



# Contents

<b>About the Skills Framework</b>	<b>2</b>
<b>Engineering Services: Charting Growth and Opportunities</b>	<b>3</b>
<b>Key Statistics</b>	<b>4</b>
<b>Future Developments</b>	<b>5</b>
<b>Desired Attributes and Skills in Demand</b>	<b>8</b>
<b>Take Your Career Further - Initiatives and Schemes</b>	<b>9</b>
<b>Realise Your Potential - Take the Next Step Forward</b>	<b>14</b>
<b>Engineering Services Career Tracks</b>	<b>15</b>
<b>Skills Map</b>	<b>17</b>
■ <b>Project Financing</b>	<b>19</b>
■ <b>Project Development</b>	<b>29</b>
■ <b>Engineering Procurement</b>	<b>39</b>
■ <b>Engineering Design</b>	<b>49</b>
■ <b>Engineering Construction and Commissioning</b>	<b>65</b>
■ <b>Operations and Maintenance</b>	<b>93</b>
<b>Overview of Technical Skills and Competencies</b>	<b>118</b>
<b>Overview of Generic Skills and Competencies</b>	<b>125</b>
<b>Supporting Organisations and Acknowledgements</b>	<b>128</b>
<b>Wage Information</b>	<b>132</b>
<b>Skills Framework for Engineering Services: Career Pathways</b>	<b>133</b>

The information in this publication serves as a guide for individuals, employers and training providers. SkillsFuture Singapore, Workforce Singapore and the Singapore Economic Development Board provide no warranty whatsoever about the contents of this document, and do not warrant that the courses of action mentioned in this document will secure employment, promotion, or monetary benefits.

Published in April 2019

# About the Skills Framework

The Skills Framework is a SkillsFuture initiative developed for the Singapore workforce to promote skills mastery and lifelong learning. Jointly developed by SkillsFuture Singapore (SSG), Workforce Singapore (WSG), and the Singapore Economic Development Board (EDB), together with employers, industry associations, education and training providers and unions, the Skills Framework for Engineering Services provides useful information on:



With the Skills Framework, individuals are equipped to make informed decisions about career choices, as well as take responsibility for skills upgrading and career planning.



Assess Career Interests

- Understand career pathways
- Recognise personal attributes required



Prepare for Desired Jobs

- Understand skills and competencies required



Find Avenues to Close Skills Gaps

- Identify relevant training programmes to equip oneself with the required skills and competencies
- Participate in on-the-job training opportunities provided by companies



Renew, Upgrade and Deepen Skills

- Plan for career development/transition
- Recognise skills and competencies required for the intended job role
- Identify training programmes to upgrade and deepen skills

# Engineering Services: Charting Growth and Opportunities

Asia's rapid development and urbanisation means that by 2030, the continent will account for 64% of the global middle class and 40% of middle class consumption<sup>1</sup>. The region will also see an increase of 1.2 billion urban dwellers between 2014 to 2050<sup>2</sup>. These trends are driving the demand for better infrastructure and services in the region. Catalysing this tremendous growth is the Engineering Services sector, which serves as a critical enabler for the development of cities, infrastructure and industrial solutions.

Singapore's Engineering Services sector comprises engineering, procurement and construction (EPC) firms, engineering consultancies, and specialist service providers. The sector provides end-to-end services across the project lifecycle - from feasibility studies, development, design and engineering, construction management to operations and maintenance. Key market segments of the sector include infrastructure (e.g. power, transportation, water and utility), industrial (e.g. manufacturing facilities) and general buildings. The Engineering Services sector accounted for about 1.2%<sup>3</sup> of Singapore's GDP, and employed about 44,770<sup>4</sup> in Singapore.

In Singapore, the Engineering Services companies contributed significantly to key infrastructure developments, including Tuas Megaport, Changi Airport Terminal 5 and the rail network expansion. The sector has also contributed towards the growth of Singapore's vibrant manufacturing industries, which today contributes around 20% of Singapore's GDP.

These projects in Singapore often serve as reference cases where new urban and industrial solutions are developed, tested and exported to markets outside of Singapore. Companies often base their regional and global operations in Singapore, taking advantage of Singapore's strong track record and R&D ecosystem. Globally leading Engineering Services companies, including AECOM, Jacobs Engineering, Exyte and Mott MacDonald, have established their regional headquarters and Centres of Excellence in Singapore. Home-grown companies such as Surbana Jurong and Meinhardt are also rapidly internationalising and developing new capabilities in innovation and technology.



Jewel Changi Airport  
Photo Credit: Civil Aviation Authority of Singapore



Tuas Mega Port  
Photo Credit: Maritime and Port Authority of Singapore

<sup>1</sup> Source: Brookings Institute.

<sup>2</sup> Source: United Nations.

<sup>3</sup> 2017 DOS data shows SGD5.1 billion nominal VA for Engineering Services sector (Singapore Standard Industrial Classification 2010: 7112), as compared to Singapore's 2017 nominal GDP of SGD464.9 billion.

<sup>4</sup> 2015 MOM data shows 44,770 employed in Engineering Services sector (Singapore Standard Industrial Classification 2010: 7112), excluding self-employed local PMEs.

## Key Accolades

**15** of the top 20 global engineering consultancies have their regional head offices based in Singapore.



## Industry Statistics

- Workforce Size: **44,770** people<sup>5</sup>
- Local Professionals, Managers, Executives and Technicians (PMETs): **70%**
- GDP contribution: **1.2%**<sup>6</sup>



<sup>5</sup> 2015 MOM data shows 44,770 employed in Engineering Services sector (Singapore Standard Industrial Classification 2010: 7112), excluding self-employed local PMEs.

<sup>6</sup> 2017 DOS data shows SGD5.1 billion nominal VA for Engineering Services sector (Singapore Standard Industrial Classification 2010: 7112), as compared to Singapore's 2017 nominal GDP of SGD464.9 billion.



Being in the heart of Asia, Singapore's Engineering Services sector will play an increasingly significant role. Its growth will be driven by Asia's rapid urbanisation and demand for smart cities and infrastructure, as well as Singapore's agenda in Industry 4.0 and advanced manufacturing.

Rapid urbanisation is increasing the demand for smart cities in the region. Spending on technologies to enable smart cities programmes in Asia Pacific (excluding Japan) is expected to accelerate and hit USD54.5 billion by 2022<sup>7</sup>.

**Smart Cities spending to hit USD54.5 billion by 2022**

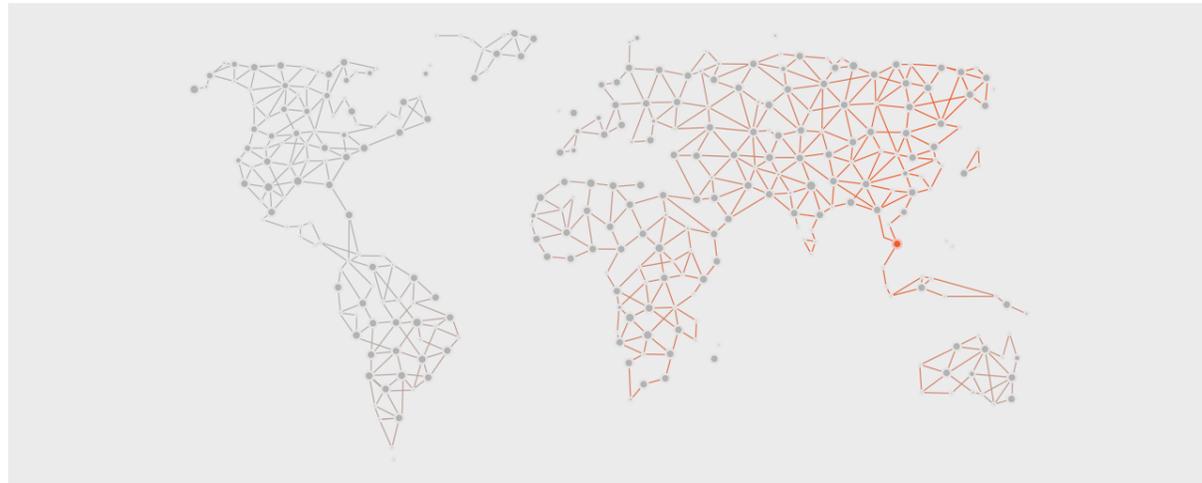


Asia Pacific (excluding Japan)

<sup>7</sup> This is according to 2018 figures from the International Data Corporation (IDC) Worldwide Smart Cities Spending Guide, which also show that spending is expected to reach USD30 billion in 2018. IDC is a global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets.

# Future Developments

Current efforts include India's 100 Smart Cities Programme, and Australia's AUD30 million investment fund to support smart cities in ASEAN. Back at home, Singapore aims to remain at the forefront of being a smart sustainable city across multiple domains, with digital technology as a horizontal enabler. To accelerate co-innovation with companies, test-beds have been set up in the area of urban mobility, power grids, water, ports/airports, and more. Singapore will also continue to strengthen platforms that enable access to the pipeline of regional smart cities projects. An example is the new ASEAN Smart Cities Network (ASCN) that was launched at World Cities Summit 2018 as part of Singapore's ASEAN Chairmanship. It comprises 26 pilot cities, and is aimed at facilitating business opportunities in the development of smart cities across the region.



Singapore at the forefront of the smart sustainable city movement in the region

The Asian Development Bank (ADB) estimated that infrastructure needs in developing Asia and the Pacific will exceed USD26 trillion through 2030. The Belt and Road initiative (BRI) is also gaining traction, with an estimated annual investment of USD2 to USD3 trillion needed, and committed public funding to date of USD254.5 billion by Asian Infrastructure Investment Bank (AIIB), Silk Road Fund and New Development Bank (NDB). Engineering Services companies have responded to this demand and Singapore's sustained efforts in enhancing our infrastructure ecosystem, by setting up relevant strategic nodes here. Examples include Atkins' new end-to-end infrastructure advisory business called Acuity, and Surbana Jurong's new unit for equity investments in early-stage projects called SJ Capital. To better position Singapore as the region's infrastructure hub, the Infrastructure Asia unit was launched in October 2018. It will bring together resources from Enterprise Singapore (ESG), the Monetary Authority of Singapore (MAS) and Singapore Economic Development Board (EDB), to provide a platform for connecting Singapore-based service providers with the pipeline of regional projects.

# Future Developments

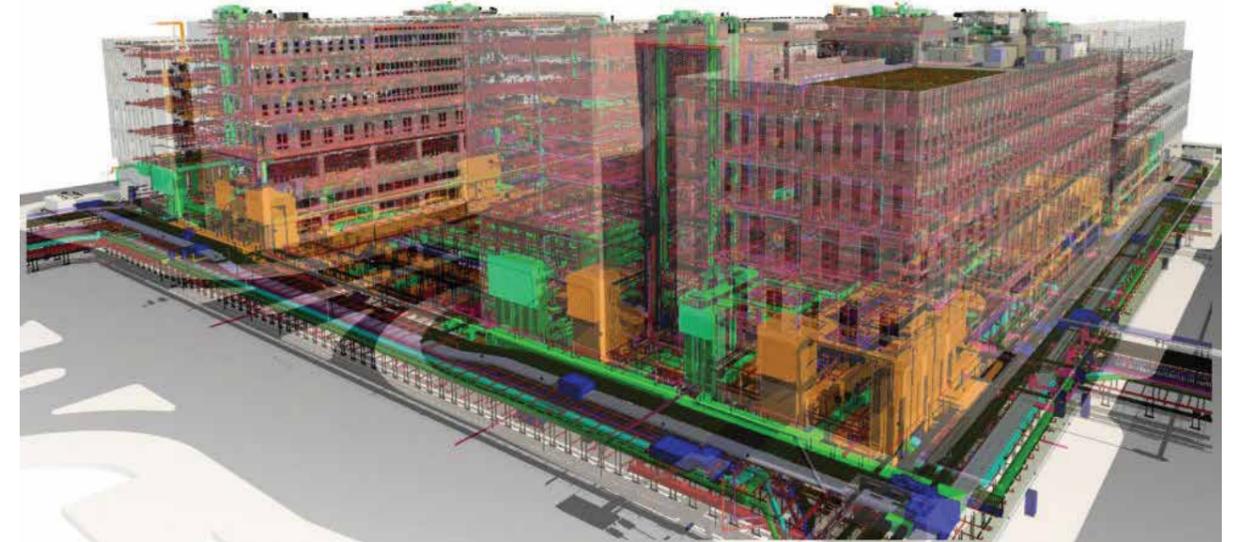


Photo Credit: Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd

Singapore is also committed to pushing its Advanced Manufacturing agenda, with the aim of enhancing the global competitiveness of our industry. With the rapid adoption of Industry 4.0 technologies in transforming our manufacturing base, Engineering Services companies will also have increased opportunities in delivering new state-of-the-art facilities and upgrading brownfield facilities, through new digital services and solutions such as digital twinning, reverse Building Information and Modelling (BIM) and more.

The Engineering Services is a growing sector, with demand for new skills in project development and financing, project management, technical engineering, as well as digital technologies. Anticipating these trends, Singapore has developed the Professional Services Industry Transformation Map (ITM), which covers the Engineering Services as a sub-sector. It encompasses key strategies and initiatives to support the industry's innovation and productivity drive, jobs and skills in the sector, and its internationalisation efforts. The ITM will be a blueprint that will steer Singapore's future development as a globally competitive and leading Engineering Services hub.

## Future Developments at a Glance



# Desired Attributes and Skills in Demand

A career in the Engineering Services sector provides diverse opportunities to individuals seeking rewarding and enriching careers. If you enjoy the challenge of working in a highly dynamic sector, delight in formulating engineering solutions, and are keen in deepening technical expertise, the Engineering Services sector offers opportunities to develop your passion and grow your career.

As the sector continues to transform, these are some examples of skills in demand which consist of existing skills augmented by emerging skills. Those seeking successful careers in the Engineering Services sector can set themselves apart by developing these attributes and acquiring these skills in demand.

## DESIRED ATTRIBUTES



### Commercial Acumen

Makes well-informed, commercially sound decisions so as to deliver economic benefits for the company and accelerate business success



### Safety Conscious

Recognises hazards, safety risks and unsafe practices at the workplace and in relation to products/services, placing safety as a top priority for self and others



### Technology Savvy

Embraces technology disruptions with an open mind and strives towards learning and application of emerging technologies in work processes



### Team Player

Works collaboratively and effectively with project team members (superiors, peers and subordinates) to achieve identified objectives



### Analytical

Uses logical reasoning and analysis based on data and facts to support decision making and suggest ideas for improvement

## SKILLS IN DEMAND



### Project Development and Financing

Builds high-quality project portfolios through identification of suitable market opportunities and strategic financial planning to maximise return on investment



### Design for Safety (DfS)

Develops engineering designs and solutions while safeguarding the safety and health of users, stakeholders, and the general public



### Internet of Things Management

Manages interconnected smart devices and equipment to access real-time data for monitoring equipment performance, and to perform troubleshooting



### Building Information Modelling (BIM) Application

Uses BIM to ensure information accuracy and accessibility across engineering projects



### Data and Statistical Analytics

Leverages large, complex data sets and advanced analytics to uncover trends or patterns and drive optimisations in the engineering value chain

# Take Your Career Further

A skilled workforce is essential in sustaining Singapore's global competitiveness as a leading Engineering Services sector. There is a wide range of initiatives and schemes available to both individuals and employers to promote skills acquisition and upgrading.



## FOR INDIVIDUALS

### Asia Leaders Programme in Infrastructure Excellence (ALPINE)

The programme allows existing industry professionals to deepen their skills and understanding of major and complex infrastructure projects in Asia. ALPINE brings together thought leaders and industry champions from the public sector and private firms to share and exchange perspectives and best practices. It is suitable for mid-level executives with at least 6 years' working experience in companies, financial institutions, or the public sector, and who are involved in infrastructure planning development and operations in Asia.

### World Bank Group's Global Secondment Programme

The programme allows officials or employees currently in companies, financial institutions, or the public sector, and who are involved in infrastructure planning development and operations in Asia, to be appointed on a 12-month long Special Assignment to the World Bank Group (WBG), the International Bank for Reconstruction and Development, or the International Finance Corporation. The programme will feature on-the-job training for skills enhancement, knowledge sharing, strategic alliances, and cultural exchange.

### Infrastructure Development Internship (IDI)

This programme allows current students to enrol in universities or fresh graduates to obtain a short internship and work attachment at major players within the infrastructure industry. Participating companies include Atkins, the World Bank Group, Aurecon, and Clifford Chance.

#### Initiatives and Schemes by:

SkillsFuture Singapore

Workforce Singapore

Singapore Economic Development Board



## FOR INDIVIDUALS

### Education and Career Guidance

Education and Career Guidance (ECG) is about equipping students, as well as adults, with the necessary knowledge, skills and values to make informed education and career decisions. With the help of trained ECG counsellors, students will be exposed to a wide range of education and career options, and given the opportunities to make informed post-secondary education choices. Singaporeans in the workforce can benefit from career coaching, employability skills workshops, networking sessions through the Workforce Singapore (WSG) Career Centres and the Employment and Employability Institute (e2i).

### Enhanced Internships

The Enhanced Internships are designed to provide students with a more meaningful internship experience through more structured learning and support at the workplace. Participating companies will work closely with the Institute of Technical Education (ITE) and polytechnics to deliver a positive and meaningful internship experience for their interns.

### SkillsFuture Credit

Credit of \$500 for all Singapore Citizens aged 25 and above to defray costs for a wide range of skills-related courses to encourage skills development and lifelong learning.

### SkillsFuture Earn and Learn Programme

A work-learn programme designed to give fresh graduates from the ITE and polytechnics a headstart in careers related to their discipline of study. Suitable candidates which include eligible Public Service Officers will be matched with a job related to their field of study, and undergo structured on-the-job training and mentorship in participating companies. They can also gain industry experience and attain an industry-recognised certification concurrently.

### SkillsFuture Work-Learn Bootcamp (Engineering)

A short and focused bootcamp training programme in Engineering 4.0, developed in partnership with PSEIs and Generation. This is to equip fresh graduates and mid-career individuals interested in Engineering 4.0 careers with a specific mindset, and behavioural and technical skills to meet demands in fast-growing sectors.

### SkillsFuture Fellowships

Monetary award of \$10,000 to recognise Singapore Citizens with deep skills, who are champions of lifelong learning, and committed to contributing to the skills development of others.

#### Initiatives and Schemes by:

■ SkillsFuture Singapore
 ■ Workforce Singapore
 ■ Singapore Economic Development Board



## FOR INDIVIDUALS

### SkillsFuture Mid-Career Enhanced Subsidy

Singaporeans aged 40 and above will receive higher subsidies of up to 90% of course fees for over 8,000 SSG-supported courses and at least 90% of programme cost for Ministry of Education-subsidised full-time and part-time courses.

### SkillsFuture Series

Targeted at Singaporeans who are keen to either gain a basic understanding or deepen their skills in eight emerging areas\*, the SkillsFuture Series comprises training programmes across three proficiency levels, namely Basic, Intermediate and Advanced. Adult learners of different skills proficiencies and industry backgrounds can therefore benefit from the SkillsFuture Series. Individuals will receive 70-90% course fee subsidy depending on eligibility.

\*Eight emerging areas are: Data analytics, Cybersecurity, Advanced manufacturing, Urban solutions, Finance, Tech-enabled services, Digital media, Entrepreneurship.

### SkillsFuture Qualification Award

This award encourages Singapore Citizens to attain full Workforce Skills Qualifications, which equip them with comprehensive and robust sets of skills to perform their jobs competently, pursue career progression and explore new job opportunities.

### SkillsFuture Study Awards

A monetary award of \$5,000 for adults in their early and mid-career to develop and deepen their skills in future economic growth sectors.

### Young Talent Programme

Students from ITE, polytechnics, and universities can embark on overseas internships to take on work and study programmes that will prepare them for global careers.

#### Initiatives and Schemes by:

■ SkillsFuture Singapore
 ■ Workforce Singapore
 ■ Singapore Economic Development Board

# Take Your Career Further



## FOR INDIVIDUALS AND EMPLOYERS

### MySkillsFuture

MySkillsFuture is a one-stop online portal that enables Singaporeans to chart their own career and lifelong learning pathways, through access to industry information and tools to search for training programmes to broaden and deepen skills.

### P-Max

The Place-and-Train programme matches job-seeking PMETs to suitable positions in SMEs, and assists SMEs to better recruit, train, manage and retain their newly-hired PMETs.

### Professional Conversion Programme (PCP)

PCP is a career conversion programme targeted at PMETs, including mid-career switchers, to undergo skills conversion and move into new occupations or sectors that have good prospects and opportunities for progression.

### Career Matching Services

Individuals can access a wide range of career advisory services and resources at WSG's Careers Connect and NTUC's e2i career centres. These include professional guidance from certified Career Coaches as well as career events and workshops.

Employers can receive recruitment advice to uncover new talent and find the right people for their business needs.

### Career Support Programme (CSP)

The CSP helps experienced Singapore Citizen PMETs, who have been unemployed or made redundant for six months or more, take on new jobs paying at least \$4,000 (\$3,600 in SMEs).

Companies can receive up to \$42,000 in salary support for up to 18 months when they hire eligible PMETs who are retrenched and/or unemployed for six months or more, in jobs that pay gross monthly salary of at least \$3,600 (for SMEs)/ \$4,000 (Non-SMEs).

#### Initiatives and Schemes by:

■ SkillsFuture Singapore ■ Workforce Singapore ■ Singapore Economic Development Board

# Take Your Career Further



## FOR INDIVIDUALS AND EMPLOYERS

### Career Trial

Jobseekers can gain experience and confidence through a short-term career trial to be assessed for employment paying \$1,500 or more and receive training allowance and retention incentives.

Employers can assess a jobseeker's job fit via a short-term career trial before offering formal employment for jobs paying \$1,500 or more. Companies can receive up to \$5,400 of salary support to hire eligible Singapore Citizens who have been unemployed for 6 months or more.

### MyCareersFuture.sg

MyCareersFuture.sg is a portal which aims to provide Singaporean jobseekers with a fast and smart search service to match them with relevant jobs, based on the jobseekers' skills and competencies.

The portal enables Singaporeans to be more aware of the skills they possess, and connect them to relevant jobs based on their current skills and competencies. It also highlights jobs which are eligible for Government support through WSG's Adapt and Grow programmes.

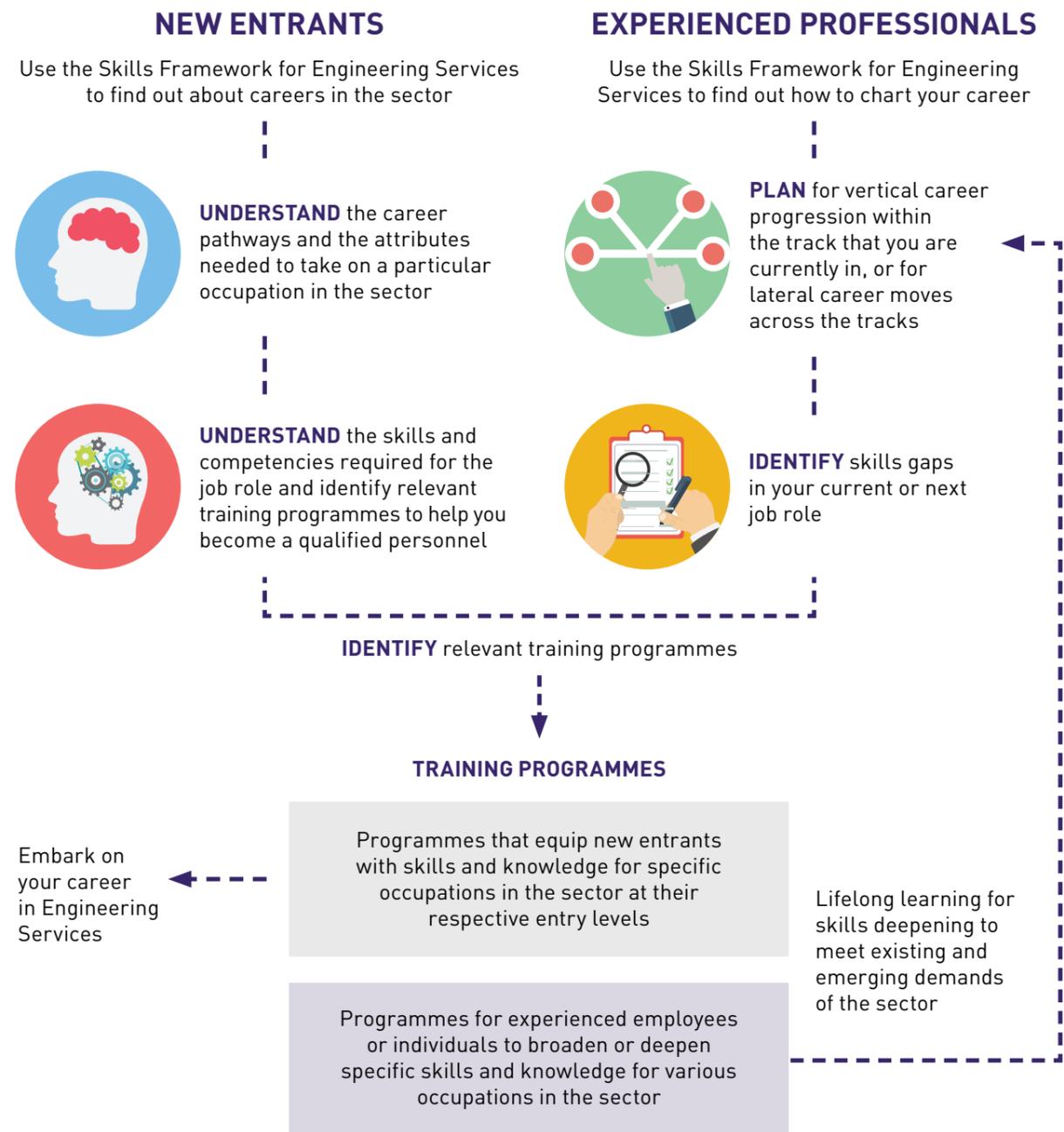
#### Initiatives and Schemes by:

■ SkillsFuture Singapore ■ Workforce Singapore ■ Singapore Economic Development Board

For more information on the initiatives and schemes, please visit  
[skillsfuture.sg](https://skillsfuture.sg) | [wsg.gov.sg](https://wsg.gov.sg) | [edb.gov.sg](https://edb.gov.sg)

# Realise Your Potential - Take the Next Step Forward

Now that you have some idea of what a career in the Engineering Services industry can offer and the available government initiatives and schemes to support your career goals, you are ready to take the next step!



