

ST0041 Level 4 Building Services Engineering Senior Technician: Assessment Plan Reform

A Case Study



Testing the Reforms: Opportunity to Learn

The Technical Apprenticeship Consortium (TAC) put forward an initial proposal to Skills England to test assessment reform against the Level 4 Building Services Engineering Senior Technician ([ST0041](#))

- **Complex case, covering:**

- High risk occupation:
 - Health and Safety;
 - Building Safety Act compliance as working in design or onsite with plant to support the functioning of a building;
 - CSCS card requirements also feature for site-based roles
- Full alignment to [EngTech](#) registration via current End Point Assessment model (with CIBSE)
- Full coverage of Engineering Council's [AAQA](#) and [UK SPEC](#) and (expected) Building Safety Act requirements (via [ICSG](#) SLG3)
- Multiple options of mandatory qualifications ([Ofqual](#) and [OfS regulated](#))
- Entry and progression are essential to get right for apprentices
- Delivery is across Further Education (FE) and Higher Education (HE) based providers, and a small number of independent training providers (ITPs)
- Alignment with Industrial Strategy for several sectors, but particularly [Construction and the Built Environment](#): but coverage of both infrastructure as well as civic buildings remains low profile, as yet, in these areas

- **The risk profile:**

- Current starts on programme are relatively small (250 per annum)
- BSE senior technician has a good QAR rating at 60% (so we aim to improve this further to national targets)
- Fewer employers and providers than other occupations that TAC manages – easier to handle process / feedback
- Could be a challenge in terms of Engineering Council regulations and licences (AAQA/AHEP coverage) and build additional relationships with further PEIs

STEP 1: Convening the Group of Persons

- Skills England approached the existing trailblazer group lead to support with the convening of the 'Group of Persons'
- Skills England also offered a nationwide call for Expert Panel members in Spring 2026 to support independent review and additional insight
- Skills England checked the Group of Persons, to ensure representation (as far as possible) from:
 - Employers
 - Assessment Organisations
 - Professional Institutions
 - Training Providers
 - Regulatory Bodies
 - Trade Bodies
 - Unions
- A series of meetings was scheduled and organised by the Group of Persons lead (trailblazer group chair / facilitator) to ensure activity was being regularly driven forward and to ensure engagement with panel members
 - Additional meetings were also scheduled with a smaller set of Group of Persons members and Skills England to ensure activity, advice and guidance were regularly addressed
 - Additional meetings were also scheduled with professional institutions and regulatory bodies to work through areas of challenge and to provide solutions to Skills England
 - Additional meetings were also scheduled with training providers to outline the revisions being proposed, and to outline who, what and how the revisions were being taken forward (noting it is for Apprenticeship Assessment Organisations to provide the detailed documentation from the revisions being made)

STEP 2: Engaging the Group of Persons to support Assessment Reform

The Group of Persons was asked to consider several elements to assessment reform, and the K&S statements in this occupation, including:

- Use of mandatory qualification (BTEC HNC or professionally approved qualification)
- Detail of content in the K&S statements to teach and assess to
- Ensure alignment with Building Safety Act requirements
- Retain access to Skills Cards
- Retaining UK SPEC (EngTech) outcomes



The Group of Persons was asked by Skills England to review:

- Mapping of K&S statements in the mandatory qualification (BTEC HNC only – CertHEs will vary by university provider)
- Add detail to some K&S statements to provide greater detail in terms of what needs to be delivered and assessed
- Add detail to some K&S statements to make these more robust and align with Building Safety Act requirements
 - Noting at the time of writing, there is a consultation on the role and scope of the Building Safety Regulator and the competence outcomes for broader roles (not just site-based skills carded occupations)

The apprenticeship already fully mapped to AAQA learning outcomes and EngTech competence outcomes

Professional outcomes had been previously built in to support apprentices to apply for appropriate skills cards, for example the Professionally Qualified Person (PQP) card

STEP 3: Reviewing the Mapping of the Mandatory Qualifications (MQ)



BTEC Higher Nationals Building Services Engineering

Change specification size: Certificate ▼

Specification



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PDF | 766.1 KB

The new 2023 BTEC Higher National qualifications in Building Services Engineering include enhanced work-related curriculum that is designed to address an increasing need for high quality professional and technical education pathways at levels 4 and 5, equipping students with the right skills and competencies for the workplace, or progression to further higher education study.

