	100%	Externally moderated	
Air conditioning and Refrigeration engineering						
Air conditioning engineering (351)	Externally set assignment	28 hours	90	100%	Externally moderated	All occupational specialism components will be awarded on the grade scale P, M, D
Refrigeration engineering (358)	Externally set assignment	28 hours	90	100%	Externally moderated	

Core component scheme of assessment

The assessments for this component consist of two core exams and an employer-set project, which are set against a set of assessment objectives (AOs) used to promote consistency among qualifications of a similar purpose. They are designed to allow judgement of the learner to be made across a number of different categories of performance.

Each assessment for this component has been allocated a set number of marks against these AOs based on weightings recommended by stakeholders of the qualification. This mark allocation remains the same for all versions of the assessments, ensuring consistency across assessment versions and over time.

AO weightings for the assessment components related to the core components are detailed below.

Core exam

Assessment objective	Description	Weighting
AO1 a Demonstrate knowledge	All AOs require the ability to recall knowledge. AO1a) refers to instances where the learner is simply required to demonstrate basic recall. In the test, this helps to give confidence in sufficiency of coverage of the content, and recognises that not all knowledge requires further understanding e.g. terminology, number facts etc.	10%
AO1 b Demonstrate understanding	The ability to explain principles and concepts beyond recall of definitions in order to be able to transfer these principles and concepts between contexts. Learners have built connections between related pieces of knowledge. AO1b) focuses on the ability of the learners to show understanding by summarising or explaining concepts in their own words, exemplifying or comparing and making inferences in general terms that show e.g. cause and effect.	25%
AO2 Apply knowledge and understanding to different situations and context	Using and applying knowledge and understanding, of processes, procedures, generalisations principles and theories to specified, concrete situations. AO2 is about being able to take the understanding of generalities (AO1b) and apply them to specific novel situations. It is more granular than the more extended synthesis/creation that may respond to an analysis (AO3a) of a more holistic complex situation/brief.	45%
AO3 Analyse and evaluate information and issues	Learners will be provided with information e.g. in the form of a detailed scenario requiring them to analyse the interrelated issues arising and evaluate, e.g., the strengths and weaknesses or advantages and disadvantages of approaches they may take to achieve a good outcome. Marks will be given for the quality of analysis and evaluation and the range of considerations considered.	20%

Component	Assessment method	Description and conditions
Core exam	Externally marked tests	These tests are **externally set and externally marked** and will be sat through question papers provided by City & Guilds. These tests are designed to assess learners' depth and breadth of understanding across the core component in the qualification at the end of the period of learning and will be sat under invigilated examination conditions. See JCQ requirements for details: **http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations** Learners who fail either one or both exams in the core component will need to retake both exams and must do so in the same assessment window. Any retake must be completed within two years after the completion of the learner's T level programme.

Component	Assessment method	Assessment overview	Permitted assessment materials
Paper 1	Externally marked tests	These exams will be made up of different question types that include short answer questions, structured questions, and extended response questions. The exam paper will consist of part A and part B. The level of difficulty will increase through the paper with lower demand questions at the beginning of the question paper to higher demand questions at the end of the question paper. Content overview: • Health and safety in construction • Construction design principles • Construction and the built environment industry • Construction sustainability principles • Building technology principles • Tools, equipment and materials	Pen with blue or black ink Non-programmable calculator A copy of the IET Wiring Regulation BS7671

Component	Assessment method	Assessment overview	Permitted assessment materials
Paper 2	Externally marked tests	These exams will be made up of different question types that include short answer questions, structured questions and extended response questions. The exam paper will consist of part A and part B. The level of difficulty will increase through the paper with lower demand questions at the beginning of the question paper to higher demand questions at the end of the question paper. Content overview: • Construction science principles • Construction measurement principles • Construction information and data principles • Relationship management in construction • Digital technology in construction • Construction commercial/business principles • Building Services Engineering (BSE) systems • Maintenance principles	Pen with blue or black ink Non-programmable calculator A copy of the IET Wiring Regulation BS7671

Both core exams will follow the same structure but each core exams covers different technical content. Each exam paper is made up of two parts:

- Part A 70%)

And

- Part B (30%)

Employer-set project

Assessment objective	Typical evidence	Approximate weighting
AO1 Planning skills and strategies	Clearly structured response to brief, cohesive response with ordered sections, logical approach to referencing, research and sources, response completed to deadline and meeting required parameters, sources used effectively and integrated into response (not just an afterthought), effective use of time allocation available for presentations.	14%
AO2 Apply knowledge and skills to the context of the project	Relevant core knowledge applied to respond to brief, references relevant legislation, building controls, materials, concepts, waste disposal and site access considerations.	54%
AO3 Select relevant techniques and resources to meet the brief	Selection of techniques and resources in order to support a response to the brief; consideration of the techniques and resources that are most effective and appropriate to use, and accurate and informed use of these.	10%
AO4 Use maths, English and digital skills	Use of correct terminology, abbreviations, units of measurement in context, consideration of audience of brief response (technical versus non-technical wording), use of calculations/graphs etc appropriately, consideration of the use of ICT and digital methods both in brief response and in presentation.	16%
AO5 Carry out tasks and evaluate for fitness for purpose	Considered analysis and evaluation of project outcome, what went well and what could be improved, response conclusion or evaluation section, identification of solutions in response to brief problem with evidence of evaluation of other options and reasons for rejection of other options where not appropriate.	6%

Component	Assessment method	Description and conditions
Employer-set project	Externally marked project	This project is **externally set and externally marked** by City & Guilds and is designed to require the learner to identify and use effectively in an integrated way an appropriate selection of skills, techniques, concepts, theories and knowledge from across the whole of the BSE core content. Projects will be released to centre staff in advance of any of the assessment windows for each task. City & Guilds will provide centres with assessment windows for centres to timetable assessment sessions within, in accordance with the assessment times prescribed in the employer-set project centre guidance. Centres will be required to maintain the security of all live assessment materials until assessment windows are open. Projects will therefore be password-protected and released to centres through a secure method. Guidance on equipment, resources and duration will be released as appropriate to ensure centres can plan for delivery of the project in advance. The marking grid for the project will be available to centres from the start of the learning programme. Learners who fail the employer-set project on first submission can retake in any assessment window. Any retake must be completed within two years after the completion of the learner's T level programme.

Component	Assessment Method	Assessment overview
Employer-set project	Externally marked project	**Content overview:** The employer-set project samples knowledge drawn from across the core content in relation to the specific project version context – however, due to their importance **all** versions of the employer-set project will cover content from the following core underpinning knowledge outcomes: • Health and safety • Construction design principles • Sustainability principles • Building services engineering (BSE) systems **Assessment overview:** The employer-set project is an assessment made up of several tasks that will take place within controlled conditions, assessing the knowledge and skills learned as part of the core element of the T Level. Each project will be developed together with employers in the industry to reflect realistic types of developments, activities and challenges. The project is made up of a number of tasks which all relate to the same employer-set project brief and tender specification. • 1.1 – Research • 1.2 – Report • 1.3 – Project plan • 1.4 – Presentation • 2.1 – Collaborative problem-solving • 2.2 – Evaluation The project only draws on the content from the common core knowledge that sits across all specialisms for BSE (specific knowledge and skills for each specialism will be assessed in the practical assignments). The project is linked to the core skills: • Problem solving • Research • Communication • Working collaboratively with others

Core grading

The T Levels Technical Qualification (TQ) in Building Services Engineering for Construction Core is made up of the below sub-components (and weightings).

- Exam (70%)
- Employer-Set Project (30%)

Uniform Mark Scale (UMS) grade boundaries

The table below shows the UMS (Uniform Mark Scale) values available for grades in the sub-components. It also shows the UMS values required to achieve each grade for the overall Core. This table will not vary across the series, the values are fixed for this TQ.

Grade boundary	Exam sub-component	ESP sub-component	Overall Core
A*	252 – 280	108 – 120	360 – 400
A	224 – 251	96 – 107	320 – 359
B	196 – 223	84 – 95	280 – 319
C	168 – 195	72 – 83	240 – 279
D	140 – 167	60 – 71	200 – 239
E	112 – 139	48 – 59	160 – 199
Unclassified (U)	0 – 111	0 – 47	0 – 159

Scheduling of the Employer-set project assessments

The employer-set project assessment window will occur from March to May annually. Specific dates will be released annually through the key date schedule for the following academic year.

Task	Scheduling	Task duration
1.1	City & Guilds sets the assessment window for the centre to timetable	3 hours
1.2	City & Guilds sets the assessment window for the centre to timetable	6 hours
1.3	City & Guilds sets the assessment window for the centre to timetable	3 hours
1.4	City & Guilds sets the assessment window for the centre to timetable	2.5 hours
2.1	City & Guilds sets the assessment window for the centre to timetable	1.5 hours
2.2	City & Guilds sets the assessment window for the centre to timetable	1 hour

Occupational specialism component scheme of assessment

What is the occupational specialism component?

The occupational specialism assignment consists of a project brief presented as client requirements or a specification of work that is realistic to the occupational specialism rather than detailed instructions on what to do, to allow the learner to demonstrate that they have the knowledge required to implement the brief. There will be several high-level tasks in every version of the assessment, and these will take the form of planning, installing, and service and maintenance. Within each high-level task there will be several sub-tasks that learners will need to complete as directed within the assessment documents. The sub-tasks will reflect the project brief for that version of the assignment.

How is the occupational specialism component marked?

Occupational specialism assessments will be set and marked at task level. Once learner evidence has been marked, Internal Assessors will make a holistic judgement on performance by applying the knowledge and skills that have been demonstrated to assessment themes within the marking grid.

Each learner will receive a total mark for each assessment theme. The total for each assessment theme is accumulated, giving a total mark for the assessment. Assessment themes will be common across every version of the assessment and will assess a similar range of evidence across assessment versions, ensuring comparability of demand between every version of the assessment.

Although evidence from across all tasks can be used to demonstrate performance against an assessment theme, internal markers will be directed to specific task evidence that must be used to support judgements on performance against the assessment theme. The assessment themes will be broad enough to ensure that all the performance criteria across the specialism are assessed, supporting reliability of the assessment.

In order to ensure reliability, and consistent and accurate judgements on performance, assessment themes may consist of sub-assessment themes due to the potentially wide content coverage and to ensure that the performance outcome is assessed to the appropriate depth and breadth. This still allows for the appropriate base mark to be applied to the assessment theme, but also ensures that the distribution of marks within and across bands is more manageable and increases the reliability of judgements made and marks awarded. Internal assessors will give an appropriate mark in relation to the learner's performance for each individual sub-assessment theme, but this will contribute to the overall mark for that assessment theme. Internal assessors will then need to evidence the decision for the mark awarded for each assessment theme on the Candidate Record Form (CRF).

Component	Assessment method	Overview and conditions
Occupational specialism assignment	Externally set, externally moderated	This assignment is **externally set, internally marked and externally moderated**, and is designed to require the learner to identify and use effectively in an integrated way an appropriate selection of skills, techniques, concepts, theories and knowledge from across the occupational area. Assignments will be released to centre staff towards the end of the learners' programme, usually the week before Easter each year. Centres will be required to maintain the security of all live assessment materials until assessment windows are open. Assignments will therefore be password-protected and released to centres through a secure method. Guidance on equipment, resources and duration will be released as appropriate to ensure centres can plan for delivery of practical assignments in advance. The marking grid for the assignment will be available to centres from the start of the learning programme. Learners who fail the occupational specialism following the first submission can retake in any assessment window. Any retake must be completed within two years after the completion of the learner's T level programme. Please note that for externally set assignments City & Guilds provides guidance and support to centres on the marking process and associated marking grid in the assessment pack for the qualification, and guidance on the use of marking grids.
Electrical engineering	Externally set, externally moderated	**Content overview** Learners will be able to: • Install electrotechnical systems • Commission electrotechnical systems • Maintain electrotechnical systems • Decommission electrotechnical systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults

Gas engineering	Externally set, externally moderated	**Content overview** Learners will be able to: • Install gas systems • Commission gas systems • Maintain gas systems • Decommission gas systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults
Electrical and electronic equipment	Externally set, externally moderated	**Content overview** Learners will be able to: • Install electrical and electronic equipment systems • Commission electrical and electronic equipment systems • Maintain electrical and electronic equipment systems • Decommission electrical and electronic equipment systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults

Protection systems engineering	Externally set, externally moderated	**Content overview** Learners will be able to: • Install protection systems • Commission protection systems • Maintain protection systems • Decommission protection systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults
Plumbing engineering	Externally set, externally moderated	**Content overview** Learners will be able to: • Install plumbing systems • Commission plumbing systems • Maintain plumbing systems • Decommission plumbing systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults

Heating engineering	Externally set, externally moderated	**Content overview** Learners will be able to: • Install heating systems • Commission heating systems • Maintain heating systems • Decommission heating systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults
Air conditioning engineering	Externally set, externally moderated	**Content overview** Learners will be able to: • Install air conditioning systems • Maintain air conditioning systems • Commission air conditioning systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults

Refrigeration engineering	Externally set, externally moderated	**Content overview** Learners will be able to: • Install refrigeration systems • Maintain refrigeration systems • Commission refrigeration systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults
Ventilation	Externally set, externally moderated	**Content overview** Learners will be able to: • Install ventilation systems • Maintain ventilation systems • Commission ventilation systems **Assessment overview** Learners will be assessed against the following assessment themes: • Health and Safety • Design and planning • Systems and components • Inspect and test systems and components • Report and information • Handover and communication • Working with faults

Availability of assessments

The table below sets out the scheduled assessment windows annually for the T Level in Building Services Engineering for Construction. Exact key dates for assessment that are externally marked (core exams and the employer-set project) will be communicated to approved providers annually through the key date schedule.

Component	Series	Exam type	Calendar Month/s	Assessment window/set date
Core exam 1	Summer series	Written exam	June	Set date/time
	*Autumn series	Written exam	November	Set date/time
Core exam 2	Summer series	Written exam	June	Set date
	*Autumn series	Written exam	November	Set date
Employer-set project	Summer series	Project	April - May	Assessment window
	*Autumn series	Project	October-November	Assessment window
Occupational specialism	One series annually	Assignment	February – May (first assessment 2023	Assessment window

*Please note that the retake series is not only restricted to retakes.

6 Technical qualification grading and result reporting

Awarding the technical qualification grade

The technical qualification components are awarded as shown below:

Component	Grading
Core	A* - E
Occupational specialism	Pass, Merit and Distinction

Core component

Calculating the grade of the core component uses the aggregation of points from across all assessment components in the core to calculate the overall grade for the core component.

Core component grade descriptors

Component	Grade	Descriptor
Core	A	To achieve an 'A' grade a learner will: Demonstrate a comprehensive understanding of the full range of principles that influence construction processes and procedures in routine contexts and allow successful implementation to non-routine contexts. Make links between relevant knowledge and understanding when responding to problems in a logical and methodical format. Legitimate and justified approaches are provided in response to complex construction industry briefs and problems. Demonstrate the ability to comprehensively identify and interpret a full range of considerations in analysing complex briefs or problems, including the impacts their decisions have on the wider industry and not solely on individual trades. There is a meticulous approach in the selection of tools, materials and methods when planning approaches or responses to construction industry briefs or problems. Use a range of communication strategies with an ability to adapt their style and format to respond well to audience and stakeholder needs in presenting approaches to solving problems. Demonstrate a high degree of accuracy in knowledge and skills from across the core content and critically evaluate their own performance in meeting a brief or problem to improve.

Component	Grade	Descriptor
Core	E	To achieve an 'E' grade a learner will: Demonstrate a limited understanding of some of the key principles and how they influence construction process and procedures in routine contexts. Make general links in knowledge and understanding that can sometimes be superficial and are supported by partial reasoning and not evidence based, and that relate to routine problems or industry briefs. Respond to briefs or problems with little awareness of the impact in relation to the wider construction industry context. There is some understanding in selection of tools, materials and methods to meet the requirements of routine construction industry briefs or problems. Demonstrate a small range of communication strategies that are sometimes not suitable in language and format for audiences and stakeholders, with inaccuracies in technical references. Provide an evaluation of performance and how requirements have been met, which is brief with no reference to how to improve. Learners need to complete all components to be awarded the technical qualification. Any performance determined as not meeting the standard set by City & Guilds will receive an unclassified (U) result.

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Occupational specialism component

Calculation of the grade for the occupational specialism is based on setting grade boundaries for Pass and Distinction. The setting of grade boundaries is based on judgemental evidence, against the grade descriptors for the occupational specialisms, review of the Guide Standard Exemplification Materials (Grade Standard Exemplification Materials after the first award) and review of statistical evidence.

Pass and Distinction grade descriptors can be found in both learner and centre occupational assessment materials.

To successfully achieve an occupational specialism the learner needs to be recognised at threshold competence (Pass).

Threshold competence refers to a level of competence that:

- signifies that a student is well placed to develop full occupational competence, with further support and development, once in employment
- is as close to full occupational competence as can be reasonably expected of a student studying the TQ in a classroom-based setting (for example, in the classroom, workshops, simulated working and (where appropriate) supervised working environments)
- signifies that a student has achieved at least a pass in relation to the relevant occupational specialism component.

If a learner does not meet the minimum standards as determined by City & Guilds for either/both the core component and occupational specialism they will be issued with an unclassified (U) grade.

T Level Grading

To be awarded an overall T Level grade, a student must pass both components of their TQ, successfully, complete an industry placement and meet any other requirements set by the T Level panel within the Institute. T Levels will vary in size, largely dependent on the size of the TQ.

In meeting the above requirements, the learner will be eligible to be awarded an overall qualification grade for the T Level in Building Services Engineering for Construction. The calculation of the qualification grade will be based on performance in the core component and occupational specialism, as set out below.

Calculation of the T Level Qualification Grade				
	Occupational specialism grade			
Core component grade	**Grade**	**Distinction**	**Merit**	**Pass**
	A*	Distinction*	Distinction	Distinction
	A	Distinction	Distinction	Merit
	B	Distinction	Merit	Merit
	C	Distinction	Merit	Pass
	D	Merit	Merit	Pass
	E	Merit	Pass	Pass

Note, for the Technical Qualification in BSE for Construction, the overall T Level Qualification Grade has a contribution from each component as outlined in the table below.

Component	Overall weighting to qualification grade
Core component grade	50%
Occupational specialism component grade	50%

Students who are required to complete a combination of two occupational specialisms

- Students will still receive separate grades for each specialism, and these will be listed separately on their T Level certificate.
- Students will need to pass both occupational specialisms to pass their T Level overall. A single combined occupational specialism grade will be used to calculate the overall T level grade. The calculation of the overall combined grade for the occupational specialism component will be based on performance in each specialism, as set out in the table below.

Calculation of the T Level Qualification Grade (Combination of two occupational specialisms)				
	Occupational Specialism 1			
Occupational Specialism 2		Distinction	Merit	Pass
	Distinction	Distinction	Distinction	Merit
	Merit	Distinction	Merit	Pass
	Pass	Merit	Pass	Pass

7 Administration

Lost candidate work

If work is lost, City & Guilds should be notified immediately of the date of the loss, how it occurred, and who was responsible for the loss. Centres should use the JCQ form, JCQ/LCW, to inform City & Guilds Customer Services of the circumstances.

Learners who move from one centre to another during the course may require individual attention. Possible courses of action depend on the stage at which the move takes place. Centres should contact City & Guilds at the earliest possible stage for advice about appropriate arrangements in individual cases.

Malpractice

Please refer to the City & Guilds guidance notes *Managing cases of suspected malpractice in examinations and assessments*. This document sets out the procedures to be followed in identifying and reporting malpractice by candidates and/or centre staff and the actions which City & Guilds may subsequently take. The document includes examples of candidate and centre malpractice and explains the responsibilities of centre staff to report actual or suspected malpractice. Centres can access this document on the City & Guilds website.

Examples of candidate malpractice are detailed below (please note that this is not an exhaustive list):

- falsification of assessment evidence or results documentation
- plagiarism of any nature
- collusion with others
- copying from another candidate (including the use of ICT to aid copying), or allowing work to be copied
- deliberate destruction of another's work
- false declaration of authenticity in relation to assessments
- impersonation

These actions constitute malpractice, for which a penalty (e.g. disqualification from the assessment) will be applied.

Where suspected malpractice is identified by a centre after the candidate has signed the declaration of authentication, the Head of Centre must submit full details of the case to City & Guilds at the earliest opportunity. Please refer to the form in the document *Managing cases of suspected malpractice in examinations and assessments*.

Accessibility

In the design of the technical qualification and its assessments the following principles have been applied:

- In the development of content, tasks and assessments, **all** learners are considered.
- Materials are well designed and do not create barriers to attainment. This includes content being presented logically and in an uncluttered way.
- No particular characteristics or groups of learners are disadvantaged by features of the qualification.
- Language is appropriate and presented in its simplest form to provide fair access to all learners.
- In the design of content and assessments, the impact on learners' social, behavioural and emotional wellbeing is considered.
- Physical and sensory needs of learners in accessing content and assessments are considered

Access arrangements

Access arrangements are adjustments that allow candidates with disabilities, special educational needs and temporary injuries to access the assessment and demonstrate their skills and knowledge without changing the demands of the assessment. These arrangements must be made before assessment takes place.

It is the responsibility of the centre to ensure at the start of a programme of learning that candidates will be able to access the requirements of the qualification.

Please refer to the *JCQ access arrangements and reasonable adjustments and Access arrangements - when and how applications need to be made to City & Guilds* for more information. Both are available on the City & Guilds website: **http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments**

Special consideration

City & Guilds can give special consideration to candidates who have had a temporary illness, injury or indisposition at the time of the examination. Where City & Guilds does this, it is given after the examination.

Applications for either access arrangements or special consideration should be submitted to City & Guilds by the Examinations Officer at the centre. For more information please consult the current version of the JCQ document, *A guide to the special consideration process*. This document is available on the City & Guilds website: **http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments**

Informing candidate of pre-moderated marks

Centres are required to inform candidates of their marks **before** external moderation. It is important that candidates are informed of their pre-moderated marks are provisional and allow sufficient time for them to appeal if felt necessary while still allowing their agreed centre marked work to be available for external moderation on time.

Centres must also provide candidates with a copy of their marked work and the centre's internal appeals procedures on request.

Internal appeals procedure

For internally marked assessments, all centres must have an internal appeals procedure for candidates, which gives them the opportunity to appeal the centre mark for their work, before moderation takes place. The procedure must ensure:

- the person completing the appeal is competent and did not mark the work originally
- that any marking errors are identified and corrected
- the candidate is informed of the outcome, reason and any change in mark.

The City & Guilds appeals process also covers access arrangements, special consideration, and malpractice. Applications are not accepted directly from candidates, but the centre can apply on a candidate's behalf. Where relevant, centres must tell candidates how to request this. The centre can refuse to make the application to City & Guilds, but the candidate must be given the opportunity to appeal this decision. This information must be included in the centre's internal appeals procedure.

Centres must provide candidates and City & Guilds with a copy of their internal appeals procedure, on request.

Results reporting

The Institute for Apprenticeships and Technical Education will certificate Learners who have successfully completed all elements of the T Level Technical Qualification Building Services Engineering for Construction.

T Level results will be released on the Level 3 results day in August

Post-results services

The services available include a review of marking and review of moderation. Requests must be submitted within the specified period after the publication of results for individual assessments.

For further details of enquiries about results services, please visit the City & Guilds website at **www.cityandguilds.com.**

8 Components

Content of components

The components in this qualification are written in a standard format and comprise the following:

- City & Guilds reference number
- Title
- Level
- Guided learning hours (provisional)
- Assessment method
- Introduction section
- Underpinning knowledge outcome – including range and depth sections
- What learners need to learn
- Links to maths, English and digital skills
- Guidance for delivery
- Suggested learning resources
- Scheme of Assessment*

*Occupational specialisms only

350 Building Services Engineering Core

Level:	3
GLH:	520
Assessment method:	Two Knowledge tests Employer-set project

What is the component about?

This component focuses on the learner's knowledge and understanding of contexts, concepts, theories and principles relevant to Onsite construction and Building Services Engineering (BSE). The component is designed to raise learners' awareness of the industries and develop knowledge and understanding of:

- Fundamental Health and Safety practices associated with carrying out construction and BSE work
- Scientific principles related to construction activities
- The construction industry and careers within it
- Principles of sustainability and design, relevant to construction projects
- Information, data and principles of measurements
- Tools, equipment and materials used in BSE work
- Legislation, regulations and approved standards that apply to BSE systems.

Learners may prepare by asking themselves questions such as:

- How are teams of different specialists co-ordinated to work together on construction projects?
- What the different career pathways and destinations are within the construction industry?
- What factors influence whether construction projects are profitable?
- What kind of tasks does a building service engineers perform?
- What systems do Building Service Engineers work on?
- What tools and equipment building service engineers use as part of their role?

Underpinning knowledge outcomes

On completion of the BSE Core, learners will understand

1. Health and safety in construction
2. Construction science principles
3. Construction design principles
4. Construction and the built environment industry
5. Construction sustainability principles
6. Construction measurement principles
7. Building technology principles
8. Construction information and data principles
9. Relationship management in construction
10. Digital technology in construction
11. Construction commercial/business principles
12. Building Services Engineering (BSE) systems
13. Maintenance principles
14. Tools, equipment and materials

Completion of the Building Services Engineering core will give learners the opportunity to develop their maths, English and digital skills. Details are presented in the skills section of each criterion.

BSE Core content

1. Health and safety in construction

Criteria

1.1 Construction **legislation and regulations**

Range:
Legislation and regulations - Health and Safety at Work Act (HASAWA), Reporting Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Control of Substances Hazardous to Health (COSHH), Control of Asbestos Regulations, Construction (Design and Management) (CDM) Regulations, Provision and Use of Work Equipment Regulations (PUWER), Manual Handling Operations Regulations, Personal Protective Equipment (PPE) at Work Regulations, Work at Height Regulations, Control of Noise at Work Regulations, environmental regulations, waste management, Electricity at Work Regulations, Control of Vibrations at Work Regulations, Confined Spaces Regulations, Management of the Health and Safety Act Regulations, lone working.

What do learners need to learn?	Skills
The role of legislation and regulations in the construction industry, including the role of the Health and Safety Executive (HSE).	CSB EC5
How current legislation impacts employer, employee and construction projects within a domestic and commercial setting.	
Regulations relating to provisions of welfare facilities during construction work (toilets, washing facilities, drinking water, heating, changing rooms and lockers, rest facilities etc). How to access to information related to welfare responsibilities Onsite.	
The bodies responsible for maintaining and updating legislation and regulations.	
The implications of not adhering to the legislation on the public, client, business and employers and employees including enforcements, penalties, and imprisonment.	
The difference between statutory and non-statutory documents, where each document is applicable in terms of construction activities.	
Regulations and the overarching guidance documents for working in the building services engineering sector including the activities and procedures they cover.	

1.2 Public liability and employer's liability

What do learners need to learn?	Skills
What liability is and what the current requirements are relating to public and employer liability for construction employees and employers. The implications of public liability such as, injury, illness/death, legal action and compensation, and employer's liability such as employee and public injury, accidents, compensation, medical cost, legal costs and loss of income.	EC5

1.3 Approved construction codes of practice

What do learners need to learn?	Skills
Where to obtain approved codes of practice through the HSE L series publications. Their use, purpose and legal status and how these are applied in the construction industry.	EC5

1.4 Development of **safe systems of work**

Range:
Safe systems of work - Company management systems, risk assessments, method statements, permits to work, safety notices and CSCS cards.

What do learners need to learn?	Skills
How safe systems of work are developed and used in construction projects. Roles and responsibilities, recording and reviewing and any potential implications of not having systems in place. How to write method statements, How to complete risk assessments How to complete a COSHH assessment How to apply CDM Site signage requirements Construction Skills certification scheme (CSCS) (SMSTS) (SSSTS)	EC3 EC5

1.5 **Safety conscious procedures**

Range:
Safety conscious procedures - Safe systems of work, reporting of potential hazards, site inductions, training, toolbox talks, good housekeeping (working systematically, keeping areas clean and clear).

What do learners need to learn?	Skills
Procedures that aim to promote and support safety consciousness within construction sites/environments/workshop areas. The benefits of having these procedures in place and the potential implications of not adhering to them – (i.e. injury/death, loss of business, fines, increased costs, project timescales slipping etc.)	EC1 EC3

1.6 **Safety inspection** of a work environment

Range:
Safety inspection - sensory inspections, visual inspections, recording documents.

What do learners need to learn?	Skills
The methods used to inspect a workplace to ensure it is safe for work. Review of area/site/workshop, use of guidance and HSE regulations, documentation used to define safe methods, dimensions, ratios and mitigate potential risks and technical health and safety terms used in the construction industry. Types and use of recording documentation • Register of inspection • Access equipment • Work equipment	CSA CSC EC3 MC4

1.7 **Implications** to those working within the BSE industry of not following health and safety legislation

Range:
Implications - penalties, improvement notice, prohibition notice, powers of prosecution.

What do learners need to learn?
Roles and responsibilities and the consequences of not carrying out own role and responsibilities for those working within the BSE industry i.e. • Employer • Employee • General Public • Health and Safety Executive

1.8 Safe working practices for the safe isolation of **systems**

Range:
Systems - Water supplies, gas supplies, electrical supplies.

What do learners need to learn?	Skills
The methods used to safely isolate various services/ systems. Safe working practices including warning notices, locking off devices, timescales for completion and continuation of services (back up) that are used while services are isolated.	CSC MC10

1.9 **Implications** of poor health and safety on building performance and individual stakeholders.

Range:
Implications - Accidents, injuries, fatalities, slips, trips, falls, down time, financial, reputation, environmental, near misses.

What do learners need to learn?	Skills
The consequences of not working safely on site to individual stakeholders. The implications of poor health and safety and who these impacts at different levels i.e. employee, employer/business, client/customer/public.	MC2

1.10 **Recording and reporting** of safety incidents and near misses.

Range:
Recording and reporting - accident book, reporting procedure, accident and incident reporting policy, RIDDOR reportable incidents.

What do learners need to learn?	Skills
The correct process to undertake and follow when reporting an incident or near miss in the workplace.	CSA CSD EC3

1.11 **Emergency procedures** for **unsafe situations**

Range:
Emergency procedures - Gas Industry Unsafe Situations Procedure (GIUSP), Gas Safety Installation and Use Regulations (GSIUR), Evacuations, electric shock, first aid.

Unsafe situations - Fire, gas leaks, terrorist threats, water leak, carbon monoxide, potential. electric shock

What do learners need to learn?	Skills
The correct procedures to follow if unsafe situations occur in the workplace. Actions to be taken when dealing with fire situations. The different fire extinguisher and their use.	CSC EC5

1.12 **Types of PPE**

Range:
Types of PPE - Head protection (safety hat, bump cap, snood), eye protection (goggles, safety glasses, full face visor), ear protection (ear defenders, ear plugs), full body protection (overalls, workwear, elbow pads), hand protection (gloves, gauntlets), knee protection (knee pads, kneeling mat), foot protection (safety shoes, safety boots, safety trainers), respiratory protection (respirators, dusk mask, face fit), vibration protection, harnesses.

What do learners need to learn?
The purpose and correct use of appropriate PPE to mitigate risks.

1.13 First aid facilities

What do learners need to learn?
The first aid facilities that must be available in the work area in accordance with Health and Safety regulations.

1.14 Warning signs for the seven main groups of hazardous substance

What do learners need to learn?
The categories of safety signs. The symbols for hazardous waste. The meaning of each pictogram in the CLP Regulation and where they would be encountered.

1.15 Safe practices and procedures for the use of **access equipment and manual handling**

Range:

Access equipment - ladders, mobile scaffold towers, platforms, trestles, steps, podiums, staging, boom and scissor lifts.

Manual handling – single, two-person lift, mechanical lifting aids.

What do learners need to learn?	Skills
The different types of access equipment and manual handling operations. The safety checks to be carried out on access equipment; visual, tagging, fit for purpose, secure level ground, operative's competency for use of equipment. Safe erection methods for access equipment. Factors that influence the choice of equipment for carrying out work at height based on the work being carried out; duration at work, action points for heights. Ratios and advantage of pulleys and other lifting aids.	MC4

1.16 Safe practices and procedures for working in excavations and confined spaces

What do learners need to learn?

- Safe working in excavations.
- The safety measures when working in excavations.
- The dangers associated with excavations.
- Safe working in confined spaces.
- The dangers associated with confined spaces.
- The safety measures used when working in confined spaces.

2. Construction science principles

Criteria

2.1 International System of **Units** (SI)

Range:
Units - Kilogram (mass) kg, second (time) s, hour (time) h, Kelvin (temperature) k, Pascal (pressure, quantity internal pressure) Pa, bar (Unit of pressure), energy – Joules (J), power – Watt (W), force - Newton (N), litres (l), Candela (cd) (unit of luminous intensity), Illuminance (Lux) (unit of illumination).

What do learners need to learn?	Skills
The Internationally recognised (SI) units of measurement and their application and use in building services engineering calculations including multiples and sub-multiples. Use of SI units and derived multiples in calculations.	MC1

2.2 **Derived SI units**

Range:
Derived SI units - area (m^2), volume (m^3), flow (l/s and m^3/h), density (kg/m^3), velocity (m/s), specific heat capacity (kJ/kg/°C), acceleration (m/s^2), volt, ampere, ohm.

What do learners need to learn?	Skills
All derived SI units and their application and use in building services engineering including those associated with area, volume, weight, power, energy and force. Use of SI units and derived multiples in calculations.	MC2

2.3 **Materials** science **principles**

Range:
Materials – pure metals, ferrous metals, alloys/solders, plastics (thermosetting and thermoplastic), fireclays/ceramics, natural and synthetic rubbers.

Principles - material properties, chemical composition, degradation, failure, effects of environmental conditions, ductility, malleability, conductivity, tensile strength, compressive, strength, durability.

What do learners need to learn?	Skills
The principles of material science in construction design and how buildings will perform in terms of durability and stability. Properties of materials, their uses and the reasons that they are suitable for application. Methods of material testing. Environmental conditions: atmospheric corrosion, oxidation of metals, UV damage to plastics, heat damage to plastics, electrolytic corrosion, electromotive series, dissimilar metals in the presence of an electrolyte (water) erosion corrosion.	CSB MC4

2.4 **Mechanical science principles**

Range:
Mechanical science principles - force, work, energy, power, levers, simple mechanics, basic mechanics.

What do learners need to learn?	Skills
Key principles of mechanical science and how they are used to inform construction methods and the relationship between force, work, energy, power and efficiency. Calculations for all mechanical principles in range. Basic mechanics: theory of moments, action and reaction, centre of gravity, equilibrium, velocity and ratio, mechanical advantage. Simple mechanics: levers, pulleys, Archimedes, screw.	MC4

2.5 **Electricity principles**

Range:
Electricity principles - sources of power, generation, transformation, distribution, voltage, current, resistance, electrical power, energy, efficiency.

Electricity principles in relation to the construction process and use of the completed building: • Types of electricity sources (including fossil fuel, nuclear and renewable energy) • The types of power plants used to provide reliable sources of energy (including coal, oil, gas and nuclear). • Transformation (electromagnetic induction and types of transformers (step up and down, three phase, single phase)). • Distribution (via networks to industry and domestic users). • Voltage currents and resistance and the relationship with power, energy and efficiency. Calculations used, including Ohms law. Why different equipment requires a different voltage, 12 V, 110 V, 230 V, 400 V. Circuit protection devices: Residual Current Devices (RCD)	**Skills**
The various uses of electricity within the built environment including basic DC circuit principles, Ohm's law and relationships between circuit values. Units of electrical measurement • Ohm's law • power consumption of electrical circuits • basic over-current protection device size • voltage, current and resistance in series and parallel circuits • current (amps) • voltage (volts) • resistance (ohms) • power (watts) **Electrical principles and simple calculations** **Basic principles:** • measurements of electrical flow • material conductivity, resistivity and resistance • direct and alternating current • earthing requirements for systems	MC4

2.6 **Structural science principles**

Range:
Structural science principles - forces, loads, materials, structural members.

What do learners need to learn?	**Skills**
Structural science principles its use and effects and how it informs the construction and design of buildings. • The effects of forces on materials and building: compression and torsion stress, tension, bending, and shear • The different types of loads acting on structures: vertical, horizontal and longitudinal • Material properties: strength, malleability, hardness, elasticity • Different types of structural members: footings, walls, beams, roof trusses, columns and beams. • Compliance with document • Calculations: permitted notching zones and maximum depths of holes and notches • Drilling and notching conventions • Importance of calculations being conducted in structural design: beam, load, column. • Appreciate the effects of adjacent structures, trees, drains and sewers, ground conditions, on the design of foundations • Where to find the Building Regulations that cover foundations	CSB MC4 DC4

2.7 **Heat principles**

Range:
Heat principles - heat transfer, air temperature, air density humidity, condensation air movement, heat loss, thermal conductivity, resistance, convection cycles.

What do learners need to learn?	**Skills**
Key principles of heat transfer and its cause and effect within the built environment. • Heat transfer: conduction, convection and radiation and how they are managed to lessen the environmental impact. • Characteristics of air: temperature, density and humidity • Condensation: sources, types and effects of condensation and controls • Thermal conductivity: R and U values • What impacts heat loss in a building: building fabric, ventilation and air temperature • Calculations: thermal conductivity, resistance, heat loss, conduction and convection • Effects of thermal expansion • How buildings are affected by temperature change, (design, faults) • How condensation is created, and buildings are designed to overcome this. • Effects of moisture on construction materials, • Methods of generating power within a building: solar, photovoltaic, heat recovery, gas, electric • Methods of heating / cooling buildings • Heat Loss calculations: Resistance - $R = {}^{T}/_{K}$, Heat Loss – Q=UA (T1-T2) • Thermal expansion calculations: change in length = coefficient of thermal expansion x change in temperature x original length • Space heating calculations: specific heat capacities	MC4

2.8 **Light principles**

Range:
Light principles - refraction, difference in artificial and natural light, glare, directed and reflected light, flow of light energy, daylight factor, colour rendering, Efficacy (lumens/watt).

What do learners need to learn?	**Skills**
How artificial and natural light are incorporated into the design of a building considering energy use and pleasant environment for the end user. Methods used to diffuse light. Calculate efficacy of lamps and luminaires.	MC4

2.9 **Acoustics principles**

What do learners need to learn?	Skills
Key principles of acoustics and acoustic barriers and how they are applied to the built environment to control and limit unwanted transference of sound internally and externally. Factors that affect acoustics of types of buildings including frequencies, reverberation, reverberation time, decibels, focusing, resonance, and echo. Acoustic principles in action in the construction industry • insulation • sound absorption • use of specific acoustic materials The effect on the operative and upon the wider environment through noise pollution, and external sources of sound and noise. Use of decibels: as a unit of measure, additional levels, and threshold limits. Compliance with approved document E (resistance to sound).	MC4

2.10 **Earth science principles**

Range:
Earth science principles - physical geography, hydrology, geology, earth forces, natural phenomenon (earthquakes, subsidence), weather.

What do learners need to learn?
Earth science principles and how these impact the built environment and basic construction design principles. Physical geography including land use, water levels and ground contamination, soil cleanliness and the use of soil samples. Hydrology including lakes rivers and water cycles. Geology including structure, conditions and ground water. Earth forces and natural phenomenon including landslides, tidal factors and earthquakes. Weather including climate change, temperature, rainfall and wind.

3. Construction design principles

Criteria

3.1 **Benefits** of good design

Range:
Benefits - efficiency**,** aesthetics, sustainability, wellbeing and improved quality of life, value for money local/community improvement, on budget.

What do learners need to learn?	**Skills**
The benefits of good design and the potential implications of poor design, reduced saleability, reduced efficiencies, negative effect on local community and the different parties affected in the construction chain (client, project sponsor, project team, consultants, suppliers, contractors and sub-contractors and end users). Efficient use of materials and quantity control. Factors that can impact on the profitability of projects – i.e. over specification leading to higher costs, difficulty of assembly leading to increased timescales and increased budgets, Corporate Social Responsibilities (CSR), vernacular construction, codes for sustainable homes, project scales, brownfield versus greenfield sites. The importance of coordination between the various disciplines to ensure that there is no negative impact on timescales for completion of projects, the cost of projects and the aesthetics of a building.	CSC EC6 MC2 MC8 MC10

3.2 **Design principles**

Range:
Design principles - Environmental Protection, safety, speed, economics, aesthetics, buildability manufacture, installation and construction feasibility, integration of services, infrastructure, inclusivity, accessibility, heat, acoustics, lighting and air quality.

What do learners need to learn?	**Skills**
Factors that need to be considered during the design of building services and how the range of design principles are influenced by the end design including buildability. The stages and outcomes of the Royal Institute of British Architecture (RIBA) plan of work. To include: • Environmental protection: sustainable technologies and materials, energy sources, energy reduction materials, local and natural environment • Safety: safe construction methods • Aesthetics (design features, materials used, colour) • Buildability manufacture: installation, feasibility, modern methods of construction, inclusivity and construction timescales • Provisions (services and access) • Traditional versus Modern methods (timber frame, thin joint, etc.) of construction, (offsite construction) • Listed Buildings Regulations • Heritage Regulations • Local Authority restrictions • Life cycle costs and life cycle CO2 emissions	CS3 EC6 DC1 DC6

3.3 Role of different **disciplines** involved in design

Range:
Disciplines - contractors and all operatives, architects and all professional occupations, planners and building inspectors, manufacturers, mechanical building services engineer, electrical building services engineer, mechanical design engineer (Building Services), mechanical engineer design coordinator, mechanical engineer CAD technician, BIM designer, retrofit coordinators, retrofit assessors

What do learners need to learn?	**Skills**
A basic knowledge of key job roles within construction design including the responsibilities and reporting lines/lines of escalation within roles. The key activities aligned to the disciplines with an appreciation of potential career progression routes.	CSB CSD

3.4 Design **process** from conception to completion

Range:
Process - research, site analysis, assessment of current and proposed characteristics, planning, approval/ review, design sign off.

What do learners need to learn?	**Skills**
The key stages of the design process from initial enquiry to completed design and factors that may impact or influence design changes; Construction Design and Management (CDM), budget, and end user requirements including: • Site analysis: location, size, topography • Planning: local planning, listed buildings, environmental factors and regulations how to make a planning application, how the approval is gained, appeals procedures. • What a feasibility study is • Animals/infestation/ Site of Specials Scientific Interest (SSSI)/protection • Planning for utilities and connecting to services (water, drainage, gas, electric) • Planning for building services • What is the frontage line and building line and how are these determined? • Project planning, Gantt charts, Critical path, use of information for costing and efficient resources	CSA EC3 EC5 EC6 MC7

3.5 The concept of the 'whole building', including **life cycle assessment**

Range:
Life cycle assessment - raw material supply, manufacture of construction products, the construction process stage, occupation, demolition, when the materials are disposed of or recycled, energy usage, CO2 emissions.

What do learners need to learn?
The concept of the whole building and how design and construction is influenced by construction systems working together, including life cycle assessments and how they influence project planning and are influenced by regulations and legislation. How environmental regulations/legislations inform on planning greener and smarter building with less impact overall on the environment. Including material acquisition, manufacturing, use and final disposition.

4. Construction and the built environment industry

Criteria

4.1 Structure of the construction industry

What do learners need to learn?	Skills
The structure of the construction industry, including roles and business types (sole traders, contractors, sub-contractors, small, medium and large organisations) and roles and client types (private, commercial, public limited companies and the Government). Size and scale in determining who is involved. The role of building regulators and the relationship with the customer/client (ensuring safety, health and welfare in and around built environments). The range of work undertaken - commercial, residential, industrial, health, retail, recreational and leisure, utilities and transport, new build, retrofit.	MC3

4.2 How the construction industry serves the economy as a whole

What do learners need to learn?
How the construction industry contributes to the UK economy with reference to wealth generation from construction developments, area regeneration, improvements in infrastructure, and community developments, including housing, transport, leisure facilities, educational establishments and hospitals. Factors that impact growth of the industry, including political changes, developments in technology/practice, skilled labour resources and environmental considerations. Climate change Act – the consequence for the country of missing the carbon budgets, the net zero target, and the related impact on construction (retrofits/ insulation) heating systems (no more gas boilers) and electric vehicle charging points. Impact of national infrastructure projects.

4.3 Integration of the **supply chain** through partnering and collaborative practices

Range:
Supply chain – client, architect, engineers, building contractor, sub-contractors, operatives, manufacturers, suppliers.

What do learners need to learn?	Skills
The integration of all partners of the supply chain in the building process. An awareness of the importance of effective planning (inventory management) and collaborative working (integrated systems and agreed roles and responsibilities and change management approaches) ensuring that the project is completed to standards, budget and on time, and the consequences of poor planning and communication (disruption, increased costs, reputation).	CSD

4.4 Procurement of projects within the construction sector

Range:
Procured - need/demand, tendering and bidding processes, supply chain, estimation, quotation, tender documentation.

What do learners need to learn?	Skills
The key stages within procurement and the development of construction projects with consideration of different scales of building projects from domestic through to commercial and industrial. The types of common procurement routes (contractor led, design and build, fast track, lump sum, single stage, two stage). The methods of tendering (open, negotiated, selective, two-stage, preferred supplier). Project, cash flow management, contract payment periods for suppliers, contractors and sub-contractors.	MC9 MC10

4.5 Managing change requests from various parties

What do learners need to learn?	Skills
The basic principles of change requests from various parties, including clients and how the changes requested are dealt with (accurate, timely, professional) along with all impacts assessed and managed correctly.	CSC DC3

4.6 Roles and responsibilities of the **construction professions and operatives**

Range:
Construction professions - architect, civil engineer, ground works, plant occupation, non-skilled operative, building services design engineer, building services engineer technician, building services engineer site management, facilities manager, client representatives, contract managers.

Construction operatives – joiner, plasterer, tiler, bricklayer, plumber, electrician, heating and ventilation fitter, gas fitter, decorator, site supervisor, trade supervisor.

What do learners need to learn?

The key job roles (position or part played) and responsibilities (types of tasks and duties they are expected to complete) of construction professionals and operatives and the stages they may be involved in a construction.

4.7 The **role of Continuing Professional Development (CPD)** in developing the knowledge and skills of those working in the sector

Range:

Role of CPD - upskilling staff, legal requirements, product knowledge.

What do learners need to learn?

The role of CPD to individuals, companies and the building industry as a whole.

Importance of CPD in maintaining occupational competence and best practice, and the link to keeping clients/customers/public safe.

CPD and career progression.

Workforce planning

Providers of CPD i.e.

- Professional bodies
- Accreditation bodies
- Certification bodies.
- Manufacturers
- In house/ toolbox talk

Types of CPD, including formal, in house, qualifications, work experience, self-learning, and chartered etc.

4.8 Building information modelling (BIM)

What do learners need to learn?	**Skills**
The aspects of BIM and the effect it has on real time project delivery in a collaborative way and BIM government levels 1-3. Building passporting and Data warehouse The collaborative role of BIM in delivering real time projects: • Digital Plan of Works (DPoW) • Employer's Information Requirements (EIR) • Common Data Environment (CDE)	CSD

4.9 **PESTLE** factors

Range:
PESTLE - political, economic, social, technological, legal, environmental.

What do learners need to learn?	**Skills CSD**
Current examples of PESTLE and how it is used for analysis in building services and construction projects. The potential impact these factors have on current and future building projects e.g. changes post Grenfell, tax changes for self-employed, augmented reality and impacts of Building Regulations and compliance.	

4.10 **Documentation** used in construction projects

Range:

Documentation: Take off sheets, contracts, schedule of rates, estimates, quotations, delivery notes, purchase orders, bill of quantities, wiring diagrams.

What do learners need to learn?
Documents used through the construction process, and when each are used including their purpose.

4.11 Procedures for handing over projects to clients

What do learners need to learn?
The procedure for handing over projects to client including contents and purpose of operation and maintenance manuals, demonstration of use and client understanding, guarantee periods, snagging.

5. Construction sustainability principles

Criteria

5.1 Sustainability when **planning** and delivering a construction project

Range:
Planning - using renewable and recyclable resources, reducing energy consumption and waste, creating a healthy and environmentally friendly environment, protecting the natural environment.

What do learners need to learn?	Skills
The importance of sustainability in relation to the stages of project development. Including design, planning and delivery and across different types/scales of construction project as well as environmental protection. The relevance of local sourcing, resource protection, re-use, and refurbishment of materials. The common sustainability assessment methods used in planning and delivering a construction project including BREEAM, LEED, TRADA, and Well building standards Carbon footprints The purpose of PAS 2035 and PAS 2038	MC3

5.2 Types of **sustainable solutions**

Range:
Sustainable solutions - social, environmental, economic, human (habitability).

What do learners need to learn?	Skills
The use of sustainable solutions including prefab construction, self-heal concrete, energy efficiency systems, insulation, green roofs, greywater harvesting systems, use of soakaways, sustainable drainage, and smart glass/electrochromic glass. How sustainable materials are used including recycled bricks and tiles/slates and timber products in construction of building and roofs/locally sourced (reducing carbon footprint).	CSB

5.3 **Environmental legislation**

Range:
Environmental legislation - Environmental Protection Act, Climate Change Act, Clean Air Act, Water Act, Building Regulations, COSHH, WEEE, Hazardous Waste Regulations, Control of Pollution (Oil Storage) (England) Regulations 2001, best practice for pollution prevention.

What do learners need to learn?	**Skills EC5**
The obligations and responsibilities of employers and employees in relation to construction/maintenance activities and environmental protection measures including hazardous waste, material considerations, disposal methods, BOCs, PPE, user guide instructions, specific risk assessments. Key requirements of environmental regulations that must be adhered to whilst working in the building engineering services industry.	

5.4 Environmental performance **measures**

Range:
Measures - source of materials, use of materials, energy source, energy consumption, water source, water consumption, radioactive waste, flexibility, durability and resilience, pollution and waste processing, transport, landscape and ecology, deconstruction and disposal.

What do learners need to learn?	**Skills EC5**
The key environmental performance measures of building services and how they are considered during design and monitored during building operation times (such as drainage polluting water courses). The types of schemes that can be used to certify levels of environmental performance in construction, including BREEAM, passivhaus and leadership in energy and design.	

5.5 **Principles** of heritage and conservation

Range:
Principles - restrictions, permission, legislation and guidance**.**

What do learners need to learn?	**Skills EC5**
Heritage and conservation considerations associated with listed and historical buildings (types of grades and restrictions) and maintenance of existing stock and how current regulations (Planning Act and Heritage Protection Bill) affect the selection of materials used for building activities.	

5.6 Lean construction

What do learners need to learn?	**Skills**
The principles of lean construction. (efficiency, best value, ensuring the work environment is clean and safe, improving planning and continuous review and improvement). The techniques aimed at maximising value and minimising waste within the building services industry including just in time deliveries, reducing errors and recycling. How advanced manufacturing techniques (control systems, high precision technologies, sustainability technologies, offsite manufacturing, computer aided design) benefits lean construction.	CSB

5.7 **Waste management legislation**

Range:
Waste management legislation - waste, Electronic and Electrical Equipment (WEEE), F Gas.

What do learners need to learn?
Key requirements and duty of care of waste management legislation including which materials may contain hazardous waste. Key requirements to include: • Waste carriers license • Separation and recycling waste • Exemptions

5.8 **Waste management**

Range:
Waste management - waste management plan, waste segregation, recycling.

What do learners need to learn?	Skills
Transportation and disposal methods for waste (including general and specialist disposal, use of licensed disposal companies, use of registered waste carriers). Plans to reduce use of pollutants in construction projects including reduction of high carbon emissions, reducing land contamination, and correct waste disposal. All current and statutory waste management systems, the way they are used in the disposal of construction materials including hazardous or specialised waste disposal. The circular economy principles and the waste hierarchy. Prioritising reduce, re-use, recycle, recover, preferred over basic disposal.	EC2 EC3 EC5

5.9 **Energy** production and energy use

Range:
Energy - wind, water (hydro), solar, nuclear, fossil fuels, ground and wind source energy.

What do learners need to learn?	Skills
Types of energy produced including nuclear, heat and power combined, fossil fuels including alternative methods such as wind, solar, hydroelectric, and their impact when used (i.e. availability, impact on environment, costs). Reasons for choosing energy sources including the advantages and disadvantages of each method (i.e. localism, regionalism). Hydrogen and how it is produced: reforming methane vs electrolytes, with pros and cons (cost vs CO2). Bio-methane Biomass Carbon capture and storage CO2 emissions for all, including projections for the next 30 years.	EC6

5.10 **Renewable energy** and **energy conservation**

Range:

Renewable energy - Solar thermal (hot water) ground source heat pump, air source heat pump, water source heat pump, biomass, solar photovoltaic, micro-wind, micro-hydro, combined and micro-combined heat and power.

Energy conservation - Rainwater and grey water recycling, heat recovery, energy efficient lighting, electric vehicle charging points, appliance efficiency ratings.

What do learners need to learn?	**Skills**
The different types of renewable energy and how they are used to improve energy efficiency in buildings. The importance of efficient design and the use of innovative products and services during the process. The different heat insulation materials used for systems and buildings. The different types of insulation materials used for ductwork, pipework, cables, building structure insulation. Their purpose, benefits and limitations. The implications of using new insulation materials on existing building services systems. Methods available for capturing surface water and recycling used water. The uses of captured and recycled water in properties. The technologies used: High carbon • Natural Gas / LPG • Fuel oils - Solid fuels (coal and peat) Low carbon • Solar thermal • Solid fuel (biomass) • Heat pumps • Electricity (from non-renewable sources) Hydrogen fuel cells • Combined heat and power (CHP) • Combined cooling, heat and power (CCHP) Zero Carbon – • Electricity – wind • Electricity – tidal • Hydroelectric • Solar photovoltaic	MC6 DC1 DC6

5.11 **Digital technologies**

Range:
Digital technologies

Internet of Things (IoT) - Building services system controls, smart meters, hubs/routers
Control and monitoring systems - Smart meters, building management system, automated controls, movement sensors.

What do learners need to learn?	**Skills**
System controls and building monitoring systems (BMS) used to improve energy efficiency in buildings, the monitoring patterns of usage and the use of innovative products and services during the process. Automated controls and settings to maximise efficiency and movement sensors used to switch building services on and off when required. The environmental technologies that could be used along including devices connected via the Internet of Things (IoT).	MC6 DC1 DC6

6. Construction measurement principles

Criteria

6.1 Accurate and appropriate measurement.

What do learners need to learn?	Skills
The benefits of accurate measurements to contractors, the client/customer, to profitability and project success. Including accuracy in site/location/areas measurements to accurately calculate material quantities to enable accurate costing of construction projects (including use of job, batch, activity, life cycle and other types of costing techniques depending on the project) and the implications of not having accurate measurements – in terms of costs, time, and safety.	CSC MC1 MC9

6.2 Standard **units of measurement** and **measurement techniques**

Range:
Units of measurement - mm millimetres, cm centimetres, m metres, km kilometres, g gram, kg kilogram, tn tonne, ltr litres, sq square and cm cubic metres, s time, N/m2 pressure, N force.

Measurement techniques - Approximation, use of measuring equipment including tapes, lasers and surveying equipment.

What do learners need to learn?	Skills
The types of units of measurement and how these are applied and used in construction projects including methods of obtaining measurements in differing situations (height, length, distance, area, volume, weight, mass, quantity, CO2 emissions, insulation). Methods of calculating units from data sources.	MC1 MC2 MC3 MC4

6.3 **Measurement standards**, guidance and practice

Range:
Measurement standards - scale, tolerances.

What do learners need to learn?	**Skills**
How to use standardised scales for recording or displaying measurements, including measurement rules. How tolerances are applied and implications of not meeting tolerances. Use common scales: 1:1 1:2 1:5 1:10 1:50 1:500 1:1250 1:2500 to communicate information by drawings to BS1192 Drawing sizes used to display information and detail.	EC1 MC1 MC3 MC4

7. Building technology principles

Criteria

7.1 **Construction methods**

Range:
Construction methods - modular, onsite, off site, 1st fix, 2nd fix, self-driving vehicles, computer-controlled manufacturing robots, large-scale 3D printers, drones.

What do learners need to learn?

Applications, benefits and limitations and procedures of both traditional and modern construction methods including the use of robotics during the construction process.

Types of traditional and modern construction methods including historic buildings pre and post 1920.

Onsite – timber frame, brick and block, container straw bale, robotics

Off-site – pre-assembled, precast, modular, panel systems, 3D printing

Renovation and refurbishment - upgrades, cosmetic and structural changes

Maintenance – fabric services and upgrades

7.2 **Forms** of construction

Range:
Forms - substructure, superstructure, infrastructure, internal/external walls, external work.

What do learners need to learn?

Current forms of construction and their use for both built environment and civil engineering structures.

Substructures: types of foundations, basements, retainer wall

Superstructure: roofs, walls, floors, windows, doors and frames

Infrastructure: roads, sewage systems, railways, bridges

Internal/external walls: cavity, solid, infill, stud, openings vertical and horizontal damp proof, weather tight, preventing water ingress and allowing for egress (weep holes)

External work: paving, boundaries, drainage, parking, (finished surfaces, sub-base materials)

Supports and fixings associated with forms in range and building services component.

7.3 Key content and required notifications of UK Building Regulations and **Approved Documents**

Range:
Approved Documents - part A – Structure, part B – fire safety, part C – site preparation and resistance to contaminates and moisture, part D – toxic substances, part E – resistance to the passage of sound, part F – ventilation, part G – sanitation, hot water safety and water efficiency, part H – drainage and waste disposal, part J – combustion appliances and fuel storage systems, part K – protection from falling, collision and impact, part L – conservation of fuel and power, part M – access to and use of buildings, part P – electrical safety, part Q – security, part R - physical infrastructure for high speed electronic communications networks.

What do learners need to learn?	**Skills**
The purpose of all current UK Building Regulations in renovations and construction of buildings and building services.	CSB EC5

7.4 **Building standards**

Range:
Building standards - BS 1192-4:2014. Collaborative production of information Part 4: Fulfilling employer's information exchange requirements using COBie – Code of practice, BS 7000-4:2013 Design management systems. Microgeneration Certification Scheme (MCS) BS 7671.

Guide to managing design in construction, BS 7913: Guide to the Conservation of Historic Buildings, BS 8536-1:2015 Briefing for design and construction.

Code of practice for facilities management (Buildings infrastructure), BS 8541, BS 9999: Code of practice for fire safety in the design, management and use of buildings, BS ISO 55000:2014 Asset management.

Overview, principles and terminology, BS ISO 16739:2013 Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries, BS ISO 17772 - Indoor environmental quality, International Organisation for Standardisation ISO, ISO 14001:2015 Environmental management systems.

Requirements with guidance for use, ISO 19650, ISO 9001, ISO 50001 Energy Management, PAS 91, PAS 180:2014 Smart cities – Vocabulary, PAS 181:2014 Smart city Framework, PAS 2035, PAS 2038.

Guide to establishing strategies for smart cities and communities, PAS 182 Smart city data concept model, PAS 1192-5:2015, PAS 2080 Carbon management in Infrastructure, PAS 8811:2017 Temporary works, PD 7503:2003 Introduction to knowledge management in construction, BIM Level 2.

What do learners need to learn?	Skills
Current British Standards including waste management, BIM, fire safety.	EC5
International Standards which includes standards for structures, materials, sustainability etc. and Common minimum standards used for public sector projects. Their purpose and benefits (e.g. guidance, pushing up standards etc.) in construction and renovation.	

7.5 **Trade Associations** and **Professional Engineering Bodies** in relation the BSE sector

Range:
Trade Associations - Air Conditioning and Refrigeration Industry Board (ACRIB) Association of Plumbing & Heating Contractors (APHC) Build Engineering Services Association (BESA) Electrical Contractors Association (ECA) Federation of Environmental Trade Associations (FETA) Renewable Energy Association (REA).

Professional Engineering Institutions - Chartered Institution of Building Services Engineers (CIBSE) Chartered Institute of Plumbing and Heating Engineering (CIPHE) Institute of Engineering and Technology (IET) Institute of Lighting Professionals (ILP) Institute of Refrigeration (IoR).

What do learners need to learn?
The trade associations, professional engineering institutions and other sources of information and their responsibilities in relation to the BSE sector. The advice and guidance on technical safety and legislative aspects.

7.6 Manufacturers' instructions

What do learners need to learn?	Skills
Type of manufacturers' instructions (maintenance, operation and installation instruction manuals) and their purpose in the construction and maintenance of buildings and services (health and safety).	CSA

7.7 Building **structure** and **fabric**

Range:
Structure - Timber framed, steel framed, masonry, concrete.

Fabric - Timber, cladding, masonry, fenestration, plaster boarding.

What do learners need to learn?
The different types of building materials and building fabrics and the implications for the application, installation and maintenance of Building Services Engineering systems including supports, fixings and hazards.

7.8 **Approved documents and guidance** for penetrating building structure and fabric

Range:
Approved documents and guidance - part A - structure, part B - fire safety, part C - site preparation and resistance to contaminates and moisture, part E - resistance to the passage of sound.

What do learners need to learn?	Skills
The procedures and processes for penetrating building structure and fabric for a range of services in compliance with the approved documents listed in the range.	CSA EC5

8. Construction information and data principles

Criteria

8.1 Data

What do learners need to learn?	Skills
Key elements of data, including accuracy, generalisation, interoperability, level of detail and metadata used to inform construction and building services processes. Different sources that data can be generated from including, • Design and construction processes • Building Information Modelling • Post occupancy evaluation • Utilities, building services, meters, building management systems. • Infrastructure and transport systems. • Enterprise systems such as purchasing systems, performance reporting, work scheduling. • Maintenance and replacement systems. • Operational cost monitoring. • ICT systems and equipment. Data from these sources can be used to understand behaviour, assess performance, improve market competitiveness, allocate resources, and determine costs.	MC5 MC6 MC9 EC4 EC5 DC3 DC4

8.2 Sources of information

What do learners need to learn?	Skills
Be able to interpret types of information and data sources used within construction and building services projects: • product data • manufacturer's specifications • client's specifications • Common Date Environment • Building Information Modelling (BIM) • Gantt charts • Critical path networks • Certification and commissioning data • Test data schedules • Condition reports • Carbon emissions Use data sources to calculate outcomes or costs	CSC EC1 EC2 EC3 DC1 DC3

8.3 **Data** management and confidentiality

Data - physical storage, virtual storage.

Confidentiality - encrypted data, virus protection software, software updates, firmware updates, GDPR Requirements, business procedures.

What do learners need to learn?	Skills
Current legislation including GDPR and organisational procedures that are used to manage data and increase confidentiality. Data storage requirements in relation to security and protection and how they help to prevent common threats e.g. cyberattacks, malware, Trojans, data loss, data recovery.	DC5

8.4 **Drawings, circuit diagrams and schematics**

Range:
Drawings, circuit diagrams and schematics - symbols, circuit diagram, wiring diagram, layout and schematic drawings, building/site plans.

What do learners need to learn?	Skills
Interpret Building Services Engineering information and data using scale, abbreviations, and BS symbols. The conventions, symbols and terminology needed to aid interpretation.	MC3 MC6 MC7 DC1 DC2

8.5 Programming and set up of **digital systems** using various **IT resources**

Range:
Digital systems - smart controls, BIM, CAD.

IT resources - modelling and design programmes, mobile technologies, computer, CAD catalogues.

What do learners need to learn?	**Skills**
Basic programming including the set-up requirements of digital systems for BSE systems and which IT resources to use.	DC1 DC6

9. Relationship management in construction

Criteria

9.1 Stakeholders

What do learners need to learn?	Skills
The different types of stakeholders including client, construction team, suppliers, community and end user in construction projects.	CSD EC1

9.2 Roles, expectations, and interrelationships

What do learners need to learn?	Skills
The roles, expectations, and interrelationships of all stakeholders throughout the construction project delivery at design stage, through construction, to handover and in use. To include: • Hierarchy of project management • Promoting good relationships across the project • Cost control measures • Time management methods • Handover processes • Public relations – to include behaviour of employees outside of work hours • Follow up and review	CSD EC1

9.3 Collaborative working to project delivery and reporting

What do learners need to learn?	Skills
The importance of a collaborative approach to project delivery and reporting (delivery, reporting, providing information at various stages in the development) and how this is applied in practice (with the use of BIM and workflow software packages as well as face to face methods).	CSC CSD EC1 EC2 EC3 DC3

9.4 Customer service principles

Range:
Customer service principles - good product knowledge, building trust, meeting timescales, good communication, efficiency, honesty and integrity.

What do learners need to learn?	Skills
The basic principles of good customer service and the benefits of good customer service including, repeat business, good reputation, satisfied customers and employees.	CSC EC1 EC6

9.5 Team work to team and project performance

What do learners need to learn?	Skills EC2 EC6
The importance of good team work to team and project performance (efficiencies, morale of staff, creativity, accountability open communication common goals) and the consequence of poor teamwork (conflict and tension, low engagement, lack of trust) and how it impacts on a construction project (effects of productivity and efficiency).	

9.6 Team dynamics

Range:
Team dynamics - knowledge of trade/business/product/service, accountability, cooperation, trust, support, reliability, effective communication, active participation, adaptability.

What do learners need to learn?	Skills EC2 EC6
Qualities and characteristics of good team dynamics, including what is expected of a team member, team structure, what qualities are needed and how these qualities are demonstrated.	

9.7 **Equality, diversity and representation**

Range:
Equality, diversity and representation - age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation.

What do learners need to learn?
Current equality and diversity legislation and the protected characteristics detailed under the Equality Act, Employment Rights Act, Human Rights Act and trade unions, including its application in the workplace.

9.8 **Negotiation techniques**

Range:
Negotiation techniques - distributive negotiation or win-lose approach, lose-lose approach, compromise approach, integrative negotiation or win-win approach.

What do learners need to learn?	Skills
Methods of negotiation and how they are used within the construction industry (acquiring land, obtaining planning permission, awarding contracts, negotiating change orders, time extensions and resolving disputes).	EC6

9.9 **Conflict management techniques**

Range:
Conflict management techniques - preventative measures, compromise, problem solving, avoiding, competing, forcing, alternative dispute resolution (informal discussions, mediation, conciliation, arbitration).

What do learners need to learn?	Skills
Conflict management techniques including preventative measures and common reasons for conflicts (e.g. ambiguous contract terms, breach of contract, late supply of materials, programme delays). Using digital methods to resolve conflict including the use of BIM for controlling conflict before it escalates. Use when construction projects change/alter.	CSD EC6

9.10 **Methods** and **styles** of communication

Range:
Methods - verbal (pitch and tone, questioning types open/closed), and non-verbal (body language, eye contact, facial expressions).

Styles - formal, informal.

What do learners need to learn?	**Skills**
The styles and methods of communication, type of communication (face to face, email, letter, telephone, drawn information) and suitability for different situations that may arise throughout a typical construction project. Digital project management and how this can be used to communicate as part of the construction project teams.	EC1 EC3 EC6 DC1 DC3

9.11 Employment **rights and responsibilities**

What do learners need to learn?	**Skills** **EC5**
The current employment rights and responsibilities of employees and their employer. Employment Rights – wage rules (minimum wage, pension), time off (holiday, parental leave, rest breaks etc.), equal rights (against harassment and discrimination), health and safety and welfare, and access to representation in times of grievance (trade union representation/independent representation). Responsibilities: Employer to employee – work, pay, health, welfare and safety provided Employee to employer – working to contract, complying with health, safety and welfare, confidentiality and reasonable behaviour as set out in the company handbook.	

9.12 Ethics and **ethical behaviour**

What do learners need to learn?	**Skills**
Ethics and ethical behaviour- (honesty, integrity, equality, loyalty, fairness, caring, respect, adherence to laws, commitment, reputation, accountability) in the construction industry.	CSD

9.13 Sources of information

What do learners need to learn?

How sources of information, including web based and social networks contribute to the knowledge sharing/stakeholder experience (sharing ideas and knowledge, advertising and promotion, getting customer reviews and feedback) within the construction industry.

10. Digital technology in construction

Criteria

10.1 **Internet of things**

Range:
Internet of things - smart technology, smart/automated building, smart learning, artificial intelligence (AI).

What do learners need to learn?	Skills
The use of technology to capture data in a completed building and how this data is used for the purpose of manufacture and delivery. The different uses of technology connected to the internet of things (smart building, smart applications and systems) and their use and role in the construction industry (productivity, assisting just in time, asset management, maintenance, smart equipment smart concrete.)	DC1 DC3 DC5

10.2 **Digital engineering techniques**

Range:
Digital engineering techniques - simulation, animation, virtual reality, 3D modelling.

What do learners need to learn?	Skills
Current Digital engineering techniques and their application in the construction industry: Simulation - structural analysis Animation - visualisation of structural behaviour Surveying - laser level and measuring and CAD modelling (2D drawings 3D modelling), drones. Artist impression	MC6 DC1 DC2 DC6

10.3 Opportunities for the use of **technology**

Range:
Technology - machine manufacturing through robotics**,** CADCAM**,** computer modelling**,** smart technologies.

What do learners need to learn?	**Skills**
The benefits of using current technologies from other industries (accuracy, accessibility, efficiency, reducing risk) and how they can be adapted for use in the construction and the built environment.	MC6

11. Construction commercial/business principles

Criteria

11.1 **Business structures**

Range:
Business structures - sole trader, partnership, limited company (PLC. Ltd.), small and medium enterprises (SMEs), not for profit organisations, not-for-profit organisations/ community interest company (CIC), franchise.

What do learners need to learn?

Typical business structures in the built environment and construction industry.

