

**Formal Training Scheme to Associate Membership  
CORE OBJECTIVES (BSS)**

1. <b>Building Services Engineering Fundamental</b>	Code	ES Initials & Date of Assessment			
		G	K	E	C
<b>1.1 Have a good understanding of the Core Building Services Engineering principles</b>	<b>K</b>				
<b>1.2 Ability to apply the properties of Materials for Building Services Components:-</b> <ul style="list-style-type: none"> <li>- Types</li> <li>- Material Specification</li> <li>- Use</li> <li>- Special Treatment (e.g. Heat)</li> <li>- Surface Coating/Finishes</li> <li>- Shield Against EMI</li> </ul>	<b>*C/E</b>				
<b>1.3 Knowledge of Materials Shaping and Fabrication to form and assembly for</b> <ul style="list-style-type: none"> <li>- Ducts</li> <li>- Panels</li> <li>- Pipes</li> <li>- Conduits Trunkings and Cable Trays</li> </ul> <p>Knowledge of Use of Hand/Power Tools and Computer Aided Machines</p>	<b>E</b>				
<b>1.4 Anchoring Fixing and Support</b> <ul style="list-style-type: none"> <li>- Resilient Mounting</li> <li>- Mechanical and Non-mechanical Fixing and Anchoring</li> <li>- Guides and supports for pipes</li> <li>- Allowance for Thermal and Building Expansion</li> <li>- Acoustic Consideration</li> <li>- Protection Against Electrical Shock, Stray Current, etc.</li> <li>- Anti-Corrosion (and Galvanic Actions)</li> <li>- Testing (e.g. Pull-out test)</li> </ul> <p>Knowledge of Use of Hand/Power Tools and Computer Aided Machines</p>	<b>*C/E</b>				
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<p><b>1.5 Fixing and Jointing</b></p> <ul style="list-style-type: none"> <li>- Cable Joints</li> <li>- Pipes Fitting and Joints</li> <li>- Panels Fastening and Seals</li> <li>- Sheet Metal Ducts and Joints and Seals</li> <li>- Anti-corrosion (and Galvanic Actions)</li> <li>- Vibration and Noise Isolation</li> <li>- Protection Against Electric Shock, Stray Current, Thermal- Weld, etc.</li> <li>- LV/ELV installation/segregation</li> </ul> <p>Knowledge of Use of Hand/Power Tools and Computer Aided Machines</p>	*C/E				
<p><b>1.6 System and Equipment Products</b></p> <ul style="list-style-type: none"> <li>- Application of System</li> <li>- Standard for Manufacturer</li> <li>- Standard for Performance Rating</li> <li>- Standard for Materials</li> <li>- Specification</li> </ul>	*E/K				
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2. Engineering Design	Code	ES Initials & Date of Assessment			
		G	K	E	C
<p><b>2.1 Design and Office Practice</b></p> <ul style="list-style-type: none"> <li>- Stages of Design</li> <li>- Information Retrieval</li> <li>- Use of Computer Packages</li> <li>- Codes of Practice</li> <li>- Specifications &amp; Standards</li> <li>- Design Appreciation</li> </ul>	<b>*E/K</b>				
<p><b>2.2 Computer Aided Engineering Application</b></p>	<b>E</b>				
<p><b>2.3 Design Aspects</b> (At least 4 of the followings)</p> <ul style="list-style-type: none"> <li>- Types, Selection and Application of Various Systems and Required Equipment</li> <li>- Measures</li> <li>- Environmental Impacts</li> <li>- Specifications</li> <li>- Statutory Requirements</li> <li>- Energy Efficiency and Energy Conservation</li> <li>- Initial &amp; Running Cost Estimates</li> <li>- Customer Requirements</li> <li>- Utilities Planning</li> <li>- Spatial Requirements</li> <li>- Buildability</li> <li>- Maintainability</li> <li>- Alternative Solutions</li> </ul>	<b>*C/E</b>				
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<b>3. Operational Reliability</b>	<b>Code</b>	<b>ES initials and Date of Assessment</b>			
		<b>G</b>	<b>K</b>	<b>E</b>	<b>C</b>
<b>3.1 Automation</b> <ul style="list-style-type: none"> <li>- Automatic Control System &amp; Units</li> <li>- Computer Aided Manufacture / Control</li> </ul>	<b>*C/E</b>				
<b>3.2 Installation Testing &amp; Commissioning</b> <ul style="list-style-type: none"> <li>- Procedures</li> <li>- Preparation</li> <li>- Testing/Setting to work</li> <li>- Guarantees &amp; Defects</li> </ul>	<b>*C/E</b>				
<b>3.3 Instrumentation</b> <ul style="list-style-type: none"> <li>- Selection</li> <li>- Range and Accuracy</li> <li>- Performance Monitoring</li> <li>- Calibration</li> </ul>	<b>*C/E</b>				
<b>3.4 Quality Procedures</b> <ul style="list-style-type: none"> <li>- Quality Management System</li> <li>- International Standards</li> <li>- Quality Control/Quality Assurance Procedures</li> </ul>	<b>*C/E</b>				
<b>3.5 Maintenance</b> <ul style="list-style-type: none"> <li>- Planning and Implementation of Maintenance Programmes for Reliability and Maintainability</li> <li>- Types of Maintenance System</li> <li>- Computer Aided Maintenance Management</li> <li>- Preventive Maintenance</li> <li>- Emergency and Major Repair</li> <li>- Diagnostic Techniques</li> </ul>	<b>*C/E</b>				
<b>3.6 Operation</b> <ul style="list-style-type: none"> <li>- Procedures</li> <li>- Supervision/Management</li> <li>- Indoor Environmental Assessment</li> <li>- Energy Efficiency Monitoring and Energy Conservation Measures</li> </ul>	<b>*C/E</b>				
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4. Engineering Administration & Management	Code	ES Initials & Date of Assessment			
		G	K	E	C
4.1 Interpretation, preparation and communication of requirements, specifications and drawings.	C				
4.2 Materials/equipment procurement procedures, tender and or contract appraisal and administration.	*E/K				
4.3 Planning, Budgeting.	*E/K				
4.4 Estimating labour, materials, installation and transport costs.	*E/K				
4.5 Project/Work scheduling.	C				
4.6 Project / Work Supervision.	*C/E				
4.7 Reports & Presentations - written reports, operation manual ,etc - presentation technique	*C/E				
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5. Technology in specialised area	Code	ES Initials & Date of Assessment			
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<p><b>5.1 The trainee must demonstrate to have gained an in depth experience in one of the areas listed below and ability to apply technology to the design, installation, testing, commissioning, maintenance and improvement.</b></p> <ul style="list-style-type: none"> <li>- HVAC System</li> <li>- Electrical Services System</li> <li>- Plumbing and Drainage System</li> <li>- Fire Services System</li> <li>- Vertical Transportation System</li> <li>- Others as approved</li> </ul>	C				
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