For a list of training programmes available for the Engineering Services sector, please visit: [skillsfuture.sg/skills-framework/engineeringservices](https://skillsfuture.sg/skills-framework/engineeringservices)

# Engineering Services Career Tracks

Tracks	Descriptions
<b>Project Financing</b> 	<p>The Project Financing track ensures that engineering projects are commercially viable and bankable by structuring projects in a way to maximise return on investment and deliver economic benefits for the company.</p> <p>This involves project finance structuring and capital raising based on estimated project costs and cash flows. It is supported by competencies in financial modeling, valuation analysis, due diligence and risk management.</p>
<b>Project Development</b> 	<p>The Project Development track involves building high-quality portfolios through strategic investment planning, and identification and execution of suitable market opportunities.</p> <p>This involves tender analysis, stakeholder identification and requirements gathering, feasibility analysis, project specification, project cost estimation and project planning.</p>
<b>Engineering Procurement</b> 	<p>The Engineering Procurement track ensures an uninterrupted supply of materials, equipment and other resources required for construction, operations and maintenance works.</p> <p>This involves contract development and management, vendor management, pricing negotiations and quality control in order to avail requisite resources in a timely and safe manner.</p>
<b>Engineering Design</b> 	<p>The Engineering Design track translates project requirements into fully functional buildings, plants or facilities through an iterative process of conceptual design, basic design and detailed design while ensuring compliance with regulations and industry best practices.</p> <p>This involves front-end engineering and design, detailed design and design validations to meet safety, reliability and sustainability requirements.</p>

Tracks	Descriptions
<p><b>Engineering Construction and Commissioning</b></p> 	<p><b>Engineering Construction</b> The Engineering Construction track focuses on supervision and management of construction works performed by subcontractors, and the validation of such construction against design specifications, while ensuring adherence to project success metrics.</p> <p>This involves subcontractor management, validation of installation and assembly works against engineering design, mechanical completion, and project management to ensure adherence to project time, cost, quality, safety and compliance requirements.</p> <p><b>Commissioning</b> The Commissioning track is responsible for assuring that all equipment, components and systems of a building, industrial plant or facility are designed, installed, tested, operated and maintained according to the project requirements of the owner or customer.</p> <p>This involves inspections, tests and reviews to ensure that functionality, operability, reliability, safety, and compliance requirements are met.</p>
<p><b>Operations and Maintenance</b></p> 	<p>The Operations and Maintenance track ensures steady-state operations and maintenance post construction and commissioning, to ensure that the infrastructure, systems and equipment perform the functions as intended.</p> <p>This involves hands-on maintenance service, on-site coordination of activities and events, off-site operational support to issue work orders, remote monitoring and data collection to ensure safe operational performance as per requirements of the owner or customer.</p>



**Project Financing**  
Page 19-28



**Project Development**  
Page 29-38



**Engineering Procurement**  
Page 39-48



**Engineering Design**  
Page 49-64



**Engineering Construction and Commissioning**  
Page 65-92



**Operations and Maintenance**  
Page 93-110





## Associate Director, Financing Group

Catherine Yeo Jia Jie

Atkins Design Engineering Consultancy

### BUILDING WITH NUMBERS

Catherine is an Associate Director (Financing Group) at Atkins, a member of the SNC-Lavalin Group, where she provides financial and investment advisory to infrastructure and real estate projects. She ensures clients get a commercially and financially viable project that maximises returns to shareholders, through providing end-to-end financial modelling, risk analysis, negotiating contracts to ensure optimal contractual structure and bankability, and assessing and coordinating funding options.

She shares, “there is no right or wrong way to do project financing, unlike more technical trades. It is really about analysing all aspects of a project and bringing the pieces required together for a robust strategy that makes it viable and ultimately, a success.”

Previously from the banking sector, Catherine feels joining Atkins allows her to apply some transferable skills in the financing role and at the same time massively widen her work horizons.

She has experienced many job ‘firsts’ in the traditionally male-dominated industry, including presenting effectively in Mandarin as the only female participant at a 250-person conference in Beijing, and working in Saudi Arabia.

While her engineering degree helps with understanding technical aspects, Catherine feels that having strong analytical skills, the ability to think on

her feet, plus being good with numbers, are traits which have served her well in such moments.

Looking to the future, Catherine considers the broad digitalisation of the engineering industry to have the greatest impact on her role. She foresees the increased use of digital technology to optimise design, performance and data collection, predictive analytics to forecast and place appropriate risk-management solutions. In addition, the spread of digital finance will improve access to remote and under-banked/unbanked markets, opening up more opportunities in these economies.

To prepare herself to take on a regional lead role, Catherine looks forward to using the Skills Frameworks for specialist programme courses. “I’m interested in learning about how developments in Blockchain, Fintech, Data Analytics and Urban Solutions will help me in my engineering project financing role, as digitalisation continues to evolve the industry.”

“I’m interested in learning about how developments in Blockchain, Fintech, Data Analytics and Urban Solutions will help me in my engineering project financing role.”

## Executive (Project Financing)

### JOB ROLE DESCRIPTION

The Executive (Project Financing) is responsible for performing data gathering and analysis to support project financing activities. He/She prepares financial models and supports the valuation analysis process to achieve project financing delivery. He also performs due diligence and analysis to ensure feasibility of projects and robustness of the project financing process. He contributes to the improvement of business operations.

He is detail-oriented, analytical and is able to work independently. He possesses contractual awareness and risk-management skills, and is able to multi-task in a fast-paced work environment.

	CRITICAL WORK FUNCTIONS	KEY TASKS
CRITICAL WORK FUNCTIONS AND KEY TASKS	Manage project financing scoping	<ul style="list-style-type: none"> <li>• Prepare materials to support origination of new opportunities</li> <li>• Research on industry trends and prepare a database of latest transactions</li> <li>• Support financial risk estimation and contingency planning</li> </ul>
	Conduct financial modelling for projects	<ul style="list-style-type: none"> <li>• Prepare financial model with given parameters and assumptions</li> <li>• Implement stress-test for assessing financial model robustness under various simulations</li> <li>• Improve financial model to allow flexibility in accounting for other variables</li> </ul>
	Manage valuation and quality assurance	<ul style="list-style-type: none"> <li>• Perform valuation exercise and necessary follow-up steps</li> <li>• Apply relevant valuation related standards and guidelines consistent with the purpose of the valuation</li> <li>• Maintain quality and continuous improvement in the valuation process</li> </ul>
	Manage project financing delivery	<ul style="list-style-type: none"> <li>• Analyse financial feasibility and financial impact on stakeholders</li> <li>• Analyse multiple project financing structures</li> <li>• Gather data on potential financiers for sourcing of funds</li> <li>• Perform due diligence and contractual compliance checks for financing deals</li> <li>• Provide necessary support for the preparation of transaction documents</li> <li>• Organise reports required for status updates on project financing</li> </ul>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>• Ensure adherence to planned budgets and financial forecasts</li> <li>• Implement risk management plans and risk controls within the team</li> <li>• Propose improvements to business processes and operations to drive continuous improvement</li> </ul>

## Executive (Project Financing)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Business Negotiation	Level 3	Digital Literacy	Basic
	Business Proposal Writing	Level 3	Sense Making	Basic
	Capital Expenditure and Investment Evaluation	Level 3	Service Orientation	Basic
	Capital Raising	Level 3	Teamwork	Basic
	Change Management	Level 3	Creative Thinking	Intermediate
	Continuous Improvement Management	Level 3		
	Contract Development and Management	Level 4		
	Cost Management	Level 3		
	Data and Statistical Analytics	Level 2		
	Financial Analysis	Level 3		
	Financial Management	Level 2		
	Financial Modelling	Level 3		
	Market Research	Level 3		
	Organisational Risk Management	Level 3		
	Programme Management	Level 2		
	Project Feasibility Assessment	Level 4		
	Project Risk Management	Level 3		
	Stakeholder Management	Level 3		
	Technical Writing	Level 2		
Technology Application	Level 3			
Valuation Approaches and Methodologies	Level 3			
Valuation Conclusion and Reporting	Level 3			
Valuation Research and Analysis	Level 3			

## Senior Executive (Project Financing)

### JOB ROLE DESCRIPTION

The Senior Executive (Project Financing) is responsible for prioritising project financing needs based on profitability, financial risk and organisation capability. He/She refines the project financial model, executes valuation analysis to assess financial feasibility of the project. He develops an ideal financing structure and is responsible for ensuring due diligence and compliance of financing deals. He manages a team of executives and ensures efficient business operations.

He is highly analytical, and possesses risk-management and stakeholder management skills. He possesses knowledge of macroeconomic trends that impact the project financing model and financing structure. He is able to multi-task in a fast-paced environment.

CRITICAL WORK FUNCTIONS AND KEY TASKS	CRITICAL WORK FUNCTIONS	KEY TASKS
	Manage project financing scoping	<ul style="list-style-type: none"> <li>Support project origination activities</li> <li>Draw insights from industry trends and database of transactions</li> <li>Conduct financial risk estimation and contingency planning</li> </ul>
	Conduct financial modelling for projects	<ul style="list-style-type: none"> <li>Validate financial models with given parameters and assumptions</li> <li>Develop stress-test for assessing financial model robustness under various simulations</li> <li>Review financial model flexibility to account for other variables</li> </ul>
	Manage valuation and quality assurance	<ul style="list-style-type: none"> <li>Review valuation results and monitor progress of follow-up steps</li> <li>Review relevant valuation related standards and guidelines to ensure consistency with the purpose of the valuation</li> <li>Ensure quality and continuous improvement in the valuation process</li> </ul>
	Manage project financing delivery	<ul style="list-style-type: none"> <li>Evaluate project financial feasibility and impact on stakeholders</li> <li>Develop optimal project financing structure</li> <li>Identify potential financiers for sourcing of funds</li> <li>Ensure due diligence and contractual compliance of financing deals</li> <li>Prepare transaction documentations required in support of project financing</li> <li>Validate reports for status updates on project financing</li> </ul>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Acquire and allocate resources to support business operations</li> <li>Drive team performance to achieve department goals</li> <li>Identify recruitment needs and areas for technical and business management training and development</li> <li>Analyse financial implications of business strategies to daily operations</li> <li>Develop risk management plans and risk controls in alignment with organisation's risk management framework</li> <li>Analyse viability of proposed continuous improvement initiatives and drive change management</li> </ul>

## Senior Executive (Project Financing)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Budgeting	Level 3	Digital Literacy	Intermediate
	Business Negotiation	Level 4	Problem Solving	Intermediate
	Business Performance Management	Level 3	Sense Making	Intermediate
	Business Presentation Delivery	Level 3	Service Orientation	Intermediate
	Business Proposal Writing	Level 4	Teamwork	Intermediate
	Capital Expenditure and Investment Evaluation	Level 4		
	Capital Raising	Level 4		
	Change Management	Level 4		
	Continuous Improvement Management	Level 4		
	Contract Development and Management	Level 4		
	Cost Management	Level 4		
	Data and Statistical Analytics	Level 3		
	Financial Analysis	Level 4		
	Financial Management	Level 3		
	Financial Modelling	Level 4		
	Learning and Development	Level 3		
	Manpower Planning	Level 3		
	Market Research	Level 3		
	Organisational Resource Management	Level 4		
	Organisational Risk Management	Level 4		
	Programme Management	Level 3		
	Project Feasibility Assessment	Level 4		
	Project Risk Management	Level 4		
	Staff Management	Level 3		
	Stakeholder Management	Level 4		
	Technical Writing	Level 3		
	Technology Application	Level 3		
	Valuation Approaches and Methodologies	Level 4		
	Valuation Conclusion and Reporting	Level 4		
	Valuation Research and Analysis	Level 4		

## Manager (Project Financing)

### JOB ROLE DESCRIPTION

The Manager (Project Financing) is responsible for planning and leading the project financing scoping, modelling and delivery. He/She drives project financing goals in line with organisational goals, closely collaborating with the Project Development team to ensure feasibility and viability of the project. He provides expert advice to internal and external stakeholders on the project financing process, managing negotiations to secure the best terms for project financing purposes. He manages a team of senior executives and ensures efficient business operations.

He keeps abreast of macroeconomic trends and market developments that impact project financing. He is able to interact effectively with internal and external stakeholders, and has excellent analytical and problem solving skills to address complex situations. He is able to multi-task in a fast-paced environment.

CRITICAL WORK FUNCTIONS AND KEY TASKS	CRITICAL WORK FUNCTIONS	KEY TASKS
		Manage project financing scoping
	Conduct financial modelling for projects	<ul style="list-style-type: none"> <li>Drive strategic collaboration with internal functions to ensure accuracy in financial modelling and feasibility analysis</li> <li>Drive stress-testing for assessing financial model robustness</li> <li>Validate financial model flexibility to account for other variables</li> </ul>
	Manage valuation and quality assurance	<ul style="list-style-type: none"> <li>Evaluate impact of valuation on projects and recommend follow-up steps</li> <li>Review relevant valuation related standards and guidelines to ensure consistency with the purpose of the valuation</li> <li>Advocate quality and continuous improvement in the valuation process</li> </ul>
	Manage project financing delivery	<ul style="list-style-type: none"> <li>Advise stakeholders on financial feasibility and financial impact</li> <li>Approve project financing structure</li> <li>Manage negotiations with financiers for sourcing of funds</li> <li>Lead due diligence and contractual compliance checks for financing deals</li> <li>Review transaction documentations required in support of project financing</li> <li>Communicate updates to management on status of project financing</li> </ul>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Develop strategies for resource planning and utilisation</li> <li>Drive department performance to achieve organisational goals</li> <li>Drive talent recruitment and development for the department in alignment with organisational strategy</li> <li>Manage the department's financial inflow and outflow against allocated budgets and forecasts</li> <li>Validate risk management plans and risk controls to ensure compliance with organisation's risk management framework</li> <li>Manage continuous improvement and change management initiatives for time, cost and quality improvements</li> </ul>

## Manager (Project Financing)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Budgeting	Level 4	Creative Thinking
	Business Negotiation	Level 5	Digital Literacy	Advanced
	Business Performance Management	Level 4	Problem Solving	Advanced
	Business Presentation Delivery	Level 4	Resource Management	Advanced
	Business Proposal Writing	Level 4	Sense Making	Advanced
	Capital Expenditure and Investment Evaluation	Level 5		
	Capital Raising	Level 5		
	Change Management	Level 4		
	Continuous Improvement Management	Level 4		
	Contract Development and Management	Level 5		
	Cost Management	Level 5		
	Data and Statistical Analytics	Level 4		
	Financial Analysis	Level 5		
	Financial Management	Level 4		
	Financial Modelling	Level 5		
	Learning and Development	Level 4		
	Manpower Planning	Level 4		
	Market Research	Level 4		
	Organisational Resource Management	Level 5		
	Organisational Risk Management	Level 4		
	Programme Management	Level 4		
	Project Feasibility Assessment	Level 5		
	Project Risk Management	Level 4		
	Staff Management	Level 4		
	Stakeholder Management	Level 4		
	Strategy Development	Level 4		
	Technical Writing	Level 4		
	Technology Application	Level 4		
	Valuation Approaches and Methodologies	Level 5		
	Valuation Conclusion and Reporting	Level 5		
	Valuation Research and Analysis	Level 5		

## Director (Project Financing)

### JOB ROLE DESCRIPTION

The Director (Project Financing) is responsible for spearheading the project financing activities while ensuring alignment with the organisation's financing goals. He/She drives direction and strategy for project financing scoping, valuation analysis and delivery. He is responsible for origination of project financing, and maintains strong links to external stakeholders. He serves as an advisor to clients and stakeholders on project strategy and establishes strong rapport to enhance customer satisfaction.

He keeps abreast of macroeconomic trends and market developments that impact project financing. He is a strategic and creative thinker, and demonstrates exceptional problem-solving capabilities. He possesses excellent analytical, problem solving and leadership skills and encourage teamwork among his team members.

CRITICAL WORK FUNCTIONS AND KEY TASKS	CRITICAL WORK FUNCTIONS	KEY TASKS
		Manage project financing scoping
	Conduct financial modelling for projects	<ul style="list-style-type: none"> <li>• Drive optimal commercial structures for transactions in support of client objectives</li> <li>• Review the results of the financial model for the different commercial structuring options</li> </ul>
	Manage valuation and quality assurance	<ul style="list-style-type: none"> <li>• Overall review of the valuation exercise and benchmarking with industry standards</li> <li>• Approve relevant valuation related standards and guidelines to ensure consistency with the purpose of the valuation</li> <li>• Foster an environment that promotes quality and continuous improvement in the valuation process</li> </ul>
	Manage project financing delivery	<ul style="list-style-type: none"> <li>• Provide expert advice to internal and external stakeholders on financial feasibility and financial impact</li> <li>• Establish strategies to optimise project financing structure</li> <li>• Lead negotiations with financiers for sourcing of funds</li> <li>• Drive comprehensive due diligence and contractual compliance of financing deals</li> <li>• Endorse transaction documentations in adherence to legal and regulatory requirements</li> <li>• Recommend directions to senior management and stakeholders resulting from status of project financing</li> </ul>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>• Establish long-term objectives for the department in alignment with organisation's strategy, vision and mission</li> <li>• Establish the operating and resourcing structure for the department to support business objectives</li> <li>• Establish department-wide performance indicators to ensure achievement of organisational goals</li> <li>• Formulate talent recruitment and development strategies in alignment with organisation's vision, mission and values</li> <li>• Drive sourcing and allocation of budgets for the department's activities</li> <li>• Contribute to the development of the organisation's risk management framework</li> <li>• Drive continuous improvement strategies and change management initiatives at organisation level</li> <li>• Drive strategic partnerships with internal and external stakeholders</li> </ul>

## Director (Project Financing)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Budgeting	Level 5	Communication	Advanced
	Business Negotiation	Level 6	Computational Thinking	Advanced
	Business Performance Management	Level 5	Creative Thinking	Advanced
	Business Presentation Delivery	Level 5	Decision Making	Advanced
	Business Proposal Writing	Level 5	Digital Literacy	Advanced
	Capital Expenditure and Investment Evaluation	Level 6		
	Capital Raising	Level 6		
	Change Management	Level 5		
	Continuous Improvement Management	Level 5		
	Contract Development and Management	Level 6		
	Cost Management	Level 6		
	Data and Statistical Analytics	Level 5		
	Financial Analysis	Level 6		
	Financial Management	Level 5		
	Financial Modelling	Level 6		
	Learning and Development	Level 5		
	Manpower Planning	Level 5		
	Market Research	Level 5		
	Organisational Resource Management	Level 6		
	Organisational Risk Management	Level 5		
	Programme Management	Level 5		
	Project Feasibility Assessment	Level 5		
	Project Risk Management	Level 5		
	Staff Management	Level 5		
	Stakeholder Management	Level 5		
	Strategy Development	Level 5		
	Technology Road Mapping	Level 5		
	Valuation Approaches and Methodologies	Level 6		
	Valuation Conclusion and Reporting	Level 6		
	Valuation Research and Analysis	Level 6		

## Project Development

JOB ROLES	PAGE
Assistant Engineer/Officer (Project Development)	31
Engineer (Project Development)	33
Assistant Manager/ Senior Engineer (Project Development)	35
Manager (Project Development)	37



## Project Manager

Steven Woon Kok How  
AECOM

### COLLABORATIVE PROBLEM-SOLVING

Steven's primary role is in the project management of civil infrastructure engineering projects, including the construction of storm water drainage, water supply pipelines, sewerage and road structures. He is also responsible for reviewing and approving project deliverables to ensure successful project completion. Clients depend on Steven and his team's technical expertise and project management capability to deliver their projects on time and on budget, while managing potential issues relating to work-site safety and environmental impact.

Besides being result-oriented, Steven believes that a good project manager needs to be able to multi-task well—handling client and authorities' requirements alongside design, drawings, report writing, tender preparation and construction supervision.

Apart from strong technical skills, his role also demands strong soft skills, such as those related to communication with both internal and external stakeholders. "Having technical knowledge isn't sufficient if you cannot get team members to cooperate, or if clients are unsatisfied with your proposals." He derives most satisfaction from collaborating with project teams and stakeholders to overcome complex project issues. The construction of Bras Basah MRT Station is a particularly memorable project for Steven.

The project faced difficult conditions such as soft marine clay ground, close proximity to the existing

Singapore Art Museum (SAM), and the ongoing construction of Singapore Management University (SMU). Despite that, Steven's team worked with design consultants, contractors and other relevant stakeholders to come up with an ideal solution that would stabilise the ground, protect SAM's structure and coordinate excavation activities with SMU. "When it comes to endorsing project deliverables, technical reviews are a non-compromise," says Steven.

Apart from getting his Professional Engineer's registration in the near future, Steven is also interested in learning about the digitalisation of work flows to improve accuracy, productivity and communication.

"The Skills Framework allows me to identify important technical skills such as technology application. With the knowledge, I can work out a sustainable development programme to sharpen and supplement my existing skills and competencies, while offering clients innovative solutions," he shares.

"Having technical knowledge isn't sufficient if you cannot get team members to cooperate, or if clients are unsatisfied with your proposals."

## Assistant Engineer/Officer (Project Development)

### JOB ROLE DESCRIPTION

The Assistant Engineer/Officer (Project Development) performs relevant research, data collection and coordination to support opportunity identification, business case development, project specification and planning phases. He/She prepares draft project proposal, project requirements and project plans. He coordinates with internal teams to identify permit requirements and legislative pre-requisites, and gathers data to support project estimation activities. He prepares project-related documentation for internal and external stakeholders.

He preferably has an engineering background and is able to address technical queries that arise during the course of his duties. He is a good team player and comfortable in engaging and interacting with internal and external stakeholders. He is able to multi-task in a fast-paced work environment. He may be expected to travel occasionally and work after office hours.

	CRITICAL WORK FUNCTIONS	KEY TASKS
CRITICAL WORK FUNCTIONS AND KEY TASKS	Drive project origination and development	<ul style="list-style-type: none"> <li>Perform research on markets and customer segments for data on project opportunities and tenders</li> <li>Gather data to support assessment of alternative project solutions</li> <li>Support economic, social and environmental impact assessment for proposed projects</li> <li>Gather data for building business case and project proposals or tender responses</li> </ul>
	Develop project specification	<ul style="list-style-type: none"> <li>Prepare draft project scope, goals and objectives</li> <li>Analyse customer or tender data to prepare draft project requirements</li> <li>Determine relevant internal and external project stakeholders</li> <li>Gather data on permit and approval requirements for compliance with regulatory and legislative prerequisites</li> <li>Record and maintain project-related documentation</li> </ul>
	Conduct project planning and estimation	<ul style="list-style-type: none"> <li>Gather data from technical experts for estimation of project costs, resources and projected cash-flows</li> <li>Support identification of baseline budget, schedules and project success metrics</li> <li>Prepare draft project deliverables and work breakdown structure</li> <li>Support development of project plans for project execution, risk management, quality control and safety management</li> </ul>

## Assistant Engineer/Officer (Project Development)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Building Information Modelling Application	Level 3	Communication	Basic
	Business Negotiation	Level 3	Computational Thinking	Basic
	Business Proposal Writing	Level 3	Teamwork	Basic
	Continuous Improvement Management	Level 2	Interpersonal Skills	Intermediate
	Data and Statistical Analytics	Level 2	Problem Solving	Intermediate
	Environmental Management System Framework Development and Implementation	Level 2		
	Hazards and Risk Identification and Management	Level 2		
	Market Research	Level 3		
	Programme Management	Level 1		
	Project Risk Management	Level 3		
Stakeholder Management	Level 3			
Technical Writing	Level 2			
Technology Application	Level 2			

## Engineer (Project Development)

### JOB ROLE DESCRIPTION

The Engineer (Project Development) is responsible for driving project development activities. He/She identifies potential project opportunities, evaluates their feasibility and prepares a business case for proposed projects. He works closely with internal and external stakeholders to develop project specifications, project estimation and project plans. He serves as a key interface between business and finance for key project needs. He also ensures periodic updates to project related documentation. He manages a team of officers and contributes to the improvement of business operations.