- Ownership
- Management of the company
- Legal status
- Liability
- Advantages/Disadvantages

11.2 **Business objectives**

Range:
Business objectives - financial and social, organisation culture, quality, innovation, compliance, sustainability.

What do learners need to learn?	Skills
The business and corporate objectives used to measure performance of an organisation in the construction industry: Financial – private organisations (profit, growth and innovation, market leadership) and not-for-profit (value for money, increased access, reduced poverty). Calculating targets for performance. Social – private organisations (providing employment) and not-for-profit (providing housing, healthcare, services and education). Organisational culture – beliefs, behaviours and ethical values aligning with business objectives. Quality – measurable objectives, including use of quality marks, ISO, etc.	MC2 MC6 MC9

Innovation – allows for generation of ideas, innovation activities and goals aligning with business objectives. Compliance – regulatory compliance with (external) rules and internal controls built into objectives. Sustainability – sustainability embedded into business objectives, from energy-efficient construction to eco-friendly use of materials.	

11.3 Business values

What do learners need to learn?	**Skills**
The fundamental business values including financial stability, customer service, care for life, ethics and transparency, codes of conduct, commitment to the customer, collaborative working.	CSD

11.4 **Principles** and **examples** of corporate social responsibility

Range:
Principles – social, economic and environmental factors, design, sustainability.

What do learners need to learn?
The basic principles of corporate social responsibility (CSR) and examples of use in the construction industry. Design – community led, inclusive, meets local needs Social, economic and environmental – positive impact Sustainability – use of local trades/suppliers and materials.

11.5 **Principles** of entrepreneurship and innovation

Range:
Principles - solution provider, vision, viable product/service, capital, growth and marketing, research, priorities.

What do learners need to learn?
Principles of innovation and entrepreneurship and role it plays in the construction industry (improved product service, increased growth/profit, advancements in industry).

11.6 Measuring success

What do learners need to learn?	**Skills**
How organisations in the built environment and construction industry use benchmarking, (KPI's, standard setting, target setting, input, output and process) when measuring business success.	CSA

11.7 Project management

What do learners need to learn?	Skills
The principles of project management, including effective planning, setting clear goals and objectives, defining roles and responsibilities, setting realistic milestones, and constraints on cost and time. Ensuring all objectives are measurable and achievable, including SMART technique.	CSC

11.8 Quality management

What do learners need to learn?	Skills
The quality management systems and techniques used in business including: • Self-assessment • Internal audit • External audit • Quality control • Quality improvement • ISO 9000 The purpose of quality management systems - to maintain the standard or quality of the work in a consistent manner.	CSD

12. Building Services Engineering (BSE) systems

Criteria

12.1 Building Services Engineering **systems**

Range:
Systems -

- Air conditioning systems - cooling air, heating air, humidification.
- Electrotechnical systems – power, data, lighting, control, heating, appliances.
- Gas systems – boilers, fires, cooking appliances.
- Heating systems – domestic, commercial, industrial.
- Plumbing systems – cold water, hot water, sanitation, rainwater systems.
- Protection systems – intruder alarms, surveillance systems, fire alarms, and access control.
- Refrigeration systems – chilled water, cooling air.
- Ventilation systems – mechanical ventilation, non-mechanical ventilation.

What do learners need to learn?	Skills
The layout and basic components included in a range of BSE systems. What these systems are used for and when they are used. Key differences in operation and advantages and disadvantages of each system type. Integration between systems including common skills.	CSA CSB

12.2 The potential effects on building performance during installation, commissioning and decommissioning of BSE systems

What do learners need to learn?
The effects of installation, commissioning and decommissioning of all or part of a BSE system, including impact on: • environment • other trades • users including loss of services or essential systems

12.3 Mechanical principles of **components**

Range:
Components - fans, pumps, burners/boilers, chillers, heat pumps, controls.

What do learners need to learn?

Basic mechanical principles of BSE components, detailing their characteristics, function within the system, and implications to the system of component failure.

12.4 Electrotechnical principles of **components**

Range:
Components - cable types, accessories, containment.

What do learners need to learn?

Electrotechnical principles of components including their characteristics, applications and functions.

Advantages and disadvantages of each component and implications for the system if components fail.

12.5 **Electrical supply.**

Range:
Electrical supply - single-phase circuits, three-phase circuits, three-phase and neutral, balanced supplies.

What do learners need to learn?

The different types of electrical supply.

The different voltage levels achieved between circuit conductors in electrical supplies in a range of buildings.

The benefits of having different voltages supplies and the voltage levels for BSE systems.

12.6 **Earthing arrangements**

Range:
Earthing arrangements - TN-C-S (PME) systems, TN-S systems, TT system.

What do learners need to learn?
The different types of earthing arrangements and the attributes of each system. The nature of the earth return path in each system and what system components are included in each arrangement. Hazards associated with each system and how this impacts the different building services.

12.7 **Cables, accessories and equipment** used in older electrical installations

Range:
Cables, accessories and equipment - lead sheathed cable, Vulcanized India Rubber (VIR) insulated cable, cable colours, BS 3036, re-wire able fuses, non-fire rated consumer units/distribution boards.

What do learners need to learn?	**Skills**
The common cable types and sizes (metric, imperial) for a range of circuits. The various electrical accessories and equipment used in old electrical systems that are still in existence in electrical installations and the potential risks when working on or near them. How these have been superseded and the components they have been replaced with, and the implications for BSE system installation and maintenance.	MC2 MC4

12.8 Pipework and **ductwork**, **components** and **systems**

Range:

Ductwork - flexible ducting, metal ducting, fabric ducting, cardboard ducting.

Components - ductwork accessories (VCD, VAV/CAV, fire dampers, attenuators, heating coils, cooling coils etc), air terminals (grilles, louvres, extract valves etc), electrical components (electrical Isolators), pipework accessories (emergency control valves, stop taps and key isolation valves, radiator valves, room thermostats).

Systems - gas, plumbing, air conditioning, refrigeration, heating, drainage.

What do learners need to learn?

The various types of components that make up both pipework and ducting systems used in BSE systems and how the selection of each affects the performance of the system.

13. Maintenance principles

Criteria

13.1 **Types of maintenance**

Range:
Types of maintenance - planned preventative maintenance, reactive maintenance.

What do learners need to learn?	Skills
General types of maintenance their key differences and which is most suitable for different situations, including planned preventative maintenance. Regular maintenance scheduled to identify any possible maintenance required before the system fails and Reactive maintenance. Maintenance that is required because the system has already failed.	CSA

13.2 **Maintenance plans**

Range:
Maintenance plans - heating system service, boiler service (gas engineer), water services, firefighting equipment, fire detection and smoke alarm systems, intruder alarm system, wiring and electrical installation system, ventilation system, air conditioning system, drainage, lighting, communications and data.

What do learners need to learn?
The requirements of maintenance plans, either as planned or reactive. Their content and typical tasks for BSE systems.

13.3 Typical timeframes between maintenance tasks.

What do learners need to learn?
The frequency for completing maintenance tasks on all BSE systems as listed in the range. Including the requirements for landlord safety checks on systems such as gas appliances and electrical systems at regular intervals.

13.4 **Documentation** required for maintenance and verification of maintenance activities

Range:
Documentation - manufacturer's instructions, maintenance checklists, servicing logbooks, maintenance schedules, job sheets, condition reports.

What do learners need to learn?	Skills
The reference documents and forms needed when completing both planned and reactive maintenance.	EC4

13.5 **Actions** required when faults cannot be rectified

Range:
Actions - inform customer, arrange secondary services until primary are back in service, make systems safe.

What do learners need to learn?	Skills
The actions required when faults cannot be rectified and the implications this can have on the customer and the business: • Time • Costs • Downtime of systems • Loss of income • Increased hazards • Loss of services	MC2 MC9 EC1 EC3 EC4

14. Tools, equipment, and materials

Criteria

14.1 Methods used to ensure tools, equipment and materials are fit for purpose

What do learners need to learn?	Skills
The methods to ensure tools, equipment and materials are fit for purpose and the required checks that are undertaken to ensure this. **Tools and equipment** • Portable appliance testing (PAT) • Calibration of instruments • Cleanliness checks • Daily checks including visual inspection and operation check • Condition reports • Asset registers **Materials** • Fit for purpose • Associated hazards • Quantity • Specialist requirements The procedure that should be applied for tools and equipment that fail safety checks The safe isolation procedure when replacing attachments to power tools: • Drill bits • Cutting blades The methods of safe supply for electrical tools and equipment on site: • battery-powered • 110 V • 230 V	MC1

14.2 **Maintenance** of tools, equipment and materials

Range:
Maintenance - safe storage, correct storage, greasing, sharpening, and cleaning.

What do learners need to learn?	**Skills**
The importance of correct tool maintenance and the methods of maintaining a range of tools used in BSE, including: • Safety • Prolonged tool life • Accuracy	

Links to occupational specialisms

All aspects of the BSE core content can be related and contextualised on delivery with the occupational specialisms. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the practical content in the occupational specialisms and provide efficiencies for teaching core knowledge in context:

BSE specific core content

- Health and safety - BSE Regulations and safe working practices
- Building Services Engineering (BSE) systems
- Tools and equipment – Use and maintenance
- Construction sustainability principles
- Scientific principles
- Building technology principles
- Information and data principles

Guidance for delivery

Visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery.

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities:

- Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

Ways of ensuring content is delivered in line with current, up to date industry practice

- Centres will need to ensure a realistic representation of BSE systems and components are available
- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration
- The provision must represent the type of equipment currently available in the UK BSE industry
- Current and emerging BSE technology should be included in delivery where possible

Suggested learning resources

Books

- Michael Maskrey, *The City & Guilds Textbook: Plumbing Book 1 for the Level 3 Apprenticeship (9189), Level 2 Technical Certificate (8202) and Level 2 Diploma (6035)*, City & Guilds, 2019
- Peter Tanner and Stephen Lane, *The City & Guilds Textbook: Plumbing Book 2 for the Level 3 Apprenticeship (9189), Level 3 Advanced Technical Diploma (8202) and Level 3 Diploma (6035)*, City & Guilds, 2019
- Peter Tanner, *The City & Guilds Textbook: Book 1 Electrical Installations for the Level 3 Apprenticeship (5357), Level 2 Technical Certificate (8202) & Level 2 Diploma (2365)*, City & Guilds, 2018
- Peter Tanner, *The City & Guilds Textbook: Book 2 Electrical Installations for the Level 3 Apprenticeship (5357), Level 3 Advanced Technical Diploma (8202) & Level 3 Diploma (2365)*, City & Guilds, 2019

Websites

- Institute for Apprenticeships and Technical Education (IfATE) **https://www.instituteforapprenticeships.org/**
- Building regulations website: https://www.gov.uk/government/collections/approved-documents
- Planning Portal https://www.planningportal.co.uk/
- Gas Safe Register https://www.gassaferegister.co.uk/
- British Standards Institution **https://shop.bsigroup.com/**
- Chartered Institution of Building Services Engineers (CIBSE) https://www.cibse.org/
- Association of plumbing and heating Contractors https://www.aphc.co.uk/
- NICEIC http://www.niceic.com/
- The carbon trust **https://www.carbontrust.com/**
- **https://energysavingtrust.org.uk/**
- https://www.hse.gov.uk/
- Office of Gas and Electricity Markets – **https://www.ofgem.gov.uk**

351 Air conditioning engineering

Level:	3
GLH-combined with refrigeration (358):	700
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to know and undertake fundamental air conditioning work. Learners will have the opportunity to plan, perform and evaluate their work while utilising a range of materials, methods and techniques.

Learners will develop their knowledge and understanding of, and skills in:

- Installing, commissioning and maintaining air conditioning systems
- The hazards and health and safety requirements when working on air conditioning systems
- Identifying and selecting the correct tools and equipment for a specific task
- Fabricating and pressure testing pipework to ensure it is leak-free
- Fault-finding mechanical and electrical problems in air conditioning systems

Learners may be introduced to this specialism by asking themselves questions such as:

- How does an air conditioning technician achieve a leak-free system?
- What are the requirements of the F-Gas Regulations?
- What tools and equipment does an air conditioning technician need?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:
1. Air conditioning knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:
2. Install air conditioning systems
3. Commission air conditioning systems
4. Maintain air conditioning systems

Completion of this specialism will give learners the opportunity to develop their Maths, English and Digital Skills.

Specialism content

Outcome 1

Common knowledge criteria

Air conditioning systems

1.1 The function and operation of **air conditioning systems**

Range:
Air conditioning systems - direct expansion, flooded, (centralised plant, air handling units (AHUs), fan coils, chilled beams), heat pump (ground, air and water source), VRV/VRF air conditioning, water chillers.

What do learners need to learn?

The range of air conditioning systems in common use.

The function and operation of air conditioning systems and how they interact in different systems and applications.

1.2 Air conditioning and ventilation in a modern economy

What do learners need to learn?

The uses of air conditioning and ventilation including the difference between cooling for human comfort and for process control in industry.

What ventilation is, and how it can apply to air conditioning systems in terms of fresh air requirements or how it is used to effect air changes to remove stale, harmful or polluted air from a space.

Air conditioning science

1.3 **Scientific principles** of air conditioning

Range:

Scientific principles - thermodynamics, gas laws, psychometrics, fluid flow, electricity, filtration, heat transfer, properties of refrigerant fluids and lubricants.

What do learners need to learn?	Skills
The principles of air conditioning science and how they apply to real life situations (gas laws and pressure testing, psychometrics and commissioning, heat calculations and heat transfer in system evaluation). Principles of thermodynamics: • Temperature scales (Celsius, Kelvin) • Laws of thermodynamics (first law, second law) • Heat transfer (conduction, convection, radiation) • Latent heat processes (melting (fusion), freezing, sublimation, condensation, evaporation, boiling) • Sensible heat processes (super heating, sub-cooling) Ideal gas laws **-** Boyle's law, Charles's law, combined gas law, Dalton's law. Units of pressure (pascal, bar, millimetres of Hg, torr), pressure scales (absolute, vacuum, gauge) Primary refrigerants - HFC, HFO, HC, natural refrigerants • Primary refrigerant ideal properties • Secondary refrigerants • Secondary refrigerant ideal properties • Environmental impact • Ideal properties of lubricants Filtration - air filter (panel, bag, HEPA, carbon), water, refrigerant Psychometrics - properties of air: physical make-up, moisture content, temperature Measuring devices: sling psychrometer, hygrometer. Psychrometric chart plot points: wet bulb temperature, dry bulb temperature, percentage saturation, moisture content, specific volume, enthalpy, dew point, apparatus dew point. Psychrometric processes - sensible, latent. The concept of temperature and temperature scales. Convert values between temperature scales. Calculate rate of heat transfer. Range of variables and calculations - cooling capacity, heating capacity, quantity of condensate over time. Pipe characteristics - (diameter, length, bends, fittings, orientation, equation of continuity) Impact on system performance - (flash gas, oil return, velocity, saturation temperature, mass flow rate, cooling/heating capacity, refrigerants, operating temperatures and pressures, efficiency, pressure drop versus velocity).	MC2 MC6

1.4 Comfort in terms of temperature, humidity, carbon monoxide, metabolism

What do learners need to learn?

The principles of air quality and its effect on human comfort. The properties of air, physical make up, humidity and water content, effect of pollutants, human comfort, air temperature (dry and wet bulb).

1.5 Types of **data**

Range:
Data - measurements, diagrams, calculations, tools, charts, tables.

What do learners need to learn?

Types and data and how to apply them. The SI system of measurement and methods to apply to a range of calculations.

Measurement:

- **Base units -** metre (length) m, kilogram (mass) kg., second (time) s., Kelvin (temperature) K, ampere (electrical current) A.
- **Derived units -** area (m^2), volume (m^3), litres (L), density (kg/m^3), velocity (m/s), acceleration (m/s2), pressure (Pascal), specific volume (m3/kg) energy (J), enthalpy (kJ/kg), conductivity (W/mk), energy rate (W).
- **Cooling and heating formulae -** (Q=mCt, Q=mL, Q/s=W).
- **Tools, charts and tables -** refrigerant comparators (slides and apps), psychrometric charts.
- **Calculations -** pressure calculations (static and dynamic) P = hpg, P =1/2pv2, room heat gain calculation.

Undertake heat load calculations for air conditioning and process heating and cooling applications.

Use manual charts, and smartphone and PC based applications to ascertain pressure/temperature relationships.

Undertake duct pressure and water systems pressure calculations (static and dynamic). Calculate room heat load.

Skills
MC4
MC6
MC7

Legislation, Regulations and Standards

1.6 Relevant **UK and international standards and Approved Codes of Practice (ACOPS)**

Range:
UK and international standards and Approved Codes of Practice (ACOPS) - Health and Safety at Work Act, The Electricity at Work Regulations, Control of Substances Hazardous to Health (COSHH) Regulations, Work at Heights Regulations, Personal Protective Equipment at Work Regulations (PPE), Lifting and Manual Handling Operations Regulations, Provision and Use of Work Equipment Regulations (PUWER), Control of Asbestos at Work Regulations, Health, Safety and Welfare Regulations, Health and Safety (First Aid) Regulations, Confined Spaces Regulations, Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR), F-Gas Regulations, Montreal Protocol.

What do learners need to learn?	**Skills**
Current health and safety and environmental legislation that apply to all aspects of the air conditioning industry. Relevant UK and international standards, and Approved Codes of Practice (ACOPS) related to air conditioning systems including indoor air quality, bacteria in water and asbestos.	EC4 EC5

1.7 **Environmental technologies** employed in the sector

Range:
Environmental technologies - cross-flow heat exchangers, thermal heat recovery wheels, run-around coils, capacity controls, inverter controls.

What do learners need to learn?

The various energy efficiency methods used to reduce power consumption and environmental impact, reducing heat gain, cooling load or energy use.

Building management systems (BMS) to manage energy consumption through load shedding.

Use of standard capacity controls to increase efficiency.

Inverter control to give infinite load positions and maximise efficiency.

Use of high efficiency heat exchangers, run around coils and other means for heat recovery and dehumidification.

Keeping systems maintained and clean improves efficiency.

Operating systems at the most efficient evaporating and condensing temperatures improves volumetric efficiency.

1.8 Supply and storage of energy from **renewable resources**

Range:

Renewable resources - wind power, solar power, solar thermal, solar photovoltaic, hydroelectric, electric storage, thermal storage, biofuels, tidal power, battery storage, waste to energy projects.

What do learners need to learn?

Supply and storage of energy from a range of renewable energy sources.

Mechanical generation of electricity principles and its application to renewable resources such as hydroelectric, tidal and wind power.

Mechanical generation of electricity as applied to biofuels, and waste to power systems
The use of photovoltaics to generate electricity, and solar power to heat water and other fluids.

How batteries store electricity and their use in storing daylight generated power (photovoltaics).

DSR/DSM (demand side response/demand side management).

1.9 Air conditioning design to reduce environmental impact

What do learners need to learn?

Low GWP refrigerants and renewable energy and heat recovery and how they reduce the carbon footprint of an air conditioning system to include an overview of renewable source energy, heat recovery, low GWP refrigerants (HFO, HC, natural refrigerants).

Use of low GWP refrigerants.

Powering air conditioning systems with electricity from renewable or low polluting sources.

The use of adiabatic cooling systems in geographically suitable areas.

Design of hardware with greater life expectancy and guarantee of replacement parts.

Increasing the insulation values of buildings and reducing electricity consumption.

1.10 The principles of operation of **heat pumps**

Range:
Heat pumps - ground source, air source.

What do learners need to learn?

The operation of heat pumps using a pressure enthalpy chart and compare potential heat pump efficiency against traditional heating methods, to include:

- gas boiler
- electric heating.

1.11 Fundamental working principles of **electrical controls** and **components** and motor **starting arrangements**

Range:
Electrical controls - pressure switches, thermostats, flow switches, over current/over temperature (bimetal, PTC, NTC), relays (current, potential, solid state).

Components - single phase motors, coils, transformers, heaters, lights.

Starting arrangements - resistance start induction run (RSIR), capacitor start induction run (CSIR), capacitor start and run (CSR).

What do learners need to learn?

The function and operation of the stated electrical controls and components and motor starting systems and their applications.

Specific knowledge criteria for performance outcomes

System Installation (Outcome 2)

1.12 Checking multiple circuits and systems for leakages

What do learners need to learn?

How the F-Gas Regulations, BS EN378 and the application of gas laws, relate to pressure testing and leak testing, and the techniques for the safe pressure and leak testing of a system.

1.13 Location methods for air handling system installation including types of **tools and equipment** needed

Range:
Tools and equipment - wall/ceiling fixings, pipe benders, brazing equipment (LPG, oxy-acetylene), pipe fittings, mechanical (flare, compression fittings) and braze jointing of pipework.

What do learners need to learn?

The methods and types of fixings used in the construction industry and how they can be used to mount air conditioning equipment.

The different types of pipe jointing methods and when one should be used as opposed to another (DSEAR).

1.14 Types of **ductwork** and **pipework**

Range:
Ductwork - plastic, steel, rectangular, circular, oval, rigid, flexible.

Pipework - Copper, steel, aluminium, plastic.

What do learners need to learn?

The different types of duct and pipes used in the RAC industry, and when the different types would be applied (pressure rating, space available).

The different materials used in ductwork - steel, aluminium plastic.

1.15 Know the safety requirements for working with **gases** and heat producing equipment

Range:
Gases - propane, butane, oxy-acetylene, nitrogen.

What do learners need to learn?

The different types of fuel gases used to braze refrigeration and air conditioning pipework.

Safety inspection before use and fire safety when performing brazing operations.

Visual inspection - inspection for general condition.
Combustion - three elements of the fire triangle.
Dangers - fires, burns, fumes, equipment damage, explosions.
Procedures - raise the alarm, follow safety evacuation procedures, call emergency services.
Classifications of fires - class A, B, C, D, electrical fires.
Fire extinguisher - carbon dioxide, water, powder, foam.

1.16 **Cable types** and their **termination**

Range:
Cable types - multi-core flex, steel wire armoured, single conductor, twin and earth, braided sheath cable, screened.

Termination - insulated crimps, non-insulated crimps.

What do learners need to learn?

The different types of electrical cable used in the RAC industry and the methods used to fix and terminate cabling safely.

System commissioning (Outcome 3)

1.17 **System operation requirements** to be checked for commissioning

Range:
System operation requirements - running pressures, temperatures, superheat, sub-cooling, running current, refrigerant charge, leak testing.

What do learners need to learn?	Skills
The system data, measurement and observations that are taken when commissioning a system and how data should be used in order to achieve maximum energy efficiency and design set conditions. In steady-state operation. Record ambient temperature, refrigerant pressure data (also converted to temperature), the air on and off temperatures to all indoor and outdoor units, indoor room temperatures down to or up to set point, running amps at full load and when at normal room temperatures. Data should be compared to design and adjustments made to meet expected design condition. Test all end user controls. Record refrigerant charged into system in addition to base charge. Where possible record subcooling and superheat. Meet all F-Gas requirements.	MC1 MC6

1.18 **Visual inspection** of an air conditioning system

Range:
Visual inspection - senses (sight, touch, hearing, smell).

What do learners need to learn?	Skills
How to use the human senses to determine fault conditions. The process of carrying out a visual aural, smell and touch inspection to determine abnormal operation, unexpected operational noises (compressor, fans, bearings, loose panels, vibration, oil seepage, high temperatures, disturbed wiring).	MC2

1.19 Expectations of a steady-state condition for air conditioning and heat pump systems

What do learners need to learn?	Skills
Design parameters and steady-state conditions for different cooling and heating applications to determine the correct operating conditions. Determine the optimum running pressures and temperatures of air conditioning, heat pump (ground coil and air source) and water chiller systems to meet the design parameters.	MC6

1.20 Know the impact of operating conditions on system performance

What do learners need to learn?	Skills
How system performance is affected when both internal and external environmental conditions change using a pressure enthalpy chart. How system performance is affected by common system faults using a pressure enthalpy chart. Environmental conditions - higher than design ambient temperatures, lower than design ambient temperatures for condensers and evaporators. Common system faults - blocked condenser, blocked evaporator, shortage of refrigerant, reduced air flow.	MC6

System maintenance (Outcome 4)

1.21 Types of **fault-finding techniques**

Range:
Fault-finding techniques - use of senses, previous site reports, customer information, commissioning data.

What do learners need to learn?	Skills
Fault-finding techniques and how these are applied in practice. The suitability of different fault-finding techniques for compact water chillers, process coolers, heat pumps (ground source and air source), single split and multi split systems determined by location, fault, refrigerant type and urgency. The importance of comparing previous commissioning data to current data to identify faults and running conditions to determine if a fault condition exists. The use of senses (sight, sound, touch, smell), manufacturer's instructions and fault codes, and historical operating and commissioning data to determine and identify a fault condition.	MC2 MC6

1.22 **Cleaning** of **components**

Range:
Cleaning - Coil cleaning fluids, spray washers.

Components – evaporator and condenser coils, drain pan, pump, drain lines.

What do learners need to learn?
The process for safe isolation of an air conditioning system electrically. The correct PPE and correct cleaning fluid for each component to ensure system is not compromised. Spray wash the evaporator and condenser coils and clean the drain pan, pump and drain lines using the correct cleaning fluid for each component tools, equipment and materials to do that.

1.23 Disassembly techniques

What do learners need to learn?
The process for safe isolation of the system electrically and the importance of following manufacturers recommendations, instructions and method statements to disassemble an air conditioning system ready for a repair activity.

1.24 **Techniques** according to use and operation of system

Range:
Techniques - preventative maintenance, reactive maintenance.

What do learners need to learn?

That reactive maintenance is usually a product of a policy of not employing preventative maintenance with the consequence that fault scenarios are often serious in terms of operation.

The difference between critical and non-critical systems (mortuary rooms and a domestic installation), reactive (breakdown fault normally inspected and replaced at a preventative service including V belt) and preventive maintenance situations and how to prioritise which fault-finding techniques must be used.

1.25 Referral of a fault to a specialist

What do learners need to learn?

How to determine if the fault-finding technique needs a specialist technician (F-Gas for charging and recovering refrigerant, electrician for electrical faults).

Accessing the system, electrical work, refrigerant charging, refrigerant recovery, and decommissioning.

Skills
MC2

Outcome 2 - Install air conditioning systems

Performance criteria

2.1 Sequence and prioritise tasks

What do learners need to learn?	Skills
Interpret the customer's requirements and plan the installation to cause minimum disruption and liaise with other trades to avoid conflict. Plan execution of the programme of works, liaison with other trades, method statements and risk assessments.	EC1 EC4 EC5

2.2 Identify **information requirements** for the task

Range:
Information requirements - drawings, manufacturer's specifications, regulatory documents, industry codes of practice, manufacturer's instructions, installation specifications, permits to work, method statements, risk assessments, non-domestic building services compliance guide, building regulations, local by-laws.

What do learners need to learn?	Skills
Identify and gather all the information needed from a range of sources to ensure compliance with local and national by-laws and legislation and any specific manufacturer's requirements.	EC4 EC5

2.3 Produce written **reports** to stakeholders about work completed

Range:
Reports - handover information, operation instructions, F-Gas records, maintenance instructions, job sheet/card, commissioning record.

What do learners need to learn?	Skills
Produce written completion documentation for legal compliance (F-gas records) and customer information (operation instructions).	EC1 EC3

2.4 Measure and mark out **installation requirements**

Range:
Installation requirements pipe routes, location of air handling units, condensing units, connection to services (electricity, gas, water, drainage, ventilation).

What do learners need to learn?	**Skills** MC1
Locate and mark out the location of indoor and outdoor sections of the system together with pipe routes for refrigerants, water, drainage and electrical cabling, with consideration for connection to services.	

2.5 Connect **components**

Range:
Components - heating and cooling coils.

What do learners need to learn?	**Skills** MC1
The connection of refrigerant, water supply and drainage pipework, electrical power and control cables. Allowance should be made where any of the connections must also connect to external services.	

2.6 Assemble pipework and insert **components** into system

Range:
Components - heat exchangers, condensing units, evaporators, condensate drains, valves, electrical cabling, drier, pressure switches, pumps, sight glass, vessels, thermostatic expansion valves, solenoid valves, vibration eliminators, Schrader valves, pressure transducers.

What do learners need to learn?

Safely connect the specified range of components into the air conditioning, heat pump (ground or air source), water chiller or process cooler with consideration given to temperature sensitive components and make any electrical connections as necessary.

Join refrigeration pipework and components using brazing, flaring and swaging methods (Cu to Cu, Cu to Fe, Cu to brass, Fe to brass). Purging using OFN to prevent internal scaling. How to prevent components from heat damage while brazing, and the application of pipe insulation materials.

Forming - braze (oxy -fuel), flare, bend, swage, other mechanical joints.

Jointing methods - similar and dissimilar metals with hot and cold joints – mechanical and compression, Cu/Al joints.

Purging - use of oxygen-free nitrogen.

System components - condensing units, evaporators, condensate drains, valves, electrical cabling, drier, pressure switches, pumps, sight glass, vessels.

Fix - vibration damping clamps, pipe saddles, pipe clips, insulated clamps.

Protective measures - wet rag, non-conductive foam, temporary removal of low melting point items.

Temperature sensitive system components: Thermostatic expansion valves, solenoid valves, vibration eliminators, Schrader valves, pressure transducers.

2.7 Adjust **components**

Range:
Components - belts, dampers, expansion valves, pressure switches, pressure regulation valves, head pressure controls, temperature controls.

What do learners need to learn?
Adjust a range of components in accordance with manufacturer's instructions including pressure switches to set-point, mechanical and digital thermostats set to design values, superheat set on expansion valves to manufacturer's specification, evaporator pressure regulators set to correct pressure, fan speed controllers correctly set to maintain condensing temperature, drive belts adjusted to correct deflection, dampers set to design opening while checking damper fire control.

2.8 Connect **control systems**

Range:
Control systems - electronic controllers, head pressure controls, pressure/temperature transducers, building management systems, central control systems.

What do learners need to learn?	**Skills**
Connect a range of control components including sensors and programmers to the refrigeration and control circuit, and make safe electrical connections as needed.	DC1

2.9 Apply final settings

What do learners need to learn?	**Skills**
Calculate the correct additional charge for an air conditioning system in accordance with manufacturer's instructions.	MC2

2.10 Confirm system is ready to commission

What do learners need to learn?
Carry out pre-commissioning checks: strength and tightness pressure/leak testing, electrical supply, electrical connections, temperature controllers, cabling before start-up of a system.

Outcome 3 - Commission air conditioning systems

3.1 Interpret a risk assessment

What do learners need to learn?	Skills
Interpret risk assessments with consideration for responsibilities and persons at risk, applying controls, and recording potential hazards and completion of documentation.	EC4 EC5

3.2 Interpret **information** provided

Range:
Information - BS EN378, F-Gas Regulations, contractual specifications, manufacturer's instructions, including bill of materials and site plans.

What do learners need to learn?	Skills
Interpret regulatory, contractual and manufacturer's specifications and requirements in readiness to carryout system commissioning.	EC4 EC5

3.3 Interpret commissioning data including determining **design parameters** have been met

Range:
Design parameters - superheat, subcooling, coil approach temperature, (Delta T), air flow, air distribution, air on and off-temperature, oil pressure, system running pressures, running current, relative humidity, primary and secondary refrigerant flow rates, temperature set-points.

What do learners need to learn?	Skills
Interpret data recorded that is downloaded and displayed on a storage device (bespoke controller, phone, PC) to ensure the design conditions and parameters (determined by the manufacturer or design engineer) are met.	MC6 DC4

3.4 Explore **requirements** of the task

Range:
Requirements – energy-efficiency requirements, heat recovery, required temperature and humidity, sound levels, air flow rates.

What do learners need to learn?	Skills
Use open questioning and listening techniques to ensure that the client's requirements and needs are met.	EC2 EC4 EC5 EC6

3.5 Visually inspect system installation

What do learners need to learn?	Skills
Conduct a visual inspection of the complete system to ensure cleanliness, and security of all fixings and mountings. Ensure all works are complete, safe and meet the specification before commencement of the commissioning activity as per contractual and manufacturer's specification.	

3.6 Establish a **steady-state** operation

Range:
Steady-state - running pressures, temperatures, running current, room temperature (dry and wet bulb).

What do learners need to learn?	Skills
Interpret the data readings recorded to ensure that the steady-state conditions achieved meet the contractual requirements.	MC6 DC3

3.7 Collect **data** from control system

Range:
Data - primary and secondary refrigerant flow rates, temperatures, humidity and filtration/air quality levels.

What do learners need to learn?	Skills
Complete measurement of all required parameters such as temperatures, pressures, electrical currents and flow rates to ensure the system is running at maximum efficiency. Wet and dry bulb temperatures should be interpreted on a psychrometric chart or the digital equivalent to ascertain the condition of the measured air.	MC5 MC6

3.8 Record **data** from commissioning instrumentation

Range:
Data - air quality, differential pressure, wet and dry temperature.

What do learners need to learn?	Skills
Use commissioning instruments to collect and record data such as temperatures, systems pressures, flow rates and running currents.	MC5 MC6 EC3

3.9 Check **function** of system against design specification

Range:
Function - air quality, filtration, differential pressure, wet and dry bulb temperature, energy efficiency.

What do learners need to learn?	Skills
Use the measured commissioning data to adjust the air conditioning, heat pump, process cooler or water chiller system to achieve the required conditions and maximum energy efficiency. Use psychrometric chart or digital equivalent to determine air conditions.	MC5

3.10 **Adjust** system to comfortable ambient conditions to ensure maximum performance and efficiency

Range:
Adjust - temperature, pressure controls, air flow rates, air distribution, energy efficiency.

What do learners need to learn?	Skills
Undertake appropriate testing and interpret data to adjust the system controls to achieve the correct environment conditions and maximise energy efficiency.	MC6

Outcome 4 - Maintain air conditioning systems

4.1 Produce a **method statement**

Range:
Method statement - scope of works, manufacturer's instructions, contractual requirements, risk assessment, preventative or reactive maintenance, permits to work.

What do learners need to learn?	Skills
Produce a method statement and risk assessment for either preventative or reactive maintenance through interpretation of system data, customer reports or contractual requirements.	EC1 EC2 EC4

4.2 Assess the suitability of **information** available

Range:
Information - previous service records, F-Gas records, customer comments, senses, site logs.

What do learners need to learn?	Skills
Consider all of the information available with regard to its accuracy, sufficiency, currency and reliability before creating a maintenance plan.	EC4 EC5

4.3 Calculate **resource requirements** for servicing the systems

Range:
Resource requirements - lubricants, filters, cleaning agents, spare parts, consumables.

What do learners need to learn?	Skills
Consider the maintenance plan and manufacturers instruction to compile a list of all materials needed to complete the maintenance task. Assess fitness for purpose of all tools and equipment.	MC2 EC3

4.4 Complete **documentation**

Range:
Documentation - maintenance plan, maintenance report, F-Gas records.

What do learners need to learn?	Skills
Complete all documentation in line with contractual and legislation requirements.	EC3

4.5 Visually inspect systems

What do learners need to learn?

Carryout a visual inspection of the system first, with consideration given to health and safety and possible faults that may not be apparent to the client/customer.

Inspection to check for corrosion in fin and tube coils, water lines, and drain pans as well as the panels and metalwork containing the system; refrigerant or water leaks particularly in jointed sections of pipework or where vibration is present; damage, loose screws or connectors in the electrical terminal boxes, isolators and control panels.

4.6 Clean **systems**

Range:
Systems - indoor and outdoor coils, air filters, water filters, drain pans, drain lines, unit casings.

What do learners need to learn?

Carry out a wide range of cleaning activities with consideration given to health and safety and maintaining maximum energy efficiency.

4.7 Tighten loose **components**

Range:
Components - screws, nuts, bolts, electrical connectors, wall/ceiling fixings.

What do learners need to learn?

Inspect, check and tighten all screws and connections, ensuring safe isolation procedure is followed before checking any electrical connections.

4.8 Adjust **components**

Range:
Components - dampers, belts, expansion valves, pressure switches, pressure regulation valves, head pressure controls, temperature controls.

What do learners need to learn?

Adjust a range of components in accordance with manufacturer's instructions including pressure switches to set-point, mechanical and digital thermostats set to design values, superheat set on expansion valves to manufacturer's specification, evaporator pressure regulators set to correct pressure, fan speed controllers correctly set to maintain condensing temperature, drive belts adjusted to correct deflection, dampers set to design opening while checking damper fire control.

4.9 Lubricate bearings and other moving parts

What do learners need to learn?

Identify and lubricate all components within the scope of works to include pulley bearings, pumps, electric motors heat recovery wheels, fan motors.

4.10 Check unit is running according to **optimum settings**

Range:
Optimum settings - manufacturer's instructions and specifications, recorded data (temperatures, pressures, currents), client comments.

What do learners need to learn?

Use manufacturer's data or the design engineer's specifications compared with either data recorded manually, or data downloaded from the specific system to ensure the system is running at optimum design conditions and maximum energy efficiency.

Psychrometric calculations using a chart or digital equivalent may be required given the wet and dry bulb temperatures.

Skills
MC6
EC5

4.11 Review system against minimal risks from **potential health hazards**

Range:
Potential health hazards - sick building syndrome (SBS), poor air distribution, blocked or missing air filters, static water (*Legionella*).

What do learners need to learn?
Inspect the system with regard to other potential hazards such as *Legionella* and SBS and advise or take action as needed.

4.12 Assess **system risks** for long term performance

Range:
System risks - components reaching end of life, wear and tear, previous service reports.

What do learners need to learn?	**Skills**
Consider system information to make an assessment of potential life of system components and make recommendation or take action as necessary.	MC2 MC6 EC5

4.13 **Report** on maintenance activities

Range:
Report - job sheet/cards, F-Gas records, maintenance reports, verbal reports to client or supervisor.

What do learners need to learn?	**Skills**
Produce verbal and written reports based on the recorded data and the results of the inspection and works carried out.	EC1 EC2 EC3 EC4 EC6 DC2 DC1

4.14 Investigate **system operation parameters** to identify faults

Range:
System operation parameters - commissioning data, manufacturer's data, system data (current and historical), design parameters, refrigerant side, air flow, secondary refrigerant flow, electrical control function, site logs, previous service records.

What do learners need to learn?	**Skills**
Using a range of information and system data including the senses (sight, touch, hearing, smell) conduct fault analysis to investigate actual or potential faults and construct a plan to put the system back into full operation.	MC2 MC6 EC4 EC5 DC4

4.15 Rectify system

What do learners need to learn?	**Skills**
Use the results of a fault-finding analysis to carry out a system repair or component replacement to put the system back into full operation. This could include the following faults: refrigerant leaks, system components, electrical faults, air flow.	MC2 MC6

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

Common core content

- Construction sustainability principles - Energy production and energy use and waste management
- Environmental impact
- Construction information and data principles – Standards, regulations and guidance

BSE specific core content

- Health and safety - BSE Regulations and safe working practices
- Building Services Engineering (BSE) systems
- Tools and equipment – Use and maintenance

Guidance for delivery

There are opportunities to consolidate learning where elements of content are common across performance outcomes, for example:

- Jointing
- Charging
- Recovery

Where content is common across installation, commissioning and maintenance activities, it is recommended that these are delivered once and contextualised where needed.

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery.

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities:

- Practical – use of pre-set formative assessment to carry out tasks and record on standardised form. Use of a variety of measuring instruments.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities – calculators, apps, office IT.

Ways of ensuring content is delivered in line with current, up-to-date industry practice:

- Delivery for this specialism will take place in a dedicated air conditioning classroom/workshop.
- A realistic representation of air conditioning systems and components should be installed in the classroom/workshop.
- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes.
- The provision must represent the type of equipment currently available in the UK air conditioning industry.
- New and emerging air conditioning technology should be included in the deliver.

Suggested learning resources

Books

- Refrigeration and Air-Conditioning (Hardcover – Illustrated) by Guy Hundy (Author)
- Refrigeration and Air Conditioning Technology (Motivate Series) by Norman Cook
- Modern Refrigeration and Air Conditioning by Althouse, Bracciano, Turnquist
- Refrigeration and Air Conditioning by A. R. Trott, T C Welch
- Air Conditioning Principles and Systems: An Energy Approach by Edward G. Pita

Websites

- **www.ior.org.uk**
- **BSEN378:2016 standard www.shop.bsigroup.com**
- **www.acrib.org.uk**
- F Gas - **www.gov.uk/government/collections/fluorinated-gas-f-gas-guidance-for-users-producers-and-traders**
- F-Gas **www.refcom.org.uk**

Scheme of Assessment – Air conditioning engineering

The air conditioning engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 28 hours.

Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 – Design	Work from a specification to determine design calculations for a proposed installation. Displays a breadth of knowledge and understanding in how system, environmental and customer needs can influence design requirements.
Task 2 – Plan the installation	Displays a breadth of knowledge and practical skills that enables them to carry out and plan for the installation of an air conditioning system. Candidates will need to produce documents to industry standards that clearly states how they will carry out the installation.
Task 3 – Install and commission	Complete the given installation and commissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately. Tools, materials, and equipment are selected and used correctly. Consideration to environmental sustainability and recycling of materials. Techniques used to make building fabric repairs to restore work area to pre-installation condition. All work carried out in line with relevant manufacturer's instructions/ building regulations.
Task 4 – Service and maintenance	Complete the fault finding, decommissioning, rectification, and maintenance activities successfully. Applies knowledge and practical skills in rectifying a fault in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	High level tasks *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	Assessment Theme	Typical evidence
PO2 Install air conditioning systems (37%)	T1- Design T2 – Planning the installation	Health and Safety	Risk assessments, PPE, Working safely
	T2- Planning the installation	Design and Planning	Method statements, installation diagrams, material lists, Selecting types of systems and components, design calculations
	T3 – Install and commission	Systems and components	Using tools and equipment, cutting and bending pipe, jointing methods, prefabrication of pipe, positioning and securing component,
	T1- Design T3 – Install and commission	Reports and information	Interpretation of drawings, specifications, manufacturer instructions
PO3 Commission air conditioning systems (23%)	Task 3 – Install and commission	Inspecting and testing systems and components	Pressure testing, testing for leaks, commissioning checks

	T3 – Install and commission T3 – Install and commission T3 – Install and commission T4 – Carry out service and maintenance	Health and Safety Reports and information Handover/ communication	Risk assessment, working safely, PPE Commissioning records Handover to customer
PO4 Maintain air conditioning systems (40%)	T4 – Carry out service and maintenance	Health and safety Working with faults Handover/ communication Reports and information	Risk assessment, working safely, PPE Fault diagnosis, client requirements, Repair and replace components, use of tools Communication with customer to diagnose fault Maintenance activity report

352 Electrical and electronic equipment engineering

Level:	3
GLH:	570
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to know and undertake fundamental electrical and electronic engineering processes and procedures. Learners will have the opportunity to plan, perform and evaluate their work while using a range of materials, methods and techniques.

Learners will develop their knowledge, understanding and skills in:

- Health and safety practices associated with electrical and electronic systems
- Tools, materials and equipment used to complete tasks in electrical and electronic systems
- Systems and products used in electrical and electronic systems
- Installing, commissioning, and decommissioning electrical and electronic equipment systems
- Maintaining electrical and electronic equipment systems

Learners may be introduced to this specialism by asking themselves questions such as:

- What different types of monitoring equipment are used in electrical and electronic systems?
- Why are there different types of electrical supply?
- How are wires and circuit components connected safely?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:

1. Electrical and electronic equipment engineering knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:

2. Install electrical and electronic equipment systems
3. Commission electrical and electronic equipment systems
4. Maintain electrical and electronic equipment systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital Skills.

Specialism content

Outcome 1

Common knowledge criteria

Health and safety

1.1 Risk assessments and safe working procedures for activities involving electrical and electronic equipment

What do learners need to learn?	Skills
Risk assessment requirements and considerations before any work activities are undertaken - use of method statements, necessity for safe isolation of systems being worked on.	EC5

1.2 Specific **risks** associated with electrical and electronic equipment

Range:

Risks – electric shock, fire, burns, static discharge, static shock.

What do learners need to learn?
Risk associated with equipment and systems, and safe working practices to avoid or minimise the risks detailed in the range. Safe isolation and discharge of systems and equipment.

Science

1.3 Electrical/electronic science principles

Range:

Electrical principles - relationship between voltage, current, resistance, and power in electrical circuits.

Resistive circuits - effects of series and parallel resistance in DC electrical circuits.

Circuit measurement - using a digital multimeter.

Capacitance – properties, construction, and function of capacitors.

Inductance - properties, construction, and function of inductors.

Transformers - properties, construction, and function of transformers.

Semiconductors - properties, construction, and function of semiconductor devices.

What do learners need to learn?	Skills
The properties of, and the relationship between, electromotive force (emf), electric current, and resistance. Reference to Ohm's Law. Potential difference (pd), and the effects of voltage drop in dc circuits. Recognise SI symbols used to denote electrical properties. The material properties of conductors and insulators.	MC5 MC6

Power in dc electrical circuits.

Resolve simple problems using equations that relate to voltage, current, resistance, and power.

Recognise circuit symbols used to denote resistors.

The effects on an electrical circuit of series, parallel, and series/parallel connected resistances. Resolve resistance circuit problems by calculation.

Use of a multimeter to measure voltage, current and resistance in low voltage dc electrical circuits. Continuity testing. Testing components; resistors, capacitors, inductors, diodes, LED.

Construction and basic operation of capacitors. Factors affecting capacitance. Units of capacitance. Identify types and polarity of capacitors. Safety considerations when handling capacitors. Typical applications.
Calculations to determine value of capacitors and resolve series and parallel capacitor circuits.

Construction and basic operation of inductors. Factors affecting the value of an inductor. Units of magnetic flux, flux density, and inductance. Reasons for, and effects of, back emf in inductors. Methods of suppressing the back emf. Typical applications.
Methods of determining the field polarity around an inductor. Self-inductance and mutual inductance. Calculations to determine flux density, induced emf, self-induced emf, and mutual induced emf.

Construction and basic operation of transformers. Typical applications.

Calculations to determine the effects of transformer turns ratio on voltage and current.
Basic construction, operation and function of the listed semiconductor devices. Recognise common devices, and the means of identifying polarity. Typical applications.
Semiconductor devices: Silicon diode, light emitting diode (LED), NPN bipolar transistor.

Tools, equipment and materials

1.4 **Tools, equipment** and materials used for installation and their purpose

Range:

Hand tools - rules, levels, cable cutters, screwdrivers, wire strippers, knives, wrenches, hammers, saws, data cabling crimps, insulation displacement tools.

Power tools - hammer drills, electric screwdrivers.

Equipment - test equipment, ICT equipment, soldering irons.

What do learners need to learn?

Selection of correct hand/power tools, equipment and materials required to complete work activities associated with electrical and electronic equipment engineering within BSE.

1.5 Provision of **storage** for equipment, tools and materials

Range:

Storage – temporary Onsite, secure, anti-static, location, logistics.

What do learners need to learn?

Suitable storage requirements to keep tools, materials and equipment secure and safe from damage. Suitable location to allow for logistics and workflow when onsite.

1.6 Tests required, including portable appliance testing (PAT) to ensure products and equipment meet national and international safety standards

What do learners need to learn?

Ensure all products and equipment have been tested correctly in accordance with PAT procedures and in line with the IET Code of Practice for the in-service inspection and testing of electrical equipment (IET COPISITEE).

1.7 **Regulations** and **codes of practice** associated with electrical and electronic equipment installations

Range:

Regulations – BS 7671, PUWER, Electricity at Work Regulations, Electromagnetic Compatibility Regulations.

Codes of Practice and guides – IET COPISITEE, IET CoP Building Integration and Control Systems, IET CoP Connected Systems Integration in Buildings.

What do learners need to learn?	**Skills**
Awareness of the range of regulations and codes of practice that influence selection, erection, design and function of electrical and electronic equipment and associated wiring systems.	EC5

1.8 Operation and handling **requirements** for power tools and equipment

Range:

Requirements - asset register, regular user checks, PAT, IET COPISITEE.

What do learners need to learn?

Safe use of tools in accordance with manufacturer's instructions and industry standards. Frequency of inspection, testing and user checks.

1.9 Principles of electrical **circuits** and **loads**

Range:

Circuits – ring-final, radial, lighting, series, parallel, AC, DC, magnetic effect, temperature effect, voltage drop.

Loads – AC, DC, resistive, inductive, capacitive, power factor, true power, apparent power.

What do learners need to learn?	**Skills**
How different circuit arrangements affect voltage and current behaviour. Control of loads by circuit arrangement and the reasons why particular circuit arrangements are selected. DC principles for series and parallel circuits. How temperature affects circuits as well as temperature induced by circuit conditions. Factors that affect voltage drop and the effects of voltage drop in terms of load behaviour and energy losses. How magnetism is induced and the effects of magnetism. How different types of load affect current and voltage including resistive, inductive, and capacitive loads. How power factor is induced and how it changes circuit properties such as current, voltage and power. Methods used to reduce power factor.	MC5 MC6

1.10 Principles of electronic components used in equipment

Range:

Components – resistors, capacitors, thermistors, light-dependant resistors (LDRs), all types of diodes, transistors, diacs, triacs, transformers, rectifiers, programmable logic controllers (PLCs).

What do learners need to learn?
Identification and working principles of electronic components used in equipment, including basic circuits using electronic equipment and how to test for basic function.

Systems and products

1.11 Requirements of **systems** in meeting product and building operations

Range:

Systems - lighting, power, heating, cooling.

What do learners need to learn?
Requirements of the systems listed in the range, along with their interfacing equipment. Selection of equipment used to meet energy efficiency requirements/considerations within building regulations and BS 7671.

1.12 **Electrical and electronic equipment,** including related software

Range:

Electrical and electronic equipment - electrical power and lighting controls, heating system controls, monitoring systems (BMS/instrumentation/software), network systems, Wi-Fi extenders, Power over Ethernet (PoE), security and access, point-of-sales.

What do learners need to learn?	Skills
Characteristics and purpose of the different types of systems/equipment used in building management and control systems, including the components and software used. Suitability of equipment for installation location and external influences. How components operate within a system and integrate to enable the product and system to operate effectively including different types of connectivity and wireless systems available and also including the internet of things (IoT). Other systems available including Wi-Fi, Bluetooth. The operation of the building systems and their individual components, how these components are connected to each other, if they are hard-wired, connected wirelessly through Bluetooth, or through a central hub. Concepts and development with the IoT.	DC1 DC5 DC6

1.13 Types of **monitoring systems**

Range:

Monitoring systems - BMS, PLCs, fire alarms, emergency lighting, security (intruder/access), heating and ventilation.

What do learners need to learn?

Operation of different types of monitoring systems, how the data is connected between them, and the use of networks within buildings. The types of data produced by systems and how the data is produced and extracted, considering different types of wireless systems available.

1.14 Types of **AV equipment**

Range:

AV equipment - optical media, display screens, infra-red transmitters, sound systems, PA and voice control systems.

What do learners need to learn?

Operation and connectivity of the different types of AV equipment within the range specified. Types of interfaces used between equipment and systems such as audio/video to network adaptors and wireless links.

1.15 Design procedures and factors associated with new and existing power systems, wiring systems and circuits, leading to **compliance with BS 7671**

Range:

Compliance with BS 7671 – assessment of general characteristics, protective measures, selection and erection, special locations, current carrying capacities.

What do learners need to learn?

The requirements of BS 7671 affecting the design of electrical systems and circuits for new installations or the addition to existing circuits and systems. Procedures used to design circuits in accordance with BS 7671 and factors affecting design.

Current carrying capacities as in BS 7671

1.16 Effects of EMI and methods used to reduce the effects to, or admitted by electrical and electronic equipment

What do learners need to learn?

Types of equipment that emit EMI, and their characteristics. Equipment vulnerable to EMI and methods used to reduce the effects such as shielding, segregation, spacing, use of non-metallic (optical) systems, bonding networks.

Specific knowledge criteria for performance outcomes

System installation (Outcome 2)

1.17 **Cable and wiring system component** installation and their supports

Range:

Cable and wiring system components - single and multicore thermoplastic cable, SWA multi-core armoured cable, MICC, FP200 - fire resistant cable, data cable CAT5/6, enclosures (cable tray, cable conduit - (steel and PVC), cable trunking, ladder racking, cable basket).

What do learners need to learn?

Methods of installing cables to a range of wiring and containment systems into a new or existing building including requirements for the installation of wiring in buildings, as in BS 7671.

1.18 **Methods** of terminating cables into accessories

Range:

Methods - SWA glands, rigid cable glands, flexible cable glands, grips, clamps.

What do learners need to learn?

Different methods for terminating cables into enclosures and accessories, to meet manufacturer's instructions and industry practices for the cables as ranged in 1.17

1.19 Identification of **electrical supply** and **earthing arrangements**

Range:

Electrical supply - single phase, polyphase, DC, renewables.

Earthing arrangements - TT, TN-S, TN-C-S.

What do learners need to learn?

Identification of different earthing systems and supplies to enable suitable selection of interfacing equipment. Suitability of supplies for addition of equipment.

1.20 Electrical **circuit types**

Range:

Circuit types - power (radial and ring final circuits), lighting (switching and ELV), control, auxiliary.

What do learners need to learn?

Identification of different types of electrical circuits in line with current building regulations and BS 7671.

1.21 **Methods** used to terminate and connect conductors

Range:

Methods - screwed, crimped, compression connections, soldered, insulation displacement.

What do learners need to learn?

Methods used to terminate and connect conductors using a variety of methods recognised within the industry.

1.22 Broadband and Wi-Fi requirements and how to assess suitability for **interfacing equipment**

Range:

Interfacing equipment - routers, switches, data receivers, smart interfaces.

What do learners need to learn?

Communication systems and interfacing equipment used by the installed equipment to monitor/control. Identify the software systems in use.

Skills
DC1

1.23 Existing systems and implications for new installations

What do learners need to learn?

Implications of installing new equipment into existing installations, and the problems associated with older installation cable types and the installed equipment. With consideration of implications including:

- cable types and sizes.
- electrical accessories and equipment.
- requirements for segregation.
- number of cores and conductors.

1.24 Decommissioning existing systems in preparation for new installations

What do learners need to learn?	Skills
Safe isolation procedures and the risks associated with older installations, including building materials (asbestos). New installations including: • processes to make existing products and systems safe to decommission before installation of new products. Isolating electrical and other relevant services • how to identify potential issues before decommissioning a system.	MC2

System commissioning (Outcome 3)

1.25 Inspections of electrical and electronic equipment before putting into service

What do learners need to learn?	Skills
Processes for inspecting electrical and electronic equipment, associated wiring and documentation required during the process, including manufacturer's instructions, BS 7671 and its model forms when checking correct electrical connections.	EC5

1.26 Testing of electrical and electronic equipment

What do learners need to learn?	Skills
Tests required and where applicable the sequence in which they are performed with reference to BS 7671 and manufacturer's instructions.	EC5

1.27 Adjusting equipment to meet installation standards to ensure correct function

What do learners need to learn?	Skills
To follow manufacturer's information for the setting-up and commissioning of electrical and electronic equipment, including functional testing.	EC5

1.28 Handover of equipment to client

What do learners need to learn?	Skills
Handover procedure to client including records, demonstration, O&M manuals, maintenance requirements and certification.	EC1 EC2 EC3 EC6

System maintenance (Outcome 4)

1.29 Fault-finding **techniques**

Range:

Techniques - safe isolation, system updates (automatic and manual), manufacturers maintenance schedules, collection of data, analysis of data, plan fault-finding and tests, carry out fault-finding, repair, test, use of questioning.

What do learners need to learn?	Skills
Logical and systematic process steps in the determination and repair of system faults. Suitable precautionary measures such as safe isolation and anti-static measures.	MC2

1.30 Technology for maintaining, fault-finding and diagnostic work as well as software / firmware updates

What do learners need to learn?
Current fault-finding instruments, information and techniques used to diagnose and rectify system faults.

1.31 Patterns of system failure and requirements for regular maintenance, repair, or replacement

What do learners need to learn?	Skills
Equipment required, with reference to manufacturers data and likely components that may fail. Ensuring that a range of components are held as spares, for each of the systems, including the reasons for doing so including potential reduction of downtime. Checking manufacturer's software and firmware support, including items no longer supported by system updates. Advising stakeholders on suitable methods for maintaining or updating systems and components.	EC4 EC5 MC2 MC6

1.32 Types of **faults** and their implications

Range:

Faults – open circuit, short circuit, earth fault, insulation fault, equipment failure, undervoltage, overvoltage, EMI.

What do learners need to learn?

The different types of fault that can occur in systems and equipment as ranged. The effects and risks associated with each type of fault and typical causes. Methods used to reduce the potential for each type of fault and how each can be detected.

Outcome 2 - Install electrical and electronic equipment systems

Performance criteria

2.1 Assess risk associated with tasks

What do learners need to learn?

Assessment of risk may relate to the production or review of a risk assessment for installation activities, with consideration of specialist equipment required.

Risks will vary depending on the system being installed but may include for example whether any specialist equipment is needed.

Consideration should be made with reference to recording of risk assessment findings in line with regulations as well as the responsibilities of employee's versus employers.

2.2 Identify and review **information** required to complete tasks, ensuring accuracy and validity, including suitability of equipment being installed

Range:

Information - manufacturer's instructions, building regulations, drawings, BS-EN standards, data sheets.

What do learners need to learn?	**Skills**
Identify information in the specification and drawings for the installation, and check that this information against the manufacturer's installation instructions to ensure that all the available information is present for the installation. Ensure that the information obtained is accurate, that it is valid, and that the equipment is suitable for the installation.	EC4 EC5

2.3 Select and inspect tools, equipment, resources and materials required to complete task

What do learners need to learn?
Select the appropriate hand and power tools to install the electrical and electronic equipment. Check the information within the manufacturer's installation instructions to identify if any specialist tools and equipment are needed for the task. Carrying out a visual inspection of equipment, tools, materials, and resources to ensure that they are fit for purpose.

2.4 Mark out the position of electrical and electronic equipment

What do learners need to learn?	Skills
Using the correct measuring and levelling equipment, along with the installation drawings, mark out the position of the equipment.	MC1 MC7

2.5 Analyse situations to identify potential causes of delays and errors

What do learners need to learn?	Skills
Identify any possible causes for delay in the installation including installation site not ready, equipment not delivered, lack of experienced qualified installation engineers and ensure that the client is informed of any likely delays.	MC1 MC2

2.6 Think creatively to adapt designs as appropriate

What do learners need to learn?
Identify and consider changes to the installation method, taking into account any change in the installation site or changes to equipment being installed, including where site conditions are different from the information provided.

2.7 Use tools and equipment to carry out tasks

What do learners need to learn?

Select and use the appropriate hand and power tools to fit cables to brackets, supports, containment systems and wiring systems.

The brackets and supports need to be fitted at the correct distances in accordance with the installation specification, industry practices and relevant standards.

2.8 Handle materials

What do learners need to learn?

Handling containment materials and cabling must be carried out safely and in accordance with the Manual Handling Operations Regulations. Ensure that lifting aids are available and have been checked for operation and damage, and that any lifting tackle available is suitable and serviceable.

Ensure all PPE relevant to the handling task is available and worn (gloves and boots).

2.9 Make systems safe to work on including safe isolation and discharging stored charge as well as isolation of water services

What do learners need to learn?

Follow safe isolation procedure of the electrical supply, ensure that any stored charge has been discharged, and also ensure that any other services, such as water are also isolated where appropriate.

2.10 Connect electrical and electronic equipment to the installed systems

What do learners need to learn?

Connect the electronic and electrical equipment to the installed systems using safe industry practices and in accordance with manufacturer's installation specifications.

2.11 Install cable and cable containment systems

What do learners need to learn?

Install cabling to previously fitted containment to industry standards, taking care not to damage the cable.

2.12 Terminate cables and connect conductors

What do learners need to learn?

Terminate the cables using the appropriate glands and ensure that they are tight and secure to industry standards and following manufacturer's instructions.

Connect conductors, for example to terminate into relevant terminals, using appropriate tools. Connections to be made using screwed, compression, crimped, insulation displacement or soldered connections.

2.13 Connect additional components to existing BSE systems

What do learners need to learn?

Make connections to any associated existing BSE systems in the range (see 1.11 - lighting, power, heating, cooling) using current industry techniques and manufacturers information.

2.14 Remove electrical, electronic and mechanical equipment

What do learners need to learn?

Remove and correctly dispose of any redundant materials and systems, ensuring that any recycling is carried out.

Ensure that any hazardous waste has been handled and disposed of by the correct methods and procedures.

Outcome 3 - Commission electrical and electronic equipment systems

3.1 Inspect electrical and electronic equipment

What do learners need to learn?
Complete inspections as per relevant electrical inspection schedules used in accordance with BS 7671 and IET Guidance Note 3. Consideration should also be given to O&M manuals and manufacturers data.

3.2 Test electrical and electronic equipment systems

What do learners need to learn?	Skills
Testing carried out on electrical systems in accordance with BS 7671 and IET Guidance Note 3 where applicable. Identifying the appropriate instrument for each test to be carried out in terms of: • the instrument being fit for purpose • identifying the correct scale or setting • specifying the requirements for the safe use of instruments to be used for testing and commissioning Consideration should be given to the testing of equipment in accordance with manufacturer's information.	DC1

3.3 Complete required documents for the task

What do learners need to learn?	Skills
Explain the purpose of certification and associated documentation and information that must be contained on completion documentation. Certification process for a completed system, the requirements for the recording and retention of completed initial verification documentation in accordance with BS 7671 where applicable.	EC1 EC3 EC4 EC5

3.4 Analyse and interpret test information and data

What do learners need to learn?	Skills
Analyse and interpret information from various digital and non-digital sources (instrumentation, log files, read-outs).	MC6 DC1 DC4 MC1

3.5 Identify inadequate installations

What do learners need to learn?	Skills
Compare results against the design criteria, manufacturers data and relevant British Standards, and check suitability. Where inadequate results are confirmed, client and manufacturers would need to be informed.	EC1 EC6 MC2 MC6 DC4

3.6 Setup connection including network and router

What do learners need to learn?
Setting-up of routers and hubs to enable Wi-Fi - follow system instructions to network equipment, either hard wired or wireless.

3.7 Review performance in relation to customer network

What do learners need to learn?	Skills
Use apps to check the speed of the internet using the customers' network. Desired/Optimum speeds should be detailed in any manufacturer's data.	EC5 DC4 DC5 DC6

3.8 Demonstrate product and present information to customer

What do learners need to learn?	Skills
Operate the system and complete a full report on the system. Use the manufacturer's information and instructions to demonstrate that installed equipment is functioning correctly and within any limits/tolerances. Detail the energy-saving practices that should be followed. To include suggesting switching equipment off instead of leaving on standby.	EC1 EC2 EC3 EC4 EC5 EC6 MC8 DC3

Use energy-efficient lighting such as LEDs. Ensure registration of the equipment is carried out with the manufacturer where equipment is under warranty.	

Outcome 4 - Maintain electrical and electronic equipment systems

4.1 Communicate health and safety risks to stakeholders orally

What do learners need to learn?	Skills
Communicate with stakeholders in line with system maintenance for example explaining unsafe situations and the risks associated with them. Communications may relate to the production of a risk assessment for maintenance activities, explaining relevant content of the risk assessment to stakeholders.	EC1 EC2 EC3 EC4 EC5 EC6

4.2 Sequence activities required to complete tasks, including planning to isolate electrical supplies, and informing relevant people where required

What do learners need to learn?

Follow correct sequence of activities to complete maintenance tasks:

- Select tools/equipment
- Obtain method statement/work order/permits
- Carry out safe and secure isolation (including getting permission to isolate)
- Carry out maintenance activities
- Remove isolation
- Functional testing

4.3 Allocate time and resources to complete tasks including materials required

What do learners need to learn?	Skills
Application of appropriate timings for each stage of maintenance tasks • Select tools/equipment • Obtain method statement/work order/permits • Carry out safe and secure isolation (including getting permission to isolate) • Carry out maintenance activities • Remove isolation • Functional testing	MC1 MC2

Liaise with stakeholders to agree timings to minimise disruption and enhance safety.	

4.4 Collect system data from ICT applications and other **sources**

Range:

Sources - questioning of client/end user, O&M manuals, manufacture's data sheets.

What do learners need to learn?	**Skills**
ICT, including use of computers, digital transmission over IP, email, mobile communication technology, for the collection of data and completion of work sheets/maintenance sheets.	DC1 DC2 DC3 DC5

4.5 Record system data

What do learners need to learn?	**Skills**
System data may include work records or equipment maintenance sheets etc. Familiarity with records of work, including preventative maintenance and reactive maintenance requirements. Inspection and test schedules maybe company or system specific, so awareness is required of documentation to be completed for maintenance activities.	EC1 EC3 EC4

4.6 Test equipment to ensure it is safe to work on

What do learners need to learn?
Check to ensure safe isolation has been carried out correctly and that any stored charge within the equipment has been discharged.

4.7 Inspect, test and analyse information to identify potential faults

What do learners need to learn?	**Skills**
Inspect for potential faults on system components through visual inspection of system, operational checks, feedback from system users, and performance testing to gather information to be used as part of analysis of situation, checking software for corruption, viruses, End of Life (EoL) . Collate all available information and analyse regarding any possible or potential faults.	EC4 EC5 MC2 MC6 DC4 DC5

Reference to be made to manufacturer's instructions or specifications (fault-finding flow chart or detailed procedure). Check system performance criteria for correct settings, readings, or maximum/minimum permitted standards. Analyse conditions that affect suitability of systems such as alterations to building, structure or equipment.	

4.8 Think creatively to propose solutions for system faults

What do learners need to learn?	**Skills** MC2 MC7 MC10
Using analysis, develop strategic, economic and practical methods for rectifying identified possible or potential faults. System faults and issues include deteriorating or outdated equipment over time and having contingency plans in place for equipment that is no longer manufactured or supported. Site inventory is required with all equipment details assigned including age. Storage of spare parts is required for equipment and parts of systems that may fail due to several reasons. Contingency budget planning needs to be reviewed regularly with consideration given to performance levels of existing equipment and plant.	

4.9 Communicate written technical advice and guidance to technical and non-technical stakeholders

What do learners need to learn?	**Skills** EC1 EC3 EC6 DC3 DC5 DC6
Communicate with stakeholders and obtain necessary permissions to rectify faults, prolong potential faults or improve systems for changing conditions. Overcome potential barriers to successful communication with specific reference to language and methods used for both technical and non-technical stakeholders.	

4.10 Replace components or update software

What do learners need to learn?
Replace components or update software within a system as necessary to meet industry and task - specific requirements. Consideration should be given to safe/appropriate disposal of replaced components and ensuring all work has been recorded or records of work updated, including O&M manuals.

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

Common core content

- Construction science principles – electricity principles, heat principles, light principles, acoustic principles
- Construction sustainability principles – energy production and energy use
- Building technology principles – internet of things
- Construction information and data principles – key elements of data

BSE specific core content

- Digital technology in construction – internet of things, digital engineering techniques, opportunities for the use of technology in other industries and contexts and adapting it for use in construction and the built environment
- Health and safety – BSE regulations, safe working practices for the safe isolation of systems
- BSE systems – electrotechnical principles of components, types of control systems, types of monitoring systems, types of electrical supply, types of earthing arrangements, cable types and sizes, accessories and equipment used in older electrical installations
- Information and data – drawings, circuit diagrams and schematics, data storage, security and protection, programming and set-up of digital systems using IT resources

Guidance for delivery

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery.

Formative assessment – oral Q&A, SmartScreen worksheets (samples available), observation of measuring activities:

- Practical – use of pre-set formative assessment to carry out tasks and record on standardised form.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use a variety of methods to carry out activities – calculators, apps, office IT.

Ways of ensuring content is delivered in line with current, up-to-date industry practice:

- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes.
- Teaching coverage must represent the type of equipment currently available and accepted for use in the UK industry.
- Current and emerging electrical installation and testing technologies should be included in the delivery where possible.

Reinforcement of learning – revisiting learning, group discussions, peer support system.

