

<b>TSC Category</b>	Engineering Design Management					
<b>TSC</b>	Engineering Drawing and Design Specifications					
<b>TSC Description</b>	Create design specifications and technical drawings to guide installation and construction works					
<b>TSC Proficiency Description</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>	<b>Level 6</b>
		<b>EGS-TDR-2006-1.1</b>	<b>EGS-TDR-3006-1.1</b>	<b>EGS-TDR-4006-1.1</b>	<b>EGS-TDR-5006-1.1</b>	
		Create technical drawings used to guide installation and construction works	Interpret and modify technical drawings to reflect changes to existing designs and specifications	Develop design specifications and new, large scale or high complexity technical drawings, advising on optimal drawing methods based on complexity, cost and time involvement	Conceptualise and validate engineering design solutions for complex engineering installations and construction based on project requirements	
<b>Knowledge</b>		<ul style="list-style-type: none"> <li>Types of engineering drawings and symbols</li> <li>Principles of two-dimensional (2D) and three-dimensional (3D) engineering drawings</li> <li>Basic principles of mechanical, civil, structural, geotechnical, instrumentation and control, and electrical engineering</li> <li>Types and specifications of engineering equipment</li> <li>Types of engineering design software relevant to creating equipment and outfitting drawings</li> <li>Regulations relating to the installation of engineering equipment and systems</li> </ul>	<ul style="list-style-type: none"> <li>Methods of translating design specification and installation requirements into two-dimensional (2D) and three-dimensional (3D) equipment drawings</li> <li>Basic principles of mechanical, civil, structural, geotechnical, instrumentation and control, and electrical engineering</li> <li>Applications of engineering drawings</li> <li>Concepts in mathematics pertinent to engineering calculations</li> <li>Methods of determining engineering equipment interactions with other systems in a facility</li> <li>Regulations relating to the installation of engineering equipment and systems</li> </ul>	<ul style="list-style-type: none"> <li>Principles of engineering design process</li> <li>Methods of translating project requirements into Basis of Design (BoD) and design specifications</li> <li>Methods of creating two-dimensional (2D) and three-dimensional (3D) engineering drawings</li> <li>Principles of mechanical, civil, structural, geotechnical, instrumentation and control, and electrical engineering</li> <li>Principles of applied mathematics, mathematical modelling and simulations</li> <li>Principles of engineering materials</li> <li>International best standards and guidelines related to engineering drawing</li> <li>Methods of evaluating technical drawings</li> </ul>	<ul style="list-style-type: none"> <li>Advanced principles of engineering design and discipline engineering expertise</li> <li>Advanced techniques for creating conceptual engineering designs</li> <li>Methods of evaluating feasibility and constructability of engineering designs</li> <li>International best practices, industry standards and regulations related to engineering drawing</li> <li>Methods of managing safety and cost-effectiveness in engineering design</li> </ul>	

**SKILLS FRAMEWORK FOR ENGINEERING SERVICES  
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE**

<p><b>Abilities</b></p>		<ul style="list-style-type: none"> <li>• Create basic technical drawings using 2D and 3D methods</li> <li>• Operate engineering design software to create technical drawings and modify existing drawings</li> <li>• Apply geometric dimensions and tolerances in engineering drawings</li> <li>• Interpret basic engineering calculations</li> </ul>	<ul style="list-style-type: none"> <li>• Create full scale technical drawings using appropriate 2D or 3D methods</li> <li>• Suggest improvements to engineering drawings</li> <li>• Interpret engineering calculations to reflect technical details and specifications in drawings</li> <li>• Apply engineering principles to installation specifications</li> <li>• Incorporate details of appropriate materials for a project in drawings based on design specifications</li> <li>• Incorporate provisions for synchronising with other engineering equipment</li> <li>• Represent interdependence with other engineering systems</li> <li>• Adhere to relevant regulations and guidelines while creating technical drawings</li> </ul>	<ul style="list-style-type: none"> <li>• Execute engineering calculations, mathematical models and simulations for engineering systems</li> <li>• Create conceptual designs and Basis of Design (BoD) to meet project requirements</li> <li>• Develop detailed design specifications for functional performance and reliability of engineering systems</li> <li>• Specify design plans, schematics, layouts and material requisition based on project requirements</li> <li>• Supervise creation of new, large scale and technical drawings using appropriate 2D or 3D methods</li> <li>• Review drawings against regulations, guidelines conventions and project requirements</li> <li>• Evaluate adherence of drawings to relevant regulations and guidelines</li> <li>• Develop efficient methods of creating equipment drawings based on complexity, cost and time involvement</li> </ul>	<ul style="list-style-type: none"> <li>• Validate conceptual design and Basis of Design (BoD) to ensure adherence to project requirements</li> <li>• Critique feasibility and constructability of design specifications and detailed design</li> <li>• Validate and approve design plans, schematics, layouts and material requisition based on project requirements</li> <li>• Ensure adherence to regulations, guidelines conventions and project requirements</li> <li>• Manage critical reviews of engineering drawings and designs</li> <li>• Establish methods for enhancing the safety and cost-effectiveness of engineering designs</li> </ul>	
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