He is preferably a trained engineer and is able to address technical queries that arise during the course of his duties. He is a good team player and comfortable in engaging and interacting with internal and external stakeholders. He possesses problem-solving and project management skills, and is able to multi-task in a fast-paced work environment. He may be expected to travel occasionally and work after office hours.

CRITICAL WORK FUNCTIONS AND KEY TASKS	CRITICAL WORK FUNCTIONS	KEY TASKS
	Drive project origination and development	<ul style="list-style-type: none"> <li>Conduct analysis on economic and market trends to support project origination opportunities</li> <li>Conduct risk and feasibility analysis for evaluation of proposed projects</li> <li>Analyse markets and customer segments for potential project opportunities and tenders</li> <li>Assess alternative project solutions based on technical and commercial value propositions</li> <li>Conduct economic, social and environmental impact assessment for proposed projects</li> <li>Develop business case and project proposals or tender responses</li> </ul>
	Develop project specification	<ul style="list-style-type: none"> <li>Define the project scope, goals and objectives</li> <li>Define project requirements and project constraints</li> <li>Define an outreach plan for relevant internal and external project stakeholders</li> <li>Determine permit and approval requirements for compliance with regulatory and legislative prerequisites</li> <li>Develop project specification documentation</li> </ul>
	Conduct project planning and estimation	<ul style="list-style-type: none"> <li>Develop quantitative estimates for project cost, resources and projected cash-flows in consultation with technical experts</li> <li>Define baseline budget, schedule and project success metrics</li> <li>Define project deliverables and work breakdown structures</li> <li>Set up project team and outline their roles and responsibilities</li> <li>Develop integrated project plans for project execution, risk management, quality control and safety management</li> </ul>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Monitor resource availability to support business operations</li> <li>Monitor employee performance by utilising performance management systems</li> <li>Provide inputs on team's recruitment, training and development needs</li> <li>Ensure adherence to planned budgets and financial forecasts</li> <li>Implement risk management plans and risk controls within the team</li> <li>Propose improvements to business processes and operations to drive continuous improvement</li> </ul>

## Engineer (Project Development)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Building Information Modelling Application	Level 3	Computational Thinking
	Business Negotiation	Level 3	Communication	Intermediate
	Business Presentation Delivery	Level 3	Teamwork	Intermediate
	Business Proposal Writing	Level 3	Interpersonal Skills	Intermediate
	Change Management	Level 3	Problem Solving	Intermediate
	Civil and Structural Engineering Management	Level 4		
	Continuous Improvement Management	Level 3		
	Contract Development and Management	Level 4		
	Cost Management	Level 3		
	Data and Statistical Analytics	Level 3		
	Electrical Engineering Management	Level 3		
	Environmental Management System Framework Development and Implementation	Level 3		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 3		
	Instrumentation and Control Design Engineering Management	Level 3		
	Learning and Development	Level 2		
	Manpower Planning	Level 3		
	Market Research	Level 3		
	Mechanical Engineering Management	Level 3		
	Organisational Resource Management	Level 4		
	Organisational Risk Management	Level 3		
	Programme Management	Level 2		
	Project Feasibility Assessment	Level 4		
	Project Risk Management	Level 3		
	Staff Management	Level 3		
	Stakeholder Management	Level 3		
	Technical Writing	Level 3		
	Technology Application	Level 3		

## Assistant Manager/Senior Engineer (Project Development)

### JOB ROLE DESCRIPTION

The Assistant Manager /Senior Engineer (Project Development) is responsible for ensuring the integrity of the project development activities. He/She reviews the business case, project proposal and tender response for capitalising on new opportunities. He validates the project specification and estimations, and ensures compliance with legislative pre-requisites. He also ensures that project execution plans and risk management plans are in line with the organisation's risk management policies and procedures. He drives collaboration with internal and external stakeholders on key project development matters. He manages a team of engineers and ensures efficient business operations.

He is preferably a trained engineer and is able to address technical queries that arise during the course of his duties. He is conversant with the industry, company clientele, competitors and contractors. He possesses analytical, problem-solving and stakeholder management skills to resolve issues that arise in the course of work. He may be expected to travel occasionally and work after office hours.

CRITICAL WORK FUNCTIONS AND KEY TASKS	CRITICAL WORK FUNCTIONS	KEY TASKS
		Drive project origination and development
	Develop project specification	<ul style="list-style-type: none"> <li>Review the project scope, goals and objectives</li> <li>Review project requirements and project constraints</li> <li>Collaborate with relevant internal and external project stakeholders to drive project development activities</li> <li>Review permit and approval requirements for compliance with regulatory and legislative prerequisites</li> <li>Verify accuracy and quality of project specification documentation</li> </ul>
	Conduct project planning and estimation	<ul style="list-style-type: none"> <li>Review quantitative estimates for project cost, resources and projected cash-flows</li> <li>Manage internal and external stakeholder buy-in on baseline budget, schedules and project success metrics</li> <li>Liaise with stakeholders to optimise project deliverables and work breakdown structures</li> <li>Oversee project staffing and acquisition of project team members</li> <li>Review integrated project plans for project execution, risk management, quality control and safety management</li> </ul>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Acquire and allocate resources to support business operations</li> <li>Drive team performance to achieve department goals</li> <li>Identify recruitment needs and areas for technical and business management training and development</li> <li>Analyse financial implications of business strategies to daily operations</li> <li>Develop risk management plans and risk controls in alignment with organisation's risk management framework</li> <li>Analyse viability of proposed continuous improvement initiatives and drive change management</li> </ul>

## Assistant Manager/Senior Engineer (Project Development)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Budgeting	Level 3	Communication
	Building Information Modelling Application	Level 4	Teamwork	Advanced
	Business Negotiation	Level 4	Decision Making	Advanced
	Business Performance Management	Level 3	Computational Thinking	Advanced
	Business Presentation Delivery	Level 4	Problem Solving	Advanced
	Business Proposal Writing	Level 4		
	Change Management	Level 4		
	Civil and Structural Engineering Management	Level 4		
	Continuous Improvement Management	Level 4		
	Contract Development and Management	Level 4		
	Cost Management	Level 4		
	Data and Statistical Analytics	Level 3		
	Electrical Engineering Management	Level 3		
	Environmental Management System Framework Development and Implementation	Level 4		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 4		
	Instrumentation and Control Design Engineering Management	Level 3		
	Learning and Development	Level 3		
	Manpower Planning	Level 4		
	Market Research	Level 4		
	Mechanical Engineering Management	Level 3		
	Organisational Resource Management	Level 4		
	Organisational Risk Management	Level 4		
	Programme Management	Level 3		
	Project Feasibility Assessment	Level 4		
	Project Risk Management	Level 4		
	Staff Management	Level 4		
	Stakeholder Management	Level 4		
	Technical Writing	Level 3		
	Technology Application	Level 3		

## Manager (Project Development)

### JOB ROLE DESCRIPTION

The Manager (Project Development) is responsible for spearheading project development strategies and plans. He/She leads project development from opportunity identification to project conceptualisation and planning. He establishes strategic relationships with internal and external stakeholders to ensure smooth project development activities, and solicits requisite approvals and permits. He leads the project specification, estimation and planning activities and also ensures project risk management. He manages a team of senior engineers and ensures efficient business operations.

He is an experienced professional, preferably a trained engineer, and is able to address technical queries that arise during the course of his duties. He is conversant with the industry, company clientele, competitors and contractors. He is highly analytical, enjoys solving challenging problems, and is able to lead others effectively. He may be expected to travel occasionally and work after office hours.

CRITICAL WORK FUNCTIONS AND KEY TASKS	CRITICAL WORK FUNCTIONS	KEY TASKS
		Drive project origination and development
	Develop project specification	<ul style="list-style-type: none"> <li>Approve the project scope, goals and objectives</li> <li>Endorse project requirements and project constraints</li> <li>Drive strategic partnerships with relevant internal and external project stakeholders</li> <li>Formulate solutions to ensure compliance with regulatory and legislative prerequisites</li> <li>Endorse project specification documentation</li> </ul>
	Conduct project planning and estimation	<ul style="list-style-type: none"> <li>Drive collaboration with internal and external stakeholders for project estimation and cash flow projection</li> <li>Lead stakeholder engagements for sign-off on baseline budget, schedule and project success metrics</li> <li>Endorse project deliverables and work breakdown structure to optimise project efficiency and performance</li> <li>Formulate strategies to optimise project staffing and acquisition of project team members</li> <li>Approve integrated project plans for project execution, risk management, quality control and safety management</li> </ul>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Develop strategies for resource planning and utilisation</li> <li>Drive department performance to achieve organisational goals</li> <li>Drive talent recruitment and development for the department in alignment with organisational strategy</li> <li>Manage the department's financial inflow and outflow against allocated budgets and forecasts</li> <li>Validate risk management plans and risk controls to ensure compliance with organisation's risk management framework</li> <li>Manage continuous improvement and change management initiatives for time, cost and quality improvements</li> </ul>

## Manager (Project Development)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Budgeting	Level 4	Communication
	Building Information Modelling Application	Level 5	Decision Making	Advanced
	Business Negotiation	Level 5	Problem Solving	Advanced
	Business Performance Management	Level 4	Resource Management	Advanced
	Business Presentation Delivery	Level 4	Leadership	Advanced
	Business Proposal Writing	Level 4		
	Change Management	Level 4		
	Civil and Structural Engineering Management	Level 4		
	Continuous Improvement Management	Level 4		
	Contract Development and Management	Level 5		
	Cost Management	Level 5		
	Data and Statistical Analytics	Level 4		
	Electrical Engineering Management	Level 3		
	Environmental Management System Framework Development and Implementation	Level 5		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 4		
	Instrumentation and Control Design Engineering Management	Level 3		
	Learning and Development	Level 4		
	Manpower Planning	Level 4		
	Market Research	Level 4		
	Mechanical Engineering Management	Level 3		
	Organisational Resource Management	Level 5		
	Organisational Risk Management	Level 4		
	Programme Management	Level 4		
	Project Feasibility Assessment	Level 5		
	Project Risk Management	Level 4		
	Staff Management	Level 4		
	Stakeholder Management	Level 4		
	Strategy Development	Level 4		
	Technical Writing	Level 4		
	Technology Application	Level 4		

## Engineering Procurement

JOB ROLES	PAGE
Assistant Engineer/Officer (Engineering Procurement)	41
Engineer (Engineering Procurement)	43
Senior Engineer (Engineering Procurement)	45
Manager (Engineering Procurement)	47



## Senior Project Manager

Hema Latha D/O Kathikaybala  
Double-Trans Pte Ltd

### SOURCING GLOBALLY IN A DIGITALISED WORLD

Hema is a Senior Project Manager at Double-Trans, specialising in the maintenance of roads. With a background in Civil Engineering, her role is operational in nature and sees her working on-site, 70% of the time. There, she acts as a bridge between the design and operations team, ensuring that the work is done according to designs based on specific calculations. She also liaises and informs the design team when plans need to be adapted, such as when unexpected on-site conditions and requirements, including equipment failure, or obstacles, such as road heave from tree roots, arise.

Part of Hema's job pertains to procurement of the necessary materials and equipment for projects, and that requires her to research and scope out "the best quality products for the best prices". On top of that, she needs to manage suppliers and their contracts.

While she notes that Singaporean businesses tend to stick to local suppliers based on prior knowledge and familiarity, Hema observes that the engineering procurement industry's exposure to the global markets from China, Europe and even India is growing. "Some supplier markets used to be less popular due to risks in quality verification, and time delays in shipping. However, developments in technology have meant that the global supply network is evolving with speedy processing capabilities and growing amounts of source-to-end data availability. Relevant knowledge to leverage on these developments have enabled us to procure from a wider range of suppliers."

These changes mean that engineers like Hema increasingly lean towards agile sourcing strategies that emphasise the entire life-cycle of a product, from design to development and forecasted disposal—as a means of managing risk.

Incorporating new technology, suppliers and risk strategies means that budgeting and financial projections are a growing part of Hema's role—one that will expand as she progresses to the level of a director. She hopes to widen her scope by learning more about management-level procurement: "The Skills Framework helps me in identifying finance and technology-related skills such as Procurement Coordination and Policy Development, and Internet of Things management. This allows me to seek out relevant courses that will put me in stronger standing moving forward."

"The Skills Framework helps me in identifying finance and technology-related skills. This allows me to seek out relevant courses that will put me in stronger standing moving forward."

## Assistant Engineer/Officer (Engineering Procurement)

### JOB ROLE DESCRIPTION

The Assistant Engineer / Officer (Engineering Procurement) is responsible for providing administrative support for procurement activities. He/She coordinates with internal teams to gather requirements for procurement, interfaces with vendors for managing delivery schedules, and prepares purchase orders. He maintains documents and reports schedules material purchases and deliveries and performs verification of current inventory.

He is comfortable in engaging and interacting with internal and external stakeholders, and is able to multi-task in a fast-paced work environment.

	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Develop sourcing strategy	<ul style="list-style-type: none"> <li>Highlight sourcing issues arising from procurement activities</li> <li>Draft sourcing schedules based on project plans</li> <li>Maintain sourcing documentation in the procurement management systems</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Building Control Act</li> </ul> <i>*Performance Expectations are non-exhaustive and subject to prevailing regulations</i>
	Oversee vendor selection and evaluation processes	<ul style="list-style-type: none"> <li>Support pre-qualification and assessment for vendor selection</li> <li>Prepare bid solicitations based on pre-qualification and assessment criteria for vendor selection</li> <li>Prepare reports on assessments of bids received</li> <li>Draft purchase orders and procurement contracts</li> <li>Maintain vendor information and records</li> </ul>	
	Drive procurement operations	<ul style="list-style-type: none"> <li>Implement procurement policies and workflows</li> <li>Coordinate procurement operations with vendors and stakeholders</li> <li>Initiate and track the status of purchase orders and re-orders to maintain materials and equipment inventory</li> <li>Communicate delivery schedules and product specifications to vendors</li> <li>Process payments to vendors</li> <li>Maintain procurement database and documentation</li> <li>Operate new technology and/or electronic tools and devices</li> </ul>	

## Assistant Engineer/Officer (Engineering Procurement)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Continuous Improvement Management	Level 2	Communication	Basic
	Data and Statistical Analytics	Level 2	Service Orientation	Basic
	Engineering Drawing Interpretation and Management	Level 2	Problem Solving	Basic
	Environmental Management System Framework Development and Implementation	Level 2	Teamwork	Basic
	Inventory Management	Level 3	Digital Literacy	Intermediate
	Materials Inspection	Level 3		
	Procurement Coordination and Policy Development	Level 3		
	Programme Management	Level 1		
	Quality System Management	Level 2		
Technical Writing	Level 2			
Technology Application	Level 2			
Third Party Management	Level 2			

## Engineer (Engineering Procurement)

### JOB ROLE DESCRIPTION

The Engineer (Engineering Procurement) is responsible for conducting procurement activities to support engineering projects. He/She is responsible for developing sourcing proposals and conducting vendor pre-qualification and assessment. He typically has an engineering background and is able to translate project requirements into specifications for materials, equipment and services to procure. He manages a team of officers and contributes to the improvement of business operations.

He is comfortable in engaging and interacting with vendors and other external parties to fulfil his responsibilities in coordinating vendor selection processes, maintaining vendor contract records and databases, and following up on vendors' deliverables.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
	Develop sourcing strategy	<ul style="list-style-type: none"> <li>Analyse effectiveness and efficiency of sourcing strategies</li> <li>Develop sourcing proposals aligned to project plans</li> <li>Prepare vendor category and spend analysis reports</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Building Control Act</li> </ul>
	Oversee vendor selection and evaluation processes	<ul style="list-style-type: none"> <li>Conduct pre-qualification and assessment for vendor selection</li> <li>Clarify bid queries with vendors</li> <li>Review and shortlist bid submissions</li> <li>Develop purchase orders and procurement contracts based on inputs from internal stakeholders</li> <li>Monitor vendor performance</li> </ul>	
	Drive procurement operations	<ul style="list-style-type: none"> <li>Implement procurement policies and workflows to comply with regulatory, safety and quality requirements</li> <li>Clarify product specifications, cost estimation and project logistics</li> <li>Determine materials and equipment inventory levels to support project requirements</li> <li>Ensure vendors' conformance to delivery schedules and product specifications</li> <li>Verify components to ensure adherence to technical specifications and quality requirements upon delivery</li> <li>Approve payments to vendors</li> <li>Monitor data on vendor performance to propose improvements</li> <li>Facilitate the use of technology and/or electronic tools and devices</li> </ul>	
Manage people and organisational function	<ul style="list-style-type: none"> <li>Monitor resource availability to support business operations</li> <li>Monitor team performance by utilising performance management systems</li> <li>Provide inputs on team's recruitment, training and development needs</li> <li>Ensure adherence to planned budgets and financial forecasts</li> <li>Implement risk management plans and risk controls within the team</li> <li>Propose improvements to business processes and operations to drive continuous improvement</li> </ul>		

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

## Engineer (Engineering Procurement)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Building Information Modelling Application	Level 3	Problem Solving
	Business Presentation Delivery	Level 3	Communication	Intermediate
	Change Management	Level 3	Teamwork	Intermediate
	Continuous Improvement Management	Level 3	Creative Thinking	Intermediate
	Contract Development and Management	Level 4	Digital Literacy	Advanced
	Cost Management	Level 3		
	Data and Statistical Analytics	Level 3		
	Engineering Drawing Interpretation and Management	Level 3		
	Environmental Management System Framework Development and Implementation	Level 3		
	Inventory Management	Level 4		
	Learning and Development	Level 2		
	Manpower Planning	Level 3		
	Materials Inspection	Level 3		
	Organisational Resource Management	Level 4		
	Organisational Risk Management	Level 3		
	Procurement Coordination and Policy Development	Level 4		
	Procurement Performance Monitoring	Level 3		
	Programme Management	Level 2		
	Project Risk Management	Level 3		
	Quality System Management	Level 3		
	Staff Management	Level 3		
	Stakeholder Management	Level 3		
	Sustainable Engineering	Level 3		
	Technical Writing	Level 3		
	Technology Application	Level 3		
	Third Party Management	Level 3		

## Senior Engineer (Engineering Procurement)

### JOB ROLE DESCRIPTION

The Senior Engineer (Engineering Procurement) is responsible for managing procurement operations for the organisation's projects. He/She ensures adherence to quality standards in all procurement activities and processes, and further improves the procurement processes by proposing sourcing strategies and suggesting improvement initiatives to enhance the organisation's ability for timely delivery on projects. He manages a team of engineers and ensures efficient business operations.

He typically comes from an engineering background. He is comfortable engaging and interacting with vendors and other external parties to manage the vendor selection and evaluation processes, as well as vendor relationships and performance. As an experienced worker with both engineering and procurement expertise, he may also be called upon to prepare training materials to develop the team's procurement capabilities.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
		Develop sourcing strategy	<ul style="list-style-type: none"> <li>Optimise effectiveness and efficiency of sourcing strategies</li> <li>Liaise with key stakeholders on modifications to sourcing proposals</li> <li>Review vendor category and spend analysis reports to recommend enhancements to sourcing strategies</li> </ul>
	Oversee vendor selection and evaluation processes	<ul style="list-style-type: none"> <li>Review vendor evaluations and recommendation reports</li> <li>Lead bid evaluation and vendor selection processes</li> <li>Review purchase orders and procurement contracts to identify opportunities for driving strategic partnerships</li> <li>Evaluate vendor performance to propose recommendations for future business dealings</li> </ul>	
	Drive procurement operations	<ul style="list-style-type: none"> <li>Ensure procurement policies and workflows comply with regulatory, safety and quality requirements</li> <li>Liaise with project, finance and legal teams to validate product specifications, cost estimation and project logistics</li> <li>Analyse materials and equipment inventory levels to identify future inventory needs</li> <li>Manage non-conformities in delivery schedules and products</li> <li>Advise on alternative equipment, parts and materials</li> <li>Monitor procurement budget and expenditure</li> <li>Analyse historical data to propose changes to procurement policies and workflows</li> <li>Evaluate latest technology trends that can be leveraged to improve productivity and innovation</li> </ul>	
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Acquire and allocate resources to support business operations</li> <li>Drive team performance to achieve department goals</li> <li>Identify recruitment needs and areas for technical and business management training and development</li> <li>Analyse financial implications of business strategies to daily operations</li> <li>Develop risk management plans and risk controls in alignment with organisation's risk management framework</li> <li>Analyse viability of proposed continuous improvement initiatives and drive change management</li> </ul>	

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

## Senior Engineer (Engineering Procurement)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Budgeting	Level 3	Communication
	Building Information Modelling Application	Level 4	Decision Making	Intermediate
	Business Performance Management	Level 3	Problem Solving	Intermediate
	Business Presentation Delivery	Level 4	Leadership	Intermediate
	Change Management	Level 4	Developing People	Intermediate
	Continuous Improvement Management	Level 4		
	Contract Development and Management	Level 4		
	Cost Management	Level 4		
	Data and Statistical Analytics	Level 3		
	Engineering Drawing Interpretation and Management	Level 4		
	Environmental Management System Framework Development and Implementation	Level 4		
	Inventory Management	Level 4		
	Learning and Development	Level 3		
	Manpower Planning	Level 4		
	Materials Inspection	Level 4		
	Organisational Resource Management	Level 4		
	Organisational Risk Management	Level 3		
	Procurement Coordination and Policy Development	Level 4		
	Procurement Performance Monitoring	Level 4		
	Programme Management	Level 3		
	Project Risk Management	Level 4		
	Quality System Management	Level 3		
	Staff Management	Level 4		
	Stakeholder Management	Level 4		
	Sustainable Engineering	Level 3		
	Technical Writing	Level 3		
	Technology Application	Level 3		
	Third Party Management	Level 4		

## Manager (Engineering Procurement)

### JOB ROLE DESCRIPTION

The Manager (Engineering Procurement) leads the procurement function and is responsible for establishing procurement plans, policies and processes required to obtain the materials, equipment and services to deliver on engineering projects. He/She leads improvement initiatives to enhance the procurement process and timeliness of providing the necessary resources to complete projects on schedule. He manages a team of senior engineers and ensures efficient business operations.

He is comfortable engaging and interacting with vendors and other external parties, as the job encompasses a strategic role in selecting new vendors, fostering relationships and managing vendor performance and contract-related processes by liaising with legal and other key stakeholders.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
		Develop sourcing strategy	<ul style="list-style-type: none"> <li>Formulate sourcing strategies to support organisation's projects</li> <li>Drive collaboration with stakeholders for development of sourcing proposals</li> <li>Assess market trends and developments, and optimise sourcing strategies</li> </ul>
	Oversee vendor selection and evaluation processes	<ul style="list-style-type: none"> <li>Develop vendor selection and evaluation workflow and criteria</li> <li>Develop formal bidding processes to facilitate vendor management</li> <li>Endorse long-term vendor contracts pertaining to complex or high-value products and services</li> <li>Develop new vendor relationships</li> </ul>	
	Drive procurement operations	<ul style="list-style-type: none"> <li>Formulate procurement policies and workflows to drive compliance with regulatory, safety and quality requirements</li> <li>Establish strategies to ensure reliability of procurement operations in line with project requirements</li> <li>Forecast materials and equipment inventory needs based on organisation's business needs</li> <li>Oversee procurement budget and key performance indicators</li> <li>Drive implementation of procurement improvement initiatives</li> <li>Lead technology application to improve productivity and innovation</li> </ul>	
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Develop strategies for resource planning and utilisation</li> <li>Drive department performance to achieve organisational goals</li> <li>Drive talent recruitment and development for the department in alignment with organisational strategy</li> <li>Manage the department's financial inflow and outflow against allocated budgets and forecasts</li> <li>Validate risk management plans and risk controls to ensure compliance with organisation's risk management framework</li> <li>Manage continuous improvement and change management initiatives for time, cost and quality improvements</li> </ul>	

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

## Manager (Engineering Procurement)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Budgeting	Level 4	Decision Making	Advanced
	Building Information Modelling Application	Level 5	Communication	Advanced
	Business Performance Management	Level 4	Leadership	Advanced
	Business Presentation Delivery	Level 4	Problem Solving	Advanced
	Change Management	Level 4	Developing People	Advanced
	Continuous Improvement Management	Level 4		
	Contract Development and Management	Level 5		
	Cost Management	Level 5		
	Data and Statistical Analytics	Level 4		
	Engineering Drawing Interpretation and Management	Level 5		
	Environmental Management System Framework Development and Implementation	Level 5		
	Inventory Management	Level 5		
	Learning and Development	Level 4		
	Manpower Planning	Level 4		
	Materials Inspection	Level 4		
	Organisational Resource Management	Level 5		
	Organisational Risk Management	Level 4		
	Procurement Coordination and Policy Development	Level 5		
	Procurement Performance Monitoring	Level 5		
	Programme Management	Level 4		
	Project Risk Management	Level 4		
	Quality System Management	Level 4		
	Staff Management	Level 4		
	Stakeholder Management	Level 4		
	Strategy Development	Level 4		
	Sustainable Engineering	Level 3		
	Technical Writing	Level 4		
	Technology Application	Level 4		
	Third Party Management	Level 5		

## Engineering Design

JOB ROLES	PAGE
Junior Designer (Engineering Design)	51
Designer (Engineering Design)	53
Engineer (Engineering Design)	55
Senior Engineer (Engineering Design)	58
Principal Engineer/Manager (Engineering Design)	61



## Principal Geotech Engineer (Civil & Structural)

Vincent Voon

Meinhardt Singapore Pte Ltd

### BREAKING NEW GROUNDS WITH TECHNOLOGY

As Principal Geotechnical Engineer, Vincent helps provide design consultancy for geotechnical work such as building foundations, basement excavations, ground improvements and other civil and infrastructure works. He enjoys challenging his design and technical skills when working with different sites, and is most excited by the applications of modern technologies and software to civil and structural engineering.