Suggested learning resources

Books

- The City & Guilds Textbook: Book 1 Electrical Installations for the Level 3 Apprenticeship (5357), Level 2 Technical Certificate (8202) & Level 2 Diploma (2365)
  Author: Peter Tanner
  Publisher: Hodder Education (28 Sept. 2018)

ISBN-13: 978-1510432246

- The City & Guilds Textbook: Book 2 Electrical Installations for the Level 3 Apprenticeship (5357), Level 3 Advanced Technical Diploma (8202) & Level 3 Diploma (2365)
  Author: Peter Tanner
  Publisher: Hodder Education (25 Jan. 2019)
  ISBN-13: 978-1510432253
- Requirements for Electrical Installations, IET Wiring Regulations, Eighteenth Edition, BS 7671:2018 (Electrical Wiring Regulations)
  Author: The Institution of Engineering and Technology
  Publisher: Institution of Engineering and Technology; 18th Edition (2 July 2018)
  ISBN-13: 978-1785611704
- Electronics For Service Engineers Author: J Cieszynski / D Fox Publisher: Routledge (2011)
  ISBN-13: *0750634766*

Websites

- Institute for apprenticeships and technical education **https://www.instituteforapprenticeships.org/**
- National Careers Service **https://nationalcareers.service.gov.uk/job-profiles/electrician**
- Electrical Contractors' Association (ECA) **https://www.eca.co.uk/**
- Institute of Engineering and Technology (IET) **https://electrical.theiet.org/bs-7671/**
- Health and Safety Executive **https://www.hse.gov.uk/electricity/**
- Safety Electrical First- **https://www.electricalsafetyfirst.org.uk/**
- Electrical Times- **https://www.electricaltimes.co.uk/**
- Sparks magazine (for trainees)- **https://www.sparks-magazine.co.uk/**
- Electrical Trade Magazine- **https://www.electricaltrademagazine.co.uk/**

Scheme of Assessment – Electrical and electronic equipment engineering

The electrical and electronic equipment engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 16 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 - Plan the installation	Displays a breadth of knowledge and practical skills that enables them to complete the given installation tasks successfully. Shows the technical skills to use tools and materials safely, and in a logical order. Displays knowledge and understanding in relation to the planning and design of systems as well as the ability to modify existing systems to accommodate equipment and technologies.
Task 2 - Install, commission and decommission	Working in a safe manner, carrying out inspection and testing and interpreting test results, use of tools and equipment, use of diagnostic equipment, working with documentation (manufactures instructions, technical regulations and building regulations), carrying out tasks in clear and logical sequence, carrying out clear record keeping of test result and setting up and commissioning systems for intended use. Providing clear and effective information on product use and care to clients.
Task 3 – Carry out maintenance activity	Applying knowledge and understanding through practical skills to solve a particular scenario/problem. Analysing data and justifying decisions/approaches taken e.g. materials, techniques, appropriate protection of customer property and effective use of materials, consideration of costs and impacts to environment. Following safe systems and procedures and providing clear technical and non-technical advice.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	***High level tasks*** *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	**Assessment Theme**	***Typical evidence***
PO2 Install electrical and electronic equipment systems (39%)	T1 Planning the installation	Health and Safety	Assessment of risk, PPE, working safely
		Design and planning	Method statement, materials and product list, circuit diagrams, measuring and marking out
	T2 Installation and commissioning	Systems and components	Using tools and equipment, positioning and securing components
	T1 Planning the installation	Reports and information	Interpretation of drawings, specifications, manufacturer instructions
PO3 Commission electrical and electronic equipment systems (34%)	T1 Planning the installation	Health and Safety	Assessment of risk, PPE, working safely
	T2 Installation and commissioning	Systems and components	Using tools and equipment, positioning and securing components
		Reports and information	Certification and schedules, completion of basic O&M manual, statement relating disposal of equipment
		Inspection and testing	Inspection and testing checks, measuring of wiring and components, installation of wiring and components

Performance outcome and weighting (%)	*High level tasks* *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	Assessment Theme	*Typical evidence*
		Handover and communication	Handover to customer
PO4 Maintain electrical and electronic equipment systems (27%)	T3 Carrying out maintenance	Health and safety Systems and components Reports and information Handover and communication Working with faults	Assessment of risk, PPE, working safely Replace components, use of tools Completed documentation Communication with customer to diagnose fault Fault diagnosis, fault rectification

353 Electrotechnical engineering

Level:	3
GLH:	650
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to know and undertake fundamental electrotechnical systems engineering processes and procedures. Learners will have the opportunity to plan, perform and evaluate their work while using a range of materials, methods and techniques.

Learners will develop their knowledge, understanding and skills in:

- Health and safety practices associated with carrying out electrotechnical systems engineering
- Installation methods and termination of connections
- Systems and products used in electrotechnical engineering
- Analysing and using information to and from electrotechnical systems
- Removal processes as part of system decommissioning

Learners may be introduced to this specialism by asking themselves questions such as:

- Who are the key stakeholders that may be involved with electrotechnical system installation and maintenance?
- How are electrotechnical systems checked and tested?
- When are different circuit types used in electrotechnical systems?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:

1. Electrotechnical engineering knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:

2. Install electrotechnical systems
3. Commission electrotechnical systems
4. Maintain electrotechnical systems
5. Decommission electrotechnical systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital Skills.

Specialism content

Outcome 1

Common knowledge criteria

Tools, equipment and materials

1.1 **Tools** and **equipment** used for installation

Range:
Hand tools - rules, levels, gauges, plumb lines, cable cutters, screwdrivers, wire strippers, knives, files, wrenches, hammers, saws, data cabling crimps, insulation displacement tools, reamers.

Power tools - hammer drills, pillar drills, electric screwdrivers.

Equipment - testing/commissioning equipment, conduit benders, tray benders, bending springs, MI kit, stocks and dies.

What do learners need to learn?

Tools required related to the requirements of the job specification – identification of the range of both general and specific tools required. Select the correct hand and power tools required to complete work activities associated with electrotechnical systems, taking into consideration the safe use of equipment and suitability of tools and equipment matched to the specific task.

1.2 Operation and handling requirements

What do learners need to learn?

Techniques for the safe use of hand and power tools, referring to specific guidance for tools required to complete and undertake tasks on specific activities. Safety checks necessary before use and regular checks necessary to avoid damage, deterioration and hazards.

Electrical installations

1.3 Principles of electrical **circuits** and **loads**

Range:

Circuits – ring-final, radial, lighting, series, parallel, AC, DC, magnetic effect, temperature effect, voltage drop, single phase, three phase.

Loads – AC, DC, resistive, inductive, capacitive, power factor, true power, apparent power.

What do learners need to learn?	**Skills**
How different circuit arrangements affect voltage and current behaviour. Control of loads by circuit arrangement and the reasons why particular circuit arrangements are selected. DC principles for series and parallel circuits. How temperature affects circuits as well as temperature induced by circuit conditions. Factors that affect voltage drop and the effects of voltage drop in terms of load behaviour and energy losses. How magnetism is induced, and the effects of magnetism. How different types of load affect current and voltage including resistive, inductive, and capacitive loads. How power factor is induced and how it changes circuit properties such as current, voltage and power. Methods used to reduce power factor.	MC5 MC6

1.4 Assessment of general characteristics outlined in national standards

What do learners need to learn?	**Skills**
Assessing general characteristics of installations such as supply types, and earthing arrangements such as TT, TN-S and TN-C-S. Determining maximum demands with application of diversity. How external influences affect installation design, selection and erection. Taking maintainability into account when designing and certificating installation work.	EC5

1.5 Application of the fundamental principles of national standards

What do learners need to learn?	Skills
Refer to the national standards and the requirements of the Electricity at Work Regulations, building regulations and BS 7671 for the design, installation, inspection and testing of electrical systems and equipment. Interpret and implement fundamental principles of BS 7671 including how they are detailed in Parts 4-6 of the standard. Use of information in the Appendices of BS 7671 and Guidance Notes to formulate installation design and protection, giving consideration to the fundamental principles.	EC5

1.6 Special installations and locations specified in national standards

What do learners need to learn?	Skills
Refer to Part 7 of the latest edition of the requirements for electrical installation (BS 7671:2018 – Requirements for Electrical Installations, IET Wiring Regulations) and IET Guidance Notes 1–8 for information and support for electrotechnical activities within special locations as specified in the national standards. This includes identifying installations where specialist activities may be beyond the competency of non-specialist operatives.	EC5

1.7 Design concepts of installations specified in national standards

What do learners need to learn?	Skills
Refer to the latest edition of the requirements for electrical installation (BS 7671:2018 – Requirements for Electrical Installations, IET Wiring Regulations) on-site guides and IET Guidance Notes 1–8 for information and support for protection and safety within electrical installations as specified in the national standards. Interpret requirements and relate these to different circuit types and accessories that form typical electrical systems. Select the correct protection methods and devices for typical systems, including those required for protection, isolation control and switching.	EC5

1.8 Methods of selecting and installing wiring systems

What do learners need to learn?

How to ensure that electrical wiring systems are selected and installed in accordance with current legislation and industry practices and are fit for purpose and safe to be put into service.

Wiring systems may include armoured, insulated and sheathed cable types etc. How different wiring is arranged to form common low and extra- low voltage circuits such as radial power, lighting, ring-final and auxiliary.

1.9 Methods of selecting and erecting electrical installation components

What do learners need to learn?

Consulting IET guidance documents in the installation of all electrical circuits and components, making sure that the installation meets the current legislation and industry practices.

Factors that affect suitable circuits and components, including their protection and longevity.

1.10 Types of lighting and luminaire

What do learners need to learn?

Application of different lighting, lamp types and luminaires used for different effects including efficacy, energy efficiency, lumens, regulatory lux levels and colour rendering.

How height and spacing of luminaires affect illumination values.

Specific knowledge criteria for performance outcomes

System installation (Outcome 2)

1.11 Methods of **cable installation and wiring system supports**

Range:
Cable installation and wiring system supports - single and multicore thermoplastic cable, SWA multicore armoured cable, MICC, FP200- Fire resistant cable, flexible cable, data cable CAT5/6, cable tray, cable conduit (steel and PVC), cable trunking, ladder racking, cable basket, cable cleats, clips, cable hangers.

What do learners need to learn?

How to install cables and containment in line with current legislation and industry practices.

Considerations when installing cables such as building regulations, manufacturer's instructions, IET guidance and British Standards.

1.12 Methods of **terminating** cables

Range:
Terminating - cable glands, grips, clamps.

What do learners need to learn?

Termination and securing of cable terminations detailed in the range in line with specification requirements and current industry standards/working methods.

When securing terminations consideration should be given to building regulations, manufacturer's instructions and British Standards.

Appropriate glands must be used to ensure security of cable types, and checks should be made to ensure termination glands are suitable for external influences and are secure.

1.13 Methods of **terminating and connecting** conductors

Range:

Terminating and connecting - screwed, crimped, compression, soldered, maintained, non-maintained, insulation displacement.

What do learners need to learn?

Termination and securing of connections of conductors detailed in the range in line with specification requirements and current industry standards/working methods.

When securing terminations/connections consideration should be given to building regulations, manufactures instructions and British Standards.

Appropriate connections/terminations must be used to ensure security of connection/termination types and checks should be made to ensure termination/connections are suitable for external influences and are secure.

Appropriate methods should be selected depending on the type of maintenance expected including access.

System commissioning (Outcome 3)

1.14 Inspections for initial verification of electrotechnical systems

What do learners need to learn?

Standard procedures and processes to undertake inspections, including the items to be inspected when carrying out initial verification in accordance with BS 7671 and IET Guidance Note 3. Consideration should also be given to providing the required information including O&M manuals.

1.15 Testing for electrotechnical systems

What do learners need to learn?	Skills
Tests to be carried out on electrical installations in accordance with BS 7671 and IET Guidance Note 3. Identify the appropriate instrument for each test to be carried out in terms of: • the instrument being fit for purpose • identifying the correct scale or setting • specifying the requirements for the safe use of instruments to be used for testing and commissioning. Know why it is necessary for test results to comply with standard values. State the actions to be taken in the event of unsatisfactory results being obtained. Explain why certain testing is carried out in the sequence specified in BS 7671 and IET Guidance Note 3.	DC1 DC5 DC6

1.16 Equipment adjustments as required by installation standards to ensure correct function

What do learners need to learn?
Standard procedures and processes to adjust and alter settings associated with electrical components in accordance with manufacturers requirements and operation system instructions when carrying out the commissioning of the installation. To include the adjusting of settings as required (fan running times, overloads). Know how this information is recorded and conveyed to stakeholders during the handover process.

System maintenance (Outcome 4)

1.17 Types of electrotechnical **system maintenance**

Range:

System maintenance - planned and preventative maintenance (PPM), reactive maintenance.

What do learners need to learn?
Legal requirements relating to PPM, responsibilities for undertaking maintenance regimes. Advantages and limitations of PPM and reactive maintenance. Requirements for completing documentation and updating O&M manuals.

1.18 **Fault-finding** and **rectification techniques**

Range:

Fault-finding techniques - identification of symptoms, collection and analysis of data, use of sources/types of information (circuit schedules, installation specifications, drawings/diagrams), determining nature/characteristics of faults through discussion and questioning, checking and testing, analysis of results/information.

Rectification techniques - repair, replace, adjust.

What do learners need to learn?	**Skills** MC2
Safe working procedures following evaluation and application of appropriate and logical fault diagnosis methods and techniques. Diagnosis of electrical faults using engineering decisions and evaluation of symptoms and findings. Appropriate and efficient action/s that should be recommended to rectify faults.	

1.19 Maintenance requirements for different **building types** and locations

Range:

Building types - private, commercial, house in multiple occupation (HMO), residential.

What do learners need to learn?
Regulations concerning set systems to put in place in relation to different types of premises. Some types of buildings (hospitals, chemical plants, paint stores) are covered by specific, specialist regulations and control measures.

1.20 Maintenance of older systems and installations

What do learners need to learn?
Identification of older systems that may not be compliant with current regulations and reporting on condition and suitability for continued use.

System decommissioning (Outcome 5)

1.21 Ways of making systems safe to decommission

What do learners need to learn?

Isolate system from the supply source or outgoing service, turn off the electrical supply.

Handle materials to protect their integrity and safety during decommissioning.

Remove pre-installed components from electrical installations.

Reconfigure electrical installations during the decommissioning process.

Categorise waste produced during the decommissioning process.

Use construction materials to make good the building fabric following installation component removal.

1.22 Methods of identifying potential issues before decommissioning systems

What do learners need to learn?

Methods including reviewing O&M manuals, and consultation of component data sheets and drawings. Benefits of devising a timely plan when decommissioning systems.

Outcome 2 - Install electrotechnical systems

Performance criteria

2.1 Assess risk associated with tasks

What do learners need to learn?

Assessment of risk may relate to the production or review of a risk assessment for installation activities, with consideration of specialist equipment required.

Risks will vary depending on the system being installed but may include for example whether any specialist equipment is needed etc.

Consideration should be given to recording of risk assessment findings in line with regulations as well as the responsibilities of employees versus employers.

2.2 Collect and collate **information** required to complete tasks

Range

Information - manufacturer's instructions, Building Regulations, drawings, BS EN standards, data sheets.

What do learners need to learn?	**Skills**
Interpret data from sources in order to correctly carry out installation processes. As part of this, the importance of currency of standards and guidance documents, and whether they are subject to change. Information may include drawings and plans or any relevant information as identified in the range and will relate to the contract/required system. Review information to ensure its accuracy and validity, including suitability of equipment being installed. Refer to design specifications and manufacturer's data sheets with specific criteria regarding equipment and components required in a system.	EC4 EC5 MC4

2.3 Select tools, equipment and materials to complete **tasks**

Range:

Tasks - installing wiring, containment systems and connecting equipment.

What do learners need to learn?
Select the correct materials and hand/power tools or specialist equipment required to complete work activities, taking into consideration safe use of the equipment and suitability of tools and equipment matched to the specific task.

2.4 **Design** installation suitable for client's specification and in accordance with national standards

Range:

Design – current capacity, voltage drop, earth fault paths, earth fault loop impedances, fault condition thermal constraints.

What do learners need to learn?	**Skills**
Design installations in accordance with BS 7671 and guidance notes. Installation circuits and protection suitable for current carrying capacity, voltage drop limitations, earth fault paths, earth fault loop impedance values and maximum values, selection of protective devices based on data and load conditions, protective conductor selection based on data such as thermal constraints and installation conditions.	MC1 EC1 EC2 MC7 DC2

2.5 Inspect the suitability of resources for use, including tools, materials and equipment

What do learners need to learn?	**Skills**
Inspecting and using hand and power tools safely – using specific tools required to complete different parts of tasks as required. Power tools, plant and equipment checked in accordance with current statutory, non-statutory regulations and codes of practice.	MC10

2.6 Analyse situations to identify potential causes of delays and errors

What do learners need to learn?	**Skills**
Delays and errors may include the work site not being ready, having incorrect drawings, insufficient materials etc. Learners should review available progress plans such as Gantt charts/critical path analysis tracking, as well as site meetings to discuss progress detailing any causes for concerns.	EC5

2.7 Mark out the position of electrical equipment

What do learners need to learn?	Skills
Positioning and securing component locations in line with specification requirements and current industry standards/working methods. When positioning, consideration should be given to plans/drawings, building regulations, manufacturer's instructions and British Standards. Considerations given to influences from other installed equipment such as heat producing equipment, steam or external influences such as direct sunlight. Appropriate fixings must be used to ensure security of components, and checks should be made to ensure components are level and secure following positioning.	MC1 EC1

2.8 Use tools, equipment and materials to carry out tasks

What do learners need to learn?
Setting up and using the correct hand and power tools, plant and equipment required to complete work activities, taking into consideration safe use of the equipment and suitability of tools and equipment, including suitable PPE, matched to specific tasks.

2.9 Install cable containment systems

What do learners need to learn?	Skills
Engineering cable containment installations – to include measuring and cutting of materials needed to required length as detailed in the job specification. Materials should be cut using appropriate cutting equipment with consideration of safety, materials and equipment available. Consideration should also be given to site restrictions such as space and potential mess when cutting. Handling materials such as metal and plastic containment systems and different cable types. When handling, relevant PPE must be worn and selected, as well as the reviewing of material data sheets, where information given must be followed to ensure the safety of the user and correct installation of components.	EC5

2.10 Install cabling

What do learners need to learn?

Install cables within containment systems or on support systems using appropriate methods for drawing in, laying and securing. Suitable consideration must be given to protection of cables during installation.

2.11 Connect electrical equipment to installed wiring systems

What do learners need to learn?

Connecting/fixing electrotechnical system components together using appropriate methods of fixing as listed in the design specification/manufacturer's details with consideration of material type, materials, and equipment, reviewing safety requirements.

Appropriate fixings must be used to ensure security of components, and checks should be made to ensure components are level and secure following positioning.

2.12 Terminate cables and connect conductors

What do learners need to learn?

Terminate and secure the connection of conductors in line with specification requirements and current industry standards/working methods.

When securing terminations/connections consideration should be given to external influences, building regulations, manufacturer's instructions and British Standards.

Appropriate terminations/connections must be used to ensure security of connection/termination types and checks should be made to ensure termination/connections are level and secure.

2.13 Measure and evaluate circuit conditions for differing **load profiles**

Load profiles – inductive, resistive, capacitive, reactive, power factor, power factor correction.

What do learners need to learn?

Use of measuring and monitoring equipment to determine and analyse different types of load and the effects of load on circuit conditions such as current and voltage. Analyse power factor and determine suitable measures to minimise impact of reactance on circuit conditions.

2.14 Select suitable lighting lamps and luminaires for **environment and usage**

Environment and usage - statutory levels of illuminance, glare, utilisation factors, photometric data, conditions of evacuation, external influences, colour rendering.

What do learners need to learn?

Select suitable types of lighting lamp and luminaire for given conditions such as intended use and location. Consider factors affecting selection such as space-height ratio, manufacturers' photometric data, conditions of evacuation, energy efficiency, colour rendering.

Outcome 3 - Commission electrotechnical systems

3.1 Prepare for inspection, testing and commissioning

What do learners need to learn?	Skills
Gather the information necessary for detailed inspection, testing and commissioning of electrical installations, including manufacturer's data, design information, tolerances, drawings and charts.	MC1 MC4

3.2 Inspect electrotechnical systems

What do learners need to learn?
Complete visual inspections as per relevant electrical inspection schedules used in accordance with BS 7671 and IET Guidance Note 3.

3.3 Test electrotechnical systems

What do learners need to learn?	Skills
Tests to be carried out on an electrical installation in accordance with BS 7671 and IET Guidance Note 3, for example tests for continuity of conductors, insulation resistance, polarity and earth fault loop impedance. Learners must select the appropriate instrument for each test to be carried out in terms of: • ensuring the instrument is fit for purpose • identifying the correct scale or setting Why it is necessary for test results to comply with standard values and actions to be taken in the event of unsatisfactory results being obtained.	DC1

3.4 Analyse and interpret information and data

What do learners need to learn?	Skills
Interpret information obtained from digital sources and from testing electrotechnical systems. Analysis and interpretation may involve the use of computer programs and packages and reviewing project management literature and plans.	MC6 MC7 DC1 DC4 DC5

3.5 Complete commissioning **documentation**

Range:

Documentation - Electrical Installation Certificate, Minor Electrical Installation Works Certificate, schedule of inspections, schedule of test results.

What do learners need to learn?	**Skills**
Complete all relevant sections/information that must be contained on initial verification documentation. Follow certification processes for a completed installation, with consideration given to responsibilities of relevant personnel in completion of the certification process. Learners must follow requirements for the recording and retention of completed initial verification documentation in accordance with BS 7671. Ensure O&M manuals are complete and reflect the 'as fitted' work undertaken. Handover information to stakeholders.	EC1 EC3 EC4 EC5

Outcome 4 - Maintain electrotechnical systems

4.1 Communicate health and safety risks to stakeholders orally

What do learners need to learn?	Skills
Communicate with stakeholders in line with system maintenance undertaken. This includes explaining unsafe situations and associated risks. Communications may relate to the production of a risk assessment for maintenance activities. Explain relevant content of the risk assessment to stakeholders.	EC1 EC2

4.2 Sequence activities required to complete task, including planning to isolate electrical supplies and informing relevant people

What do learners need to learn?
Follow correct sequence of activities to complete a maintenance task: • Select tools/equipment • Obtain method statement/work order • Carry out safe and secure isolation (including getting permission to isolate) • Carry out maintenance activities • Remove isolation • Functional testing

4.3 Allocate time and resources to complete the task including materials required

What do learners need to learn?	Skills
Application of appropriate timings for each stage of maintenance tasks • Select tools/equipment • Obtain method statement/work order/permits • Carry out safe and secure isolation (including getting permission to isolate) • Carry out maintenance activities • Remove isolation • Functional testing Liaise with stakeholders to agree timings to minimise disruption and enhance safety.	MC10

4.4 Collect and record electrical installation data

What do learners need to learn?	Skills
Collect relevant electrical installation data. Electrical installation data may include work records or equipment maintenance sheets. Familiarity with records of work, including preventative maintenance and reactive maintenance requirements. Inspection and test schedules may be company or system specific, so awareness needed of documentation to be completed for maintenance activities.	DC1 DC4 EC1 EC2 MC1 MC4 MC7

4.5 Analyse data from work activity

What do learners need to learn?	Skills
Interpret figures and values obtained from electrical installations (generated diagnostic reports.) in order to evaluate the condition of the electrical installation, and complete appropriate documents. Relevant documentation should be populated with values and comments relating to set task or activity undertaken.	MC6 DC1 DC4

4.6 Provide technical advice and guidance to technical and non-technical stakeholders

What do learners need to learn?	Skills
Convey information for example safety considerations, maintenance requirements etc. to inform and educate stakeholders with a specific focus on ensuring all stakeholders are aware of health and safety responsibilities. Learners must be able to overcome potential barriers to successful communication with specific reference to language and methods used for both technical and non-technical stakeholders.	EC1 EC2

4.7 Test electrical installation to ensure it is safe to work on

What do learners need to learn?
Check to ensure safe isolation has been carried out correctly and that any stored charge within the equipment has been discharged.

4.8 Analyse information to identify potential faults

What do learners need to learn?	Skills
Inspect for potential faults on installation components through visual inspection of electrical installation, operational checks, feedback from users and performance testing to gather information to be used as part of analysis of situation. Collate all available information and analyse regarding any possible or potential faults. Reference may also be made to manufacturer's instructions or specifications (fault-finding flow chart).	MC6 DC1 DC4

4.9 Think creatively to propose solutions for installation faults

What do learners need to learn?	Skills
Installation faults and issues may include insulation resistance readings deteriorating over time and having contingency plans in place for equipment that is no longer manufactured etc. Site inventory is required with all equipment details assigned including age. Storage of spare parts is required for equipment and parts of the electrical installation that may fail for a number of reasons. Contingency budget planning needs to be reviewed regularly with consideration given to performance levels of existing equipment and plant.	MC2

4.10 Replace **components** of electrotechnical systems

Range:

Components - lamps, tubes, accessories, wiring, containment, devices

What do learners need to learn?
Replace components within an electrical installation as necessary to meet industry and task specific requirements. Consideration should be given to safe/appropriate disposal of replaced components and ensuring all work has been recorded in work and O&M manuals.

Outcome 5 - Decommission electrotechnical systems

5.1 Communicate with relevant stakeholders to ensure required information is available to undertake the task using electronic communication

What do learners need to learn?	Skills
Systems used in the tracking and monitoring of site/contract progress. This includes software packages (word processing, email, spreadsheets).	EC1 EC2

5.2 Make systems safe to work on including safe and secure isolation and discharging stored charge

What do learners need to learn?	Skills
Carry out safe isolation procedures and ensure that the electrical installations is discharged before commencing work on decommissioning.	MC7

5.3 Remove electrotechnical systems

What do learners need to learn?
Remove all redundant equipment and wiring of the electrical installation with consideration given to categorising waste produced during the decommissioning process. Using construction materials to make good the building fabric following component or system removal. Update and change records to reflect work undertaken.

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

Common core content

- Construction science principles – electricity principles, heat principles, light principles, acoustic principles
- Construction sustainability principles – energy production and energy use
- Building technology principles – internet of things
- Construction information and data principles – key elements of data

BSE specific core content

- Digital technology in construction – internet of things, digital engineering techniques, opportunities for the use of technology in other industries and contexts, and adapting it for use in construction and the built environment
- Health and safety – BSE regulations, safe working practices for the safe isolation of systems
- BSE systems – electrotechnical principles of components, types of control systems, types of monitoring systems, types of electrical supply, types of earthing arrangements, cable types and sizes, accessories and equipment used in older electrical installations
- Information and data – drawings, circuit diagrams and schematics, data storage, security and protection, programming and set-up of digital systems using IT resources

Guidance for delivery

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery.

Formative assessment – oral Q&A, SmartScreen worksheets (samples available), observation of measuring activities:

- Practical – use of pre-set formative assessment to carry out tasks and record on standardised form.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use a variety of methods to carry out activities – calculators, apps, office IT.

Ways of ensuring content is delivered in line with current, up-to-date industry practice:

- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes.
- Teaching coverage must represent the type of equipment currently available and accepted for use in the UK industry.
- Current and emerging electrical installation and testing technologies should be included in the delivery where possible.

Reinforcement of learning – revisiting learning, group discussions, peer support system.

Suggested learning resources

Books

- The City & Guilds Textbook: Book 1 Electrical Installations for the Level 3 Apprenticeship (5357), Level 2 Technical Certificate (8202) & Level 2 Diploma (2365)
  Author: Peter Tanner
  Publisher: Hodder Education (28 Sept. 2018)

ISBN-13: 978-1510432246

- The City & Guilds Textbook: Book 2 Electrical Installations for the Level 3 Apprenticeship (5357), Level 3 Advanced Technical Diploma (8202) & Level 3 Diploma (2365)
  Author: Peter Tanner
  Publisher: Hodder Education (25 Jan. 2019)
  ISBN-13: 978-1510432253
- Requirements for Electrical Installations, IET Wiring Regulations, Eighteenth Edition, BS 7671:2018 (Electrical Regulations)
  Author: The Institution of Engineering and Technology
  Publisher: Institution of Engineering and Technology; 18th Edition (2 July 2018)
  ISBN-13: 978-1785611704
- Electronics For Service Engineers Author: J Cieszynski / D Fox Publisher: Routledge (2011)
  ISBN-13: *0750634766*

Websites

- Institute for apprenticeships and technical education **https://www.instituteforapprenticeships.org/**
- National Careers Service **https://nationalcareers.service.gov.uk/job-profiles/electrician**
- Electrical Contractors' Association (ECA) **https://www.eca.co.uk/**
- Institute of Engineering and Technology (IET) **https://electrical.theiet.org/bs-7671/**
- Health and Safety Executive **https://www.hse.gov.uk/electricity/**
- Safety Electrical First- **https://www.electricalsafetyfirst.org.uk/**
- Electrical Times- **https://www.electricaltimes.co.uk/**
- Sparks magazine (for trainees)- **https://www.sparks-magazine.co.uk/**
- Electrical Trade Magazine- **https://www.electricaltrademagazine.co.uk/**

Scheme of Assessment – Electrotechnical Engineering

The electrotechnical engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 24 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 - Plan the installation	Displays a breadth of knowledge and practical skills that enables them to design and plan for the installation of an electrical system. Candidates will need to produce documents to industry standards that clearly states how they will carry out the installation.
Task 2 - Install, commission and decommission	Complete the given installation, commissioning and decommissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately Tools, materials and equipment are selected and used correctly. Consideration to environmental sustainability and recycling of materials. Techniques used to make building fabric repairs to restore work area to pre-installation condition. All work carried out in line with relevant manufacturer's instructions/ building regulations.
Task 3 – Carry out maintenance activity	Applies knowledge and practical skills in locating and rectifying faults in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance Outcome and percentage (%) ***Defined by IfATE and covers broad K&S of an OS***	**Task** ***The specific instructions for candidates to provide evidence for***	**Assessment Theme** ***The themes markers are judging the evidence on for OC***	***Typical evidence to be marked***
PO2 Install electrotechnical systems (36%)	T1 Planning the installation T2 Installation, commissioning and decommissioning	Health and Safety Design and planning Systems and components Reports and information	Assessment of risk, PPE, working safely Design grids, design forms, assessment of characteristics, materials take off sheet Using tools and equipment, installation of wiring components Interpretation of drawings, specifications, manufacturer instructions
PO3 Commission electrotechnical systems (30%)	T1 Planning the installation T2 Installation, commissioning and decommissioning T3 Carrying out maintenance	Health and Safety Systems and components Reports and information Inspection and testing Handover and communication	Assessment of risk, PPE, working safely Using tools and using tools and equipment, installation of wiring components Documentation completion Inspection and testing checks Handover to customer, reflective accounts
PO3 Maintain electrotechnical systems (20%)	T2 Installation, commissioning and decommissioning T3 Carrying out maintenance	Health and safety Systems and components Reports and information	Assessment of risk, PPE, working safely Repair/replacement of components, use of tools Documentation completion Communication with customer to diagnose fault

Performance Outcome and percentage (%) ***Defined by IfATE and covers broad K&S of an OS***	**Task** ***The specific instructions for candidates to provide evidence for***	**Assessment Theme** ***The themes markers are judging the evidence on for OC***	***Typical evidence to be marked***
		Handover and communication Working with faults	Fault diagnosis, fault rectification
PO4 Decommission electrotechnical systems (14%)	T2 Installation, commissioning and decommissioning T3 Carrying out maintenance	Health and Safety Systems and components	Safe isolation procedures Handling / disposing of components and materials

354 Gas engineering

Level:	3
GLH:	650
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to understand and undertake fundamental gas engineering work. Learners will have the opportunity to plan, perform and evaluate their work while utilising a range of materials, methods and techniques.

Learners will develop their knowledge and understanding of, and skills in:

- Fundamental safe working practices associated with gas engineering
- Tools and equipment associated with the installation of gas systems
- Installation, maintenance, repair and service requirements of gas systems and appliances
- Scientific principles used in gas engineering
- Measuring and marking of components and pipework

Learners may be introduced to this specialism by asking themselves questions such as:

- What does a gas engineer do?
- What tools and equipment do gas engineers use as part of their role?
- What are the steps required to become a qualified gas engineer?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:
1. Gas knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:
2. Install gas systems
3. Commission gas systems
4. Maintain gas systems
5. Decommission gas systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills.

Specialism content

Outcome 1

Common knowledge criteria

Health and safety

1.1 **Typical hazards** and risks associated with working with gas systems

Range:

Typical hazards - asbestos, explosions, carbon monoxide poisoning, slips and trips, manual handling, working at height, burns, dust, electrocution.

What do learners need to learn?
The different hazards associated with working with gas systems and how to negate the risks.

1.2 Safe working practices associated with working with gas systems

What do learners need to learn?	Skills
Safe working practices associated with working with gas systems including building regulations, documents (risk assessments and method statements) and PPE.	EC3 EC5

1.3 Emergency procedures for **unsafe situations**

Range:

Emergency procedures - Gas Industry Rights of Entry Regulations, Gas Industry Unsafe Situations Procedure.

Unsafe situations - gas escapes, explosions, carbon monoxide.

What do learners need to learn?	Skills
The unsafe situations that that may occur in the workplace. The correct procedures and reference documents to use if they do arise. When unsafe situations need to be reported with consideration given to the, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR).	EC5

Tools, equipment and materials

1.4 Types of **tools** and **equipment, and** materials

Range:
Tools and equipment - pressure gauges, combustion performance analyser, leak detector, pipe cutter, hacksaw, blowtorch, spanner, water pump pliers, bending machine, drill, hammer, screwdrivers, temporary continuity bonds, step ladders, mobile scaffolding.

What do learners need to learn?

Tools, equipment and materials, their correct method of use and when they should be used, for access and measuring when working on gas systems.

The characteristics and properties of different tools, equipment and materials and what makes them suitable for different tasks.

1.5 Operation and handling requirements of **tools, equipment** and materials

Range:
Tools and equipment - pressure gauges, combustion performance analyser, leak detector, temporary continuity bonds.

What do learners need to learn?

How tools, equipment and materials are maintained and stored to minimise damage and maximise longevity.

The processes for maintaining and re-calibrating equipment, and the implications of not following these processes correctly.

Gas systems

1.6 Types of **components** and their suitability for different **appliances** and types of **systems**

Range:
Components – fan, air/gas ratio control valve, thermistors, printed circuit board, multi-functional control valve, air pressure switch, flame supervision devices.

Appliances - water heaters, central heating boilers, space heaters, cookers, gas meters (≤ 6 m3/h), heat pumps, hydrogen boilers.

Systems - natural gas (NG), liquefied petroleum gas (LPG).

What do learners need to learn?	**Skills** EC5
The requirements of different components and their suitability for different systems, including: • purpose • sequence of operations • appliance type Reference to manufacturer's instructions	

1.7 How **components** operate within a system/appliance and integrate to enable the system to operate effectively

Range:
Components - fan, air/gas ratio control valve, thermistors, printed circuit board, multi-functional control valve, air pressure switch, flame supervision devices.

Appliance - water heaters, central heating boilers, space heaters, cookers, gas meters (≤ 6 m3/h).

What do learners need to learn?
Components within a gas appliance/system, how they interact with each other to control the temperature of heated water, operational periods and safe combustion of the gas.

1.8 **Factors** that affect the choice and suitability of components included in a system

Range:
Factors - Location, gas type, appliance type, size, independent certification/approval (CE marking), legislation, environmental/ efficiency.

What do learners need to learn?

Characteristics of components in a system and how these affect choice and suitability.

1.9 Waste and **waste products**

Range:
Waste products - magnetite, corrosion smells, bacteria.

What do learners need to learn?

Waste produced within a gas appliance and how these inform servicing and maintenance schedules for the gas system/appliance.

Waste and waste products including types of systems, attributes hazards to user, interaction with other parties, environmental impact.

1.10 **Safety devices** applicable to gas systems, their characteristics and operation

Range:
Safety devices - carbon monoxide detectors, under pressure shut off valves (UPSO), over pressure shut off valves (OPSO), safety shut off valves (SSOV), emergency control valves (ECV), air pressure switches, low water pressure switches, thermostats, flame supervision devices.

What do learners need to learn?	**Skills**
Safety devices used in gas systems/appliances, their testing procedures and how to replace if faulty to ensure safe use of the appliance/system.	MC2

1.11 Gas and the combustion process

What do learners need to learn?

The combustion process and analysis including complete and incomplete combustion, the by-products (carbon dioxide (CO2) levels, carbon monoxide (CO) levels oxygen (O2) levels) of combustion and their trigger values.

Types of burners (simplex and duplex) and interaction with other devices. These include ventilators and mechanical heat ventilation recovery (MHVR).

Gas properties:

- correct gas type for appliance being installed
- calorific values
- heat input/output
- flame speed
- ignition temperature
- flammability limit
- freezing temperatures
- relative density
- wobbe numbers

1.12 Mechanical heat ventilation recovery (MHVR)

What do learners need to learn?

MHVR system. The method of extracting useable heat from the ambient air to further reduce heating costs - flue gas recycling.

The combustion process, correct operation, safe operation and suitability for different types of system.

1.13 Types of chimneys and chimney systems in relation **to gas appliance types**

Range:
Gas appliance types - open flued (type B appliances), room sealed (type C appliances), flueless (type A appliances).

What do learners need to learn?

The fundamental operating principles of the various chimneys and chimney systems, their testing requirements and their suitability for different appliances types.

1.14 **Types of ventilation** in relation to gas

Range:
Types of ventilation - permanently open, closeable, flyscreen, terracotta, unsleeved, incomplete, cooling air, high/low level ventilation, compartment ventilation, type A appliance (flueless) ventilation requirements and calculations, type B appliance (open flued) ventilation requirements and calculations, type C appliance (room sealed) ventilation requirements and calculations, ventilation through two or more rooms, mechanical ventilation.

What do learners need to learn?	**Skills**
The types of ventilation and their requirements for each fuel, flue type and appliance. Calculations of ventilation.	MC2

1.15 Types of **gas appliances** and their system requirements

Range:
Gas appliances - water heaters, central heating boilers, space heaters, cookers, gas meters (≤ 6 m^3/h).

What do learners need to learn?

Different gas burning appliances and their system requirements.

Gas engineering science

1.16 **Scientific principles** and **concepts** as applied to gas engineering

Range:
Scientific principles - complete combustion, incomplete combustion, stoichiometric combustion, fuels, chemical, smouldering, diffusion, rapid, spontaneous, explosive.

Concepts - ventilation, flue draft, fuels.

What do learners need to learn?

Scientific principles of combustion and the effects these can have on the combustion process.

Pipework technology

1.17 Types of **pipework**

Range:
Pipework - copper pipework, steel pipework, pliable corrugated (stainless steel) pipework, polyethylene (PE) pipework.

What do learners need to learn?

Characteristics of different types of pipework, including prefabricated and modularised components and distribution systems, different sizes, types of materials, their suitability for different situations, and tools and equipment (including fixings) required.

Fittings and components and their use for different piping scenarios. The types of fixings available for the different materials.

1.18 Flow rates and their relationship to pipework and system design

What do learners need to learn?

Different pipework materials, fittings and components and their effects on pressure and flow of the gas. The detrimental effect that pressure loss can have on the combustion of gas if too large.

1.19 Different **techniques** for forming and bending pipework

Range:
Techniques - bending machine, bending spring.

What do learners need to learn?

The different techniques for forming and bending pipework and how these are applied during the installation of gas systems/appliances.

Legislation and industry guidance

1.20 Implications of legislation, **standards and manufacturer's instructions** alongside additional **guidance** to employers and those working with gas systems

Range:

Legislation, standards and manufacturer's instructions - Gas Safety (Installation and Use) Regulations, Gas Industry Unsafe Situations Procedure, Gas Safety Rights of Entry Regulations, Institution of Gas Engineers and Managers (IGEM) Standards, British Standards, Building Regulations, Manufacturer's Instructions.

Guidance - Gas Safe Register Technical Bulletins.

What do learners need to learn?	**Skills** EC5
Legislation standards and manufacturer's instructions alongside additional guidance for installation of systems and the implications of these for employers and end users.	

Building technology
1.21 Types of **fixtures** and suitability for different **building fabrics**

Range:
Fixtures - screws, nails, solid wall fixings, plasterboard fixings, security bolts.

Building fabrics - block walls, brick walls, wooden partitions, plasterboard walls.

What do learners need to learn?

The various types of fixings, and their suitability for different building materials.

Specific knowledge criteria for performance outcomes

System installation (Outcome 2)

1.22 Bending techniques

Range:
Bending techniques - hand bending machine, spring.

What do learners need to learn?

Types of bending techniques and the different tasks these may be used for.

1.23 Connection techniques

Range:
Connection techniques - threading, soldering, compression, press-fit, PTFE, jointing compound.

What do learners need to learn?

Types of jointing methods and processes and how to transition from one pipework material to another.

Soldering must be lead-free in all applications.

System commissioning (Outcome 3)

1.24 **Inspection techniques** and how they are applied in commissioning systems

Range:
Inspection techniques - visual inspection.

What do learners need to learn?	**Skills**
The factors to inspect during a visual inspection in line with manufacturer's instructions.	EC5

1.25 **Factors** to inspect during commissioning, and how expected standards are defined

Range:
Factors - flow rate, temperature rise, combustion analysis, gas rate, installation operating pressure, standing pressure, appliance operating/ burner pressure, appliance condition, ventilation requirements, chimney / chimney system requirements, ventilation provision.

What do learners need to learn?	**Skills**
Factors to inspect during commissioning. How to interpret results and findings from commissioning tests. How expected standards are defined (manufacturer's instructions) and what actions to take if appliance/system is not functioning as expected.	MC2 MC6

1.26 **Testing** of installation

Range:
Testing - tightness test, flue flow test, spillage test, room sealed appliance (case seals) test.

What do learners need to learn?
Critical testing that needs to be completed as part of installation and commissioning.

1.27 Safe storage and supply of **fuel source**

Range:
Safe storage – LPG cylinders, LPG bulk tanks.
Fuel source - natural gas (NG), liquefied petroleum gas (LPG).

What do learners need to learn?
The safe storage and safe supply of NG and LPG.

System maintenance (Outcome 4)

1.28 Cleaning of components without compromising the system and associated tools, equipment and materials

What do learners need to learn?	Skills
Cleaning and servicing with consideration given to appropriate, techniques, tools and processes in line with manufacturer's recommendations and servicing schedules.	EC5

1.29 **Fault-finding techniques,** their suitability for different situations and how they are applied in practice

Range:
Fault-finding techniques -safe isolation procedures (gas and electrical), safe to touch procedures (electrical), preliminary electrical testing, resistance testing with a multimeter, testing switches with a multimeter, voltage testing with a multimeter, pressure testing, checking flow rates, reading manufacturers fault finding charts, questioning end user, researching the internet, industry knowledge.

What do learners need to learn?	Skills
The process for carrying out fault-finding techniques and which techniques are suitable for different situations and how planned maintenance activities can minimise faults.	EC5 MC2 DC1 DC5

Decommissioning (Outcome 5)

1.30 Procedures involved in decommissioning

What do learners need to learn?
The processes and procedures involved in decommissioning gas systems.

1.31 Requirements for recording, labelling and reporting decommissioned systems

What do learners need to learn?	**Skills**
Requirements for each system to record, label and report decommissioned systems to prevent the use of decommissioned appliance to include: • informing the responsible person • warning notices • labels	EC1 EC3 EC4 EC6

Outcome 2 - Install gas systems

Performance criteria

2.1 Interpret information from a risk assessment

What do learners need to learn?	Skills
Review and interpret risk assessments following HSE guidance. Consideration of employee's versus employer's responsibilities in relation to risk assessment completion.	EC4 EC5

2.2 Use **tools** in accordance with good working practice

Range:
Tools - pressure gauges, screwdriver, hammer, wood chisel, water pump pliers, spanner, spirit level, manual pipe threading machine, pipe cutter, pipe slice, hand saw, bending machine, bending spring, blowtorch, drill.

What do learners need to learn?
Select the correct hand and power tools required to complete work activities on gas systems, taking into consideration safe use of the equipment and suitability of tools and equipment matched to the specific task.

2.3 Install **pipework** relevant to the **type of gas** being conveyed

Range:
Pipework - copper pipework/fittings, steel pipework/fittings, pliable corrugated (stainless steel) pipework/fittings.

Type of gas - Natural gas (NG), Liquefied petroleum gas (LPG).

What do learners need to learn?	Skills
Install gas pipework within or on the building fabric in line with industry standards, building regulations and safe working practices.	MC1

2.4 Install **clips/brackets** to various **substrates**

Range:
Clips/Brackets - nail-on clip, plastic stand-off, brass Munson ring, steel Munson ring, meter brackets, flue brackets.

Substrates – wood, brick/block, plasterboard.

What do learners need to learn?	**Skills**
Fix clips and brackets at recommended spacing intervals to meet the specification requirements and in line with current industry standards.	MC1

2.5 Install **flues**/chimneys to facilitate a range of **gas appliances** and equipment

Range:
Flues/Chimneys - open flues/chimneys (type B appliances), room sealed flues/chimneys (type C appliances).
Gas appliances - open flued appliances (type B appliances), room sealed appliances (type C appliances).

What do learners need to learn?	**Skills**
Install a selection of flue types to different locations in line with gas and building regulations and manufacturer's instructions, including the use of terminal guards as required.	MC1

2.6 Install ventilators to facilitate the correct combustible air requirements for **appliances** installed in a variety of **locations/buildings**

Range:
Appliances - space heater, boiler, water heater, gas cooker.
Locations/buildings - cavity walls, high level, low level, through two or more rooms.

What do learners need to learn?	**Skills**
Install ventilators to different building substrates ensuring that they are adequately sized and of the correct design for the type and size of appliance and fuel type.	MC1

2.7 Install **appliances**

Range:
Appliances - space heater, boiler, water heater, cooker.

What do learners need to learn?	Skills
Install gas appliances in line with manufacturer's instructions, following all installation instructions.	MC1

2.8 Install **components** into appliances

Range:
Components - multi-functional control valve/ gas valve, fan, burner, pressure relief valve, automatic air vent, printed circuit board, air pressure switch.

What do learners need to learn?
Install a range of components into gas appliances.

2.9 Install **controls** into systems

Range:
Controls - programmer, room thermostat, cylinder thermostat.

What do learners need to learn?	Skills
Install control components into a central heating system.	DC6

2.10 Install **thermal insulation materials**

Range:
Thermal insulation materials - polyisocyanurate foam pipework insulation, nitrile rubber pipework insulation, polyethylene foam pipework insulation.

What do learners need to learn?
Install various thermal insulation to prevent the freezing of system pipework.

2.11 Install **seals** appropriate to the gas **appliance**

Range:
Seals - combustion chamber/burner seals, gas seals, water seals.

Appliances - space heater, boiler, water heater, cooker.

What do learners need to learn?
Check the condition of and replace different types of seal found in a gas appliance from a selection of seals.

2.12 Check **gas components** are in accordance with **design parameters**

Range:
Gas components - thermistors, air/gas ratio control valves, thermostats, combustion performance analysis, gas valves.

Design parameters - resistance readings, pressure settings, temperature range, acceptable levels, manufacturer's parameters.

What do learners need to learn?	**Skills**
Use recognised testing methods (multimeters, gas rating, gas pressure testing, etc) to ensure all components are within design parameters.	MC1 MC2 EC5

2.13 Check gas components are suitably certified

What do learners need to learn?	**Skills**
Check that gas components comply with manufacturer's requirements and are suitably certified (CE marking).	EC5

2.14 Analyse information to identify **requirements** for gas installation

Range:
Requirements - flueing requirements, ventilation requirements, pipe sizing requirements, heat output requirements.

What do learners need to learn?	**Skills**
Analyse customer requirements to identify the size of gas pipework and appliances to meet possible demand.	EC5 MC2

2.15 Communicate **system requirements** to allied trades

Range:
System requirements - electrical control requirements, hot and cold pipework layout, heating system pipework layout.

What do learners need to learn?	**Skills**
Identify and communicate with other trades, detailing timescales and other system requirements.	EC1 EC2 EC6

2.16 Establish **safe working environment** to conduct gas installation

Range:
Safe working environment - well ventilated area, no ignition sources, good housekeeping, temporary removal of meter, use of a temporary continuity bond, liaise with end user.

What do learners need to learn?
Create a safe and clean working environment when installing gas systems and appliances, (housekeeping).

2.17 Ensure no ingress of foreign objects within gas system and component

What do learners need to learn?
Install system pipework and use appropriate methods to ensure no foreign objects enter the gas system. Complete cleaning of gas filters and gauzes, ensuring; no open-ended pipework and good housekeeping.

2.18 Update relevant line diagrams/installation plans

What do learners need to learn?	**Skills**
Complete a schematic/installation diagram of a gas carcass in a property, complete with pipe sizing and appliance gas rates.	MC1 MC2 MC6 MC7 EC1 EC2 EC3 DC2

2.19 Complete a method statement for installation and identifying any potential delays

What do learners need to learn?	Skills
Complete a method statement, identify the possibility of delays and unforeseen circumstances, and put systems in place to minimise risks.	EC1 EC2 EC3 MC1 MC2 MC10

2.20 Adapt onsite specific gas system installation changes

What do learners need to learn?

The necessary changes that need to be made if an appliance is to burn a different gas type:

- LPG to natural gas.
- injector sizes
- ventilation requirements
- notification

2.21 Gather relevant gas system component part **information**

Range:
Information - manufacturer's instructions, normative documents, trade magazines, merchants.

What do learners need to learn?	Skills
Gather relevant documentation for working with gas systems and appliances.	EC5 EC6

2.22 Update digital building information management system **software**

What do learners need to learn?	Skills
Refer to and update digital building information management system software.	DC1 DC2 DC3 DC5 DC6

Outcome 3 - Commission gas systems

3.1 Assess **risks** associated with completing activities

Range:
Risks - explosive atmosphere, carbon Monoxide production, slips, trips and falls, crushing injuries, burns, cuts.

What do learners need to learn?	Skills
Produce a risk assessment for commissioning activities in accordance with the six stages of assessment: • Identify hazards • Identify who is at risk and how • Assess risk and action • Record findings • Review risk assessment • Take appropriate safety precautions Record risk assessment findings in line with regulations as well as responsibilities of employee's versus employers.	EC1 EC2 EC3 EC4

3.2 Test all gas rates and **pressures** are within regulatory requirements

Range:
Pressures – operating pressure at the meter or regulator outlet where no meter installed (e.g. LPG), operating pressure at the appliance.

What do learners need to learn?	Skills
Use recognised procedures to calculate the various gas rates and pressures required as well as the gas rate of the appliance. Complete a gas rate and undertake gas pressures.	MC1 MC2 EC5

3.3 Ensure any tools/**equipment** are calibrated correctly

Range:
Equipment – electronic combustion performance analyser, electronic pressure gauge

What do learners need to learn?	**Skills**
Calibrate tools and equipment correctly. Consider requirements of electronic testing equipment and check if calibration is required. Calibration certificates.	EC5

3.4 Calculate correct purge volumes in accordance with gas installation

What do learners need to learn?	**Skills**
Calculate purge volume and purge requirements, including calculating purge requirements to air, calculating purge requirements to burn.	MC1 MC2

3.5 Purge system correctly

What do learners need to learn?
Complete a safe purge of a gas installation to all industry standards.

3.6 Visually inspect installation to ensure compliance with Gas Safety (Installation and Use) Regulations and appropriate standards

What do learners need to learn?	**Skills**
While completing gas work, the learner may encounter various non-conformance in the installation of gas pipework and appliances - therefore the learner must be able to identify faults on a pre- assembled system: • Unsupported pipework • Pipework not sealed correctly • Pipework not sleeved • Sleeve not sealed • Open-ended pipework • Unsafe fitting • Undersized pipework • Incorrect appliance location • Incorrect meter installation • Incorrect terminal location • Inadequate ventilation requirements • Incorrect flueing requirements • Incorrect gas type for appliance	MC2 EC3 EC4 EC5

3.7 Complete gas system **handover documentation** to end user

Range:
Handover documentation - manufacturer's commissioning paperwork, industry recognised forms (Gas Safety Records, Testing and Purging Form), job sheet

What do learners need to learn?	**Skills**
Commission gas appliance/system and complete all commissioning documentation as required by the gas sector.	EC1 EC2 EC3 EC4 EC6 DC1

3.8 Demonstrate safe operation of gas appliance and controls to the end user

What do learners need to learn?	Skills
Instruct the customer on the safe and efficient use of all user controls during the handover process of the appliance/system including emergency actions (gas leak and what to do in the event of a carbon monoxide alarm sounding).	EC1 EC6

3.9 Visually check gas system installation conforms to original design requirements

What do learners need to learn?
Complete a visual check of gas system installation during handover/commissioning to the original system design as well as manufacturer's/regulatory requirements.

3.10 Set gas system parameters to commission in accordance with manufacturer's instructions, appropriate standards and Gas Safety and Use Regulations

What do learners need to learn?	Skills
Test gas system/appliance to ensure all measurements are within manufacturer parameters (pressure, temperature, flow rates, gas rate) and in line with the Gas (Installation and Use) Regulations 1998. Ensure appliance is commissioned following manufacturer instructions.	MC1 MC2

3.11 Record commissioning results

What do learners need to learn?	Skills
Complete a gas system/appliance commissioning record that is correctly documented using relevant technical terms and values. Record all commissioning checks on the commissioning record.	EC3 EC4

3.12 Analyse commissioning results to determine correct gas installation in accordance with original design

What do learners need to learn?	**Skills**
Complete a gas system/appliance commissioning record, ensuring that all parameters are within scope for the appliance/system. Evaluate commissioning data to ensure that it falls within manufacturer's parameters.	MC2 MC6

Outcome 4 - Maintain gas systems

4.1 Question end user to identify any **user concerns**

Range:
User concerns - risk assessments, smell of gas, carbon monoxide alarm sounding, using too much gas, appliance/system not working as intended, gas escapes / water leaks, noise.

What do learners need to learn?	Skills
Discuss maintenance requirements with end user /client with reference to other relevant available source materials (manufacturer's instructions/service history documents). Advise on options for system/component maintenance and how it can best be achieved. Consideration should be given to potential barriers/concerns to overcome as well as to costs, sustainability and timescales.	EC1 EC2 EC3 EC4 EC5 EC6 MC2 MC6

4.2 Identify the correct replacement **parts** relevant to the appliance from a selection of similar parts

Range:
Parts - multi-functional control valve, fan, burner, pump, plate to plate heat exchanger, main heat exchanger, automatic air vent, diverter valve/cartridge, pressure relief valve, printed circuit board.

What do learners need to learn?
Select the correct replacement part from a selection of similar replacement parts to be fitted to a gas appliance/system. .

4.3 Calculate maintenance downtime

What do learners need to learn?	Skills
Calculate maintenance downtime. Inform customer of the expected timescales for completion as well as any unexpected delays, including shipment of the part or additional faults in the system.	MC2 EC1 EC6 DC3 DC5

4.4 Safe handling of all **gas components** when conducting maintenance

Range:
Gas components - smart meters, pre-payment meters, fragile components, dangerous components.

What do learners need to learn?
Handle gas components carefully when conducting maintenance. In addition, the learner is also to be made aware of the possible injuries that may be sustained while working on gas systems/appliances.

4.5 **Identify** potential gas installation system defects and follow unsafe situations procedure, as required

Range:
Gas installation system defects - undersized pipework, blocked pipework, incorrect pipework material, incorrect fittings used on gas pipework, damaged pipework, signs of spillage, undersized/no ventilation where required, vitiated atmosphere, incorrect flue termination, blocked flue, damaged flue, incorrect clearances, faulty safety devices, incorrect gas pressures, incorrect gas rates, incorrect gas type, incorrect flame picture, incorrect parts used.

What do learners need to learn?
Identify a range of potential gas installation system errors and take the correct steps to ensure these are rectified following the unsafe situations procedure.

4.6 Test system in accordance with end user requirements and **appliance type**

Range:
Test - combustion performance analysis, tightness test (NG and LPG), gas rate/heat input, hot water flow rate, standing pressure test, operating pressure test, ventilation check, flue flow test, spillage test, temperature/differential checks (balancing).

What do learners need to learn?

Complete critical testing of gas appliance/installations to ensure safety and compliance with end user requirements.

4.7 Remove and replace **faulty gas system components**

Range:
Faulty gas system components - meter regulator, air/gas ratio control valve, multi-functional control valve, burner, thermistor, thermostats, flame supervision devices, printed circuit board.

What do learners need to learn?

Identify faulty gas system parts and components and remove and replace faulty component with new components in accordance with manufacturer's instructions.

4.8 Repair faulty gas system components

What do learners need to learn?

Repair faulty gas components ensuring they work to all parameters, with repairs to include:

- blocked gauze on governor
- thermocouple within a multifunctional valve
- damaged leads.

Outcome 5 - Decommission gas systems

5.1 Enable control mechanism from a risk assessment prior to working

What do learners need to learn?
Complete safe and verified isolation of gas, electricity and water supplies prior to commencing work on gas systems/appliances, including the use of isolation locks and 'Do not turn on' information signs.

5.2 Establish consumer needs when decommissioning any gas installation

What do learners need to learn?	Skills
Discuss with end user their needs when decommissioning any gas installation. Establish customer requirements, to maintain a temporary heating or hot water system.	EC1 EC3 EC4 EC6 DC3 DC5

5.3 **Safely isolate** the gas system prior to decommissioning

Range:
Safely isolate - isolate gas at the appropriate valve (emergency control valve (ECV), additional emergency control valve (AECV)), isolate electrical installation (if required) at appropriate point (main consumer unit, fused spur), isolate water (if required) at appropriate isolation point.

What do learners need to learn?
Complete safe and competent isolation procedures for the gas, electricity and water supplies when required, to include locking off and the placement of 'Do not turn on' information signs.

5.4 Extract gas equipment and components from installation with appropriate handling techniques

What do learners need to learn?

Complete safe systems of work, risk assessments, method statements and select correct PPE when extracting equipment and components from installation.

5.5 Reinstate appropriate service post decommissioning

What do learners need to learn?

Reinstate all utilities to the system post-installation to facilitate commissioning and handover:

- Re-pressurise heating system following a replacement part
- Reinstate gas supply and test
- Reinstate electricity supply and test.

5.6 Maintain **safe working area**

Range:
Safe working area - well ventilated area, no ignition sources, good housekeeping, correct PPE.

What do learners need to learn?

Maintain a safe and clean working environment when installing gas systems and appliances.

5.7 Return clean installation to end user

What do learners need to learn?	**Skills**
Complete handover of gas system/appliance to end user. Clear up any mess and replace any damaged items. Notify end user of safe and efficient use of the system/appliance in situations where they have been re-commissioned following temporary decommissioning.	EC1 EC2 EC3 EC4 EC6

5.8 Safe disposal of **waste products** when decommissioning gas system

Range:
Waste products - asbestos, dust, packaging, appliance, pipework.

What do learners need to learn?

Ensure all waste products are disposed of safely when decommissioning a gas system. Recycle as much waste as possible, remove any non-recyclable waste/hazardous waste and deposit at appropriate waste facility. Clean up any remaining mess.

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

BSE core content:

- Construction sustainability principles - Energy production and energy use and waste management
- Building technology principles - Internet of things
- Construction information and data principles – Standards, regulations and guidance
- Health and safety - BSE Regulations and safe working practices
- Building Services Engineering (BSE) systems – Boilers and fires
- Maintenance – Boiler service

Guidance for delivery

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities

- Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

Ways of ensuring content is delivered in line with current, up to date industry practice

- Delivery for this specialism will take place in a dedicated workshop with a range of gas appliances.
- A realistic representation of UK gas systems and components should be installed in the workshop
- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
- The provision must represent the type of equipment currently available in the UK gas industry
- New and emerging gas technology should be included in the delivery e.g. smart controls

Suggested learning resources

Books

- The City and Guilds textbook: Plumbing book 2 for the level 3 Apprenticeship (9189). Level 3 Advanced Technical Diploma (8202) and Level 3 Diploma (6035) (City and Guilds)
- Gas Safe Register Technical Bulletins
- CORGI Direct Manuals, Pocket Guides, etc.
- Level 3 Gas Engineer: Apprenticeship Training Manual (City and Guilds)
- Gas Installation Technology, RD Treloar, Wiley-Blackwell

Websites

- https://www.corgi-direct.com/city-guilds-qualifications-18169-0000
- Gas Safe Register https://www.gassaferegister.co.uk
- British Standards Institution https://shop.bsigroup.com/
- Institution of **Gas** Engineers and Managers **https://igem.org.uk/**
- Planning portal **https://www.planningportal.co.uk/**
- National Careers Service **https://nationalcareers.service.gov.uk/job-** profiles/gas-service-technician
- **https://www.hse.gov.uk/pubns/books/l56.htm** Gas Safety (Installation and Use) Regulations 1998 (GSIUR) as amended. Approved Code of Practice and guidance

Scheme of Assessment – Gas engineering

The Gas engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 24 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 - Plan the installation	Displays a breadth of knowledge and practical skills that enables them to carry out and plan for the installation of a gas system. Candidates will need to produce documents to industry standards that clearly states how they will carry out the installation.
Task 2 - Install, commission and decommission	Complete the given installation, commissioning and decommissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately Tools, materials and equipment are selected and used correctly. Consideration to environmental sustainability and recycling of materials. Techniques used to make building fabric repairs to restore work area to pre-installation condition. All work carried out in line with relevant manufacturer's instructions/ building regulations.
Task 3 – Carry out maintenance activity	Applies knowledge and practical skills in rectifying a fault in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	***High level tasks*** *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	**Assessment Theme**	***Typical evidence***
PO2 Install gas systems (42%)	T1- Planning the installation T2 – Install, commission, and decommission	Health and Safety	Risk assessments, PPE, Working safely
	T1- Planning the installation	Design and Planning	Method statements, installation diagrams, material lists, selecting types of systems and components, measuring and marking out
	T2 – Install, commission, and decommission	Systems and components	Using tools and equipment, cutting and bending pipe, jointing methods, prefabrication of pipe, positioning and securing component,
	T1- Planning the installation T2 – Install, commission, and decommission	Reports and information	Interpretation of drawings, specifications, manufacturer instructions

PO3 Commission gas systems (18%)	Task 2 - Install, commission and decommission Task 2 - Install, commission and decommission Task 2 - Install, commission and decommission Task 2 - Install, commission and decommission	Inspecting and testing systems and components Health and Safety Reports and information Handover/ communication	Soundness testing, leaks, commissioning checks Risk assessment, working safely, PPE Commissioning records Handover to customer
PO4 Maintain gas systems (23%)	T3 – Carry out Maintenance	Health and safety Working with faults Handover/ communication Reports and information	Risk assessment, working safely, PPE Fault diagnosis, client requirements, Repair and replace components, use of tools Communication with customer to diagnose fault Maintenance activity report
PO5 Decommission gas systems (17%)	Task 2 - Install, commission and decommission	Health and Safety Systems and components	Safe isolation process, safely isolate valves Extracting components, making good the building fabric, handling components and materials

355 Heating engineering

Level:	3
GLH – Combined with 356 Plumbing:	840
GLH – Combined with 359 Ventilation	765
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to understand and undertake fundamental heating work. Learners will have the opportunity to plan, perform and evaluate their work while utilising a range of materials, methods and techniques.

Learners will develop their knowledge and understanding of, and skills in:

- Fundamental health and safety practices associated with carrying out heating engineering work
- Heating engineering tools and equipment
- Pipework technology
- Heating systems
- Heating engineering science
- Regulations, legislation and industry guidance used in the heating industry.

Learners may be introduced to this specialism by asking themselves questions such as:

- What does a heating engineer do?
- What tools and equipment do heating engineers use as part of their role?
- What are the steps required to become a qualified heating engineer?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:

1. Heating knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:

2. Install heating systems
3. Commission heating systems
4. Maintain heating systems
5. Decommission heating systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills.

Specialism content

Outcome 1

Common knowledge Criteria

Health and safety

1.1 **Typical hazards** and associated risks with heating systems

Range:
Typical hazards - tripping hazards, slipping hazards, inadequate or lack of personal protective equipment, defective (unsafe) equipment, manual handling, working at heights, fire, electrocution, chemical injuries, inhalation of gases/chemicals.

What do learners need to learn?

The different controls that must be in place to minimise hazards occurring.

Safe use of electrical equipment and how to prevent electrocution.

Risks associated with the use of chemicals within the industry and how these can be categorised.

Heat producing equipment.

The various types of gases used in jointing processes.

- Propane
- MAP gas
- Butane
- Oxy acetylene

Safe transportation and storage of bottled gases and equipment.

The various types of heat-producing equipment and how to check them for safety and assemble them, as follows:

- hoses
  - colours used
  - thread directions
  - flashback arrestors
  - dates
- control valves
- gauges
- blowpipes

Safe:

- bottle location and position

- equipment assembly sequence
- leak detection procedures
- purging procedure
- lighting and extinguishing procedure
- actions in the event of leakage
- transportation

The dangers of working with heat-producing equipment and how to prevent fires occurring.

The method for fighting small localised fires that can occur in the workplace.

Fighting small localised fires:

- tackling fires to aid escape
- types of extinguisher
- selection of extinguisher by fire type
- method of use
- evacuation procedures

Tools, equipment and materials

1.2 Types of **tools, equipment** and **materials** used when working on heating systems

Range:

Tools - screwdriver, hammer, chisel, grip, wrench, spanner, spirit level, manual pipe threader, pipe cutter, hand saw, pliers, bending tool, blowtorch.

Power tools - power drill, circular saw, jig saw, reciprocating saws, portable pipe threading machine, hydraulic machine bender, hydraulic crimping kit, portable pipe freezing kit

Equipment access equipment, tape measure, digital measuring equipment.

Materials - copper pipework/fittings, LCS pipework/fittings, plastic pipework/fittings.

What do learners need to learn?

Common equipment and materials and their purpose.

New and emerging systems, tools and technology to ensure currency of practice.

Additional tools and equipment that can be used for adapted ways of working.

How to store tools and equipment appropriately.

The sources of information for carrying out preparatory work, to include:

- statutory regulations
- industry standards
- manufacturer's technical instructions
- building plans
- specifications

Preparation techniques to prepare the building fabric to include work methods and damage to property.

Work methods:

- holes in masonry surfaces – hammer and chisel, large power drill
- making good to masonry surfaces
- lifting and replacing timber flooring materials
- notching timber floor joists
- drilling holes – timber floor joists
- cutting chases – wall and floor surfaces
- walking boards
- dust sheets
- removal of personal property

1.3 Operation and handling requirements of tools

What do learners need to learn?

The use of electricity for powered tools and the specific safety considerations relating to their use and hazards. Maintenance schedules and processes for escalating or reporting broken, unsafe or faulty equipment. PAT requirements, PPE requirements.

Heating systems

1.4 Heating systems

Range:
Heating systems – wet central heating, warm air, storage heaters, district heating.

What do learners need to learn?

The different types of heating systems:

- pumped heating gravity hot water
- fully pumped, 2 x two port valves (S plan)
- fully pumped, 3 x two port valves (S plan+)
- fully pumped, 3 port valve (mid position/diverting) (Y/W plans)
- combination boiler
- system boiler

Larger system control

- constant temperature
- variable temperature

Layout features:

- one pipe
- two pipe
- manifold (microbore minibore)
- underfloor heating
- multiple boiler installation (low loss header)

The advantages and disadvantages of types and layout features of heating systems.

The typical pipe sizes used in central heating systems.

The importance of pump positioning.

Identify operating principles of controls for system operation.

The zoning and control requirements of central heating systems in accordance with statutory legislation.

The insulation requirements and system frost protection.

The expansion and contraction in central heating systems and negative effects.

1.5 **Components** used in heating systems

Range:

Components – radiator valves – thermostatic and manual valves, automatic air vents, filling loop, pressure gauge, feed and expansion cisterns, circulating pumps, thermo-mechanical cylinder control valves, anti-gravity valves, drain valves, additives, low loss headers, buffers, pressure relief valves, expansion joints, corrosion filters, zone valves (two port, three port, mid position and diverter), low loss headers for multiple boiler installation, multiple heat producing appliances installation, programmer, timer, thermostats, programmable room stat, optimizer, frost stat, wiring centre, cylinder stat, expansion vessel, automatic by-pass, bespoke heat emitters, panel radiators, column radiators, low surface temperature radiators, fan convectors, plinth heaters, towel warmers, underfloor heating components, manifolds, pump control unit, insulation, pipework, manifold isolation ball valves, supports, controls.

What do learners need to learn?

Different components used in heating systems.

How they operate to support the system operation.

Positioning, fixing, connection and operation of components.

Importance of correct pump positioning.

Zoning and control requirements of central heating systems in accordance with statutory legislation.

Insulation requirements of heating systems and components to ensure system frost protection and energy efficiency.

How expansion and contraction is catered for in central heating systems, and the negative effects of pipework expansion.

1.6 **Factors** that affect the choice and suitability of components in a heating system

Range:
Factors - appliances, purpose, size, location, cost, end users' needs, building regulation requirements, occupants, fuel availability, local availability.

What do learners need to learn?	**Skills**
Factors that affect the choice and suitability of components included in a system, taking into consideration current regulations, industry guidance and best practice.	EC5

1.7 **Appliances** supported by heating systems

Range:
Appliances – heat producing appliances, traditional boilers, condensing boilers, combination boilers, freestanding boilers, wall-mounted boilers, types of cylinder and ways of storing hot water (vented, unvented, thermal store).

What do learners need to learn?

Different types of appliances supported by heating systems, including their limitations, operating parameters and legal requirements.

Procedures for filling and venting system types.

Basic operating principles of heat-producing appliances.

1.8 Types of waste and waste products found in different types of heating systems

What do learners need to learn?

Waste and waste products, their attributes (magnetite, corrosion), hazards to user and interaction with other parties including consumers.

Methods to reduce corrosion in systems.

Methods to remove existing corrosion using chemical flushing and power flushing methods.

1.9 **Safety devices** applicable to heating systems

Range
Safety devices - pressure/temperature relief valve, overheat thermostats, control thermostats.

What do learners need to learn?	**Skills**
Safety devices applicable to heating systems, their characteristics and operation. The typical operating pressures/temperatures of safety devices found in heating systems.	MC2

Heating engineering science

1.10 **Scientific principles** and concepts of heating engineering

Range:
Scientific principles - heat transfer, conduction, convection, radiation, heat loss.

What do learners need to learn?

The application of scientific principles and concepts to heating engineering.

Be able to calculate:

- quantity of heat energy required to raise the temperature of a substance
- the amount of power required to heat a substance
- simple force and pressure calculations

Force and pressure:

- force calculations
    - pressure head
- pressure calculations
    - static pressure
    - dynamic pressure
    - draught
    - forced draught
    -

Velocity, pressure and flow rate:

- effects of increasing/reducing pressure
- effects of increasing/reducing pipe size

Restrictions:

- changes of direction, bends and tees
- pipe size
- pipe reductions
- roughness of material surface
- constrictions, such as valves
- expansion in systems

1.11 Heating systems and the **combustion** process

Range:

Combustion - complete combustion, incomplete combustion, ventilation, flue draft, combustion triangle, stoichiometric, fuels, chemical, smouldering, diffusion, rapid, spontaneous.

