

Reference – Professional Engineering Competence Standards for ACIBSE

Please find on the following pages my completed Engineering Practice report required as part of my application to become an associate member of CIBSE.

Thank you.

Ref	EC (UK) Generic Standards	ACIBSE Guidance
A		Use a combination of general and specialist engineering knowledge and understanding to apply existing and emerging technology.
A1	Maintain and extend a sound theoretical approach to the application of technology in engineering practice.	Identify the limits of own personal knowledge and skills. Strive to extend own technological capability. Broaden and deepen own knowledge base through new applications and techniques.
		<p>Ventilation</p> <p>I have had extensive experience in the design, installation, commissioning, and maintenance of a wide range of ventilation systems. These have included;-</p> <ul style="list-style-type: none"> • The installation and commissioning of specialist LEV systems for fume and safety cabinets (BASF) using specialist chemical resistant ducting and fans; • The design, installation, commissioning, and maintenance of specialist ventilated dissection tables and cabinets for pathology services (Newcastle General Hospital); • The commissioning and maintenance of ultra clean theatre suites and plants (South Shields General Hospital and Newcastle General Hospital); • The design, installation, commissioning, and maintenance of specialist ultra clean paediatric units for the care of SCIDS babies (Newcastle General Hospital). This unit was the first in Europe to use ultra clean ventilation systems (using double HEPA filtration systems) to provide a FDA 209a class environment for the care and treatment of babies born with no immune system preparing them for bone marrow transplants and keeping them in a virtual “Bubble” for up to a year post transplant. The system operated at a rate of 300 air changes per hour with a positive room pressure of 30Pa which could be increased to over 200 Pa to enable the opening up of doorways to allow medical equipment access (such as portable X-Ray machines). It consisted of 4 single bed units operating from a pair of air handling plants fitted with pre-filters, secondary filters, primary HEPA filters; Terminal HEPA filters and low level extract filters to maintain a “clean room” environment. The installation was monitored and control via a series of “Wilson flow grids” and motor frequency invertors and ran 24 hrs. per day for up to 1 year between shutdowns due to patient need. I was responsible for approving the design, installation, and commissioning of the system based on ward 23 at Newcastle General Hospital, and oversaw the maintenance for a period of 8 years.

		<p>Water / Legionella</p> <p>Since 1993 I have acted as a “Responsible Person” for water quality for a number of organisations. During that time I have undertaken numerous site audits and two investigations following suspected outbreaks of legionella. I have also recruited to the post of Head of Estates at Northgate & Prudhoe (NHS) Trust following a patient scalding incident/death, where I completely overhauled the operational policies and procedures of the water management systems and instigated a comprehensive “safe water and surface” temperature regime as part of the HSE improvement scheme. I have as part of the site audit process identified and undertaken system improvements by eliminating excessive storage and stagnation, removal of dead legs, and the development of operation systems for various NHS Trusts.</p>
A2	Use a sound evidence-based approach to problem solving and contribute to continuous improvement.	<p>Establish users’ requirements for improvement. Use market intelligence and knowledge of technological developments to promote and improve the effectiveness of engineering products, systems and services. Contribute to the evaluation and development of continuous improvement systems. Apply knowledge and experience to investigate and solve problems arising during engineering tasks and implement corrective action.</p>
		<p>Two examples of personal involvement with projects requiring problem solving are as follows:</p> <p>Daventry Community Hospital, H Block water systems assessment and improvements; Acting in the role as a specialist technical client advisor to Clugston Facilities Management on the above PFI PSP contract, I was asked to review and advise on the level of compliance of the domestic hot and cold water systems within a retained building within the PFI project scope. The scheme had reached contract completion in 2007 and since then there had been repeated issues with latent temperature heat gains on the cold water system. Having firstly inspected both the maintenance test records and the installation, a number of issues were highlighted which required attention. I was then asked to review the original contract and specifications to identify the original scope of works and establish a position with regards to liability for corrective action (this was believed to either lie with the Trust via the SPV as the client or the original M&E contractor responsible for the refurbishment). The specification and PFI contract clearly showed that the installation should have been brought up to compliance with HTM 2027/40 and L8 at the time of refurbishment and through latent defect negotiations this was accepted by the M&E contractor. I subsequently identified areas of the</p>