One memorable project for Vincent was applying computer-aided design to overcome complex ground conditions for deep basement excavation works—all while maintaining high efficiency and operational safety. He shares: "It is important to be innovative in our line of work - we managed to devise a solution for the job with the help of 2 different software programmes."

Vincent also expressed that the assignment while complicated, was a learning experience. It required him to input the codes into the program that would expedite the modelling process, and improved his interpretation of modelling results, valuable skills that would help him make informed decisions in assessing the impact of excavations to adjacent building structures.

As the developer for Meinhardt Singapore's standard design procedure and methodology, Vincent organises learning and knowledge-sharing sessions that demonstrate the use of design software, to upskill his team. He often attends geotechnical and building structure software learning sessions to improve his technical and project management skills. The Skills Framework will be useful in helping him assess the

pathways and development of his career, especially as he intends to further upgrade himself by earning a Master's Degree in Civil Engineering (Geotechnical).

A passionate go-getter, Vincent is also applying for his Professional Engineer's certification in both Civil and Specialist Geotechnical Engineering, which can help him progress to become a Technical Director.

As Vincent's role involves not just the technical aspects of advanced construction and workload supervision, but a substantial amount of coordination with stakeholders ranging from governing authorities, architects, and more, he therefore considers good communication and detailed planning skills as priorities. "The Skills Framework highlights generic skills on top of technical skills, allowing industry practitioners to also understand the importance of the "softer" skills required to build a strong career in the Engineering Services sector."

"The Skills Framework highlights generic skills on top of technical skills, allowing industry practitioners to also understand the importance of the "softer" skills required to build a strong career in the Engineering Services sector."

## Junior Designer (Engineering Design)

### JOB ROLE DESCRIPTION

The Junior Designer (Engineering Design) assists with development of technical drawings and models based on pre-defined specifications and engineering calculations. He/She interprets engineering calculations and uses multiple design software and modelling methods for preparation of drawings and designs. He complies with Design for Safety (DfS) regulations and adheres to industry standards and conventions in technical drawings. He also maintains design databases and documentations.

He is meticulous and detail-oriented, and is able to adhere precisely to calculations, regulations and specifications involving engineering design. He possesses good analytical and time management skills, and is able to multi-task in a fast-paced work environment.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*	
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Develop technical drawings and engineering designs	<ul style="list-style-type: none"> <li>Interpret engineering calculations to support product and system designs</li> <li>Assist with creation of design drawings, schematics and layouts based on design specifications</li> <li>Assist with creation of 3D models based on design specifications</li> <li>Adopt industry standards and international conventions in drawings and models</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Fire Safety Act</li> </ul>
	Support advanced analytics and big data	<ul style="list-style-type: none"> <li>Maintain design database and documentation</li> <li>Assist with preparation of technical and business reports based on data analysis findings</li> </ul>	
	Implement sustainable design initiatives	<ul style="list-style-type: none"> <li>Comply with relevant regulations and standards for sustainability in engineering designs</li> <li>Gather data for sustainable design and product innovations</li> <li>Support implementation of sustainable design initiatives</li> </ul>	
	Adhere to Design for Safety (DfS) regulations	<ul style="list-style-type: none"> <li>Highlight foreseeable design risks during design and planning phase</li> <li>Gather relevant safety information for design, construction and maintenance manuals</li> <li>Record data related to design risks and modifications</li> </ul>	

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

## Junior Designer (Engineering Design)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	3D Modelling	Level 2	Teamwork	Advanced
	Continuous Improvement Management	Level 2	Digital Literacy	Basic
	Data and Statistical Analytics	Level 1	Computational Thinking	Basic
	Design for Safety	Level 3	Communication	Basic
	Engineering Drawing and Design Specification	Level 2	Lifelong Learning	Basic
	Engineering Drawing Interpretation and Management	Level 1		
	Environmental Management System Framework Development and Implementation	Level 1		
	Hazards and Risk Identification and Management	Level 1		
	Programme Management	Level 1		
	Quality System Management	Level 2		
	Sustainable Engineering	Level 3		
	Technical Writing	Level 2		
Technology Application	Level 2			
Workplace Safety and Health Framework Development and Implementation	Level 1			

## Designer (Engineering Design)

### JOB ROLE DESCRIPTION

The Designer (Engineering Design) develops technical drawings and models based on pre-defined specifications and engineering calculations. He/She interprets engineering calculations and uses design software and modelling methods for preparation of drawings and designs. He identifies relevant design data and highlights design issues where applicable. He also complies with Design for Safety (DfS) regulations and ensures compliance with industry standards and international conventions.

He possesses high detail-orientation and adheres to engineering calculations, regulations and specifications involved in engineering designs. He possesses good analytical, problem-solving and visualisation skills, and is able to multi-task in a fast-paced work environment.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
	Develop technical drawings and engineering designs	<ul style="list-style-type: none"> <li>Interpret engineering calculations for dimensioning in technical drawings to support product and system designs</li> <li>Create design drawings, schematics and layouts for feasibility, practicability, and completion timeframe</li> <li>Create 3D models based on design specifications</li> <li>Highlight design and engineering gaps in technical drawings and designs</li> <li>Ensure compliance with industry standards and international conventions in drawings and models</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Fire Safety Act</li> </ul> <i>*Performance Expectations are non-exhaustive and subject to prevailing regulations</i>
	Employ advanced analytics and big data	<ul style="list-style-type: none"> <li>Source design data from databases and/or existing designs</li> <li>Prepare technical and business reports based on data analysis findings</li> </ul>	
	Implement sustainable design initiatives	<ul style="list-style-type: none"> <li>Identify relevant regulations and standards for sustainability in engineering designs</li> <li>Conduct research for sustainable design and product innovations</li> <li>Support implementation of sustainable design initiatives</li> </ul>	
	Adhere to Design for Safety (DfS) regulations	<ul style="list-style-type: none"> <li>Propose modifications to design plans to reduce design risks</li> <li>Provide relevant safety information in design, construction and maintenance manuals</li> <li>Maintain DfS records of key decisions made with respect to design risks and modifications</li> </ul>	

## Designer (Engineering Design)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	3D Modelling	Level 3	Digital Literacy	Intermediate
	Continuous Improvement Management	Level 2	Teamwork	Advanced
	Data and Statistical Analytics	Level 2	Virtual Collaboration	Intermediate
	Design for Safety	Level 3	Computational Thinking	Basic
	Engineering Drawing and Design Specification	Level 3	Communication	Basic
	Engineering Drawing Interpretation and Management	Level 2		
	Environmental Management System Framework Development and Implementation	Level 2		
	Hazards and Risk Identification and Management	Level 2		
	Programme Management	Level 2		
	Quality System Management	Level 2		
	Sustainable Engineering	Level 3		
Technical Writing	Level 2			
Technology Application	Level 2			
Workplace Safety and Health Framework Development and Implementation	Level 2			

## Engineer (Engineering Design)

### JOB ROLE DESCRIPTION

The Engineer (Engineering Design) develops conceptual, basic and detailed engineering designs based on project requirements. He/She develops front-end engineering design packages and participates in feasibility reviews. He executes engineering calculations to develop technical design specifications. He reviews technical drawings, plans, schematics and material requisition specifications. He also ensures that engineering designs are sustainable and compliant with Design for Safety (DfS) and other regulations. He manages a team of engineering designers and contributes to the improvement of business operations.

He is meticulous and detail-oriented. He possesses excellent mathematical, analytical and problem-solving skills. His duties may require him to work on-site to ensure alignment of construction works to engineering designs.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
	Develop technical drawings and engineering designs	<ul style="list-style-type: none"> <li>Develop conceptual designs and Front-end Engineering and Design (FEED) packages based on project requirements</li> <li>Execute system design calculations to ascertain equipment specifications</li> <li>Develop detailed design including schematics, technical specifications, test plans, and material requisition</li> <li>Review design drawings and 3D models for feasibility, practicability, and completion timeframe</li> <li>Resolve design and engineering gaps with stakeholders</li> <li>Evaluate applicability of industry standards and international conventions in drawings</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Fire Safety Act</li> </ul>
	Employ advanced analytics and big data	<ul style="list-style-type: none"> <li>Assist in establishing design-related hypotheses for testing through data analysis</li> <li>Specify appropriate advanced analytical techniques to create information which supports decision-making</li> <li>Evaluate data analysis findings for technical and business reports</li> <li>Present data analysis results, and technical and business reports to relevant stakeholders</li> </ul>	
	Implement sustainable design initiatives	<ul style="list-style-type: none"> <li>Review design solutions taking into consideration their social, environmental and economic impact</li> <li>Conduct environmental impact assessment and lifecycle cost and benefits analyses for products and systems</li> <li>Recommend environmentally and economically preferable designs and solutions</li> <li>Recommend enhancements to engineering designs to reduce waste and increase efficient use of resources</li> <li>Recommend sustainable design initiatives</li> </ul>	
	Adhere to Design for Safety (DfS) regulations	<ul style="list-style-type: none"> <li>Identify and eliminate foreseeable risks during design and planning phases</li> <li>Ensure relevant safety information for design, construction and maintenance are available to stakeholders</li> <li>Review DfS records in accordance with DfS regulations</li> </ul>	
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Monitor resource availability to support business operations</li> <li>Monitor employee performance by utilising performance management systems</li> <li>Provide inputs on team's recruitment, training and development needs</li> <li>Ensure adherence to planned budgets and financial forecasts</li> <li>Implement risk management plans and risk controls within the team</li> <li>Propose improvements to business processes and operations to drive continuous improvement</li> </ul>	
		*Performance Expectations are non-exhaustive and subject to prevailing regulations	

## Engineer (Engineering Design)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		3D Modelling	Level 4	Problem Solving
	Artificial Intelligence Application	Level 3	Creative Thinking	Intermediate
	Building Information Modelling Application	Level 3	Digital Literacy	Intermediate
	Business Presentation Delivery	Level 3	Sense Making	Intermediate
	Change Management	Level 3	Teamwork	Advanced
	Civil and Structural Engineering Management	Level 4		
	Continuous Improvement Management	Level 3		
	Cost Management	Level 3		
	Data and Statistical Analytics	Level 3		
	Design for Safety	Level 4		
	Electrical Engineering Management	Level 3		
	Engineering Drawing and Design Specification	Level 4		
	Engineering Drawing Interpretation and Management	Level 3		
	Engineering Safety Standards Interpretation	Level 3		
	Environmental Management System Framework Development and Implementation	Level 3		
	Front-End Engineering and Design	Level 3		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 3		
	Instrumentation and Control Design Engineering Management	Level 3		
	Learning and Development	Level 2		
	Manpower Planning	Level 3		
	Market Research	Level 3		
	Mechanical Engineering Management	Level 3		
	Organisational Resource Management	Level 4		
	Organisational Risk Management	Level 3		
	Programme Management	Level 3		
	Project Risk Management	Level 3		
	Quality System Management	Level 3		
	Reliability Engineering Management	Level 4		
	Staff Management	Level 3		
	Stakeholder Management	Level 3		
	Sustainable Engineering	Level 4		

## Engineer (Engineering Design)

SKILLS AND COMPETENCIES	Technical Inspection	Level 2
	Technical Writing	Level 3
	Technology Application	Level 3
	Test Planning	Level 4
	Workplace Safety and Health Framework Development and Implementation	Level 3

# Senior Engineer (Engineering Design)

## JOB ROLE DESCRIPTION

The Senior Engineer (Engineering Design) oversees the development of conceptual, basic and detailed engineering designs based on project requirements. He/She provides discipline engineering expertise in feasibility and constructability reviews. He validates engineering calculations, design specifications and other design submittals. He optimises engineering designs from a feasibility and practicability perspective. He leverages advanced data analytics to make key design decisions. He also enhances technical designs for sustainable engineering and compliance with Design for Safety (DfS) regulations. He manages a team of engineers and ensures efficient business operations.

He possesses analytical, problem-solving and stakeholder management skills. He is able to multi-task in a fast-paced work environment, and may be required to work on-site to ensure alignment of construction works to engineering designs.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
Develop technical drawings and engineering designs	<ul style="list-style-type: none"> <li>Review conceptual designs and Front-end Engineering and Design (FEED) packages based on project requirements</li> <li>Review system design calculations and specifications</li> <li>Validate detailed designs including schematics, technical specifications, test plans, and material requisition</li> <li>Validate design drawings and 3D models based on feasibility, practicability, and completion timeframe</li> <li>Advise stakeholders on design and engineering gaps</li> <li>Drive adoption of industry standards and international conventions in drawings</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Fire Safety Act</li> </ul>
Employ advanced analytics and big data	<ul style="list-style-type: none"> <li>Establish design-related hypotheses for testing through data analytics</li> <li>Specify appropriate advanced analytical techniques to create information which supports decision-making</li> <li>Evaluate data analysis findings for technical and business reports</li> <li>Utilise data analytics to make key business decisions</li> </ul>	
Implement sustainable design initiatives	<ul style="list-style-type: none"> <li>Optimise design solutions to mitigate adverse social, environmental and economic impact</li> <li>Evaluate environmental impact assessment and lifecycle cost and benefits analyses for products and services</li> <li>Validate environmentally and economically preferable designs and solutions</li> <li>Advise on methods to enhance engineering designs to optimise resource usage</li> <li>Validate effectiveness of sustainable design initiatives</li> </ul>	
Adhere to Design for Safety (DfS) regulations	<ul style="list-style-type: none"> <li>Validate design plans to ensure mitigation of design risks</li> <li>Conduct DfS review meetings with stakeholders</li> <li>Ensure compliance with DfS regulations</li> </ul>	
Manage people and organisational function	<ul style="list-style-type: none"> <li>Acquire and allocate resources to support business operations</li> <li>Drive team performance to achieve department goals</li> <li>Identify recruitment needs and areas for technical and business management training and development</li> <li>Analyse financial implications of business strategies to daily operations</li> <li>Develop risk management plans and risk controls in alignment with organisation's risk management framework</li> <li>Analyse viability of proposed continuous improvement initiatives and drive change management</li> </ul>	

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

# Senior Engineer (Engineering Design)

TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
3D Modelling	Level 4	Computational Thinking	Advanced
Artificial Intelligence Application	Level 4	Decision Making	Intermediate
Budgeting	Level 3	Digital Literacy	Advanced
Building Information Modelling Application	Level 4	Problem Solving	Advanced
Business Performance Management	Level 3	Transdisciplinary Thinking	Advanced
Business Presentation Delivery	Level 4		
Change Management	Level 4		
Civil and Structural Engineering Management	Level 4		
Continuous Improvement Management	Level 4		
Cost Management	Level 4		
Data and Statistical Analytics	Level 3		
Design for Safety	Level 4		
Electrical Engineering Management	Level 3		
Engineering Drawing and Design Specification	Level 4		
Engineering Drawing Interpretation and Management	Level 4		
Engineering Safety Standards Interpretation	Level 4		
Environmental Management System Framework Development and Implementation	Level 4		
Front-End Engineering and Design	Level 3		
Geotechnical Engineering Management	Level 4		
Hazards and Risk Identification and Management	Level 4		
Instrumentation and Control Design Engineering Management	Level 3		
Learning and Development	Level 3		
Manpower Planning	Level 4		
Market Research	Level 3		
Mechanical Engineering Management	Level 3		
Organisational Resource Management	Level 4		
Organisational Risk Management	Level 3		
Programme Management	Level 4		
Project Risk Management	Level 4		
Quality System Management	Level 3		
Reliability Engineering Management	Level 4		
Staff Management	Level 4		
Stakeholder Management	Level 4		
Sustainable Engineering	Level 4		

## SKILLS AND COMPETENCIES

## Senior Engineer (Engineering Design)

SKILLS AND COMPETENCIES	Technical Inspection	Level 3
	Technical Writing	Level 3
	Technology Application	Level 3
	Test Planning	Level 4
	Workplace Safety and Health Framework Development and Implementation	Level 4

## 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, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
	Develop technical drawings and engineering designs	<ul style="list-style-type: none"> <li>• Approve conceptual designs and Front-end Engineering and Design (FEED) packages based on project requirements</li> <li>• Devise process workflows to execute and approve system designs and engineering calculations</li> <li>• Approve detailed design including schematics, technical specifications, test plans, and material requisition based on technical feasibility and alignment with project requirements</li> <li>• Evaluate performance specification analyses on structures, equipment and systems</li> <li>• Drive cross-team collaborations for resolution of design and engineering gaps</li> <li>• Endorse industry standards and international conventions in technical drawings</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>• Professional Engineers Act and Rules;</li> <li>• Workplace Safety and Health (WSH) Act;</li> <li>• Building Control Act;</li> <li>• Fire Safety Act</li> </ul>
	Employ advanced analytics and big data	<ul style="list-style-type: none"> <li>• Conceptualise new data models and evaluate existing models for suitability</li> <li>• Define areas of focus that can be analysed using advanced methods to support research and development (R&amp;D) in design processes</li> <li>• Provide leadership and guidance for analysis of both internal and external data</li> <li>• Devise methods to leverage advanced analytical findings for strategic decision-making</li> </ul>	

## Principal Engineer/Manager (Engineering Design)

<b>CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS</b>	Implement sustainable design initiatives	<ul style="list-style-type: none"> <li>Formulate strategies to integrate social, environmental and economic considerations in the design processes</li> <li>Endorse environmental impact assessment and lifecycle cost and benefits analyses for products and systems</li> <li>Endorse environmentally and economically preferable designs and solutions</li> <li>Establish innovative solutions for waste reduction and resource optimisation through sustainable designs</li> <li>Drive continuous improvements in sustainable design initiatives</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations
	Adhere to Design for Safety (DfS) regulations	<ul style="list-style-type: none"> <li>Formulate strategies and procedures to manage design risks</li> <li>Lead DfS review meetings with stakeholders</li> <li>Drive organisational compliance with DfS regulations</li> </ul>	
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Develop strategies for resource planning and utilisation</li> <li>Drive department performance to achieve organisational goals</li> <li>Drive talent recruitment and development for the department in alignment with organisational strategy</li> <li>Manage the department's financial inflow and outflow against allocated budgets and forecasts</li> <li>Validate risk management plans and risk controls to ensure compliance with organisation's risk management framework</li> <li>Manage continuous improvement and change management initiatives for time, cost and quality improvements</li> </ul>	

<b>SKILLS AND COMPETENCIES</b>	<b>TECHNICAL SKILLS AND COMPETENCIES</b>		<b>GENERIC SKILLS AND COMPETENCIES (TOP 5)</b>	
	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		

## Principal Engineer/Manager (Engineering Design)

<b>SKILLS AND COMPETENCIES</b>	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	





## Section Manager – Building Services

Galvin Chua

Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd

### MEANINGFUL MENTORSHIP

An Electrical Engineer by training, Galvin is a Senior Associate Director in Beca Singapore and the Section Manager of its Building Services Section.

As Section Manager, Galvin oversees team leaders, job directors and managers on their projects; reviews key milestones, plus financial and resourcing matters to ensure efficient delivery and quality standards. Galvin also leads Beca's Mechanical & Electrical teams at project-level and engages clients to understand their needs, before identifying deliverables for team members to work on.

Galvin considers it imperative to hone his understanding of sustainable design considerations, risk factors and implementation methodologies. These help to elevate his design and technical evaluation capabilities amidst challenges such as growing concerns on environmental impact. "We aim to improve quality of life, work processes and our environment in our work," he quips. He then collaborates with equipment vendors and authorities to evaluate emerging technologies for more sustainable solutions, and recommends these solutions to his clients.

A firm believer in helping others fulfil their full potential, Galvin is also involved in mentoring junior engineers, through Beca's performance development plan. Although a young leader, Galvin credits Beca's 2-year leadership training course with preparing him for the responsibilities. One of his mentees not only won the ACES Young Consulting Female Engineer

of the Year in 2017, but also recently obtained her Professional Engineer's registration.

Galvin hopes to continue developing the next generation to be competent and innovative consulting engineers, and feels that the Skills Framework is a good source to identify courses which can enhance his leadership and mentoring skills. He also feels the Skills Framework can guide companies in identifying clear and distinct career pathways for employees.

Galvin shares, "The Skills Framework allows Beca Singapore to design its internal competency framework, by highlighting existing skill gaps, such as a skill shortage in the training for electrical licensing-related works. Relevant training programmes can then be designed to fill these gaps, lifting the overall competency of the entire team."

"The Skills Framework allows the organisation to design its internal competency framework, by highlighting existing skills gaps. Relevant training programmes can then be designed to fill these gaps, lifting the overall competency of the entire team."

## Technician/Coordinator (Engineering Construction)

### JOB ROLE DESCRIPTION

The Technician/Coordinator (Engineering Construction) assists with supervision of installation and assembly works for equipment, components and systems. He/She coordinates with contractors, prepares technical documents and monitors compliance with quality and safety standards and regulations. He also assists with mechanical completion activities. He specialises in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines.

He is a good team player, interacts effectively with others, and has good coordination skills. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
Manage execution of engineering construction projects	<ul style="list-style-type: none"> <li>Monitor execution of engineering construction activities in line with construction sequence</li> <li>Assist with soliciting required work permits and approvals based on regulatory and legislative prerequisites</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
Oversee installation of equipment, components and systems	<ul style="list-style-type: none"> <li>Assist with monitoring installation and assembly of equipment, components and systems</li> <li>Track incidences of technical deviation from design specifications</li> <li>Coordinate with contractors for engineering construction activities</li> <li>Maintain record of compliance with quality standards and guidelines</li> </ul>	
Conduct mechanical completion activities	<ul style="list-style-type: none"> <li>Support checks and inspections to validate completion of installation in line with project requirements</li> <li>Prepare equipment, components and systems for functional and technical tests</li> <li>Track status of outstanding punch list items</li> <li>Assist in performing compliance checks against applicable codes, regulations and relevant authority requirements</li> <li>Assist in preparation of technical documents for mechanical completion</li> </ul>	
Manage health, safety and environment	<ul style="list-style-type: none"> <li>Comply with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Coordinate with contractors to ensure compliance with the organisational WSH and EMS standards and practices</li> <li>Report accidents and incidents in accordance with WSH and EMS standards and practices</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations

\*Performance Expectations are non-exhaustive and subject to prevailing regulations

## Technician/Coordinator (Engineering Construction)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Continuous Improvement Management	Level 2	Problem Solving
	Data and Statistical Analytics	Level 1	Teamwork	Basic
	Engineering Drawing Interpretation and Management	Level 1	Communication	Intermediate
	Environmental Management System Framework Development and Implementation	Level 1	Digital Literacy	Basic
	Equipment and Systems Testing	Level 2	Interpersonal Skills	Basic
	Hazards and Risk Identification and Management	Level 1		
	Installation and Assembly	Level 2		
	Inventory Management	Level 3		
	Programme Management	Level 1		
	Quality System Management	Level 2		
	Structural Testing	Level 2		
	Technical Inspection	Level 2		
	Technical Writing	Level 2		
	Technology Application	Level 2		
	Third Party Management	Level 2		
	Workplace Safety and Health Culture Development	Level 2		
	Workplace Safety and Health Framework Development and Implementation	Level 1		

## Assistant Engineer/Senior Technician (Engineering Construction)

### JOB ROLE DESCRIPTION

The Assistant Engineer/Senior Technician (Engineering Construction) oversees the installation and assembly of equipment, components and systems. He/She assists with contractor management, prepares technical documents and ensures compliance with quality and safety standards as per external regulations and organisational standards. He also assists with mechanical completion activities. He specialises in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines.