What do learners need to learn?

The main constituents of complete and incomplete combustion for a range of fuels:

- Gas
- Oil
- Solid Fuel

The causes and signs of incomplete combustion.

The symptoms of carbon monoxide (CO) poisoning and the purpose of CO detectors.

1.12 **Flues/Chimneys** in relation to gas and the combustion process

Range:
Flues/Chimneys - open flued**,** room sealed.

What do learners need to learn?

Types of flues and the relation to gas and the combustion process. The types of flue, sizes and the correct and safe operation in line with industry requirements. Basic inspection requirements of flue systems

Operating principles:

- remove combustion products
- draw in combustion air

Components:

- primary flue
- draught diverter
- secondary flue
- terminal

1.13 Ventilation in relation to gas and the combustion process

What do learners need to learn?

Ventilation requirements in relation to gas and the combustion process including the purpose, types and installation practices of providing ventilation.

Types of ventilation:

- natural
- mechanical

Installation practices:

- adequately sized
- continuous size
- sleeved
- permanently open
- fly screen removed
- correctly positioned

Pipework technology

1.14 Types of **pipework**

Range:
Pipework - copper pipework/fittings, LCS pipework/fittings, plastic pipework/fittings, lead.

What do learners need to learn?

Characteristics of different types of pipework, including prefabricated and modularised components and distribution systems, different sizes, types of materials, their suitability for different situations and tools and equipment required.

The positioning and fixing of pipework within the building fabric

Pipework materials and sizes used in buildings, where the materials may be used appropriately including some of the materials used for condensing and waste pipework.

- copper
  - R220 soft coils
  - R250 half hard lengths
  - R290 hard lengths
- low carbon steel (LCS)
  - light grade
  - medium grade
  - heavy grade
- plastic pipework
  - polyethylene (MDPE)
  - polybutylene
  - PVC-u
  - polypropylene
  - MUPVC
  - ABS
- lead

1.15 Jointing methods

What do learners need to learn?

The methods of jointing new pipe to existing lead pipework.

Methods of jointing pipework:

- copper pipe
  - solder ring and end feed
  - compression (type A and B)
  - push-fit
  - press-fit
- low carbon steel (LCS) pipe
  - threaded
  - compression
- plastic pressure pipe
  - push fit
  - compression
  - proprietary - copper and MDPE
- plastic jointing (sanitary for condense)
  - ring seal
  - compression
  - solvent

Methods of bending pipework:

- copper machine bending
  - 90° bends
  - sets and offset bends
  - passover bends
- copper spring bend

- LCS hydraulic machine bending
  - 90° bends
  - sets and offset bends
  - passover bends
- plastic pressure pipe
  - spring bend
  - cabling technique
  - cold forming bend

1.16 Types of **fitting**

Range:
Fitting - couplers/sockets, elbows and bends, equal tees, reducing tees, reducers, tap connectors, flexible connectors, manifolds, tank connectors, nipples, unions, flanges.

What do learners need to learn?

The different types and use of fitting and their suitability for different applications/material types.

1.17 Types of **support** and **fixings**

Range:
Support - saddle clip, Munson ring, plastic clip, LCS bracket, nail in clip.
Fixings - cavity fixings, nails, screws, wall plugs, anchor bolts.

What do learners need to learn?

Different types of pipework support and fixings, and their suitability for different systems, purposes and building fabrics.

Regulations, legislation and industry guidance

1.18 Implications of **legislation and additional guidance** to employers and those working with heating systems

Range:
Legislation and additional guidance – workplace information, company policies and procedures.

What do learners need to learn?

Implications of legislation and additional guidance for employers and those working with heating systems including legal requirements and the consequences of not following the legislation.

Workplace information:

- statutory legislation
- building regulations
- job specifications
- plans/drawings
- work programmes
- variation order
- delivery notes
- time sheets
- policy documentation – health and safety, environmental, customer service
- manufacturer guidance
- installation instructions
- service and maintenance instructions
- user instructions

Company policies and procedures:

- company working policies/procedures
  - behaviour
  - timekeeping
  - dress code
  - contract of employment
  - limits to personal authority
- organisation/reporting structures
- relevant qualifications and training

Specific knowledge criteria for performance outcomes

System installation (Outcome 2)

1.19 Bending techniques

Range:
Bending techniques - machine bending, hydraulic, scissor, hand (spring bend).

What do learners need to learn?

Different types of bending techniques and when they would be used.
Copper machine bending:

- 90° bends
- sets and offset bends
- passover bends

Copper spring bend:

- 90° bends
- sets and offset bends

Low Carbon Steel (LCS) hydraulic machine bending:

- 90° bends
- sets and offset bends
- passover bends

The equipment used to carry out accurate bending of LCS and copper.

1.20 Connection techniques

Range:
Connection techniques - solder ring and end feed, compression, push-fit, press-fit, threaded, flanged.

What do learners need to learn?

Different types of connection techniques used during the installation and maintenance of heating systems and where and when to use them.

Copper pipe:

- solder ring and end feed
- compression (type A and B)
- push-fit
- press-fit

LCS pipe:

- threaded

Plastic pressure pipe

- push fit
- compression

System commissioning (Outcome 3)

1.21 Inspection techniques

Range:
Inspection techniques - visual inspection, pre-commissioning checks.

What do learners need to learn?

Inspection techniques and how they are applied during the pre-commissioning of heating systems in conjunction with manufacturer's instructions and current industry guidance.

Skills
EC5

1.22 **Factors** to inspect during pre-commissioning

Range:
Factors - appropriate checks to be made before commissioning, principles of commissioning.

What do learners need to learn?	**Skills**
Factors to inspect during pre-commissioning, and how expected standards are defined in conjunction with manufacturer's instructions and industry guidance: • pipework installed as specified, positioned as drawing and plumb • appropriate brackets and supports fitted at specified intervals • joints cleaned and complete • valves/controls fitted as specified and positioned as drawing • fittings tight, flange bolts, unions, compression joints etc • commissioning/ test points fitted as specified and positioned as drawing • D.O.C fitted as specified and closed • valves set in the correct position • controls set in the correct position • pipework painted as necessary • sensitive items isolated or removed as necessary • pipework installed to accommodate insulation • sleeves fitted as necessary • heat emitters installed as specified and positioned as drawing • storage and expansion vessels installed as specified and positioned as drawing • appliances installed as specified and positioned as drawing • flues and ductwork installed as specified and positioned as drawing • safety requirements adhered to • relevant people notified • relevant items cleaned wherever necessary An overview of the basic principles of the commissioning process and what activities are carried out should also be covered: • visual inspection • fill and vent • soundness test • flush • operational checks • commissioning documentation • handover procedure	MC2 MC6

1.23 **Testing techniques** and their application

Range:
Testing techniques - soundness testing, safety component testing, performance testing.

What do learners need to learn?	**Skills**
The process for carrying out testing, including the type of test required for the system and the test pressures/durations in line with the relevant current British Standards. Soundness test to industry requirements on central heating system pipework and components: • initial fill • stabilisation • test to required pressure • check for leaks • check pressures after test period Operational checks: • temperature • flow rate • pressure • controls	MC2 EC5

System maintenance (Outcome 4)

1.24 **Fault-finding techniques** and their application

Range:
Fault-finding techniques - end user, manufacturer's instructions, fault diagnosis flow charts, service history, industry experience.

What do learners need to learn?	Skills
Fault-finding techniques on system components through visual inspection of system, operational checks and performance testing to gather information to be used as part of analysis of situation.	EC5 MC2 DC1 DC5

1.25 **Causes** of **typical faults** in heating systems

Range:
Causes - poor installation, inadequate design, user error, environmental factors, appliance/ component malfunction.
Typical faults - pumping over, persistent venting, emitter cold spots, stuck TRVs, motorised valves not operating, heat when no demand, leaks, blockages, pump failure, control failure.

What do learners need to learn?	Skills
Repair and rectification procedures to deal with a range of typical faults found on a heating system: • pumping over • persistent venting • emitter cold spots • stuck TRVs • motorised valves not operating • expansion vessel failure blockages • pump failure • pressure relief valve • incorrect support to system pipework and components Typical causes of common heating faults and how they are identified during normal operation of a heating system.	MC2

1.26 Actions required when faults cannot be rectified

What do learners need to learn?	**Skills**
Rectification procedures to deal with a range of faults • diagnose • notify client • safely isolate • decommission • rectify • re-commission • handover The actions required when faults cannot be rectified: • safe isolation • report to responsible person The potential implications to customer and business including: • time • costs • loss or temporary loss of industry operations • alternative provisions	MC2 MC10 EC1 EC6

System decommissioning (Outcome 5)

1.27 **Procedures** involved in decommissioning

What do learners need to learn?

Step-by-step procedure for decommissioning heating systems

Procedure:

- notify relevant person
- isolate fuel/electricity supply to the system as appropriate
- isolate water supply
- apply warning notices and signs
- drain system to a suitable location
- appropriately dispose of contents and any additives
- continuity bonding as required
- temporary capping of pipework sections as required
- notify building users
- alternative source of heat or supplies as required

Decommissioning:

- permanent
- temporary

1.28 Requirements for recording, labelling and reporting decommissioned systems

What do learners need to learn?	**Skills**
Requirements for each system to record, label and report decommissioned systems to prevent the use of decommissioned appliance to include: • informing the responsible person • warning notices • labels	EC1 EC3 EC4 EC6

Outcome 2 - Install heating systems

Performance criteria

2.1 Install **pipework** relevant to the type of system

Range:
Pipework - copper pipework, LCS pipework, plastic pipework.

What do learners need to learn?	Skills
Install pipework relevant to the type of system to be worked on with consideration given to measuring and recording accurately in line with industry and practices. Pipework installed must be completed in line with building regulations, industry standards and best practices such as lead-free plumbing.	MC1

2.2 Install **clips/brackets** to different types of **building fabric**

Range:
Clips/brackets - saddle clip, Munson ring, plastic clip, LCS bracket, nail in clip, school board clips.

Building fabric - timber, masonry, plasterboard.

What do learners need to learn?	Skills
Install and fix pipework clips and brackets at recommended spacing intervals to meet specification requirements and in line with current industry standards. Identify installation requirements for pipework: • prefabrication of pipework • installing pipework in-situ • use of sleeves • timber joist notching • first and second fix • pipework protection	MC1

2.3 Install **appliances**

Range:
Appliances – boilers, heat pumps, hydrogen boilers.

What do learners need to learn?	Skills
Position, install and secure appliances in line with specification requirements and current industry standards/working methods, following manufacturer's instructions. Install pipework to a pre-installed/pre hung boiler.	MC1

2.4 Install **heat emitting devices**

Range:
Heat emitting devices - traditional radiators, underfloor heating components.

What do learners need to learn?
Install a heat emitting device with consideration given to appropriate fixing for material, installation equipment and safety requirements during installation.

2.5 Install **components** into appliances

Range:
Components - diverter valves, safety controls, automatic air vents, circulating pumps.

What do learners need to learn?
Install components listed in the range into pre-installed appliances in line with manufacturer's instructions.

2.6 Install **controls** into a range of systems

Range:
Controls - timing devices – clocks and programmers, room thermostats, hot water thermostats, smart controls, zone valves, automatic bypass valves.

What do learners need to learn?	Skills
Install components listed in the range into a range of systems in line with manufactures instructions.	DC6

2.7 Install **thermal insulation materials**

Range:
Thermal insulation materials - polyisocyanurate foam, PVC foam, polyethylene foam.

What do learners need to learn?

Select appropriate thermal installation materials for installation taking into consideration the material and suitability.

2.8 Install seals for heat emitting devices

What do learners need to learn?

Install seals for heat emitting devices in line with manufacturer's instructions including PTFE on radiator tails, rubber seals, vent points and blanks on a radiator.

2.9 Check **heating products** are in accordance with design parameters

Range:
Heating products - radiator sizes, boiler size, zone valves, controls, pressure vessels, feed and expansion cisterns, circulating pumps.

What do learners need to learn?	**Skills**
Carry out the following checks on heating products to ensure they meet system design parameters: • temperature • flow rate • pressure • functional testing of electrical and mechanical controls.	MC1 MC2 EC5

2.10 Install control systems for the **system**

Range:
System - fully pumped, 3 x 2 port valves (S plan Plus)

What do learners need to learn?	**Skills**
Install control systems for heating systems in line with manufacturer's instructions, current building regulations and British Standards.	EC5

2.11 Prepare a safe working environment to conduct heating system installation

What do learners need to learn?	**Skills**
Prepare a safe working environment to conduct heating system installation by clearing the work area, and ensuring correct storage of materials and equipment in line with industry practices referring to health and safety documentation: • risk assessment • method statement • clear working area • site survey .	EC5

2.12 Update line diagrams/installation plans

What do learners need to learn?	**Skills**
Update line diagrams/installation plans following heating installation. There is no requirement to create an installation/system plan within the system - updating of basic data as part of a planning review is all that is required.	MC1 MC2 MC6 MC7 EC1 EC2 EC3 DC1 DC2 DC5

2.13 Use **hand and power tools** when penetrating a range of building fabrics

Range:
Hand and power tools - power drill, hand saw, hammer, wood chisel.

What do learners need to learn?
Use hand and power tools listed in the range to penetrate a range of building fabrics following safe systems of work (visual checks to ensure safe for use, PAT tested as appropriate, used in line with training and only where trained to do so).

2.14 Update digital building information management system software

What do learners need to learn?	Skills
Update basic information within a digital building information management system following heating installation. There is no requirement to create an installation plan/system plan within the system - updating of basic data as part of planning review is all that is required.	DC1 DC2 DC3 DC5 DC6

Outcome 3 - Commission heating systems

3.1 Assess risks associated with completing activities

What do learners need to learn?	Skills
Produce a risk assessment for commissioning activities in accordance with the six stages of assessment: • Identification of hazards • Identification of who is at risk and how • Assessment of risk and action • Recording of findings • Review of risk assessment • Take appropriate safety precautions Record risk assessment findings in line with regulations as well as responsibilities of employee's versus employers.	EC1 EC2 EC3 EC4

3.2 Set **heating controls**

Range:
Heating controls - programmer, time clock, thermostats, programmable room stat, optimiser, smart controls.

What do learners need to learn?	Skills
Set the heating controls and parameters in accordance with manufacturer's technical instructions and end user requirements.	EC5

3.3 Verify fitness for purpose of **tools/equipment**

Range:
Tools/equipment - thermometer, voltage indicating device.

What do learners need to learn?	Skills
Verify fitness for purpose of tools/equipment using a known source.	EC5

3.4 Complete heating system **handover documentation**

Range:
Handover documentation - benchmark logbook, handover pack- instructions, user guide, warranty information.

What do learners need to learn?	Skills
Complete heating system handover documentation and pass to the end user. Explain details of this pack and provide full demonstration of all controls and equipment to end user.	EC1 EC2 EC3 EC4 EC6

3.5 **Test** heating system installation

Range:
Test - temperature, flow rate, pressure.

What do learners need to learn?	Skills
Perform appropriate soundness tests, in line with current industry requirements, on installed systems and components, with consideration given to materials used and testing method. Ensure tests conforms to original design requirements. Identify information sources required to complete testing and commissioning. Soundness test to include: • visual inspection • notify • initial fill • stabilisation • test to required pressure • check for leaks • check pressures after test period • complete documentation and notify as required	MC1 MC2 EC5

3.6 Adjust heating system parameters to commission

What do learners need to learn?	Skills
Adjust heating system parameters to commission in accordance with manufacturer's instructions.	EC5

3.7 Test heating system

What do learners need to learn?
Carry out the operational checks required during commissioning. Test system to include fully pumped, 3 x two port valves (S Plan Plus).

3.8 Record **commissioning results**

Range:
Commissioning results - temperature, flow rate, pressure.

What do learners need to learn?	Skills
Complete system commissioning records to industry standards with the required information outlining the actions that must be taken when commissioning reveals defects.	EC3 EC4

3.9 Visually inspect to check that correct equipment is utilised in the heating system

What do learners need to learn?
Visually inspect correct equipment is utilised in the heating system with reference to original specifications and diagrams.

3.10 Compare commissioning results against design parameters

What do learners need to learn?
Compare commissioning results against design parameters to determine correct installation in accordance with original design ensuring efficiency and compliance with manufacturer's instructions.

Outcome 4 - Maintain heating systems

4.1 Identify any end user concerns around system operation

What do learners need to learn?	Skills
Use open questioning and listening to discuss maintenance requirements with end user /client with reference to other relevant available source materials (manufacturer's instructions/service history documents). Advise on options for system/component maintenance and how it can best be achieved. Consideration should be given to potential barriers/concerns, and how to overcome them, as well as to costs, sustainability and timescales.	EC1 EC2 EC3 EC4 EC5 EC6 MC2 MC6 DC3

4.2 Calculate maintenance downtime prior to deactivating

What do learners need to learn?	Skills
Calculate maintenance downtime prior to deactivating the system. Consideration should be given to information to be passed on to the end user, including the impact on the end user or industrial practice.	MC2 MC10

4.3 Conduct **fault finding**

Range:
Fault-finding - manufacturer's instructions, service history, end user.

What do learners need to learn?	Skills
Complete inspection for potential faults on system components in a methodical manner using a range of techniques including visual inspection of system, operational checks and performance testing to gather information to be used as part of analysis of the situation. Reference may also be made to manufacturer's instructions or specifications (fault-finding flow chart).	MC2 EC5

4.4 Engineer corrective measures to rectify fault

What do learners need to learn?	Skills
Carry out safely and in line with manufacturer's requirements the repair and rectification procedures to deal with a range of faults: • pumping over • persistent venting • emitter cold spots • stuck TRVs • motorised valves not operating • expansion vessel failure blockages • pump failure • pressure relief valve • incorrect support to system pipework and components	MC2 EC5

4.5 Assemble system **components**

Range:
Components - heat emitters, pumps, zone valves, expansion vessel.

What do learners need to learn?
Carry out the assembly of components as required, safely and in line with manufacturer's requirements and industry standards.

4.6 Disassemble system components when conducting maintenance

What do learners need to learn?
Dissemble system with safe isolation and strip down of plumbing components following employer's and manufacturer's recognised process – systematically and with regard to minimising disruption and mess.

4.7 Repair faulty heating system **components** as identified

Range:
Components - radiator valves – thermostatic and manual valves, timing devices – clocks and programmers, room thermostats, hot water thermostats, zone valves (2 port, 4 port, mid position and diverter), circulating pumps, filling loop, pressure gauge, expansion vessel.

What do learners need to learn?

Carry out the maintenance and repair of components as required, safely and in line with manufacturer's requirements and industry standards.

4.8 Classify waste for disposal and recycling

What do learners need to learn?

Classify waste for disposal and recycling in line with site management waste plans and approved disposal methods. Consideration should be given to safe/appropriate disposal of replaced components.

Outcome 5 - Decommission heating systems

5.1 Apply **control mechanisms** from a risk assessment prior to working

Range:
Control mechanisms - safe disposal of heating system fluids, safe isolation of fuel.

What do learners need to learn?	Skills
Apply control mechanisms from a risk assessment for the safe disposal of heating system fluids and safe isolation of fuel. Apply control mechanisms to a range of systems, including sealed systems and open vented systems. Procedure for decommissioning: • notify relevant person • isolate the fuel/electricity supply to the system as appropriate • isolate water supply • apply warning notices and signs • drain system to a suitable location • appropriately dispose of contents and any additives • continuity bonding as required • temporary capping of pipework sections as required • notify building users • alternative supplies as required Decommissioning: • permanent • temporary	EC5

5.2 Communicate with user to establish **needs** when decommissioning heating

Range:
Needs - temporary heating requirements, duration, hot water requirements.

What do learners need to learn?	Skills
Discuss decommissioning requirements with end user, taking into consideration end user needs.	EC1 EC2 EC3 EC4 EC6 DC3 DC5

5.3 Safely electrically isolate the heating system prior to decommissioning

What do learners need to learn?

Safely isolate the heating system following the recognised safe isolation procedure and using the correct equipment.

The six-step safe isolation procedure:

- Identify
- Isolate
- Prove
- Test
- Re-prove
- Lock

5.4 Extract old **heating equipment** from installation

Range:
Heating equipment - boiler, radiators, components.

What do learners need to learn?

Remove pre-installed components from a pre-installed heating system using safe working practices.

5.5 Make good building fabric post system removal

What do learners need to learn?

Use construction materials to make good the building fabric following component or system removal - could include filling holes with plaster, removing waste build materials.

5.6 Reinstate appropriate **service** post-decommissioning

Range:
Service - electricity, water, fuel.

What do learners need to learn?

Reinstate appropriate services in the range post decommissioning, ensuring safety for the end user and compliance with industry standards.

5.7 **Safe disposal** of waste products when decommissioning heating systems

Range:
Safe disposal - licensed waste disposal, Waste Carriers license, recycling, specialist disposal – asbestos and other forms of hazardous waste.

What do learners need to learn?

Safely dispose of waste products when decommissioning heating systems. Use appropriate method of disposal for the type of waste product.

Decommissioning of heating systems could include sealed systems and open vented systems.

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

BSE core content:

- Construction sustainability principles - Energy production and energy use and waste management
- Building technology principles - Internet of things
- Construction information and data principles -Standards, regulations and guidance
- Health and safety - BSE Regulations and safe working practices
- Building Services Engineering (BSE) systems – Heaters, radiators
- Tools and equipment - Use and maintenance

Guidance for delivery

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities

- Practical –Use of pre-set formative assessments carry out tasks and record on standardised form
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

Ways of ensuring content is delivered in line with current, up to date industry practice

- Centres will need to ensure a realistic representation of heating systems and components
- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
- The provision must represent the type of equipment currently available in the UK heating industry
- Staff delivering the qualification should be technically competent and have up to date industry CPD
- Current and emerging heating technology should be included in delivery e.g. smart controls

Suggested learning resources

Books

- The City & Guilds Textbook: Plumbing Book 2 for the Level 3 Apprenticeship (9189), Level 3 Advanced Technical Diploma (8202) and Level 3 Diploma (6035) (City & Guilds)
- Collins Complete Plumbing and Central Heating (Collins)
- CORGIdirect Commercial Heating Manual - Non-Domestic - ND3 (CORGIdirect)
- CORGIdirect Central Heating - Wet and Dry Manual - GID7 (New 5th Edition)

(CORGIdirect)

- The Domestic Heating Design Guide (DHDG) - CIBSE

Websites

- National Careers Service **https://nationalcareers.service.gov.uk/job-profiles/plumber**
- HETAS – Heating Equipment Testing and Approval Scheme -https://www.hetas.co.uk
- Chartered Institute of Plumbing and Heating Engineering (CIPHE)- **https://www.ciphe.org.uk/**
- Honeywell - **https://heatingcontrols.honeywellhome.com/**
- Grundfos - **https://uk.grundfos.com/**
- Association of plumbing and heating contractors https://www.aphc.co.uk/
- Worcester Bosch- **https://www.worcester-bosch.co.uk/**
- Baxi - **https://www.baxi.co.uk**
- Danfoss - **https://www.danfoss.com/en-gb/**
- Planning portal **https://www.planningportal.co.uk/**
- Oil Firing Technical Association – OFTEC - **https://www.oftec.org**
- British Standards Institution **https://shop.bsigroup.com/**
- Domestic building services compliance guide – 2013 **https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697525/DBSCG_secure.pdf**
- HDVH domestic heating design guide CIBSI https://www.cibse.org/knowledge/knowledge-items/detail?id=a0q20000008I7odAAC

Scheme of Assessment – Heating engineering

The Heating engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 20 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 - Plan the installation	Displays a breadth of knowledge and practical skills that enables them to carry out and plan for the installation of a heating system. Candidates will need to produce documents to industry standards that clearly states how they will carry out the installation.
Task 2 - Install, commission and decommission	Complete the given installation, commissioning and decommissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately Tools, materials and equipment are selected and used correctly. Consideration to environmental sustainability and recycling of materials. Techniques used to make building fabric repairs to restore work area to pre-installation condition. All work carried out in line with relevant manufacturer's instructions/ building regulations.
Task 3 – Carry out maintenance activity	Applies knowledge and practical skills in rectifying a fault in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	***High level tasks*** *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	**Assessment Theme**	***Typical evidence***
PO2 Install heating systems (36%)	T1- Planning the installation T2 – Install, commission, and decommission	Health and Safety	Risk assessments, PPE, Working safely
	T1- Planning the installation	Design and Planning	Method statements, installation diagrams, material lists, selecting types of systems and components, measuring, and marking out
	T2 – Install, commission, and decommission	Systems and components	Using tools and equipment, cutting and bending pipe, jointing methods, prefabrication of pipe, positioning and securing component,
	T1- Planning the installation T2 – Install, commission, and decommission	Reports and information	Interpretation of drawings, specifications, manufacturer instructions
PO3 Commission heating systems (24%)	Task 2 - Install, commission and decommission	Inspecting and testing systems and components	Soundness testing, leaks, commissioning checks

	Task 2 - Install, commission and decommission	Health and Safety	Risk assessment, working safely, PPE
	Task 2 - Install, commission and decommission	Reports and information	Commissioning records
	Task 2 - Install, commission and decommission	Handover/ communication	Handover to customer
PO4 Maintain heating systems (26%)	T3 – Carry out Maintenance	Health and safety Working with faults Handover/ communication Reports and information	Risk assessment, working safely, PPE Fault diagnosis, client requirements, Repair and replace components, use of tools Communication with customer to diagnose fault Maintenance activity report
PO5 Decommission heating systems (14%)	Task 2 - Install, commission and decommission	Health and Safety Systems and components	Safe isolation process, safely isolate valves Extracting components, making good the building fabric, handling components and materials

356 Plumbing engineering

Level:	3
GLH – Combined with 355 Heating:	840
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to learn about and undertake fundamental plumbing work. Learners will have the opportunity to plan, perform and evaluate their work while using a range of materials, methods and techniques.

Learners will develop their knowledge, understanding and skills of:

- Fundamental health and safety practices associated with carrying out plumbing work.
- Plumbing tools and equipment
- Pipework materials, installation methods and jointing processes.
- Plumbing systems and their purpose
- Plumbing science
- Principles of measurement and marking out components and pipework

Learners may be introduced to this specialism by asking themselves questions such as:

- What kind of tasks does a plumber perform?
- What systems do plumber's work on?
- What tools and equipment do plumber's use as part of their role?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:
1. Plumbing knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:
2. Install plumbing systems
3. Commission plumbing systems
4. Maintain plumbing systems
5. Decommission plumbing systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills.

Specialism content

Outcome 1

Common knowledge criteria

Health and safety

1.1 Key requirements of **Codes of Practice (CoP)**

Range:
Codes of practice (CoP) – L5 Control of substances hazardous to health, L8 Legionnaires' disease – the control of *Legionella* bacteria in water systems, L21 Management of health and safety at work, L22 Provision and Use of Work Equipment Regulations 1998, L23 Manual handling – Manual Handling Operations Regulations 1992, L25 Personal protective equipment at work, L74 The Health and Safety (First Aid) Regulations 1981, guidance on regulations.

What do learners need to learn?	**Skills**
Current legislation/regulation and who is responsible for safety under relevant legislation and COP. The potential implications of non-compliance of: • general legislation • construction specific legislation • building services specific legislation including site safety card schemes	EC5

1.2 **Typical hazards** and risks associated with plumbing systems

Range:
Typical hazards - tripping hazards, slipping hazards, inadequate or lack of personal protective equipment, defective (unsafe) equipment, manual handling, working at heights, electrocution, safe use of heat-producing equipment.

What do learners need to learn?

The controls that need to be in place to minimise hazards.
Asbestos:

- types
- places you may come across asbestos
- how to deal with asbestos

Electrocution
Common electrical dangers encountered on construction sites and in private dwellings:

- faulty electrical equipment
- signs of damaged or worn electrical cables – power tools and property hard wiring system
- trailing cables
- proximity of cables to services pipework
- buried/hidden cables
- inadequate over-current protection devices

Heat producing equipment
The various types of gases used in jointing processes:

- propane
- MAP gas
- butane
- oxy acetylene

Safe transportation and storage of bottled gases and equipment.

The various types of heat-producing equipment and how to check them for safety and assemble:

- hoses
  - colours used
  - thread directions
  - flashback arrestors
  - dates
- control valves
- gauges
- blowpipes

Safe

- bottle location and position

- equipment assembly sequence
- leak detection procedure
- purging procedure
- lighting and extinguishing procedure
- actions in the event of leakage
- transportation.

The dangers of working with heat-producing equipment and how to prevent fires occurring.

The method for fighting small localised fires that can occur in the workplace.

Fighting small localised fires:

- tackling fires to aid escape
- types of extinguisher
- selection of extinguisher by fire type
- method of use
- evacuation procedures

Tools, equipment and materials

1.3 **Tools**, equipment and **materials** used for installation

Range:
Tools – screwdriver, hammer, chisel, grip, wrench, spanner, spirit level, manual pipe threader, pipe cutter, hand saw, plier, bending tool, soldering equipment, pressfit, tape measure, measuring equipment.

Materials - copper pipework/fittings, LCS pipework/fittings, plastic pipework/fittings, sanitary appliances.

What do learners need to learn?

Common equipment and materials and their purpose. New and emerging systems, tools and technology used to ensure currency of practice. Additional tools and equipment that can be used for adapted ways of working. How to store tools and equipment appropriately.

The sources of information for carrying out preparatory work, to include:

- statutory regulations
- industry standards
- manufacturers' technical instructions
- building plans
- specifications

Preparation techniques to prepare the building fabric to include work methods and damage to property.

Work methods:

- holes in masonry surfaces – hammer and chisel, large power drill
- making good masonry surfaces
- lifting and replacing timber flooring materials
- notching timber floor joists
- drilling holes – timber floor joists
- cutting chases – wall and floor surfaces
- walking boards
- dust sheets
- removal of personal property

1.4 Operation and handling requirements for tools and equipment

What do learners need to learn?

The use of electricity for powered tools and the specific safety considerations relating to their use and hazards. Maintenance schedules and processes for escalating or reporting broken, unsafe or faulty equipment. PAT test requirements, PPE requirements.

Plumbing systems

1.5 **Sources** and distribution of water

Range:
Surface sources - lakes, reservoirs, rivers, streams**.**

Underground sources - deep and shallow wells, artesian wells, bore-holes, springs.

What do learners need to learn?

Supply and water treatment:
- mains
- private

Fluid categories:
- 1–5
- preventing waste, undue consumption, misuse or contamination.

Service to the property:
- connection methods to the main
- communication pipe detail
- service pipe detail
- main external stop valve location and meter housings
- installation requirements
- methods of entry of the service pipework to a property

1.6 **Plumbing systems**

Range:
Plumbing systems - direct and indirect cold water, boosted cold water, hot water, above ground drainage, below ground drainage, rainwater harvesting, rainwater systems, grey water re-use.

What do learners need to learn?

The types of plumbing systems their purpose and key considerations for installation and maintenance.

The advantages and disadvantages and working principles of different systems.
The layout features, pipe sizes used and working principles of systems and components.

Cold water systems:

- direct cold water system
- indirect cold water system
- boosted

Components (cold water):

- appliances
- taps, outlets and valves
- water meters
- showers
- water treatment
- cisterns
- boosted system components

Cistern layout and installation requirements.

Backflow risk and methods of backflow prevention. Methods of backflow prevention to include:

- non-mechanical types: AA, AB, AD, AG, AUK1, AUK2, AUK3, and DC pipe interrupter.
- mechanical types: BA, CA, DB, EA/EB, EC/ED, HA, HUK1 and HC (4.4)

Hot water systems and components:

- vented
- unvented

Rainwater systems and components:

- half round
- square
- ogee
- high capacity

Sanitation systems:

- primary ventilated stack system
- secondary ventilated stack system
- ventilated branch discharge system

- stub stack system

Below ground drainage systems:
- combined drainage systems
- separate drainage systems
- partially separate drainage systems
- soakaways, cesspits and septic tanks

1.7 **Components** used in plumbing systems

Range:
Components - WC flushing cistern, sink tap, terminal fittings, bath, drain valves, blending valves, check valves, air admittance valves, float operated valves, service valves, supply stop valves, WC, basin, appliance trap, flushing syphons water treatment, water softeners/conditioners/filters, booster pumps, accumulators, showers, dishwashers, washing machines, cylinders.

What do learners need to learn?

Components used in plumbing systems, their characteristics and function within the system and how they work together to support the operation of the system.

1.8 **Factors** that affect the choice and suitability of components in a system

Range:
Factors - appliances, purpose, size, location, temperature, flow rate, pressure, environmental, customer needs.

What do learners need to learn?

Factors that affect the choice and suitability of components included in a system.

Skills
EC5

1.9 Types of **control systems** required for plumbing systems

Range:
Control systems - digital water controls**,** solenoid valves**,** infrared controls**,** water treatment.

What do learners need to learn?

Types of control systems required for plumbing systems including digital controls, their characteristics, operation and suitability for different situations.

1.10 **Appliances** supported by plumbing systems

Range:
Appliances - WC, basin, bath, shower, urinal.

What do learners need to learn?

Common appliances connected to plumbing systems: their limitations, operating parameters, waste outputs and fluid categories.

1.11 Types of waste and waste products and the associated **systems** and **attributes**

Range:
Systems - septic tanks, wastewater lifters**,** macerators.
Attributes - smells, bacteria.

What do learners need to learn?

Main types of waste and waste products including types of systems. The hazards to user and interaction with other parties including the undertaker and treatment.

1.12 The effects of damage interference from **external sources** on system operation

Range:
External sources - electrolytic action, atmospheric corrosion, chemical damage, water damage, heat damage, mechanical damage, UV damage, freezing, cold, vibration.

What do learners need to learn?

Potential effects of damage interference from external sources on system operation.

Plumbing science

1.13 **Scientific principles** and concepts to plumbing engineering

Range:
Scientific principles - relative densities, properties of solid materials, corrosion prevention, application of liquids and gases, properties of liquids and gases.

What do learners need to learn?	**Skills** MC4

Relative densities:
- relative density to air
- relative density to water

Reasons for breakdown:
- atmospheric corrosion
- oxidisation of metals
- UV damage to plastics
- heat damage to plastics
- electrolytic corrosion
- electromotive series
- dissimilar metals in the presence of an electrolyte (water)
- erosion corrosion

Application of liquids:
- water
- refrigerants
- anti-freeze/glycol mixes
- fuel oils
- lubricants/greases

Gases:
- air and steam
- LPG
- natural gas
- carbon dioxide
- refrigerant gases

Properties of liquids:
- water
  - boiling/freezing point
  - relationship Celsius and Kelvin
  - change of state and molecular changes
  - volume and pressure increases
  - density at differing temperatures
  - to steam/super heated steam
  - capillarity
  - acidity/alkalinity (pH value)
  - water hardness
  - soft
  - temporary hard

- o permanently hard

Properties of gases:
- natural gas, LPG and air
  - o pressure
  - o volume
  - o temperature of gases found within the industry

The types of water, properties and chemical states.
Water quality (including pH) and treatments.

1.14 Relationship between flow and pressure

What do learners need to learn?

Relationship between flow and pressure for both liquids and gases to include Boyle's law and Charles's L law.

1.15 Relationship between mass/volume and specific heat capacity

What do learners need to learn?

How to calculate specific heat capacity.
How to calculate density.

Heat capacity - calculate the quantity of heat energy required to raise the temperature of a substance and the amount of power required to heat a substance.

Mass/volume - calculate the density of solids, liquids and gases.
The density of water changes with the water's temperature.

Skills
MC2

1.16 Types of **insulation materials**

Range:
Insulation materials - polyisocyanurate foam, PVC foam, polyethylene foam.

What do learners need to learn?

Types of insulation materials, their properties including relevant standards and current building regulations and their suitability for different systems.

1.17 Electrolyte qualities of materials and the periodic table

What do learners need to learn?

Electrolyte qualities of materials – the type, installation and size of pipework and fittings and their effect on flow rates.

Pipework technology

1.18 Characteristics of types of **pipework**

Range:
Pipework - prefabricated components, modularised components, Onsite installation.

What do learners need to learn?

Characteristics of different types of pipework including prefabricated and modularised components and distribution systems, different sizes, types of materials, their suitability for different situations, and tools and equipment (including fixings) required.

1.19 Types of **support**, fittings and **fixings**

Range:
Support - saddle clip, munson ring, plastic clip, LCS bracket, waste pipe clip, soil pipe clip, nail in clip, gutter and rainwater clips.

Fixings - cavity fixings, nails, screws, wall plug, appliance fixing kit, anchor bolts.

What do learners need to learn?

Different types of support, fixings and fittings, and their purpose and suitability for different systems and building fabrics.

Information and data

1.20 Plumbing drawing symbols and markings

What do learners need to learn?	Skills
Common drawing symbols and markings.	EC3

1.21 Types of **documentation**

Range:
Documentation - commissioning record, maintenance record, delivery note, job specification, working drawings, work programme, plans, quotations and estimates, invoice, risk assessment, method statement.

What do learners need to learn?	Skills
Different types of documentation, the specific content of different documents and what they are used for.	EC3 EC5 MC1 MC2

Measurement

1.22 **Metric and imperial dimensions**

Range:
Metric and imperial dimensions - metre (length) m, kilogram (mass) kg, feet**,** inches**,** centre metre**,** millimetre, bar (metric unit of pressure)**,** PSI (pounds per square inch, or pound force per square inch).

What do learners need to learn?	Skills
The metric and imperial dimensions of height, weight, length and pressure.	MC1 MC3 MC4

Specific knowledge criteria for performance outcomes

System installation (Outcome 2)

1. Plumbing knowledge criteria

1.23 **Bending techniques**

Range:
Bending techniques - machine**,** scissor, hand (spring bend), pre-formed.

What do learners need to learn?

Different types of bending techniques and when they would be used. The equipment used to carry out accurate bending of low carbon steel (LCS) and copper.

Methods of bending pipework

Copper machine bending:

- 90° bends
- sets and offset bends
- passover bends
- copper spring bend

LCS hydraulic machine bending:

- 90° bends
- sets and offset bends
- passover bends

Plastic pressure pipe

- spring bend
- cabling technique
- cold forming bend

1.24 **Connection techniques**

Range:
Connection techniques - solder ring and end feed, compression, push-fit, press-fit, threaded, solvent.

What do learners need to learn?

Different types of connection techniques during the installation and maintenance of plumbing systems and where and when to use them.

Solder and solder ring should be lead-free.

Copper pipe:

- solder ring and end feed (lead free)
- compression (type A and B)
- push-fit
- press-fit

Low carbon steel (LCS) pipe:

- threaded

Plastic pressure pipe:

- push fit
- compression
- proprietary
- copper and MDPE
-

Plastic jointing (sanitary):

- ring seal
- compression
- solvent

1.25 Potential **impact** of installation activities

Range:
Impact – no water, temporary loss of water, delayed arrival of resource or materials.

What do learners need to learn?

Potential impacts of installation activities on customer essential services and the ways these can be minimised:

- Isolation of services
- Preparation of temporary services – providing water during temporary loss
- Completing work out of hours or when unoccupied – cost related disability (no sanitation services)

System commissioning (Outcome 3)

1.26 **Inspection techniques**

Range:
Inspection techniques - visual inspection.

What do learners need to learn?	Skills
The use of senses in a visual inspection. The application of visual inspections in commissioning systems and the importance of referring to manufacturer's instructions.	EC5

1.27 **Factors** to inspect during commissioning

Range:
Factors – temperature**,** flow rate**,** pressure.

What do learners need to learn?	Skills
The factors to inspect during commissioning and how expected standards are defined in relation to manufacturer's guidance and building regulations. Factors to inspect during pre-commissioning and how expected standards are defined in conjunction with manufacturer's instructions and industry guidance. • pipework installed as specified, positioned as drawing and plumb • appropriate brackets and supports fitted at specified intervals • joints cleaned and complete • valves/controls fitted as specified and positioned as drawing • fittings tight, flange bolts, unions, compression joints etc • commissioning/test points fitted as specified and positioned as drawing • D.O.C fitted as specified and closed • valves set in the correct position • controls set in the correct position • pipework painted as necessary • sensitive items isolated or removed as necessary • pipework installed to accommodate insulation • sleeves fitted as necessary • heat emitters installed as specified and positioned as drawing • storage and expansion vessels installed as specified and positioned as drawing • appliances installed as specified and positioned as drawing • flues and ductwork installed as specified and positioned as drawing • safety requirements adhered to • relevant people notified • relevant items cleaned wherever necessary	MC2 MC6

1.28 **Testing techniques**

Range:
Testing techniques - air testing, hydraulic pressure testing, safety component operation**,** soundness testing**,** performance testing.

What do learners need to learn?	**Skills**
The different testing techniques when they are used, and how they are applied in line with current industry standards. How to carry out testing and disposal of by-products safely. Soundness test to industry requirements on plumbing system pipework and components: • initial fill • stabilisation • test to required pressure • check for leaks • heck pressures after test period Operational checks: • temperature • flow rate • pressure • controls	MC2 EC5

1.29 **Documentation** required for commissioning and verification of commissioning

Range:
Documentation - commissioning record**,** service sheet**,** warranty information**,** manufacturer's guarantees, self-certification.

What do learners need to learn?	**Skills**
The different documentation required for commissioning and verification of commissioning, its content, and when and how it is used within the commissioning process.	EC5

1.30 **Technical information** required for use by different **stakeholders**

Range:
Technical information - handover pack**,** instructions**,** user guides**,** service requirements.
Stakeholders - client/customer, installer, tenant, end user.

What do learners need to learn?	**Skills**
The types of technical information and different stakeholders. Completion of technical information, and who to pass it on to once complete.	EC1 EC3 EC4 DC2 DC3

System maintenance (Outcome 4)

1.31 **Fault-finding techniques**

Range:
Fault-finding techniques – end user discussions and questioning, consulting manufacturer's instructions, following fault diagnosis flow chart, checking service history, knowledge gained from industry experience.

What do learners need to learn?	Skills
The fault finding process and techniques used to diagnose faults. The application of different techniques for different situations. The fault finding and rectification process on a range of plumbing systems including obtaining information on system faults from the end user with reference to manufacturer instructions and how to carry out diagnostic checks with reference to fault diagnosis flow charts.	EC5 MC2 DC1 DC5

1.32 **Causes** of typical faults in plumbing

Range:
Causes - poor installation, inadequate design, user error, environmental factors.

What do learners need to learn?	Skills
Common faults in plumbing systems, and how they are caused during normal operation of a plumbing system. Repair and rectification procedures to deal with a range of typical faults found on a heating system: • leak in system pipework • noise in systems • corrosion of system components • inadequate supply pressure at discharge points • loose pipework • trap seal loss • blockages in system components/pipework, incorrect backflow devices in relation to the fluid categories	MC2

1.33 **Documentation** required for maintenance and verification of maintenance activities

Range:
Documentation - manufacturer's instructions**,** maintenance record**,** maintenance programme, maintenance checklist, service history, job sheets.

What do learners need to learn?	**Skills**
The different documentation required for maintenance and verification of maintenance activities. Know what information is required for each, how they are completed and when they are used.	EC5

1.34 **Actions** required when faults cannot be rectified

Range:
Actions - notify end user, make appliance safe, apply warning notices/signs, discuss next steps.

What do learners need to learn?	**Skills**
The actions required when faults cannot be rectified, and the potential implications to customer and business, including time, costs, loss or temporary loss of industry operations and alternative provisions.	MC2 MC10 EC1 EC6

System decommissioning (Outcome 5)

1.35 Procedures involved in decommissioning **systems**

Range:

Systems - above ground drainage, below ground drainage, rainwater harvesting, grey water re-use, rainwater systems, hot water, cold water.

What do learners need to learn?

The decommissioning procedures, and own role and responsibilities

Procedures for isolation and decommissioning:

- notify relevant person
- isolate fuel/electricity supply to the system as appropriate
- isolate water supply
- apply warning notices and signs
- drain system to a suitable location
- appropriately dispose of contents and any additives
- continuity bonding as required
- temporary capping of pipework sections as required
- notify building users
- alternative supplies as required

Decommissioning:

- permanent
- temporary

1.36 **Waste management procedures**

Range:
Waste management procedures - licensed waste disposal, Waste Carriers Licence, recycling, specialist disposal, transport of licenced waste.

What do learners need to learn?

Waste management procedures and own role and responsibilities. Relevant procedure for type of waste. Materials that can be recycled (metals, plastics, wood/cardboard).

1.37 Safe removal of different **types of waste** from the working area

Range:
Types of waste - asbestos, materials**,** contaminated water, recyclable, non-recyclable.

What do learners need to learn?
Methods used to safely remove different types of waste from the working area for both licensed and unlicensed disposal.

1.38 **Documentation** required for decommissioning and verification of **decommissioning activities**

Range:
Documentation - job sheet**,** decommissioning record sheet.
Decommissioning activities - domestic installations**,** industrial and commercial installations**.**

What do learners need to learn?	Skills
Documentation required for decommissioning and verification of decommissioning activities, their content and purpose.	EC1 EC3 EC4 EC5

1.39 Requirements for recording, labelling and reporting decommissioned systems

What do learners need to learn?	Skills
Requirements for recording, labelling and reporting decommissioned systems to prevent the use of decommissioned appliances, by informing the responsible person, warning notices, labels, notifying other trades.	EC1 EC6

Outcome 2 - Install plumbing systems

Performance criteria

2.1 Interpret risk assessments and related documentation

What do learners need to learn?	Skills
Review and interpret risk assessments following HSE guidance. Consideration of employer's versus employee's responsibilities in relation to risk assessment completion. The related documentation: • work permit • method statement • toolbox talks	EC4 EC5

2.2 Select **tools**, equipment and **materials**

Range:
Tools-screwdriver, hammer, chisel, grip, wrench, spanner, spirit level, manual pipe threader, pipe cutter, hand saw, pliers, bending tool, blowtorch.

Materials - copper pipework/fittings, LCS pipework/fittings, plastic pipework/fittings.

What do learners need to learn?

Select the correct hand and power tools required to complete work activities on plumbing systems, taking into consideration the safe use of the equipment and suitability of tools and equipment matched to specific tasks.

2.3 Measure site requirements and materials

What do learners need to learn?	Skills
Measure site requirements and calculate material requirements from plans/drawings. Measure fixings to pipework and plumbing components using appropriate available equipment (tape measure, laser measure). Record findings accurately using appropriate SI units for scale of task, in line with industry standards and practices.	MC1 MC2

2.4 Mark out **requirements**

Range:
Requirements - notching timber floor joists, drilling holes – timber floor joists, pipework clipping distances.

What do learners need to learn?	Skills
Prepare the building fabric for the installation of pipework and plumbing components in line with building regulations and industry standards.	MC1 EC5

2.5 Use hand and power **tools**

Range:
Tools - power drill, hand saw, hydraulic machine bender, hydraulic crimping kit.

What do learners need to learn?
Use hand and power tools to secure and install plumbing pipework and appliances following safe systems of work (visual checks to ensure safe for use, PAT tested as appropriate, used in line with training and only where trained to do so).

2.6 Prefabricate pipes by bending to **shape**

Range:
Shape - 90° angle**,** offset angle, Passover.

What do learners need to learn?
Bend pipes to meet the needs of the pipework specification, use appropriate material (copper, low carbon steel (LCS), plastic) and specific site considerations Use appropriate bending equipment/bending machine, safely and in line with manufacturer's instructions.

2.7 Cut **pipes**

Range
Pipes - copper pipework, LCS pipework, plastic pipework.

What do learners need to learn?	**Skills**
Measure and cut pipework materials to required length as detailed in the job specification. Use appropriate cutting equipment with consideration for safety, materials and equipment available. Consider site restrictions such as space and potential mess when cutting ensuring burrs are removed and edges are chamfered.	MC1

2.8 Connect materials using **jointing methods**

Range:

Jointing methods - copper pipe – solder ring and end feed, compression (type A and B), push-fit, press-fit; low-carbon steel (LCS) pipe – threaded, plastic pipe (hot, cold and heating), push-fit, compression, proprietary; copper and MDPE – plastic jointing (sanitary), ring seal, compression.

What do learners need to learn?	**Skills**
Connect pipework together using the appropriate jointing method for materials, equipment and safety requirements.	MC1

2.9 Fix **pipework** to **structures**

Range:
Pipework - copper pipework**,** LCS pipework**,** plastic pipework.
Structures – timber, masonry.

What do learners need to learn?	**Skills**
Fix pipework clips and brackets at recommended spacing intervals to meet specification requirements and in line with current industry standards.	MC1

2.10 Position and secure **components** in plumbing **system**

Range:
Components - WC flushing cistern, sink tap, wash hand basin tap, drain valves, float operated valves, service valves, supply stop valves, WC, basin, bath, appliance trap.

System - direct and indirect cold water, boosted cold water, hot water, above ground drainage, below ground drainage, rainwater harvesting, rainwater systems, grey water re-use, unvented hot water cylinder.

What do learners need to learn?	**Skills**
Position and secure components in line with specification requirements and current industry standards/working methods. Work to be carried out in line with building regulations, manufacturer's instructions, and British Standards. Use appropriate fixings to ensure security of components and check to ensure components are level and secure following positioning.	MC1

2.11 Interpret **information** provided

Range:
Information - plans/drawings, job specifications, work programmes, installation instructions, local site considerations.

What do learners need to learn?	**Skills**
Use the information provided to install plumbing systems. Collate and review information to inform subsequent installation process. Use information in the creation of a plan, quote or take-off.	EC2 EC5 MC7

2.12 Update digital building information management system software

What do learners need to learn?	Skills
Update basic information within a digital building information management system following plumbing installation. There is no requirement to create an installation plan/system plan within the system - updating of basic data as part of a planning review is all that is required.	DC1 DC2 DC3 DC5 DC6

Outcome 3 - Commission plumbing systems

3.1 Assess risks associated with completing activities

What do learners need to learn?	Skills
Produce a risk assessment for commissioning activities in accordance with the five stages of assessment: • identification of hazards • identification of who is at risk and how • assessment of risk and action • recording of findings • review of risk assessment Record risk assessment findings in line with regulations, as well as the responsibilities of employees versus employers.	EC1 EC2 EC3 EC4

3.2 Interpret information and data

What do learners need to learn?	Skills
Interpret data from visual and other sources including manufacturer's instructions, building regulations, drawings and BS-EN standards, in order to correctly carry out the commissioning process. The importance of reference to accurate/current sources, currency of standards and guidance documents, and whether they are subject to change.	EC5 MC6 DC3

3.3 Inspect the installation of components

What do learners need to learn?	Skills
Carry out visual inspection of systems and interpret relevant information sources required to complete commissioning activities in line with manufacturer's instructions and installation drawings. Escalate any potential issues that have been identified.	MC2 EC3 EC4 EC5

3.4 Test **systems**

Range:
Systems - cold water, hot water, sanitation, rainwater.

What do learners need to learn?	**Skills**
Perform appropriate soundness tests, in line with current industry requirements, on installed systems and components, with consideration given to materials used and testing methods. Soundness test: • visual inspection • notify • initial fill • stabilisation • test to required pressure • check for leaks • check pressures after test period • complete documentation and notify as required Pipework: • metal pipework • plastic pipework Flushing requirements: • cold • disinfection System additives: • neutralisers • cleanser • water softener (salt)	MC1

3.5 Ensure accuracy and compliance with **intended outcomes**

Range:
Intended outcomes – temperature, flow rate, pressure, electrical controls, mechanical controls, functional testing.

What do learners need to learn?
Carry out operational checks required during commissioning Commissioning procedure: • visual inspection • fill and vent • soundness test • flush • operational checks • commissioning documentation • handover procedure

3.6 Record data from commissioning **checks**

Range:
Checks – temperature**,** flow rate, pressure, operation of controls, functional checks.

What do learners need to learn?	**Skills**
Measure and record system information using recognised methods in line with the requirements of current building regulations.	EC3 EC4

3.7 Complete required **documentation**

Range:
Documentation - commissioning record, service sheet**,** benchmark/appliance certificates.

What do learners need to learn?	**Skills**
Complete system commissioning records to industry standards with the required information outlining the actions that must be taken when commissioning reveals defects. Be aware of the customer handover process.	EC3 EC4 MC7

3.8 Present technical information orally for different stakeholders

What do learners need to learn?	**Skills**
Discuss commissioning requirements with stakeholders during the handover procedure in a professional manner, following employer-set procedures and best practice. Consider audience in terms of delivery method (in person, over the phone), appropriate use of terminology, and appropriate methods of identifying and overcoming barriers as well as the potential implications of miscommunication or communication breakdown.	EC1 EC2 EC3 EC4 EC5 EC6 MC2 MC6

Outcome 4 - Maintain plumbing systems

4.1 Identify information **requirements** from a brief

Range:
Requirements - end user, manufacturer's instructions, fault diagnosis flow chart, service history.

What do learners need to learn?	Skills
Check all necessary job information is available before commencing the maintenance work with reference to manufacturer's requirements and guidance.	EC5 MC2 MC6

4.2 Explore end user or client requirements

What do learners need to learn?	Skills
Use open questioning and listening to discuss maintenance requirements with the end user or client with reference to other relevant available source materials (manufacturer's instructions/service history documents). Advise on options for system/component maintenance and how it can best be achieved. Consideration should be given to potential barriers/concerns, how to overcome them as well as to costs, sustainability and timescales.	EC1 EC2 EC3 EC4 EC5 EC6 MC2 MC6

4.3 Estimate and calculate time and resources

What do learners need to learn?	Skills
Interpret data from sources in order to make judgements on time and resources required for the maintenance process – equipment, materials, and human resources. Consider potential impacts on the client and the business of inaccurate estimations and calculations.	MC2 MC6

4.4 Analyse situations to identify potential causes for delays and errors

What do learners need to learn?	Skills
Identify potential problems in relation to system maintenance procedures as a whole (not specific errors with a system) that may affect efficiency and completion (lack of resources, timescale issues, availability of materials/parts, site specific issues, specific client needs). Consider how best to mitigate these potential issues and whether risks can be removed or just minimised.	MC2 EC1 EC6 DC3 DC5

4.5 Inspect the suitability of materials, **tools and equipment**

Range:
Tools and equipment - screwdriver, hammer, chisel, grip, wrench, adjustable spanner/ adjustable spanner, spirit level, pipe cutter, circlip pliers, pliers, plunger, tap reseating tool, drain auger, drain rods, copper pipework/fittings, LCS pipework/fittings, plastic pipework/fittings, pressure gauge, flow cup, thermometer.

What do learners need to learn?
Check tools, materials and equipment for suitability via visual inspection or relevant checks, including reporting and removal procedures for faulty or inappropriate items.

4.6 Analyse situations to identify potential faults

What do learners need to learn?	Skills
Complete inspection for potential faults on system components through visual inspection of system, operational checks and performance testing to gather information to be used as part of analysis of situation. Refer to manufacturer's instructions or specifications (fault-finding flow chart).	MC2 MC7 EC5

4.7 Repair **component faults** in systems

Range:
Components - taps-mixer or pillar, float valve, shower mixer valve, drain valve, WC siphon/drop valve, sanitary appliance trap, line strainer, control components, safety components.

What do learners need to learn?

Carry out the maintenance and repair of components as required, safely and in line with manufacturer's requirements and industry standards. Consider cost of repair versus replacement of component(s).

4.8 Disassemble **parts** of a system

Range:
Parts - WC flushing cistern, sink tap, wash hand basin tap, shower mixer valve, sanitary appliance trap, hot/cold sanitary pipework.

What do learners need to learn?

System disassembly with safe isolation and strip down of plumbing components following employer's and manufacturer's recognised process – systematically and with regard to minimising disruption and mess.

4.9 Replace **components** within a system

Range:
Components - taps-mixer or pillar, float valve, shower mixer valve, drain valve, WC siphon/drop valve, sanitary appliance trap, line strainer, control components, safety components.

What do learners need to learn?

Replace components within a system as necessary to meet industry and task-specific requirements. Use safe and appropriate methods to dispose of replaced components.

Outcome 5 - Decommission plumbing systems

5.1 Safely isolate valves/services to **types of systems**

Range:

Types of system: cold water, hot water, sanitation.

What do learners need to learn?	Skills
Procedures for isolation and decommissioning: • notify relevant person. • isolate fuel/electricity supply to the system as appropriate. • isolate water supply. • apply warning notices and signs. • drain system to a suitable location. • appropriately dispose of contents and any additives. • continuity bonding as required. • temporary capping of pipework sections as required. • notify building users. • alternative supplies as required. Decommissioning: • permanent • temporary	EC1 EC2 EC3 EC4 EC5 EC6

5.2 Handle **materials** to protect their integrity and safety

Range:
Materials - components**,** pipework materials.

What do learners need to learn?
Handle materials to protect their integrity and safety during decommissioning. Adopt safe storage of components and materials following health and safety procedures.

5.3 Extract **components** from systems

Range:
Components - WC flushing cistern, sink tap, wash hand basin tap, bath, drain valves, float operated valves, service valves, supply stop valves, WC, basin, appliance trap, cylinders.

What do learners need to learn?

Remove pre-installed components from plumbing systems following recognised industry practices.

5.4 Reconfigure systems

What do learners need to learn?

Reconfigure plumbing systems during the decommissioning process, ensuring the system is left in full working order.

5.5 Make good the building fabric.

What do learners need to learn?

Use construction materials to make good the building fabric following component or system removal - filling holes with plaster, removing waste build materials.

5.6 Categorise **waste**

Range:
Waste – licenced, recyclable, specialist, general site.

What do learners need to learn?	**Skills**
Categorise the waste produced during the decommissioning process in line with waste management plans and environmental policies. Methods including licensed waste disposal, Waste Carriers Licence, recycling, specialist disposal – asbestos and other forms of hazardous waste.	EC5

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

BSE core content

- Construction sustainability principles - Energy production and energy use and waste management
- Building technology principles - Internet of things
- Construction information and data principles – Standards, regulations and guidance
- Health and safety - BSE Regulations and safe working practices
- Building Services Engineering (BSE) systems – Cold water, hot water and sanitation and drainage
- Tools and equipment – Use and maintenance

Guidance for delivery

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities

- Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

Ways of ensuring content is delivered in line with current, up to date industry practice

- Centres will need to ensure a realistic representation of plumbing systems and components are available
- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
- The provision must represent the type of equipment currently available in the UK ventilation industry
- Current and emerging plumbing technology should be included in delivery where possible

Suggested learning resources

Books

- The City & Guilds Textbook: Plumbing Book 2 for the Level 3 Apprenticeship (9189), Level 3 Advanced Technical Diploma (8202) and Level 3 Diploma (6035) (City & Guilds)
- Collins Complete Plumbing and Central Heating (Collins)
- Plumbing Encyclopaedia 4th edition RD (Treloar)
- Water Regulations Guide by **Laurrie Young** (Author), **Graham Mays** (Author)

Websites

- WaterSafe https://www.watersafe.org.uk
- https://www.wras.co.uk/
- National Careers Service https://nationalcareers.service.gov.uk/job-profiles/plumber
- CIPHE- **https://www.ciphe.org.uk/**
- Planning portal **https://www.planningportal.co.uk/**
- British Standards Institution **https://shop.bsigroup.com/**
- **https://www.pegleryorkshire.co.uk/**
- Association of Plumbing and Heating Contractors https://www.aphc.co.uk/
- **https://www.wras.co.uk/resources_for_applicants/**

Scheme of Assessment – Plumbing engineering

The Plumbing engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 20 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 - Plan the installation	Displays a breadth of knowledge and practical skills that enables them to carry out and plan for the installation of a plumbing system. Candidates will need to produce documents to industry standards that clearly states how they will carry out the installation.
Task 2 - Install, commission and decommission	Complete the given installation, commissioning and decommissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately Tools, materials and equipment are selected and used correctly. Consideration to environmental sustainability and recycling of materials. Techniques used to make building fabric repairs to restore work area to pre-installation condition. All work carried out in line with relevant manufacturer's instructions/ building regulations.
Task 3 – Carry out maintenance activity	Applies knowledge and practical skills in rectifying a fault in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	***High level tasks*** *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	**Assessment Theme**	***Typical evidence***
PO2 Install plumbing systems (40%)	T1- Planning the installation T2 – Install, commission, and decommission	Health and Safety	Risk assessments, PPE, Working safely
	T1- Planning the installation	Design and Planning	Method statements, installation diagrams, material lists, selecting types of systems and components, measuring and marking out
	T2 – Install, commission, and decommission	Systems and components	Using tools and equipment, cutting and bending pipe, jointing methods, prefabrication of pipe, positioning and securing component,
	T1- Planning the installation T2 – Install, commission, and decommission	Reports and information	Interpretation of drawings, specifications, manufacturer instructions

PO3 Commission plumbing systems (20%)	Task 2 - Install, commission and decommission Task 2 - Install, commission and decommission Task 2 - Install, commission and decommission Task 2 - Install, commission and decommission	Inspecting and testing systems and components Health and Safety Reports and information Handover/ communication	Soundness testing, leaks, commissioning checks Risk assessment, working safely, PPE Commissioning records Handover to customer
PO4 Maintain plumbing systems (23%)	T3 – Carry out Maintenance	Health and safety Working with faults Handover/ communication Reports and information	Risk assessment, working safely, PPE Fault diagnosis, client requirements, Repair and replace components, use of tools Communication with customer to diagnose fault Maintenance activity report
PO5 Decommission plumbing systems (17%)	Task 2 - Install, commission and decommission	Health and Safety Systems and components	Safe isolation process, safely isolate valves Extracting components, making good the building fabric, handling components and materials

357 Protection systems engineering

Level:	3
GLH:	570
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to know fundamental protection systems engineering processes and undertake key procedures. Learners will have the opportunity to plan, perform and evaluate their work while utilising a range of materials, methods and techniques.

Learners will develop their knowledge and understanding of, and skills in:

- Fundamental health and safety practices associated with carrying out protection systems engineering
- Electrical and electronic principles applicable to electronic protection systems
- Electronic protection systems and their purpose
- Information and data used in the protection systems industry
- Protection systems installation and commissioning
- Protection systems maintenance and decommissioning

Learners may be introduced to this specialism by asking themselves questions such as:

- What data and details are needed when planning protection system installations?
- What types of checks and adjustments may be required to protection systems during and after installation?
- Where is system data relating to protection system maintenance recorded?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:

1. Protection systems engineering knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:

2. Install protection systems
3. Commission protection systems
4. Maintain protection systems
5. Decommission protection systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills.

Specialism content

Outcome 1

Common knowledge criteria

Health and safety

1.1 **Safe working practices** specific to work on protection systems

Range:

Safe working practices - carrying out safe isolation before working on 230 V AC connections to systems and equipment, selection of appropriate tools for isolation in accordance with GS 38, discharge / disconnection of stand-by supplies, requirements for working with and disposing of chemical batteries and detection devices, requirements for working with fibre optic cables.

What do learners need to learn?	Skills
Safe working practices with reference to full, current industry recognised electrical safe isolation and lock-off procedures. Hazards and PPE associated with working with chemical and radioactive equipment, and fibre-optic cables.	EC5

Science

1.2 Electrical/electronic science principles

Range:

Electrical principles - relationship between voltage, current, resistance, and power in electrical circuits.

Resistive circuits - effects of series and parallel resistance in DC electrical circuits.

Circuit measurement - using a digital multimeter.

Capacitance – properties, construction, and function of capacitors.

Inductance - properties, construction, and function of inductors.

Transformers - properties, construction, and function of transformers.

Semiconductors - properties, construction, and function of semiconductor devices.

What do learners need to learn?	Skills
The properties of, and the relationship between, electromotive force (EMF), electric current and resistance. Reference to Ohm's law. Potential difference (PD), and the effects of voltage drop in DC circuits. Recognise SI symbols used to denote electrical properties. The material properties of conductors and insulators.	MC5 MC6

Power in DC electrical circuits.

Resolve simple problems using equations that relate voltage, current, resistance and power.

Recognise circuit symbols used to denote resistors.

The effects on an electrical circuit of series, parallel and series/parallel connected resistances. Resolve resistance circuit problems by calculation.

Use of a multimeter to measure voltage, current and resistance in low-voltage DC electrical circuits. Continuity testing. Testing components – resistors, capacitors, inductors, diodes, LEDs.

Construction and basic operation of capacitors. Factors affecting capacitance. Units of capacitance. Identify types and polarity of capacitors. Safety considerations when handling capacitors. Typical applications.

Calculations to determine value of capacitors and resolve series and parallel capacitor circuits.

Construction and basic operation of inductors. Factors affecting the value of an inductor. Units of magnetic flux, flux density and inductance. Reasons for, and effects of, back EMF in inductors. Methods of suppressing the back EMF. Typical applications.

Methods of determining the field polarity around an inductor. Self-inductance and mutual inductance. Calculations to determine flux density, induced EMF, self-induced EMF and mutual induced EMF.

Construction and basic operation of transformers. Typical applications.

Calculations to determine the effects of transformer turns ratio on voltage and current.

Basic construction, operation and function of the listed semiconductor devices. Recognise common devices, and the means of identifying polarity. Typical applications.

Semiconductor devices: silicon diode, light emitting diode (LED), NPN bipolar transistor.

Tools, equipment and materials

1.3 **Tools** and **equipment** used when working with protection systems

Range:

Hand tools - rules, levels, gauges, plumb lines, cable cutters, wire cutters, pliers, screwdrivers, wire strippers, knives, files, wrenches, hammers, saws, data cabling crimps, insulation displacement tools.

Power tools - hammer drills, pillar drills, electric screwdrivers.

Equipment - multimeter, RF signal strength meter, network cable tester, insulation resistance tester, smoke hoods, smoke cannisters, testing/commissioning equipment, programming devices, programming software.

What do learners need to learn?

Selection of correct hand and power tools and equipment required to complete work activities associated with protection systems, taking into consideration the safe and correct use of the equipment and suitability of tools and equipment matched to specific task, in line with manufacturer's instructions.

Safety checks may include checking equipment is safe to use, appropriate instrument leads selected for the test, correct speed setting, correct attachments, attached correctly, guards in place, use of correct PPE.

1.4 Operation and handling requirements of tools and commissioning equipment

What do learners need to learn?

User checks, calibration checks, operation/function of equipment.

Protection systems

1.5 Types of **protection systems, signalling and notification**

Range:
Protection systems - fire detection systems (conventional, addressable), access control systems, video surveillance (CCTV), intruder and hold up alarm systems (I&HAS), and addressable emergency lighting systems.

Signalling and notification - Specifications and devices used for signalling and notification in protection systems.

What do learners need to learn?

Reference to guidance on different types of protection systems used in different building environments. Reference must be made to relevant British Standards and manufacturer's literature. This will range from conventional basic systems to intelligent digital addressable systems at different voltage levels.

The relationship of fire detection and security systems to the fire and security industry, and the requirements and implementation of security risk assessments.

Devices employed for local audible and visual signalling in protection systems. Standards and requirements for each of these devices.

Methods, and equipment required, for remote signalling to an alarm receiving centre (ARC). Standards and requirements for each of these devices.

Methods, and equipment required, for private signalling (speech dialler, mobile app's)

1.6 Protection system **components**

Range:
Components - control equipment, indicating equipment, detection devices, sensing devices, manually operated devices, warning and signalling devices, cameras, recording equipment, monitoring equipment, door locking devices, door release devices, door lock override devices, power supply back-up devices/components.

What do learners need to learn?	**Skills**
Selection and location of components suitable for environment, system and function. Consideration of fire and smoke patterns in and around buildings in relation to fire detection systems. Consideration of system grade for I&HAS. Method of determining system grade, and effect on selection of components and equipment. Consideration of coverage patterns for detectors and cameras. Standby batteries. Regulations relating to standby batteries relevant to the system type and grade. Use of UPS for standby applications for equipment such as NVR's, administration PC's and servers.	DC1 DC5 DC6

1.7 Protection system **circuits**

Range:
Circuits - open loop, closed loop, fully supervised loop (FSL), addressable, radial, audio/visual circuit, communication data buses (i.e. RS 485, RS 422, RS 232, USB), wireless, AC and DC supplies.

What do learners need to learn?	**Skills**
Circuit properties including suitability, applications, advantages and limitations for given protection system. Data bus topologies and connection. Effects of series and parallel resistances and configurations. Effects of voltage drop.	MC7

Specific knowledge criteria for performance outcomes

System installation (Outcome 2)

1.8 Methods of selecting and installing **cable installation and wiring support systems**

Range:

Cable installation and wiring support systems - single and multi-core thermoplastic cable, FP200 – fire resistant cable, data cable CAT5e/6e, coaxial, cable tray, cable conduit (steel and PVC), cable trunking (steel and PVC), ladder racking, cable basket.

What do learners need to learn?	**Skills**
How to install cables and containment in line with current legislation and industry practices. Need for segregation of particular cable systems. When installing cables consideration should be given to building regulations, manufacturer's instructions and British Standards. Selection of cable suitable for current capacity, voltage drop limitations, signal transmission type, and environment. Selection of wiring support system suitable for environment, type and quantity of cables, and availability of fixing methods.	EC4

1.9 Termination of **cables**

Range:

Cables - single and multi-core thermoplastic cable, FP200 – fire resistant cable, CAT5e/6e data cable, UTP and STP data cables, coaxial, shielded data cable.

What do learners need to learn?

Termination and securing of cable glands detailed in the range in line with specification requirements and current industry standards/working methods. When securing terminations consideration should be taken of Building Regulations, manufacturer's instructions and British Standards.