		<p>installation which required attention / improvement to bring the entire installation up to a level of conformity, agreed a scope and specification for the same, and over saw the corrective action plan for this work.</p> <p>Aspergillus precautions at NGH; In 1999 I was a specialist engineering estates officer at Newcastle General Hospital, when we experienced a series of deaths and infections as a result of Aspergillus. As a result of this incident I was tasked by the Board of the Trust to identify protective measures to control and manage the risk associated with this disease and to advise on future precautions and develop safe operational procedures. At the time NHS Estates were not able to provide an expert opinion or advice and as such I was responsible, in conjunction with the control of infection team and clinical leads for the development of a range of immediate protection systems (based on positive pressure ventilation with HEPA filtration) and safe working procedures for the identified “at risk” patients. I have enclosed a paper written as a result of these works. I was responsible for the assessment of each identified “at risk” area and a positive pressure HEPA filtered air supply system designed to provide a clean air environment and reduce the risk of contamination of the immediate patient area by Aspergillus spores. This protected environment was supplemented by an increase regime of barrier nursing techniques and other general dust / pollutant reduction precautions to manage the risk associated with the Aspergillus spores.</p> <p>For several years after the initial incident I was asked to help and advise other Trusts both from the UK and Ireland on similar protection systems and was used by NHS Estates, as such.</p>
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B	Apply appropriate theoretical and practical methods to design, develop, manufacture, construct, commission, operate, maintain, decommission and recycle engineering processes, systems, services and products.	
B1	Identify, review and select techniques, procedures and methods to undertake engineering tasks. This could include an ability to:	Select a review methodology Review the potential for enhancing engineering products, processes, systems and services, using evidence from best practice.
		<p>Establish an action plan to implement the results of the review. Client technical advisor of PFI (Walkergate Park Hospital); As part of my role as Head of Estates for Northgate & Prudhoe (NHS) Trust in 2004 I was the designated Responsible Technical project lead for the design and delivery of a 11,000m² hospital development. Within this role I was personally responsible for the appointment of other technical advisors (including architects, M&E design consultants, legal advisors, planning advisors, and quantity surveyors). The assembled team developed the “public sector comparison” design and used this to assess and select a preferred design solution from those invited to tender. Following the selection of a preferred bidder I was subsequently responsible for the assessment and approval of all of the Reviewable Design Data (RDD) and the signing off of the commissioning and testing for the services for the completed facility. Integral to this role was the identification of engineering options and solutions to the various areas of design development including specialist ventilation plant for the hydrotherapy pool installation, wireless nurse call and staff attack systems for internal and external areas of the site, Fire precautions and fire protection systems, energy management systems, medical gas pipeline systems, and emergency generator and power supply systems. All of these systems had to be selected from those sources available and acceptable to the end-users whilst being fully compliant to the relevant HTM and NHS standards and within the overall cost envelop agreed at financial close with the SPV (developer).</p> <p>O P & P review for CFM PFI projects; In 2010 I was commissioned to undertake an independent review of the maintenance procedures and compliance audit on four PFI sites operated by Clugston Facilities Management. Following this review exercise I was asked to establish a new/revised system for their “in-house” Operational Policies and Procedures to ensure all building engineering and estates related services where being undertaken in compliance with the recommendations and standards of the appropriate NHS HTM standards</p>