Qualification summary:

Credits: **120**

Pathways: **Heating, Ventilation & Air Conditioning; Electrical**

Qualification number (QN): **610/0940/4**

Loan funded via: **Student Finance England, Wales, NI**

Availability: **UK and International**

First teaching: **1 September 2023**

Review date: **31 August 2028**

Knowledge and Skills statements were mapped by Skills England to Learning Outcomes in the following mandatory qualifications (mandatory units)

- Level 4 HTQ Building Services Engineering (RQF) (610/0926/X – starts from September 2025)
- Level 4 BTEC HNC Building Services Engineering (RQF) (610/0940/4 – starts from September 2023)
- *Level 4 BTEC HNC Construction and the Built Environment (Building Services Engineering) (603/0465/0 – closed to starts in August 2023)*

The coverage in the MQ was assessed by Skills England:

- **Fully assessed**
- **Partially assessed**
- **Not assessed**

Where the MQ is deemed to fully assess the K or S statement, the MQ is the only point of assessment.

Where there is partial or no coverage, the K and S statements are then entered into the Apprenticeship Assessment Plan (AAP)

Note: We could not map to CerTHEs due to the lack of detailed specifications published across all providers. However, these qualifications must be professionally approved qualifications to comply with the occupational standard

K&S Coverage in the Mandatory Qualifications (1 of 2)

When we reviewed the Skills England mapping of the K&S statements in the L4 BSEng Senior Technician we found there were discrepancies that needed revision.

The only K and S statements **fully covered** (competence-based outcomes / sufficient to cover EngTech / BSAct requirements) are:

- K1: Engineering principles, underpinned by relevant scientific, theoretical and technical knowledge and understanding to solve well-defined building services engineering problems
- K15: Methods of communication and when to use them, using appropriate engineering terminology and conventions
- K17: Relationships between key organisations in the building services engineering sector (for example organisations, customers, partners and suppliers)
- S5: Select and use technical literature and other sources of information and data to address well-defined building services engineering problems
- S15: Communicate using appropriate methods for the audience, using appropriate engineering terminology and conventions

A number of K and S statements were **not covered** at all by the qualification (competence-based outcomes / sufficient to cover EngTech / Building Safety Act requirements), and these are:

- S4: Interpret and compare performance information to choose compliant materials, components or parts
- S9: Complete risk assessments to identify, evaluate and mitigate risks
- S10: Apply principles of sustainable development, and assess the impact of these in their work
- S12: Assess and report on quality using appropriate management and assurance systems and continuous improvement processes
- S16: Apply ethical principles to building services engineering projects, including the secure use of data and information

K&S Coverage in the Mandatory Qualifications (2 of 2)

In terms of the remaining K&S statements, many were classified as ‘**partial coverage**’ with areas not fully covered to meet industry and competence-based outcomes demanded.

For example:

- K3 / S3: Advanced mathematical, statistical and analytical problem-solving tools / employ a range of advanced mathematical, statistical and data interpretation tools, using analytical and computational methods to interpret and solve well-defined building services engineering problems
- K9 / S7: Industry policies, standards, regulations and legislation, and codes of practice, including Building Safety legislation or BSI Flex 8670 / Produce building services engineering technical solutions in accordance with relevant industry standards, procedures, codes of practice, regulations, and legislation
- K10 / S8: Statutory health, safety and welfare policies, procedures, and regulations including Construction (Design and Management) (CDM) / Comply with, and encourage others to demonstrate, statutory health, safety and welfare policies, procedures and regulations.