He is a good team player, and interacts effectively with others. He possesses problem-solving and interpersonal skills. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
		Manage execution of engineering construction projects	<ul style="list-style-type: none"> <li>Ensure adherence to construction sequence and project plans for engineering construction activities</li> <li>Solicit required work permits and approvals based on regulatory and legislative prerequisites</li> </ul>
	Oversee installation of equipment, components and systems	<ul style="list-style-type: none"> <li>Monitor installation and assembly of equipment, components and systems</li> <li>Monitor compliance with design specifications for accurate installation and assembly of equipment, components and systems</li> <li>Coordinate with contractors for engineering construction activities</li> <li>Monitor compliance with quality standards and guidelines</li> </ul>	
	Conduct mechanical completion activities	<ul style="list-style-type: none"> <li>Support checks and inspections to validate completion of installation in line with project requirements</li> <li>Schedule functional and technical tests on equipment, components and systems</li> <li>Coordinate with engineering construction teams on closure of outstanding punch list items</li> <li>Perform compliance checks against applicable codes, regulations and authority requirements</li> <li>Prepare technical documents for mechanical completion</li> </ul>	
	Manage health, safety and environment	<ul style="list-style-type: none"> <li>Comply with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Coordinate with contractors to ensure compliance with the organisational WSH and EMS standards and practices</li> <li>Support WSH and EMS accident and incident investigations</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations

## Assistant Engineer/Senior Technician (Engineering Construction)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Continuous Improvement Management	Level 2	Problem Solving
	Data and Statistical Analytics	Level 2	Communication	Intermediate
	Engineering Drawing Interpretation and Management	Level 2	Teamwork	Intermediate
	Environmental Management System Framework Development and Implementation	Level 2	Digital Literacy	Basic
	Equipment and Systems Testing	Level 2	Lifelong Learning	Basic
	Hazards and Risk Identification and Management	Level 2		
	Installation and Assembly	Level 2		
	Internet of Things Management	Level 2		
	Inventory Management	Level 3		
	Programme Management	Level 2		
	Quality System Management	Level 2		
	Robotic and Automation Technology Application	Level 2		
	Structural Testing	Level 2		
	Technical Inspection	Level 2		
	Technical Writing	Level 2		
	Technology Application	Level 2		
	Third Party Management	Level 3		
	Workplace Safety and Health Culture Development	Level 2		
	Workplace Safety and Health Framework Development and Implementation	Level 2		

## Engineer/Supervisor (Engineering Construction)

### JOB ROLE DESCRIPTION

The Engineer/Supervisor (Engineering Construction) provides discipline engineering support to projects on matters related to construction efficiency and installation of equipment, components and systems. He/She oversees the planning and execution of engineering construction, and ensures adherence to cost, time, quality, and safety targets while maintaining compliance with external regulations and organisational standards. He provides technical support for query resolutions and mechanical completion activities. He specialises in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines. He manages a team of technicians and contributes to the improvement of business operations.

He possesses strong problem-solving and interpersonal skills. He possesses planning and supervision skills. He is proactive and takes lead when resolving issues. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
	Manage execution of engineering construction projects	<ul style="list-style-type: none"> <li>Develop construction sequence and project plans for engineering construction activities</li> <li>Provide discipline engineering support for project scoping, procurement and contractor selection</li> <li>Conduct constructability and feasibility reviews for engineering designs</li> <li>Identify required work permits and approvals based on regulatory and legislative prerequisites</li> <li>Implement organisational approaches to resolve conflicts and disputes</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
	Oversee installation of equipment, components and systems	<ul style="list-style-type: none"> <li>Interpret design drawings to oversee installation and assembly of equipment, components and systems</li> <li>Determine technical deviations from design specifications during installation and assembly of equipment, components and systems</li> <li>Monitor contractors' performance on engineering construction activities</li> <li>Communicate quality standards and guidelines to engineering construction teams</li> <li>Provide technical support for root cause analyses and troubleshooting of equipment faults and failures</li> </ul>	
	Conduct mechanical completion activities	<ul style="list-style-type: none"> <li>Conduct checks and inspections to validate completion of installations in line with project requirements</li> <li>Witness functional and technical tests on equipment, components and systems</li> <li>Conduct punch list testing to ensure closure of any outstanding works</li> <li>Ensure compliance with applicable codes, regulations and authority requirements</li> <li>Maintain updated technical documents for mechanical completion</li> </ul>	
	Manage health, safety and environment	<ul style="list-style-type: none"> <li>Ensure compliance with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Ensure that contractors and vendors comply with the organisational WSH and EMS standards and practices</li> <li>Conduct WSH and EMS accident and incident investigations</li> <li>Implement sustainable engineering procedures and guidelines</li> </ul>	

## Engineer/Supervisor (Engineering Construction)

<b>CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS</b>	Manage people and organisational function	<ul style="list-style-type: none"> <li>• Monitor resource availability to support business operations</li> <li>• Monitor employee performance by utilising performance management systems</li> <li>• Provide inputs on team's recruitment, training and development needs</li> <li>• Ensure adherence to planned budgets and financial forecasts</li> <li>• Implement risk management plans and risk controls within the team</li> <li>• Propose improvements to business processes and operations to drive continuous improvement</li> </ul>	<i>*Performance Expectations are non-exhaustive and subject to prevailing regulations</i>

<b>SKILLS AND COMPETENCIES</b>	<b>TECHNICAL SKILLS AND COMPETENCIES</b>		<b>GENERIC SKILLS AND COMPETENCIES (TOP 5)</b>	
		3D Modelling	Level 4	Problem Solving
	Artificial Intelligence Application	Level 3	Communication	Intermediate
	Building Information Modelling Application	Level 3	Teamwork	Advanced
	Business Presentation Delivery	Level 3	Creative Thinking	Basic
	Change Management	Level 3	Interpersonal Skills	Intermediate
	Civil and Structural Engineering Management	Level 4		
	Conflict Resolution	Level 4		
	Continuous Improvement Management	Level 3		
	Cost Management	Level 3		
	Data and Statistical Analytics	Level 3		
	Design for Safety	Level 3		
	Electrical Engineering Management	Level 3		
	Engineering Drawing Interpretation and Management	Level 3		
	Engineering Safety Standards Interpretation	Level 3		
	Environmental Management System Framework Development and Implementation	Level 3		
	Equipment and Systems Testing	Level 3		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 3		
	Installation and Assembly	Level 3		
	Instrumentation and Control Design Engineering Management	Level 3		
	Internet of Things Management	Level 3		
	Inventory Management	Level 4		
	Learning and Development	Level 2		
	Manpower Planning	Level 3		

## Engineer/Supervisor (Engineering Construction)

<b>SKILLS AND COMPETENCIES</b>	Mechanical Engineering Management	Level 3
	Organisational Resource Management	Level 4
	Organisational Risk Management	Level 3
	Programme Management	Level 3
	Project Risk Management	Level 3
	Quality System Management	Level 3
	Robotic and Automation Technology Application	Level 3
	Staff Management	Level 3
	Stakeholder Management	Level 3
	Structural Testing	Level 3
	Sustainable Engineering	Level 3
	Systems Integration	Level 3
	Technical Inspection	Level 3
	Technical Writing	Level 3
	Technology Application	Level 3
	Third Party Management	Level 3
	Workplace Safety and Health Culture Development	Level 3
Workplace Safety and Health Framework Development and Implementation	Level 3	

# Senior Engineer/Assistant Manager (Engineering Construction)

## JOB ROLE DESCRIPTION

The Senior Engineer/Assistant Manager (Engineering Construction) leads discipline engineering support to projects on matters related to construction efficiency and installation of equipment, components and systems. He/She optimises project plans, leads constructability reviews, validates installation and assembly, and manages contractors. He leads mechanical completion activities and coordinates with stakeholders to ensure operational excellence and fulfilment of project requirements, while ensuring compliance with external regulations and organisational standards. He specialises in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines. He manages a team of engineers and ensures efficient business operations.

He possesses strong analytical, project management and problem-solving skills. He possesses leadership and stakeholder management skills. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
Manage execution of engineering construction projects	<ul style="list-style-type: none"> <li>Review construction sequence and project plans to ensure alignment with construction strategies and methods</li> <li>Lead discipline engineering support for project scoping, procurement and contractor selection</li> <li>Lead constructability and feasibility reviews for engineering designs</li> <li>Ensure compliance with required work permits and approvals based on regulatory and legislative prerequisites</li> <li>Ensure mitigation of potential conflicts and disputes using relevant organisational approaches</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
Oversee installation of equipment, components and systems	<ul style="list-style-type: none"> <li>Review installation and assembly of equipment, components and systems</li> <li>Evaluate technical deviations from design specifications to warrant change-out or major overhaul of equipment, components and systems</li> <li>Review contractor performance to ensure alignment with organisational standards and practices</li> <li>Ensure that engineering construction teams operate in accordance with quality standards and guidelines</li> <li>Recommend corrective and preventive measures for equipment faults and failures</li> </ul>	
Conduct mechanical completion activities	<ul style="list-style-type: none"> <li>Ensure resolution of findings from checks and inspections for fulfilment of project requirements</li> <li>Validate functional and technical test results to ensure quality and reliability of equipment, components and systems</li> <li>Lead demonstration and acceptance of pre-checked systems for handover to commissioning and operations</li> <li>Review compliance with applicable codes, regulations and authority requirements</li> <li>Review technical documents for mechanical completion to ensure compliance with organisational procedures</li> </ul>	

# Senior Engineer/Assistant Manager (Engineering Construction)

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	PERFORMANCE EXPECTATIONS*
Manage health, safety and environment	<ul style="list-style-type: none"> <li>Drive departmental plans to ensure compliance with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Review contractors' and vendors' compliance with the organisational WSH and EMS standards and practices</li> <li>Ensure proper closure of WSH and EMS accident and incident investigations and their notifications to relevant authorities</li> <li>Ensure implementation of sustainable engineering procedures and guidelines</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations
Manage people and organisational function	<ul style="list-style-type: none"> <li>Acquire and allocate resources to support business operations</li> <li>Drive team performance to achieve department goals</li> <li>Identify recruitment needs and areas for technical and business management training and development</li> <li>Analyse financial implications of business strategies to daily operations</li> <li>Develop risk management plans and risk controls in alignment with organisation's risk management framework</li> <li>Analyse viability of proposed continuous improvement initiatives and drive change management</li> </ul>	

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	3D Modelling	Level 4	Communication	Advanced
	Artificial Intelligence Application	Level 4	Teamwork	Advanced
	Budgeting	Level 3	Problem Solving	Intermediate
	Building Information Modelling Application	Level 4	Decision Making	Advanced
	Business Performance Management	Level 3	Interpersonal Skills	Intermediate
	Business Presentation Delivery	Level 4		
	Change Management	Level 4		
	Civil and Structural Engineering Management	Level 4		
	Conflict Resolution	Level 4		
	Continuous Improvement Management	Level 4		
	Cost Management	Level 4		
	Data and Statistical Analytics	Level 3		
	Design for Safety	Level 3		
	Electrical Engineering Management	Level 3		
	Engineering Drawing Interpretation and Management	Level 4		
	Engineering Safety Standards Interpretation	Level 4		
	Environmental Management System Framework Development and Implementation	Level 4		
	Equipment and Systems Testing	Level 4		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 4		

## Senior Engineer/Assistant Manager (Engineering Construction)

SKILLS AND COMPETENCIES	Installation and Assembly	Level 4
	Instrumentation and Control Design Engineering Management	Level 3
	Internet of Things Management	Level 4
	Inventory Management	Level 4
	Learning and Development	Level 3
	Manpower Planning	Level 4
	Mechanical Engineering Management	Level 3
	Organisational Resource Management	Level 4
	Organisational Risk Management	Level 3
	Programme Management	Level 4
	Project Risk Management	Level 4
	Quality System Management	Level 3
	Robotic and Automation Technology Application	Level 4
	Staff Management	Level 4
	Stakeholder Management	Level 4
	Structural Testing	Level 3
	Sustainable Engineering	Level 3
	Systems Integration	Level 4
Technical Inspection	Level 3	
Technical Writing	Level 3	
Technology Application	Level 3	
Third Party Management	Level 4	
Workplace Safety and Health Culture Development	Level 4	
Workplace Safety and Health Framework Development and Implementation	Level 4	

## Principal Engineer/Manager (Engineering Construction)

### JOB ROLE DESCRIPTION

The Principal Engineer/Manager (Engineering Construction) acts as a technical advisor to provide problem-solving consultation and discipline engineering expertise for complex projects. He/She drives stakeholder and contractor management, and manages key project metrics for cost, time, quality, risk, safety and environmental impact. He leads mechanical completion activities to ensure compliance with project requirements, regulations, and safety and quality standards in accordance with local and international regulations. He is a professional engineer, specialising in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines. 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 works on-site and is expected to travel occasionally to project locations.

	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Manage execution of engineering construction projects	<ul style="list-style-type: none"> <li>Establish construction strategy and methods for engineering construction activities</li> <li>Provide expert technical advice for project scoping, procurement and contractor selection</li> <li>Provide technical expertise to validate constructability and feasibility reviews for engineering designs</li> <li>Formulate procedures to ensure compliance with work permits and regulatory and legislative prerequisites</li> <li>Drive effective working relationships using appropriate communication protocols, and conflict and dispute resolution mechanisms</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
	Oversee installation of equipment, components and systems	<ul style="list-style-type: none"> <li>Approve installation and assembly of equipment, components and systems</li> <li>Resolve incidences of technical deviation from design specifications using appropriate change plans</li> <li>Implement strategies to optimise contractor performance in line with organisation's standards and practices</li> <li>Collaborate across departments to drive compliance with organisational quality standards and guidelines</li> <li>Provide expert technical recommendations for equipment and system degradation issues to enhance reliability and availability</li> </ul>	
	Conduct mechanical completion activities	<ul style="list-style-type: none"> <li>Drive checks and inspections to guarantee fulfilment of project requirements</li> <li>Endorse functional and technical tests to deliver high quality and reliable installation of equipment, components and systems</li> <li>Collaborate across departments to drive smooth handover to commissioning and operations</li> <li>Drive compliance with applicable codes, regulations and authority requirements</li> <li>Approve technical documents for mechanical completion to ensure compliance with organisational procedures</li> </ul>	

## Principal Engineer/Manager (Engineering Construction)

<b>CRITICAL WORK FUNCTIONS AND KEY TASKS / PERFORMANCE EXPECTATIONS</b>	Manage health, safety and environment	<ul style="list-style-type: none"> <li>Establish departmental plans aligned to organisational strategies and frameworks to drive compliance with Workplace Safety and Health (WSH) and Environmental Management Systems (EMS)</li> <li>Drive contractors' and vendors' compliance with the organisation's WSH and EMS standards and practices</li> <li>Review WSH and EMS accident and incident findings and trends to recommend improvements</li> <li>Drive sustainable engineering strategies, procedures and guidelines</li> </ul>	<i>*Performance Expectations are non-exhaustive and subject to prevailing regulations</i>
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Develop strategies for resource planning and utilisation</li> <li>Drive department performance to achieve organisational goals</li> <li>Drive talent recruitment and development for the department in alignment with organisational strategy</li> <li>Manage the department's financial inflow and outflow against allocated budgets and forecasts</li> <li>Validate risk management plans and risk controls to ensure compliance with organisation's risk management framework</li> <li>Manage continuous improvement and change management initiatives for time, cost and quality improvements</li> </ul>	

<b>SKILLS AND COMPETENCIES</b>	<b>TECHNICAL SKILLS AND COMPETENCIES</b>		<b>GENERIC SKILLS AND COMPETENCIES (TOP 5)</b>	
		3D Modelling	Level 5	Communication
	Artificial Intelligence Application	Level 5	Decision Making	Advanced
	Budgeting	Level 4	Teamwork	Advanced
	Building Information Modelling Application	Level 5	Problem Solving	Advanced
	Business Performance Management	Level 4	Developing People	Advanced
	Business Presentation Delivery	Level 4		
	Change Management	Level 4		
	Civil and Structural Engineering Management	Level 5		
	Conflict Resolution	Level 5		
	Continuous Improvement Management	Level 4		
	Cost Management	Level 5		
	Data and Statistical Analytics	Level 4		
	Design for Safety	Level 3		
	Electrical Engineering Management	Level 4		
	Engineering Drawing Interpretation and Management	Level 5		
	Engineering Safety Standards Interpretation	Level 5		
	Environmental Management System Framework Development and Implementation	Level 5		
	Equipment and Systems Testing	Level 4		
	Geotechnical Engineering Management	Level 5		
	Hazards and Risk Identification and Management	Level 4		

## Principal Engineer/Manager (Engineering Construction)

<b>SKILLS AND COMPETENCIES</b>	Installation and Assembly	Level 5
	Instrumentation and Control Design Engineering Management	Level 4
	Internet of Things Management	Level 4
	Inventory Management	Level 5
	Learning and Development	Level 4
	Manpower Planning	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
	Robotic and Automation Technology Application	Level 5
	Staff Management	Level 4
	Stakeholder Management	Level 4
	Strategy Development	Level 4
	Structural Testing	Level 4
	Sustainable Engineering	Level 3
	Systems Integration	Level 5
	Technical Inspection	Level 4
Technical Writing	Level 4	
Technology Application	Level 4	
Third Party Management	Level 5	
Workplace Safety and Health Culture Development	Level 4	
Workplace Safety and Health Framework Development and Implementation	Level 5	

# Technician/ Coordinator (Commissioning)

## JOB ROLE DESCRIPTION

The Technician/Coordinator (Commissioning) is responsible for coordinating commissioning activities to ensure that all equipment, components and systems are functional and in optimal operating conditions. He/ She works under supervision, supports inspections, testing and documentation of commissioning activities. He complies with statutory policies, procedures and regulations, and adheres to Workplace Health and Safety (WSH) requirements. He specialises in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines.

He is a good team player, interacts effectively with others, and has good coordination skills. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Conduct commissioning planning	<ul style="list-style-type: none"> <li>Identify equipment, systems and assemblies to be commissioned</li> <li>Assist with identification of commissioning requirements</li> <li>Provide inputs on relevant test cases, test wares and test scripts for functional tests</li> </ul>
	Commission equipment, systems and assemblies	<ul style="list-style-type: none"> <li>Coordinate with design teams for review of engineering design submittals</li> <li>Schedule commissioning meetings and site visits</li> <li>Assist in preparation of construction checklists</li> <li>Prepare equipment, systems and assemblies prior to functional and technical tests</li> <li>Schedule surveys, inspections and tests for vendors and external stakeholders</li> <li>Maintain updated commissioning issues log</li> </ul>
	Conduct handover and initial start-up	<ul style="list-style-type: none"> <li>Record data related to commissioning activities and findings</li> <li>Support pre-start-up safety reviews (PSSR)</li> <li>Prepare master list of commissioned equipment, systems and assemblies</li> <li>Support orientation, demonstration and training for owners and operations and maintenance personnel</li> <li>Support commissioning activities during initial start-up and ramp-up periods</li> </ul>
	Manage health, safety and environment	<ul style="list-style-type: none"> <li>Comply with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Coordinate with contractors to ensure compliance with the organisational WSH and EMS standards and practices</li> <li>Report accidents and incidents in accordance with WSH and EMS standards and practices</li> </ul>

In accordance with:

- Workplace Safety and Health (WSH) Act;
- Building Control Act;
- Electricity Act;
- Fire Safety Act

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

# Technician/ Coordinator (Commissioning)

TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
Commissioning and Start-Up Management	Level 2	Problem Solving	Intermediate
Continuous Improvement Management	Level 2	Communication	Intermediate
Data and Statistical Analytics	Level 1	Teamwork	Basic
Engineering Drawing Interpretation and Management	Level 1	Interpersonal Skills	Intermediate
Environmental Management System Framework Development and Implementation	Level 1	Service Orientation	Basic
Equipment and Systems Testing	Level 2		
Hazards and Risk Identification and Management	Level 1		
Programme Management	Level 1		
Quality System Management	Level 2		
Structural Testing	Level 2		
Technical Inspection	Level 2		
Technical Writing	Level 2		
Technology Application	Level 2		
Third Party Management	Level 2		
Workplace Safety and Health Culture Development	Level 2		
Workplace Safety and Health Framework Development and Implementation	Level 1		

## SKILLS AND COMPETENCIES

# Assistant Engineer/ Senior Technician (Commissioning)

## JOB ROLE DESCRIPTION

The Assistant Engineer/Senior Technician (Commissioning) assists with commissioning activities including inspection, testing, handover and initial start-up. He/She determines commissioning requirements and test cases. He tracks commissioning issues and prepares the commissioning reports. He provides administrative support for hand-over and start-up. He ensures compliance with external regulations and organisational standards, and adheres to Workplace Health and Safety (WSH) requirements. He specialises in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines.

He is a good team player, and interacts effectively with others. He has problem-solving and interpersonal skills. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
	Conduct commissioning planning	<ul style="list-style-type: none"> <li>Perform basic commissioning scoping and scheduling activities</li> <li>Propose commissioning and resourcing plans</li> <li>Determine commissioning requirements based on project specifications and regulatory requirements</li> <li>Identify test cases, test wares and test scripts for functional tests</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
	Commission equipment, systems and assemblies	<ul style="list-style-type: none"> <li>Support review of engineering design submittals to ensure compliance with the owner's project requirements (OPR)</li> <li>Participate in commissioning meetings and site visits</li> <li>Prepare construction checklists</li> <li>Support execution of functional and technical tests to ensure quality and reliability of equipment, systems and assemblies</li> <li>Participate in surveys, inspections and tests conducted by vendors and external stakeholders</li> <li>Update commissioning issues logs to record commissioning items that do not comply with the OPR</li> </ul>	
	Conduct handover and initial start-up	<ul style="list-style-type: none"> <li>Prepare commissioning report documenting all commissioning activities and findings</li> <li>Support pre-start-up safety review (PSSR)</li> <li>Prepare operational equipment, systems and assemblies for hand-over to approved personnel</li> <li>Determine training requirements for owners and operations and maintenance personnel</li> <li>Support commissioning activities during initial start-up and ramp-up period</li> </ul>	
Manage health, safety and environment	<ul style="list-style-type: none"> <li>Comply with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Coordinate with contractors to ensure compliance with the organisational WSH and EMS standards and practices</li> <li>Support WSH and EMS accident and incident investigations</li> </ul>		

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

# Assistant Engineer/ Senior Technician (Commissioning)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Commissioning and Start-Up Management	Level 2	Communication	Intermediate
	Continuous Improvement Management	Level 2	Problem Solving	Intermediate
	Data and Statistical Analytics	Level 2	Interpersonal Skills	Intermediate
	Engineering Drawing Interpretation and Management	Level 2	Teamwork	Intermediate
	Environmental Management System Framework Development and Implementation	Level 2	Service Orientation	Basic
	Equipment and Systems Testing	Level 2		
	Hazards and Risk Identification and Management	Level 2		
	Programme Management	Level 2		
	Quality System Management	Level 2		
	Structural Testing	Level 2		
	Technical Inspection	Level 2		
	Technical Writing	Level 2		
	Technology Application	Level 2		
Third Party Management	Level 3			
Workplace Safety and Health Culture Development	Level 2			
Workplace Safety and Health Framework Development and Implementation	Level 2			

# Engineer/Supervisor (Commissioning)

## JOB ROLE DESCRIPTION

The Engineer/Supervisor (Commissioning) is responsible for overseeing commissioning activities from planning to hand-over and initial start-up. He engages with the project owner to develop owner's project requirements (OPR) and commissioning plans. He conducts commissioning-focused reviews, inspections, site-visits and tests to validate the quality, safety, and reliability of engineering construction. He conducts pre-start-up safety reviews to ensure smooth handover to project owner. He ensures compliance, risk and safety in accordance with external regulations and organisational standards. He manages a team of technicians and contributes to the improvement of business operations.