		<p>and good industry practice. As part of this process I developed individual documents and supporting "Toolbox Talk" training presentations for the follow areas;</p> <ul style="list-style-type: none">• Water systems• Ventilation• Electrical Installations• Medical Gases• Fire• Environmental & Sustainability• Health & Safety• Lifts• Asbestos &• Emergency Planning
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B2	Contribute to the design and development of engineering solutions	<p>Contribute to the identification and specification of design and development requirements for engineering products, processes, systems and services.</p> <p>Identify potential operational problems and evaluate possible engineering solutions, taking account of cost, quality, safety, reliability, appearance, fitness for purpose and environmental impact</p> <p>Contribute to the design of engineering solutions.</p>
		<p>Aspergillus precautions at NGH; As a Specialist Engineering Estates Officer at Newcastle General Hospital, when I was tasked by the Board to identify protective measures to control and manage the risk associated with Aspergillus and to advise on future precautions and the development of safe operational procedures, I was directly responsible for the establishment of systems which were acceptable to the Control of Infection team in reducing the risk of contamination by Aspergillus to identified “at risk” patients. The precautions were based around the establishment of isolation / clean rooms. Each area was designed to (where possible) incorporate an air-lock entrance lobby with appropriate changing space and provide the internal protected area with HEPA filtered “clean air” at a rate of 30 air changes per hour at a positive pressure profile of 30 Pa. This regime of positive pressure and air change rate was selected from the design criteria similar to those used within operating theatres and used similar technology to that used at the NGH “SCIDS” specialist paediatric unit which I was responsible for commissioning and maintaining for 8 years whilst based at the NGH site (see details in section B3 below).</p> <p>M&E Consultant and Estates advisor on OC & JB units, Birmingham; In 2010 I was commissioned through my consulting company to act as the M&E design consultant on a project to refurbish two former care homes into rehabilitation centres for people with neuro-behavioural and neuro-rehabilitation disorders. This clinical profile requires a balance between traditional healthcare and mental health design standards whilst creating a non-institutional “homely” environment to promote rehabilitation and enable clients to progress to more independent supported living. This clinical need is reflected in the engineering solutions and systems which were required to be designed and installed within the scheme. My role covered the full range of processes from design development through to project management and commissioning of the scheme, and also involved the establishment of maintenance plans and appointment of third party contractors to undertake the operation of the estates related functions of the finished scheme.</p>

B3	Implement design solutions and contribute to their evaluation	<p>Secure the resources required for implementation. Implement design solutions, taking account of critical constraints Identify problems during implementation and take corrective action Contribute to the evaluation of design solutions. Contribute to recommendations for improvement and actively learn from feedback on results.</p>
		<p>SCIDS Ventilation Systems; For a period of 8 years I was responsible for the operation and maintenance of a highly specialised ventilation system based on Ward 23 of Newcastle General Hospital (SCIDS unit). This unit cared for children born with no or very little immune systems and required a “sterile” environment to treat any established infections, provide, via bone marrow donor transplants, a new immune system to the patient and monitor blood cell counts until such time as the patient developed their own immune system. This clinical work requires a very “clean” and sterile environment and was designed to deliver a cleanroom condition of 30Pa positive pressure with a double HEPA filtered Ventilation supply rate of over three hundred (300) air changes per hour. This very high air change rate along with a top entry and low level extract system design was developed to keep the patient at bed level total protected from contamination by carers nursing staff and the surrounding environment. The entire ceiling above the bed area was a laminar flow style HEPA filtered delivery grille, and due to the very high air change rate the extract system was also filtered to allow up to 95% re-circulation of air flow to reduce energy consumption and extend filter life. All hand wash basin were fitted with water filters and “boiling” traps to sterilise water supplies and the rooms where designed to incorporate control systems to constantly monitor room pressures and maintain a safe environment. I was responsible for ensuring that these systems (2 systems feeding a total of 4 isolation rooms) were maintained and operated satisfactorily and undertook / co-ordinated all essential maintenance as required (the systems operated 24 hrs. a day for the duration of any individual or pair of patients which could be up to 18 months depending upon clinical condition). In conjunction with the Trusts Control of Infection team and the clinical team on the ward I was responsible for the evaluation of the systems performance and responsible for ensuring the integrity of the systems.</p> <p>Defects and Corrective actions (NHS and CFM) Evaluation; Throughout my career I have been responsible for the assessment of new and refurbished schemes including the assessment and completion of commissioning and defects of a wide range of healthcare specific engineering</p>