Mandatory Qualification Mapping: Group of Persons Request for Review

As there were several discrepancies in the Skills England mapping when compared to our detailed knowledge of the mandated qualifications, we:

- Put forward a revised mapping showing what we believed was full, partial and no coverage
- Provided a clear rationale for review for each K&S statement against the mapping, for example:
 - Breadth and depth of coverage
 - Areas where gaps existed in terms of competence-based outcomes
 - Areas where industry specifications and regulatory issues were lacking
 - Areas where professional institution requirements were lacking

Skills England then reviewed this feedback and agreed to accept our position

This meant that additional K&S statements could be added into the Apprenticeship Assessment Plan

We were, however, asked to revise a small number of K&S statements to ensure they covered required content and improve references to regulatory areas (which support the currency of the occupational standard)

STEP 4: Proposed revisions to K&S statements ensure currency and aid clarity

- We worked with the professional institutions initially to prepare revisions to a small number of K&S statements as requested by Skills England
- These were presented to the Group of Persons in a meeting to capture additional feedback
- These were presented to Skills England for review and inclusion in public consultation

K or S	Existing Statement	Proposed Revision
K3	Advanced mathematical, statistical and analytical problem-solving tools	Advanced mathematical, statistical and analytical problem-solving tools, to include algebra, functions, trigonometry, calculus, vector analysis, matrices, probability theory, sampling, distributions, and graphical presentation and interpretation
K5	Techniques and methods to collect data and technical information for analysis and evaluation	Techniques and methods to collect data and technical information for planning, analysis and evaluation, to include: 'golden thread' data and information from technical specifications, materials specifications and performance data; method statements; data and drawings; digital information from CAD and/or BIM; project planning, budgets, schedules of work; and environmental and sustainability evaluation
K9	Industry policies, standards, regulations and legislation, and codes of practice, including Building Safety legislation or BSI Flex 8670	Industry policies, standards, regulations and legislation, and codes of conduct, including Building Safety Act 2022 and associated secondary legislation (regulations) and BSI Flex guidance
S14	Monitor and manage individual performance, and supervise others, recognising the need to comply with appropriate codes of practice and equality, diversity & inclusion (EDI) requirements	Monitor and manage individual performance, and supervise others where appropriate
S18 (NEW)	NEW This is to simplify the assessment of S14 by splitting the statement and grouping these more appropriately in the AAP	Apply equality, diversity and inclusion (EDI) codes of practice in building services engineering environments

STEP 5: The Apprenticeship Assessment Plan (AAP)



Skills England initially drafted the Apprenticeship Assessment Plan based on initial discussions with the Group of Persons lead

Following a review of the Mandatory Qualification mapping, Skills England entered the K & S statements into the Assessment Plan

- Where there is full coverage in the MQ (BTEC HNC/HTQ) the K&S statements are removed from 'final' assessment; there is no need to duplicate assessment
- Where there is partial or no coverage in the MQ, these K&S statements are added into the Assessment Plan for 'full and final' assessment

Skills England grouped the K&S statements into:

- '**assessment outcomes**' that link together and
- '**performance criteria**' that describe a pass or distinction

The Group of Persons was asked to review and revise these to ensure acceptance by the group

- Additional attention was given to awarding organisation, professional institution and regulatory body feedback: this was to ensure ongoing compliance

As a result:

- All K&S statements in the assessment plan were mandated (all apprentices will need to demonstrate all K&S statements) and
- The grouping and performance criteria proposed was felt to be achievable for apprentices and supported competence and professional assessment

Assessment Outcome	Mapping
AO1: Engineering System Analysis and Technical Evaluation Analyses building services engineering systems by applying engineering principles, mathematical and analytical tools, and technical data sources to address well defined engineering problems. They evaluate materials, techniques and performance information to select compliant solutions and support the design, testing, installation, commissioning or maintenance of building services systems.	K2 , K3, K4, K5 S1, S2, S3, S4, S5
AO2: Design Development and Technical Modelling Develops and interprets building services engineering designs by producing technical drawings, models and digital representations using analytical and computer-based software. They apply design principles, control processes and industry standards to create compliant technical solutions while recognising the capabilities and limitations of computational and BIM-based tools.	K6, K7, K8 S6, S7
AO3: Health, Safety, Compliance and Sustainable Practice Follows and promotes statutory health, safety and welfare requirements while completing risk assessments to identify, evaluate and control hazards in building services environments. They apply industry regulations and sustainability principles to guide compliant, responsible and environmentally conscious engineering practice.	K9, K10, K11, K12 S8, S9, S10
AO4: Project Planning, Resource Management and Quality Assurance Plans and coordinates building services engineering tasks by applying project management techniques, allocating resources and monitoring progress against project requirements. They assess and report on quality, use assurance and improvement processes, and supervise others while working effectively within organisational structures, roles and sector relationships.	K13, K14, K16, K17 S11, S12, S13, S14
AO5: Ethical Practice, Professional Development and Inclusive Working Applies ethical principles by managing data and information securely and following recognised equality, diversity and inclusion practices in building services environments. They plan, undertake and review their professional development to maintain competence and improve their performance through ongoing CPD activities.	K18, K19, K20 S16, S17, S18