1.10 Methods of **terminating and connecting** conductors

Range:

Terminating and connecting - screwed, crimped, compression, insulation displacement, clamp.

What do learners need to learn?

Termination and connection of conductors as detailed in the range in line with specification requirements and current industry standards/working methods. When securing terminations/connections consideration should be given to building regulations, manufacturer's instructions and British Standards.

Consideration of advantages and limitations of termination and connection methods and consequences of poor connections.

Shape and type of material being connected, junction of materials and volume/number of conductors.

1.11 Methods of supporting protective system components

What do learners need to learn?

Selection of appropriate fixing methods, considering load bearing, environment, building structure/materials and aesthetics.

System commissioning (Outcome 3)

1.12 Inspections of protection systems

What do learners need to learn?

Standard procedures and processes for completing visual inspections of electronic protection systems in line with current standards and codes of practice. Consideration should also be given to O&M manuals.

1.13 Testing of protection systems

What do learners need to learn?

Tests to be carried out on electronic protection systems in line with relevant current standards and codes of practice, and manufacturers documentation.

Functional tests and commissioning to manufacturer's specifications and system requirements. Identification of expected and incorrect test values, and potential implications of incorrect test values.

Skills
DC1
DC4

1.14 Verification of protection systems

What do learners need to learn?

Verifying compliance with system design and manufacturers specifications, and relevant current standards and codes of practice. Completion of documentation relevant to the protection system, and importance of documentation/O&M manual handover to end user.

System maintenance (Outcome 4)

1.15 Types of protection **system maintenance**

Range:

System maintenance - planned and preventative maintenance (PPM), reactive maintenance.

What do learners need to learn?
Legal requirements relating to PPM, responsibilities for undertaking maintenance regimes. Advantages and limitations of PPM and reactive maintenance. Requirements for completing documentation and updating O&M manuals. The tests that must be carried out during a maintenance activity for each of the listed protection systems.

1.16 **Fault-finding** and **rectification techniques**

Range:

Fault-finding techniques - identification of symptoms, collection and analysis of data, use of sources/types of information (circuit schedule, installation specifications, drawings/diagrams), determining nature/characteristics of faults through discussion and questioning, checking and testing, analysis of results/information.

Rectification techniques - repair, replace, adjust.

What do learners need to learn?	Skills
Safe working procedures following evaluation and the application of appropriate and logical fault diagnosis methods and techniques. Diagnosis of electrical, electronic and software related faults using engineering decisions and evaluation of symptoms and findings. Appropriate and efficient action(s) that should be recommended to rectify faults.	MC2

1.17 Maintenance requirements for different **building types** and locations

Range:

Building types - private, commercial, HMO's, residential.

What do learners need to learn?	Skills

Regulations concerning set systems to put in place in relation to different types of premises. Some types of buildings are covered by specific, specialist regulations and control measures (hospitals, chemical plants, paint stores).	EC5

1.18 Maintenance of older systems and installations

What do learners need to learn?

Identification of older systems that may not be compliant with current regulations and reporting on condition and suitability for continued use.

System decommissioning (Outcome 5)

1.19 Making systems safe to decommission

What do learners need to learn?

Isolation of systems from the supply source or outgoing integrated services, for example automatic shutters or door releases.

Handling of materials to protect their integrity and safety during decommissioning. Removal of pre-installed components from protection systems.

Reconfiguration of protection systems during the decommissioning process. Categorisation of waste produced during the decommissioning process.

Use of construction materials to make good the building fabric following component or system removal.

1.20 Methods of identifying potential issues before decommissioning systems

What do learners need to learn?	**Skills**
Methods including reviewing O&M manuals, and consultation of component data sheets and drawings. Benefits of devising a timely plan when decommissioning systems.	MC2 EC5

Outcome 2 - Install protection systems

Performance criteria

2.1 Assess risk associated with tasks

What do learners need to learn?	Skills
Assessment of risk may relate to the production or review of a risk assessment for installation activities, with consideration of specialist equipment required, in accordance with the five stages of assessment: • Identification of hazards • Identification of who is at risk and how • Assessment of risk and action • Recording of findings • Review of risk assessment Risks will vary depending on the protection system being installed. Consideration should be given to recording of risk assessment findings in line with regulations as well as responsibilities of employees versus employers.	EC4 EC5

2.2 Collect and collate **information** required to complete tasks

Range:

Information - manufacturer's instructions, data sheets, building regulations, drawings, BS -EN standards, relevant codes of practice, inspectorate standards.

What do learners need to learn?	Skills
Information may include drawings and plans or any relevant information as identified in the range and will relate to the contract/required system. Review information to ensure its accuracy and validity, including suitability of equipment being installed. Interpreting data from sources in order to correctly carry out the installation process. As part of this, the importance of currency of standards and guidance documents, and whether they are subject to change. Referring to design specifications and manufacturer data sheet with specific criteria regarding equipment and components required in a system.	EC4 EC5

2.3 Select tools, equipment and materials to complete tasks

What do learners need to learn?

Select the correct materials and hand/power tools or specialist equipment required to complete work activities associated with protection systems, taking into consideration the safe use of the equipment and suitability of tools and equipment.

2.4 Inspect the suitability of plant for use, including tools, materials and equipment

What do learners need to learn?

Inspect and use hand and power tools safely – using specific tools required to complete different parts of tasks as required. Power tools, plant and equipment checked in accordance with current statutory and non-statutory regulations and codes of practice.

2.5 Analyse formal and informal information to identify potential causes of delays and errors

What do learners need to learn?	**Skills**
Delays and errors may include the work site not being ready, having incorrect drawings, insufficient materials, resources. Learners should review available progress plans such as Gantt charts/critical path analysis tracking, as well as site meeting notes to discuss progress, detailing any causes for concerns.	MC2 MC6 MC7 EC4 EC5

2.6 Think creatively to adapt designs appropriately to minimise delays and errors

What do learners need to learn?

Engineering situations to suit different environments and un-planned situations, after consultations with site managers and designers, for example where site conditions are different from information provided. This could be through fabrication alterations or cable routes/sizes that require these amendments, or alterations once approved need to be formalised on the associated drawings/plans.

2.7 Mark out the position of equipment

What do learners need to learn?	Skills
Positioning and securing components, for example detection and monitoring equipment locations in line with specification requirements and current industry standards/working methods, smoke patterns and building features/layout. When positioning, consideration should be given to plans/drawings, building regulations, manufacturer's instructions and British Standards. Consideration given to influences from other installed equipment such as heat producing equipment, steam or external influences such as direct sunlight. Appropriate fixings must be used to ensure security of components and checks should be made to ensure components are level and secure following positioning.	MC1 EC5

2.8 Use tools, equipment and materials to carry out **tasks**

Range:

Tasks - installing wiring and containment systems, connecting equipment.

What do learners need to learn?
Setting up and using the correct hand and power tools, plant and equipment required to complete work activities on associated protection systems, taking into consideration safe use of the equipment and suitability of tools and equipment, including suitable PPE, matched to specific tasks.

2.9 Install cable containment systems

What do learners need to learn?	Skills
Engineering cable and containment installations – to include the measuring and cutting of materials (conduit, trunking, basket and tray) to required length as detailed in the job specification. Materials should be cut using appropriate cutting equipment with consideration given safety, materials and equipment available. Consideration should also be given to site restrictions such as space and potential mess when cutting. Handling materials such as metal and plastic containment systems and different cable types. When handling, relevant PPE must be worn and selected, and material data sheets reviewed, where information given must be followed to ensure the safety of the user and correct installation of components.	MC1

2.10 Install cabling

What do learners need to learn?

Install cables within containment systems or on support systems using appropriate methods for drawing in, laying and securing. Suitable considerations to protection of cables during installation.

Suitable means used to identify cables.

2.11 Connect equipment to the installed wiring systems

What do learners need to learn?	**Skills**
Connecting/fixing protection system components together using appropriate methods of fixing as listed in the design specification/manufacturers details (call points, detectors, control equipment). with consideration given to material type, materials, and equipment reviewing safety requirements. Appropriate fixings must be used to ensure security of components, and checks should be made to ensure components are level and secure following positioning.	MC1

2.12 Terminate and connect cables and conductors

What do learners need to learn?

Terminate and secure cable glands (armoured, insulated, coax and data cables) and conductors in line with specification requirements and current industry standards/working methods.

When securing terminations consideration should be given to external influences, building regulations, manufacturer's instructions, and British Standards. Appropriate glands and connections/terminations must be used to ensure security of cable types. Checks should be made to ensure termination glands/connections are level and secure, with no exposed conductors.

Outcome 3 - Commission protection systems

3.1 Prepare for inspection, testing and commissioning

What do learners need to learn?	Skills
Gathering the information necessary for detailed inspection, testing and commissioning of protection systems including manufacturers data, design information, tolerances, drawings and charts.	EC4 EC5

3.2 Inspect protection systems

What do learners need to learn?
Standard procedures and processes for how to complete visual inspections of electronic protection systems as per relevant current standards and codes of practice. Consideration should also be given to O&M manuals.

3.3 Test protection systems

What do learners need to learn?	Skills
Tests to be carried out on electronic protection systems in accordance with relevant current standards and codes of practice, and manufacturers documentation Tests to be carried out on protection systems as per relevant current standards and codes of practice. Learners must select the appropriate instrument for each test to be carried out in terms of: • ensuring the instrument is fit for purpose • verifying calibration. • identifying the correct scale or setting	MC1 MC2 MC4

3.4 Analyse and interpret information and data from ICT applications

What do learners need to learn?	Skills
Interpreting information obtained from digital sources and from testing protection systems. Analysis and interpretation may involve the use of computer programs and packages and reviewing project management literature and plans to ensure compliance of the system. Why it is necessary for test results to comply with standard values, and actions to be taken in the event of unsatisfactory results being obtained.	MC6 DC1 DC4 DC5

3.5 Adjust protection systems equipment as required by installation standards

What do learners need to learn?	Skills
Considering relevant adjustments required in relation to system requirements (adjusting settings of sensors, detectors, cameras) with reference to manufacturer's information, and design specification for adjustment parameters. Making adjustments with consideration of industry standards and requirements.	DC4 EC5

3.6 Complete **documentation** relevant for tasks

Range:

Documentation - system test record, Certificate of Conformance, as fitted document, handover acceptance.

What do learners need to learn?	Skills
Completing all relevant sections/information that must be included on initial verification documentation. Following certification processes for a completed installation, with consideration given to responsibilities of relevant personnel in relation to the completion of the certification process. Learners must follow requirements for the recording and retention of completed commissioning documentation in accordance with relevant standards, codes of practice.	EC1 EC2 EC3 EC4 DC2

3.7 Use oral and non-verbal communication skills to demonstrate system operation

What do learners need to learn?	Skills
Making reference to O&M manuals as well as manufacturers information when conveying information on the operation of systems to client and users. Information handed over to client and/or users. Use of techniques to ensure understanding, including user demonstration and explanation.	EC1 EC2 EC3 EC6 DC3 DC5

3.8 Update digital building information management system software and/or O&M manuals

What do learners need to learn?	Skills
Updating relevant system software may include using different types of program (word processing, email, spreadsheets), CAD, PLC's BMS software. Information relating to both basic and advanced systems. Ensuring operational and maintenance manuals are complete and reflect the 'as fitted' work undertaken.	DC1 DC2 DC3 DC5 DC6

Outcome 4 - Maintain protection systems

4.1 Communicate health and safety risks to stakeholders orally

What do learners need to learn?	Skills
Communicating with stakeholders in line with system maintenance, for example explaining unsafe situations and the risks associated with them. Communications may relate to the production of a risk assessment for maintenance activities and explaining relevant content of the risk assessment to stakeholders.	EC1 EC2 EC6

4.2 Sequence activities required to complete task including planning to isolate electrical supplies and informing relevant people where required

What do learners need to learn?	Skills
Follow correct sequence of activities to complete a maintenance task: • select tools/equipment • obtain method statement/work order • carryout safe and secure isolation (including getting permission to isolate) • remove Isolation • identify checks to be made before working on equipment with the 230 V AC supply connected. Checks to include correct location of all barriers, no damage to barriers or insulation, no modifications to the equipment electrical supply which have not been approved by the equipment manufacturer. • carry out maintenance activities • functional testing	MC10

4.3 Allocate time and resources to complete the task including materials required

What do learners need to learn?	Skills
Review sequence of maintenance activities as detailed. With application of appropriate timings for each stage. Liaison with stakeholders to agree timings to minimise disruption and enhance safety. Sequence of activities to complete a maintenance task: • select tools/equipment • obtain method statement/work order • carryout safe and secure isolation (including getting permission to isolate) • remove Isolation • identify checks to be made before working on equipment with the 230 V AC supply connected. Checks to include correct location of all barriers, no damage to barriers or insulation, no modifications to the equipment electrical supply which have not been approved by the equipment manufacturer. • carry out maintenance activities • functional testing	MC1 MC2

4.4 Collect system data from ICT applications

What do learners need to learn?	Skills
ICT, including use of computers, digital transmission over IP, email and mobile communication technology for the collection of data and completion of work sheets/maintenance sheets.	MC6 DC4 EC3

4.5 Record system data

What do learners need to learn?	Skills
System data may include work records or equipment maintenance sheets etc. Familiarity with records of work, including preventative maintenance and reactive maintenance requirements. Inspection and test schedules may be company or system specific, so awareness is needed of documentation required to be completed for maintenance activities.	EC1 EC3

4.6 Test equipment to ensure it is safe to work on

What do learners need to learn?	Skills
Check to ensure safe isolation has been carried out correctly and that any stored charge within the equipment has been discharged. Identify checks to be made before working on equipment with the 230 Vac supply connected. Checks to include correct location of all barriers, no damage to barriers or insulation, no modifications to the equipment electrical supply which have not been approved by the equipment manufacturer.	DC1

4.7 Inspect, test and analyse information to identify potential faults

What do learners need to learn?	Skills
Inspection for potential faults on system components through visual inspection of system, operational checks, feedback from system users and performance, testing to gather information to be used as part of analysis of situation. Collating all available information and analysing regarding any possible or potential faults. Reference may also be made to manufacturer's instructions or specifications (fault-finding flow chart or detailed procedure). Checking system performance criteria for correct settings, readings, or maximum/minimum permitted standards. Analyses of conditions that affect suitability of protective systems such as alterations to building, structure or equipment.	MC1 MC2 MC6 DC4

4.8 Think creatively to propose solutions for installation faults

What do learners need to learn?	Skills
Using analysis, develop strategic, economic and practical methods for rectifying identified possible or potential faults. Installation faults and issues may include deteriorating or outdated equipment over time and having contingency plans in place for equipment that is no longer manufactured. Site inventory is required with all equipment details assigned including age. Storage of spare parts is required for equipment and parts of systems that may fail due to a number of reasons. Contingency budget planning needs to be reviewed regularly with consideration given to performance levels of existing equipment and plant.	MC6 DC4 MC9

4.9 Communicate written technical advice and guidance to technical and non-technical stakeholders

What do learners need to learn?	Skills
Communicate with stakeholders and obtain necessary permissions to rectify faults, prolong potential faults or improve systems for changing conditions. Convey information (safety considerations, system maintenance requirements) to inform and educate stakeholders with a specific focus on ensuring all stakeholders are aware of health and safety responsibilities. Be able to overcome potential barriers to successful communication with specific reference to language and methods used for both technical and non-technical stakeholders.	EC1 EC3 EC6 DC3 DC5

4.10 Replace **components** of protection systems

Range:

Components - sensors, detectors, control equipment, signalling equipment, monitoring equipment, power supplies.

What do learners need to learn?
Replace components within a protection system as necessary to meet industry and task-specific requirements. Consideration should be given to safe/appropriate disposal of replaced components, ensuring correct adjustment (where required) of replacement components to maintain system specification, ensuring replacement component grade (where applicable) is equal to or better than the original, and ensuring all work has been recorded or records of work updated including O&M manuals.

Outcome 5 - Decommission protection systems

5.1 Communicate with stakeholders to ensure required information is available to undertake tasks using electronic communication

What do learners need to learn?	Skills
Information on systems used in the tracking and monitoring site/contract progress. Communications may include use of software packages (word processing, email, spreadsheets). Information sources may include CAD, PLC's BMS software, and also information relating to both simple and complex systems.	EC1 EC4 EC6 MC7 DC3 DC5

5.2 Make systems safe to work on including safe isolation and discharging stored charge

What do learners need to learn?

Carry out safe isolation procedures and ensure that any charged storage devices such as power supplies are discharged before commencing work on decommissioning.

5.3 Remove protection systems and maintain records

What do learners need to learn?

Remove all redundant equipment and wiring of the protection system with consideration given to categorising waste produced during the decommissioning process.

Use construction materials to make good the building fabric following component or system removal. Update and change records to reflect work undertaken.

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context:

Common core content

- Construction science principles – Electricity Principles, Heat Principles, Light Principles, Acoustic Principles
- Construction sustainability principles - Energy production and energy use
- Building technology principles - Internet of things
- Construction information and data principles - Key elements of data

BSE specific core content

- Digital technology in construction - Internet of things, digital engineering techniques, opportunities for the use of technology used in other industries and contexts and adapting for use in construction and the built environment
- Health and safety - BSE Regulations, safe working practices for the safe isolation of systems
- Building Services Engineering (BSE) systems - Electrotechnical principles of components, types of control systems, types of monitoring systems, types of electrical supply, types of earthing arrangements, cable types and sizes, accessories and equipment used in older electrical installations
- Information and data - Drawings, circuit diagrams and schematics, data storage, security and protection, programming and set up of digital systems using IT resources

Guidance for delivery

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities

- Practical - Use of pre-set formative assessments to carry out tasks and record on standardised form.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

Ways of ensuring content is delivered in line with current, up to date industry practice

- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
- Teaching coverage must represent the type of equipment currently available and accepted for use in the UK industry
- Current and emerging testing and programming methods should be included in the delivery where possible

Reinforcement of learning – revisiting learning, group discussions, peer support system

Suggested learning resources

Books

- The City & Guilds Textbook: Book 1 Electrical Installations for the Level 3 Apprenticeship (5357), Level 2 Technical Certificate (8202) & Level 2 Diploma (2365)
  Author: Peter Tanner
  Publisher: Hodder Education (28 Sept. 2018)

ISBN-13: 978-1510432246

- The City & Guilds Textbook: Book 2 Electrical Installations for the Level 3 Apprenticeship (5357), Level 3 Advanced Technical Diploma (8202) & Level 3 Diploma (2365)
  Author: Peter Tanner
  Publisher: Hodder Education (25 Jan. 2019)
  ISBN-13: 978-1510432253
- Requirements for Electrical Installations, IET Wiring Regulations, Eighteenth Edition, BS 7671:2018 (Electrical Regulations)
  Author: The Institution of Engineering and Technology
  Publisher: Institution of Engineering and Technology; 18th Edition (2 July 2018)
  ISBN-13: 978-1785611704
- Closed Circuit Television
  Author: Joe Cieszynski
  Publisher: Newnes; 3rd edition (28 Dec. 2006)
  ISBN-13: 978-0750681629
- Intruder Alarms
  Author: Gerard Honey
  Publisher: Newnes; 3rd edition (Jan. 2007)
  ISBN-13: *9780750681674*
- Electricians Guide to Fire Detection and Alarm Systems
  Author: P. R. L Cook
  Publisher: The Institution of Engineering and Technology (IET) (2014)
  ISBN-13: 1849197636, 9781849197632

Websites

- Institute for apprenticeships and technical education **https://www.instituteforapprenticeships.org/**
- National Careers Service **https://nationalcareers.service.gov.uk/job-profiles/security-systems-installer**
- Security Systems and Alarms Inspection Board (SSAIB)- **https://www.ssaib.org**
- National Security Inspectorate (NSI)- **https://www.nsi.org.uk**
- Institute of Engineering and Technology (IET) **https://electrical.theiet.org/bs-7671/**
- Health and Safety Executive **https://www.hse.gov.uk/electricity/**
- Safety Electrical First- **https://www.electricalsafetyfirst.org.uk/**
- Electrical Times- **https://www.electricaltimes.co.uk/**
- Sparks magazine (for trainees)- **https://www.sparks-magazine.co.uk/**
- Electrical Trade Magazine- **https://www.electricaltrademagazine.co.uk/**
- Fire & Security matters- **https://www.fsmatters.com/Home**

Scheme of Assessment – Protection Systems engineering

The protection systems engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 15 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 - Plan the installation	Displays a breadth of knowledge and practical skills that enables them to carry out and plan for the installation of an electronic security or emergency system. Candidates will need to produce documents to industry standards that clearly state how they will carry out the installation.
Task 2 - Install, commission and decommission	Complete the given installation, commissioning and decommissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately Tools, materials and equipment are selected and used correctly. Consideration to environmental sustainability and recycling of materials. Techniques used to make building fabric repairs to restore work area to pre-installation condition. All work carried out in line with relevant standards, codes of practice, and manufacturer's instructions.
Task 3 – Carry out maintenance activity	Applies knowledge and practical skills in locating and rectifying faults in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	***High level tasks*** *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	**Assessment Theme**	***Typical evidence***
PO2 Install protection systems (29%)	T1 Planning the installation T2 Installation, commissioning and decommissioning	Health and Safety Design and planning Systems and components Reports and information	Assessment of risk, PPE, working safely Method statements, plans and drawings, material lists Using tools and equipment, installation of wiring components Interpretation of drawings, specifications, manufacturer instructions
PO3 Commission protection systems (28%)	T1 Planning the installation T2 Installation, commissioning and decommissioning T3 Carrying out maintenance	Health and Safety Systems and components Reports and information Inspection and testing Handover and communication	Assessment of risk, PPE, working safely Using tools and Using tools and equipment, installation of wiring components Documentation completion Inspection and testing checks Handover to customer
PO4 Maintain protection systems (31%)	T2 Installation, commissioning and decommissioning T3 Carrying out maintenance	Health and safety Systems and components Reports and information	Assessment of risk, PPE, working safely Repair/replace components, use of tools Documentation completion

Performance outcome and weighting (%)	*High level tasks* *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	Assessment Theme	*Typical evidence*
		Handover and communication Working with faults	Communication with customer to diagnose fault Fault diagnosis, fault rectification
PO5 Decommission protection systems (12%)	T2 Installation, commissioning and decommissioning T3 Carrying out maintenance	Health and Safety Systems and components	Safe isolation procedures Extracting components, handling / disposing of components and materials

358 Refrigeration engineering

Level:	3
GLH-combined with Air conditioning (351):	700
Assessment method:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to learn about and undertake fundamental refrigeration work. Learners will have the opportunity to plan, perform and evaluate their work while utilising a range of materials, methods and techniques.

Learners will develop their knowledge and understanding of, and skills in:

- Installing, commissioning and maintaining refrigeration systems
- The hazards, health and safety and environmental requirements when working on a refrigeration system
- Identifying and selecting the correct tools and equipment for a specific task.
- Fabricating pipework and pressure testing a refrigeration system to ensure it is leak-free
- Fault-finding mechanical and electrical problems in refrigeration systems

Learners may be introduced to this specialism by asking themselves questions such as:

- How does a refrigeration technician minimise the environmental impact of a refrigeration system?
- What are the requirements of the F-Gas regulations?
- What tools and equipment does a refrigeration technician need?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:

1. Refrigeration knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:

2. Install refrigeration systems
3. Commission refrigeration systems
4. Maintain refrigeration systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills.

Specialism content

Outcome 1

Common knowledge criteria

1.1 Types of **fluids**

Range:
Fluids - primary refrigerants (CFCs, HCFCs, HFCs, HFOs, HCs, natural), secondary refrigerants (glycols), lubricants (mineral, synthetic), refrigerant vapour/liquid, saturated refrigerant fluids.

What do learners need to learn?

How to identify the refrigerant state at different parts of the system covering saturated, superheated and subcooled conditions using temperature and pressure values around a refrigeration system.

The range of primary refrigerants in use.

The difference between a primary and secondary refrigerant and a mineral and synthetic oil.

What miscibility is and how oils behave in various volume flow and fluid velocity situations and its impact on oil return to the compressor. Suction risers for oil return

Different types of liquids and gases, how they flow and the effect of different pipe sizes on flow. The effect of pressure drop on system performance and how it can change specific volume of gases.

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1.2 The safe recovery, recycling and disposal of equipment and hazardous waste transfer

What do learners need to learn?

Classification of waste.

Methods of safe recovery, recycling and disposal of equipment.

The safe recovery of refrigerant (using the F-Gas regulations as a benchmark) from a system, for its re-use, its recovery for legal destruction and recovery for reclaiming and resale.

Disposal of recovered fluids such as oil, ammonia-contaminated water, secondary refrigerants

Safe electrical isolation, and removal and disposal of waste electrical equipment

Regulation and law applicable to waste disposal. Includes the Environmental Protection Act, F-Gas Regulation, and the Waste Electrical and Electronic Equipment (WEEE) regulations.

Mandatory paperwork associated with any hazardous waste transfer and refrigerant recovery.

Legislation, regulations and standards

1.3 Key requirements of **environmental legislation**

Range:
Environmental legislation - Climate Change Act, Control on Ozone-Depleting Substances, F-Gas Regulations, Environmental Protection Act, Hazardous Waste Regulations.

What do learners need to learn?	**Skills**
The key requirements of current environmental legislation and their relation to refrigeration systems. The responsibilities under the requirements of the legislation. The emphasis on phasing out of environmentally damaging refrigerants Good practice of achieving zero leaks on refrigeration systems Ensuring system pressure access is undertaken with minimal loss	EC4 EC5

Refrigeration systems

1.4 **Processes** of refrigeration cycles

Range:
Processes - temperature scales (Celsius, Kelvin), laws of thermodynamics (first law, second law), heat transfer (conduction, convection, radiation), latent heat processes (melting, fusion, freezing, sublimation, condensation, evaporation, boiling), sensible heat processes (superheating, sub-cooling), evaporation, compression, condensation and expansion processes.

What do learners need to learn?

Celsius and Kelvin temperature scales and their conversion

The laws of thermodynamics and their relationship to the refrigeration system and how heat is transferred (conduction, convection and radiation) to effect latent heat (including sublimation and fusion) and sensible heat processes.

The four main components of the refrigeration system and their role in the cycle.

How the processes of heat transfer are accomplished. How latent heat and sensible heat processes are vital to the efficient operation of the cycle.

1.5 **Performance parameters** for running a refrigeration cycle

Range:
Performance parameters - suction and discharge pressures, saturated suction / discharge temperatures, superheat, subcooling, storage set-points, running currents, refrigerants (HFC, HC, HFO, natural).

What do learners need to learn?

Different refrigeration systems, including cold storage (-20°C room temperature), blast freezing (-40°C, utilising individual quick freezing (IQF), blast freezers, spiral freezers, IQF tunnels), chilled storage (3°C including blast chilling) and liquid chillers (utilising low-, medium- and high-temperature secondary refrigerants).

Choice of refrigerants for different tasks (low-, medium- and high-temperature applications).

Optimising the system for the most efficient operation (low condensing temperatures and high as possible evaporating temperatures for the application).

That optimised running conditions result in the least electrical consumption.

1.6 Refrigeration system **components**

Range:

Components:

- **Compressors** - reciprocating, rotary vane, scroll, centrifugal.
- **Condensers** - air, liquid cooled, evaporative.
- **Evaporators** - forced draft, induced draft, natural convection, liquid cooling, direct expansion, flooded.
- **Expansion devices** - capillary tube restrictor, thermostatic expansion valves (internally and externally equalised), linear/electronic expansion valves, liquid level control.
- **Ancillary components** - liquid and suction line driers, pressure relief valves, strainers, oil separators, moisture indicating sight glass, service valves.
- **Storage vessels** - suction line accumulator, high-pressure receivers.
- **Control valves** - four way reversing, solenoid, evaporator, crankcase, differential pressure regulators, non-return valves.
- **Fans** - axial, propeller, centrifugal.

What do learners need to learn?

The function of a compressor.

The operating principles of reciprocating, screw, rotary, scroll and centrifugal compressors. Their configurations (open, hermetic, semi-hermetic) and typical applications.

The function of a condenser.

The operating principle of air cooled, water cooled, and evaporative condensers as well as their typical applications.

The function of an evaporator.

The operating principles of forced and induced draught, natural convection, and liquid cooled evaporators. Linked to metering devices below, know the difference between flooded and direct expansion feeds to an evaporator.

The function and operating principles of a metering device.

The operating principles of a capillary tube restrictor, thermostatic expansion valve (internal and external equalisation), electronic expansion valve (pulse and linear) and low-side float valve.

The function and operating principles of a variety of ancillary devices including sight glasses, driers (suction and liquid line types), service valves and oil separators.

The function of system storage pressure vessel such as a liquid receiver, a suction accumulator and a surge drum in industrial and commercial systems.

The function and operating principles of four-way reversing valve, solenoid valve, evaporator

and crankcase pressure regulators, non-return valves in industrial and commercial systems.

The function and operating principles of axial, propeller and centrifugal fans along with the range of electric motors used to drive them.

1.7 Types of components for **refrigeration systems**

Range:
Refrigeration systems - direct expansion, flooded, pump overfeed, cascade, compound, booster, trans-critical, blast freezing, cold storage, chill storage.

What do learners need to learn?

The different types of components and their suitability in different situations to meet differing client needs.

Flooded evaporators and the need for a surge drum and associated level control system.

Pumped overfeed systems, the importance of recirculation ratio and where such systems are used.

Cascade systems, their operating principles, where they are used and common refrigerant combinations.

Compound systems, the operating principles, and comparisons with single stage and economised operation particularly in terms of efficiency.

CO2 systems in trans-critical operation, where used, pressure range, triple point, and environmental factors

Blast freezing, typical design, expected evaporating temperatures and air velocity, commercial and industrial systems.

Cold storage systems, system types, cold store temperature range (product and regulation dependent), and expected heat loads

Chill storage, the issues of product degradation due to improper conditions (temperature and or air flow), temperature range dependent on product

1.8 The **operating principles** for **defrost systems**

Range:
Operating principles - initiation, termination, defrost sequence.

Defrost systems – off-cycle, electric, hot gas, saturated gas.

What do learners need to learn?

The different types of defrost system used in the refrigeration industry and their control systems.

Why to defrost, the reasons ice accumulates on evaporator surfaces and the impact of ice on evaporator performance.

Off-cycle defrost, use of low-pressure switch, thermostat, air flow pressure differential sensing and where used

Electric defrost, methods of initiation and termination, sequence of operation and determination of frequency.

Hot gas defrost, uses sensible heat from discharge only, small systems including domestic refrigeration.

Saturated (latent heat) defrost, system design, including reverse cycle, use in industrial and commercial systems

1.9 Methods to apply **ideal gas laws**

Range:
Ideal gas laws - Boyle's law, Charles' law, combined gas law, Dalton's law.

What do learners need to learn?

Methods to apply the gas laws for common refrigeration operations such as evacuation and pressure testing, and when adaptations to a refrigeration system are needed.

Units of pressure (pascal, bar, millimetres of Hg, torr), pressure scales (absolute, gauge, vacuum).

The gas laws – Boyle's, Charles's (Gay Lusak), Dalton's, and how the combined gas law is derived.

1.10 How to show a **refrigeration cycle** on pressure-enthalpy charts

Range:
Refrigeration cycle - evaporation, compression, condensation, and expansion processes. Refrigeration effect, compressor work done, total heat rejection, dryness fraction, subcooling, useful and non-useful superheat.

What do learners need to learn?

The pressure enthalpy chart, overview of the chart as a theoretical tool, its layout in terms of zones, identifying pressure, enthalpy temperature, specific volume, entropy and quality lines.

Gauge and absolute pressure conversion.

Plot a refrigeration cycle on a pressure-enthalpy chart given system operating values and identify the key thermodynamic processes. These include work done by the compressor, evaporator and condenser.

From the system plot calculate a range of variables which must include enthalpy, work done by the compressor, evaporator and condenser, identification of useful superheat, and quality of the refrigerant at the metering device outlet.

1.11 Interpret refrigeration **data** from pressure-enthalpy charts

Range:
Data - work done, refrigeration effect, total heat rejected, coefficient of performance, mass flow rate, pressure ratio, compressor power input, specific volume at suction, cooling capacity, heating capacity (total rate of heat rejection).

What do learners need to learn?

How to perform calculations using refrigeration data on pressure-enthalpy charts to determine cooling capacity, refrigerant flow rate, total heat rejection and compressor swept volume.

From the system plot calculate a range of variables, which must include enthalpy, specific volume at the suction inlet, discharge temperature, work done by the compressor, evaporator and condenser, calculate coefficient of performance, identify useful superheat, quality of the refrigerant at the metering device outlet, and compression (pressure) ratio. Additional calculations include system refrigeration capacity given a duty, refrigerant mass flow rate and compressor swept volume.

Skills
MC5
MC2
MC4

1.12 The **properties** of air and how they are changed by vapour compression systems

Range:

Properties - air temperature, moisture content.

Vapour compression systems - split system for a single room cooling application, fruit and vegetable chill store system, freezer cold room system.

What do learners need to learn?

How a vapour compression system will alter the air temperature and moisture content and the effect this has on the storage of produce.

1.13 **Ideal properties** of **refrigerant fluids** and lubricants

Range:

Primary refrigerant ideal properties - has an odour, non-flammable, non-toxic, miscible with oil, high latent heat value, easily leak detectable, efficient pressure ratio, non-ozone depleting, non-global warming potential, high dielectric strength, high density.

Secondary refrigerant ideal properties - low viscosity, non-toxic, non-flammable, high specific heat value, low cost, non-corrosive, low freezing point

Environmental impact: Ozone depletion, global warming /climate change.

Refrigerant Hazard groups - A, B. 1, 2L, 2, 3.

Ideal properties of lubricants - low floc point, low pour point, low viscosity, high dielectric strength, low foaming tendency, high flashpoint, low hygroscopic effect, low acidity, low moisture content, low toxicity, high miscibility with refrigerant.

Primary refrigerants - HFC, HFO, HC, Natural refrigerants.

Secondary refrigerants - water, propylene glycol, ethylene glycol, brines.

What do learners need to learn?

The ideal properties of a range of primary refrigerants and lubricants and their uses for a range of refrigeration applications.

The ideal properties of a range of secondary refrigerants and lubricants and their uses for a range of refrigeration applications. The use of only sensible heat and the limitations of such refrigerants and the implications for their use in refrigeration systems.

The differences between pure fluid, azeotropic and zeotropic refrigerants.

The hazard groups for toxicity and flammability.

The environmental considerations.

1.14 Types of **monitoring systems**

Range:
Monitoring systems - local, remote, building management system (BMS), pack control systems.

What do learners need to learn?

The different types of monitoring equipment and how they can be used to reduce the environmental impact of a refrigeration system. The types of data produced by systems and how the data is produced and extracted. The different types of connectivity available.

Sustainability

1.15 **Environmental impact** of refrigerants

Range:
Environmental impact - F-Gas Regulations, phasedown of refrigerants, effect on global warming /climate change and ozone depletion.

What do learners need to learn?

The environmental impact that different refrigerants have on climate change, their ozone depletion potential (ODP) and their global warming potential (GWP).

1.16 **New developments** in refrigeration

Range:
New developments - low GWP refrigerants (HFO, HC, Natural), safety classifications.

What do learners need to learn?

New developments in the refrigeration industry to reduce the environmental impact of refrigerant gases including using brazed joints and compulsory leak detection.

New refrigerants and their toxicity and fire risks and reduced environmental impact.

1.17 Maximise efficient refrigeration system performance

What do learners need to learn?

Methods to maximise efficiency of a refrigeration system through the selection of refrigerants and components including inverters and PID controllers and setting them up correctly to mitigate direct and indirect carbon emissions

1.18 Fundamental working principles of **electrical controls and components** and **motor starting arrangements**

Range:
Electrical controls - pressure switches, thermostats, flow switches, over current/over temperature (bimetal, PTC, NTC), relays (current, potential, solid state).

Electrical components - single phase motors, coils, transformers, heaters, lights.

Motor starting arrangements - resistance start induction run (RSIR), capacitor start induction run (CSIR), capacitor start and run (CSR).

What do learners need to learn?

The function and operation of the stated electrical controls and components and motor starting systems and their applications.

Specific knowledge criteria for performance outcomes

System Installation (Outcome 2)

1.19 **Methods** for checking refrigeration system leakages

Range:
Methods - strength and tightness testing, use of inert gases, electronic leak detection, leak test fluids, UV dye.

What do learners need to learn?

The methods used to check refrigeration systems for leakages in accordance with the F-Gas Regulations and BS EN 378-2016.

1.20 Types of **substrates**

Range:

Substrates - insulated panels, brickwork, plasterboard, concrete.

What do learners need to learn?

Health and safety implications of drilling into an unknown wall.

The tools and equipment (power drills, types of drill bit) required for fixing a range of system components to a range of wall, floor and ceiling substrates. The implications for refrigeration system installation.

1.21 Types of **protective materials**

Range:

Protective materials - thermal insulation materials.

What do learners need to learn?

The different types of insulation material used to protect against heat gain/loss. Their properties and how to ensure the material operates effectively.

1.22 Types of **pipework**

Range:

Pipework - copper, steel, aluminium.

What do learners need to learn?

Different types of pipework and their suitability for different purposes.

How pipe characteristics affect refrigerant and oil flow.

1.23 Fix and **terminate cabling**

Range:

Cabling - multi-core flex, steel wire armoured, single conductor, twin and earth, braided sheath cable, screened.

Terminate - insulated crimps, non-insulated crimps.

What do learners need to learn?

The different types of electrical cable used in the refrigeration industry and the methods used to fix and terminate cabling safely.

System commissioning (Outcome 3)

1.24 System operation requirements

What do learners need to learn?

The checks required for commissioning, including after a long period of non-use.

The range of tests and measurements needed to ensure a refrigeration system is operating at maximum efficiency – visual checks, strength test, tightness test, evacuation, charging, system running, measure (superheating, sub-cooling, evaporator air on and off temperature, running currents, refrigerant type and quantity, condenser air on and off) and coil approach temperatures

1.25 **Visual inspection** of a refrigeration system

Range:
Visual inspection - use of human senses (sight, sound, smell, touch).

What do learners need to learn?

Visual inspection of a refrigeration system to determine if any fault conditions are present.

1.26 Expectations of a steady-state operation for refrigeration system

What do learners need to learn?

Expectations of a refrigeration system when it is running at the correct steady-state conditions, including after a long period of non-use. The checks required to confirm expectations include suction and discharge pressures, saturated suction/discharge temperatures, superheating, sub-cooling, storage set-points, running currents, refrigerant charge.

System maintenance (Outcome 4)

1.27 Types of **fault-finding techniques**

Range:
Fault-finding techniques - use of human senses (sight, sound, smell, touch), customer reports, historical records, manifold gauges, electrical test meters, safe electrical isolation.

What do learners need to learn?

Types of fault-finding techniques and diagnostic equipment, and how these are applied to determine a range of mechanical and electrical faults on a refrigeration system. The suitability of different fault-finding techniques for different situations, and how they are applied in practice.

1.28 Cleaning of **components**

Range:
Components - coils, drain pans, drain lines.

What do learners need to learn?

The components that require cleaning and how to clean without compromising the system. The tools, equipment and materials used to clean components - pressure washers and cleaning fluids.

1.29 Disassembly **techniques**

Range:
Techniques - unbrazing, flaring.

What do learners need to learn?

Considerations to safely disassemble a refrigeration system and its components prior to repair or replacement of individual components.

Considerations to include - use of tools, safe electrical isolation, refrigerant recovery. Reference documents to include - manufacturer's instructions, method statements, risk assessments.

1.30 **Methods** to extract refrigerant

Range:
Methods - recover, reclamation and recycling methods, safe electrical isolation.

What do learners need to learn?
Methods to safely remove refrigerant from a system in accordance with the F-Gas Regulation and all current environmental legislation, Hazardous Waste Regulations. The purpose of Waste Transfer Notes, and methods to safely handle and manage refrigerant once extracted.

Install refrigeration systems – Outcome 2

Performance criteria

2.1 Sequence and prioritise tasks

What do learners need to learn?	**Skills**
Interpret the customer's requirements, plan the installation to cause minimum disruption and liaise with other trades to avoid conflict. Plan execution of programme of works, liaise with other trades, method statements and risk assessments.	EC1 EC4 EC5

2.2 Identify **information requirements** from a brief

Range:
Information requirements - drawings, manufacturer's specifications, regulatory documents, industry codes of practice, manufacturer's instructions, installation specifications, permits to work, method statement, risk assessment.

What do learners need to learn?	**Skills**
Identify all the information needed from a range of sources to ensure compliance with local and national by-laws and legislation and any specific manufacturer's requirements.	EC4 EC5

2.3 Gather required **information**

Range:
Information - manufacturer's instructions, non-domestic building services compliance guide, building regulations, local by-laws.

What do learners need to learn?	Skills
Gather all necessary information from a range of sources to ensure compliance with local and national by-laws and legislation and any specific manufactures requirements.	EC4

2.4 Interpret **information and data**

Range:
Information and data - manufacturer's instructions, non-domestic building services compliance guide, building regulations, local by-laws.

What do learners need to learn?	Skills
Interpret all the information gathered to plan the installation of the refrigeration system.	EC4 EC5 MC6

2.5 Calculate **data required**

Range:
Data required - heat gains in cold rooms, product cooling loads, component selection, ideal storage temperatures.

What do learners need to learn?	Skills
Calculate the heat gain into a cold room and determine the product cooling load as well as the ideal storage temperature.	MC2

2.6 Produce written **reports** to stakeholders about work completed

Range:
Reports - handover information, operation instructions, F-Gas records, maintenance instructions, job sheet/card, commissioning record.

What do learners need to learn?	Skills
Produce written completion documentation for legal compliance (F-gas records) and customer information (operation instructions).	EC1 EC3

2.7 Measure and mark out **installation requirements**

Range:
Installation requirements - pipe routes, location of evaporator coils (coolers), condensing units, services (electricity, gas, water, drainage, ventilation).

What do learners need to learn?	Skills
Mark out the location of indoor and outdoor sections of the system together with pipe routes for refrigerants, water, drainage and electrical cabling.	MC1

2.8 Drill holes for fixings in various **substrates**

Range:
Substrates - insulated panels, brickwork, plasterboard, concrete.

What do learners need to learn?	Skills
Drill the correct size hole for a range of fixings in a variety of wall materials.	MC1

2.9 **Position components**

Range:
Position - levelling, squaring.
Components - coolers, condensers, condensing units, control panels, pipe routes.

What do learners need to learn?	Skills
Determine the ideal position for the internal and external components with regard to servicing and maintenance requirements and energy efficiency.	MC1 MC2

2.10 Insert **protective materials** into drilled holes

Range:
Protective materials - conduits, trunking, fireproof insulation, intumescent mastic.

What do learners need to learn?
To fix protective materials into wall penetrations to prevent collapse and spread of fire.

2.11 Cut **pipework**

Range:
Pipework - copper, steel, aluminium.

What do learners need to learn?
Cut and prepare refrigeration pipework and conduit to required dimensions, ready for connection to other components.

2.12 Manually bend **pipework**

Range:
Pipework - copper, steel, aluminium.

What do learners need to learn?	**Skills**
Manually bend a range of refrigeration pipes and conduits to suit the installation requirement, to include 90º, 180º and offset bends. Use hydraulic benders to bend larger diameter copper and steel pipes to the same specification as above.	MC1

2.13 Assemble pipework using a range of **forming** and **jointing methods**

Range:

Forming methods - braze (oxy -fuel), flare, bend, swage, other mechanical joints.

Jointing methods - similar and dissimilar metals with hot and cold joints – mechanical and compression, Cu/Al joints.

What do learners need to learn?

Join refrigeration pipework and components using brazing, flaring and swaging methods (Cu to Cu, Cu to Fe, Cu to brass, Fe to brass). Purging using oxygen-free nitrogen (OFN) to prevent internal scaling. How to protect components from heat damage while brazing, and the application of pipe insulation materials.

Purging – use of OFN.

System components – condensing units, evaporators, condensate drains, valves, electrical cabling, drier, pressure switches, pumps, sight glass, vessels.

Fixing – vibration damping clamps, pipe saddles, pipe clips, insulated clamps.

Protective measures – wet rag, non-conductive foam, temporary removal of low melting point items.

Temperature-sensitive system components – thermostatic expansion valves, solenoid valves, vibration eliminators, Schrader valves, pressure transducers.

2.14 Permanently fix indoor and outdoor units

What do learners need to learn?

Permanently fix a range of refrigeration components and supports including pipework and cabling to different wall, ceiling and floor materials, insulated panels, brickwork, plasterboard, concrete.

2.15 **Leak test** system inert gas

Range:

Leak test - strength and tightness testing, pressure testing using inert gas, soap solutions, proprietary leak test solutions.

What do learners need to learn?

Leak test a refrigeration system in accordance with the requirements of the F-Gas Regulations using inert gases prior to commissioning.

Outcome 3 - Commission refrigeration systems

3.1 Interpret a risk assessment

What do learners need to learn?	Skills
Interpret risk assessments with consideration given to responsibilities, persons at risk, and applying controls, recording potential hazards and completion of documentation.	EC4 EC5

3.2 Interpret **information** provided

Range:
Information - BS EN378, F-Gas Regulations, contractual specifications, manufacturer's instructions, including tabular and graphical information.

What do learners need to learn?	Skills
Interpretation of regulatory, contractual and manufacturer's specifications and requirements in readiness to carry out system commissioning.	EC4 EC5

3.3 Collect **data** from control system

Range:
Data - superheat, subcooling, coil approach temperature (Delta T), air flow, air distribution, air on and off temperature, oil pressure, system running pressures, running current, relative humidity, primary and secondary refrigerant flow rates, temperature set-points.

What do learners need to learn?	Skills
Access the system and its controls to collect a range of data.	MC5 MC6 DC4

3.4 Interpret commissioning **data** collected

Range:
Data - superheat, subcooling, coil approach temperature (Delta T), air flow, air distribution, air on and off temperature, oil pressure, system running pressures, running current, relative humidity, primary and secondary refrigerant flow rates, temperature set-points.

What do learners need to learn?	Skills
Interpret recorded data to ensure the design conditions and parameters are met.	MC6 DC4 EC5

3.5 Discuss **requirements** with stakeholders

Range:
Requirements - product load, types of product stored, required storage temperatures, access and usage.

What do learners need to learn?	Skills
Use open questioning and listening techniques to ensure that the end user's/client's requirements and needs are met.	EC2 EC4 EC5 EC6

3.6 Inspect system installation

What do learners need to learn?
Conduct visual inspections of the complete system to ensure all works are complete, safe and meet the specification before commencement of the commissioning activity. Check to ensure systems are leak free, clean and fixings are secure.

3.7 Establish a **steady-state** operation

Range:
Steady state - storage temperatures, operating pressures, superheat, subcooling, running current, air flow rates.

What do learners need to learn?	Skills
Use commissioning instruments to collect and record data such as temperatures, systems pressures, flow rates and running currents. Interpret the data readings recorded to ensure that the steady-state conditions achieved meet the contractual requirements.	MC6 DC3

3.8 **Adjust** system for optimum performance.

Range:
Adjust - storage temperature, safety controls (high and low pressure), air flow rates, head pressure controls, position of sensors, energy efficiency.

What do learners need to learn?	Skills
Use the measured commissioning data to adjust the refrigeration system to achieve the required storage conditions, set all safety controls and ensure maximum energy efficiency.	MC6

3.9 Record **test results**

Range:

Test results - superheat, subcooling, coil approach temperature (Delta T), air flow, air distribution, air on and off temperature, oil pressure, system running pressures, running current, relative humidity, primary and secondary refrigerant flow rates, temperature set-points.

What do learners need to learn?	**Skills**
Record all commissioning data and set-points in accordance with the client's requirements, F-Gas Regulations and future reference (service activities).	EC3

Outcome 4 - Maintain refrigeration systems

4.2 Produce a **method statement**

Range:
Method statement - scope of works, manufacturer's instructions, contractual requirements, risk assessment, preventative or reactive maintenance, permits to work.

What do learners need to learn?	**Skills**
Produce a method statement and risk assessment for either preventative or reactive maintenance through interpretation of system data, customer reports or contractual requirements.	EC1 EC2 EC4

4.3 Assess suitability of **information** provided

Range:
Information - sufficiency, accuracy, currency, previous service records, F-Gas records, customer, senses, site logs.

What do learners need to learn?	**Skills**
Consider all of the information available with regard to its accuracy and reliability before creating a maintenance plan.	EC4 EC5

4.4 Calculate **resource requirements**

Range:
Resource requirements - refrigerant type and quantity, lubricants, cleaning agents, spare parts, consumables.

What do learners need to learn?	**Skills**
Consider the maintenance plan and manufacturers instruction to calculate and compile a list of all materials needed to complete the maintenance task.	MC2 EC3

4.5 Produce **technical reports**

Range:
Technical reports - maintenance reports, maintenance plans and schedules, site logs, F-Gas records.

What do learners need to learn?	**Skills**
Complete service and maintenance site reports on work carried out and update site logs and F-Gas records.	EC3

4.6 Visually inspect the system

What do learners need to learn?
Carry out a visual inspection of the system first, with consideration given to health and safety and possible faults that may not be apparent to the client/customer. Visual inspection to include security of pipework, vibration mounts, corrosion, refrigerant or water leaks, mechanical damage, loose screws or connectors.

4.7 Clean **system**

Range:
System - evaporator and condenser coils, air filters, water filters, drain pans, drain lines, unit casings.

What do learners need to learn?
Carry out a wide range of cleaning activities with consideration given to health and safety and maintaining maximum energy efficiency.

4.8 Extract **components** from the system.

Range:
Components - compressors, driers, fan motors, defrost heaters, expansion devices, refrigerants, solenoid valves, pressure control valves.

What do learners need to learn?
Remove and replace a variety of components from a refrigeration system ensuring all health and safety and environmental considerations are followed.

4.9 Apply **fault-finding techniques** to identify faults

Range:
Fault-finding techniques - data analysis, leak-testing, operational logs, F-Gas records.

What do learners need to learn?	**Skills**
Apply a range of fault-finding techniques such as data analysis, observation of running conditions, and review of operation logs and past service reports to identify a range of mechanical and electrical faults.	MC2 MC6 DC4 EC5

4.10 Rectify **faults**

Range:
Faults - poorly fitted insulation, broken or blocked condensate drain, incorrectly set controls, component failure.

What do learners need to learn?
Replace or repair a range of system faults and components to return a refrigeration system to full operational condition.

4.11 Report on maintenance concerns

What do learners need to learn?	**Skills**
Produce verbal and written reports based on the recorded data and the results of the inspection and any maintenance concerns - hot running compressor, evidence of leaks, not maintaining temperature, system trips, product loading, air flow.	EC1 EC2 EC3 EC6

4.12 Classify **waste** for disposal and recycling

Range:
Waste - refrigerants, lubricants, pipework, valves, driers.

What do learners need to learn?
Identify a range of waste materials produced during a service and maintenance activity in accordance with the Hazardous Waste Regulations and the F-Gas Regulations.

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

Common core content

- Construction sustainability principles - Energy production and energy use and waste management
- Environmental impact
- Construction information and data principles – Standards, regulations and guidance

BSE specific core content

- Health and safety - BSE Regulations and safe working practices
- Building Services Engineering (BSE) systems
- Tools and equipment – Use and maintenance

Guidance for delivery

There are opportunities to consolidate learning where elements of content are common across performance outcomes, for example:

- Jointing
- Charging
- Recovery

Where content is common across installation, commissioning and maintenance activities, it is recommended that these are delivered once and contextualised where needed.

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities

- Practical - Use of pre-set formative assessments carry out tasks and record on standardised form. Use of a variety of measuring instruments
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

Ways of ensuring content is delivered in line with current, up to date industry practice

- Delivery for this specialism will take place in a dedicated refrigeration classroom/workshop
- A realistic representation of refrigeration systems and components should be installed in the classroom/workshop
- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
- The provision must represent the type of equipment currently available in the UK refrigeration industry
- New and emerging refrigeration technology should be included in the delivery

Suggested learning resources

Books

- Refrigeration and Air-Conditioning (Hardcover – Illustrated) by Guy Hundy (Author)
- Refrigeration and Air Conditioning Technology (Motivate Series) by Norman Cook
- Modern Refrigeration and Air Conditioning by Althouse, Bracciano, Turnquist
- Refrigeration and Air Conditioning by A. R. Trott, T C Welch
- Air Conditioning Principles and Systems: An Energy Approach by Edward G. Pita

Websites

- **www.ior.org.uk**
- **BSEN378:2016 standard www.shop.bsigroup.com**
- **www.acrib.org.uk**
- F Gas - **www.gov.uk/government/collections/fluorinated-gas-f-gas-guidance-for-users-producers-and-traders**
- F-Gas **www.refcom.org.uk**

Scheme of Assessment – Refrigeration engineering

The refrigeration engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 28 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 – Design	Work from a specification to determine design calculations for a proposed installation. Displays a breadth of knowledge and understanding in how system, environmental and customer needs can influence design requirements.
Task 2 – Plan the installation	Displays a breadth of knowledge and practical skills that enables them to carry out and plan for the installation of a plumbing system. Candidates will need to produce documents to industry standards that clearly states how they will carry out the installation.
Task 3 – Install and commission the installation	Complete the given installation and commissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately Tools, materials and equipment are selected and used correctly. Consideration to environmental sustainability and recycling of materials. Techniques used to make building fabric repairs to restore work area to pre-installation condition. All work carried out in line with relevant manufacturer's instructions/ building regulations.
Task 4 – Carry out maintenance activity	Applies knowledge and practical skills in decommissioning and rectifying a fault in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	***High level tasks*** *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	**Assessment Theme**	***Typical evidence***
PO2 Install refrigeration systems (37%)	T1- Design T2 – Planning the installation	Health and Safety	Risk assessments, PPE, Working safely
	T2- Planning the installation	Design and Planning	Method statements, installation diagrams, material lists, Selecting types of systems and components, design calculations
	T3 – Install and commission	Systems and components	Using tools and equipment, cutting and bending pipe, jointing methods, prefabrication of pipe, positioning and securing component,
	T1- Design T3 – Install and commission	Reports and information	Interpretation of drawings, specifications, manufacturer instructions
PO3 Commission refrigeration systems (23%)	Task 3 – Install and commission	Inspecting and testing systems and components	Pressure testing, testing for leaks, commissioning checks Risk assessment, working safely, PPE

	T3 – Install and commission T3 – Install and commission T3 – Install and commission T4 – Carry out service and maintenance	Health and Safety Reports and information Handover/ communication	 Commissioning records Handover to customer
PO4 Maintain refrigeration systems (40%)	T4 – Carry out service and maintenance	Health and safety Working with faults Handover/ communication Reports and information	Risk assessment, working safely, PPE Fault diagnosis, client requirements, Repair and replace components, use of tools Communication with customer to diagnose fault Maintenance activity report

359 Ventilation

Level:	3
GLH – Combined with 355 Heating	765
Assessment:	Practical assignment

What is this specialism about?

The purpose of this specialism is for learners to understand and undertake fundamental ventilation work. Learners will have the opportunity to plan, perform and evaluate their work while utilising a range of materials, methods and techniques.

Learners will develop their knowledge and understanding of, and skills in:

- Fundamental health and safety practices associated with carrying out ventilation installation work
- Technical terms, data and units of measurement in ventilation systems design and installation
- Ventilation systems and their purpose (mechanical and natural ventilation)
- Ventilation systems tools, equipment and controls
- Ductwork materials (metal and non-metal) fittings, installation processes and jointing methods

Learners may be introduced to this specialism by asking themselves questions such as:

- What kind of tasks are carried out by a ventilation system installer?
- What types of systems does a ventilation installer work on?
- What tools and equipment are used by a ventilation installer?

Underpinning knowledge outcome

On completion of this specialism, learners will understand:

1. Ventilation knowledge criteria

Performance outcomes

On completion of this specialism, learners will be able to:

2. Install ventilation systems
3. Commission ventilation systems
4. Maintain ventilation systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills.

Specialism content

Outcome 1

Common knowledge criteria

Health and safety

1.1 **Typical hazards** and **safe systems** of work specific to ventilation engineering

Range:

Typical hazards - legionnaires disease**,** asbestos, working at height, manual handling.

Safe systems of work - risk assessment, method statement**,** safe isolation techniques.

What do learners need to learn?	**Skills** EC5
The different controls that need to be in place to minimise hazards occurring. Safe use of electrical equipment and how to prevent electrocution. Roles and responsibilities for safety under relevant legislation, codes of practice and permits to work. Implications of poor health and safety performance: indoor air quality (IAQ), dust, contaminants, odours.	

Ventilation systems

1.2 Types of **systems**

Range:

Systems - mechanical ventilation, natural ventilation, mixed mode ventilation, mechanical ventilation with heat recovery (MVHR), supply, extract, local exhaust ventilation (LEV), kitchen extract, fire and smoke.

What do learners need to learn?

The types of ventilation systems used in buildings (domestic, industrial, commercial, education, health care, leisure sector and community buildings).

The basic functions, and typical environments of occupied spaces in buildings (kitchens and bathrooms in housing, manufacturing spaces in factories, open plan offices in commercial buildings).

Variations for special environments (cleanrooms, hospital operating theatres, scientific laboratories, swimming pools, toilet extracts) and key considerations for energy efficiency, installation and maintenance.

Their purposes, similarities and differences in operation.

1.3 Mechanical components

Range:

Mechanical components - fans, filters, dampers, air-to-air heat exchangers, fire dampers, air handling units (AHUs), fan coil units (FCUs), variable air volume (VAV).

What do learners need to learn?

The different mechanical components used in ventilation engineering systems.

Their function and performance characteristics and the implications for the system of component failure.

1.4 Electrotechnical components

Range:

Electrotechnical components - inverters, actuators, sensors, motors.

What do learners need to learn?

The types of electronic components used in ventilation engineering systems: thermostat, humidistat, anemometer, manometer.

Their function and performance characteristics.

The implications to the system of component failure.

1.5 Types of **control system**

Range:

Control system - Building management system (BMS), stand alone, time clock, manual on/off.

What do learners need to learn?

The types of controls required in ventilation engineering systems. The purpose of different controls, their components, similarities and differences and efficiencies.

1.6 The importance of system cleanliness

What do learners need to learn?

The importance of system cleanliness.

Cleanliness industry standards and guidance.

The methods used to achieve system cleanliness pre and post installation.

The implications for system performance and the health and wellbeing of building occupants of poor cleanliness standards in ventilation systems.

1.7 Tools, equipment and **materials**

Range:

Tools - power tools**,** hand tools.

Equipment - portable access equipment, anemometer, flow meter, temperature sensors, bolometer (flow hood).

Materials - rigid**,** semi-rigid**,** flexible**,** thermal insulation, jointing compounds, seals and tape.

What do learners need to learn?

Common equipment, tools and materials, and their purpose.

1.8 Operation and handling requirements

What do learners need to learn?

The importance of protecting ventilation system components (ductwork) during delivery from a manufacturer (fabrication location) and others in the supply chain to a site delivery address (pre-delivery and installation (PDI) levels). The importance of correct Onsite storage and handling.

1.9 Types of ductwork and in-line system components and their suitability for different systems

What do learners need to learn?

The types of ductwork and in-line system components, their function and technical performance characteristics.

The nature of the environment and its effect on ductwork and components, IP ratings of electrical components, corrosion of metallic elements, durability of plastic, flexible and fabric ductwork.

1.10 Types of linings, coatings and identification labels

What do learners need to learn?

The types of ductwork linings and coatings.

Their characteristics and use for different purposes/applications and suitability for different systems.

The purpose of identification labels.

1.11 Types of ductwork **materials**

Range:

Materials - rigid**,** semi-rigid**,** flexible**,** fabric.

What do learners need to learn?

The range and types of ductwork materials, their function and technical performance characteristics (strength and durability).

Materials = metals, plastics, fabrics.

Their use in domestic and non-domestic buildings (industrial, commercial, education, health care, leisure sector and community buildings).

Their use in specialist situations such as swimming pools.

Their properties (fire ratings, thickness gauges) and suitability for different systems.

1.12 Types of **thermal insulation materials**

Range:

Thermal insulation materials - rockwool insulation, phenolic insulation.

What do learners need to learn?

The types of ductwork thermal insulation materials, their function and technical performance characteristics (thermal conductivity, thermal resistance). Their properties and suitability for different systems.

1.13 Types of **support**

Range:

Support - fittings (clips, brackets), fixings (uni-rail, threaded bar).

What do learners need to learn?

The types of ductwork fittings and fixings for structural integrity.

Their function and technical performance characteristics (tensile strength, maximum load) and their suitability for different systems.

Information and data

1.14 Asbestos register and legionella control logbook

What do learners need to learn?

Systems of recording information and data related to safety.

The contents and importance of the asbestos register and legionella control logbook.

Methods of minimising sources of other airborne contaminants.

1.15 Indoor air quality requirements for different situations

What do learners need to learn?

The requirements for indoor air quality for different building situations (domestic, industrial, commercial, education, health care, leisure sector and community buildings) to ensure health and wellbeing for building occupants.

The air quality for typical environments of occupied spaces in buildings (bathrooms, toilets, kitchens, offices, classrooms, hotel rooms) as well as variations for special environments (hospital operating theatre, museums, computer chip manufacturing, data centres, pharmaceutical manufacturing, food manufacturing).

1.16 Types of **documentation** produced

Range:

Documentation - commissioning certificates, manufacturer's data sheets, asset lists, as built drawings.

What do learners need to learn?	**Skills**
Types of documentation, their content and purpose. Quality assurance (QA) systems for documentation. The importance of file management, file sharing and specific document version control.	EC3 EC5 DC5

Specific knowledge criteria for performance outcomes

System commissioning (Outcome 3)

1.17 Positive and negative pressure classification, airtightness, and system balancing

What do learners need to learn?

Ductwork operating pressures.

Integrity of ductwork and acceptable leakage rates.

Positive and negative pressure ventilation systems.

1.18 Types of **checks** and **tests**

Range:

Checks - visual inspection (system integrity, system cleanliness).

Tests - system balance, set to work, air flows, volume, pressure, temperature, BMS point-to-point and functional tests, post clean vacuum testing.

What do learners need to learn?

Types of checks and tests, their purpose and the techniques to be applied.

The importance of completing commissioning checks and procedures.
Commissioning and testing principles for ventilation ductwork, mechanical fans and natural ventilation systems.

Relevant testing and commissioning references, building regulations Approved Document F (fan flow rate testing), DW/111 or BSRIA BG19 (ductwork systems testing) and BSRIA TN 11/95 (natural ventilation design).

Testing methods and instrumentation for mechanical ventilation flow rates.

Natural ventilation design strategies and post-construction testing (single sided, crossflow, stack effect and atria designs).

System maintenance (Outcome 4)

1.19 Cutting techniques

What do learners need to learn?	Skills
The common tools, equipment and materials needed for cutting sections of ventilation ductwork.	MC1

1.20 Mechanical joining techniques

What do learners need to learn?
The common tools, equipment and materials needed for joining sections of ventilation ductwork.

1.21 Assembly and disassembly techniques

What do learners need to learn?
The access equipment for safely assembling and taking apart ductwork sections.

1.22 Fault-finding

What do learners need to learn?	Skills
Fault-finding techniques (electronic sensors sending signals to a BMS indicating a fault on supply or extract ductwork flow rate, air pressure, temperature or humidity, power failure). Unusual reading of CO_2 concentration in a room or building zone or operational faults in mechanical fans, at supply or extract grilles or exhaust outlets. How fault-finding techniques are applied and their suitability for different situations.	MC1 MC2

1.23 Waste management of decontaminated ductwork

What do learners need to learn?

Maintenance best practice related to cleanliness and hygiene of ventilation systems.
Regulations, procedures and guidance for ensuring the cleanliness of ventilation systems (air handling units, ductwork, fans, filters and all other associated components in ventilation systems).

The Building Engineering Services Association (BESA formerly the HVCA) publication TR/19 (Guide to Good Practice: Internal Cleanliness of Ventilation Systems).
The relevant regulations included in the Workplace (Health, Safety and Welfare) Regulations 1992.

Regulation 6 Ventilation: important aspects are dirt, dust, grease, and other contaminants in ventilation ductwork systems.

Outcome 2 - Install ventilation systems

Performance criteria

2.1 Interpret a risk assessment

What do learners need to learn?	Skills
Review and assess any work task for its risk to health and safety with consideration given to HSE guidelines. The Construction (Design and Management) (CDM) Regulations and the responsibilities of all employers and employees. Apply safety controls where identified by a risk assessment. Review and adjust a risk assessment where necessary. Consider COSHH in relation to extension of existing systems.	EC4 EC5

2.2 Interpret **information** provided

Range:

Information - specification, drawings, locations of in-duct temperature and humidity sensors, local site considerations.

What do learners need to learn?	Skills
Interpret information needed to install ventilation systems. Use specifications and plan layout drawings to identify ductwork routes and location of components. Create a materials list as required.	EC5

2.3 Calculate **installation requirements**

Range:

Installation requirements - thermal comfort of building occupants, supply ventilation volumes, extract ventilation volumes, flow rates, mechanical ventilation, natural ventilation, positive and negative static pressure, ductwork dimensions, ductwork fittings pressure loss, duct route lengths, fan specification, air velocity, velocity pressure (VP), structural load bearing, necessary fixings and support tolerances, window opening sizes for natural ventilation air flow.

What do learners need to learn?	**Skills**
Determine ventilation installation requirements in a range of building types (domestic, industrial, commercial, education, health care, leisure sector and community buildings). Calculate installation requirements.	MC1 MC2 MC6

2.4 Measure **ductwork requirements**

Range:

Ductwork requirements - ductwork route lengths**,** locations of fixings**,** locations of components, accessibility of components.

What do learners need to learn?	**Skills**
Measure ductwork route lengths, dimensions, fitting space and the locations of all ventilation components (fans, dampers, silencers, diffusers, inlet and extract grilles). The use of access equipment to measure ductwork.	MC1

2.5 Mark out required measurements

What do learners need to learn?	**Skills**
Measure positions in the building for the locations of ductwork fixings, routes and components to include on the building fabric (wall or ceiling) and on ductwork. .	MC1

2.6 Prepare work areas for installation activities

What do learners need to learn?

Prepare the work area appropriately and safely for all ventilation system ductwork and components by ensuring:

- necessary access and space requirements to build a safe working platform
- necessary lighting for the work tasks (general area lighting and task-specific spotlights)
- necessary power for the work tasks equipment (power drills, ductwork cutting tools)
- correct PPE
- all aspects of toolbox talks are considered.

2.7 Position, fix, insert and secure ventilation ductwork

What do learners need to learn?

Fixing procedures and tasks including various types of bearers and hangers for ductwork.

Install rectangular, circular, rigid, semi-rigid, flexible and fabric ducting.

Install steel and aluminium ducting. Install ventilation ductwork components (fans, dampers, silencers, diffusers, inlet and extract grilles).

2.8 Test for air leakages and make corrections

What do learners need to learn?	**Skills**
Test for airtightness (air leakages in ductwork) to ensure the integrity of the system and its air flow performance, in accordance with DW143. Carry out airtightness tests for ductwork. Note the location of any ductwork air leakages for a repair and maintenance plan. Rectify and re-test.	MC1

2.9 Update digital building information management system software

What do learners need to learn?	Skills
Record and update all digital building information management system software when new ventilation ductwork and components have been installed.	DC1 DC2 DC3 DC5 DC6

Outcome 3 - Commission ventilation systems

3.1 Assess risks associated with completing activities

What do learners need to learn?	Skills
Produce, review and/or adjust risk assessment for commissioning tasks. Complete commissioning and testing method statement. Produce a risk assessment and method statement for ventilation system commissioning activities in accordance with the five stages of risk assessment: • Identification of hazards (working at height, working on a temporary work platform including a scaffold tower (medium risk) or step ladder (high risk) • Identification of who is at risk and how • Assessment of risk and action • Recording of findings • Review of risk assessment • Method statements for work activities should be prepared to ensure that all commissioning technicians work to the same sequence and procedure, using the same tools and equipment and work in pairs or teams where required for safe working.	EC1 EC2 EC3 EC4

3.2 Assess suitability of information provided

What do learners need to learn?	Skills
Carry out commissioning tests to provide to the building owner or facilities management team full and accurate records of the performance of the installed ventilation system. • Assess all essential commissioning and testing information for the installed system. • Prepare commissioning and testing checklist in a logical sequence for the site. • Complete commissioning records for the site. • Confirm testing instrumentation accuracy (calibration). • Record all results accurately (operator).	EC1 EC3 EC5 MC2 MC6 DC5

3.3 Interpret collected data

What do learners need to learn?	Skills
Carry out preliminary checks of the building construction and the ventilation system to make sure they are at a point that is appropriate for commissioning and testing to take place, checking that the ductwork is complete and meets required air leakage limits (pressure testing), and is at a standard of cleanliness that is appropriate for the commissioning stage. Accurately interpret all ventilation system performance targets and actual test results and compare the two data sets to record if the actual results are within expected tolerances.	EC5 MC6

3.4 Test system

What do learners need to learn?	Skills
Carry out a testing and commissioning procedure for a ventilation system and its components. Switch on fan, initially running at less than full speed, checking for no excessive vibration or noise and no overheating of the fan motor, then at full speed. • Set ventilation ductwork dampers to the correct position for the test (all fully open). • Switch on fan and allow it to run. • Check fan operation is correct. • Check initial air volume flow rate and fan pressures. • Record air volume flow rates (for comparison to design performance targets). • Regulate air flow rates (system balancing). Test actuators for automatic window opening and automatic damper operation in a natural ventilation system.	MC1 MC10

3.5 Record test results

What do learners need to learn?	Skills
Record performance test results in the system checks, including test results for air volume flow rates and for various fan static pressures.	EC1 EC3 EC4

3.6 Annotate system profile and layout drawings reflecting system adaptions

What do learners need to learn?	Skills
Annotate all system drawings and specifications to show fans and other system components. Information - fan pressure, volume flow rates delivered, motor current at various fan speeds, air temperature and humidity (psychrometry), component identification reference numbers, main ducts and branch duct routes, terminals - types and locations and their air flow rates, controller test results for various set-points. Test results information to be annotated in schematic and layout drawings.	MC7

3.7 Update building information systems

What do learners need to learn?	Skills
Update the building information system after the testing and commissioning have been completed.	DC1 DC2 DC3 DC4 DC5

3.8 Produce handover documentation

What do learners need to learn?	Skills
Prepare all handover documentation for client/end user. Agree format for commissioning documentation appropriate for the building design and site location. Produce site asset list (ventilation system component, reference number, manufacturer, model, site location). Record notes on visual checks and preliminary checks in handover documentation. Record design performance and actual performance test results in handover documentation. Hand over to customer/end user. Communicate system information, demonstration and maintenance requirements to customer.	EC1 EC2 EC3 EC4 EC6

Outcome 4 - Maintain ventilation systems

4.1 Sequence and prioritise tasks

What do learners need to learn?
Carry out tasks for both emergency maintenance and planned maintenance. Respond quickly to emergency maintenance (an alert from BMS or client's needs). React to and prioritise tasks depending on how critical the maintenance is. Carry out planned maintenance with consideration for the client's needs to minimise any inconvenience. Plan tasks using a maintenance schedule.