He possesses strong analytical and problem-solving skills, and interacts effectively with stakeholders. He possesses strong planning and supervision skills, is proactive and takes lead when resolving issues. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
Conduct commissioning planning	<ul style="list-style-type: none"> <li>Develop owner's project requirements (OPR) and success criteria for the project</li> <li>Define the commissioning scope, schedule and budget</li> <li>Develop commissioning plans, communication protocols and resourcing plans</li> <li>Ensure communication of commissioning requirements across project teams</li> <li>Develop testing procedures and test data forms including test prerequisites and acceptance criteria</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
Commission equipment, systems and assemblies	<ul style="list-style-type: none"> <li>Conduct review of engineering design submittals to ensure compliance with the OPR</li> <li>Conduct periodic commissioning meetings and site visits to ensure accurate engineering construction</li> <li>Oversee handover from construction based on construction checklists</li> <li>Execute functional and technical tests to ensure quality and reliability of equipment, systems and assemblies</li> <li>Oversee surveys, inspections and tests conducted by vendors and external stakeholders</li> <li>Identify commissioning items that do not comply with the OPR and corresponding corrective measures</li> </ul>	
Conduct handover and initial start-up	<ul style="list-style-type: none"> <li>Lead development of commissioning reports documenting all commissioning activities and findings</li> <li>Conduct pre-start-up safety review (PSSR) to ensure that all necessary pre-conditions for start-up are in place</li> <li>Conduct handover of operational equipment, systems and assemblies to approved personnel</li> <li>Conduct orientation, demonstration and training for project owners and operations and maintenance personnel</li> <li>Provide ongoing commissioning support during initial start-up and ramp-up period</li> </ul>	

# Engineer/Supervisor (Commissioning)

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS
Manage health, safety and environment	<ul style="list-style-type: none"> <li>Ensure compliance with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Ensure that contractors and vendors comply with the organisational WSH and EMS standards and practices</li> <li>Conduct WSH and EMS accident and incident investigations</li> <li>Implement sustainable engineering procedures and guidelines</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations
Manage people and organisational function	<ul style="list-style-type: none"> <li>Monitor resource availability to support business operations</li> <li>Monitor employee performance by utilising performance management systems</li> <li>Provide inputs on team's recruitment, training and development needs</li> <li>Ensure adherence to planned budgets and financial forecasts</li> <li>Implement risk management plans and risk controls within the team</li> <li>Propose improvements to business processes and operations to drive continuous improvement</li> </ul>	

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Building Information Modelling Application	Level 3	Problem Solving	Intermediate
	Business Presentation Delivery	Level 3	Communication	Intermediate
	Change Management	Level 3	Teamwork	Advanced
	Civil and Structural Engineering Management	Level 4	Interpersonal Skills	Intermediate
	Commissioning and Start-Up Management	Level 3	Service Orientation	Intermediate
	Continuous Improvement Management	Level 3		
	Cost Management	Level 3		
	Data and Statistical Analytics	Level 3		
	Design for Safety	Level 3		
	Electrical Engineering Management	Level 3		
	Engineering Drawing Interpretation and Management	Level 3		
	Engineering Safety Standards Interpretation	Level 3		
	Environmental Management System Framework Development and Implementation	Level 3		
	Equipment and Systems Testing	Level 3		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 3		
	Instrumentation and Control Design Engineering Management	Level 3		
	Learning and Development	Level 2		
	Manpower Planning	Level 3		
	Mechanical Engineering Management	Level 3		

## Engineer/Supervisor (Commissioning)

SKILLS AND COMPETENCIES	Organisational Resource Management	Level 4
	Organisational Risk Management	Level 3
	Programme Management	Level 3
	Project Risk Management	Level 3
	Quality System Management	Level 3
	Staff Management	Level 3
	Stakeholder Management	Level 3
	Structural Testing	Level 3
	Sustainable Engineering	Level 3
	Technical Inspection	Level 3
	Technical Writing	Level 3
	Technology Application	Level 3
	Third Party Management	Level 3
	Workplace Safety and Health Culture Development	Level 3
Workplace Safety and Health Framework Development and Implementation	Level 3	

## Senior Engineer/ Assistant Manager (Commissioning)

### JOB ROLE DESCRIPTION

The Senior Engineer/Assistant Manager (Commissioning) is responsible for driving operational excellence and effectiveness in commissioning activities. He/She verifies the accuracy of owner's project requirements, reviews commissioning plans, and ensures adherence to project scope, schedule and budget. He reviews commissioning issues from inspections, tests and site-visits, and ensures implementation of corrective and preventive measures. He coordinates with engineering procurement, design, and engineering construction teams to ensure compliance, safety and risk management in accordance with external regulations and organisational standards. He manages a team of engineers and ensures efficient business operations.

He possesses strong analytical and problem-solving skills. He possesses good leadership, stakeholder management and project management skills. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
	Conduct commissioning planning	<ul style="list-style-type: none"> <li>Verify accuracy, completeness and clarity of owner's project requirements (OPR) and success criteria for the project</li> <li>Review the commissioning scope, schedule and budget</li> <li>Review commissioning plans, communication protocols and resourcing plans</li> <li>Review commissioning requirements against project specifications and regulatory requirements</li> <li>Review functional testing procedures and test data forms including test prerequisites and acceptance criteria</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
	Commission equipment, systems and assemblies	<ul style="list-style-type: none"> <li>Lead review of engineering design submittals to ensure compliance with the OPR</li> <li>Lead commissioning meetings and site visits to pre-empt systemic problems in engineering construction</li> <li>Review construction checklists to validate handover from construction</li> <li>Review functional and technical test results for equipment, systems and assemblies to ensure that they meet predefined acceptance criteria for quality and reliability</li> <li>Ensure resolutions of issues identified from surveys, inspections and tests conducted by vendors and external stakeholders</li> <li>Provide constructive inputs for resolution of commissioning issues and system deficiencies</li> </ul>	
	Conduct handover and initial start-up	<ul style="list-style-type: none"> <li>Verify quality of commissioning report documenting all commissioning activities and findings</li> <li>Recommend systemic solutions to be implemented prior to start-up based on pre start-up safety review (PSSR) findings</li> <li>Lead handover of operational equipment, systems and assemblies to approved personnel</li> <li>Lead orientation, demonstration and training for owners and operations and maintenance personnel</li> <li>Ensure ongoing commissioning support during initial start-up and ramp-up period</li> </ul>	

## Senior Engineer/ Assistant Manager (Commissioning)

<b>CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS</b>	Manage health, safety and environment	<ul style="list-style-type: none"> <li>• Drive departmental plans to ensure compliance with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>• Review contractors' and vendors' compliance with the organisational WSH and EMS standards and practices</li> <li>• Ensure closure of WSH and EMS accident and incident investigations and their notification to relevant authorities</li> <li>• Ensure implementation of sustainable engineering procedures and guidelines</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations
	Manage people and organisational function	<ul style="list-style-type: none"> <li>• Acquire and allocate resources to support business operations</li> <li>• Drive team performance to achieve department goals</li> <li>• Identify recruitment needs and areas for technical and business management training and development</li> <li>• Analyse financial implications of business strategies to daily operations</li> <li>• Develop risk management plans and risk controls in alignment with organisation's risk management framework</li> <li>• Analyse viability of proposed continuous improvement initiatives and drive change management</li> </ul>	

<b>SKILLS AND COMPETENCIES</b>	<b>TECHNICAL SKILLS AND COMPETENCIES</b>		<b>GENERIC SKILLS AND COMPETENCIES (TOP 5)</b>	
		Budgeting	Level 3	Communication
	Building Information Modelling Application	Level 4	Problem Solving	Intermediate
	Business Performance Management	Level 3	Decision Making	Advanced
	Business Presentation Delivery	Level 4	Teamwork	Advanced
	Change Management	Level 4	Service Orientation	Intermediate
	Civil and Structural Engineering Management	Level 4		
	Commissioning and Start-Up Management	Level 4		
	Continuous Improvement Management	Level 4		
	Cost Management	Level 4		
	Data and Statistical Analytics	Level 3		
	Design for Safety	Level 3		
	Electrical Engineering Management	Level 3		
	Engineering Drawing Interpretation and Management	Level 4		
	Engineering Safety Standards Interpretation	Level 4		
	Environmental Management System Framework Development and Implementation	Level 4		
	Equipment and Systems Testing	Level 4		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 4		
	Instrumentation and Control Design Engineering Management	Level 3		
	Learning and Development	Level 3		

## Senior Engineer/ Assistant Manager (Commissioning)

<b>SKILLS AND COMPETENCIES</b>	Manpower Planning	Level 4
	Mechanical Engineering Management	Level 3
	Organisational Resource Management	Level 4
	Organisational Risk Management	Level 3
	Programme Management	Level 4
	Project Risk Management	Level 4
	Quality System Management	Level 3
	Staff Management	Level 4
	Stakeholder Management	Level 4
	Structural Testing	Level 3
	Sustainable Engineering	Level 3
	Technical Inspection	Level 3
	Technical Writing	Level 3
	Technology Application	Level 3
	Third Party Management	Level 4
Workplace Safety and Health Culture Development	Level 4	
Workplace Safety and Health Framework Development and Implementation	Level 4	

# Principal Engineer/ Manager (Commissioning)

## JOB ROLE DESCRIPTION

The Principal Engineer/Manager (Commissioning) acts as a technical advisor to provide problem-solving consultation and technical expertise for commissioning projects. He/She leads commissioning activities, while managing key metrics for cost, time, quality, risk, safety and environmental impact. He establishes strategic partnerships and collaborates with internal and external stakeholders to ensure that all equipment, components and systems are fully functional and in optimal operating condition. He leads compliance, safety and risk management in accordance with external regulations and organisational standards. He manages a team of senior engineers and ensures efficient business operations.

He is a key resource person who advises senior management and technical groups on commissioning matters. He is highly analytical, enjoys solving challenging problems, and is able to lead others effectively. He possesses strong project management, transdisciplinary and risk-management skills. He works on-site and is expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
Conduct commissioning planning	<ul style="list-style-type: none"> <li>Solicit project owner approval on owner's project requirements (OPR) and success criteria for the project</li> <li>Approve the commissioning scope, schedule and budget</li> <li>Approve commissioning plans, communication protocols and resourcing plans</li> <li>Approve commissioning requirements based on project specifications and regulatory requirements</li> <li>Confirm functional test readiness to ensure smooth execution of the functional testing process</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Professional Engineers Act and Rules;</li> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
Commission equipment, systems and assemblies	<ul style="list-style-type: none"> <li>Establish strategies and plans for review of engineering design submittals depending on project complexity</li> <li>Endorse commissioning meetings and site visits to drive pre-emptive risk identification and mitigation in engineering construction</li> <li>Approve construction checklists to endorse handover from construction</li> <li>Approve functional and technical test results for equipment, systems and assemblies that meet the predefined acceptance criteria for quality and reliability</li> <li>Endorse surveys, inspections and tests conducted by vendors and external stakeholders</li> <li>Provide expert technical guidance and oversight for the resolution of commissioning issues and system deficiencies</li> </ul>	
Conduct handover and initial start-up	<ul style="list-style-type: none"> <li>Approve detailed commissioning reports documenting all commissioning activities and findings</li> <li>Approve systemic solutions to be implemented prior to start-up based on pre-start-up safety review (PSSR) findings</li> <li>Endorse handover of operational equipment, systems and assemblies to approved personnel</li> <li>Drive effective orientation, demonstration and training for owners and operations and maintenance personnel</li> <li>Lead ongoing commissioning support during initial start-up and ramp-up period</li> </ul>	

# Principal Engineer/ Manager (Commissioning)

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	PERFORMANCE EXPECTATIONS*
Manage health, safety and environment	<ul style="list-style-type: none"> <li>Establish departmental plans aligned to organisational strategies and frameworks to drive compliance with Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Drive contractors' and vendors' compliance with the organisational WSH and EMS standards and practices</li> <li>Review WSH and EMS accident and incident findings and trends to recommend improvements</li> <li>Drive sustainable engineering strategies, procedures and guidelines</li> </ul>
Manage people and organisational function	<ul style="list-style-type: none"> <li>Develop strategies for resource planning and utilisation</li> <li>Drive department performance to achieve organisational goals</li> <li>Drive talent recruitment and development for the department in alignment with organisational strategy</li> <li>Manage the department's financial inflow and outflow against allocated budgets and forecasts</li> <li>Validate risk management plans and risk controls to ensure compliance with organisation's risk management framework</li> <li>Manage continuous improvement and change management initiatives for time, cost and quality improvements</li> </ul>

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Budgeting	Level 4	Decision Making	Advanced
	Building Information Modelling Application	Level 5	Problem Solving	Advanced
	Business Performance Management	Level 4	Communication	Advanced
	Business Presentation Delivery	Level 4	Teamwork	Advanced
	Change Management	Level 4	Service Orientation	Advanced
	Civil and Structural Engineering Management	Level 5		
	Commissioning and Start-Up Management	Level 5		
	Continuous Improvement Management	Level 4		
	Cost Management	Level 5		
	Data and Statistical Analytics	Level 4		
	Design for Safety	Level 3		
	Electrical Engineering Management	Level 4		
	Engineering Drawing Interpretation and Management	Level 5		
	Engineering Safety Standards Interpretation	Level 5		
	Environmental Management System Framework Development and Implementation	Level 5		
	Equipment and Systems Testing	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		

## Principal Engineer/ Manager (Commissioning)

SKILLS AND COMPETENCIES	Manpower Planning	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
	Staff Management	Level 4
	Stakeholder Management	Level 4
	Strategy Development	Level 4
	Structural Testing	Level 4
	Sustainable Engineering	Level 3
	Technical Inspection	Level 4
	Technical Writing	Level 4
	Technology Application	Level 4
	Third Party Management	Level 5
Workplace Safety and Health Culture Development	Level 4	
Workplace Safety and Health Framework Development and Implementation	Level 5	

## Operations and Maintenance

JOB ROLES	PAGE
Technician/Coordinator (Operations and Maintenance)	95
Assistant Engineer/Senior Technician (Operations and Maintenance)	97
Engineer/Supervisor (Operations and Maintenance)	99
Senior Engineer/Assistant Manager (Operations and Maintenance)	102
Principal Engineer/Manager (Operations and Maintenance)	105
Director (Operations and Maintenance)	108



## Senior Technician

Muhammad Fauzi bin Asril  
SP Group

### MAINTAINING A COOL OPERATION

Fauzi is a Senior Technician with the Operations and Maintenance team at SP Group’s district cooling plant at Marina Bay. The centralised cooling facility provides chilled water to buildings in the area for their cooling needs. Fauzi’s responsibility is to ensure supply reliability and quality, system efficiency and optimal equipment performance.

A big part of Fauzi’s day is working two to five storeys underground, inspecting machinery and electronic instruments for signs of abnormality or underperformance. His findings guide colleagues in carrying out accurate and comprehensive repair and maintenance work.

“Strong communication skills are needed in order to collaborate effectively with engineers, technicians, vendors and customers of varying expertise, experience and ages,” says Fauzi. The ability to give and act on instructions well, is essential to his role.

Invisible to many are the precision and quality control round the clock to ensure customers’ facilities are supplied with chilled water within a temperature of 5.5°C to 6.5°C. Fauzi feels a strong sense of pride in his work. “Through our technology, we provide services that enable customers to enjoy energy savings of up to 40 per cent.”

An advocate of lifelong learning, Fauzi is currently pursuing a diploma in Building Management and Fire

Safety, which will enable him to take on a supervisory role in the future. He has also tapped on the Skills Framework for Engineering Services to upgrade his skills to be future-ready. “I want to keep learning and improving. The Skills Framework will help me identify short courses in Urban Solutions, especially in areas such as intelligent building systems and instrumentation control, which will broaden my skillsets at work.”

For those interested in a profession like Fauzi’s, it is important to have technical knowledge in mechanics, electrics or electronics. Beyond that, he says, “Interest in understanding how things work is a must, along with a willingness to explore new technology, as the equipment used for operations is largely computer-based. That frames the mindset to constantly improve and perform this role well.”

“Interest in understanding how things work is a must, along with a willingness to explore new technology - that frames the mindset to constantly improve.”

## Technician/ Coordinator (Operations and Maintenance)

### JOB ROLE DESCRIPTION

The Technician/Coordinator (Operations and Maintenance) is responsible for ensuring that all engineering equipment and systems are fully functional and in optimal operating condition. He/She supports the team by performing maintenance on equipment and systems in accordance with maintenance Standard Operating Procedures (SOPs). He follows corporate guidelines and best practices, ensuring work activities are carried out safely and in compliance with regulatory and statutory policies, procedures and regulations. He follows emergency response plans and adheres to workplace safety and health (WSH) requirements.

He usually works under supervision. He is a good team player and is able to engage and interact with internal and external stakeholders. He is also expected to work on-site, on a rotating or day-shift, and/or may be employed on-call basis.

	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Maintain equipment and systems	<ul style="list-style-type: none"> <li>• Conduct testing of equipment and systems</li> <li>• Perform repair works on equipment and systems</li> <li>• Monitor equipment and system condition</li> <li>• Perform housekeeping of tools after maintenance and repairs</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>• Workplace Safety and Health (WSH) Act;</li> <li>• Building Control Act;</li> <li>• Electricity Act;</li> <li>• Fire Safety Act</li> </ul> <i>*Performance Expectations are non-exhaustive and subject to prevailing regulations</i>
	Conduct operations	<ul style="list-style-type: none"> <li>• Follow resourcing plans in support of engineering projects</li> <li>• Operate equipment and systems in adherence to operational plans and Standard Operating Procedures (SOPs)</li> <li>• Monitor equipment and systems performance</li> </ul>	
	Manage responses to emergencies and crises	<ul style="list-style-type: none"> <li>• Follow emergency response plans and relevant safety procedures</li> <li>• Respond to emergencies as an emergency response team member</li> </ul>	
	Manage health, safety and environment	<ul style="list-style-type: none"> <li>• Comply with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>• Coordinate with contractors to ensure compliance with the organisational WSH and EMS standards and practices</li> <li>• Report accidents and incidents in accordance with WSH and EMS standards and practices</li> </ul>	

## Technician/ Coordinator (Operations and Maintenance)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Asset Management	Level 3	Communication
	Condition-based Assets Monitoring Management	Level 1	Teamwork	Intermediate
	Continuous Improvement Management	Level 2	Interpersonal Skills	Basic
	Data and Statistical Analytics	Level 1	Problem Solving	Basic
	Emergency Response Management	Level 2	Digital Literacy	Basic
	Engineering Drawing Interpretation and Management	Level 1		
	Environmental Management System Framework Development and Implementation	Level 1		
	Equipment and Systems Repair	Level 2		
	Equipment and Systems Testing	Level 2		
	Equipment Maintenance and Housekeeping	Level 1		
	Facility Maintenance	Level 2		
	Hazards and Risk Identification and Management	Level 1		
	Inventory Management	Level 3		
	Preventive Maintenance	Level 2		
	Programme Management	Level 1		
	Quality System Management	Level 2		
	Structural Testing	Level 2		
	Technical Inspection	Level 2		
	Technical Writing	Level 2		
	Technology Application	Level 2		
	Third Party Management	Level 2		
	Workplace Safety and Health Culture Development	Level 2		
	Workplace Safety and Health Framework Development and Implementation	Level 1		

## Assistant Engineer/ Senior Technician (Operations and Maintenance)

### JOB ROLE DESCRIPTION

The Assistant Engineer/Senior Technician (Operations and Maintenance) is responsible for supporting the planning of corrective, preventive and predictive maintenance activities that ensure equipment and systems are fully functional and in optimal operating condition. He/She follows corporate guidelines and best practices, ensuring work activities are carried out safely and enhancing the organisation's compliance with regulatory and statutory policies, procedures and regulations. He follows emergency response plans and adheres to workplace safety and health (WSH) requirements.

He is a good team player and is able to engage and interact with internal and external stakeholders. He possesses good analytical and problem-solving skills. He is also expected to work on-site, on a rotating or day-shift, and/or may be employed on-call basis.

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
		Maintain equipment and systems	<ul style="list-style-type: none"> <li>Conduct testing of equipment and systems</li> <li>Interpret results of equipment and systems testing</li> <li>Perform repair works on equipment and systems</li> <li>Interpret indicators of equipment and system damages and malfunctions</li> <li>Document testing, maintenance and repair works in accordance with organisational procedures</li> <li>Perform housekeeping of tools after maintenance and repairs</li> <li>Support the testing and calibration of automated equipment, systems and controls</li> </ul>
	Conduct operations	<ul style="list-style-type: none"> <li>Follow resourcing plans in support of engineering projects</li> <li>Operate equipment and systems in adherence to operational plans and Standard Operating Procedures (SOPs)</li> <li>Apply emerging technologies for performance monitoring and process troubleshooting</li> <li>Interpret indicators of equipment and system underperformance</li> </ul>	
	Manage responses to emergencies and crises	<ul style="list-style-type: none"> <li>Implement emergency response plans and relevant safety procedures</li> <li>Supervise the emergency response team</li> </ul>	
	Manage health, safety and environment	<ul style="list-style-type: none"> <li>Comply with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Coordinate with contractors to ensure compliance with the organisational WSH and EMS standards and practices</li> <li>Support WSH and EMS accident and incident investigations</li> </ul>	

*\*Performance Expectations are non-exhaustive and subject to prevailing regulations*

## Assistant Engineer/ Senior Technician (Operations and Maintenance)

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Asset Management	Level 3	Communication
	Condition-based Assets Monitoring Management	Level 2	Teamwork	Intermediate
	Continuous Improvement Management	Level 2	Problem Solving	Intermediate
	Data and Statistical Analytics	Level 2	Interpersonal Skills	Intermediate
	Emergency Response Management	Level 2	Lifelong Learning	Basic
	Engineering Drawing Interpretation and Management	Level 2		
	Environmental Management System Framework Development and Implementation	Level 2		
	Equipment and Systems Repair	Level 3		
	Equipment and Systems Testing	Level 2		
	Equipment Maintenance and Housekeeping	Level 2		
	Facility Maintenance	Level 2		
	Hazards and Risk Identification and Management	Level 2		
	Internet of Things Management	Level 2		
	Inventory Management	Level 3		
	Preventive Maintenance	Level 2		
	Programme Management	Level 2		
	Quality System Management	Level 2		
	Robotic and Automation Technology Application	Level 2		
	Structural Testing	Level 2		
	Technical Inspection	Level 2		
	Technical Writing	Level 2		
	Technology Application	Level 2		
	Third Party Management	Level 3		
	Workplace Safety and Health Culture Development	Level 2		
	Workplace Safety and Health Framework Development and Implementation	Level 2		

## Engineer/Supervisor (Operations and Maintenance)

### JOB ROLE DESCRIPTION

The Engineer/Supervisor (Operations and Maintenance) is responsible for ensuring the continuous operations of equipment, components and systems. He/She supervises the operations and maintenance of equipment and systems. He leads the initiatives for identifying and implementing innovation within the organisation. He also follows corporate guidelines and best practices, monitoring compliance of work activities to regulatory and statutory policies, procedures and regulations. He implements emergency response plans and adheres to workplace safety and health (WSH) requirements. He manages a team of technicians and contributes to the improvement of business operations.

He is a good team player and is adept in engaging and interacting with internal and external stakeholders. He is systematic and logical in his work approaches, possesses good analytical and problem-solving skills, and is able to work in a fast-paced environment. He is also expected to work on a rotating or day-shift, and/or may be employed on-call basis.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*	
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Maintain equipment and systems	<ul style="list-style-type: none"> <li>Assign responsibilities and resources for inspection, testing, repair and predictive maintenance of equipment and systems</li> <li>Interface with procurement team and vendors to align lead time with planned maintenance work activities</li> <li>Recommend repair works and solutions to address equipment and system failures</li> <li>Conduct root cause analysis of equipment and system failures and malfunctions</li> <li>Analyse testing, maintenance and repair records to identify trends, potential malfunctions and solutions applied</li> <li>Outline housekeeping procedures and standards to be adhered to for maintenance and repair works</li> <li>Conduct test runs of new processes involving automated equipment, systems and controls</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
	Conduct operations	<ul style="list-style-type: none"> <li>Liaise with internal stakeholders on operations</li> <li>Determine resourcing requirements to achieve operational state in accordance with organisational standards</li> <li>Develop operational plans and Standard Operating Procedures (SOPs) for equipment and systems</li> <li>Devise methods of application for emerging technologies to improve performance monitoring and process troubleshooting</li> <li>Conduct root cause analysis of equipment and system underperformance</li> </ul>	
	Manage responses to emergencies and crises	<ul style="list-style-type: none"> <li>Analyse the impact of emergency response plans and relevant safety procedures on operations</li> <li>Coordinate the emergency response team activities</li> </ul>	
	Manage health, safety and environment	<ul style="list-style-type: none"> <li>Ensure compliance with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Ensure that contractors and vendors comply with the organisation's WSH and EMS standards and practices</li> <li>Conduct WSH and EMS accident and incident investigations</li> <li>Implement sustainable engineering procedures and guidelines</li> </ul>	

## Engineer/Supervisor (Operations and Maintenance)

CRITICAL WORK FUNCTIONS AND KEY TASKS / PERFORMANCE EXPECTATIONS	Manage people and organisational function	<ul style="list-style-type: none"> <li>• Monitor resource availability to support business operations</li> <li>• Monitor employee performance by utilising performance management systems</li> <li>• Provide inputs on team's recruitment, training and development needs</li> <li>• Ensure adherence to planned budgets and financial forecasts</li> <li>• Implement risk management plans and risk controls within the team</li> <li>• Propose improvements to business processes and operations to drive continuous improvement</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Artificial Intelligence Application	Level 3	Communication
	Asset Management	Level 4	Problem Solving	Advanced
	Building Information Modelling Application	Level 3	Interpersonal Skills	Intermediate
	Business Presentation Delivery	Level 3	Teamwork	Intermediate
	Change Management	Level 3	Decision Making	Advanced
	Civil and Structural Engineering Management	Level 4		
	Condition-based Assets Monitoring Management	Level 3		
	Continuous Improvement Management	Level 3		
	Cost Management	Level 3		
	Data and Statistical Analytics	Level 3		
	Electrical Engineering Management	Level 3		
	Emergency Response Management	Level 3		
	Engineering Drawing Interpretation and Management	Level 3		
	Environmental Management System Framework Development and Implementation	Level 3		
	Equipment and Systems Repair	Level 4		
	Equipment and Systems Testing	Level 3		
	Equipment Maintenance and Housekeeping	Level 3		
	Facility Maintenance	Level 3		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 3		
	Instrumentation and Control Design Engineering Management	Level 3		
	Internet of Things Management	Level 3		
	Inventory Management	Level 4		
	Learning and Development	Level 2		

## Engineer/Supervisor (Operations and Maintenance)

SKILLS AND COMPETENCIES	Maintenance Scheduling	Level 3
	Manpower Planning	Level 3
	Mechanical Engineering Management	Level 3
	Organisational Resource Management	Level 4
	Organisational Risk Management	Level 3
	Preventive Maintenance	Level 3
	Programme Management	Level 3
	Project Risk Management	Level 3
	Quality System Management	Level 3
	Robotic and Automation Technology Application	Level 3
	Staff Management	Level 3
	Stakeholder Management	Level 3
	Structural Testing	Level 3
	Sustainable Engineering	Level 3
	Technical Inspection	Level 3
	Technical Writing	Level 3
	Technology Application	Level 3
	Third Party Management	Level 3
	Workplace Safety and Health Culture Development	Level 3
	Workplace Safety and Health Framework Development and Implementation	Level 3

# Senior Engineer/ Assistant Manager (Operations and Maintenance)

## JOB ROLE DESCRIPTION

The Senior Engineer/Assistant Manager (Operations and Maintenance) is responsible for developing the operations and maintenance plans and schedules for the continuous operations of equipment and systems. He/She ensures resourcing needs of engineering projects are met based on developed plans and resourcing requirements. He ensures compliance of work activities to regulatory and statutory policies, procedures and regulations, performing root cause analysis to manage safety lapses. He manages emergency response procedures and adheres to workplace safety and health (WSH) requirements. He manages a team of engineers and ensures efficient business operations.