Performance Category	Pass	Distinction
Applied Knowledge	Demonstrates sound application of building services engineering knowledge to address well- defined- but complex and nonroutine problems and reach appropriate, generally effective outcomes while operating- within set parameters and meeting organisational or sector expectations.	Applies building services engineering knowledge with confidence and precision, consistently producing high- quality outputs in response to -well defined- but complex and non-routine problems, with solutions that are appropriate- and often enhance outcomes or processes.
Applied Skills	Identifies and applies suitable cognitive and practical skills in building services contexts to complete work activities, adapting as necessary to meet requirements. Methods chosen are generally appropriate-, with results that meet organisational or sector expectations.	Adapts and applies cognitive and practical skills in building services contexts with a high degree of flexibility and operational fluency, ensuring that methods are both effective and optimised for quality and efficiency of service outcomes.
Regulatory and Procedural Awareness	Applies relevant building services legislation, regulations and organisational procedures with sound judgement, adapting appropriately to varied and occasionally complex situations while remaining- within set parameters.	Interprets and applies building services regulatory and procedural requirements with insight and appropriate flexibility, identifying- implications and making informed decisions in varied and occasionally complex situations.
Communication and Collaboration	Communicates clearly and collaborates effectively with colleagues and stakeholders in building services- contexts, contributing to effective coordination and supporting responsive service delivery.	Communicates and collaborates with confidence and insight, tailoring approach to meet diverse stakeholder needs in building services- environments and contributing to improved collaboration and service outcomes.
Information Use and Decision Making	Analyses and interprets relevant engineering and project information to make informed decisions, showing a clear awareness of the occupational context and the broader scope of the role.	Analyses, interprets and evaluates information from a range of sources, providing insightful justification for decisions and demonstrating a strong awareness of broader implications within the occupational area.
Responsibility and Autonomy	Takes responsibility for actions and decisions within set parameters. Manages own work and, where relevant, oversees others or coordinates resources with adequate awareness of risks and priorities.	Proactively takes responsibility for actions and decisions within set parameters. Manages own work and the coordination of others, independently using sound judgement about risks and priorities to manage resources or actions.

STEP 6: Proposed Apprenticeship Assessment Plan Method(s)



Skills England initially drafted the Apprenticeship Assessment Plan based on initial discussions with the Group of Persons lead. The Group of Persons was asked to review and revise these to ensure acceptance by the group. Additional attention was given to awarding organisation, professional institution and regulatory body feedback to ensure apprentices can readily apply for professional registration and the appropriate skills card **without duplication**.

As a result, the agreed assessment methods (below) fully aligned with current professional (regulated) practice and external documentation referenced for Awarding Organisations to comply with.

Assessment organisations must design and set apprenticeship assessments

After detailed discussion with the professional institutions that are the current apprenticeship assessment organisations, we are proposing the following assessment methods:

- **Professional discussion**

Assessment organisations can also use **an** additional assessment method, from the following **list** of methods to ensure the assessment outcomes are met in full:

- **Report**
- **Presentation**
- **Portfolio**
- **Project**
- **Questions and answers**

THE AAP ALSO REQUIRES CONSIDERATION OF EXTERNAL

DOCUMENTS (relevant frameworks, standards, guidance or other documents that may be published by industry regulators, professional bodies, and other representative groups)

Wording agreed in this case is:

