SKILLS FRAMEWORK FOR ENGINEERING SERVICES SKILLS MAP – PRINCIPAL ENGINEER/MANAGER (ENGINEERING DESIGN)			
Sector	Engineering Services		
Track	Engineering Design		
Occupation	Engineering Professional		
Job Role	**Principal Engineer/Manager (Engineering Design)**		
Job Role Description	The Principal Engineer/Manager (Engineering Design) leads the development of conceptual, basic and detailed engineering design based on project requirements. He/She leads technical feasibility reviews and engineering studies. He approves and submits final design submittals including basis of design, technical specifications, plans layouts, schematics and detail design. He provides expert guidance for creative and innovative design solutions. He leads the organisation's safe and sustainable design initiatives and drives compliance with regulatory and legislative requirements. He manages a team of senior engineers and ensures efficient business operations. He is a key resource person who advises senior management, and internal and external stakeholders on engineering matters. He is highly analytical, enjoys solving challenging problems, and is able to lead others effectively. He possesses strong project management and decision-making skills. He is able to multi-task in a fast-paced work environment and may be required to travel to project locations.		
Critical Work Functions and Key Tasks / Performance Expectations	**Critical Work Functions**	**Key Tasks**	**Performance Expectations* (For legislated / regulated occupations)**
	Develop technical drawings and engineering designs	Approve conceptual designs and Front-end Engineering and Design (FEED) packages based on project requirements	In accordance with: • Professional Engineers Act and Rules; • Workplace Safety and Health (WSH) Act; • Building Control Act; • Fire Safety Act
		Devise process workflows to execute and approve system designs and engineering calculations	
		Approve detailed design including schematics, technical specifications, test plans, and material requisition based on technical feasibility and alignment with project requirements	
		Evaluate performance specification analyses on structures, equipment and systems	
		Drive cross-team collaborations for resolution of design and engineering gaps	

		Endorse industry standards and international conventions in technical drawings	
	Employ advanced analytics and big data	Conceptualise new data models and evaluate existing models for suitability	
		Define areas of focus that can be analysed using advanced methods to support research and development (R&D) in design processes	
		Provide leadership and guidance for analysis of both internal and external data	
		Devise methods to leverage advanced analytical findings for strategic decision-making	
	Implement sustainable design initiatives	Formulate strategies to integrate social, environmental and economic considerations in the design processes	
		Endorse environmental impact assessment and lifecycle cost and benefits analyses for products and systems	
		Endorse environmentally and economically preferable designs and solutions	
		Establish innovative solutions for waste reduction and resource optimisation through sustainable designs	
		Drive continuous improvements in sustainable design initiatives	
	Adhere to Design for Safety (DfS) regulations	Formulate strategies and procedures to manage design risks	
		Lead DfS review meetings with stakeholders	
		Drive organisational compliance with DfS regulations	
	Manage people and organisational function	Develop strategies for resource planning and utilisation	
		Drive department performance to achieve organisational goals	
		Drive talent recruitment and development for the department in alignment with organisational strategy	
		Manage the department's financial inflow and outflow against allocated budgets and forecasts	
		Validate risk management plans and risk controls to ensure compliance with	*Performance Expectations are

		organisation's risk management framework	non-exhaustive and subject to prevailing regulations
		Manage continuous improvement and change management initiatives for time, cost and quality improvements	

	Technical Skills & Competencies		Generic Skills & Competencies (Top 5)	
Skills & Competencies	3D Modelling	Level 5	Decision Making	Advanced
	Artificial Intelligence Application	Level 5	Creative Thinking	Advanced
	Budgeting	Level 4	Communication	Advanced
	Building Information Modelling Application	Level 5	Sense Making	Advanced
	Business Performance Management	Level 4	Resource Management	Advanced
	Business Presentation Delivery	Level 4		
	Change Management	Level 4		
	Civil and Structural Engineering Management	Level 5		
	Continuous Improvement Management	Level 4		
	Cost Management	Level 5		
	Data and Statistical Analytics	Level 4		
	Design for Safety	Level 5		
	Electrical Engineering Management	Level 4		
	Engineering Drawing and Design Specification	Level 5		
	Engineering Drawing Interpretation and Management	Level 5		
	Engineering Safety Standards Interpretation	Level 5		
	Environmental Management System Framework Development and Implementation	Level 5		
	Front-End Engineering and Design	Level 4		
	Geotechnical Engineering Management	Level 5		
	Hazards and Risk Identification and Management	Level 4		

	Instrumentation and Control Design Engineering Management	Level 4	
	Learning and Development	Level 4	
	Manpower Planning	Level 4	
	Market Research	Level 4	
	Mechanical Engineering Management	Level 4	
	Organisational Resource Management	Level 5	
	Organisational Risk Management	Level 4	
	Programme Management	Level 4	
	Project Risk Management	Level 4	
	Quality System Management	Level 4	
	Reliability Engineering Management	Level 5	
	Staff Management	Level 4	
	Stakeholder Management	Level 4	
	Strategy Development	Level 4	
	Sustainable Engineering	Level 5	
	Technical Inspection	Level 4	
	Technical Writing	Level 4	
	Technology Application	Level 4	
	Test Planning	Level 5	
	Workplace Safety and Health Framework Development and Implementation	Level 5	
Programme Listing	For a list of Training Programmes available for the Engineering Services sector, please visit: www.skillsfuture.sg/skills-framework/engineeringservices		

The information contained in this document serves as a guide.