		services from nurse call systems, pneumatic transportation systems, specialist ventilation, and medical gas installations. In all of these cases the compliance to the original design specification or intent has been established and where appropriate corrective action agreed to complete the installation to a satisfactorily acceptable condition.
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C	Provide Technical and commercial Management	
C1	Plan for effective Project Implementation	Show details of positions held in an organisation demonstrating technical and commercial management
		<p>N&P asset realisation programme; Whilst I was employed at the Northgate & Prudhoe (NHS) Trust I undertook, as part of the Estates Strategic review exercise, an assessment of property and surplus assets and developed a business case for the restructuring of services to release under-utilised assets and sites for sale. This business case was endorsed by the Trust Board and became the “Asset Realisation Programme” which formed the backbone of the Trusts financial plan for the next 5 years. The project consisted of relocating services to free up / empty key sites, securing outline planning consent (to maximise value and market interest), marketing and disposal of land on over 40 sites (mainly former community care homes) and surplus land on both principle hospital sites. The project involved the co-ordination of a wide range of staff groups (both clinical & non-clinical), stakeholders and multiple technical advisors. The scheme was also influenced by the strategic planning context of local communities and authorities which had to be considered at an early planning stage to maximise potential benefits.</p> <p>Aspergillus protection ventilation systems; The Aspergillus protection scheme was planned and implemented in a fully operational hospital environment and involved co-ordination of both technical and clinical disciplines. The scheme was undertaken under extreme pressure both as a result of patient safety issues, and the suspension of a critical demolition scheme also on site during the same period. Co-ordination of technical disciplines to meet the challenging deadlines required careful preparation and execution and this was one of my primary responsibilities in the delivery of the scheme.</p>

C2	Manage the planning, budgeting and organisation of tasks, people and resources.	<p>Operate appropriate management systems. Work to the agreed quality standards, programme and budget, within legal and statutory requirements. Manage work teams, coordinating project activities. Identify variations from quality standards, programme and budgets, and take corrective action. Evaluate performance and recommend improvements.</p>
		<p>N&P asset realisation programme; As outlined above (in C1) the asset realisation programme involved multiple site disposals and phases which had to be managed in a structured manner and kept within financial and time limits to ensure effective delivery.</p> <p>Head of Estates / Property & Planning; During my 10 years as a senior manager in the Estates field within the NHS I was responsible for up to 200 staff and a budget of over £15million per annum.</p> <p>Walkergate Park (PFI) Project; In 2000 I transferred to Northgate & Prudhoe (NHS) Trust as Head of Estates where, in 2004 I was the responsible technical project lead for a PFI hospital development at Walkergate Park, Newcastle. My involvement covered development of output and performance specifications, approval of contractor proposals, and management of the contract process from tender negotiations to commissioning of the completed facility.</p> <p>OC & JB refurbishment schemes; As part of my role as technical and Estates advisor to my client on this scheme I was responsible for setting, agreeing, and monitoring all aspects of the programme and costs associated with the engineering elements of the project. This included weekly programme reviews, budget monitoring (inc. variations and amendments), co-ordination of services and specialist contractors, and the commissioning and handover of the scheme to the client. I was also responsible for the submission and acceptance of the facilities to the Care Quality Commission for formal registration and acceptance.</p>