4.2 Identify information requirements

What do learners need to learn?	Skills
Identify and correctly interpret maintenance needs in ventilations system for both planned and emergency maintenance. Emergency maintenance could include, fan failure, temperature, humidity, CO_2 sensor readings not being what they should be or ductwork damage being visible (flexible ducting tear / puncture). Planned maintenance could include, filter replacements, ductwork cleaning and visual inspection.	EC4 EC5 MC1 MC2 MC6

4.3 Gather required **information**

Range:

Information - component manufacturer specifications for recommended maintenance requirements**,** commissioning and testing handover documentation**,** site registers**,** as-built schematic and layout drawings.

What do learners need to learn?	Skills
Gather all necessary information required for a maintenance task, including component manufacturer's specifications or commissioning and testing handover documentation.	EC4 EC5

4.4 Calculate maintenance downtime

What do learners need to learn?	Skills
Plan maintenance work schedules appropriately to minimise the system downtime in a building location with consideration given to downtime estimate for system maintenance, appropriate work planning schedule (weekends or night hours, appropriate site access arrangements).	MC2

4.5 Convert imperial **measurements** to metric

Range:

Measurements – air flow rates, air pressure, fan diameter, fan specification.

What do learners need to learn?	Skills
Convert imperial measurements to metric, for example - fan performance air flow rates in m^3/s, m^4/h and in cubic feet per minute (cfm).	MC1 MC4

4.6 Calculate resource and equipment requirements

What do learners need to learn?	Skills
Plan maintenance work schedules appropriately to make sure that all necessary resources for a maintenance task are in place. Estimate and calculate required human resources, materials, tools and equipment for the system maintenance.	MC1 MC2 EC5

4.7 Discuss with the client the effectiveness and efficient status of the installation

What do learners need to learn?	Skills
Use open questioning and listening techniques to establish client needs with regard to the effectiveness of the ventilation system and adjust and adapt set points if necessary, to meet customer needs.	EC1 EC6

4.8 Clean system including pre-and post-clean testing

What do learners need to learn?
Access and clean ventilation system ductwork and components (supply and extract grilles, fan motor casings, fan blades, filters, dampers). Remove dust and other debris from all parts of a ventilation system to ensure it operates to its full performance level. Clean ductwork and components in-situ or remove for cleaning and replacement.

4.9 Handle all **materials** correctly and in a safe way

What do learners need to learn?
Handle materials to maintain their integrity and that of the system.

4.10 Identify root cause of **faults**

Range:

Faults - ventilation system component failure**,** heating chilled water system component failure.

What do learners need to learn?	Skills
Respond to sensor alarms and building management system control panels to identify and understand the cause of ventilation system faults.	MC2 MC10

4.11 Apply **fault-finding techniques** to rectify system operation

Range:

Fault-finding techniques - visual checks, performance testing, check operation of heating and cooling coils.

What do learners need to learn?	**Skills**
Inspect faults in the ventilation system through visual checks and performance testing. Faults could be identified by electrical power failure, mechanical component failure (grilles, filters, or dampers not opening and closing properly or a ducting rupture (rigid, semi-rigid or flexible)). Use fault-finding techniques to rectify fault and repair system operation. Inform responsible personnel of heating, cooling or electrical faults.	MC2 EC1 EC6

4.12 Measure **ductwork dimensions**

Range:

Ductwork dimensions - rectangular ductwork dimensions, circular ductwork dimensions, oval ductwork, fitting into building spaces, transformation sections (expansion and contraction).

What do learners need to learn?	**Skills**
Correctly measure ductwork dimensions: length, breadth, rectangular perimeter, circular circumference, diameter, radius and cross-sectional area.	MC1

4.13 Cut **ductwork**

Range:

Ductwork - rigid, semi-rigid, flexible.

What do learners need to learn?	**Skills**
Use tools and equipment correctly, to cut ductwork.	MC1

4.14 Join ductwork using mechanical **techniques**

Range:

Techniques – frames, slip joints.

What do learners need to learn?	**Skills** MC1
Use methods and techniques to join ductwork sections together.	

4.15 Disassemble parts of a system

What do learners need to learn?
Access ductwork sections for their removal (rigid, semi-rigid and flexible ductwork sections).
Follow disassembling procedures by completing isolation of system/system part before disassembly.
Use suitable access equipment where necessary.

4.16 Reinstall **components** within a system

Range:

Components - ductwork sections, supply and extract grilles, fan motor casings, fan blades, filters and dampers.

What do learners need to learn?
Access ductwork components for their replacement (re-installation).
Re-install components in a ventilation system.
Use suitable access equipment where necessary.

Core content

All aspects of the common core and BSE specific core content can be related and contextualised on delivery in relation to this specialism. However, the following are **key areas** of the content that may be **of particular relevance** when delivering the knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context.

BSE core content

- Construction sustainability principles - Energy production and energy use and waste management
- Environmental impact
- Construction information and data principles – Standards, regulations and guidance
- Health and safety - BSE Regulations and safe working practices
- Building Services Engineering (BSE) systems
- Tools and equipment – Use and maintenance

Guidance for delivery

Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery

Considerations for innovative methods of delivery to include blended learning and other forms of technology,

Innovative methods of delivery could include:

- Blended learning throughout theory and practical to contextualise learning – using measurements and calculations (room dimensions and volume, room type, estimated occupancy, air supply and/or extract requirements, fan size, duct size and grille size)
- Natural ventilation - survey work for openable windows for cross flow, single sided or stack natural ventilation
- Use different rooms in a building for questioning i.e. – would this room be suitable for natural ventilation?
- Comparison of calculated data to actual data (measured)
- CIBSE guide B – why would different building types have different ventilation requirements? (group debates/ discussions)

Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities

- Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
- Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

Ways of ensuring content is delivered in line with current, up to date industry practice

- Centres will need to ensure a realistic representation of ventilation systems and components
- Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes

- The provision must represent the type of equipment currently available in the UK ventilation industry
- New and emerging ventilation systems, tools, components and technology should be included in delivery e.g. MVHR Mechanical Ventilation with Heat Recovery.

Suggested learning resources

Books/documents

- BSRIA the illustrated guide to ventilation
- CIBSE Natural Ventilation AM10
- CIBSE Mixed Mode Ventilation AM13
- CIBSE Guide B Heating, ventilating, air conditioning and refrigeration
- CIBSE Guide F Energy efficiency in buildings
- Building Regulations App Doc F - **Building Regulations App Doc F**
- BSRIA guide – The rules of thumb (BG9)

Websites

- FläktWoods **https://www.flaktgroup.com/uk/products/air-movement/ventilation- fans/**
- Vent Axia **https://www.vent-axia.com/**
- Monsoon **https://www.nationalventilation.co.uk/**
- **www.air-source.net**
- **www.bsria.co.uk**
- **www.CIBSE.org**
- **www.barkell.co.uk**
- **www.ke-fibretec.com**

Scheme of Assessment – Ventilation

The Ventilation engineering occupational specialism is assessed by one practical assignment. The duration of the assessment is 20 hours. Learners will be assessed against the following assessment themes:

- Health and safety
- Design and planning
- Systems and components
- Inspect and test systems and components
- Report and information
- Handover and communication
- Working with faults

By completing the following tasks:

Task	Typical Knowledge and skills
Task 1 - Plan the installation	Displays a breadth of knowledge and practical skills that enables them to carry out and plan for the installation of a ventilation system. Candidates will need to produce documents to industry standards that clearly states how they will carry out the installation.
Task 2 – Install and commission	Complete the given installation and commissioning task successfully. The task is carried out in a clear and logical sequence. Works in a safe manner, able to carry out testing and interpret and record test results accurately Tools, materials and equipment are selected and used correctly. All work carried out in line with relevant manufacturer's instructions/ building regulations.
Task 3 – Carry out maintenance activity	Applies knowledge and practical skills in rectifying a fault in a component or system. Candidates will need to be able carry out, record and communicate maintenance activity with a customer.

The information provided in the following tables demonstrates to approved providers the weightings of each performance outcome and how each performance outcome is assessed.

Performance outcome and weighting (%)	***High level tasks*** *Provide specific instructions for candidates to provide evidence for and are the same for every version of the assessment*	**Assessment Theme**	***Typical evidence***
PO2 Install ventilation systems (44%)	T1 – Plan the installation T2 – Install and commission T1 – Plan the installation T2 – Install and commission T1 – Plan the installation	Health and Safety Design and Planning Measure and mark out Installation of systems and components Reporting and information	Risk assessments, PPE, Working safely Method statements, installation diagrams, material lists, selecting types of systems and components, measuring and marking out., installation requirements and calculations Measure and mark out ductwork requirements Using tools and equipment, cutting and bending ductwork, jointing methods, positioning and securing components. Interpretation of drawings, specifications, manufacturer instructions

		Inspecting and testing systems and components	Air leakage tests,

PO3 Commission ventilation systems (23%)	T2 – Install and commission	Inspecting and testing systems and components Health and Safety Reporting and information Handover/ communication	Commissioning checks and tests Risk assessment, working safely, PPE Commissioning records Hand over to customer

PO4 Maintain ventilation systems (33%)	T3 – Carry out maintenance activity	Health and safety	Risk assessment, working safely, PPE
		Working with faults	Fault diagnosis, client requirements, conversion of measurements, Repair and replace components, use of tools
		Installation of systems and components	Measure, cut and join ductwork
		Documents	Materials list, method statement
		Reports and information	Maintenance report
		Handover/ communication	Communication with customer to diagnose fault

Appendix 1 Sources of general information

The following documents contain essential information for Providers delivering City & Guilds T Level Technical Qualifications. They should be referred to in conjunction with this specification and the Provider approval and quality assurance information.

You can download these from **www.cityandguilds.com**.

Centre Contract General Terms
Quality Assurance Standards: Centre Handbook
Quality Assurance Standards: Centre Assessment

Within these documents you will find information in relation to;

- centre assessment,
- internal quality assurance (IQA),
- IQA strategy,
- alternative locations and subcontractors,
- non-compliance,
- malpractice, and
- centre support roles and resources

All T Level providers must ensure they familiarise themselves with the above documents and adhere to the general terms as part of their conditions of approval.

Useful contacts

UK learners General qualification information	**E: learnersupport@cityandguilds.com**
International learners General qualification information	**E: intcg@cityandguilds.com**
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	**E: centresupport@cityandguilds.com**
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	**E: singlesubjects@cityandguilds.com**
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	**E: intops@cityandguilds.com**
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	**E: walledgarden@cityandguilds.com**
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 **E: business@cityandguilds.com**

If you have a complaint, or any suggestions for improvement about any of the services that City & Guilds provide, email: **feedbackandcomplaints@cityandguilds.com.**

About City & Guilds

As the UK's leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

City & Guilds Group

The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes ILM (management and leadership qualifications), City & Guilds Licence to Practice (land-based qualifications) and Learning Assistant (an online e-portfolio).

City & Guilds
5-6 Giltspur Street
London EC1A 9DE
www.cityandguilds.com

Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

Monday - Friday | 08:30 - 17:00 GMT

T: 0300 303 53 52

E: **technicals.quality@cityandguilds.com**

W: **www.cityandguilds.com/tlevels**

Web chat available **here**.

The T Level is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.

Schedule 3

Implementation

The content for this Schedule is contained in separate files at;

S3_GEN2W1_BSE_Implementation_Plan

S3_GEN2W1_BSE_Resource_Plan

Schedule 3

Implementation Plan

S3_GEN2W1_BSE_Implementation_Plan

Schedule 3

Resource Plan

S3_GEN2W1_BSE_Resource_Plan

Award Questionnaire Q10.7: Resource Plan - Instructions

Lot (qualification) name:	5
Potential Supplier name:	WJEC

Introduction

The following three tabs are designed for Potential Suppliers to outline and explain their Resource Plan.

How to complete this document: Q10.7

Potential Suppliers must complete and submit one copy of this dcoument for each TQ (ie a separate response for each Lot they intend to submit a Tender for).

The three sheets that follow form the requirement of Q10.7:

>> Outline Resource Plan: Potential Suppliers are to complete all highlighted (yellow) blank boxes in the table, providing an overall outline of the proposed Resource Plan. All answers should include a level of detail that enables the Authority to assess the basis and reasonableness of the proposed strategy. For the first 6 named resources (marked as * key resources), Potential Suppliers are required to provide a named replacement resource and detail their relevant experience.

>> Blank Diagram Sheet: This sheet has been left blank for Potential Suppliers to include a diagram or picture of their resourcing and/or readiness approach should they wish to include this to further support/illustrate their Resource Plan.

>> Further 10.7 Requirements: The information requested here is designed to supplement the Resource Plan provided in Sheet 1. Potential Suppliers must complete all blank boxes, providing an appropriate amount of detail.

Schedule 4

Co-operation

1 Objective of the joint arrangements

1.1 The Supplier shall cooperate, coordinate and seek to agree certain arrangements with all third party Awarding Organisations, including the Former Supplier, involved in the delivery of the technical education qualification element of each T Level forming part of the T Levels Programme ("**T Level Awarding Organisations**") from time to time with the aim of:

1.1.1 ensuring the quality, consistency, efficiency and effectiveness of the T Levels Programme as a whole; and

1.1.2 in the interest of Students and Providers, streamlining administration relating to the T Levels Programme.

1.2 The Supplier shall ensure that all activities carried out by it under this Schedule appropriately take into account the views of each T Level Awarding Organisation (including T Level Awarding Organisations appointed subsequent and/or prior to the appointment of the Supplier) and do not risk or result in:

1.2.1 a disproportionate burden falling on any given T Level Awarding Organisation or on Providers; and/or

1.2.2 a disproportionate burden (whether by any act or omission on the part of the Supplier) on Providers and/or Students.

2 Joint arrangements

2.1 In particular, the Supplier shall (at its own cost):

2.1.1 attend a meeting convened by the Authority (on reasonable prior notice and at least once per calendar quarter) with all other T Level Awarding Organisations to discuss progress on coordination efforts including the activities set out below, and to make decisions relating to any outstanding areas of coordination;

2.1.2 in order to minimise the administrative burden on Providers, cooperate with all other T Level Awarding Organisations to coordinate and deliver an efficient method of both regular and ad hoc inspections (on an ongoing basis) of the delivery by Approved Providers of the technical education qualification element of each T Level, to ensure that the relevant Approved Providers continue to meet the requirements of their Provider Approval by the Supplier and equivalent approval by other T Level Awarding Organisations, provided always that where, as a result of such cooperation and/or coordination it is necessary for the Supplier to amend and/or modify that part of the Supplier's Response to which the provisions of paragraph 3.1.2 of Part 1 of the Service Requirements apply, then the Supplier shall obtain Approval to such amendment and/or modification;

2.1.3 coordinate and seek to agree with all other T Level Awarding Organisations (at the earliest possible date) common rules and guidance applicable to the teaching and assessment of and provision of Post-Results Services for the technical education qualification element of each T Level with the aim of having aligned rules, guidance and Post-Results Services, where appropriate, across the T Levels Programme, addressing topics such as conducting examinations;

2.1.4 share information between T Level Awarding Organisations as necessary (subject to the relevant obligations on confidentiality in this Contract) to:

(i) facilitate the joint arrangements anticipated by this Schedule;

(ii) enable transfer of achievement of the TQ Core Component of a T Level between T Level Awarding Organisations; and

(iii) enable results analysis in respect of the Route of which the TQ forms part;

2.1.5 where possible, utilise systems in the delivery of the Services which are interoperable with those utilised by other T Level Awarding Organisations so as to facilitate the portability of the Services to any Future Supplier;

2.1.6 coordinate and seek to agree with all other T Level Awarding Organisations pre-assessment access arrangements for T Levels to ensure equivalence of approach between T Level Awarding Organisations;

2.1.7 adopt a common process and, where possible, system, to that used by other T Level Awarding Organisations for applications for access arrangements for T Levels to be made and considered for the benefit of Students;

2.1.8 coordinate and seek to agree with all other T Level Awarding Organisations a common process and approach and, where possible, system to that used by other T Level Awarding Organisations, to manage and/or facilitate Reasonable Adjustments and/or applications for Special Consideration to ensure equivalence of approach between T Level Awarding Organisations;

2.1.9 seek to agree between T Level Awarding Organisations a Key Dates Schedule, such schedule to be developed in consultation with the Department, GCE Awarding Organisations, Providers and UCAS and to be Approved by the Authority;

2.1.10 attend regular meetings (at least once per calendar month unless otherwise notified by the Authority) with all other T Level Awarding Organisations to discuss operational issues in relation to the T Level Programme;

2.1.11 in order to minimise the administrative burden on Providers, co-operate with the Former Supplier, where relevant, to facilitate a smooth transition during the Entry Transition Period; and

2.1.12 where notified by the Authority, work with other T Level Awarding Organisations responsible for TQs in the same Route with the aim to, where appropriate, harmonise the common TQ Core Component across that Route.

3 Disputes relating to joint arrangements

3.1 In the event the Supplier contends that it is unable to meet its obligations under this Schedule as a result of the action or inaction of one or more third party T Level Awarding Organisation, the Supplier shall seek to resolve such matter with the relevant

T Level Awarding Organisation(s). In the event that the Supplier is unable to resolve such matter, having used its reasonable endeavours to do so, the Supplier shall promptly notify the Authority in writing with the relevant details including the steps taken to attempt to resolve the matter, and the Authority shall use its reasonable endeavours to promptly resolve such matter.

3.2 In the event that a third party T Level Awarding Organisation contends that it is unable to meet its joint arrangement obligations as a result of the action or inaction of the Supplier, then the Supplier shall comply with the reasonable instructions of the Authority in relation to such action or inaction.

3.3 Nothing in this Schedule (including any failure to agree any matters referred to in paragraph 2 of this Schedule) shall operate to reduce or otherwise diminish the Supplier's obligations and/or the Authority's rights under this Contract.

4 Reporting

4.1 The Supplier shall, on request by the Authority, promptly provide a written report to the Authority setting out its progress in achieving the joint arrangements set out in paragraph 2 of this Schedule.

Schedule 5

Supplier's Response

The content for this Schedule is contained in separate files at;

S5_GEN2W1_BSE_Risk_Register

S5_GEN2W1_BSE_AQ9.1-10.7_Supplier_Responses

S5_GEN2W1_BSE_Q9.5_Grading_and_Awarding_Structure

S5_GEN2W1_BSE_Q10.4_Internal_Quality_Assurance_Process

S5_GEN2W1_BSE_Q10.7_Management_and_Governance

S5_GEN2W1_BSE_Q10.7_Escalation_Process_Flow

S5_GEN2W1_BSE_Issues_Log

S5_GEN2W1_WJEC_Clarifications

S5_GEN2W1_BSE_Employer_and_Centre_Engagement_Strategy

Schedule 5

Risk Register

S5_GEN2W1_BSE_Q10.1_TQ_Risk_Register

Schedule 5

Supplier Responses

S5_GEN2W1_BSE_AQ9.1 - Q10.7_Supplier_Responses

Schedule 5

Awarding Structure

S5_GEN2W1_BSE_Q9.5_Grading_and_Awarding_Structure

Schedule 5

Internal Quality Assurance Process

S5_GEN2W1_BSE_Q10.4_Internal_Quality_Assurance_Process

Schedule 5

Management and Governance

S5_GEN2W1_BSE_Q10.7_Management_and_Governance

Schedule 5

Escalation Process Flow

S5_GEN2W1_BSE_Q10.7_Escalation_Process_Flow

Schedule 5

Issues Log

S5_GEN2W1_BSE_Q10.7_Issues_log

Schedule 5

Clarifications

S5_GEN2W1_BSE_Clarifications

Schedule 5

Employer Strategy

S5_GEN2W1_BSE_Employer_Stratgey

Schedule 6

Pricing Schedule

The content for this Schedule is contained in a separate file at;

S6_GEN2W1_BSE_Pricing_Schedule

Pricing Schedule - Instructions

Lot (qualification) name:	**BUILDING SERVICES ENGINEERING (FOR CONSTRUCTION)**
Potential Supplier name:	WJEC

Introduction

This Pricing Schedule enables Potential Suppliers to complete the price element of their Tender. This is to be done against the price elements defined in the definition section below and with reference to the rest of the documents forming part of this ITT, particularly the Service Requirements. Note the separate instructions relating to question 10.5 which must also be followed by Potential Suppliers.

The figures provided against each of the pricing elements will be used in conjunction with expected numbers of Technical Qualification (TQ) students (5 cohorts), chargeable updates to the TQ content and uptake of Additional Services to calculate an estimated Total Contract Value ("TCV"). The TCV calculated in this Pricing Schedule will form the basis of the pricing evaluation, as described in the Evaluation Methodology and Guidance.

Please note that all of the volumes given in this Pricing Schedule are estimates and are not guaranteed. Please also note that no price impacting assumptions or caveats will be accepted in Tenders and the Potential Supplier will not be permitted to vary any charges or fees included in this Pricing Schedule in the event that its estimates prove to be inaccurate. The only charges and fees which will be payable to Suppliers for the Services provided under the Contract are those set out in the Pricing Schedule, subject only to the variation procedures set out in the Contract.

How to complete this Pricing Schedule

Potential Suppliers must complete and submit one copy of this Pricing Schedule for each Lot they intend to submit a Tender for. There are **7** versions of the Pricing Schedule, one for each Lot, and Potential Suppliers should ensure that they complete and submit the correct version of the Pricing Schedule for the Lot which they are submitting a Tender for. Potential Suppliers must complete their name on this instructions tab.

Potential Suppliers must complete all boxes coloured yellow in each of tabs 'Input A', 'Input B', 'Input C' and 'Input D'. The spreadsheet will then automatically calculate the TCV in the "Total Contract Value" tab using the values entered. The rate card in 'Input B' will automatically populate the relevant rows in 'Input C' and 'Input D'. Values should be entered in £ pounds sterling and rounded to the nearest pound. Prices should exclude any applicable VAT.

>> Input A: Potential Suppliers should enter their proposed entry fee and the price for each of their Additional Services (each as defined below). The Qualification Development Fee will automatically be populated when 'Input C' is completed. The scenario based update charge will be automatically populated when 'Input D' is completed. Potential Suppliers submitting a Tender for multiple Lots should note the requirement to apply the multi-lot discount to the entry fee at Contract Award stage, should the Potential Supplier be awarded multiple lots. The discount to the entry fee will be applied as described in paragraph 5.16 of the ITT.

>> Input B: In the 'Personnel Costs' section, Potential Suppliers should enter a daily rate (for a 7 hour working day) of each type / grade of individual who may be involved in work on the refresh of, and updates to, the Technical Qualification (TQ), together with their grade or level where applicable to their role and whether they are an internal (i.e. employed) or external resource. Individual roles should be entered in the relevant category of Drafting, Consultation / Stakeholder Engagement, or Quality Assurance / Review that best describes the majority of their role in relation to the refresh of / update to the TQ or 'Other' where none of the other listed categories are relevant. Only complete as many lines as needed for the number of roles that will be involved, and leave the remaining lines blank. A blended day rate will automatically be calculated for evaluation purposes only based on the total of all daily rates divided by the number of roles listed. This will form part of the TCV calculation. In the 'Other Costs' section, Potential Suppliers should enter any non personnel related costs which they wish to include in either or both of their development costs or change costs in 'Input C' and 'Input D'. Non personnel related costs should be broken down into different types of cost. Details of each type of costs and the unit cost should be provided. If the unit cost for a non personnel cost is different for development and change, the cost should be entered twice with a different unit cost for each entry (e.g. Software licensing costs - development £x; software licensing costs - change £y). Both the personnel cost and other cost lines entered in 'Input B' will then be available for Potential Suppliers to select from when completing 'Input C' and 'Input D'. Only enter details for personnel and other costs if they are relevant to be able to complete 'Input C' or 'Input D' tabs. For the purpose of this exercise, marketing costs are not to be included. The Rate Card costs may be subject to indexation based increase as set out in the Contract.

>> Input C: Potential Suppliers should enter the number of days of input which would be required from each of the listed individual roles to refresh the qualification. The available roles will automatically complete from your entries in 'Input B' (which should therefore be completed before this section). Potential Suppliers should provide the type and estimated frequency of any non personnel related costs that will be incurred to refresh the qualification in the 'Other Costs' section. The available types of non personnel cost will automatically complete from your entries in 'Input B'.

>> Input D: Potential Suppliers should enter the number of days of input which would be required from each of the listed roles to complete the relevant change to the TQ as described in the relevant scenario. The available roles will automatically complete from your entries in 'Input B' (which should therefore be completed before this section). Potential Suppliers should provide the estimated frequency of any non personnel related costs that will be incurred in the 'Other Costs' section. The available types of non personnel cost will automatically complete from your entries in 'Input B'.

>> Total Contract Value: This is for information and evaluation purposes only, and no cells need to be completed by Potential Suppliers. Please note the figures for estimating the take up of Additional Services (dependent on the Additional Service, 0.1%, 0.5%, 5%, 10% or 20% of TQ students/assessments as applicable, or 40 instances of visits/reviews as applicable) including the anticipated number of assessments, is for evaluation purposes only. The unspecified TQ update charge based on a fixed number of days (20), is also an estimate used for evaluation purposes only. The Total Contract Value will be based on 5 cohorts only (please note that the estimated total contract value provided in the PIN Notice is based on 5 cohorts including the optional 1 + 1 cohort extension which is at the discretion of the Authority).

Fee definitions

1. Qualification Development Fee: A fixed charge for the initial refresh and update of the TQ covering the elements set out in paragraph 10.4 of the Evaluation Guidance. This will be paid in three installments as set out in the Contract. To complete this pricing schedule, Potential Suppliers must fill in tab 'Input C' with the relevant details as described above. The total Qualification Refresh charge, will then be automatically shown on the 'Input A' tab, cell H7, and will be the Qualification Refresh Charge as defined in the Contract.

2. Entry fee: A per student entry fee charged to Providers.This will cover all assessment and support services for the whole TQ. The fee provided here remains fixed throughout the Contract term (noting that in the occassion where a Potential Supplier is awarded more than one lot, the discount to the entry fee described above will be applied) other than inflationary increases in accordance with the Contract. Note that Potential Suppliers may not make any separate charge for Provider approval. Anticipated costs for Provider approval services must be included in other charges or fees in this Pricing Schedule. The entry fee must be inputted directly on the 'Input A' tab.

3. Fees for Additional Services: These are fees charged directly to Providers in relation to the provision of Additional Services from the menu of services that Suppliers must make available to Providers. Each Additional Service must be delivered on request. Each fee provided here should cover one instance of the relevant Additional Service being delivered. The fee provided here is expected to remain fixed throughout the Contract, other than inflationary increases in accordance with the Contract. The Additional Services fees are to be inputted directly on the 'Input A' tab.

4. Fees for Exclusive Changes to the TQ: The Authority will pay the Supplier for making changes to the TQ during the Contract term where these are defined as Exclusive TQ Changes in the Contract. For evaluation purposes, Potential Suppliers must price two TQ change scenarios as described in tab 'Input D'.

For evaluation purposes, the rate card completed in 'Input B' and the detail entered in 'Input D' will be used to calculate the cost of two scenarios, and a cost of an unspecified TQ change as follows:
> The weighted average for the two scenarios is calculated by multiplying the total charges of the 2 scenarios by their relative weighting and adding them together, to represent an average charge for a Exclusive TQ Change. This charge will then be automatically shown on the 'Input A' tab, cell H17. For the purposes of the TCV, this average charge will be multiplied by the estimated number of Exclusive TQ Changes over the Contract term that are similar to the scenarios (i.e. 2).
> The unspecified TQ update charge is calculated using a blended day rate. The blended day rate will be calculated on 'Input B' using the total of all daily rates listed in the rate card divided by the number of roles that are listed. For the purposes of the TCV, an unspecified TQ update charge will then be calculated by multiplying the blended day rate by 20 days. This is for the purposes of evaluation only and neither the blended rate or the unspecified TQ update charge are expected to form the basis for a specific charge to be paid by the Authority.

Schedule 6A

Adaptive Pricing

1. The Review Triggers

1.1 The Parties agree that the Entry Fee, as referred to in Schedule 6, shall be reviewed and may change, in the following two instances:

1.1.1 in or around December 2026, which shall be referred to as the Mid-Term Review; and

1.1.2 in the event that the Authority seeks to extend the Contract in accordance with clause 2.2 and 15.2 of the Contract, in or around December 2028, which shall be referred to as the Extension Review.

2. The Mid Term Review

2.1 On or around December 2026 the Authority shall provide the Supplier with an updated projection of total learner volumes for the five Exclusive Cohorts under the Contract which shall be referred to as the Updated Projection.

2.2 The Updated Projection shall be calculated by the Authority by combining the actual learner volumes for Exclusive Cohorts one and two, as confirmed by the Department to the Authority, with the revised estimates for the remaining three Exclusive cohorts of the Contract, as determined by the Department and confirmed to the Authority.

Circumstances in which an Enhanced Entry Fee is permitted

2.3 Where the Updated Projection is calculated to be at least 15% less than the total learner volume contained in the original tender documents, which shall be referred to as the Initial Projection, the Authority shall determine a revision to the Entry Fee which shall be referred to as the Enhanced Entry Fee and will be in such amount as to enable the Supplier to retain the opportunity to achieve its % profit margin, as set out in Schedule 6, over the life of the original Contract and;

2.3.1 the Authority shall notify the Supplier in writing, on or before the 31st December 2026 of the Enhanced Entry Fee;

2.3.2 by no later than the end of February in the Academic Year prior to the Academic Year in which the Enhanced Entry Fee may be applied the Supplier shall notify the Authority in writing of its intention to substitute the Entry Fee with the Enhanced Entry Fee, or such other Entry Fee not exceeding the Enhanced Entry Fee, as the case may be;

2.3.3 for the avoidance of doubt, any Entry Fee to be adopted by the Supplier pursuant to the provisions of this paragraph 2.3, will also incorporate any adjustments proposed by the Supplier under clause 4.12 of the Contract. The collective adjustments calculated in accordance with this paragraph 2.3 and or clause 4.12 will not exceed the Enhanced Entry Fee.

2.3.4 Any Enhanced Entry Fee shall apply for the Cohort for the Academic Year commencing 1 August 2027 and shall continue to apply to the Cohort for the Academic Year commencing 1 August 2027 and the Cohort for the Academic Year commencing 1 August 2027, and may be subject to later adjustments effected by the further application of clause 4.12 of the Contract.

Circumstances in which a Reduced Entry Fee will be required

2.4 Where the Updated Projection is calculated to be at least 15% more than the Initial Projection, the Authority shall determine a reduced Entry Fee which shall be referred to as the Reduced Entry Fee which will be in such amount as to enable the Supplier to retain the opportunity to achieve, but not exceed, its % profit margin, as set out in Schedule 6.

2.4.1 The Authority shall notify the Supplier in writing, on or before the 31 December 2026 of the Reduced Entry Fee;

2.4.2 For the avoidance of doubt, the Reduced Entry Fee will also incorporate any adjustments proposed by the Supplier under clause 4.12 of the Contract.

2.4.3 The Reduced Entry Fee shall apply for the Cohort for the Academic Year commencing 1 August 2027 and shall apply to the Cohort for the Academic Year commencing 1 August 2027 and the Cohort for the Academic Year

commencing 1 August 2027, and may be subject to later adjustments effected by the further application of clause 4.12 of the Contract.

3. The Extension Review

3.1 In the event of notification by the Authority to the Supplier of their intention to extend the Contract in accordance with clause 2.2 and 15.2, which shall be referred to as 'the First Extension Period', the Authority shall:

3.1.1 before the end of the final Exclusive Cohort, provide the Supplier with the projection of learners for the Academic Years which fall within the First Extension Period following the end of the fifth Exclusive Cohort, as determined by the Department and confirmed to the Authority, which shall be referred to as the Final Updated Projection;

3.1.2 where the Final Updated Projection is calculated to be at least 15% less than the Updated Projection for the fifth Exclusive Cohort, calculate the Entry Fee applicable to the First Extension which shall be referred to as the Extension Entry Fee, in such a sum which ensures that the Supplier retains the opportunity to achieve its % profit margin, as set out in Schedule 6, during the First Extension Period;

3.1.3 the Authority shall notify the Supplier in writing, on or before the 31st December 2028 of the Extension Entry Fee;

3.1.4 by no later than the end of February in the Academic Year prior to the Academic Year in which the Extension Entry Fee may be applied the Supplier shall notify the Authority in writing of its intention to substitute the Entry Fee with such other Entry Fee not exceeding the Extension Entry Fee, as the case may be;

3.1.5 the Extension Entry Fee shall also incorporate any adjustments to the Entry Fee effected by the application of clause 4.12;

3.1.6 any Extension Entry Fee shall apply for the Cohorts for the Academic Years which fall within the First Extension Period.

3.2 In the event that the Authority seeks to extend the Contract beyond the First Extension Period, in accordance with the provisions of clause 2.2 and 15.2 of the Contract, the Extension Entry Fee shall not be amended further save for any adjustments effected by the application of clause 4.12.

Circumstances in which a Reduced Extension Entry Fee will be required

3.3 Where the Final Updated Projection is calculated to be at least 15% more than the Updated Projection for the fifth Exclusive Cohort, the Authority shall determine a reduced Entry Fee which shall be referred to as the 'Reduced Extension Entry Fee' which will be in such amount as to enable the Supplier to retain the opportunity to achieve, but not exceed, its % profit margin, as set out in Schedule 6.

3.3.1 The Authority shall notify the Supplier in writing, on or before the [31st December 2028] of the Reduced Extension Entry Fee;

3.3.2 For the avoidance of doubt, the Reduced Extension Entry Fee will also incorporate any adjustments proposed by the Supplier under clause 4.12 of the Contract.

3.3.3 The Reduced Extension Entry Fee shall apply for the Cohorts for the Academic Years which fall in with the First Extension Period, and may be subject to later adjustments effected by the further application of clause 4.12 of the Contract.

4. General

4.1 The Authority does not provide any assurance that the Updated Projection will be achieved and the Supplier bears all risks arising from any variance between the Updated Projection, the Final Updated Projection and the actual learner volumes that emerge through the life of the contract.

Schedule 7

Staff (including Key Personnel)

1 Key Personnel

1.1 The Supplier shall ensure that the Key Personnel fulfil the Key Roles during the Term. The Annex to this Schedule 7 lists the Key Roles. remit and names of the persons who the Supplier shall appoint to fill those Key Roles at the Effective Date.

1.2 The Authority can identify any further roles as being Key Roles and, following agreement on this by the Supplier (such agreement not to be unreasonably withheld or delayed) any relevant person selected to fill those Key Roles (and details of the role itself) shall be included on the list of Key Personnel in the Annex to this Schedule 7.

1.3 The Supplier shall not remove or replace any Key Personnel (including when carrying out its obligations under Schedule 12 (*Exit Management*)) unless:

1.3.1 requested to do so by the Authority;

1.3.2 the person concerned resigns, retires or dies or is on maternity or long-term sick leave;

1.3.3 the person's employment or contractual arrangement with the Supplier or a Subcontractor is terminated for material breach of contract by the employee; or

1.3.4 the Supplier obtains Approval (such Approval not to be unreasonably withheld or delayed).

1.4 The Supplier shall:

1.4.1 notify the Authority promptly of the absence of any Key Personnel (other than for short-term sickness or holidays of 2 weeks or less, in which case the Supplier shall ensure appropriate temporary cover for that Key Role);

1.4.2 ensure that any Key Role is not vacant for any longer than 10 Working Days;

1.4.3 give as much notice as is reasonably practicable of its intention to remove or replace any member of Key Personnel and, except in the cases of death, unexpected ill health or a material breach of the Key Personnel's employment contract, this will mean at least 60 Working Days' notice;

1.4.4 ensure that all arrangements for planned changes in Key Personnel provide adequate periods during which incoming and outgoing personnel work together to transfer responsibilities and ensure that such change does not have an adverse impact on the performance of the Services and/or supply of any Products; and

1.4.5 ensure that any replacement for a Key Role:

(i) has a level of qualifications and experience appropriate to the relevant Key Role; and

(ii) is fully competent to carry out the tasks assigned to the Key Personnel whom he or she has replaced.

2 <u>Staff vetting</u>

2.1 For the purposes of this paragraph 2, "**Convictions**" means, other than in relation to minor road traffic offences, any previous or pending prosecutions, convictions, cautions and binding-over orders (including any spent convictions as contemplated by section 1(1) of the Rehabilitation of Offenders Act 1974 or any replacement or amendment to that Act).

2.2 The Supplier shall ensure that all potential Supplier Staff or persons performing any of the Services during the Term who may reasonably be expected in the course of performing any of the Services under this Contract to have access to or come into contact with Students or vulnerable persons (and/or access to data or information relating to such Students or vulnerable persons) are, to the extent permitted by Law:

2.2.1 questioned concerning their Convictions; and

2.2.2 required to obtain appropriate disclosures from the Disclosure and Barring Service (or other appropriate body) where required by Law,

before the Supplier engages the potential staff or persons in the provision of the Services.

2.3 The Supplier shall take all necessary steps to ensure that such potential staff or persons referred to in paragraph 2.2 obtain standard and enhanced disclosures from the Disclosure and Barring Service (or other appropriate body) and shall ensure all such disclosures are kept up to date. The obtaining of such disclosures shall be at the Supplier's cost and expense.

2.4 The Supplier shall ensure that no person is employed or otherwise engaged in the provision of the Services without the Authority's prior written consent if:

2.4.1 the person has disclosed any Convictions upon being questioned about their Convictions in accordance with paragraph 2.2.1;

2.4.2 the person is found to have any Convictions following receipt of standard and/or enhanced disclosures from the Disclosure and Barring Service (or other appropriate body) in accordance with paragraph 2.2.2; or

2.4.3 the person fails to obtain standard and/or enhanced disclosures from the Disclosure and Barring Service (or other appropriate body) upon request by the Supplier under paragraph 2.2.2.

2.5 In addition to the requirements of paragraphs 2.1 to 2.4, where the Services are or include regulated activities as defined by the Safeguarding Vulnerable Groups Act 2006 the Supplier shall:

2.5.1 comply with all requirements placed on it by the Safeguarding Vulnerable Groups Act 2006;

2.5.2 ensure that it has no reason to believe that any member of Supplier Staff is barred in accordance with the Safeguarding Vulnerable Groups Act 2006; and

2.5.3 ensure that no person is employed or otherwise engaged in the provision of the Services if that person is barred from carrying out, or whose previous conduct or records indicate that they would not be suitable to carry out, any

regulated activities as defined by the Safeguarding Vulnerable Groups Act 2006 or may present a risk to Students or any other person.

2.6 The Supplier shall ensure that the Authority is kept advised at all times of any member of the Supplier Staff who, subsequent to their commencement of employment as a member of the Supplier Staff receives a Conviction or whose previous Convictions become known to the Supplier or whose conduct or records indicate that they are not suitable to carry out any regulated activities as defined by the Safeguarding Vulnerable Groups Act 2006 or may present a risk to Students or any other person. The Supplier shall only be entitled to continue to engage or employ such individual with the Authority's written consent and with such safeguards being put in place as the Authority may reasonably request. Should the Authority withhold consent the Supplier shall immediately remove such individual from the Supplier Staff.

2.7 The Supplier shall immediately provide to the Authority any information that the Authority reasonably requests to enable the Authority to satisfy itself that the obligations set out in paragraphs 2.1 to 2.6 of this Schedule have been met.

2.8 For Supplier Staff appointed following the Effective Date who shall or may have access to IfATE Data, in addition to meeting its obligations under this paragraph 2, the Supplier shall carry out pre-employment screening meeting the HMG Baseline Personnel Security Standard (BPSS) or equivalent in accordance with Schedule 9 (*Data Handling and Security Management*).

Annex to Schedule 7

List of Key Personnel

The content for this Annex is contained in a separate file at;

S7_A1_GEN2W1_BSE_List_of_Key_Personnel

Schedule 8

Supply Chain (including approved Subcontractors)

1 Appointment of Key Subcontractors

1.1 Where the Supplier wishes to enter into a Key Sub-Contract or replace a Key Subcontractor, it must obtain Approval, such Approval not to be unreasonably withheld or delayed. For these purposes, the Authority may withhold its Approval to the appointment of a Key Subcontractor if it reasonably considers that:

1.1.1 the appointment of a proposed Key Subcontractor may prejudice the provision of the Services and/or the supply of the Products or may be contrary to the interests of the Authority and/or the TQ;

1.1.2 the proposed Key Subcontractor is unreliable and/or has not provided reasonable services to its other customers or clients;

1.1.3 the proposed Key Subcontractor employs unfit persons; or

1.1.4 the proposed Key Subcontractor should be excluded in accordance with clause 15.715.8 (*Ending or extending this Contract*).

1.2 The Authority confirms its Approval of the appointment of the Key Subcontractors listed in Annex 1 to this Schedule 8.

1.3 Except where the Authority has given its Approval otherwise, the Supplier shall ensure that each Key Sub-Contract shall include:

1.3.1 provisions which will enable the Supplier to discharge its obligations under this Contract;

1.3.2 a right for the Authority to enforce any provisions under the Key Sub-Contract which are capable of conferring a benefit upon the Authority;

1.3.3 a provision enabling the Authority to enforce the Key Sub-contract as if it were the Supplier;

1.3.4 a provision enabling the Supplier to assign, novate or otherwise transfer any of its rights and/or obligations under the Key Sub-Contract to the

Authority or any Replacement Supplier without restriction (including any need to obtain any consent or approval) or payment by the Authority; and

1.3.5 obligations no less onerous on the Key Subcontractor than those imposed on the Supplier under this Contract:

(i) under clauses 18.1 to 18.9.4 (*Data protection and information*);

(ii) under clause 20 (*When information can be shared*);

(iii) in respect of any obligation not to bring the Authority, the Department or the ESFA and/or the T Levels Programme into disrepute and/or otherwise diminish the trust that the public places in the Authority, the Department or the ESFA, as set out in clause 3.1.9 (*How the Services must be supplied*); and

(iv) in respect of the keeping of records and provision of information (including (as applicable) Management Information) in relation to that part of the Services being provided and/or those Products being supplied under the Key Sub-Contract.

1.4 The Supplier shall, as soon as reasonably practicable following a request by the Authority, provide a copy of any proposed Key Sub-Contract (and/or any Key Sub-Contract which it has entered into) to demonstrate compliance by the Supplier with its obligations under this paragraph 1.

2 <u>Subcontractor information</u>

2.1 If the Authority asks the Supplier for details about Subcontractors, the Supplier must provide details of Subcontractors at all levels of the supply chain including:

2.1.1 their name;

2.1.2 the scope of their appointment; and

2.1.3 the duration of their appointment.

Annex 1 to Schedule 8

Key Subcontractors

The content for this Annex is contained in a separate file at;

S8_A1_GEN2W1_BSE_Key_Sub_Contractors

Schedule 9

Data Handling and Security Management

1 The Supplier shall maintain Cyber Essentials certification and shall operate an Information Security Management System in relation to the Services that is compliant with ISO 27001 (the International Standard for Information Security Management Systems) or an equivalent standard.

2 The Supplier shall have in place and maintain physical security, in line with the requirements outlined in ISO 27002 (the International Standard describing the Code of Practice for Information Security Controls), including entry control mechanisms (e.g. door access) to premises and sensitive areas.

3 The Supplier shall have in place and maintain an access control policy and process for the logical access (e.g. identification and authentication) to IT systems to ensure only authorised personnel have access to IfATE Data.

4 The Supplier shall have in place and shall maintain procedural, personnel, physical and technical safeguards to protect IfATE Data, including: physical security controls; Good Industry Practice policies and processes; anti-virus and firewalls; security updates and up-to-date patching regimes for anti-virus solutions, operating systems, network devices and application software; user access controls; and the creation and retention of audit logs of system use.

5 The Supplier shall carry out and shall maintain records of appropriate technical risk assessments in respect of all aspects of the Supplier's handling of IfATE Data. The Supplier shall provide such records to the Authority on request and shall ensure that such records are capable of demonstrating to the Authority's reasonable satisfaction that appropriate procedures are in place to address any significant risks identified.

6 The Supplier shall ensure that IfATE Data is processed and stored in a manner which enables such IfATE Data to be identified and securely deleted when required. The Supplier shall ensure that IfATE Data which is not in electronic form is kept physically separate from the data of the Supplier and any of the Supplier's other customers.

7 Any IfATE Data transferred by the Supplier using electronic transfer methods across public space or cyberspace, including mail and courier systems, or third party provider

networks must be encrypted to an encryption standard meeting Transport Layer Security (TLS) 1.2 or later.

8 Storage of IfATE Data on any portable devices or media shall be limited to the absolute minimum required to deliver the stated requirement and shall be subject to paragraphs 9 and 10 below.

9 Any portable removable media (including pen drives, flash drives, memory sticks, CDs, DVDs, or other devices) which handle, store or process IfATE Data to deliver or support the Services, shall be under the control and configuration management of the Supplier, shall be necessary to deliver the Services and shall be encrypted to the Advanced Encryption Standard (AES) 256 or equivalent.

10 All portable IT devices (including laptops, tablets, smartphones or other devices, such as smart watches) which handle, store or process IfATE Data to deliver and support the Services, shall be under the control and configuration management of the Supplier, shall be necessary to deliver the Services and shall be full-disk encrypted to the Advanced Encryption Standard (AES) 256 or equivalent.

11 Whilst in the Supplier's care, all removable media and hardcopy paper documents containing IfATE Data must be handled securely and secured under lock and key when not in use and shall be securely destroyed when no longer required, using either a cross-cut shredder, a professional secure disposal organisation or an equivalent secure disposal method.

12 When necessary to hand-carry removable media and/or hardcopy paper documents containing IfATE Data, the media or documents being carried shall be kept under cover and transported in such a way as to ensure that no unauthorised person has either visual or physical access to the material being carried. This paragraph shall apply equally regardless of whether the material is being carried inside or outside of the Supplier's premises.

13 The Supplier shall ensure throughout the Term that it is in a position (and is able to demonstrate to the Authority's reasonable satisfaction that it is in a position) to provide a complete copy of all IfATE Data at the Authority's request at any time and on the termination or expiry of the Contract.

14 At the end of the Contract or in the event of equipment failure or obsolescence, all IfATE Data, in either hardcopy or electronic format, that is physically held or logically stored on the Supplier's IT infrastructure must be securely sanitised or destroyed and accounted for in a manner that ensures that the relevant data is not retrievable using normally available methods and/or tools and which allows the Supplier to demonstrate its compliance with this paragraph 14 at the Authority's request. Where sanitisation or destruction is not possible for legal, regulatory or technical reasons, then the Supplier shall protect the Authority's information and data until such time that it can be securely cleansed or destroyed.

15 Access by Supplier Staff to IfATE Data shall be confined to those individuals who have a "need-to-know" in order to carry out their role and have undergone pre-employment screening appropriate to the nature and sensitivity of the IfATE Data and, for Supplier Staff appointed following the Effective Date, have undergone pre-employment screening which is at least equivalent to the HMG Baseline Personnel Security Standard (BPSS).

16 All Supplier Staff who handle IfATE Data must have annual awareness training in protecting information.

17 The Supplier shall have in place robust business continuity arrangements and processes including IT disaster recovery plans and procedures to ensure that the delivery of the Services is not adversely affected in the event of an incident (as set out in the Supplier's Business Continuity Plan). An incident shall be defined as any situation that might, or could lead to, a disruption, loss, emergency or crisis to the Services. Upon request from the Authority, the Supplier will provide evidence of the effectiveness of their business continuity arrangements and processes including IT disaster recovery plans and procedures. This should include evidence that the Supplier has tested or exercised these plans within the last 12 months and produced a written report of the outcome, including required actions.

18 Any suspected or actual breach of the confidentiality, integrity or availability of IfATE Data being handled in the course of providing the Services, or any non-compliance with security standards pertaining to the Services, shall be investigated immediately and escalated to the Authority. The Supplier shall maintain audit records and event logs in respect of any such security events in accordance with documented retention policies approved by the Authority.

19 The Supplier shall ensure that any IT systems and hosting environments that are used to handle, store or process IfATE Data shall be subject to independent penetration testing, to take place within the three month period immediately prior to the start of each Academic Year, to test the security of such systems and hosting environments, by a penetration testing provider that is CHECK, CREST or TIGER scheme approved. The Supplier shall include a summary of the findings of such penetration testing and the details of any necessary remedial work carried out in the annual penetration testing report required under Schedule 2 (*Service Requirements*). In the event of security issues being identified which are ranked as "high" importance or above, the Supplier shall notify the Authority as soon as reasonably possible (and in any event within 2 Working Days), shall promptly remedy such issues, and shall promptly carry out a follow-up remediation test at the Authority's request.

20 The Supplier shall ensure that any consumer-off-the-shelf software used in relation to the IfATE Data or otherwise to deliver the Services is kept up-to-date and subject to mainstream support.

21 The Supplier shall procure and implement security patches to address any vulnerabilities in the IT systems used to handle the IfATE Data or to deliver the Services, within a period of time appropriate to the risk the vulnerability presents.

22 The Supplier shall not without the prior written agreement of the Authority store any IfATE Data outside of the UK or perform any form of IT management, support or development function from outside the UK. The Supplier shall provide the Authority with full details of any proposal to do so and shall not go ahead with any such proposal without the prior written agreement of the Authority.

23 The Supplier shall undergo appropriate security assurance activities as may reasonably be determined by the Authority from time to time and shall support the provision of appropriate evidence of assurance and the production of the necessary security documentation. This will include obtaining any necessary professional security resources required to support the Supplier's security assurance activities.

24 The Supplier shall have in place and maintain a secure system for data exchange sufficient to enable the Supplier to make all required Management Information and Ofqual information returns in relation to the TQ and the Services.

25 Unless otherwise agreed in writing by the Authority, the Supplier shall ensure that any of their Subcontractors, third party suppliers or partners (including any Assessor who is self-employed or who provides services to the Supplier through that Assessor's own personal service company) who could potentially access any IfATE Data meet all of the requirements in this Schedule as they apply to the Supplier and shall contractually enforce such requirements onto any such Subcontractors, third party suppliers or partners (including any Assessor who is self-employed or who provides services to the Supplier through that Assessor's own personal service company).

Schedule 10

Business Continuity

The content for this Schedule is contained in a separate file at;

S10_GEN2W1_BSE_Business_Continuity

Schedule 11

Change Management

Variation Form

Variation Form / change control note (CCN) No:	**Contract:**	**Effective Date of Variation:**
Initiated by: Change requested by [Supplier **OR** Authority]		
Date of request:		
Period of validity: This Variation Form is valid for acceptance until [DATE].		
Reason for change:		
Description and impact of the change (including to delivery and performance):		
Time limit for Impact Assessment:		
Required amendments to wording of Contract or Schedules:		
Adjustment to Charges resulting from change:		
Supporting or additional information:		

SIGNED ON BEHALF OF THE AUTHORITY	**SIGNED ON BEHALF OF THE SUPPLIER**
Signature:	Signature:
Name:	Name:
Position:	Position:
Date:	Date:

Schedule 12

Exit Management

PART A: GENERAL

1 Exit Plan

1.1 The Supplier shall, within two Months after the Effective Date, deliver to the Authority an initial Exit Plan (adopting and updating the form of plan at Annex 1 to this Schedule 12) that:

1.1.1 sets out the Supplier's proposed methodology for achieving an orderly transfer of the Services to the Authority and/or its Replacement Supplier on the expiry or termination of this Contract;

1.1.2 complies with the requirements set out in paragraph 1.3 below; and

1.1.3 is otherwise reasonably satisfactory to the Authority.

1.2 The Authority shall consider the initial Exit Plan and shall notify the Supplier of any amendments it believes are necessary. The Parties shall use reasonable endeavours to agree the contents of the Exit Plan. If the Parties are unable to agree the contents of the Exit Plan within 30 Working Days of the Authority requesting any amendments, then such Dispute shall be resolved in accordance with the Dispute Resolution Procedure.

1.3 The Exit Plan shall set out, as a minimum:

1.3.1 how the Exit Information will be obtained;

1.3.2 separate mechanisms for dealing with Ordinary Exit, Early Exit and Emergency Exit, with the provisions relating to Early Exit and Emergency Exit prepared on the assumption that the Supplier may be unable to provide the full level of assistance that is required by the provisions relating to Ordinary Exit, and to include in the case of Early Exit and Emergency Exit, provision for the supply by the Supplier of all such reasonable assistance as the Authority shall require to enable the Authority or its sub-contractors to provide the Services;

1.3.3 the management structure to be employed during the transfer of the Services in the event of each of an Ordinary Exit, an Early Exit and an Emergency Exit;

1.3.4 a detailed description of the transfer processes, including a timetable, applicable in the case of each of an Ordinary Exit, an Early Exit and an Emergency Exit;

1.3.5 steps the Supplier will take to mitigate the potential for and/or costs of any redundancies (if applicable) of any individual employed by either the Supplier or any Subcontractor in the provision of the Services in the event of each of an Ordinary Exit, an Early Exit and an Emergency Exit; and

1.3.6 without prejudice to the Supplier's obligations elsewhere in this Schedule, the scope of any further termination-related assistance that may reasonably be required by the Authority to achieve an orderly transfer of the Services to the Authority and/or its Replacement Supplier in the case of each of an Ordinary Exit, an Early Exit, and an Emergency Exit.

2 Updates to the Exit Plan

2.1 The Supplier shall review and (if appropriate) update the Exit Plan:

2.1.1 following IfATE Approval;

2.1.2 at least once every Academic Year;

2.1.3 whenever there is a material change to the Services (including any TQ Change); and

2.1.4 within 10 Working Days of the service of a Termination Notice,

and consider what changes (if any) are necessary to reflect the current state of the Services and the TQ at the relevant point in time and to ensure that the Exit Plan meets the requirements of this Schedule and is capable of being implemented promptly.

2.2 Following each review required under paragraph 2.1, the Supplier shall submit for the Authority's approval a revised draft of the Exit Plan showing any proposed amendments necessary to ensure the Exit Plan continues to meet the requirements of

this Schedule. The Authority shall consider each such revised draft and shall notify the Supplier of any further amendments it believes are necessary. The Supplier shall incorporate all reasonable amendments requested by the Authority in a further revised draft of the Exit Plan. If the Parties are unable to agree the contents of a revised Exit Plan within 30 Working Days of the Authority requesting any amendments, then such Dispute shall be resolved in accordance with the Dispute Resolution Procedure.

2.3 When the revised Exit Plan is agreed, it shall be signed by both Parties, following which it shall supersede any previous versions of the Exit Plan.

3 Provision of Exit Information

3.1 The Supplier shall provide to the Authority the Exit Information (as defined in paragraph 3.2 below) in an appropriate documentary form:

3.1.1 within one Month of the date 12 Months prior to the Expiry Date (as extended by any Extension Period);

3.1.2 as soon as reasonably practicable after (and in any event within one Month of) the date of service of a Termination Notice by either Party; and

3.1.3 at the Authority's request on reasonable notice at any point during the Term provided that the Authority shall not make such a request more than twice in any 6 month period.

3.2 Subject to paragraph 3.3, the information to be provided under paragraph 3.1 shall include all such information as is reasonably necessary and sufficient to enable the Authority and/or any Replacement Supplier to take over and provide the Services and the TQ following the expiry or termination of this Contract (the "**Exit Information**"), and in particular shall include:

3.2.1 details of all Supplier third party contracts or licences used for the provision of the Services (including any Transferable Contracts) including, where applicable, whether such contracts or licences are used by the Supplier to provide services to other customers of the Supplier, save to the extent these details are subject to an obligation of confidence to a third party that is not part of the Supplier's corporate group;

3.2.2 details of all the Intellectual Property Rights used in the provision of the Services or developed as part of the Services;

3.2.3 details of any IfATE Data that is in the possession or control of the Supplier or any Subcontractors or that is otherwise used in the provision of the Services;

3.2.4 details of any Key Materials and Ancillary Materials;

3.2.5 details of any ongoing projects or other work carried out under this Contract; and

3.2.6 in respect of all individuals engaged in providing the Services, such information as the Authority may reasonably request (subject, at all times, to any relevant Data Protection Legislation), including in an anonymised format full and accurate details of:

(i) the total number of such individuals;

(ii) details of whether they are employed, self-employed contractors or consultants, agency workers or otherwise;

(iii) their dates of commencement of employment or engagement;

(iv) their remuneration and other benefits;

(v) their other terms and conditions of employment, as applicable (including their relevant contractual notice periods and any other terms relating to termination of employment, redundancy procedures and redundancy payments);

(vi) their job titles and job descriptions;

(vii) details of any such individuals on long term sickness absence, parental leave, maternity leave, paternity leave or other authorised long-term absence;

(viii) any outstanding or potential contractual, statutory or other liabilities in respect of such individuals (including in respect of personal injury claims);

(ix) details of who reports to each individual and to whom each individual reports; and

(x) any collective agreements that apply to them; and

3.2.7 any other material or information reasonably requested by the Authority.

3.3 The Supplier shall not be required to provide in the Exit Information any information that has already been provided to the Authority as part of the Management Information, unless that information has become outdated and/or inaccurate since it was last provided as part of the Management Information.

3.4 Once provided in accordance with paragraph 3.1 above, the Supplier shall provide any updates to the Exit Information to the Authority:

3.4.1 on a Monthly basis (following any Month where there are changes to the Exit Information) following the earliest of the dates referred in to paragraphs 3.1.1 and 3.1.2; and

3.4.2 as soon as reasonably practicable following (and in any case within one Month of) the Authority's reasonable request, provided that the Authority shall not make such a request more than twice in any 6 Month period.

3.5 The Exit Information shall be deemed to be Confidential Information. The Authority shall only use the Exit Information for the Exit Purposes as defined in paragraph 4.2 below, and shall ensure that such Exit Information is only disclosed within the Authority to those individuals who need to know the Exit Information for the Exit Purposes. The Authority may disclose the Exit Information to any Replacement Supplier for the Exit Purposes.

4 Provision of assistance on termination or expiry

4.1 In connection with any expiry or termination of this Contract for whatever reason, the Parties shall perform their respective obligations as stated in the Exit Plan, and without prejudice to the generality of this obligation:

4.1.1 the Supplier shall provide to the Authority and/or any Replacement Supplier (as applicable) all reasonable assistance requested by the Authority for the transfer of the Services and the TQ from the Supplier to the Authority and/or

the Replacement Supplier (as applicable) with the minimum of disruption and inconvenience to Students and Stakeholders;

4.1.2 the Supplier shall provide the Authority with:

(i) a complete copy of all Key Materials;

(ii) a complete copy of any Ancillary Materials that have not previously been provided or that have been updated since they were last provided; and

(iii) at the Authority's request, further copies of any Ancillary Materials previously provided;

4.1.3 the Supplier shall provide the Authority or, at the Authority's request, any Replacement Supplier, with a copy of all IfATE Data that is in the possession or control of the Supplier or any Subcontractors or that is otherwise used in the provision of the Services;

4.1.4 the Supplier shall provide any additional information reasonably required by the Authority to understand and access any data or information provided by the Supplier; and

4.1.5 at the Authority's request, the Supplier shall enter into a period of parallel running of the Services alongside the running of any Replacement Services and shall use its reasonable endeavours to facilitate a phased transfer of the Services to the Authority and/or any Replacement Supplier (but only where that phased transfer does not impact on the Supplier's ability to deliver the Services that it remains responsible for providing under this Contract).

4.2 Without prejudice to the terms of clause 13 (*Intellectual Property Rights*), the Supplier hereby grants to the Authority a worldwide, royalty free licence (with a right to sublicense to any Replacement Supplier) to use any information, data, software or materials referred to in the Exit Information or provided by the Supplier or its Subcontractors in the performance of the Supplier's obligations under this paragraph 4. The Authority and any Replacement Supplier sub-licensees may only use such information, data, software and materials for such purposes and for such period as is

reasonably necessary to ensure an orderly transfer of the Services to the Authority or a Replacement Supplier that minimises disruption and inconvenience to Students and Stakeholders ("**Exit Purposes**").

4.3 In the event of an Emergency Exit, the Supplier shall grant or procure the grant to the Authority and any Replacement Supplier the right during any Transition Period and on termination of this Contract to access and use the IT systems used by the Supplier (including software and databases) insofar as such access and use is necessary in order to enable an orderly transfer of the Services to the Authority and/or its Replacement Supplier on the termination of this Contract, and the Supplier shall provide such access, information and credentials as are required for the Authority and/or Replacement Supplier to access such systems for such purposes.

5 Transferable Contracts

5.1 During the period beginning 6 Months prior to the End Date or following the service of a Termination Notice by either party, the Supplier shall not without the Authority's prior written consent terminate, enter into or vary:

5.1.1 any Transferable Contract; or

5.1.2 any other Sub-Contract, except to the extent such change does not or will not affect the provision of the Services or the Charges.

5.2 On expiry or termination of this Contract for any reason, the Supplier shall at the Authority's request assign, novate or procure the novation of the Supplier's interest in the Transferable Contracts to the Authority or a Replacement Supplier.

6 Costs of assistance on termination or expiry

6.1 Save in respect of the provision of the Services (for which the Supplier shall continue to be remunerated in accordance with Schedule 6 (*Pricing Schedule*)):

6.1.1 where the Contract is terminated by the Authority as a result of a Supplier Termination Event under clause 15.3 (*Ending or extending this Contract*) or where the Contract is wrongfully terminated or repudiated by the Supplier, the Parties' costs of compliance with paragraph 4 shall be borne by the Supplier; and

6.1.2 where the Contract is terminated by the Supplier under clause 15.5 (*Ending or extending this Contract*) or where the Contract is wrongfully terminated or repudiated by the Authority, the Parties' costs of compliance with paragraph 4 shall be borne by the Authority.

6.2 References to "**costs**" in paragraph 6.1 shall be deemed to refer only to direct, reasonable and verifiable costs (which, in the case of the Supplier, shall be calculated in accordance with the Rate Card). Both Parties shall use all reasonable endeavours to mitigate such costs and, to the extent reasonably practicable, each Party shall notify and obtain the consent of the other Party before incurring any costs for which the other Party would be liable under paragraph 6.1.

6.3 Subject to paragraph 6.1, each Party shall bear its own costs of compliance with this Schedule.

7 General

7.1 The Supplier warrants to the Authority that all the information provided under paragraphs 3 and 4 shall conform to the requirements of this Contract or, where there are no such requirements, shall be prepared in accordance with Good Industry Practice.

7.2 Except as otherwise stated in the Exit Plan:

7.2.1 the obligations in paragraphs 4 and 5 shall be in addition to, and not in substitution for, the provision of the Services; and

7.2.2 subject to the continued payment of the Charges in accordance with the terms of this Contract, the Supplier shall continue to provide, and the Authority shall continue to receive, the Services during the Term in accordance with the terms and conditions of this Contract.

PART B: EMPLOYMENT

8 Employment exit provisions

8.1 This Contract envisages that subsequent to its commencement, the identity of the provider of the Services (or any part of the Services) may change (whether as a result of termination of this Contract, or part or otherwise) resulting in a transfer of the

Services in whole or in part ("**Subsequent Transfer**"). If a Subsequent Transfer is a Relevant Transfer then the Authority or Replacement Supplier will inherit liabilities in respect of the Relevant Employees with effect from the Relevant Transfer Date.

8.2 The Supplier shall and shall procure that any Subcontractor shall on receiving notice of termination of this Contract or otherwise, on request from the Authority and at such times as required by TUPE, provide in respect of any person engaged or employed by the Supplier or any Subcontractor in the provision of the Services, the Supplier's Provisional Supplier Personnel List and the Staffing Information together with any additional information required by the Authority, including information as to the application of TUPE to each individual listed on the Supplier's Provisional Supplier Personnel List. The Supplier shall notify the Authority of any material changes to this information as and when they occur.

8.3 At least 28 days prior to the Relevant Transfer Date, the Supplier shall and shall procure that any Subcontractor shall prepare and provide to the Authority and/or, at the direction of the Authority, to the Replacement Supplier, the Supplier's Final Supplier Personnel List, which shall be complete and accurate in all material respects. The Supplier's Final Supplier Personnel List shall identify which of the Supplier's and Subcontractor's personnel named are Relevant Employees.

8.4 The Authority shall be permitted to use and disclose the Supplier's Provisional Supplier Personnel List, the Supplier's Final Supplier Personnel List and the Staffing Information for informing any tenderer or other prospective Replacement Supplier for any services that are substantially the same type of services as (or any part of) the Services.

8.5 The Supplier warrants to the Authority and the Replacement Supplier that the Supplier's Provisional Supplier Personnel List, the Supplier's Final Supplier Personnel List and the Staffing Information ("**TUPE Information**") will be true and accurate in all material respects and that no persons are employed or engaged in the provision of the Services other than those included on the Supplier's Final Supplier Personnel List.

8.6 The Supplier shall and shall procure that any Subcontractor shall ensure at all times that it has the right to provide the TUPE Information under Data Protection Legislation.

8.7 Any change to the TUPE Information which would increase the total employment costs of the staff in the 12 months prior to the Expiry Date and/or the period following the date of service of a Termination Notice by either Party, shall not (so far as reasonably practicable) take place without the Authority's prior written consent, unless such changes are required by law. The Supplier shall and shall procure that any Subcontractor shall supply to the Authority full particulars of such proposed changes and the Authority shall be afforded reasonable time to consider them.

8.8 In the 12 months prior to the Expiry Date and the period following the date of service of a Termination Notice by either Party, the Supplier shall not and shall procure that any Subcontractor shall not materially increase or decrease the total number of staff listed on the Supplier's Provisional Supplier Personnel List, their remuneration, or make any other change in the terms and conditions of those employees without the Authority's prior written consent.

8.9 The Supplier shall be responsible for all remuneration, benefits, entitlements and outgoings in respect of the Supplier's Personnel, including without limitation, all wages, holiday pay, bonuses, commissions, payments of PAYE, National Insurance, pension contributions and otherwise, up to the Relevant Transfer Date.

8.10 The Supplier shall indemnify and keep indemnified in full the Authority and at the Authority's request each and every Replacement Supplier against all Employee Liabilities relating to:

8.10.1 any person who is or has been employed or engaged by the Supplier or any Subcontractor in connection with the provision of any of the Services; or

8.10.2 any trade union or staff association or employee representative,

arising from or connected with any failure by the Supplier and/or any Subcontractor to comply with any legal obligation, and whether any such claim arises or has its origin before or after the Relevant Transfer Date.

8.11 The Authority will and/or shall ensure that any Replacement Supplier will indemnify and keep indemnified in full the Supplier against any liability to the extent only arising from any failure by the Authority and/or any Replacement Supplier to comply with their obligations under TUPE.

8.12 The parties shall co-operate to ensure that any requirement to inform and consult with the employees and or employee representatives in relation to any Relevant Transfer as a consequence of a Subsequent Transfer will be fulfilled.

8.13 The parties agree that the Contracts (Rights of Third Parties) Act 1999 shall apply in respect of paragraph 8.2 to paragraph 8.10 to the extent necessary to ensure that any Replacement Supplier shall have the right to enforce the obligations owed to, and indemnities given to, the Replacement Supplier by the Supplier or the Authority in its own right under the Contracts (Rights of Third Parties) Act 1999.

8.14 Despite paragraph 8.13, it is expressly agreed that the parties may by agreement rescind or vary any terms of this Contract without the consent of any other person who has the right to enforce its terms or the term in question despite that such rescission or variation may extinguish or alter that person's entitlement under that right.