- Assessment organisations must fully align with the **Engineering Council UK SPEC**, all relevant frameworks including standards, industry-recognised practices and guidance published by regulators, professional bodies, Sector Representative Organisations (SROs) and Standard Setting Bodies (SSBs).
- Assessment must fully align with the relevant **Industry Competence Steering Group (ICSG) competence frameworks** where published, and generate the evidence required for successful apprentices to obtain the appropriate **Construction Skills Certification Scheme (CSCS) Alliance scheme card without duplicate assessment**

STEP 7: Moving forwards with Review and Approval

- Final meetings with the Group of Persons and an additional meeting with training providers were hosted to gather final feedback before formal submission to Skills England and public consultation
- The Group of Persons worked with Skills England to revise and finalise the 'consultation version' of the Standard and the Apprenticeship Assessment Plan
 - The Group of Persons used this opportunity to clarify the occupational standard further by removing no longer taught qualifications (such as those now expired for starts)
- Skills England concurrently worked with colleagues in DWP to prepare documentation for public consultation, and approval via the Skills England 'internal approval committee'
- Skills England then publishes the proposed revisions via its regular public consultation ([on the Skills England webpage](#))
 - Revisions to the K&S statements run concurrently with the revisions to the Assessment Plan
 - A period of between 2 and 4 weeks for consultation was requested
 - The Group of Persons also promotes this opportunity to stakeholders across the sector
- Skills England provides feedback to the Group of Persons for final review and agreement
- Final revisions are then agreed and Skills England seeks final approval for publication
 - This leads to a new version number for this occupation (2.0)
 - A lead in period is also agreed

STEP 8: Plans to agree and support an appropriate lead-in period



- **A lead-in timescale for implementation needed to be agreed**
 - The Group of Persons, following consultation with Awarding Organisations and Training Providers, recommended to Skills England the need for at least 6 months lead in to support implementation
 - This provides AAOs time to prepare for assessment, and for their communication to training providers
- **The Group of Persons also communicated with employers and training providers of the implementation timescales and what to expect**
 - AAOs should also produce guidance and agreements for training providers
 - Training providers should work with AAOs to revise their training programmes to meet new requirements for all starts by the implementation date, and for those seeking transfer
- AAOs (in the construction and built environment) can also use the CIC guidance and toolkit to support **employer verification of behaviours** – this can be adapted and shared with training providers, employers and apprentices
- **The Group of Persons also communicated with employers and training providers about the opportunity, risks and process for ‘transferring apprentices’ onto newer versions**

STEP 9: Next Steps for apprenticeship assessment organisations (AAOs)



- **Verifying implementation timescales**
 - By working with Skills England and the Group of Persons, a timeline for full implementation must be agreed (prior to public consultation of revisions is best)
 - Skills England to agree these timescales to support the design of assessment, and implementation of new programme (where new version goes live, and old version ceases for new starts)
- **AAO uses Apprenticeship Assessment Plan (AAP) to design and develop Apprenticeship Assessment**
 - AAO to define workplan and allocate appropriate resources (including staff & stakeholders, committees)
 - Design new assessment based on new Apprenticeship Assessment Plan
 - Develop and deliver assessor guidance and training
 - Develop application pack for online application (in this case, a digital version held on the ACE360 assessment platform)
 - Use the CIC guidance and toolkit to formalise the AAO route to demonstrate the **employer verification of behaviours**
 - Design shortened route to professional registration for apprentices after achievement, where appropriate
- **AAO to design and deliver Assessment Guidance**
 - In the case of this apprenticeship, the Group of Persons shared (with the assessment organisation) all its documentation and slides from employer, training provider and stakeholder engagement meetings
 - The Group of Persons also supported the development of a 'Questions and Answers' document based on the feedback in meetings
 - Develop and deliver guidance, including webinars, video clips, documents for apprentices, employers and training providers, including the new area of employer verification of behaviours
- **AAO to formally apply to Ofqual and contracts to be organised**
 - AAO to formalise new contracts for training providers
 - AAO to raise with training providers if there is an intention to transfer apprentices onto the new version, and the expected timescales for this – to enable the AAO to be prepared