C3	Manage teams and develop staff to meet changing technical and managerial needs.	<p>Agree objectives and work plans with teams and individuals. Identify team and individual needs, and plan for their development. Manage and support team and individual development. Assess team and individual performance, and provide feedback.</p>
		<p>N&P Estates team re-structure; During my time as Head of Estates at Northgate & Prudhoe (NHS) Trust I was responsible for the complete re-structuring of the staff groups including the development of a detailed secession plan and staff development programme.</p> <p>Agenda for Change lead; Whilst employed at Northgate & Prudhoe (NHS) Trust I was responsible for the implementation of the national “Agenda for Change” review for the department and wrote and agreed new / revised job descriptions for all staff to ensure suitable skill-mix and resources where available for the organisation. A key element of this process was the management of expectation and perceived threat to jobs and job security, whilst managing budgets and costs. I also trained and acted as an evaluation and selection panellist for other areas of the Trust.</p> <p>Property & Planning team; In 2008 when three NHS Trusts merged into a single new organisation I was responsible for establishing a new Property & Planning Team within the Estates structure to manage and maintain the property assets of the new organisation. This included both technical and non-technical staff and the development of training programmes to ensure staff had the necessary skills to deliver the required tasks.</p>
C4	Manage continuous quality improvement.	<p>Ensure the application of quality management principles by team members and colleagues. Manage operations to maintain quality standards. Evaluate projects and make recommendations for improvement.</p>
		<p>Review of HTM’s and assessment of impact from 2000 series to 00 (current) series; Since leaving the NHS I currently advise a number of private facility management organisations on the running and compliance issues around healthcare PFI schemes and undertake regular compliance audits for all HTM’s and other NHS specific approved codes of practice. Part of the PFI contract process is to devise and deliver measurable continuous improvements in areas such as energy conservation and maintenance best practices.</p>

		<p>I have also contributed to the review and consultation process in connection with the recently revised L8 and HSG 274 guidance through the IHEEM Technical Water platform.</p> <p>In addition to these activities I am a qualified Lead Assessor for ISO 9000 quality management systems and have undertaken the role of formal assessor for the North East Quality Awards under the EFQM award scheme. I have also successfully completed a Post Graduate Diploma in Total Quality Management from Northumbria University.</p>
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D	Demonstrate effective interpersonal skills	
D1	Communicate in English with others at all levels.	<p>Contribute to, chair and record meetings and discussions. Prepare letters, documents and reports on technical matters Exchange information and provide advice to technical and non-technical colleagues.</p> <p>Throughout my career I have been responsible for the delivery of a wide range of communication, (verbal & written) examples include;-</p> <p>Written</p> <ul style="list-style-type: none"> • Project Initiation reports • Outline and Full Business Cases • Planning Applications • Production of Technical Specifications & Scopes of Work • Compliance Audits • Quality Management Audits and Assessments • Formal Letters • Estates Property and Maintenance Strategies • Departmental Operational Policies and Procedures • Health & Safety Committee reports <p>Verbal</p> <ul style="list-style-type: none"> • Chairing and participation in a range of meetings from staff meetings, Trust Board meetings, and Formal investigations • Deliver of training programmes, toolbox talks, and public consultation presentations (using "power-point") • Supplier / Contractor negotiations • Formal staff performance reviews and disciplinary investigations / hearings

		<ul style="list-style-type: none"> • Interview and recruitment panels • Telephone and conference calls to peers, clients, other professions (legal and financial) and subordinates
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D2	Present and discuss proposals.	<p>Prepare and deliver appropriate presentations. Manage debates with audiences. Feed the results back to improve the proposals.</p>
		<p>During my career I have presented and undertaken negotiations / discussions on a wide range of issues and proposals including;-</p> <ul style="list-style-type: none"> • Public presentations of development plans • Formal presentation of planning applications • Formal Trust Board presentations of Estate Strategies • Training and awareness seminars • Business Cases • Project Plans • Contingency and Emergency Response Plans <p>In addition to these group style presentations I have held numerous in-depth discussions, negotiations, and debates with superiors, peers and subordinates on topics covering the whole range of services associated with healthcare estate management and building services.</p> <p>Training delivery (water / HTM's / Asbestos awareness / Fire); I have delivered a range of awareness training and toolbox talks for over 12 years on subjects including asbestos, fire safety, legionella and water management, aspergillus, and ventilation.</p>