Schedule 12: Annex 1 – Exit Plan

The content for this Annex is contained in separate files at;

S12_A1_GEN2W1_BSE_Q10.4_Exit_Plan

S12_A1_GEN2W1_BSE_Q10.4_Entry_Plan

Schedule 12 Annex 1

Exit Plan

S12_A1_GEN2W1_BSE_Q10.4_Exit_Plan

Schedule 12 Annex 1

Entry Plan

S12_A1_GEN2W1_BSE_Q10.4_Entry_Plan

Schedule 13

Form of Guarantee

Not Used

Schedule 14

Form of Assignment and Licence

DATED

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

and

[*Supplier*]

INTELLECTUAL PROPERTY ASSIGNMENT AND LICENCE IN RELATION TO THE [xxx] T LEVEL TECHNICAL QUALIFICATION

[***DN: The highlighted details above are to be completed at the Contract award stage***]

THIS ASSIGNMENT AND LICENCE is made on

BETWEEN:

(1) **THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION** of Sanctuary Buildings, 20 Great Smith Street, London SW1P 3BT ("**Authority**"); and

(2) **[*DN: Insert Supplier name and details at Contract award stage*]** ("**Supplier**"),

each a "**Party**" and together the "**Parties**".

BACKGROUND TO THIS ASSIGNMENT AND LICENCE

(A) The Authority and the Supplier have entered into a contract on the date of this Assignment and Licence for the design, development and delivery of the technical education qualification element ("**TQ**") for the [*DN: Relevant pathway to be inserted at Contract award stage*] T Level ("the **TQ Agreement**").

(B) The Supplier has agreed to assign certain intellectual property rights to the Authority, and to licence certain intellectual property rights to the Authority in connection with the TQ. The Authority has agreed to grant a licence back to the Supplier in relation to certain assigned intellectual property rights.

(C) This Assignment and Licence, together with the TQ Agreement sets out the agreed terms of such assignment and licences.

1 Assignment and Licence start, formation and interpretation

1.1 This Assignment and Licence is legally binding from the Effective Date until it ends in accordance with its terms.

1.2 In this Assignment and Licence, unless the context otherwise requires, capitalised expressions shall have the meanings set out in this clause 1 or, where no definition is given in this clause 1, Schedule 1 to the TQ Agreement.

1.3 If a capitalised expression does not have an interpretation in this clause 1 or Schedule 1 to the TQ Agreement, it shall, in the first instance, be interpreted in accordance with the common interpretation within the relevant market sector where appropriate. Otherwise, it shall be interpreted in accordance with the dictionary meaning.

1.4 In this Assignment and Licence, unless the context otherwise requires:

1.4.1 the singular includes the plural and vice versa;

1.4.2 reference to a gender includes the other gender and the neuter;

1.4.3 references to a person include an individual, company, body corporate, corporation, unincorporated association, firm, partnership or other legal entity or Crown Body;

1.4.4 references to a legal entity (other than the Supplier) shall include unless otherwise expressly stated any statutory successor to such entity and/or the relevant functions of such entity, and references to the Department shall include, where relevant, the ESFA;

1.4.5 a reference to any Law includes a reference to that Law as amended, extended, consolidated or re-enacted from time to time;

1.4.6 the words "**including**", "**other**", "**in particular**", "**for example**" and similar words shall not limit the generality of the preceding words and shall be construed as if they were immediately followed by the words "**without limitation**";

1.4.7 references to "**writing**" include typing, printing, lithography, photography, display on a screen, electronic and facsimile transmission and other modes of representing or reproducing words in a visible form, and expressions referring to writing shall be construed accordingly;

1.4.8 references to "**clauses**" and "**Schedules**" are, unless otherwise provided, references to the clauses and schedules of this Assignment and Licence and references in any Schedule to parts, paragraphs, annexes and tables are, unless otherwise provided, references to the parts, paragraphs, annexes and tables of the Schedule in which these references appear;

1.4.9 references to "**paragraphs**" are, unless otherwise provided, references to the paragraph of the appropriate Schedules unless otherwise provided; and

1.4.10 the headings in this Assignment and Licence are for ease of reference only and shall not affect the interpretation or construction of this Assignment and Licence.

1.5 In this Assignment and Licence, unless the context otherwise requires, the following words shall have the following meanings:

"**Ancillary Materials**" means all information and materials (other than Key Materials) to which the Authority and/or a Future Supplier would require access for the Portability Purposes, and any other materials which would be required on or to facilitate succession to a Future Supplier in a seamless manner in relation to the TQ offered or Operated by the Supplier.

Ancillary Materials shall include, without limitation:

(a) Student results including grades;

(b) statistical analysis for grading (excludes the systems supporting the analysis);

(c) lists of Providers;

(d) marked Student evidence (with moderation outcomes);

(e) documentation which provides an overview or analysis of Student performance (including chief examiner and chief moderator reports), which include but are not limited to, examples of student responses to assessment questions and/or tasks as well as narrative explaining why students did well/ less well on individual items/ components/ subcomponents);

(f) data on Student credits;

(g) data on Student appeals;

(h) data on special considerations for Students;

(i) the Assessment Strategy;

(j) Student registrations;

(k) draft materials in preparation for forthcoming assessments;

(l) the Key Dates Schedule (in respect of forthcoming assessments);

(m) lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ;

(n) materials from completed assessments, such as completed Students' examination answer booklets; and

(o) TQ Live Assessment Materials

"**Approval**" has the same meaning as in the TQ Agreement;

"**Assigned Rights**" means the Intellectual Property Rights in the Key Materials;

"**Authority Authorised Representative**" has the same meaning as in the TQ Agreement;

"**Background IPR**" means any IPR owned by a Party prior to the Effective Date or created or developed by a Party otherwise than in the provision of the Services or under or in connection with the TQ Agreement, but does not include IPR in Key Materials;

"**Beneficiary**" means a Party having (or claiming to have) the benefit of an indemnity under this Assignment and Licence;

"**Claim**" means any claim for which it appears that a Beneficiary is, or may become, entitled to indemnification under this Assignment and Licence;

"**Continuing Activities**" means activities of the Supplier under the TQ Agreement which continue following the end of the second Academic Year for the final Exclusive Cohort (each as defined in the TQ Agreement) in relation to the TQ as offered by the Supplier, such as retakes, appeals, and any ongoing records management contracted to the Supplier;

"**Default**" means any breach of the obligations of the Supplier (including abandonment of the Assignment and Licence in breach of its terms) or any other default (including material default), act, omission, negligence or statement of the Supplier, of its Subcontractors or any Supplier Staff howsoever arising in connection with or in relation to the subject-matter of this Assignment and Licence and in respect of which the Supplier is liable to the Authority;

"**Deliverables**" means all information and data the Supplier creates, identifies for use, or uses as part of or for the Operation of the TQ, including Products and Management Information;

"**Dispute**" means any claim, dispute or difference which arises out of or in connection with this Assignment and Licence or in connection with the negotiation, existence, legal validity, enforceability or termination of this Assignment and Licence, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts;

"**Effective Date**" means the date on which the last Party to sign has signed this Assignment and Licence;

"**Final Approval Milestone**" has the meaning given in the TQ Agreement;

"**Future Supplier**" means any Awarding Organisation appointed, at any point in the future and including any Replacement Supplier, to operate one or more T Level technical education qualifications by or at the direction of the Authority from time to time, and where the Authority is operating a T Level technical education qualification, shall also include the Authority;

"**Indemnifier**" means a Party from whom an indemnity is sought under this Assignment and Licence;

"**Insolvency Event**" means:

(a) in respect of a company:

(i) a proposal is made for a voluntary arrangement within Part I of the Insolvency Act 1986 or of any other composition scheme or arrangement with, or assignment for the benefit of, its creditors; or

(ii) a shareholders' meeting is convened for the purpose of considering a resolution that it be wound up or a resolution for its winding-up is passed (other than as part of, and exclusively for the purpose of, a bona fide reconstruction or amalgamation); or

(iii) a petition is presented for its winding up (which is not dismissed within fourteen (14) Working Days of its service) or an application is made for the appointment of a provisional liquidator or a creditors' meeting is convened pursuant to section 98 of the Insolvency Act 1986; or

(iv) a receiver, administrative receiver or similar officer is appointed over the whole or any part of its business or assets; or

(v) an application order is made either for the appointment of an administrator or for an administration order, an administrator is appointed, or notice of intention to appoint an administrator is given; or

(vi) it is or becomes insolvent within the meaning of section 123 of the Insolvency Act 1986; or

(vii) being a "**small company**" within the meaning of section 382(3) of the Companies Act 2006, a moratorium comes into force pursuant to Schedule A1 of the Insolvency Act 1986; or

(b) where the person is an individual or partnership, any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs in relation to that individual or partnership; or

(c) any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs under the law of any other jurisdiction;

"**Intellectual Property Rights**" or "**IPR**" means:

(a) copyright, rights related to or affording protection similar to copyright, rights in databases, patents and rights in inventions, semi-conductor topography rights, trade marks, rights in internet domain names and website addresses and other rights in trade or business names, goodwill, designs, Know-How, trade secrets and other rights in Confidential Information;

(b) applications for registration, and the right to apply for registration, for any of the rights listed at (a) that are capable of being registered in any country or jurisdiction; and

(c) all other rights having equivalent or similar effect in any country or jurisdiction;

"**IPR Claim**" means any claim of infringement or alleged infringement (including the defence of such infringement or alleged infringement) of any IPR used to provide the Services and/or

supply the Products or otherwise provided and/or licensed by the Supplier (or to which the Supplier has provided access) to the Authority in the fulfilment of its obligations under the TQ Agreement or this Assignment and Licence;

"**Key Materials**" means materials the IPR in which the Authority reasonably requires ownership of for the Portability Purposes. Examples of where the Authority may reasonably require ownership include because the Authority or a Future Supplier (or, where relevant, a potential Future Supplier) may need to copy or otherwise reproduce such materials (in whole or in part), to supply or communicate the same, or to be able control the use (in whole or in part) of such materials by third parties, or to authorise others to do so.

Key Materials shall include:

(a) specifications of content for each TQ including core and all specialist components;

(b) assessment guidelines (for Providers);

(c) quality assurance requirements (for Providers);

(d) specimen assessment materials;

(e) standards exemplification materials;

(f) supplementary specimen assessment materials

(g) employer set project guide exemplar responses

(h) employer set project grade exemplar responses

(i) updates or redevelopments of specifications of content;

(j) updates and redevelopments of any Key Materials; and

(k) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes.

Key Materials shall not include:

(1) Support Materials, insofar as they are not part of any of the expressly included items listed above;

(2) question banks insofar as they are not part of any of the included items listed above and are not developed for the TQ; and

(3) any systems and platforms used to support the delivery of the TQ, provided that the relevant TQ content or data held in or processed by such systems and/or platforms can be extracted without requiring further processing post-extraction (and the Supplier can demonstrate that they can be so extracted) to enable use of the relevant content and/or data by a Skilled Future Supplier in conjunction with a non-proprietary or generally commercially available system or platform;

"**Know-How**" means all ideas, concepts, schemes, information, knowledge, techniques, methodology, and anything else in the nature of know-how relating to the Services;

"**Law**" means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Supplier is bound to comply;

"**Losses**" means all losses, liabilities, damages, costs, expenses (including legal fees), disbursements, costs of investigation, litigation, settlement, judgment, interest and penalties whether arising in contract, tort (including negligence), breach of statutory duty, misrepresentation or otherwise and "**Loss**" shall be interpreted accordingly;

"**New IPR**" means :

(a) IPR in items created by the Supplier (or by a third party on behalf of the Supplier) specifically for the purposes of the TQ Agreement and updates and amendments of these items including (but not limited to) database schema; and/or

(b) IPR in or arising as a result of the performance of the Supplier's obligations under the TQ Agreement and all updates and amendments to the same,

but shall not include any IPR owned by the Supplier prior to the Effective Date;

"**Operate**" in relation to a qualification means to provide the Services or a material part of the Services, or services replacing the Services or a material part of the Services, or of an equivalent character to the Services or a material part of the Services in relation to any other qualification (whether a T Level technical education qualification or not); and "**Operation**" and other cognate terms shall have a corresponding meaning;

"**Party**" means the Authority or the Supplier and "**Parties**" means both of them where the context permits;

"**Product**" has the meaning given in the TQ Agreement;

"**Provider**" means an organisation that has a grant agreement and/or a contract in place with the ESFA to provide qualifications to Students;

"**Replacement Services**" means any services which are substantially similar to any of the Services (including the supply of any Products) and which the Authority receives in substitution for any of the Services, whether those services are provided by the Authority internally and/or by any third party;

"**Replacement Supplier**" has the meaning given in the TQ Agreement;

"**Required Insurances**" has the meaning given in the TQ Agreement;

"**Services**" means the services as described in Schedule 2 to the TQ Agreement (*Service Requirements*) including any Additional Services as defined in the TQ Agreement;

"**Termination Notice**" means a written notice of termination given by one Party to the other, notifying the Party receiving the notice of the intention of the Party giving the notice to terminate this Assignment and Licence on a specified date and setting out the grounds for termination;

"**Third Party IPR**" means Intellectual Property Rights owned by a third party which is or will be used by the Supplier for the purpose of providing the Services and/or supplying the Products;

"**TQ Agreement**" has the meaning given in recital A (above);

"**Transparent**" means that students and employers will regard the TQ delivered by a Future Supplier as materially the same as the TQ delivered and operated by the (existing) Supplier;

"**Working Day**" means any day other than a Saturday or Sunday or public holiday in England and Wales.

2 Assignment

2.1 Pursuant to and for the consideration set out in the TQ Agreement, the Supplier assigns to the Authority, absolutely with full title guarantee all its right, title and interest in and to all of the Intellectual Property Rights in the Key Materials (which, for the avoidance of doubt, includes the Guide Standard Exemplification Materials) including the right to bring, make, oppose, defend, appeal proceedings, claims or actions and obtain relief (and to retain any damages recovered) in respect of any infringement, or any other cause of action arising from ownership, of any of the Assigned Rights on or after the date of this Assignment and Licence. Such assignment shall take place on the earlier of:

2.1.1 the creation of any relevant materials known to be Key Materials;

2.1.2 the identification by the Supplier of the use of the relevant materials as part of the TQ; and

2.1.3 delivery of the relevant Key Materials to the Authority, or Operation of the TQ by the Supplier.

2.2 With the exception of Guide Standard Exemplification Materials, all Key Materials are relevant course documents for the purposes of section A2D3(4) of the Apprenticeships, Skills, Children and Learning Act 2009, and on approval of the TQ at the Final Approval Milestone and on any subsequent Approval, to the extent that any copyright or any rights in copyright forming part of the Assigned Rights have not then been assigned to and vested absolutely in the Authority, they shall be transferred to the Authority by operation of statute in accordance with section A2IA of the Apprenticeships, Skills, Children and Learning Act 2009. Intellectual Property Rights in the Guide Standard Exemplification Materials is assigned to the Authority by virtue of 2.1 above.

3 Licences to the Authority

3.1 The Supplier hereby grants to the Authority (and the Authority shall have, in addition to any retained rights under clause 13.8 of the TQ Agreement) a non-exclusive, perpetual, royalty-free, irrevocable, transferable worldwide licence to use, exploit and sub-license the IPR in the Ancillary Materials and the Supplier's Background IPR and, in respect of any IPR in Key Materials, in each case to the extent that the same are not

at the relevant time vested absolutely in the Authority, as necessary to enable the Authority (and its sub-licensees) to:

3.1.1 use the Key Materials and Ancillary Materials in its administration, approval and oversight of the TQ and other T Level technical education qualifications and to make the same available to others (such as Ofqual) to do the same; and

3.1.2 to use the Key Materials and the Ancillary Materials, and for any Future Supplier or potential Future Supplier to use the Key Materials and the Ancillary Materials:

(i) for competing or tendering for the delivery and Operation of the TQ and/or any Replacement TQ, during any Transition Period and following expiry or termination of the TQ Agreement; and

(ii) to deliver and Operate the TQ and any Replacement TQ, during any Transition Period and following expiry or termination of the TQ Agreement; and

3.1.3 otherwise to receive and use the Services and the Deliverables and allow any Future Supplier to use the Deliverables; and

3.1.4 to sub-license others to exercise the rights set out in this clause 3.1.

3.2 The Authority agrees that it shall use any Ancillary Materials which fall solely within element (l) of the definition of Ancillary Materials (being "*lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ*") only for the purposes of planning for or executing an Emergency Exit.

4 Licence to the Supplier

4.1 The Authority hereby grants to the Supplier, in respect of the Assigned Rights, a worldwide, royalty free, perpetual and irrevocable non-exclusive licence, with the right to sublicense, to use and exploit the IPR in the Key Materials during and after the Term, but not, save as provided in the TQ Agreement, to use the same as part of a T Level,

such licence being subject to clauses 13.13 and 13.14 of the TQ Agreement (which for these purposes shall survive any termination or expiry of the TQ Agreement).

5 Warranties and representations

5.1 The Supplier warrants and represents (on the Effective Date and on any relevant assignment or grant of licence taking effect) that:

5.1.1 it is or will be the sole legal and beneficial owner of, and that it owns all the rights and interests in the Assigned Rights no later than the time for assignment specified in clause 2.1 or when they are assigned in accordance with clause 13.2.1 of the TQ Agreement, save for Assigned Rights other than New IPR, in respect of which it has previously notified the Authority and the Authority has agreed in writing that this warranty shall not apply;

5.1.2 where it is not the sole legal and beneficial owner of the Assigned Rights, including the Assigned Rights which are to be used or embodied in any Key Materials, it has established that all owners of such rights consent to their assignment and transfer absolutely to the Authority;

5.1.3 it has all the necessary right and title to grant all the licences granted to the Authority under this Assignment and Licence and the TQ Agreement;

5.1.4 it has not licensed or assigned any of the Assigned Rights other than pursuant to this Assignment and Licence or the TQ Agreement;

5.1.5 the Assigned Rights are free from any security interest, option, mortgage, charge or lien;

5.1.6 it is unaware of any infringement or likely infringement of any of the Assigned Rights;

5.1.7 as far as it is aware, all the Assigned Rights are valid and subsisting and there are and have been no claims, challenges, disputes or proceedings, pending or threatened, in relation to the ownership, validity or use of any of the Assigned Rights;

5.1.8 the use of the Key Materials and Ancillary Materials, and exploitation of the Assigned Rights by the Supplier in the provision of the Services and Deliverables or by the Authority in receiving and using the Services and Deliverables or procuring any Replacement Services or by any Future Supplier in Operating any Replacement Services, will not infringe the rights of any third party; and

5.1.9 the Key Materials are its original work and have not been copied wholly or substantially from any other source.

6 Indemnity

6.1 Subject to clause 19, if there is an IPR Claim, the Supplier indemnifies the Authority against all losses, damages, costs or expenses (including professional fees and fines) incurred as a result.

6.2 If an IPR Claim is made or anticipated, the Supplier must at its own expense and the Authority's sole option, either:

6.2.1 obtain for the Authority the rights in clause 2.1 and 3.1 without infringing any Third Party IPR; or

6.2.2 replace or modify the relevant item with substitutes that do not infringe IPR without adversely affecting the functionality or performance of the Deliverables.

7 Moral rights

7.1 The Supplier shall procure written absolute waivers from all authors of the Key Materials and Ancillary Materials in relation to all their moral rights arising under the Copyright, Designs and Patents Act 1988 in relation to the Key Materials and Ancillary Materials and, as far as is legally possible, any broadly equivalent rights such authors may have in any territory of the world.

8 Ending or extending the Assignment and Licence

8.1 This Assignment and Licence ends if terminated by the Authority for any reason set out in this Assignment and Licence.

8.2 If any of the following events happen, the Authority has the right to immediately terminate this Assignment and Licence or any of the licences granted under this Assignment and Licence by issuing a Termination Notice to the Supplier (in the latter case specifying the relevant licences):

8.2.1 a Default incapable of remedy;

8.2.2 a Default capable of remedy that is not corrected within 30 days; and

8.2.3 anything occurs which entitles the Authority to terminate the TQ Agreement.

9 Claims against third parties

9.1 The Supplier may take any action it considers appropriate or necessary, subject to the Authority's prior written consent, not to be unreasonably withheld or delayed, if there is a breach, other than in connection with the TQ, by a third party of the Authority's rights in any IPR licensed to the Supplier under clause 4, and the Authority agrees to provide all such assistance as the Supplier may reasonably require (subject to meeting the Authority's reasonably agreed costs and expenses and the Supplier hereby indemnifying the Authority in respect of any loss, damage or liability the Authority incurs by reason of any such action).

10 Further assurance

10.1 At the Authority's expense the Supplier shall, and shall use all reasonable endeavours to procure that any necessary third party shall, promptly execute and deliver such documents and perform such acts as may reasonably be required for the purpose of giving full effect to this Assignment and Licence and the TQ Agreement, including:

10.1.1 registration of the Authority as applicant or (as applicable) proprietor of the Assigned Rights; and

10.1.2 assisting the Authority in obtaining, defending and enforcing the Assigned Rights, and assisting with any other proceedings which may be brought by or against the Authority against or by any third party relating to the Assigned Rights.

10.2 The Supplier appoints the Authority to be its attorney in its name and on its behalf to execute documents, use the Supplier's name and do all things which are necessary or

desirable for the Authority to obtain for itself or its nominee the full benefit of this Assignment and Licence.

10.3 This power of attorney is irrevocable and is given by way of security to secure the performance of the Supplier's obligations under this Assignment and Licence and the proprietary interest of the Authority in the Assigned Rights and so long as such obligations of the Supplier remain undischarged, or the Authority has such interest, the power may not be revoked by the Supplier, save with the consent of the Authority.

10.4 Without prejudice to clause 10.2, the Authority may, in any way it thinks fit and in the name and on behalf of the Supplier:

10.4.1 take any action that this Assignment and Licence requires the Supplier to take;

10.4.2 exercise any rights which this Assignment and Licence gives to the Supplier; and

10.4.3 appoint one or more persons to act as substitute attorney(s) for the Supplier and to exercise such of the powers conferred by this power of attorney as the Authority thinks fit and revoke such appointment.

10.5 The Supplier undertakes to ratify and confirm everything that the Authority and any substitute attorney does or arranges or purports to do or arrange in good faith in exercise of any power granted under this clause 10.

11 How much each Party can be held responsible for

11.1 Each Party's total aggregate liability under this Assignment and Licence (whether in tort, contract or otherwise) for each claim or series of connected claims is no more than £1 million.

11.2 No Party is liable to the other for:

11.2.1 any indirect Losses; or

11.2.2 loss of profits, turnover, savings, business opportunities or damage to goodwill (in each case whether direct or indirect).

11.3 The limitation of liability set out in clause 11.1 does not apply to either Party in relation to the following:

11.3.1 its liability for death or personal injury caused by its negligence, or that of its employees, agents or subcontractors;

11.3.2 bribery or fraud or fraudulent misrepresentation by it or its employees; or

11.3.3 any liability that cannot be excluded or permitted by Law.

11.4 Each Party must use all reasonable endeavours to mitigate any Losses which it suffers under or in connection with this Assignment and Licence, including where any such Losses are covered by an indemnity.

11.5 When calculating the Supplier's liability under clause 11.1, Losses covered by Required Insurances will not be taken into consideration.

12 Invalid parts of this Assignment and Licence

12.1 If any part of this Assignment and Licence is prohibited by Law or judged by a court to be unlawful, void or unenforceable, it must be removed from this Assignment and Licence as much as required and rendered ineffective as far as possible without affecting the rest of the Assignment and Licence, or whether it is valid or enforceable.

13 No other terms apply

13.1 Except as otherwise expressly provided in this Assignment and Licence or in the TQ Agreement, the provisions incorporated into this Assignment and Licence are the entire agreement between the Parties. The Assignment and Licence replaces all previous statements and agreements whether written or oral. No other provisions apply.

13.2 Variation of this Assignment and Licence is only effective if agreed in writing and signed by both Parties.

14 Other people's rights in this Assignment and Licence

14.1 No third parties may use the Contracts (Rights of Third Parties) Act ("**CRTPA**") to enforce any term of this Assignment and Licence unless stated (referring to CRTPA) in this Assignment and Licence. This does not affect third party rights and remedies that exist independently from CRTPA.

15 Relationships created by this Assignment and Licence

15.1 This Assignment and Licence does not create a partnership, joint venture or employment relationship. The Supplier must represent themselves accordingly and ensure others do so.

16 Giving up contract rights

16.1 A partial or full waiver or relaxation of the terms of this Assignment and Licence is only valid if it is stated to be a waiver in writing to the other Party.

17 Transferring responsibilities

17.1 The Supplier must not assign this Assignment and Licence without Approval.

17.2 The Authority can assign, novate or transfer this Assignment and Licence or any part of it to any Crown Body, public or private sector body which performs the functions of the Authority.

17.3 The Supplier must enter into a novation agreement in the form that the Authority specifies in order to use its rights under clause 17.2.

17.4 The Supplier can terminate this Assignment and Licence if it is novated under clause 17.2 to a private sector body that is experiencing an Insolvency Event.

18 How to communicate about this Assignment and Licence

18.1 All notices under this Assignment and Licence must be in writing and are considered effective on the Working Day of delivery as long as delivered before 5:00 pm on a Working Day. Otherwise the notice is effective on the next Working Day. An email is effective when sent unless an error message is received.

18.2 Notices to the Authority must be sent to the Authority Authorised Representative's address and email address, and all notices must be copied to the Authority's Head of Commercial Delivery Management (xxx@education.gov.uk) and the Authority's Head of Legal (xxx@education.gov.uk) .

18.3 This clause does not apply to the service of legal proceedings or any documents in any legal action, arbitration or dispute resolution.

19 Dealing with claims

19.1 If a Beneficiary is notified or otherwise becomes aware of a Claim then it must notify the Indemnifier as soon as reasonably practical and no later than 10 Working Days after such notification or date of first awareness.

19.2 At the Indemnifier's cost the Beneficiary must both:

19.2.1 allow the Indemnifier to conduct all negotiations and proceedings to do with a Claim; and

19.2.2 give the Indemnifier reasonable assistance with the Claim if requested.

19.3 The Beneficiary must not make admissions about the Claim without the prior written consent of the Indemnifier which cannot be unreasonably withheld or delayed.

19.4 The Indemnifier must consider and defend the Claim diligently using competent legal advisors and in a way that does not damage the Beneficiary's reputation.

19.5 The Indemnifier must not settle or compromise any Claim without the Beneficiary's prior written consent which it must not unreasonably withhold or delay.

19.6 Each Beneficiary must take all reasonable steps to minimise and mitigate any losses that it suffers because of the Claim.

19.7 If the Indemnifier pays the Beneficiary money under an indemnity and the Beneficiary later recovers money which is directly related to the Claim, the Beneficiary must immediately repay the Indemnifier the lesser of either:

19.7.1 the sum recovered minus any legitimate amount spent by the Beneficiary when recovering this money; or

19.7.2 the amount the Indemnifier paid the Beneficiary for the Claim.

20 Resolving disputes

20.1 If there is a Dispute, the senior representatives of the Parties who have authority to settle the Dispute will, within 28 days of a written request from the other Party, meet in good faith to resolve the Dispute.

20.2 If the Dispute is not resolved at that meeting, the Parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the Parties cannot agree on a mediator, the mediator will be nominated by CEDR. If either Party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute, the Dispute must be resolved using clauses 20.3 to 20.5.

20.3 Unless the Authority refers the Dispute to arbitration using clause 20.4, the Parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction to:

20.3.1 determine the Dispute;

20.3.2 grant interim remedies, or any other provisional or protective relief.

20.4 The Supplier agrees that the Authority has the exclusive right to refer any Dispute to be finally resolved by arbitration under the London Court of International Arbitration Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

20.5 The Authority has the right to refer a Dispute to arbitration even if the Supplier has started or has attempted to start court proceedings under clause 20.4, unless the Authority has agreed to the court proceedings or participated in them. Even if court proceedings have started, the Parties must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under clause 20.4.

20.6 The Supplier cannot suspend the performance of this Assignment and Licence during any Dispute.

21 Which law applies

21.1 This Assignment and Licence and any issues arising out of, or connected to it, are governed by English law.

ANNEX

IPR Assurance Certificate

This certificate is given pursuant to clause 13.9 of the agreement ("**Contract**") between the Institute for Apprenticeships and Technical Education ("**Authority**") and the supplier named below ("**Supplier**"), and the Intellectual Property Assignment and Licence between the Authority and the Supplier (which also forms Schedule 14 of the Contract) ("**Assignment and Licence**").

Guidance:

When to complete this certificate: This certificate should be completed in respect of each Deliverable (as defined in the Contract) which is made available to the Authority under the Contract, and a completed certificate should be supplied to the Authority with that Deliverable. This includes updates to existing Deliverables.

Purpose of this certificate: This certificate is intended to confirm that the specific Deliverable fully complies with the intellectual property provisions of the Contract. A copy of the certificate will be retained by the Authority as evidence of the intellectual property position.

Supplier Declaration:

We (being the Supplier named below) confirm that the Deliverable(s) supplied together with (or shortly before or after) this certificate, all elements of which are listed in either Table 1 or Table 2 below[1], comply with the intellectual property provisions in the Contract, in particular the applicable warranties set out in clause 5 of the Assignment and Licence.

We confirm that the Deliverable(s) either:
(i) contain no third party intellectual property rights, or
(ii) contain third party intellectual property rights and we have obtained the consent of the applicable third party:

- in the case of Key Materials, to their assignment and transfer to the Authority; and/or
- in the case of Ancillary Materials, to their licence to the Authority,

in each case on the terms and conditions of the Contract and Assignment and Licence.

We confirm that this certificate overrides any statement or copyright notice forming part of the Deliverable(s) which is in any way inconsistent with this certificate. We agree that this certificate does not detract in any way from the rights granted to the Authority in the Contract.

Key Materials

We confirm that the Deliverable(s) set out in Table 1 below, or the elements of the Deliverable(s) set out in Table 1 below, are Key Materials, as defined in the Contract:

[1] If, by exception, the Supplier asserts that the Deliverable includes elements which are neither Key Materials nor Ancillary Materials, this should be notified in writing to the Authority prior to the relevant Deliverable being made available to the Authority.

Table 1

Deliverable	Key Materials
[Set out title / description of the Deliverable]	Set out elements which are Key Materials, or confirm "entire Deliverable"
[insert additional rows if required]	

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 1 as Key Materials, have vested or hereby vest in the Authority pursuant to the Assignment and Licence.

Ancillary Materials

We confirm that the Deliverable(s) set out in Table 2 below, or the elements of the Deliverable set out in Table 2 below are Ancillary Materials, as defined in the Contract:

Table 2

Deliverable	Ancillary Materials
[Set out title / description of the Deliverable]	Set out elements which are Ancillary Materials, or confirm "entire Deliverable"
[insert additional rows if required]	

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 2 as Ancillary Materials, are licensed to the Authority on the terms and conditions of and pursuant to the Assignment and Licence.

Signed for and on behalf of the Supplier:

Name

Position

Date

Signed by

[*Supplier*]

Director: ……..[*Insert/print name*]

Signature: ……...

Signed by

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

Director: ……..[Insert/print name]

Signature: ……...

Schedule 15

Monitoring of Performance

1 Self monitoring

1.1 The Supplier shall monitor its performance of the Services (other than the Initial Development Services) and (where applicable) the supply of the Products against each KPI (in the manner set out in paragraph 1.2) and shall deliver to the Authority Authorised Representative the Operational Delivery Report in accordance with paragraph 3 (*Operational Delivery Report and Performance Review Meetings*).

1.2 The Supplier shall, in respect of each KPI, apply the applicable Performance Monitoring Methodology to such KPI to assess the Supplier's performance of such relevant KPI during the relevant Performance Monitoring Period.

2 What happens if you don't meet the Service Levels

2.1 The Supplier shall at all times provide the Services and (where applicable) supply the Products to meet or exceed the Target Service Level for each KPI.

2.2 If, in any Contract Month in which a Performance Monitoring Period for a KPI ends, the Supplier fails to achieve the Target Service Level for that KPI ("**Service Failure**"), the Supplier shall submit to the Authority (as part of the Operational Delivery Report for that Contract Month) for Approval an improvement plan ("**KPI Improvement Plan**") setting out:

2.2.1 the reasons for such Service Failure; and

2.2.2 what steps the Supplier proposes to take to:

(i) mitigate the impact of the Service Failure;

(ii) rectify the event, matter or circumstance giving rise to the Service Failure (including details of the proposed timings for such rectification); and

(iii) prevent the Service Failure from recurring.

2.3 The Authority shall (as soon as reasonably practicable following receipt of the KPI Improvement Plan) either:

2.3.1 confirm to the Supplier that the KPI Improvement Plan is Approved and following receipt of such Approval the Supplier shall:

(i) carry out and complete all of the actions in accordance with the approved KPI Improvement Plan; and

(ii) report on its progress against such KPI Improvement Plan in each and every Performance Review Meeting which occurs whilst the Supplier is (or should be, if it was complying with its obligations under this Contract) carrying out and completing the actions in accordance with the KPI Improvement Plan; or

2.3.2 confirm to the Supplier that the Authority is not satisfied with the KPI Improvement Plan and/or that the steps proposed by the Supplier in the KPI Improvement Plan will address the matters referred to in paragraph 2.2.1, in which case the provisions of clause 14.2 (*What may happen if there are issues with your provision of the Services*) shall apply.

2.4 Where:

2.4.1 the Supplier fails to provide a KPI Improvement Plan in accordance with paragraph 2.2; or

2.4.2 following Approval by the Authority of the KPI Improvement Plan in accordance with paragraph 2.3, the Supplier fails to carry out and/or complete the actions in accordance with the KPI Improvement Plan (as Approved),

then such failure shall be deemed to be a Critical Service Failure.

3 Operational Delivery Report and Performance Review Meetings

3.1 Within 5 Working Days after the end of each Contract Month, the Supplier shall deliver to the Authority Authorised Representative the Operational Delivery Report in respect of the performance by the Supplier of the Services (and (where applicable) the supply of the Products) during the Contract Month just ended together with updated versions

(meeting, where applicable, all of the requirements of the relevant Product Description) of the following:

3.1.1 the Implementation and Delivery Plan;

3.1.2 the Resource Plan;

3.1.3 the Risk Register;

3.1.4 the Issues Log;

3.1.5 the Assessment Strategy; and

3.1.6 any draft version of the Key Dates Schedule that the Supplier intends shall (if Approved) become the Key Dates Schedule for the purposes of this Contract from time to time.

3.2 Within 5 Working Days of receipt by the Authority Authorised Representative of the Operational Delivery Report for the relevant Contract Month, the Parties shall attend a meeting to discuss the content of the relevant Operational Delivery Report (the "**Performance Review Meeting**") at such location and time (within normal business hours) as the Authority shall reasonably require and such Performance Review Meeting shall:

3.2.1 be attended by the Authority Authorised Representative and the Supplier Authorised Representative and/or such other senior representatives of either Party as the Authority Authorised Representative and/or the Supplier Authorised Representative shall reasonably require (having regard to the matters to be discussed at the relevant Performance Review Meeting); and

3.2.2 be fully minuted by the Supplier and the minutes shall be circulated by the Supplier to all attendees at the relevant Performance Review Meeting (and any other recipients agreed at the relevant meeting) as soon as reasonably practicable following the relevant Performance Review Meeting.

3.3 The minutes of the preceding Contract Month's Performance Review Meeting will be agreed and signed by both the Authority Authorised Representative and the Supplier Authorised Representative at or prior to the following Performance Review Meeting.

3.4 Without prejudice to clause 9 (*Record keeping, monitoring and reporting*), the Supplier shall provide to the Authority such additional information and/or documentation as the Authority may reasonably require in order to verify the Supplier's compliance with its obligations under this Contract, including to verify:

3.4.1 whether a Service Failure has occurred; and/or

3.4.2 the level of the performance by the Supplier of the whole or any part of the Services and (where applicable) the supply of the Products,

and the Supplier shall provide such information and/or documentation within such time period as the Authority shall reasonably specify at the time of making the request for such information and/or documentation.

Schedule 15: Annex 1 – Key Performance Indicators

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
1. The Supplier has in place clear and TQ specific arrangements to approve Eligible Providers and monitor Approved Providers and (i) completes the relevant processes for approval quickly upon application and (ii) carries out the required monitoring	TQ Provider approval and monitoring services – paragraph 3	(i) 100% of applications from Eligible Providers decided within 30 Working Days of receipt of application; and (ii) Supplier has carried out the required monitoring in accordance with the Implementation and Delivery Plan and/or the Assessment Strategy.	Each Contract Month following IfATE Approval	Management Information in relation to: (i) Eligible Providers that have applied for approval and in respect of which a decision has been made; and (ii) details of monitoring undertaken.	Performance measurement will include Eligible Providers new to the Supplier as well as the Supplier's existing Eligible Providers who have applied to have their approval extended to include the TQ.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
2. Supplier has ensured that Approved Providers are clear about what they are expected to teach and to what standard of attainment, and about how Students will be assessed	Initial TQ deliverables and development services – paragraph 2 TQ Provider support services – paragraph 4 TQ live assessment design and delivery – paragraph 6	80% of Approved Providers that have responded to the survey, rating at least 4 on a 1-5 scale. The target performance scale will use 2 positive, 2 negative and 1 neutral response. (For example (noting that the exact wording of the descriptors may vary) where 5 = very clear 4 = mostly clear	During the Summer Term each Academic Year from September 2025	The Authority shall undertake or commission a survey of Approved Providers delivering the TQ	Online questionnaire to Approved Providers delivering the TQ in the relevant Academic Year. This survey should achieve a minimum response rate of 20% of those surveyed to be valid

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
		3 = moderately clear 2 = mostly unclear 1 = not clear at all)			
3. Queries from Eligible Providers and Approved Providers (other than those related to KPI 4 and KPI 11) are satisfactorily resolved in accordance with the Target Service Level	Initial TQ deliverables and development services – paragraph 2 TQ Provider approval and monitoring services – paragraph 3 TQ Provider support services – paragraph 4 Student registration and student entry – paragraph 5 TQ live assessment design and delivery – paragraph 6 TQ Post-Results Services – paragraph 9	Queries raised by letter and other forms of electronic correspondence: 90% resolved within 10 Working Days; remaining 10% resolved within 15 Working Days; and Queries raised through telephone calls: 90% resolved within 2 Working Days; remaining 10% resolved within 10 Working Days	Each Contract Month from the Effective Date	Management Information based on data and information collected from the Supplier's customer management systems referred to in Service Requirement 5 in Part 2 of the Service Requirements. This must include relevant information that closed queries have been satisfactorily resolved.	The required resolution time commences on and from the Working Day on which the relevant query is received by the Supplier Percentage of queries that are resolved in accordance with the applicable Target Service Level

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
4. Formal complaints made about the Services are satisfactorily resolved (i) in accordance with the timescales set out in the Implementation and Delivery Plan[2] or (ii) where complaints are received solely by the Department, ESFA or the Authority, within the timescales reasonably required by the Department, ESFA or the Authority at the time of notifying the Supplier of such complaints	Initial TQ deliverables and development services – paragraph 2 TQ Provider approval and monitoring services – paragraph 3 TQ Provider support services – paragraph 4 Student registration and student entry – paragraph 5 TQ live assessment design and delivery – paragraph 6 TQ Post-Results Services – paragraph 9	100% of formal complaints are resolved within: (i) the relevant timescales detailed in the Implementation and Delivery Plan; or (ii) the timescales specified by the Department, ESFA or the Authority, (as the case may be).	Each Contract Month from the Effective Date	Management Information based on data and information collected from the Supplier's customer management systems referred to in Service Requirement 5 in Part 2 of the Service Requirements. This must include relevant information that complaints have been satisfactorily resolved.	The required resolution time commences on and from the Working Day on which the relevant complaint is received by the Supplier. Percentage of complaints that are satisfactorily resolved within the applicable Target Service Level. Any complaints received solely by the Department, ESFA or the Authority, in relation to the Services, shall be deemed to have been received by the Supplier on the date on which the Supplier is notified of the complaint by the

[2] The Supplier Response should detail the Supplier's proposals for resolving formal complaints.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
					Department, ESFA or the Authority.
5. Approved Providers are satisfied with the quality of the Provider Services	TQ Provider approval and monitoring services – paragraph 3 TQ Provider support services – paragraph 4 Student registration and student entry – paragraph 5 TQ live assessment design and delivery – paragraph 6 TQ Post-Results Services – paragraph 9	80% of Approved Providers that have responded to the survey, rating at least 4 on a 1-5 scale. The target performance scale will use 2 positive, 2 negative and 1 neutral response. For example (noting that the exact wording of the descriptors may vary)	During the Summer Term each Academic Year from September 2025	The Authority shall undertake or commission a survey of Approved Providers delivering the TQ	Online questionnaire to Approved Providers delivering the TQ in the relevant Academic Year. This survey should achieve a minimum response rate of 20% of those surveyed to be valid.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
		(where 5 = very satisfied 4 = satisfied 3 = neither satisfied nor dissatisfied 2 = dissatisfied 1 = very dissatisfied).			
6. A sufficient number of appropriately qualified and trained Assessors (and Moderators where permitted in accordance with the Approved Assessment Strategy) are available to assess (or Moderate, if applicable) Student assessment evidence when required in accordance with the	TQ live assessment design and delivery – paragraph 6	100% of appropriately qualified and trained Assessors (and Moderators, if applicable) are available in accordance with the Implementation and Delivery Plan and/or the Resource Plan (as the case may be).	Each Contract Month from (and including) September 2025	Management Information in relation to Assessor (and Moderator, if applicable) actual recruitment, training, and retention against the details set out in the Implementation and Delivery Plan and Resource Plan (as the case may be).	Performance will be measured against the number of Assessors (and Moderators, if applicable) that are envisaged as being trained and available as detailed in the Implementation and Delivery Plan and/or the Resource Plan (as the case may be).

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
Implementation and Delivery and/or the Resource Plan (as the case may be)					
7. The TQ Live Assessment Materials (as defined in the Service Requirements) are high quality and developed in accordance with the Assessment Strategy	TQ live assessment design and delivery – paragraph 6	Full compliance with parts of both the Assessment Strategy and Implementation Plan that relate to the development of the TQ Live Assessment Materials; and TQ Live Assessment Materials are 100% free of errors that could affect clarity about requirements for Students.	Each Contract Month from IfATE Approval	Management Information in relation to: (i) progress against and compliance with the relevant part of the Assessment Strategy and Implementation Plan; and (ii) any errors reported in TQ Live Assessment Materials.	Review of Supplier self-reporting Identification of any reported errors in TQ Live Assessment Materials.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
8. Student assessment evidence is accurately assessed and processed for grading and awarding in accordance with the relevant parts of the Assessment Strategy and the Implementation and Delivery Plan	TQ live assessment design and delivery – paragraph 6 TQ Grade awarding – paragraph 7	Assessing of Student assessment evidence is conducted in accordance with the relevant parts of the Assessment Strategy; and 100% of Students' assessments are marked and processed in accordance with the relevant parts of the Implementation and Delivery Plan.	Each Contract Month from September 2025 until the end of the Term	Management Information in relation to compliance with the relevant parts of the Assessment Strategy and the relevant parts of the Implementation and Delivery Plan.	Review of Supplier self-reporting.
9.Grade Standard Exemplification Materials are validated by Employers	TQ live assessment design and delivery – paragraph 6 TQ Grade awarding – paragraph 7	At least 5 Employers in each relevant Occupational	In October in each Academic Year following the first grade awarding but in any event no	Evidence of validation from Employers relevant to the Occupational Specialist Components that validate	Validation means that Employers relevant to the Occupational Specialist Components judge that the Grade

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
		Specialist Component.	later than from October 2027	the Grade Standard Exemplification Materials. The Supplier may use its existing network of Employers, but it must ensure a turnover of Employers each Academic Year. Employers may take part in validation activity for up to two consecutive Academic Years, after which they must not take part in validation activity for a period of one Academic Year. Suppliers may then repeat this cycle, ensuring that Employers do not take part in validation activity for more than two consecutive Academic Years. For each Occupational Specialist Component, validations are required from at least two new	Standard Exemplification Materials are comparable to the Approved Guide Standard Exemplification Materials. Validation also means that Employers relevant to the Occupational Specialist Components judge that the Grade Standard Exemplification Material on the pass boundary is the type of work Employers would expect to see from an employee, who is of Occupational Entry Competence and that the Grade Standard Exemplification Material on the distinction boundary, is the type of work that exceeds Employer expectations of what they would

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
				Employers each Academic Year who did not submit evidence of validation in any previous Academic Year.	expect to see from an employee who is of Occupational Entry Competence, as defined within the assessment strategy as distinction. Review by the Authority of the evidence of Validation from Employers.
10. Student assessment results are submitted to the Authority (or its nominee (as applicable)) by the relevant date(s) set out in the Key Dates Schedule	TQ Grade awarding – paragraph 7 TQ Results – paragraph 8	100% of results are submitted to the Authority (or its nominee) by the date(s) set out in the relevant Key Dates Schedule.	Each Contract Month from September 2025 until the end of the Term	Results have been received by the Authority (or its nominee (as applicable)) in the required format.	Receipt of the results by the relevant date(s) in the relevant Key Dates Schedule.
11. Post-Results Services (excluding the issuing of revised assessment results, which is covered by	TQ Post-Results Services – paragraph 9	100% of the Post-Results Services are carried out and completed in accordance with	Each Contract Month from (and including) September	Management Information in relation to compliance with the relevant part of the Assessment Strategy.	Review of self-reporting.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
KPI 10) are delivered in accordance with the relevant part of the Assessment Strategy		the relevant part of the Assessment Strategy.	2025 until the end of the Term		
12. Submission to the Authority of: (i) all Management Information in accordance with the requirements of Service Requirement 9 in Part 2 of the Service Requirements; and (ii) updated versions of all required Products in accordance with clause 5.5.1(i) and/or paragraph 3 of Schedule 15 (as the case may be); and (iii) where requested by the Authority, updated versions of all	TQ Provider approval and monitoring services – paragraph 3 Student registration and student entry – paragraph 5 Reporting – paragraph 10	100% for timeliness of the submission of all Management Information and all required (including requested) Products and/or other documents including Key Materials and Ancillary Materials; and 100% for completeness of all: (i) Management Information; and	Each Contract Month from the Effective Date	Management Information and updated versions of the Products and/or other documents referred to in column one and/ or Key Materials and Ancillary Materials are received by the Authority by the date required by this Contract. Management Information, updated versions of the Products and/or other documents referred to in column one, Key Materials and Ancillary Materials are accurate and complete and cover all relevant information, Data and reports as specified in the Management Information	Review of self-reporting.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
requested Products and/or other documents in accordance with clause 5.5.1(ii).		(ii) required Products (including requested Products and/ or Key Materials and Ancillary materials).		and reporting requirements. Updated versions of the Products referred to in column one, Key Materials and Ancillary Materials include all relevant updates.	

Schedule 16

Logos and Trademarks – T Level Trade Mark Licence

1 Interpretation

The definitions and rules of interpretation in this paragraph apply in this T Level Trade Mark Licence, in addition to the definitions and rules of interpretation in Schedule 1 to this Contract.

1.1 Definitions:

"**Approved Provider**" means an Eligible Provider (as defined in Schedule 1 (*Definitions and Interpretation*) of this Contract) that has been granted Provider Approval (as defined in Schedule 1 (*Definitions and Interpretation*) of this Contract) and in respect of which such Provider Approval has not been revoked pursuant to clause 7.2 of this Contract (*Interaction with Providers*).

"**Brand Licensed Material**" means any instance of a Brand Licensed Product or Service in material form, including as an electronic copy or any other electronic form, and any promotional or marketing material relating to any Brand Licensed Product or Service;

"**Brand Licensed Product or Service**" means any products or services listed as such in Appendix 1 (and "**Brand Licensed Products**" and "**Brand Licensed Services**" means such Products or Services respectively;

"**Mandatory Marked Material**" is material of the type identified in Appendix 1 (and to which the Mark must be applied);

"**Mark**" means the trade mark(s) set out in Appendix 2, including the listed registrations and applications and any registrations which may be granted pursuant to those applications and the related trade marks, devices and get-ups that may be notified in writing by the Authority to the Supplier from time to time;

"**Marked Material**" means any Brand Licensed Material or other material in or on which the Mark is used.

2 Grant

2.1 The Authority hereby grants to the Supplier a non-exclusive licence to use the Mark on or in relation to the Brand Licensed Products or Services provided or supplied in England, including in connection with the promotion, use and supply of the Brand Licensed Products or Services.

2.2 The Supplier may, subject to the prior written approval of the Authority and paragraph 11, sublicense (without the right to further sublicense) each Approved Provider of the TQ to use the Mark on or in relation to the Brand Licensed Products or Services provided or supplied in England, including in connection with the promotion, use and supply of the Brand Licensed Products or Services.

2.3 Any use of the Mark in accordance with paragraph 2.1 or 2.2 shall be strictly in accordance with the T Level Branding Guidelines and, when using the Mark, the Supplier shall fully comply with, the T Level Branding Guidelines.

2.4 Subject to paragraph 2.2, the Supplier shall have no right to sublicense use of the Mark.

3 Application of the Mark

3.1 The Supplier shall use the Mark, in accordance with this Schedule, on all Mandatory Marked Materials.

3.2 Subject to clause 13.10 (*Intellectual Property Rights*) of the Contract and paragraph 3.3 below, apart from the Mark, no other trade mark or logo may be affixed or used in a manner in which it may be seen to be used as a trade mark or designation of origin in relation to any Brand Licensed Products or Services or in or on any Brand Licensed Materials.

3.3 The Supplier may, subject to the prior written agreement of the Authority, authorise each Approved Provider of the TQ sublicensed in accordance with paragraph 2.2 to use the Approved Provider's name, logos, trademarks and/or other signs which refer to the Approved Provider on Brand Licensed Products or Services or Brand Licensed Materials on the same terms as, and subject to compliance with clauses 13.10 and

13.11 (*Intellectual Property Rights*) of the Contract (and clauses 13.10 and 13.11 shall apply *mutatis mutandis* to such Approved Provider).

3.4 The Supplier shall procure that the Mark, when used in or on any Brand Licensed Materials, shall be clearly and reasonably prominently identified as a trade mark of the Authority, in such manner as is set out in the T Level Branding Guidelines, or with any other statement as notified by the Authority to the Supplier.

3.5 The Supplier shall comply strictly with the directions of the Authority regarding the form and manner of the application of the Mark, including the directions contained in the T Level Branding Guidelines.

3.6 The Supplier shall, on written request from the Authority or as otherwise provided in the T Level Branding Guidelines, provide samples of all proposed Marked Materials.

3.7 The Supplier shall not use in its business any other trade mark confusingly similar to the Mark and shall not use the Mark or any word confusingly similar to the Mark as, or as part of, its corporate or trading name.

4 Title, goodwill and registrations

4.1 The Supplier acknowledges that the Authority is the owner of the Mark.

4.2 Any goodwill derived from the use by the Supplier of the Mark shall accrue to the Authority. The Authority may, at any time, call for a document confirming the assignment of that goodwill and the Supplier shall immediately execute it.

4.3 The Supplier shall not do, or omit to do, or permit to be done, any act that will or may weaken, damage or be detrimental to the Mark or the reputation or goodwill associated with the Mark or the Authority, or that may invalidate or jeopardise any registration of the Mark.

4.4 The Supplier shall not apply for, or obtain, registration of the Mark in any country for any goods or services.

4.5 The Supplier shall not apply for, or obtain, registration of any trade or service mark in any country which consists of, or comprises, or is confusingly similar to, the Mark for any goods or services.

5 Quality control

5.1 The Supplier shall comply with the specifications and standards relating to the Brand Licensed Products or Services which are specified in the Contract.

5.2 The Supplier shall promptly provide the Authority with copies of all communications relating to the Mark with any regulatory, industry or other authority.

5.3 The Supplier shall permit, and shall use its best endeavours to obtain permission for, the Authority at all reasonable times and on reasonable notice to enter any place used for the production, storage or distribution of the Marked Materials to inspect the Marked Materials in relation to compliance with this T Level Trade Mark Licence.

5.4 Without prejudice to any other rights of the Authority, in the event that the Authority finds that any sample of Marked Materials does not meet the requirements of this T Level Trade Mark Licence, it may give notice to the Supplier, and the Supplier shall take all reasonable steps to correct any deficiency as soon as reasonably practicable (having regard to constraints of the academic timetable).

6 Marketing, advertising and promotion

6.1 The Supplier undertakes to ensure that its advertising, marketing and promotion of Brand Licensed Products or Services shall in no way reduce or diminish the reputation, image and prestige of the Mark.

7 Recordal of licence

7.1 The Authority may, at its own cost, record the licence granted to it in paragraph 2 in the relevant registries against any registrations and applications for registration of the Marks.

7.2 The Supplier shall, at the Authority's request, execute a formal licence in such form and provide such other assistance as may be required for the purpose of such recordal.

8 Protection of the Mark

8.1 The Supplier shall immediately notify the Authority in writing giving full particulars if any of the following matters come to its attention:

8.1.1 any actual, suspected or threatened infringement of the Mark;

8.1.2 any actual or threatened claim that the Mark is invalid;

8.1.3 any actual or threatened opposition to the Mark;

8.1.4 any claim made or threatened that use of the Mark infringes the rights of any third party;

8.1.5 any person applies for, or is granted, a registered trade mark by reason of which that person may be, or has been, granted rights which conflict with any of the rights granted to the Supplier under this T Level Trade Mark Licence; or

8.1.6 any other form of attack, charge or claim to which the Mark may be subject.

8.2 In respect of any of the matters listed in paragraph 8.1:

8.2.1 the Authority shall, in its absolute discretion, decide what action if any to take;

8.2.2 the Authority shall have exclusive control over, and conduct of, all claims and proceedings;

8.2.3 the Supplier shall not make any admissions other than to the Authority and shall provide the Authority with all assistance that it may reasonably require in the conduct of any claims or proceedings; and

8.2.4 the Authority shall bear the cost of any proceedings and shall be entitled to retain all sums recovered in any action for its own account.

8.3 The provisions of section 30 of the Trade Marks Act 1994 (or equivalent legislation in any jurisdiction) are expressly excluded.

8.4 Nothing in this T Level Trade Mark Licence shall constitute any representation or warranty that:

8.4.1 any registration comprised in the Mark is valid;

8.4.2 any application comprised in the Mark shall proceed to grant or, if granted, shall be valid; or

8.4.3 the exercise by the Supplier of rights granted under this T Level Trade Mark Licence will not infringe the rights of any person.

9 Liability, indemnity and insurance

9.1 Nothing in this paragraph shall impose or create any liability of the Supplier to the Authority for use in England of the Mark on or in respect of Mandatory Marked Materials in accordance with the terms of this T Level Trade Mark Licence.

9.2 To the fullest extent permitted by law, the Authority shall not be liable to the Supplier for any costs, expenses, loss or damage (whether direct, indirect or consequential, and whether economic or other loss of profits, business or goodwill) arising from the Supplier's exercise of the rights granted to it under this T Level Trade Mark Licence.

9.3 Save as provided in paragraph 9.1, the Supplier indemnifies the Authority against all Loss to the Authority arising out of or in connection with the Supplier's exercise of its rights granted under this T Level Trade Mark Licence, including any claim made against the Authority for actual or alleged infringement of a third party's intellectual property rights arising out of or in connection therewith, other than where any such Loss and/or claim arises exclusively from the use of the Mark in accordance with this T Level Trade Mark Licence.

10 Additional Supplier obligations

10.1 The Supplier shall:

10.1.1 only make use of the Mark for the purposes authorised in this T Level Trade Mark Licence; and

10.1.2 comply with all regulations and practices in force or use in any territory to safeguard the Authority's rights in the Mark.

10.2 The Supplier shall not, nor directly or indirectly assist any other person to:

10.2.1 use the Mark except as permitted under this T Level Trade Mark Licence; or

10.2.2 do or omit to do anything to diminish the rights of the Authority in the Mark or impair any registration of the Mark.

10.3 The Supplier acknowledges and agrees that the exercise of the licence granted to the Supplier under this T Level Trade Mark Licence is subject to all applicable laws, enactments, regulations and other similar instruments in any territory, and the Supplier understands and agrees that it shall at all times be solely liable and responsible for such due observance and performance.

11 Sub-licensing

11.1 The Supplier shall have the right to grant to Approved Providers a sub-licence of any of its rights under this T Level Trade Mark Licence provided that:

11.1.1 the Supplier shall ensure that the terms of any sub-licence are in writing and are substantially the same as the terms of this T Level Trade Mark Licence (except that the sub-licensee shall not have the right to sub-license its rights) and the Supplier shall provide the Authority with a copy of the sub-licence on request and the Authority may require that any such sublicence includes the Authority as a party, and that the Authority is entitled to enforce its terms;

11.1.2 all sub-licences granted shall terminate automatically on termination or expiry of this T Level Trade Mark Licence; and

11.1.3 the Supplier shall be liable for all acts and omissions of any sub-licensee in relation to such sub-licence and indemnifies the Authority against all Losses incurred or suffered by the Authority, or for which the Authority may become liable, (whether direct, indirect or consequential and including any economic loss or other loss of profits, business or goodwill) arising out of any act or omission of any sub-licensee in relation to such sub-licence, other than to the extent any such Losses arise exclusively from the use of the Mark in accordance with this T Level Trade Mark Licence.

12 Duration and termination

12.1 This T Level Trade Mark Licence shall commence on the Effective Date and shall continue for the Term.

12.2 Without affecting any other right or remedy available to it under this T Level Trade Mark Licence or the Contract, the Authority may terminate this T Level Trade Mark Licence in respect of any Brand Licensed Product or Service with immediate effect by giving notice to the Supplier if:

12.2.1 the Supplier commits a material breach of any term of this T Level Trade Mark Licence in respect of such Brand Licensed Product or Service which breach is irremediable, or (if such breach is remediable) fails to remedy that breach within a period of 7 days after being notified to do so;

12.2.2 the Supplier repeatedly breaches any of the terms of this T Level Trade Mark Licence in respect of relevant Brand Licensed Products or Services or Brand Licensed Materials in such a manner as to reasonably justify the opinion that its conduct is inconsistent with it having the intention or ability to give effect to the terms of this T Level Trade Mark Licence; or

12.2.3 the Supplier challenges the validity of the Mark.

For the purposes of paragraph 12.2.1, **material breach** means a breach that is serious in the widest sense or of any of the obligations set out in paragraphs 3, 4.3, 4.4, 4.5, 5, 6.1, 10.1 or 11.1. In deciding whether any breach is material no regard shall be had to whether it occurs by some accident, mishap, mistake or misunderstanding.

13 Consequences of termination

13.1 On expiry or termination of this T Level Trade Mark Licence for any reason and subject to any express provisions set out elsewhere in this T Level Trade Mark Licence:

13.1.1 all rights and licences granted pursuant to this T Level Trade Mark Licence shall cease;

13.1.2 the Supplier shall cease all use of the Mark save as set out in this paragraph 13;

13.1.3 the Supplier shall co-operate with the Authority in the cancellation of any licences registered pursuant to this T Level Trade Mark Licence and shall execute such documents and do all acts and things as may be necessary to effect such cancellation;

13.1.4 the Supplier shall promptly deliver up to the Authority (or at the Authority's option, destroy) at the Supplier's expense all copies of promotional material which is Marked Material or otherwise bears any Mark as a designation of origin; and

13.1.5 any provision of this T Level Trade Mark Licence that expressly or by implication is intended to come into or continue in force on or after termination or expiry of this T Level Trade Mark Licence shall remain in full force and effect.

13.2 Termination or expiry of this T Level Trade Mark Licence shall not affect any rights, remedies, obligations or liabilities of the parties that have accrued up to the date of termination or expiry, including the right to claim damages in respect of any breach of the T Level Trade Mark Licence which existed at or before the date of termination or expiry.

Schedule 16 Appendix 1

Brand Licensed Products or Services

Those products and services identified as such in the T Level Branding Guidelines.

Mandatory Marked Materials

All Key Materials and such other materials as are identified as such in the T Level Branding Guidelines.

T Level Branding Guidelines

(November 2023)

T Level Branding Guidelines

1 Introduction

1.1 T Levels are high-quality technical qualifications for 16 to 19-year olds which are approved and managed by the Institute for Apprenticeships and Technical Education (IfATE). The T Level brand has been devised to ensure that Government, Awarding Organisations, Employers, Suppliers, Providers (schools and colleges), Students, and others involved with the qualification, support and promote T Levels in a positive manner that inspires confidence.

1.2 IfATE's T Level Branding Guidelines, including supporting annexes (the 'Guidelines') are essential reference material for all Suppliers responsible for the delivery of the Technical Qualification (TQ) component of the T Level qualification.

1.3 For simplicity, the registered trade marks associated with the T Level brand are referred to in the Guidelines as the 'T Level Marks' and are as follows:

- The word 'T Level';
- The Department for Education's (DfE's) 'T Level' logo (in black);
- IfATE's name and accompanying flower logo (in blue and black as detailed within the IfATE brand guide); and
- the respective Supplier's corporate name and logo.

1.4 These Guidelines set out essential information as to how the T Levels Marks should be used in: a) TQ materials and b) other T Level communications including for marketing, advertising and promotional purposes.

1.5 These Guidelines are subject to reasonable development. They adopt many of the general principles which apply in relation to good branding practice, and where they are developed further IfATE intends that they will, in terms of general principles, be similar in many respects to commonly used branding guidelines.

2 General principles for use of the T Level Marks

2.1 When using the T Level Marks, Suppliers (and any other authorised users, such as Providers) must comply with these Guidelines (in addition to any other requirements of the TQ Contract and the IfATE brand guide).

2.2 The T Level Marks must be used by Suppliers on the front/landing/home page **only** of all Mandatory Marked Materials, key TQ documents and supporting resources (unless otherwise agreed by IfATE), in accordance with and in the form set out at **Annex 1**.

2.3 Nothing in these Guidelines is intended to restrict the use of the text mark 'T Level' where that use is necessary to indicate the intended purpose of a product or service and is in accordance with honest practices in industrial or commercial matters. (This does not apply, unless authorised and used in accordance with these Guidelines, to the use of the T Level logo.)

2.4 By way of example, use to describe the relevance or purpose of a text book or support materials for a specific technical education qualification forming part of a T Level is generally acceptable, but any such use which is liable to confuse third parties as to whether the relevant T Level is approved, managed or otherwise controlled by a party other than IfATE, or that the text book or support materials are endorsed and/or approved by IfATE would not be acceptable.

2.5 The Secretary of State for Education, or IfATE under delegation by the Secretary of State for Education, shall have the exclusive power to issue certificates of award and statements of achievement (and equivalent documents, excluding a breakdown of attainment) within the T Level Programme. It is intended that such documents will include the Supplier's name but not the Supplier's logo.

2.6 Suppliers must not issue any document bearing the title or name, or described or represented as, a 'certificate' or 'statement of achievement' or its substantial equivalent to which, or in respect of which, any T Level Mark is applied or used, or otherwise apply the T Level Marks to, or create an association with any T Level or TQ with any document or material bearing the title or name, or described or represented as, a 'certificate' or 'statement of achievement'" or its substantial equivalent.

2.7 Suppliers must use the T Level Marks on all *Mandatory Marked Materials* used in the operational delivery of the TQ. The documents classified as *Mandatory Marked Materials* are listed in **Annex 2.**

2.8 *Mandatory Marked Materials* should include a descriptive qualification name, as determined and/or mutually agreed by IfATE and the Supplier, in line with the TQ Contract and these Guidelines e.g. [technical qualification] in x [Pathway]".

2.9 Suppliers must ensure that it is clear that any T Level, or qualification associated with a T Level (such as the TQ), is a qualification approved and managed by IfATE. T Level Marks must not be used on any materials which relate to a T Level or TQ which has been wholly or partly superseded, unless the material is equally prominently identified as such.

2.10 Suppliers must, on request from IfATE, submit copies of any material where their name or branding, or any other trade marks or branding are used and/or in association with a T Level or a TQ.

2.11 Suppliers must not promote that, or give the impression that, any of its other qualifications - similar or equivalent – are linked to the TQ or T Level qualification i.e. other Level 2, 3 or 4 qualifications.

3 Intellectual Property Rights (IPR) and the TQ Contract

3.1 Full details of Suppliers' rights and responsibilities in respect of IPR are set out in the TQ Contract, and Suppliers should pay particularly close attention to clause 13 Intellectual Property Rights; Schedule 14 Form of Assignment and License; and Schedule 16 Logos and Trademarks – T Level Trade Mark Licence.

3.2 Providers engaged with the T Level qualification may use the T Level Marks but it is the responsibility of Suppliers to ensure that they comply with these Guidelines and the TQ Contract.

3.3 Suppliers should note that the T Level Marks are registered trade marks; any breach could lead to an action for trade mark infringement (as well as other consequences under the TQ Contract).

4 Advertising, marketing and promotion

4.1 Suppliers must ensure that any advertising, marketing and promotion products or services i.e. those activities outside the scope of the core TQ delivery component, do not undermine or diminish the reputation, image and prestige of the T Level Marks when used in any such aforementioned activity e.g. media advertising.

4.2 Suppliers may use the T Level Marks in relation to *Brand Licensed Products or Services* set out in **Annex 3**, in accordance with (and subject to) the terms of the TQ Contract and these Guidelines.

4.3 Suppliers must not give the impression that their visual identity is being used as a distinct brand, trade mark or designation of origin for any materials, including for activity defined as *Brand Licensed Products or Services.*

5 Style, positioning and form of T Level Marks

5.1 Suppliers must ensure that, except for the T Level Marks, no other trade marks, logos, banners or graphics are to be presented and/or affixed to any materials which relate to a T Level or TQ.

T Level Marks on TQ Materials

5.2 The T Level Marks should be included on the front page only of the TQ materials (whether in paper or digital form) in accordance with and in the form set out at **Annex 1**.

5.3 The T Level Marks should be acknowledged on the final page of the TQ materials (whether in paper or digital form) in accordance with and in the form set out at **Annex 1**.

T Level Marks on other T Level communications (including for marketing, advertising and promotional purposes)

Positioning/Layout:

5.4 T Level Marks may be represented in the form of a logo or graphic image ("**Logo Mark**"); or as an isolated word mark ("**Isolated Word Mark**"); or as a text or word mark[1] used within relevant text ("**Text Mark**") as described below. There are some common requirements in relation to each type of use (sections 6 to 8 - "No mixing", "Prominence" and "Acknowledgements") and some requirements which differ depending on the form in which Suppliers plan to use the mark (set out below).

5.5 Use of the word mark may also be made in oral form. The same principles should, so far as practicable, apply to oral use of any T Level Marks i.e. if appropriate, the respective changes being proposed are applied consistently.

5.6 Where it is used otherwise than in text form, the form in which the Supplier reproduces the logo or graphic should conform precisely to the logo and graphic forms designated by IfATE.

[1] Text form includes in spoken text

5.7 **Logo Mark**:

- Suppliers must use the Logo Mark in precisely the form and subject to any requirements set out in **Annex 1**;
- Suppliers must not change the colours, or skew, stretch or angle the logo, or distort, add a border or otherwise alter the logo in any way;
- Suppliers must ensure that the logos are always clearly separate from any other material, and in particular that it has a clear space surrounding the logos, as illustrated, specified or referenced at **Annex 1**.
- Suppliers must not resize the logo, unless resizing is permitted in accordance with these Guidelines.

5.8 **Isolated Word Mark**

- Suppliers must use the fonts and size ranges of font set out in or referenced in these Guidelines and/ or as otherwise specified by IfATE*;*
- Suppliers must use only the colours and weights set out in or referenced in these Guidelines and/ or as otherwise specified by IfATE;
- Suppliers must not use underlining;
- The words should have initial capitalisation (only) and no other punctuation etc. "T Level" is acceptable; "T LEVEL", "T level" or T-Level" are not acceptable; and
- Suppliers must not use the Isolated Word Mark as a watermark.

5.9 **Text Mark**:

- Suppliers must use the Text Mark in the same font as the surrounding text; and
- Suppliers must acknowledge its first use in the text as noted under paragraph 5.15 (Acknowledgement) of these Guidelines.

No mixing/combination/background use

5.10 Suppliers must ensure that the T Level Marks are always clearly separate from any other trade mark or name used in the same document. In particular:

- Suppliers must not use their trade mark mixed or combined with any other trade mark or name such that they could be seen or understood to be part of a single trade mark. For example, “the Mrs Blogs [Supplier] T Level” would not be acceptable use; and

- Suppliers must not combine a T Level Mark into a single logo or something which might be seen to be or have a unitary character. For example:

is not acceptable.

- The T Level Mark and a Supplier’s mark should not be combined into a single logo or something which might be seen to be or have a unitary character. For example:

is not acceptable.

- There should always be a clear separation between the T Level Mark and any other mark used by Suppliers or on any documents, and, when used as a logo or graphic, Suppliers should take account of any requirements for separation set out in these Guidelines.

5.11 Any use of a name given to the qualification element of a T Level (including any use of “TQ” as a reference to part of a T Level) should also only be such that it is always a clearly separate mark or name from any other trade mark or name used in the same document with any other trade mark or trade name.

5.12 Suppliers must not place a T Level Mark against a background colour, pattern or picture except as specified below:

- as set out in or referenced in **Annex 1** or as otherwise agreed in writing by IfATE or specified in these Guidelines; or

- with imagery which is of a purely illustrative character, and does not suggest any other source or business connection, and is appropriate to the context and brand identity, and allows the entire mark to be clearly visible more prominently than such imagery, and complies with any other limitations notified by IfATE in writing from time to time,

and in any event any imagery must be consistent with the overall brand identity and values of the T Level Marks and the T Level Programme, and not be liable to bring the T Level Marks or the T Level Programme into disrepute.