He is a good team player and is adept in engaging and interacting with internal and external stakeholders. He is systematic and logical in his work approaches, and possesses strong technical writing, communication, analytical and problem-solving skills. He is also expected to travel occasionally to project locations.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
Maintain equipment and systems	<ul style="list-style-type: none"> <li>Develop maintenance plans and schedules for inspection, testing, repair and predictive maintenance of equipment and systems</li> <li>Verify that recommended repair works for equipment and system failures are implemented</li> <li>Review recommended repair works and solutions to address equipment and system failures</li> <li>Lead root cause analysis of equipment and system failures and malfunctions, and develop reports</li> <li>Review testing, maintenance and repair records to evaluate impact of trends, and potential malfunctions and solutions</li> <li>Review housekeeping procedures and standards to ensure adherence to required quality standards</li> <li>Oversee test runs of new processes involving automated equipment, systems and controls</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
Conduct operations	<ul style="list-style-type: none"> <li>Collaborate with internal stakeholders on operations</li> <li>Evaluate feasibility of identified resourcing requirements to achieve operational state in accordance with organisational standards</li> <li>Review operational plans and Standard Operating Procedures (SOPs) for equipment and systems</li> <li>Review methods of application for emerging technologies to improve performance monitoring and process troubleshooting</li> <li>Lead root cause analysis of equipment and system underperformance, and develop reports</li> </ul>	
Manage responses to emergencies and crises	<ul style="list-style-type: none"> <li>Propose emergency technical and recovery activities based on the crisis management frameworks</li> <li>Evaluate the severity of emergency situations and determine the type of responses needed</li> </ul>	
Manage health, safety and environment	<ul style="list-style-type: none"> <li>Drive departmental plans to ensure compliance with the organisational Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Review contractor and vendor compliance with the organisation's WSH and EMS standards and practices</li> <li>Ensure proper closure of WSH and EMS accident and incident investigations and their notification to relevant authorities</li> <li>Ensure implementation of sustainable engineering procedures and guidelines</li> </ul>	

# Senior Engineer/ Assistant Manager (Operations and Maintenance)

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Manage people and organisational function	<ul style="list-style-type: none"> <li>Acquire and allocate resources to support business operations</li> <li>Drive team performance to achieve department goals</li> <li>Identify recruitment needs and areas for technical and business management training and development</li> <li>Analyse financial implications of business strategies to daily operations</li> <li>Develop risk management plans and risk controls in alignment with organisation's risk management framework</li> <li>Analyse viability of proposed continuous improvement initiatives and drive change management</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations
---	---	---	--

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Artificial Intelligence Application	Level 4	Decision Making	Advanced
	Asset Management	Level 4	Communication	Advanced
	Budgeting	Level 3	Problem Solving	Advanced
	Building Information Modelling Application	Level 4	Interpersonal Skills	Advanced
	Business Performance Management	Level 3	Digital Literacy	Advanced
	Business Presentation Delivery	Level 4		
	Change Management	Level 4		
	Civil and Structural Engineering Management	Level 4		
	Condition-based Assets Monitoring Management	Level 4		
	Continuous Improvement Management	Level 4		
	Cost Management	Level 4		
	Data and Statistical Analytics	Level 3		
	Electrical Engineering Management	Level 3		
	Emergency Response Management	Level 3		
	Engineering Drawing Interpretation and Management	Level 4		
	Environmental Management System Framework Development and Implementation	Level 4		
	Equipment and Systems Repair	Level 4		
	Equipment and Systems Testing	Level 4		
	Equipment Maintenance and Housekeeping	Level 3		
	Facility Maintenance	Level 3		
	Geotechnical Engineering Management	Level 4		
	Hazards and Risk Identification and Management	Level 4		
	Instrumentation and Control Design Engineering Management	Level 3		
	Internet of Things Management	Level 4		

## Senior Engineer/ Assistant Manager (Operations and Maintenance)

SKILLS AND COMPETENCIES	Inventory Management	Level 4
	Learning and Development	Level 3
	Maintenance Scheduling	Level 4
	Maintenance Strategy Management	Level 4
	Manpower Planning	Level 4
	Mechanical Engineering Management	Level 3
	Organisational Resource Management	Level 4
	Organisational Risk Management	Level 3
	Preventive Maintenance	Level 4
	Programme Management	Level 4
	Project Risk Management	Level 4
	Quality System Management	Level 3
	Robotic and Automation Technology Application	Level 4
	Staff Management	Level 4
	Stakeholder Management	Level 4
	Structural Testing	Level 3
	Sustainable Engineering	Level 3
	Technical Inspection	Level 3
	Technical Writing	Level 3
Technology Application	Level 3	
Third Party Management	Level 4	
Workplace Safety and Health Culture Development	Level 4	
Workplace Safety and Health Framework Development and Implementation	Level 4	

## Principal Engineer/Manager (Operations and Maintenance)

### JOB ROLE DESCRIPTION

The Principal Engineer/Manager (Operations and Maintenance) is responsible for acting as a technical advisor to provide problem-solving consultations and engineering expertise for engineering projects. He/ She maintains oversight on all operations and maintenance plans and schedules and ensures alignment to organisational strategy. He reviews the organisational policies to ensure compliance to statutory and regulatory policies, procedures and regulations. He manages emergency response procedures and ensures adherence to workplace safety and health (WSH) requirements. He manages a team of senior engineers and ensures efficient business operations.

He interacts proactively with various stakeholders and takes lead when resolving issues, and is able to communicate information in a clear and concise manner. He possesses strong analytical, problem-solving, trans-disciplinary and decision-making skills. He is also expected to travel occasionally to project locations.

	CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Maintain equipment and systems	<ul style="list-style-type: none"> <li>Optimise maintenance plans and schedules for inspection, testing, repair and predictive maintenance of equipment and systems to minimise downtime and costs</li> <li>Facilitate cross-departmental collaborations on maintenance and repair activities</li> <li>Approve recommended repair works for major equipment and system failures</li> <li>Evaluate root cause analysis reports of equipment and system failure, and develop potential solutions</li> <li>Provide technical guidance on equipment and systems maintenance for equipment and systems</li> <li>Develop financial and budgetary requirements of maintenance plans to organisational strategies</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act;</li> <li>Electricity Act;</li> <li>Fire Safety Act</li> </ul>
	Conduct operations	<ul style="list-style-type: none"> <li>Lead cross-department integration on operations</li> <li>Endorse resourcing requirements to achieve operational state in accordance with organisational standards</li> <li>Review and approve operational plans and Standard Operating Procedures (SOPs)</li> <li>Provide technical guidance on operations of equipment and systems for equipment and systems</li> <li>Evaluate root cause analysis reports of equipment and system underperformance, and develop potential solutions</li> <li>Develop financial and budgetary requirements of operational plans to organisational strategies</li> </ul>	
	Manage responses to emergencies and crises	<ul style="list-style-type: none"> <li>Facilitate responses to crisis situations and recovery activities, in accordance with the crisis management framework and procedures</li> <li>Lead emergency responses as a Site Incident Controller</li> </ul>	

## Principal Engineer/Manager (Operations and Maintenance)

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Manage health, safety and environment	<ul style="list-style-type: none"> <li>Establish departmental plans to align with organisational strategies and frameworks to drive compliance with Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Drive contractor and vendor compliance with the organisational WSH and EMS standards and practices</li> <li>Review WSH and EMS accident and incident findings and trends to recommend improvements</li> <li>Drive sustainable engineering strategies, procedures and guidelines</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations
	Manage people and organisational function	<ul style="list-style-type: none"> <li>Develop strategies for resource planning and utilisation</li> <li>Drive department performance to achieve organisational goals</li> <li>Drive talent recruitment and development for the department in alignment with organisational strategy</li> <li>Manage the department's financial inflow and outflow against allocated budgets and forecasts</li> <li>Validate risk management plans and risk controls to ensure compliance with organisation's risk management framework</li> <li>Manage continuous improvement and change management initiatives for time, cost and quality improvements</li> </ul>	

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
		Artificial Intelligence Application	Level 5	Problem Solving
	Asset Management	Level 5	Communication	Advanced
	Budgeting	Level 4	Leadership	Advanced
	Building Information Modelling Application	Level 5	Decision Making	Advanced
	Business Performance Management	Level 4	Teamwork	Advanced
	Business Presentation Delivery	Level 4		
	Change Management	Level 4		
	Civil and Structural Engineering Management	Level 5		
	Condition-based Assets Monitoring Management	Level 5		
	Continuous Improvement Management	Level 4		
	Cost Management	Level 5		
	Data and Statistical Analytics	Level 4		
	Electrical Engineering Management	Level 4		
	Emergency Response Management	Level 4		
	Engineering Drawing Interpretation and Management	Level 5		
	Environmental Management System Framework Development and Implementation	Level 5		
	Equipment and Systems Repair	Level 5		
	Equipment and Systems Testing	Level 4		
	Facility Maintenance	Level 4		
	Geotechnical Engineering Management	Level 5		

## Principal Engineer/Manager (Operations and Maintenance)

SKILLS AND COMPETENCIES	Level
Hazards and Risk Identification and Management	Level 4
Instrumentation and Control Design Engineering Management	Level 4
Internet of Things Management	Level 4
Inventory Management	Level 5
Learning and Development	Level 4
Maintenance Scheduling	Level 5
Maintenance Strategy Management	Level 5
Manpower Planning	Level 4
Mechanical Engineering Management	Level 4
Organisational Resource Management	Level 5
Organisational Risk Management	Level 4
Preventive Maintenance	Level 5
Programme Management	Level 4
Project Risk Management	Level 4
Quality System Management	Level 4
Robotic and Automation Technology Application	Level 5
Staff Management	Level 4
Stakeholder Management	Level 4
Strategy Development	Level 4
Structural Testing	Level 4
Sustainable Engineering	Level 3
Technical Inspection	Level 4
Technical Writing	Level 4
Technology Application	Level 4
Third Party Management	Level 5
Workplace Safety and Health Culture Development	Level 4
Workplace Safety and Health Framework Development and Implementation	Level 5

# Director (Operations and Maintenance)

## JOB ROLE DESCRIPTION

The Director (Operations and Maintenance) is responsible for the strategic planning and management of the department. He/She drives the strategies for the operation and maintenance needs of engineering projects, and ensures that all initiatives, and processes are in conformance with established organisational policies and objectives. He manages emergency response procedures and drives adherence to workplace safety and health (WSH) requirements. He is also responsible for ensuring the performance of the department is in line with organisational goals through enhancing the technical capabilities of the team.

He is a forward-thinking leader who is directional and motivational, and is able to manage resources and plan efficiently. He possesses excellent analytical, problem-solving and excellent leadership skills and encourage teamwork among his team members.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*	
CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Maintain equipment and systems	<ul style="list-style-type: none"> <li>• Drive direction and strategies for optimal maintenance of equipment and systems to enhance efficiency and effectiveness</li> <li>• Endorse cross-departmental collaboration on maintenance and repair activities to minimise equipment downtime</li> <li>• Formulate pre-emptive strategies to mitigate risk of equipment and system failures and malfunctions</li> <li>• Drive innovation and performance improvements for equipment and systems</li> <li>• Endorse financial and budgetary requirements of maintenance plans to organisational strategies</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>• Professional Engineers Act and Rules;</li> <li>• Workplace Safety and Health (WSH) Act;</li> <li>• Building Control Act;</li> <li>• Electricity Act;</li> <li>• Fire Safety Act</li> </ul>
	Conduct operations	<ul style="list-style-type: none"> <li>• Develop strategic partnerships with stakeholders on operations</li> <li>• Establish best practices for execution and documentation of operations activities</li> <li>• Formulate pre-emptive strategies to mitigate risk of equipment and system underperformance</li> <li>• Endorse financial and budgetary requirements of operational plans to organisational strategies</li> </ul>	
	Manage responses to emergencies and crises	<ul style="list-style-type: none"> <li>• Drive continuous improvement of the organisational emergency response planning and crisis management frameworks</li> <li>• Oversee emergency responses in the department as a Site Main Controller</li> </ul>	
	Manage health, safety and environment	<ul style="list-style-type: none"> <li>• Formulate strategies and frameworks to drive a culture of workplace safety, health and environmental management at organisational level</li> <li>• Establish strategies and frameworks to drive compliance with Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>• Formulate proactive strategies for mitigation of WSH and EMS accidents and incidents</li> <li>• Establish the organisational sustainable engineering strategies, procedures and guidelines</li> </ul>	

# Director (Operations and Maintenance)

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	Manage people and organisational function	<ul style="list-style-type: none"> <li>• Establish long-term objectives for the department in alignment with organisation's strategy, vision and mission</li> <li>• Establish the operating and resourcing structure for the department to support business objectives</li> <li>• Establish department-wide performance indicators to ensure achievement of organisational goals</li> <li>• Formulate talent recruitment and development strategies in alignment with organisation's vision, mission and values</li> <li>• Drive sourcing and allocation of budgets for the department's activities</li> <li>• Contribute to the development of the organisation's risk management framework</li> <li>• Drive continuous improvement strategies and change management initiatives at organisation level</li> <li>• Drive strategic partnerships with internal and external stakeholders</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations
---	---	--	--

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Artificial Intelligence Application	Level 6	Global Mindset	Advanced
	Asset Management	Level 6	Leadership	Advanced
	Budgeting	Level 5	Decision Making	Advanced
	Building Information Modelling Application	Level 5	Communication	Advanced
	Business Performance Management	Level 5	Developing People	Advanced
	Business Presentation Delivery	Level 5		
	Business Proposal Writing	Level 5		
	Change Management	Level 5		
	Civil and Structural Engineering Management	Level 6		
	Condition-based Assets Monitoring Management	Level 5		
	Continuous Improvement Management	Level 5		
	Contract Development and Management	Level 6		
	Cost Management	Level 6		
	Data and Statistical Analytics	Level 5		
	Electrical Engineering Management	Level 5		
	Emergency Response Management	Level 5		
	Engineering Drawing Interpretation and Management	Level 5		
	Environmental Management System Framework Development and Implementation	Level 6		
	Geotechnical Engineering Management	Level 6		
	Hazards and Risk Identification and Management	Level 5		

## Director (Operations and Maintenance)

SKILLS AND COMPETENCIES	Instrumentation and Control Design Engineering Management	Level 5
	Internet of Things Management	Level 5
	Learning and Development	Level 5
	Maintenance Scheduling	Level 5
	Maintenance Strategy Management	Level 6
	Manpower Planning	Level 5
	Mechanical Engineering Management	Level 5
	Organisational Resource Management	Level 6
	Organisational Risk Management	Level 5
	Preventive Maintenance	Level 5
	Programme Management	Level 5
	Project Risk Management	Level 5
	Quality System Management	Level 5
	Robotic and Automation Technology Application	Level 6
	Staff Management	Level 5
	Stakeholder Management	Level 5
	Strategy Development	Level 5
	Sustainable Engineering	Level 3
	Technology Road Mapping	Level 5
	Workplace Safety and Health Culture Development	Level 5
Workplace Safety and Health Framework Development and Implementation	Level 6	

JOB ROLES	PAGE
Director (Engineering)	112
Chief Executive Officer/Managing Director/ General Manager/President	115

# Director (Engineering)

## JOB ROLE DESCRIPTION

The Director (Engineering) is responsible for spearheading the strategic planning, design and implementation of complex engineering solutions to meet customers' requirements. He/She drives direction and strategy for the development and execution of engineering projects, and ensures alignment to the organisational strategy, vision and mission. He formulates strategies and frameworks to drive workplace health, safety, risk and environmental management in accordance with local and international regulations. He develops the organisation's technology roadmap and drives continuous improvement strategies. In addition, he leverages his deep technical expertise and industry experience to develop technical capabilities and domain expertise for the organisation. He is a professional engineer, specialising in mechanical, electrical, control and instrumentation, civil, structural or geotechnical engineering disciplines.

He is the organisation's technical expert who advises senior management and business partners on complex engineering matters. He maintains and builds strong links with the external engineering community and establishes best practises in the implementation of engineering standards and design. He is a strategic and creative thinker, demonstrates exceptional leadership and problem-solving skills, and establishes strategic partnerships.

CRITICAL WORK FUNCTIONS	KEY TASKS	PERFORMANCE EXPECTATIONS*
Manage execution of engineering projects	<ul style="list-style-type: none"> <li>Drive direction and strategies for engineering projects in line with organisational strategies and plans</li> <li>Formulate strategies to ensure operational excellence and effectiveness across the engineering value chain</li> <li>Establish workflows to ensure effectiveness of Front-End Engineering and Design (FEED) for engineering projects</li> <li>Endorse feasibility and process safety reviews for engineering projects</li> <li>Establish strategies to drive compliance with regulatory and legislative requirements</li> <li>Establish communication protocols and conflict and dispute resolution mechanisms for strengthening industrial relations</li> </ul>	In accordance with: <ul style="list-style-type: none"> <li>Professional Engineers Act and Rules;</li> <li>Workplace Safety and Health (WSH) Act;</li> <li>Building Control Act</li> </ul>
Deploy new technologies	<ul style="list-style-type: none"> <li>Lead innovation in new technologies for engineering processes and systems</li> <li>Evaluate benefits, trade-offs and impact of new technologies</li> <li>Build business case for implementing new technologies in the organisation</li> </ul>	
Employ advanced analytics and big data	<ul style="list-style-type: none"> <li>Drive the organisation's commitment to efficient and effective analyses of large data sets</li> <li>Lead innovation in advanced analytics through adoption of new methodologies and identification of new datasets</li> <li>Evaluate the benefits and trade-offs of implementing advanced analytics within strategic decision-making</li> <li>Develop organisational advanced analytics application strategy</li> <li>Prepare business case for implementing advanced analytical methods in new areas</li> </ul>	

# Director (Engineering)

CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	CRITICAL WORK FUNCTIONS, KEY TASKS AND PERFORMANCE EXPECTATIONS	PERFORMANCE EXPECTATIONS*
Manage health, safety and environment	<ul style="list-style-type: none"> <li>Formulate strategies and frameworks to drive a culture of workplace safety, health and environmental management at organisational level</li> <li>Establish strategies and frameworks to drive compliance with Workplace Safety and Health (WSH) policies and Environmental Management Systems (EMS)</li> <li>Formulate proactive strategies to mitigate WSH and EMS accidents and incidents</li> <li>Establish the organisation's sustainable engineering strategy, procedures and guidelines</li> </ul>	
Manage people and organisational function	<ul style="list-style-type: none"> <li>Establish long-term objectives for the department in alignment with organisation's strategy, vision and mission</li> <li>Establish the operating and resourcing structure for the department to support business objectives</li> <li>Establish department-wide performance indicators to ensure achievement of organisational goals</li> <li>Formulate talent recruitment and development strategies in alignment with organisation's vision, mission and values</li> <li>Drive sourcing and allocation of budgets for the department's activities</li> <li>Contribute to the development of the organisation's risk management framework</li> <li>Drive continuous improvement strategies and change management initiatives at organisation level</li> <li>Drive strategic partnerships with internal and external stakeholders</li> </ul>	*Performance Expectations are non-exhaustive and subject to prevailing regulations

SKILLS AND COMPETENCIES	TECHNICAL SKILLS AND COMPETENCIES		GENERIC SKILLS AND COMPETENCIES (TOP 5)	
	Artificial Intelligence Application	Level 6	Decision Making	Advanced
	Budgeting	Level 5	Communication	Advanced
	Building Information Modelling Application	Level 5	Leadership	Advanced
	Business Negotiation	Level 6	Problem Solving	Advanced
	Business Performance Management	Level 5	Resource Management	Advanced
	Business Presentation Delivery	Level 5		
	Business Proposal Writing	Level 5		
	Change Management	Level 5		
	Civil and Structural Engineering Management	Level 6		
	Commissioning and Start-Up Management	Level 5		
	Conflict Resolution	Level 6		
	Continuous Improvement Management	Level 5		
	Contract Development and Management	Level 6		
	Cost Management	Level 6		
	Data and Statistical Analytics	Level 5		

## Director (Engineering)

SKILLS AND COMPETENCIES		
	Design for Safety	Level 6
	Electrical Engineering Management	Level 5
	Engineering Drawing Interpretation and Management	Level 5
	Engineering Safety Standards Interpretation	Level 5
	Environmental Management System Framework Development and Implementation	Level 6
	Front-End Engineering and Design	Level 5
	Geotechnical Engineering Management	Level 6
	Hazards and Risk Identification and Management	Level 5
	Instrumentation and Control Design Engineering Management	Level 5
	Internet of Things Management	Level 5
	Learning and Development	Level 5
	Manpower Planning	Level 5
	Market Research	Level 5
	Mechanical Engineering Management	Level 5
	Organisational Resource Management	Level 6
	Organisational Risk Management	Level 5
	Procurement Coordination and Policy Development	Level 6
	Programme Management	Level 5
	Project Feasibility Assessment	Level 5
	Project Risk Management	Level 5
	Quality System Management	Level 5
	Reliability Engineering Management	Level 6
	Robotic and Automation Technology Application	Level 6
	Staff Management	Level 5
	Stakeholder Management	Level 5
	Strategy Development	Level 5
	Sustainable Engineering	Level 6
	Technology Road Mapping	Level 5
	Workplace Safety and Health Culture Development	Level 5
	Workplace Safety and Health Framework Development and Implementation	Level 6

## Chief Executive Officer/Managing Director/General Manager/President

### JOB ROLE DESCRIPTION

The Chief Executive Officer/Chief Operating Officer/Managing Director/General Manager/President defines the long-term strategic direction to grow the business in line with the organisation's overall vision, mission and values. He/She translates broad goals into achievable steps, anticipates and stays ahead of trends, and takes advantage of business opportunities. He represents the organisation with customers, investors, and business partners, and holds responsibility for fostering a culture of workplace safety and health and adherence to industry quality standards.

He inspires the organisation towards achieving business goals and fulfilling the vision, mission and values by striving for continuous improvement, driving innovation and equipping the organisation to embrace change. He possesses excellent analytical, problem-solving and leadership skills and is an effective people leader.