STEP 10: Next steps for training providers

- **Training Provider collaborates with Apprenticeship Assessment Organisation and Professional Bodies**
 - AAOs will provide a clear timescale for training providers as to when the new assessment process and guidance will be delivered, and when transfer of cohorts of apprentices will be feasible
 - Where AAOs are the professional bodies, routes to professional registration and qualification also need to be considered and confirmed
- **Training Providers use AAO offered support and guidance to design and deliver revised Assessment Guidance**
 - Use Apprenticeship Assessment Organisation guidance to design and revise the training programme with the new assessment mechanisms built in
 - Design and implement (using AAO documentation and guidance) a series of assessment sessions and workshops for apprentices and employers to support smooth transition to new version, explaining delivery and assessment changes, and how employers should start to consider the verification of behaviours during and at final assessment
 - Work with professional body to understand and promote route to professional registration during programme delivery, during quarterly progress reviews and to support apprentices on their way to assessment
- **Training Providers use new version of the Apprenticeship and its Assessment Plan (AAP) to design and develop apprenticeship delivery within lead-in periods**
 - Define workplan and allocate appropriate resources (including staff & stakeholders, committees) within the lead in timescales set by Skills England
 - Design or adapt new curriculum based on the Occupational Standard and assessment plan requirements using appropriate stakeholder engagement
 - Engage with professional institutions to ensure ongoing compliance with accreditation/approval and registration processes, and ensure the route to professionalism is embedded through programme design, quarterly progress reviews and in preparation for apprenticeship assessment
- **Training Provider to formally contract with AAO for assessment services**
 - Training Provider to ensure employers are aware of new contracting requirements and costs
 - Consider if professional bodies should be included at this point to reassure employers and apprentices of the full alignment of training and assessment with professional requirements, and to ensure roles are clearly presented
 - Where there is a choice of AAO, work with employers to ensure there is a best fit for them prior to contracting
- **Training Provider to update communication, marketing and website**
 - Websites often have outdated information on them: use this as an opportunity to refresh and update webpages, including which assessment organisation is used, and how this links to professional registration for successfully completing apprentices, and the support they will require and receive whilst on programme
 - Do the same for marketing and communications: make sure this is used as an opportunity to work with employers and apprentices

STEP 11: Next Steps to working with professional bodies



- **Professional body support and guidance**
 - Develop and deliver clear guidance for apprentices, employers, training providers and assessment organisations on the requirements for:
 - Accreditation/approval of underpinning qualifications (as applied to the specific apprenticeship occupation),
 - The mapping of KSBs to the professional standards (and assessment process where feasible)
 - Provide best practice guidance on developing and achieving professional outcomes through training programmes, progress reviews, employer verification of behaviours and apprenticeship assessment
- **Professional Bodies engage with Assessment Organisations**
 - Contracting with professional bodies to support apprenticeship assessment, and where relevant access to assessors
 - Ensure AAOs are aware of professional qualification requirements and how the AAO aligns with these to mitigate duplication of apprentice assessment
 - Provide and communicate guidance including how AAOs can support moving apprentices from apprenticeship completion to professional registration
- **Professional Bodies engage with Employers and Apprentices to provide guidance, covering**
 - Contracting with professional bodies to cover supportive professional development
 - Importance of mentoring within an apprenticeship (and how to access mentors)
 - How to embed professional practice into training plans and progress reviews
 - How to prepare apprentices for assessment
 - How to check if apprentices are ready for final assessment, including readiness checks and employer verification of behaviours
 - How to move from apprenticeship completion to professional registration
- **Professional Bodies engage with Training Providers**
 - Professional bodies engage with training providers to ensure that they understand and support professional qualification processes through accreditation/approval, training plan development, progress reviews and apprenticeship assessment
 - Provide guidance to training providers on:
 - How to embed professional practice into training plans and progress reviews
 - Importance of mentoring within an apprenticeship (and how to access mentors)
 - How to prepare apprentices for assessment
 - How to check if apprentices are ready for final assessment, including readiness checks and employer verification of behaviours
 - How to move from apprenticeship completion to professional registration



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