Prominence

5.13 Where Suppliers use the T Level Marks on material which carries other branding in conjunction with or in the same part of the material, the T Level Marks should be given at least equal prominence with the other branding. For example:

- it should appear in script of at least the same font size as the script of any Supplier's trade mark, and where Suppliers use a logo covering at least the same overall surface area;
- the style used for the other mark should not lead to it being more prominent than the style used for the T Level Mark;
- the colouring used for the other mark should not draw more attention to it than the T Level Mark; and
- it should appear in at least as prominent a position.

5.14 Typically, use of one T Level Mark will not be regarded as 'in conjunction' with another mark when they are in separate distinct parts of the document, including for example, use of a Supplier's letter head (one part) and use of the T Level Mark in the body of the letter (a separate part).

Acknowledgement

5.15 Subject to paragraph 5.16 of these Guidelines, where the T Level Marks are used in any document, Suppliers should place in the document reasonably prominently (so that it would reasonably be expected to come to the attention of the reader or addressee of the document) an acknowledgement that IfATE's name and logo are registered trade marks of IfATE. For example:

- where the T Level Mark is used in the title or opening description of the document or in a manner intended to show that the document relates to a T Level or a TQ, by using a referenced footnote acknowledging that 'T Level is a registered trade mark of The Institute for Apprenticeships and Technical Education' or 'Registered trade mark of The Institute for Apprenticeships and Technical Education';

- where it is used in the text of a document, the first time it appears it should include a referenced footnote acknowledging that the '[Mark] is a registered trade mark of The Institute for Apprenticeships and Technical Education' or 'Registered trade mark of The Institute for Apprenticeships and Technical Education';

- in each case the referenced footnote should, where practicable, appear in the same visual field as the use of the T Level Marks, or in other cases, where such notice would otherwise commonly be placed. For example, on the rear of a single page which is printed on both sides, on the rear of the front page of a booklet, or on the rear of the last page of a booklet; and

- where a Supplier's or a Provider's name or branding is also used in the document, the referenced footnote should also make clear that the T Level is a qualification approved and managed by IfATE, and that the Supplier is currently authorised by IfATE to develop and deliver the qualification (and/or that the Provider offers or provides courses for part of the T Level, which is a qualification approved and managed by IfATE), as appropriate.

5.16 Where a reference is made to T Level in any document indirectly (for example with a description which is evidently a reference to a T Level or the TQ) in association with a Supplier (whether using a Supplier's name or otherwise), the document should make clear that the T Level and a TQ is a qualification approved and managed by IfATE.

5.17 No further acknowledgement is necessary where the use of the T Level Marks or a reference to a T Level or TQ is in a document, other than those materials/document listed in **Annex 2** of these Guidelines. To illustrate: such use is in word form (as part of the text[2]) of the document and would clearly be understood by addressees and readers as being a reference to the T Level or, as appropriate and reference has been to the fact that the TQ is approved and managed by IfATE and it is not being suggested otherwise: it has been made clear that the role of the Supplier is focused on developing and/or delivering the TQ component of the T Level and it has a relationship with IfATE.

Illustrations

The approach may be adjusted sensibly for the particular materials and circumstances of use. For example:

5.18 On promotional documentation intended for Providers, where it might be expected that a high level of prominence would be given to a Supplier's name or branding (for example in large

[2] including spoken text in the case of spoken material

script), or on explanatory documentation intended for Providers, the use of T Level (and T Level Marks, including text marks) should be given equal prominence. In a referenced footnote should appear on the reverse of the first page (for example with other similar notices, such as copyright notices, but no less prominently than those notices);

5.19 For promotional and explanatory documentation aimed at students or employers, the use of T Level should be given equal prominence; and a clear note should appear on the same page in the same visual field that the T Level is a qualification approved and managed by IfATE, and a Supplier's development and delivery of the qualification and use of the mark is under the authority of IfATE;

5.20 For assessment or examination papers (for single use) relating to materials for examiners, a reasonably prominent note should appear at the bottom of the first page that the T Level is a qualification approved and managed by IfATE, and a Supplier's development and delivery of the qualification and use of the mark is under the authority of IfATE;

5.21 For sample papers which may be re-used, there should in addition be a note that T Level is a registered trade mark of IfATE; and

5.22 For any supplementary materials (such as text books and learning aids), other than those materials/ documents listed in Annex 2, there should be a clear reasonably prominent explanation that the material is designed for use with the relevant T Level; including the date of the T Level, and that the T Level is a qualification approved and managed by IfATE, and that the T Level is a registered trade mark of IfATE used by a Supplier (or other source) with the authority of IfATE.

Providers (Schools and Colleges)

5.23 Suppliers are responsible for ensuring that:

- each Provider complies with these marking requirements, as they apply to use of a Supplier's name or branding and equally, to any permitted use of the Provider's name or branding in association with the T Level Mark; and
- any use by a Provider of the T Level Mark is clearly a reference to a T Level approved and managed by IfATE.

6 Inspection and Approval

6.1 Suppliers must permit IfATE to inspect on reasonable request and on reasonable notice any materials bearing or intended to bear a T Level Mark, for the purposes of ascertaining compliance with these Guidelines.

6.2 Where IfATE determines (acting reasonably) that it appears that there is a non-compliance with these Guidelines, Suppliers must consult with IfATE on how such non-compliance may be remedied, taking into account both the seriousness of the non-compliance, including how the relevant material does not comply, what the potential impact may be (bearing in mind the volumes of material in question and the audience for those materials) and the potential impact of remedial steps, with a view to reaching fair and reasonable consensus on remedial action (which may range from taking steps in relation to future materials to the withdrawal and reissue of current materials).

6.3 In the event that no consensus can be reached, the disagreement or difference will be subject to the Dispute Resolution Procedure.

7 Amendments to the Guidelines

7.1 IfATE may amend these Guidelines from time to time, in a manner consistent with the general principles (Section 2).

7.2 IfATE will notify Suppliers of any changes together with the date on which such amendments are to take effect.

7.3 IfATE will take reasonable account of Suppliers' comments or concerns in relation to any amendments and the timetable for implementation, and Suppliers agree to act reasonably to seek a consensus. In the absence of consensus the disagreement or difference may be referred by Suppliers or IfATE to be resolved under the Dispute Resolution Procedure, as set out in Annex 4.

Annex 1 (a): T Level Marks on Mandatory Marked TQ materials

Front page

*

*to be placed top right within the header

Supplier logo]**

**to be placed bottom right within the footer

Final page

The T Level Technical Qualification is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.

[SUPPLIER] is authorised by the Institute for Apprenticeships and Technical Education to develop and deliver this Technical Qualification.

Annex 1 (b): T Level Marks on Marked TQ materials

Front page

T-LEVELS*

*to be placed top right within the header

[Supplier logo]**

**to be placed bottom right within the footer

Final page

Annex 2: Mandatory Marked Materials

Key Materials

a) specifications of content for each TQ including core and all specialist components;
b) assessment guidelines (for Providers);
c) quality assurance requirements (for Providers);
d) specimen assessment materials;
e) standards exemplification materials;
f) updates or redevelopments of specifications of content;
g) updates and redevelopments of any Key Materials; and
h) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes.

Key Materials shall **not** include support Materials, insofar as they are not part of any of the expressly included items listed above;

Ancillary Materials

a) Assessment Strategy;

Annex 3: Brand Licensed Products and Services

Marketing materials relating to T Levels

Suppliers will be expected to adhere to the form of branding as set out in Annex 1 wherever reasonably practicable.

Annex 4: Dispute Resolution Procedure

Definitions[3]

"**Dispute**" means any claim, dispute or difference which arises out of or in connection with these Guidelines or in connection with the existence, legal validity or enforceability of these Guidelines, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts.

"**Style**" means any matter set out in or referred to in paragraph 5 of the Guidelines.

"**Dispute Resolution Procedure**" means the dispute resolution procedure set out in paragraphs 1.1 to 1.5.

1 Resolving disputes

1.1 Where a Dispute (not being a Dispute arising solely in respect of Style):

1.1.1 arises solely between IfATE and a Supplier, the dispute resolution procedure set out in clause 37 of the Supplier's Contract shall apply and the provisions of this Dispute Resolution Procedure shall not apply; or

1.1.2 relates to or is in connection with a dispute that is progressing under the Supplier's Contract, the parties agree to be bound by the decision that is reached in accordance with the dispute resolution procedure set out in clause 37 of the Supplier's Contract in respect of the dispute under the Supplier's Contract, provided always that IfATE and/or the Supplier (as the case may be) have taken into account all reasonable comments and/or submissions of any third party who is a party to, or connected with, the Dispute.

1.2 Where the Dispute is one to which the circumstances described in paragraph 1.1 do not apply:

1.2.1 and the Dispute remains unresolved, the relevant parties connected with the Dispute shall procure that nominated senior representatives of each such party who have authority to settle the Dispute will, within 28 days of a written request from another connected party, meet in good faith to resolve the Dispute; and

1.2.2 if the Dispute is not resolved at that meeting, the relevant parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the relevant parties

cannot agree on a mediator, the mediator with experience in trade mark law will be nominated by CEDR. If a relevant party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute:

(i) the Dispute (other than a Dispute relating to Style) must be resolved using paragraphs 1.3 to 1.5; or

(ii) a Dispute relating to Style must be resolved using paragraph 1.6.

1.3 Unless IfATE refers the Dispute (other than a Dispute relating to Style) to arbitration using paragraph 1.4, the parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction (other than in relation to a Dispute relating to Style) to:

1.3.1 determine the Dispute; and/or

1.3.2 grant interim remedies, or any other provisional or protective relief.

1.4 The parties agree that IfATE has the exclusive right to refer any Dispute (other than a Dispute relating to Style) to be finally resolved by arbitration under the London Court of International Arbitration Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

1.5 IfATE has the right to refer a Dispute (other than a Dispute relating to Style) to arbitration even if a party has started or has attempted to start court proceedings under paragraph 1.3, unless IfATE has agreed to the court proceedings or participated in them. Even if court proceedings have started, the relevant party must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under paragraph 1.4.

1.6 If the Dispute is one which relates to Style, IfATE's decision will be final.

Schedule 16 Appendix 2

Mark

T Level

Registered trade mark(s) and applications[3]

Country	Mark	App or regn no	Date of app or regn	Classes	Specification
UK	T Level (word)	UK00003318112	15 June 2018	9, 16, 41	Class 9: Electronic apparatus and instruments for testing, examination and assessment purposes; computer software, hardware and firmware for the provision of examination and assessments including software for operation over computer networks or by remote computer access; all of the aforesaid for use in the provision of education, teaching, training and/or assessment. Class 16: Examination papers; syllabi; diplomas; education, academic and vocational certificates; printed examination regulations; all of the

[3] To be updated as required based on trade mark application position at the Effective Date.

					aforesaid for use in the provision of education, teaching, training and/or assessment. Class 41: Issuing of educational awards; awarding of educational certificates; educational assessment services; provision of examination, testing and assessment services; provision of examination, testing and assessment services electronically, by online delivery, by way of the Internet or world wide web; online publication of syllabi, examination papers, assessments; examination services; assessment services; educational certification services; certification in relation to examinations and other forms of assessment; preparation and validation, accreditation, conducting and administration of examinations, assessments and tests; provision of examination papers; information, advisory and consultancy services relating to all of the aforesaid; all of the aforesaid relating to the provision of education, teaching, training and/or assessment.
EU	T Level (word)	017999579	13 December 2018	9, 16, 41	Class 9: Educational, teaching, instruction or research apparatus and instruments; electronic apparatus and instruments for teaching, instruction, training, research, education, testing, examination and assessment purposes; media bearing electronic publications and data; electronic publications; electronic publications (downloadable)

					provided online from a database or the Internet; downloadable text and information provided electronically, by online delivery, by way of the Internet or world wide web; electronic database; audio visual teaching apparatus; films and video films; computer software, hardware and firmware; computer software, hardware and firmware for the provision of teaching, instruction, training, research, education, testing, examination and assessments including software for operation over computer networks or by remote computer access; educational software; all of the aforesaid for use in the provision of education, teaching, training and/or assessment. Class 16: Printed publications; educational publications; printed matter; educational materials; examination papers; syllabi; diplomas; education, academic and vocational certificates; printed examination regulations; books; magazines; publications; textbooks; exercise books and notebooks; catalogues, handbooks and manuals; study guides; instructional or teaching materials; all of the aforesaid for use in the provision of education, teaching, training and/or assessment. Class 41: Education services; teaching services; publication services; educational publication services; publication of printed matter relating to education; issuing of educational awards; awarding of educational

					certificates; electronic publication; publication of printed matter; educational assessment services; provision of training, teaching, academic, education, instruction, examination, testing and assessment services; provision of training, teaching, academic, education, instruction, examination, testing and assessment services electronically, by online delivery, by way of the Internet or world wide web; online publication of electronic texts, books, textbooks, brochures, syllabi, examination papers, assessments; examination services; assessment services; educational certification services; certification in relation to examinations and other forms of assessment, education, training and awards; preparation and validation, accreditation, conducting and administration of examinations, assessments and tests; provision of examination papers; information, advisory and consultancy services relating to all of the aforesaid services; all of the aforesaid relating to the provision of education, teaching, training and/or assessment services.

Schedule 17

Provider Contract requirements

1 Provider Contract

1.1 This Schedule sets out the requirements that Provider Contracts must meet.

1.2 Provider Contracts must:

1.2.1 be in writing, enforceable, and on terms that are fair and reasonable;

1.2.2 set out all the requirements with which the Approved Provider must comply in order to continue to deliver the TQ;

1.2.3 establish a sanctions policy to be applied in the event that the Approved Provider fails to comply with the requirements in the Provider Contract;

1.2.4 require the Approved Provider to:

(i) take all reasonable steps to ensure that the Supplier is able to comply with its Conditions of Recognition;

(ii) retain a workforce of appropriate size and competence to undertake the delivery of the TQ as required by the Supplier;

(iii) have available sufficient managerial and other resources to enable it effectively and efficiently to undertake the delivery of the TQ as required by the Supplier;

(iv) undertake the delivery of the qualification required by the awarding organisation in accordance with the Equality Act 2010, any Act that was a statutory predecessor to that Act, or any legislation in a jurisdiction other than England which has an equivalent purpose and effect; and

(v) operate a complaints handling procedure or appeals process for the benefit of Students;

1.2.5 where, in accordance with the Approved Assessment Strategy an Approved Provider is permitted to carry out or procure the carrying out of marking of Student assessment evidence, set out details for carrying out Moderation;

1.2.6 not materially depart from any relevant industry standards and common education sector practices;

1.2.7 be materially consistent across all Approved Providers in respect of the provision of the Provider Services and, in particular, shall not discriminate against any particular types, sizes or geographical locations of Approved Providers in connection with the provision of any Provider Services;

1.2.8 include appropriate GDPR provisions: where the Supplier, in fulfilling its obligations under this Contract, is acting as a Processor on behalf of an Approved Provider, the Provider Contract will include provisions to ensure that any personal data (as defined in the GDPR) that is Processed by the Supplier in relation to the Provider Services is Processed in accordance with Data Protection Legislation;

1.2.9 be consistent with, and to the extent necessary allow for, any information, document and data sharing requirements contained within this Contract (to include any information, documents and data that must be provided by the Supplier to the Authority and/or any third party and any information, documents and data requested by Ofqual);

1.2.10 require the Approved Provider to assist the Supplier in carrying out any reasonable monitoring activities and to assist Ofqual in any investigations made for the purposes of performing its functions;

1.2.11 allow Approved Providers to purchase Provider Services on an “as and when needed” basis without any minimum or maximum volume commitments (including in relation to the number of Students);

1.2.12 require Approved Providers to register all Students on a TQ by the end of November or within such other timescales as are required by the Key Dates Schedule for the relevant Academic Year and pay that part of the Fees referred to in limb (a) of the definition of Fees within 30 days of such

registration and provide that, if a Student terminates their study of the TQ before the end of the following January in the same Academic Year, the Supplier must provide a full refund of such Fees (relating to such Student) to the Approved Provider (for the avoidance of doubt, if the Student terminates their study of the TQ after the end of the following January in the same Academic Year, the Supplier is not obliged to give a refund);

1.2.13 include detailed provisions relating to the Approved Provider's role in quality assurance, such provisions shall give effect to the requirements of the Approved Provider's Quality Assurance Process;

1.2.14 require Approved Providers to provide advice and guidance to Students (including any Student no longer enrolled with the Approved Provider) in relation to making enquiries about results (and any further steps that may be taken following such an enquiry (including those contemplated by the Additional Services)) and where such Student reasonably requests the Approval Provider (whether directly or indirectly) to request the provision of an Additional Service, require the Approved Provider to request the provision of such Additional Service from the Supplier;

1.2.15 require Approved Providers to seek written approval from the Supplier before permitting a third party (for example training providers or satellite centres) to deliver any part of the TQ, including its assessments, and requires the Approved Providers to agree in writing to the Supplier's requirements before the Supplier approves the use of a third party;

1.2.16 place responsibility on the Approved Provider to monitor whether any third party involved with the delivery and assessment of the TQ on its behalf has appropriate capacity and capability; and

1.2.17 specify a process to be followed in any withdrawal of the Approved Provider (whether voluntary or not) from its role in delivering the TQ and require Approved Providers to take all reasonable steps to protect the interests of Students in the case of such a withdrawal.

1.3 Provider Contracts must not:

1.3.1 include terms in connection with Provider Services that are not strictly necessary for the provision of the relevant Provider Services and/or which are materially inconsistent with any of the Supplier's obligations under this Contract;

1.3.2 make the provision of the Provider Services contingent on the take up of any further qualifications or services by the Approved Provider;

1.3.3 require the Approved Provider to make any payments other than the Fees (e.g. for the avoidance of doubt, Provider Contracts shall not require any fees to be paid by the Approved Provider (or an Eligible Provider) for Provider Approval in relation to a TQ);

1.3.4 offer any discounts to the Fees; and/or

1.3.5 include provisions that are materially more onerous than any comparable provisions in this Contract.

1.4 The Supplier shall not offer to any Approved Provider any rebate, discount or other incentive in relation to services outside the Provider Services (whether or not in the Provider Contract) which is contingent on or linked to the Approved Provider entering into the Provider Contract and/or registering Students for the TQ.

Schedule 18

Commercially Sensitive Information

The content for this Schedule is contained in a separate file at;

S18_GEN2W1_BSE_Commerically_Sensitive_Confidential_Information

Attachment 9: Commercially Sensitive Information and/or Confidential Information

1 All the information that the Authority supplies (to the Potential Supplier or otherwise) as part of this Procurement shall be treated as confidential information under paragraph 12 of the Terms of Participation.

2 a. During this Procurement, the Potential Supplier considers that the type of information listed in Table 1 below contained in its response to the ITT is 'Confidential Information'.

b. From the Effective Date of the Contract, the Potential Supplier considers that the type of information listed in Table 3 below contained in its response to the ITT shall be 'Confidential Information'.

3 a. During this Procurement, the Potential Supplier considers that the type of information listed in Table 2 below contained in its response to the ITT is not Confidential Information but is 'Commercially Sensitive Information'.

b. From the Effective Date of the Contract, the Potential Supplier considers that the type of information listed in Table 4 below contained in its response to the ITT is not Confidential Information but is 'Commercially Sensitive Information'.

4 The Potential Supplier must complete each Table fully and give full, valid and justifiable reasons for including any information in the Tables below. The Authority cannot accept any broad attempt to class all, or any broad categories of, information as either 'Confidential Information' or 'Commercially Sensitive Information' and may discard a Potential Supplier's attempts to classify information in this way.

5 The information supplied in this Attachment 9 shall be used to populate Schedule 18 of the Contract.

6 Potential Suppliers are reminded that notwithstanding the inclusion of any information in Table 1, Table 2, Table 3 and/or Table 4 below, the Authority shall be responsible for determining in its absolute discretion whether any information is exempt from disclosure in accordance with FoIA and/or the EIRs.

Schedule 19

Required Insurances

PART A: THIRD PARTY PUBLIC AND PRODUCTS LIABILITY INSURANCE

1 Insured

The Supplier

2 Interest

To indemnify the Insured in respect of all sums which the Insured shall become legally liable to pay as damages, including claimant's costs and expenses, in respect of accidental:

2.1 death or bodily injury to or sickness, illness or disease contracted by any person; and

2.2 loss of or damage to property,

happening during the period of insurance (as specified in paragraph 5) and arising out of or in connection with the provision of the Services under this Contract.

3 Limit of indemnity

Not less than £5,000,000 in respect of any one occurrence, the number of occurrences being unlimited, but £5,000,000 in the aggregate per annum in respect of products and pollution liability.

4 Territorial limits

United Kingdom.

5 Period of insurance

From the Effective Date and renewable on an annual basis unless agreed otherwise by the Authority in writing for the Term.

6 Cover features and extensions

Indemnity to principals clause.

7 Principal exclusions

7.1 War and related perils.

7.2 Nuclear and radioactive risks.

7.3 Liability for death, illness, disease or bodily injury sustained by employees of the Insured during the course of their employment.

7.4 Liability arising out of the use of mechanically propelled vehicles whilst required to be compulsorily insured by applicable Law in respect of such vehicles.

7.5 Liability in respect of predetermined penalties or liquidated damages imposed under any contract entered into by the Insured.

7.6 Liability arising out of technical or professional advice other than in respect of death or bodily injury to persons or damage to third party property.

7.7 Liability arising from the ownership, possession or use of any aircraft or marine vessel.

7.8 Liability arising from seepage and pollution unless caused by a sudden, unintended and unexpected occurrence.

8 Maximum deductible threshold

Not to exceed £10,000 for each and every third party property damage claim (personal injury claims to be paid in full).

PART B: PROFESSIONAL INDEMNITY INSURANCE

1 Insured

The Supplier

2 Interest

To indemnify the Insured for all sums which the Insured shall become legally liable to pay (including claimants' costs and expenses) as a result of claims first made against the Insured during the period of insurance (as specified in paragraph 13) by reason of any negligent act, error and/or omission arising from or in connection with the provision of the Services.

3 Limit of indemnity

Not less than £5,000,000 in respect of any one claim and in the aggregate per annum, exclusive of defence costs which are payable in addition.

4 Territorial Limits

United Kingdom

5 Period of insurance

From the Effective Date and renewable on an annual basis unless agreed otherwise by the Authority in writing (a) for the Term; and (b) for a period of 6 years thereafter.

6 Cover features and extensions

Retroactive cover to apply to any “claims made policy wording” in respect of this Contract or retroactive date to be no later than the Effective Date.

7 Principal exclusions

7.1 War and related perils

7.2 Nuclear and radioactive risks

8 Maximum deductible threshold

Not to exceed £10,000 for each and every claim.

PART C: UNITED KINGDOM COMPULSORY INSURANCES

1 The Supplier shall meet its insurance obligations under applicable Law in full, including, UK employers' liability insurance and motor third party liability insurance.

Schedule 20

Authorised Representatives

The content for this Annex is contained in a separate file at;

S20_GEN2W1_BSE_Authorised_Representatives

Schedule 20

Authorised Representatives

Authority Authorised Representative

[redacted]	[redacted]
[redacted]	[redacted]
Postal Address:	Sanctuary Buildings, 20 Great Smith Street, London SW1P 3BT
[redacted]	[redacted]

Supplier Authorised Representative

[redacted]	[redacted]
[redacted]	[redacted]
Postal Address:	245 Western Avenue, Cardiff CF5 2YX
[redacted]	[redacted]

Schedule 21

Staff Transfer

1. **Definitions**

1.1 In this Schedule, the following definitions shall apply:

"Former Supplier" means the Awarding Organisation that is operating or operated the T Level technical education qualification under the Original Contract;

"Notified Sub-contractor" means a Sub-contractor to whom Transferring Former Supplier Employees will transfer on a Relevant Transfer Date;

"Replacement Sub-contractor" means a sub-contractor of the Replacement Supplier to whom Transferring Supplier Employees will transfer on a Service Transfer Date (or any sub-contractor of any such sub-contractor);

"Relevant Transfer" means a transfer of employment to which TUPE applies;

"Relevant Transfer Date" means in relation to a Relevant Transfer, the date upon which the Relevant Transfer takes place;

"Service Transfer" means any transfer of the Services (or any part of the Services), for whatever reason, from the Supplier or any Sub-contractor to a Replacement Supplier or a Replacement Sub-contractor;

"Service Transfer Date" means the date of a Service Transfer;

"Staffing Information" means in relation to all persons identified on the Supplier's Provisional Supplier Personnel List or Supplier's Final Supplier Personnel List, as the case may be, such information as the Authority may reasonably request (subject to all applicable provisions of the Data Protection Legislation), but including in an anonymised format:

(a) their ages, dates of commencement of employment or engagement, gender and place of work;

(b) details of whether they are employed, self-employed contractors or consultants, agency workers or otherwise;

(c) the identity of the employer or relevant contracting Party;

(d) their relevant contractual notice periods and any other terms relating to termination of employment, including redundancy procedures, and redundancy payments;

(e) their wages, salaries, bonuses and profit sharing arrangements as applicable;

(f) details of other employment-related benefits, including (without limitation) medical insurance, life assurance, pension or other retirement benefit schemes, share option schemes and company car schedules applicable to them;

(g) any outstanding or potential contractual, statutory or other liabilities in respect of such individuals (including in respect of personal injury claims);

(h) details of any such individuals on long term sickness absence, parental leave, maternity leave or other authorised long term absence;

(i) copies of all relevant documents and materials relating to such information, including copies of relevant contracts of employment (or relevant standard contracts if applied generally in respect of such employees); and

(j) any other Employee Liability Information" as such term is defined in regulation 11 of TUPE;

"Supplier's Final Supplier Personnel List" means a list provided by the Supplier of all Supplier Personnel who will transfer under TUPE on the Service Transfer Date;

"Supplier's Provisional Supplier Personnel List" means a list prepared and updated by the Supplier of all Supplier Personnel who are at the date of the list wholly or mainly engaged in or assigned to the provision of the Services or any relevant part of the Services which it is envisaged as at the date of such list will no longer be provided by the Supplier;

"Transferring Former Supplier Employees" means in relation to a Former Supplier, those employees of the Former Supplier to whom TUPE will apply on the Relevant Transfer Date; and

"Transferring Supplier Employees" means those employees of the Supplier and/or the Supplier's Sub-contractors to whom TUPE will apply on the Service Transfer Date.

2. Interpretation

2.1 Where a provision in this Schedule imposes an obligation on the Supplier to provide an indemnity, undertaking or warranty, the Supplier shall procure that each of its Sub-contractors shall comply with such obligation and provide such indemnity, undertaking or warranty to the Authority, Former Supplier, Replacement Supplier or Replacement Sub-contractor, as the case may be.

Transferring Former Supplier Employees at Commencement of Services

3. Relevant Transfers

3.1 The Authority and the Supplier agree that:

3.1.1 the commencement of the provision of the Services or of any relevant part of the Services will be a Relevant Transfer in relation to the Transferring Former Supplier Employees; and

3.1.2 as a result of the operation of TUPE, the contracts of employment between each Former Supplier and the Transferring Former Supplier Employees (except in relation to any terms disapplied through the operation of regulation 10 of TUPE) shall have effect on and from the Relevant Transfer Date as if originally made between the Supplier and/or Notified Sub-contractor and each such Transferring Former Supplier Employee.

3.2 The Authority shall procure that each Former Supplier shall comply with all its obligations under TUPE and shall perform and discharge all its obligations in respect of all the Transferring Former Supplier Employees in respect of the period up to (but not including) the Relevant Transfer Date (including the payment of all remuneration, benefits, entitlements and outgoings, all wages, accrued but untaken holiday pay, bonuses, commissions, payments of PAYE, national insurance contributions and pension contributions which in any case are attributable in whole or in part in respect

of the period up to (but not including) the Relevant Transfer Date) and the Supplier shall make, and the Authority shall procure that each Former Supplier makes, any necessary apportionments in respect of any periodic payments.

4. Former Supplier Indemnities

4.1 Subject to Paragraph 4.2, the Authority shall procure that each Former Supplier shall indemnify the Supplier and any Notified Sub-contractor against any Employee Liabilities arising from or as a result of:

4.1.1 any act or omission by the Former Supplier in respect of any Transferring Former Supplier Employee or any appropriate employee representative (as defined in TUPE) of any Transferring Former Supplier Employee arising before the Relevant Transfer Date;

4.1.2 the breach or non-observance by the Former Supplier arising before the Relevant Transfer Date of:

(a) any collective agreement applicable to the Transferring Former Supplier Employees; and/or

(b) any custom or practice in respect of any Transferring Former Supplier Employees which the Former Supplier is contractually bound to honour;

4.1.3 any proceeding, claim or demand by HMRC or other statutory authority in respect of any financial obligation including, but not limited to, PAYE and primary and secondary national insurance contributions:

(a) in relation to any Transferring Former Supplier Employee, to the extent that the proceeding, claim or demand by HMRC or other statutory authority relates to financial obligations arising before the Relevant Transfer Date; and

(b) in relation to any employee who is not a Transferring Former Supplier Employee and in respect of whom it is later alleged or determined that TUPE applied so as to transfer his/her employment from the Former Supplier to the Supplier and/or any Notified Sub-contractor as appropriate, to the extent that the proceeding, claim or demand by

HMRC or other statutory authority relates to financial obligations in respect of the period to (but excluding) the Relevant Transfer Date;

4.1.4 a failure of the Former Supplier to discharge or procure the discharge of all wages, salaries and all other benefits and all PAYE tax deductions and national insurance contributions relating to the Transferring Former Supplier Employees in respect of the period to (but excluding) the Relevant Transfer Date;

4.1.5 any claim made by or in respect of any person employed or formerly employed by the Former Supplier other than a Transferring Former Supplier Employee for whom it is alleged the Supplier and/or any Notified Sub-contractor as appropriate may be liable by virtue of this Contract and/or TUPE; and

4.1.6 any claim made by or in respect of a Transferring Former Supplier Employee or any appropriate employee representative (as defined in TUPE) of any Transferring Former Supplier Employee relating to any act or omission of the Former Supplier in relation to its obligations under regulation 13 of TUPE, except to the extent that the liability arises from the failure by the Supplier or any Sub-contractor to comply with regulation 13(4) of TUPE.

4.2 The indemnities in Paragraph 4.1 shall not apply to the extent that the Employee Liabilities arise or are attributable to an act or omission of the Supplier or any Sub-contractor whether occurring or having its origin before, on or after the Relevant Transfer Date including, without limitation, any Employee Liabilities:

4.2.1 arising out of the resignation of any Transferring Former Supplier Employee before the Relevant Transfer Date on account of substantial detrimental changes to his/her working conditions proposed by the Supplier or any Sub-contractor to occur in the period from (and including) the Relevant Transfer Date; or

4.2.2 arising from the failure by the Supplier and/or any Sub-contractor to comply with its obligations under TUPE.

4.3 If any person who is not identified as a Transferring Former Supplier Employee claims, or it is determined in relation to any person who is not identified as a Transferring Former Supplier Employee, that his/her contract of employment has been transferred

from a Former Supplier to the Supplier and/or any Notified Sub-contractor pursuant to TUPE then:

4.3.1 the Supplier shall, or shall procure that the Notified Sub-contractor shall, within 5 Working Days of becoming aware of that fact, give notice in writing to the Authority and, where required by the Authority, to the Former Supplier; and

4.3.2 the Former Supplier may offer (or may procure that a third party may offer) employment to such person within 15 Working Days of the notification by the Supplier and/or the Notified Sub-contractor or take such other reasonable steps as the Former Supplier considers appropriate to deal with the matter provided always that such steps are in compliance with applicable Law.

4.4 If an offer referred to in Paragraph 4.3.2 is accepted, or if the situation has otherwise been resolved by the Former Supplier and/or the Authority, the Supplier shall, or shall procure that the Notified Sub-contractor shall, immediately release the person from his/her employment or alleged employment.

4.5 If by the end of the 15 Working Day period specified in Paragraph 4.3.2:

4.5.1 no such offer of employment has been made;

4.5.2 such offer has been made but not accepted; or

4.5.3 the situation has not otherwise been resolved,

the Supplier and/or any Notified Sub-contractor may within 5 Working Days give notice to terminate the employment or alleged employment of such person.

4.6 Subject to the Supplier and/or any Notified Sub-contractor acting in accordance with the provisions of Paragraphs 4.3 to 4.5 and in accordance with all applicable proper employment procedures set out in Law, the Authority shall procure that the Former Supplier indemnifies the Supplier and/or any Notified Sub-contractor (as appropriate) against all Employee Liabilities arising out of the termination of employment pursuant to the provisions of Paragraph 4.5 provided that the Supplier takes, or shall procure that the Notified Sub-contractor takes, all reasonable steps to minimise any such Employee Liabilities.

4.7 The indemnity in Paragraph 4.6:

4.7.1 shall not apply to:

(a) any claim for:

(b) discrimination, including on the grounds of sex, race, disability, age, gender reassignment, marriage or civil partnership, pregnancy and maternity or sexual orientation, religion or belief; or

(c) equal pay or compensation for less favourable treatment of part-time workers or fixed-term employees;

(d) in any case in relation to any alleged act or omission of the Supplier and/or any Sub-contractor; or

(e) any claim that the termination of employment was unfair because the Supplier and/or Notified Sub-contractor neglected to follow a fair dismissal procedure; and

4.7.2 shall apply only where the notification referred to in Paragraph 4.3.1 is made by the Supplier and/or any Notified Sub-contractor (as appropriate) to the Authority and, if applicable, the Former Supplier, within 6 months of the Relevant Transfer Date.

4.8 If any such person as is described in Paragraph 4.3 is neither re-employed by the Former Supplier nor dismissed by the Supplier and/or any Notified Sub-contractor within the time scales set out in Paragraph 4.5, such person shall be treated as having transferred to the Supplier or Notified Sub-contractor and the Supplier shall comply with such obligations as may be imposed upon it under the Law.

5. <u>Supplier Indemnities and Obligations</u>

5.1 Subject to Paragraph 5.2, the Supplier shall indemnify the Authority and/or the Former Supplier against any Employee Liabilities arising from or as a result of:

5.1.1 any act or omission by the Supplier or any Sub-contractor in respect of any Transferring Former Supplier Employee or any appropriate employee representative (as defined in TUPE) of any Transferring Former Supplier Employee whether occurring before, on or after the Relevant Transfer Date;

5.1.2 the breach or non-observance by the Supplier or any Sub-contractor on or after the Relevant Transfer Date of:

(a) any collective agreement applicable to the Transferring Former Supplier Employee; and/or

(b) any custom or practice in respect of any Transferring Former Supplier Employees which the Supplier or any Sub-contractor is contractually bound to honour;

5.1.3 any claim by any trade union or other body or person representing any Transferring Former Supplier Employees arising from or connected with any failure by the Supplier or a Sub-contractor to comply with any legal obligation to such trade union, body or person arising on or after the Relevant Transfer Date;

5.1.4 any proposal by the Supplier or a Sub-contractor prior to the Relevant Transfer Date to make changes to the terms and conditions of employment or working conditions of any Transferring Former Supplier Employees to their material detriment on or after their transfer to the Supplier or a Sub-contractor (as the case may be) on the Relevant Transfer Date, or to change the terms and conditions of employment or working conditions of any person who would have been a Transferring Former Supplier Employee but for their resignation (or decision to treat their employment as terminated under regulation 4(9) of TUPE) before the Relevant Transfer Date as a result of or for a reason connected to such proposed changes;

5.1.5 any statement communicated to or action undertaken by the Supplier or a Sub-contractor to, or in respect of, any Transferring Former Supplier Employee before the Relevant Transfer Date regarding the Relevant Transfer which has not been agreed in advance with the Authority and/or the Former Supplier in writing;

5.1.6 any proceeding, claim or demand by HMRC or other statutory authority in respect of any financial obligation including, but not limited to, PAYE and primary and secondary national insurance contributions:

(a) in relation to any Transferring Former Supplier Employee, to the extent that the proceeding, claim or demand by HMRC or other statutory authority relates to financial obligations arising on or after the Relevant Transfer Date; and

(b) in relation to any employee who is not a Transferring Former Supplier Employee, and in respect of whom it is later alleged or determined that TUPE applied so as to transfer his/her employment from the Former Supplier to the Supplier or a Sub-contractor, to the extent that the proceeding, claim or demand by the HMRC or other statutory authority relates to financial obligations arising on or after the Relevant Transfer Date;

5.1.7 a failure of the Supplier or any Sub-contractor to discharge or procure the discharge of all wages, salaries and all other benefits and all PAYE tax deductions and national insurance contributions relating to the Transferring Former Supplier Employees in respect of the period from (and including) the Relevant Transfer Date;

5.1.8 any claim made by or in respect of a Transferring Former Supplier Employee or any appropriate employee representative (as defined in TUPE) of any Transferring Former Supplier Employee relating to any act or omission of the Supplier or any Sub-contractor in relation to obligations under regulation 13 of TUPE, except to the extent that the liability arises from the Former Supplier's failure to comply with its obligations under regulation 13(4) of TUPE; and

5.1.9 a failure by the Supplier or any Sub-Contractor to comply with its obligations under Paragraph 2.8 above.

5.2 The indemnities in Paragraph 5.1 shall not apply to the extent that the Employee Liabilities arise or are attributable to an act or omission of the Former Supplier whether occurring or having its origin before, on or after the Relevant Transfer Date including, without limitation, any Employee Liabilities arising from the Former Supplier's failure to comply with its obligations under TUPE.

5.3 The Supplier shall comply, and shall procure that each Sub-contractor shall comply, with all its obligations under TUPE (including without limitation its obligation to inform

and consult in accordance with regulation 13 of TUPE) and shall perform and discharge, and shall procure that each Sub-contractor shall perform and discharge, all its obligations in respect of all the Transferring Former Supplier Employees, on and from the Relevant Transfer Date (including the payment of all remuneration, benefits, entitlements and outgoings, all wages, accrued but untaken holiday pay, bonuses, commissions, payments of PAYE, national insurance contributions and pension contributions and any other sums due under the Admission Agreement which in any case are attributable in whole or in part to the period from (and including) the Relevant Transfer Date) and any necessary apportionments in respect of any periodic payments shall be made between the Supplier and the Former Supplier.

6. Information

6.1 The Supplier shall, and shall procure that each Sub-contractor shall, promptly provide to the Authority and/or at the Authority's direction, the Former Supplier, in writing such information as is necessary to enable the Authority and/or the Former Supplier to carry out their respective duties under regulation 13 of TUPE. The Authority shall procure that the Former Supplier shall promptly provide to the Supplier and each Notified Sub-contractor in writing such information as is necessary to enable the Supplier and each Notified Sub-contractor to carry out their respective duties under regulation 13 of TUPE.

7. Procurement Obligations

7.1 Notwithstanding any other provisions of this Schedule, where in this Schedule the Authority accepts an obligation to procure that a Former Supplier does or does not do something, such obligation shall be limited so that it extends only to the extent that the Authority's contract with the Former Supplier contains a contractual right in that regard which the Authority may enforce, or otherwise so that it requires only that the Authority must use reasonable endeavours to procure that the Former Supplier does or does not act accordingly.

8. Pensions

8.1 The Supplier shall, and shall procure that each Sub-contractor shall, comply with the requirements of Part 1 of the Pensions Act 2008, section 258 of the Pensions Act 2004

and the Transfer of Employment (Pension Protection) Regulations 2005 for all transferring staff.

DATED

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

and

WJEC CBAC LIMITED

INTELLECTUAL PROPERTY ASSIGNMENT AND LICENCE IN RELATION TO THE CONSTRUCTION: BUILDING SRVICES ENGINEERING T LEVEL TECHNICAL QUALIFICATION

THIS ASSIGNMENT AND LICENCE is made on

BETWEEN:

(3) **THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION** of Sanctuary Buildings, 20 Great Smith Street, London SW1P 3BT ("**Authority**"); and

(4) **WJEC CBAC LIMITED** a company registered in England and Wales (company registration number: **03150875**), whose registered office is at 245 Western Avenue, Cardiff, South Glamorgan, CF5 2YX ("**Supplier**"),

each a "**Party**" and together the "**Parties**".

BACKGROUND TO THIS ASSIGNMENT AND LICENCE

(D) The Authority and the Supplier have entered into a contract on the date of this Assignment and Licence for the design, development and delivery of the technical education qualification element ("**TQ**") for the Building Services Engineering T Level ("the **TQ Agreement**").

(E) The Supplier has agreed to assign certain intellectual property rights to the Authority, and to licence certain intellectual property rights to the Authority in connection with the TQ. The Authority has agreed to grant a licence back to the Supplier in relation to certain assigned intellectual property rights.

(F) This Assignment and Licence, together with the TQ Agreement sets out the agreed terms of such assignment and licences.

2 Assignment and Licence start, formation and interpretation

2.1 This Assignment and Licence is legally binding from the Effective Date until it ends in accordance with its terms.

2.2 In this Assignment and Licence, unless the context otherwise requires, capitalised expressions shall have the meanings set out in this clause 1 or, where no definition is given in this clause 1, Schedule 1 to the TQ Agreement.

2.3 If a capitalised expression does not have an interpretation in this clause 1 or Schedule 1 to the TQ Agreement, it shall, in the first instance, be interpreted in accordance with the common

interpretation within the relevant market sector where appropriate. Otherwise, it shall be interpreted in accordance with the dictionary meaning.

2.4 In this Assignment and Licence, unless the context otherwise requires:

2.4.1 the singular includes the plural and vice versa;

2.4.2 reference to a gender includes the other gender and the neuter;

2.4.3 references to a person include an individual, company, body corporate, corporation, unincorporated association, firm, partnership or other legal entity or Crown Body;

2.4.4 references to a legal entity (other than the Supplier) shall include unless otherwise expressly stated any statutory successor to such entity and/or the relevant functions of such entity, and references to the Department shall include, where relevant, the ESFA;

2.4.5 a reference to any Law includes a reference to that Law as amended, extended, consolidated or re-enacted from time to time;

2.4.6 the words "**including**", "**other**", "**in particular**", "**for example**" and similar words shall not limit the generality of the preceding words and shall be construed as if they were immediately followed by the words "**without limitation**";

2.4.7 references to "**writing**" include typing, printing, lithography, photography, display on a screen, electronic and facsimile transmission and other modes of representing or reproducing words in a visible form, and expressions referring to writing shall be construed accordingly;

2.4.8 references to "**clauses**" and "**Schedules**" are, unless otherwise provided, references to the clauses and schedules of this Assignment and Licence and references in any Schedule to parts, paragraphs, annexes and tables are, unless otherwise provided, references to the parts, paragraphs, annexes and tables of the Schedule in which these references appear;

2.4.9 references to "**paragraphs**" are, unless otherwise provided, references to the paragraph of the appropriate Schedules unless otherwise provided; and

2.4.10 the headings in this Assignment and Licence are for ease of reference only and shall not affect the interpretation or construction of this Assignment and Licence.

2.5 In this Assignment and Licence, unless the context otherwise requires, the following words shall have the following meanings:

"**Ancillary Materials**" means all information and materials (other than Key Materials) to which the Authority and/or a Future Supplier would require access for the Portability Purposes, and any other materials which would be required on or to facilitate succession to a Future Supplier in a seamless manner in relation to the TQ offered or Operated by the Supplier.

Ancillary Materials shall include, without limitation:

(a) Student results including grades;

(b) statistical analysis for grading (excludes the systems supporting the analysis);

(c) lists of Providers;

(d) marked Student evidence (with moderation outcomes);

(e) documentation which provides an overview or analysis of Student performance (including chief examiner and chief moderator reports), which include but are not limited to, examples of student responses to assessment questions and/or tasks as well as narrative explaining why students did well/ less well on individual items/ components/ subcomponents);

(f) data on Student credits;

(g) data on Student appeals;

(h) data on special considerations for Students;

(i) the Assessment Strategy;

(j) Student registrations;

(k) draft materials in preparation for forthcoming assessments;

(l) the Key Dates Schedule (in respect of forthcoming assessments);

(m) lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ;

(n) materials from completed assessments, such as completed Students' examination answer booklets; and

(o) TQ Live Assessment Materials

"**Approval**" has the same meaning as in the TQ Agreement;

"**Assigned Rights**" means the Intellectual Property Rights in the Key Materials;

"**Authority Authorised Representative**" has the same meaning as in the TQ Agreement;

"**Background IPR**" means any IPR owned by a Party prior to the Effective Date or created or developed by a Party otherwise than in the provision of the Services or under or in connection with the TQ Agreement, but does not include IPR in Key Materials;

"**Beneficiary**" means a Party having (or claiming to have) the benefit of an indemnity under this Assignment and Licence;

"**Claim**" means any claim for which it appears that a Beneficiary is, or may become, entitled to indemnification under this Assignment and Licence;

"**Continuing Activities**" means activities of the Supplier under the TQ Agreement which continue following the end of the second Academic Year for the final Exclusive Cohort (each as defined in the TQ Agreement) in relation to the TQ as offered by the Supplier, such as retakes, appeals, and any ongoing records management contracted to the Supplier;

"**Default**" means any breach of the obligations of the Supplier (including abandonment of the Assignment and Licence in breach of its terms) or any other default (including material default), act, omission, negligence or statement of the Supplier, of its Subcontractors or any Supplier Staff howsoever arising in connection with or in relation to the subject-matter of this Assignment and Licence and in respect of which the Supplier is liable to the Authority;

"**Deliverables**" means all information and data the Supplier creates, identifies for use, or uses as part of or for the Operation of the TQ, including Products and Management Information;

"**Dispute**" means any claim, dispute or difference which arises out of or in connection with this Assignment and Licence or in connection with the negotiation, existence, legal validity, enforceability or termination of this Assignment and Licence, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts;

"**Effective Date**" means the date on which the last Party to sign has signed this Assignment and Licence;

"**Final Approval Milestone**" has the meaning given in the TQ Agreement;

"**Future Supplier**" means any Awarding Organisation appointed, at any point in the future and including any Replacement Supplier, to operate one or more T Level technical education qualifications by or at the direction of the Authority from time to time, and where the Authority is operating a T Level technical education qualification, shall also include the Authority;

"**Indemnifier**" means a Party from whom an indemnity is sought under this Assignment and Licence;

"**Insolvency Event**" means:

(d) in respect of a company:

(i) a proposal is made for a voluntary arrangement within Part I of the Insolvency Act 1986 or of any other composition scheme or arrangement with, or assignment for the benefit of, its creditors; or

(ii) a shareholders' meeting is convened for the purpose of considering a resolution that it be wound up or a resolution for its winding-up is passed (other than as part of, and exclusively for the purpose of, a bona fide reconstruction or amalgamation); or

(iii) a petition is presented for its winding up (which is not dismissed within fourteen (14) Working Days of its service) or an application is made for the appointment of a provisional liquidator or a creditors' meeting is convened pursuant to section 98 of the Insolvency Act 1986; or

(iv) a receiver, administrative receiver or similar officer is appointed over the whole or any part of its business or assets; or

(v) an application order is made either for the appointment of an administrator or for an administration order, an administrator is appointed, or notice of intention to appoint an administrator is given; or

(vi) it is or becomes insolvent within the meaning of section 123 of the Insolvency Act 1986; or

(vii) being a "**small company**" within the meaning of section 382(3) of the Companies Act 2006, a moratorium comes into force pursuant to Schedule A1 of the Insolvency Act 1986; or

(e) where the person is an individual or partnership, any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs in relation to that individual or partnership; or

(f) any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs under the law of any other jurisdiction;

"**Intellectual Property Rights**" or "**IPR**" means:

(g) copyright, rights related to or affording protection similar to copyright, rights in databases, patents and rights in inventions, semi-conductor topography rights, trade marks, rights in internet domain names and website addresses and other rights in trade or business names, goodwill, designs, Know-How, trade secrets and other rights in Confidential Information;

(h) applications for registration, and the right to apply for registration, for any of the rights listed at (a) that are capable of being registered in any country or jurisdiction; and

(i) all other rights having equivalent or similar effect in any country or jurisdiction;

"**IPR Claim**" means any claim of infringement or alleged infringement (including the defence of such infringement or alleged infringement) of any IPR used to provide the Services and/or supply the Products or otherwise provided and/or licensed by the Supplier (or to which the Supplier has provided access) to the Authority in the fulfilment of its obligations under the TQ Agreement or this Assignment and Licence;

"**Key Materials**" means materials the IPR in which the Authority reasonably requires ownership of for the Portability Purposes. Examples of where the Authority may reasonably require ownership include because the Authority or a Future Supplier (or, where relevant, a potential Future Supplier) may need to copy or

otherwise reproduce such materials (in whole or in part), to supply or communicate the same, or to be able control the use (in whole or in part) of such materials by third parties, or to authorise others to do so.

Key Materials shall include:

(a) specifications of content for each TQ including core and all specialist components;

(b) assessment guidelines (for Providers);

(c) quality assurance requirements (for Providers);

(d) specimen assessment materials;

(e) standards exemplification materials;

(f) supplementary specimen assessment materials

(g) employer set project guide exemplar responses

(h) employer set project grade exemplar responses

(i) updates or redevelopments of specifications of content;

(j) updates and redevelopments of any Key Materials; and

(k) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes.

Key Materials shall not include:

(1) Support Materials, insofar as they are not part of any of the expressly included items listed above;

(2) question banks insofar as they are not part of any of the included items listed above and are not developed for the TQ; and

(3) any systems and platforms used to support the delivery of the TQ, provided that the relevant TQ content or data held in or processed by such systems and/or platforms can be extracted without requiring further processing post-extraction (and the Supplier can demonstrate that they can be so extracted) to enable use of the relevant content and/or data by a Skilled

Future Supplier in conjunction with a non-proprietary or generally commercially available system or platform;

"**Know-How**" means all ideas, concepts, schemes, information, knowledge, techniques, methodology, and anything else in the nature of know-how relating to the Services;

"**Law**" means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Supplier is bound to comply;

"**Losses**" means all losses, liabilities, damages, costs, expenses (including legal fees), disbursements, costs of investigation, litigation, settlement, judgment, interest and penalties whether arising in contract, tort (including negligence), breach of statutory duty, misrepresentation or otherwise and "**Loss**" shall be interpreted accordingly;

"**New IPR**" means :

(a) IPR in items created by the Supplier (or by a third party on behalf of the Supplier) specifically for the purposes of the TQ Agreement and updates and amendments of these items including (but not limited to) database schema; and/or

(b) IPR in or arising as a result of the performance of the Supplier's obligations under the TQ Agreement and all updates and amendments to the same,

but shall not include any IPR owned by the Supplier prior to the Effective Date;

"**Operate**" in relation to a qualification means to provide the Services or a material part of the Services, or services replacing the Services or a material part of the Services, or of an equivalent character to the Services or a material part of the Services in relation to any other qualification (whether a T Level technical education qualification or not); and "**Operation**" and other cognate terms shall have a corresponding meaning;

"**Party**" means the Authority or the Supplier and "**Parties**" means both of them where the context permits;

"**Product**" has the meaning given in the TQ Agreement;

"**Provider**" means an organisation that has a grant agreement and/or a contract in place with the ESFA to provide qualifications to Students;

"**Replacement Services**" means any services which are substantially similar to any of the Services (including the supply of any Products) and which the Authority receives in substitution for any of the Services, whether those services are provided by the Authority internally and/or by any third party;

"**Replacement Supplier**" has the meaning given in the TQ Agreement;

"**Required Insurances**" has the meaning given in the TQ Agreement;

"**Services**" means the services as described in Schedule 2 to the TQ Agreement (*Service Requirements*) including any Additional Services as defined in the TQ Agreement;

"**Termination Notice**" means a written notice of termination given by one Party to the other, notifying the Party receiving the notice of the intention of the Party giving the notice to terminate this Assignment and Licence on a specified date and setting out the grounds for termination;

"**Third Party IPR**" means Intellectual Property Rights owned by a third party which is or will be used by the Supplier for the purpose of providing the Services and/or supplying the Products;

"**TQ Agreement**" has the meaning given in recital A (above);

"**Transparent**" means that students and employers will regard the TQ delivered by a Future Supplier as materially the same as the TQ delivered and operated by the (existing) Supplier;

"**Working Day**" means any day other than a Saturday or Sunday or public holiday in England and Wales.

3 Assignment

3.1 Pursuant to and for the consideration set out in the TQ Agreement, the Supplier assigns to the Authority, absolutely with full title guarantee all its right, title and interest in and to all of the Intellectual Property Rights in the Key Materials (which, for the avoidance of doubt, includes the Guide Standard Exemplification Materials) including the right to bring, make, oppose, defend, appeal proceedings, claims or actions and obtain relief (and to retain any damages recovered) in respect of any infringement, or any other cause of action arising from ownership, of any of the Assigned Rights on or after the date of this Assignment and Licence. Such assignment shall take place on the earlier of:

3.1.1 the creation of any relevant materials known to be Key Materials;

3.1.2 the identification by the Supplier of the use of the relevant materials as part of the TQ; and

3.1.3 delivery of the relevant Key Materials to the Authority, or Operation of the TQ by the Supplier.

3.2 With the exception of Guide Standard Exemplification Materials, all Key Materials are relevant course documents for the purposes of section A2D3(4) of the Apprenticeships, Skills, Children and Learning Act 2009, and on approval of the TQ at the Final Approval Milestone and on any subsequent Approval, to the extent that any copyright or any rights in copyright forming part of the Assigned Rights have not then been assigned to and vested absolutely in the Authority, they shall be transferred to the Authority by operation of statute in accordance with section A2IA of the Apprenticeships, Skills, Children and Learning Act 2009. Intellectual Property Rights in the Guide Standard Exemplification Materials is assigned to the Authority by virtue of 2.1 above.

4 Licences to the Authority

4.1 The Supplier hereby grants to the Authority (and the Authority shall have, in addition to any retained rights under clause 13.8 of the TQ Agreement) a non-exclusive, perpetual, royalty-free, irrevocable, transferable worldwide licence to use, exploit and sub-license the IPR in the Ancillary Materials and the Supplier's Background IPR and, in respect of any IPR in Key Materials, in each case to the extent that the same are not at the relevant time vested absolutely in the Authority, as necessary to enable the Authority (and its sub-licensees) to:

4.1.1 use the Key Materials and Ancillary Materials in its administration, approval and oversight of the TQ and other T Level technical education qualifications and to make the same available to others (such as Ofqual) to do the same; and

4.1.2 to use the Key Materials and the Ancillary Materials, and for any Future Supplier or potential Future Supplier to use the Key Materials and the Ancillary Materials:

(i) for competing or tendering for the delivery and Operation of the TQ and/or any Replacement TQ, during any Transition Period and following expiry or termination of the TQ Agreement; and

(ii) to deliver and Operate the TQ and any Replacement TQ, during any Transition Period and following expiry or termination of the TQ Agreement; and

4.1.3 otherwise to receive and use the Services and the Deliverables and allow any Future Supplier to use the Deliverables; and

4.1.4 to sub-license others to exercise the rights set out in this clause 3.1.

4.2 The Authority agrees that it shall use any Ancillary Materials which fall solely within element (l) of the definition of Ancillary Materials (being "*lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ*") only for the purposes of planning for or executing an Emergency Exit.

5 Licence to the Supplier

5.1 The Authority hereby grants to the Supplier, in respect of the Assigned Rights, a worldwide, royalty free, perpetual and irrevocable non-exclusive licence, with the right to sublicense, to use and exploit the IPR in the Key Materials during and after the Term, but not, save as provided in the TQ Agreement, to use the same as part of a T Level, such licence being subject to clauses 13.13 and 13.14 of the TQ Agreement (which for these purposes shall survive any termination or expiry of the TQ Agreement).

6 Warranties and representations

6.1 The Supplier warrants and represents (on the Effective Date and on any relevant assignment or grant of licence taking effect) that:

6.1.1 it is or will be the sole legal and beneficial owner of, and that it owns all the rights and interests in the Assigned Rights no later than the time for assignment specified in clause 2.1 or when they are assigned in accordance with clause 13.2.1 of the TQ Agreement, save for Assigned Rights other than New IPR, in respect of which it has previously notified the Authority and the Authority has agreed in writing that this warranty shall not apply;

6.1.2 where it is not the sole legal and beneficial owner of the Assigned Rights, including the Assigned Rights which are to be used or embodied in any Key Materials, it has established that all owners of such rights consent to their assignment and transfer absolutely to the Authority;

6.1.3 it has all the necessary right and title to grant all the licences granted to the Authority under this Assignment and Licence and the TQ Agreement;

6.1.4 it has not licensed or assigned any of the Assigned Rights other than pursuant to this Assignment and Licence or the TQ Agreement;

6.1.5 the Assigned Rights are free from any security interest, option, mortgage, charge or lien;

6.1.6 it is unaware of any infringement or likely infringement of any of the Assigned Rights;

6.1.7 as far as it is aware, all the Assigned Rights are valid and subsisting and there are and have been no claims, challenges, disputes or proceedings, pending or threatened, in relation to the ownership, validity or use of any of the Assigned Rights;

6.1.8 the use of the Key Materials and Ancillary Materials, and exploitation of the Assigned Rights by the Supplier in the provision of the Services and Deliverables or by the Authority in receiving and using the Services and Deliverables or procuring any Replacement Services or by any Future Supplier in Operating any Replacement Services, will not infringe the rights of any third party; and

6.1.9 the Key Materials are its original work and have not been copied wholly or substantially from any other source.

7 Indemnity

7.1 Subject to clause 19, if there is an IPR Claim, the Supplier indemnifies the Authority against all losses, damages, costs or expenses (including professional fees and fines) incurred as a result.

7.2 If an IPR Claim is made or anticipated, the Supplier must at its own expense and the Authority's sole option, either:

7.2.1 obtain for the Authority the rights in clause 2.1 and 3.1 without infringing any Third Party IPR; or

7.2.2 replace or modify the relevant item with substitutes that do not infringe IPR without adversely affecting the functionality or performance of the Deliverables.

8 Moral rights

8.1 The Supplier shall procure written absolute waivers from all authors of the Key Materials and Ancillary Materials in relation to all their moral rights arising under the Copyright, Designs and

Patents Act 1988 in relation to the Key Materials and Ancillary Materials and, as far as is legally possible, any broadly equivalent rights such authors may have in any territory of the world.

9 Ending or extending the Assignment and Licence

9.1 This Assignment and Licence ends if terminated by the Authority for any reason set out in this Assignment and Licence.

9.2 If any of the following events happen, the Authority has the right to immediately terminate this Assignment and Licence or any of the licences granted under this Assignment and Licence by issuing a Termination Notice to the Supplier (in the latter case specifying the relevant licences):

9.2.1 a Default incapable of remedy;

9.2.2 a Default capable of remedy that is not corrected within 30 days; and

9.2.3 anything occurs which entitles the Authority to terminate the TQ Agreement.

10 Claims against third parties

10.1 The Supplier may take any action it considers appropriate or necessary, subject to the Authority's prior written consent, not to be unreasonably withheld or delayed, if there is a breach, other than in connection with the TQ, by a third party of the Authority's rights in any IPR licensed to the Supplier under clause 4, and the Authority agrees to provide all such assistance as the Supplier may reasonably require (subject to meeting the Authority's reasonably agreed costs and expenses and the Supplier hereby indemnifying the Authority in respect of any loss, damage or liability the Authority incurs by reason of any such action).

11 Further assurance

11.1 At the Authority's expense the Supplier shall, and shall use all reasonable endeavours to procure that any necessary third party shall, promptly execute and deliver such documents and perform such acts as may reasonably be required for the purpose of giving full effect to this Assignment and Licence and the TQ Agreement, including:

11.1.1 registration of the Authority as applicant or (as applicable) proprietor of the Assigned Rights; and

11.1.2 assisting the Authority in obtaining, defending and enforcing the Assigned Rights, and assisting with any other proceedings which may be brought by or against the Authority against or by any third party relating to the Assigned Rights.

11.2 The Supplier appoints the Authority to be its attorney in its name and on its behalf to execute documents, use the Supplier's name and do all things which are necessary or desirable for the Authority to obtain for itself or its nominee the full benefit of this Assignment and Licence.

11.3 This power of attorney is irrevocable and is given by way of security to secure the performance of the Supplier's obligations under this Assignment and Licence and the proprietary interest of the Authority in the Assigned Rights and so long as such obligations of the Supplier remain undischarged, or the Authority has such interest, the power may not be revoked by the Supplier, save with the consent of the Authority.

11.4 Without prejudice to clause 10.2, the Authority may, in any way it thinks fit and in the name and on behalf of the Supplier:

11.4.1 take any action that this Assignment and Licence requires the Supplier to take;

11.4.2 exercise any rights which this Assignment and Licence gives to the Supplier; and

11.4.3 appoint one or more persons to act as substitute attorney(s) for the Supplier and to exercise such of the powers conferred by this power of attorney as the Authority thinks fit and revoke such appointment.

11.5 The Supplier undertakes to ratify and confirm everything that the Authority and any substitute attorney does or arranges or purports to do or arrange in good faith in exercise of any power granted under this clause 10.

12 How much each Party can be held responsible for

12.1 Each Party's total aggregate liability under this Assignment and Licence (whether in tort, contract or otherwise) for each claim or series of connected claims is no more than £1 million.

12.2 No Party is liable to the other for:

12.2.1 any indirect Losses; or

12.2.2 loss of profits, turnover, savings, business opportunities or damage to goodwill (in each case whether direct or indirect).

12.3 The limitation of liability set out in clause 11.1 does not apply to either Party in relation to the following:

12.3.1 its liability for death or personal injury caused by its negligence, or that of its employees, agents or subcontractors;

12.3.2 bribery or fraud or fraudulent misrepresentation by it or its employees; or

12.3.3 any liability that cannot be excluded or permitted by Law.

12.4 Each Party must use all reasonable endeavours to mitigate any Losses which it suffers under or in connection with this Assignment and Licence, including where any such Losses are covered by an indemnity.

12.5 When calculating the Supplier's liability under clause 11.1, Losses covered by Required Insurances will not be taken into consideration.

13 Invalid parts of this Assignment and Licence

13.1 If any part of this Assignment and Licence is prohibited by Law or judged by a court to be unlawful, void or unenforceable, it must be removed from this Assignment and Licence as much as required and rendered ineffective as far as possible without affecting the rest of the Assignment and Licence, or whether it is valid or enforceable.

14 No other terms apply

14.1 Except as otherwise expressly provided in this Assignment and Licence or in the TQ Agreement, the provisions incorporated into this Assignment and Licence are the entire agreement between the Parties. The Assignment and Licence replaces all previous statements and agreements whether written or oral. No other provisions apply.

14.2 Variation of this Assignment and Licence is only effective if agreed in writing and signed by both Parties.

15 Other people's rights in this Assignment and Licence

15.1 No third parties may use the Contracts (Rights of Third Parties) Act ("**CRTPA**") to enforce any term of this Assignment and Licence unless stated (referring to CRTPA) in this Assignment and Licence. This does not affect third party rights and remedies that exist independently from CRTPA.

16 Relationships created by this Assignment and Licence

16.1 This Assignment and Licence does not create a partnership, joint venture or employment relationship. The Supplier must represent themselves accordingly and ensure others do so.

17 Giving up contract rights

17.1 A partial or full waiver or relaxation of the terms of this Assignment and Licence is only valid if it is stated to be a waiver in writing to the other Party.

18 Transferring responsibilities

18.1 The Supplier must not assign this Assignment and Licence without Approval.

18.2 The Authority can assign, novate or transfer this Assignment and Licence or any part of it to any Crown Body, public or private sector body which performs the functions of the Authority.

18.3 The Supplier must enter into a novation agreement in the form that the Authority specifies in order to use its rights under clause 17.2.

18.4 The Supplier can terminate this Assignment and Licence if it is novated under clause 17.2 to a private sector body that is experiencing an Insolvency Event.

19 How to communicate about this Assignment and Licence

19.1 All notices under this Assignment and Licence must be in writing and are considered effective on the Working Day of delivery as long as delivered before 5:00 pm on a Working Day. Otherwise the notice is effective on the next Working Day. An email is effective when sent unless an error message is received.

19.2 Notices to the Authority must be sent to the Authority Authorised Representative's address and email address, and all notices must be copied to the Authority's Head of Commercial Delivery Management [redacted] and the Authority's Head of Legal [redacted].

19.3 This clause does not apply to the service of legal proceedings or any documents in any legal action, arbitration or dispute resolution.

20 Dealing with claims

20.1 If a Beneficiary is notified or otherwise becomes aware of a Claim then it must notify the Indemnifier as soon as reasonably practical and no later than 10 Working Days after such notification or date of first awareness.

20.2 At the Indemnifier's cost the Beneficiary must both:

20.2.1 allow the Indemnifier to conduct all negotiations and proceedings to do with a Claim; and

20.2.2 give the Indemnifier reasonable assistance with the Claim if requested.

20.3 The Beneficiary must not make admissions about the Claim without the prior written consent of the Indemnifier which cannot be unreasonably withheld or delayed.

20.4 The Indemnifier must consider and defend the Claim diligently using competent legal advisors and in a way that does not damage the Beneficiary's reputation.

20.5 The Indemnifier must not settle or compromise any Claim without the Beneficiary's prior written consent which it must not unreasonably withhold or delay.

20.6 Each Beneficiary must take all reasonable steps to minimise and mitigate any losses that it suffers because of the Claim.

20.7 If the Indemnifier pays the Beneficiary money under an indemnity and the Beneficiary later recovers money which is directly related to the Claim, the Beneficiary must immediately repay the Indemnifier the lesser of either:

20.7.1 the sum recovered minus any legitimate amount spent by the Beneficiary when recovering this money; or

20.7.2 the amount the Indemnifier paid the Beneficiary for the Claim.

21 Resolving disputes

21.1 If there is a Dispute, the senior representatives of the Parties who have authority to settle the Dispute will, within 28 days of a written request from the other Party, meet in good faith to resolve the Dispute.

21.2 If the Dispute is not resolved at that meeting, the Parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the Parties cannot agree on a mediator, the mediator will be nominated by CEDR. If either Party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute, the Dispute must be resolved using clauses 20.3 to 20.5.

21.3 Unless the Authority refers the Dispute to arbitration using clause 20.4, the Parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction to:

21.3.1 determine the Dispute;

21.3.2 grant interim remedies, or any other provisional or protective relief.

21.4 The Supplier agrees that the Authority has the exclusive right to refer any Dispute to be finally resolved by arbitration under the London Court of International Arbitration Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

21.5 The Authority has the right to refer a Dispute to arbitration even if the Supplier has started or has attempted to start court proceedings under clause 20.4, unless the Authority has agreed to the court proceedings or participated in them. Even if court proceedings have started, the Parties must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under clause 20.4.

21.6 The Supplier cannot suspend the performance of this Assignment and Licence during any Dispute.

22 Which law applies

22.1 This Assignment and Licence and any issues arising out of, or connected to it, are governed by English law.

ANNEX

IPR Assurance Certificate

This certificate is given pursuant to clause 13.9 of the agreement ("**Contract**") between the Institute for Apprenticeships and Technical Education ("**Authority**") and the supplier named below ("**Supplier**"), and the Intellectual Property Assignment and Licence between the Authority and the Supplier (which also forms Schedule 14 of the Contract) ("**Assignment and Licence**").

Guidance:

When to complete this certificate: This certificate should be completed in respect of each Deliverable (as defined in the Contract) which is made available to the Authority under the Contract, and a completed certificate should be supplied to the Authority with that Deliverable. This includes updates to existing Deliverables.

Purpose of this certificate: This certificate is intended to confirm that the specific Deliverable fully complies with the intellectual property provisions of the Contract. A copy of the certificate will be retained by the Authority as evidence of the intellectual property position.

Supplier Declaration:

We (being the Supplier named below) confirm that the Deliverable(s) supplied together with (or shortly before or after) this certificate, all elements of which are listed in either Table 1 or Table 2 below[4], comply with the intellectual property provisions in the Contract, in particular the applicable warranties set out in clause 5 of the Assignment and Licence.

We confirm that the Deliverable(s) either:
(i) contain no third party intellectual property rights, or
(ii) contain third party intellectual property rights and we have obtained the consent of the applicable third party:

- in the case of Key Materials, to their assignment and transfer to the Authority; and/or
- in the case of Ancillary Materials, to their licence to the Authority,

in each case on the terms and conditions of the Contract and Assignment and Licence.

We confirm that this certificate overrides any statement or copyright notice forming part of the Deliverable(s) which is in any way inconsistent with this certificate. We agree that this certificate does not detract in any way from the rights granted to the Authority in the Contract.

Key Materials

We confirm that the Deliverable(s) set out in Table 1 below, or the elements of the Deliverable(s) set out in Table 1 below, are Key Materials, as defined in the Contract:

Table 1

[4] If, by exception, the Supplier asserts that the Deliverable includes elements which are neither Key Materials nor Ancillary Materials, this should be notified in writing to the Authority prior to the relevant Deliverable being made available to the Authority.

Deliverable	Key Materials
[Set out title / description of the Deliverable]	Set out elements which are Key Materials, or confirm "entire Deliverable"
[insert additional rows if required]	

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 1 as Key Materials, have vested or hereby vest in the Authority pursuant to the Assignment and Licence.

Ancillary Materials

We confirm that the Deliverable(s) set out in Table 2 below, or the elements of the Deliverable set out in Table 2 below are Ancillary Materials, as defined in the Contract:

Table 2

Deliverable	Ancillary Materials
[Set out title / description of the Deliverable]	Set out elements which are Ancillary Materials, or confirm "entire Deliverable"
[insert additional rows if required]	

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 2 as Ancillary Materials, are licensed to the Authority on the terms and conditions of and pursuant to the Assignment and Licence.

Signed for and on behalf of the Supplier:

Name

Position

Date

Signed by

WJEC CBAC LIMITED

[redacted] [redacted]

Signature: [redacted]

Signed by

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

[redacted] [redacted]

Signature: [redacted]