D3	Demonstrate personal and social skills	<p>Know and manage own emotions, strengths and weaknesses. Be aware of the needs and concerns of others. Be confident and flexible in dealing with new and changing interpersonal situations. Identify, agree and work towards collective goals. Create, maintain and enhance productive working relationships, and resolve conflicts.</p>
		<p>In the 26 years of my working life in the field of building services engineering (with 20 of those years in the healthcare sector) I have dealt with a very wide range of people, and professional disciplines. These have included;-</p> <ul style="list-style-type: none"> • Chairing / Hosting Public consultations • Trust Board Meetings • Health & Safety Committees • Interview panels • Staff investigations and Dicipinaries • Professional conferences and meetings (HEFMA) • Delivery of training and presentations • Staff meetings • Project meetings <p>The personal and social skills resulting from those have been:</p> <ul style="list-style-type: none"> • The management of my own emotions • Recognition of my own strengths and areas for improvement • Listening to customer / user complaints, being supportive of the needs of others and following up to ensure satisfaction. • Confidence in managing multiple tasks and priorities • Developing goals based on the objectives and needs of clients • Measuring the goals through performance and ensuring buy-in from subordinates to achieve the goals. Discuss goals with stakeholders for feedback and input. • Resolving conflict • Equality & Diversity awareness

E	Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment.	
E1	Comply with relevant codes of conduct.	Comply with the rules of professional conduct of CIBSE. Manage work within all relevant legislation and regulatory frameworks, including social and employment legislation.
		I am Practiced and required to adhere to in all positions of employment the following codes of conduct; <ul style="list-style-type: none"> • CIBSE Code and Rules of Conduct and Disciplinary Regulations, • NHS Managers Business Code of Conduct Guide. The two codes of conduct referenced above are supplemented by my business practices based on my experience and personal values and governed by the Health & Safety at Work etc. Act (1974) and all other relevant UK law.
E2	Manage and apply safe systems of work.	Identify and take responsibility for own obligations for health, safety and welfare issues Manage systems that satisfy health, safety & welfare requirements Develop and implement appropriate hazard identification and risk management systems Manage, evaluate and improve these systems
		My personal experience of managing and Health and Safety issues are based upon the standards and expectations of my current clients, my own company's standards and my 26 years, experience in the profession. Examples include; <ul style="list-style-type: none"> • Production of method statements for all appropriate work activities • Induction and awareness training for those affected by or undertaking work • Awareness and knowledge of health and safety law, good industry practice, and specific site requirements • Use of risk assessment and hazard identification processes • Use of Permit to Work systems

E3	Undertake engineering activities in a way that contributes to sustainable development.	<i>Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously. Provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives Understand and encourage stakeholder involvement in sustainable development.</i>
		For the last four years since leaving the NHS I have developed “excel” based systems for calculating and forecasting the potential impact of the CRC initiative and assisted CFM in developing site specific sustainability policies for all four of their healthcare PFI sites. In addition to these activities I have developed a revised monthly reporting format for the PFI schemes which includes utility consumptions, annual energy performance reports and life cycle investment plans which include energy reduction impact assessments.
E4	Carry out continuous professional development necessary to maintain and enhance competence in own area of practice.	<i>Undertake reviews of own development needs. Prepare action plans to meet personal and organisational objectives. Carry out planned (and unplanned) CPD activities. Maintain evidence of competence development. Evaluate CPD outcomes against the action plans Assist others with their own CPD.</i>
		Throughout my career I have undertaken a wide range of CPD and practical training in health and safety related topics including, Asbestos, legionella, lifts, scaffold inspection, and gas safety. In addition to these technical courses I have completed a range of managerial, leadership, and financial courses, which have all contributed to my current knowledge base and experience. Specific courses and training include completion of the NHS Leadership and Management course, Ventilation and air conditioning for the Authorised Person (HTM03), Combined course (Authorised / Responsible / Nominated roles (HTM 04 & ACoP L8)), and Authorised Engineers foundation programme (HTM 00). In addition to these formal courses and CPD I have regularly attended and participated in the CIBSE regional awards and dinner for the last 25 years.