CRITICAL WORK FUNCTIONS AND KEY TASKS	CRITICAL WORK FUNCTIONS	KEY TASKS
CRITICAL WORK FUNCTIONS AND KEY TASKS	Define strategic business direction	<ul style="list-style-type: none"> <li>Steer the organisation to achieve excellence in a globalised environment</li> <li>Set organisational business goals for high performance and growth</li> <li>Develop long-term strategic business plans to maintain a leading position in the marketplace</li> <li>Drive organisational development with respect to change, innovation, and knowledge to achieve desired strategic business goals</li> </ul>
	Drive organisational business performance	<ul style="list-style-type: none"> <li>Establish organisational business performance indicators and measurement standards</li> <li>Review organisational business performance against plans to recognise achievements</li> <li>Assess principal risks to the organisation</li> <li>Ensure organic and inorganic profitable revenue growth</li> </ul>
	Promote workplace safety and health	<ul style="list-style-type: none"> <li>Promote workplace safety and health (WSH) across the organisation</li> <li>Nurture an organisational culture that complies with WSH internal and external standards, and regulations</li> <li>Ensure that the organisation has appropriate WSH measures established to conduct work activities both lawfully and ethically</li> <li>Keep abreast of international WSH regulations pertaining to the sector</li> <li>Collaborate with internal stakeholders to establish WSH policies and procedures</li> </ul>
	Establish quality management policies and processes	<ul style="list-style-type: none"> <li>Foster an organisational culture of proactive compliance with quality regulations, internal standards, and policies</li> <li>Ensure that the board is informed of quality management related matters</li> <li>Endorse organisational quality management policies</li> </ul>
	Lead people	<ul style="list-style-type: none"> <li>Foster a culture of high performance and innovation amongst employees</li> <li>Formulate organisational systems to develop employees in line with organisation's mission and emerging industry trends</li> <li>Champion succession planning initiative for key management positions</li> <li>Approve strategies in attracting new employees based on business objectives and regulatory standards</li> </ul>
	Grow business and stakeholder relationships	<ul style="list-style-type: none"> <li>Foster an atmosphere of inclusiveness with diverse external stakeholders and the global business community</li> <li>Lead networking and relationship-building with strategic stakeholders</li> <li>Establish effective working relationships with union representatives to ensure synergy between tripartite parties</li> <li>Endorse business expansion proposals and manpower forecasts</li> <li>Assess new business growth opportunities</li> </ul>



# Overview of Technical Skills and Competencies

## Technical Skills and Competencies (TSCs)

TSC Category	TSC Title	TSC Description	Proficiency Levels						
			1	2	3	4	5	6	
<b>Business and Organisational Management</b>	Continuous Improvement Management	Apply continuous improvement processes to optimise operating cost, task efficiency and effectiveness in production, services and processes		●	●	●	●	●	●
	Organisational Risk Management	Implement organisational risk management frameworks and processes to manage and control strategic, business and operational risks			●	●	●	●	●
	Organisational Resource Management	Implement resource management plans including, defining organisation's resource requirements, functional roles, job role descriptions, reporting lines, accountabilities and responsibilities				●	●	●	●
	Quality System Management	Establish quality assurance policy and management system for services to ensure compliance with internal quality requirements, client expectations, international quality standards and/or regulations		●	●	●	●	●	●
	Strategy Development	Develop organisational strategies and policies by analysing the impact of internal and external influencing factors and seeking consultation from relevant stakeholders				●	●	●	●
<b>Business Development</b>	Business Negotiation	Conduct negotiations to establish win-win outcomes for the organisation			●	●	●	●	●
	Business Presentation Delivery	Formal exercise of persuasion involving preparation, understanding of audience, delivery and tailoring of messages to be conveyed			●	●	●	●	●
	Business Proposal Writing	Strategise action plans and prepare business proposals to capitalise on new business opportunities			●	●	●	●	●
	Market Research	Conduct research on industry, customer and competitor trends to shape the organisation's business development strategy			●	●	●	●	●
<b>Business Finance</b>	Budgeting	Prepare organisational budgets to support short- and long-term business plans through forecasting, allocation and financial policy setting			●	●	●	●	●
	Cost Management	Analyse, plan and manage costs for cost efficiency and expense reduction			●	●	●	●	●
<b>Discipline Engineering Specialisation</b>	Civil and Structural Engineering Management	Manage the design, technical specification, selection, modification and troubleshooting of civil structures and systems to provide civil and structural engineering discipline support to construction, maintenance and project teams				●	●	●	●
	Electrical Engineering Management	Manage design, technical specification, selection, modification and troubleshooting of electrical engineering equipment, components and systems to provide electrical engineering discipline support to construction, operations, maintenance and project teams			●	●	●	●	●

# Overview of Technical Skills and Competencies

## Technical Skills and Competencies (TSCs)

TSC Category	TSC Title	TSC Description	Proficiency Levels						
			1	2	3	4	5	6	
<b>Discipline Engineering Specialisation</b>	Geotechnical Engineering Management	Manage the design, technical specification, selection, modification and troubleshooting of geotechnical equipment, structures and systems to provide geotechnical engineering discipline support to construction, maintenance and project teams				●	●	●	●
	Instrumentation and Control Design Engineering Management	Manage technical design, selection, specification, modification and troubleshooting of instrumentation and control systems to provide instrumentation and control engineering discipline support to construction, operations, maintenance and project teams			●	●	●	●	●
	Mechanical Engineering Management	Manage the design, technical specification, selection, modification and troubleshooting of mechanical equipment, structures and systems so as to provide mechanical engineering discipline support to construction, operations, maintenance and project teams			●	●	●	●	●
	Asset Management	Formulate and implement the organisation's asset management policies to optimise asset life-cycle and performance			●	●	●	●	●
<b>Engineering Construction, Operations and Maintenance</b>	Commissioning and Start-Up Management	Manage the commissioning and start-up of new or modified equipment, components and systems into operational modes		●	●	●	●	●	●
	Condition-based Assets Monitoring Management	Formulate and implement condition-based maintenance procedures to enhance organisation maintenance regimes and operational reliability	●	●	●	●	●	●	●
	Engineering Safety Standards Interpretation	Design and implement appropriate safety and safeguarding engineering solutions standards in accordance with legislative requirements and industry best practices			●	●	●	●	●
	Equipment and Systems Repair	Execute equipment and systems repair procedures to correct faults and restore functionalities		●	●	●	●	●	●
	Equipment and Systems Testing	Execute equipment and systems testing procedures to ensure continuity of operations and meet standards of performance		●	●	●	●	●	●
	Equipment Maintenance and Housekeeping	Maintain and upkeep tools and equipment and implement organisational housekeeping practices	●	●	●	●	●	●	●
	Facility Maintenance	Manage facility system maintenance activities for uninterrupted business operations		●	●	●	●	●	●
	Installation and Assembly	Install equipment and system components by evaluating product specifications and manufacturers' recommendations and aligning them with the needs of the project		●	●	●	●	●	●
	Maintenance Scheduling	Plan and manage maintenance schedules in accordance to the organisational standards and Original Equipment Manufacturer (OEM) recommendations			●	●	●	●	●

# Overview of Technical Skills and Competencies

Technical Skills and Competencies (TSCs)

TSC Category	TSC Title	TSC Description	Proficiency Levels					
			1	2	3	4	5	6
Engineering Construction, Operations and Maintenance	Maintenance Strategy Management	Formulate and implement organisational maintenance strategy to enhance performance and operational reliability				●	●	●
	Preventive Maintenance	Perform scheduled maintenance procedures on equipment without halting business operations to reduce the likelihood of failure	●	●	●	●		
	Structural Testing	Execute non-destructive structural tests to ensure integrity and reliability of structural components against standards and product specifications based on determined test methods, criteria, equipment, and timeframe	●	●	●			
	Systems Integration	Realise the system-of-interest by progressively combining system elements in accordance with design requirements and the integration strategy			●	●	●	
	Technical Inspection	Execute formal inspection exercises to ensure quality, safety, and reliability adhering with technical specifications and compliance requirements	●	●	●			
	Test Planning	Develop testing plans and procedures by determining scope and risks, identifying the objects of testing, selecting test methods and tools, and controlling test implementation				●	●	
	Engineering Design Management	3D Modelling	Generate 3D models using a variety of modelling software to represent characteristics of a real-world system	●	●	●	●	
Design for Safety		Develop engineering designs and solutions while safeguarding the safety and health of users, stakeholders, and the general public			●	●	●	●
Engineering Drawing and Design Specification		Create design specifications and technical drawings to guide installation and construction works		●	●	●	●	
Engineering Drawing Interpretation and Management		Use engineering drawings, equipment datasheets, vendor equipment engineering drawings/layouts and equipment datasheets to support construction, operations, maintenance and engineering activities	●	●	●	●	●	
Front-End Engineering and Design		Manage Front-End Engineering and Design (FEED) for equipment, components and systems			●	●	●	
Reliability Engineering Management		Manage life cycle costing, root cause failure analyses, reliability modelling and assessments, fit-for-purpose analyses and failure patterns of equipment to provide reliability engineering technical support to construction, maintenance and project teams				●	●	●
Sustainable Engineering		Design, construct and operate engineering systems and assets to optimise energy management and enhance environmental performance			●	●	●	●

# Overview of Technical Skills and Competencies

Technical Skills and Competencies (TSCs)

TSC Category	TSC Title	TSC Description	Proficiency Levels					
			1	2	3	4	5	6
General Management	Business Performance Management	Implement organisational performance systems to meet business plans and objectives by establishing performance indicators, tracking progress and addressing gaps			●	●	●	●
	Change Management	Manage organisational change management systems to drive organisational success and outcomes by preparing, equipping and supporting adoption of change			●	●	●	●
	Conflict Resolution	Adopt organisation's conflict mediation guidelines to find peaceful solutions to disagreements by evaluating and implementing resolution approaches and analysing mediation outcomes				●	●	●
	Stakeholder Management	Manage organisation's key stakeholders, strategic partners and investors to ensure continuous levels of engagement by identifying needs, setting service standards and resolving issues in accordance with organisational procedures			●	●	●	●
	Technical Writing	Apply technical writing approaches to communicate complex information and enable actions in pursuit of defined project goals		●	●	●		
	Third Party Management	Manage third parties such as contractors, suppliers and vendors so as to ensure control of work and compliance in full alignment with organisation's policy and standards		●	●	●	●	
	Health, Safety and Environment (HSE) Management	Environmental Management System Framework Development and Implementation	Develop Environmental Management System (EMS) frameworks and implement procedures and practices to ensure compliance with legal and organisational requirements as well as commitment to environment protection	●	●	●	●	●
Hazards and Risk Identification and Management		Implement a systematic approach for hazard identification and risk assessment so as to effectively eliminate or reduce risks	●	●	●	●	●	
People Development		Learning and Development	Manage employees' learning and development activities to maximise employee' potential and capabilities to contribute to the organisation		●	●	●	●
	Staff Management	Apply organisation's human resources policy, procedures and standards to effectively manage staff under the direct control of the position holder ranging from coordination to directing people and teams			●	●	●	●
Procurement Management	Contract Development and Management	Maximise the organisation's operational and financial performance by drafting contracts, negotiating contract terms and conditions, ensuring compliance with contract terms and conditions, and effecting amendments				●	●	●
	Inventory Management	Formulate and implement inventory management strategies targeted at ensuring availability of equipment, tools and materials for engineering projects for the purpose of construction, operations and maintenance works			●	●	●	

# Overview of Technical Skills and Competencies

Technical Skills and Competencies (TSCs)

TSC Category	TSC Title	TSC Description	Proficiency Levels					
			1	2	3	4	5	6
Procurement Management	Materials Inspection	Verify correctness and usability of vendor products and services through specification matching and quality checks			●	●		
	Procurement Coordination and Policy Development	Design and implementation of procurement strategy and workflow to govern activities relating to sourcing and purchasing of materials as required to deliver on project expectations			●	●	●	●
	Procurement Performance Monitoring	Monitor procurement performance to cut costs, alleviate risks, and drive continuous process improvement by measuring and analysing vendor and process efficiency			●	●	●	
Project Finance	Capital Expenditure and Investment Evaluation	Assess investments based on alignment with strategies, affordability, acceptable returns and prioritisation of options			●	●	●	●
	Capital Raising	Acquire or raise capital and funds to carry out organisational goals and objectives			●	●	●	●
	Financial Analysis	Analyse the financial statements and data to provide insights about the financial performance and position of the organisation over time			●	●	●	●
	Financial Management	Ensure healthy finance to aid business growth and operations	●		●	●	●	●
	Financial Modelling	Develop financial models and valuation models to arrive at valuation conclusions			●	●	●	●
	Valuation Approaches and Methodologies	Apply valuation approaches and methodologies to arrive at valuation conclusions			●	●	●	●
	Valuation Conclusion and Reporting	Develop valuation reports for the valuation engagement			●	●	●	●
	Valuation Research and Analysis	Research and analyse information to arrive at a valuation conclusions			●	●	●	●
	Project Management	Manpower Planning	Estimate and fulfil manpower requirements to achieve business goals and targets			●	●	●
Programme Management		Manage multiple projects within the organisation to identify efficiencies of common policies, procedures and practices	●	●	●	●	●	●
Project Feasibility Assessment		Assess the business environment and organisational capabilities to evaluate and determine the feasibility of a project				●	●	
Project Risk Management		Manage risks relating to specific projects as precaution against internal and external vulnerabilities			●	●	●	

# Overview of Technical Skills and Competencies

Technical Skills and Competencies (TSCs)

TSC Category	TSC Title	TSC Description	Proficiency Levels					
			1	2	3	4	5	6
Technology Road-mapping	Artificial Intelligence Application	Apply algorithmic, statistical and engineering knowledge to integrate artificial intelligence into engineering and maintenance processes			●	●	●	●
	Building Information Modelling Application	Use Building Information Modelling (BIM) software to make design, engineering, project and operational information accurate, accessible and actionable for engineering projects			●	●	●	
	Data and Statistical Analytics	Identify data sets for the application of statistical techniques to analyse and interpret large complex data to uncover trends or patterns in order to locate and define new process improvement opportunities	●	●	●	●	●	●
	Internet of Things Management	Interrelate computing devices, equipment and machines data in a networked environment to provide specific solutions		●	●	●	●	
	Robotic and Automation Technology Application	Integrate robotic and automation technologies in Engineering Services, including construction, operations and maintenance so as to enhance productivity and precision and to reduce reliance on manual tasks		●	●	●	●	●
	Technology Application	Integrate technologies into operations of the organisation to optimise efficiency and effectiveness of processes		●	●	●		
Workplace Safety and Health (WSH) Management	Technology Road Mapping	Plan short-term and long-term goals with specific technology solutions to help meet those goals in order to make capital out of future market needs					●	●
	Emergency Response Management	Manage emergency response plans for the range of contingencies affecting work operations such as fire, explosion, power failure, chemical spillage, leakages, collapses, flooding, falling from height and other types of emergencies		●	●	●	●	
	Workplace Safety and Health Culture Development	Create and maintain a Workplace Safety and Health culture based on a common set of attitudes, behaviours, and competencies		●	●	●	●	●
	Workplace Safety and Health Framework Development and Implementation	Develop Workplace Safety and Health (WSH) frameworks and implement procedures and practices to ensure a safe and reliable workplace environment	●	●	●	●	●	●

# Overview of Technical Skills and Competencies

## General Descriptors for Technical Skills and Competencies (TSCs)

Level	Responsibility (Degree of supervision and accountability)	Autonomy (Degree of decision-making)	Complexity (Degree of difficulty of situations and tasks)	Knowledge and Abilities (Required to support work as described under Responsibility, Autonomy and Complexity)
6	Accountable for significant area of work, strategy or overall direction	Empower to chart direction and practices within and outside of work (including professional field/ community), to achieve/ exceed work results	Complex	<ul style="list-style-type: none"> <li>Synthesise knowledge issues in a field of work and the interface between different fields, and create new forms of knowledge</li> <li>Employ advanced skills, to solve critical problems and formulate new structures, and/or to redefine existing knowledge or professional practice</li> <li>Demonstrate exemplary ability to innovate, and formulate ideas and structures</li> </ul>
5	Accountable for achieving assigned objectives, decisions made by self and others	Provide leadership to achieve desired work results; Manage resources, set milestones and drive work	Complex	<ul style="list-style-type: none"> <li>Evaluate factual and advanced conceptual knowledge within a field of work, involving critical understanding of theories and principles</li> <li>Select and apply an advanced range of cognitive and technical skills, demonstrating mastery and innovation, to devise solutions to solve complex and unpredictable problems in a specialised field of work</li> <li>Manage and drive complex work activities</li> </ul>
4	Work under broad direction  Hold accountability for performance of self and others	Exercise judgment; Adapt and influence to achieve work performance	Less routine	<ul style="list-style-type: none"> <li>Evaluate and develop factual and conceptual knowledge within a field of work</li> <li>Select and apply a range of cognitive and technical skills to solve non-routine/ abstract problems</li> <li>Manage work activities which may be unpredictable</li> <li>Facilitate the implementation of innovation</li> </ul>
3	Work under broad direction  May hold some accountability for performance of others, in addition to self	Use discretion in identifying and responding to issues, work with others and contribute to work performance	Less routine	<ul style="list-style-type: none"> <li>Apply relevant procedural and conceptual knowledge, and skills to perform differentiated work activities and manage changes</li> <li>Able to collaborate with others to identify value-adding opportunities</li> </ul>
2	Work with some supervision  Accountable for a broader set of tasks assigned	Use limited discretion in resolving issues or enquiries. Work without frequently looking to others for guidance	Routine	<ul style="list-style-type: none"> <li>Understand and apply factual and procedural knowledge in a field of work</li> <li>Apply basic cognitive and technical skills to carry out defined tasks and to solve routine problems using simple procedures and tools</li> <li>Present ideas and improve work</li> </ul>
1	Work under direct supervision  Accountable for tasks assigned	Minimal discretion required. Expected to seek guidance	Routine	<ul style="list-style-type: none"> <li>Recall factual and procedural knowledge</li> <li>Apply basic skills to carry out defined tasks</li> <li>Identify opportunities for minor adjustments to work tasks</li> </ul>

# Overview of Generic Skills and Competencies

## Generic Skills and Competencies (GSCs)

GSC	GSC Description	Proficiency Levels		
		Basic	Intermediate	Advanced
<b>Communication</b>	Convey and exchange thoughts, ideas and information effectively through various mediums and approaches.	Communicate information with others to respond to general inquiries and to obtain specific information.	Articulate and discuss ideas and persuade others to achieve common outcomes.	Negotiate with others to address issues and achieve mutual consensus.
<b>Computational Thinking</b>	Develop and use computational models, tools and techniques to interpret and understand data, solve problems and guide decision-making.	Use computational models, tools and techniques to identify patterns in a problem and develop a solution.	Modify existing computational models, tools and techniques to develop different solutions.	Develop and create computational models, tools and techniques to implement new solutions and apply to other problems.
<b>Creative Thinking</b>	Adopt a fresh perspective to combine ideas or information in new ways and make connections between seemingly unrelated fields to create new ideas and applications.	Connect ideas or information from related fields or applications to address an immediate issue.	Connect or combine ideas or information from unrelated fields or applications to generate multiple ideas to bring about a specific outcome.	Create original applications or ideas to reveal new possibilities and reshape goals through high level of innovativeness.
<b>Decision Making</b>	Choose a course of action from various alternatives using a reasoned process to achieve intended goals.	Make decisions of simple or routine nature to achieve intended goals using given information and guidelines.	Make decisions in a complex setting to achieve intended goals using a structured process and multiple sources of available information.	Make decisions in a volatile and ambiguous setting using a structured process and limited sources of available information to achieve intended goals.
<b>Developing People</b>	Help others to learn and develop their capabilities to enhance their performance and achieve personal or professional goals.	Use demonstration and explanation to teach a familiar task to inexperienced co-workers.	Provide coaching to others to develop their skills and knowledge on their jobs to enhance performance.	Provide mentorship to help others in their professional and personal development to improve performance and further their careers.
<b>Digital Literacy</b>	Use ICT tools, equipment and software to create, evaluate and share information digitally with others.	Perform basic functions using software programmes pertaining to computer operating systems and file management, and search online information.	Use available software features to create and edit documents, customise templates and reports and evaluate online information.	Use available software features to enhance documents, analyse and manipulate data, and use ICT to organise, share and communicate information clearly and coherently.
<b>Global Mindset</b>	Awareness of diversity across global cultures and markets. Seek opportunities to adopt successful practices and ideas.	Demonstrate understanding of global challenges and opportunities and how to transfer best practices across cultures. Respect cultural differences and needs of a diverse workforce.	Develop global networks and manage virtual relationships while balancing both local and global perspectives. Adopt a local and global perspective when making decisions.	Build the organisation's capabilities to compete in a global environment. Manage tension between corporate requirements, global and cultural differences.

# Overview of Generic Skills and Competencies

Generic Skills and Competencies (GSCs)

GSC	GSC Description	Proficiency Levels		
		Basic	Intermediate	Advanced
<b>Interpersonal Skills</b>	Manage relationships efficiently and communicate with others effectively to achieve mutual consensus and outcomes.	Recognise own internal feelings and emotional states to manage interpersonal relationships in social situations.	Detect and decipher emotions of others to manage interpersonal relationships in social situations.	Influence, guide and handle others' emotions to build instrumental relationships and manage conflicts and disagreements.
<b>Leadership</b>	Lead others to achieve objectives in the most effective way. Provide an inclusive workplace that cultivates workplace relationships and teamwork, and foster the development of others.	Demonstrate professionalism to set a good example at peer level. Support others through own initiative and enthuse others through own positive and energetic approach.	Lead by example at team level. Encourage and guide others to adopt a point of view, make changes or take action. Provide a team environment that facilitates relationships building, teamwork and the development of others.	Lead by example at organisational level. Inspire, motivate and guide others to adopt a point of view, make changes or take action. Cultivate an open, cooperative and collaborative learning culture for the organisation.
<b>Lifelong Learning</b>	Seek out opportunities to enhance one's knowledge and skills. Access and acquire new knowledge and skills actively for continual learning.	Organise and manage own learning by setting learning targets. Identify learning approaches to achieve work or career goals.	Engage in collaborative learning by discussing one's learning with others and soliciting feedback to continually improve oneself.	Conduct self-reflective practices to review one's learning to facilitate continual growth in one's career or profession.
<b>Managing Diversity</b>	Work well with people from different ethnic, social, cultural and educational backgrounds and understand the concerns and interests of diverse work groups.	Demonstrate sensitivity to the cultural characteristics, values, beliefs, and behaviors of another ethnic or cultural group.	Build relationships with different ethnic or cultural groups by engaging in cross-cultural cooperative projects.	Manage conflicts arising from different ethnic or cultural groups and work effectively in cross-cultural settings.
<b>Problem Solving</b>	Generate feasible and efficient solutions to solve problems and capitalise on new opportunities.	Identify easily perceivable problems and follow given guidelines and procedures to solve the problems.	Identify less perceivable problems and use problem solving tools and techniques to solve the problems.	Anticipate potential problems beyond the current scope and apply higher order problem solving tools and techniques to turn problems into opportunities.
<b>Resource Management</b>	Efficient and effective deployment and allocation of resources when and where they are needed. Include planning, allocating and scheduling of resources to tasks, which typically include manpower, machines, money and materials.	Use resources to ensure optimum and efficient use of resources.	Deepen insights into the planning, allocation and deployment of resources to anticipate needs. Plan the allocation and deployment of resources efficiently and effectively.	Establish strategies for the allocation and deployment of resources efficiently and effectively.

# Overview of Generic Skills and Competencies

Generic Skills and Competencies (GSCs)

GSC	GSC Description	Proficiency Levels		
		Basic	Intermediate	Advanced
<b>Sense Making</b>	Organise and analyse data and information accurately to identify relationships and detect patterns and trends to gain insights for decision-making.	Identify relationships and linkages within different components of data.	Interpret data to uncover patterns and trends between various sources of data.	Analyse data relationships, patterns and trends to gain important insights and make informed decisions.
<b>Service Orientation</b>	Commit to exceeding both internal and external customers' needs. Proactively identify customer needs and sustain a culture of service excellence within the organisation.	Exceed customer needs and expectations and handle service challenges with a positive mindset. Demonstrate an understanding of the organisation's service vision, mission and values.	Anticipate customer needs and expectations and elicit feedback from customers to improve service. Build relationships with customers to create and sustain customer loyalty.	Model, lead, train and motivate staff with a focus on sustaining a culture that encourages commitment to service excellence and high performance.
<b>Teamwork</b>	Work collaboratively and effectively with others to contribute to group efforts to achieve identified objectives.	Contribute to a positive and cooperative working environment by fulfilling own responsibilities and providing support to co-workers to achieve team goals.	Facilitate work team activities, provide assistance and support needed by team members and promote ownership and commitment among team members to work goals to improve team performance.	Establish teams, design and assess tasks to continually improve team effectiveness and cultivate a sense of organisational ownership and a cooperative working environment.
<b>Transdisciplinary Thinking</b>	Understanding of concepts across multiple disciplines, with the capacity to synthesise the knowledge and insights to guide decisions and foster cooperation.	Research and adapt concepts from outside one's field of expertise to supplement one's core knowledge and proficiency.	Co-relate material from diverse knowledge bases to guide decisions and policy making. Participate in reflective and trans-disciplinary communities within and outside the organisation.	Synthesise knowledge and insights across disciplinary boundaries to aid strategic decisions and foster cooperation within and outside of the organisation.
<b>Virtual Collaboration</b>	Use online collaborative communication tools to work as teams to accomplish tasks or projects.	Participate and contribute in a virtual team. Set up appropriate online collaborative tools and supporting equipment.	Use interactive collaborative tools to foster cohesion and commitment among virtual team members to achieve goals. Keep up-to-date with innovative online collaborative tools and applications to enhance one's proficiency in engaging in virtual collaboration.	Leverage on diverse team talent, latest online collaborative technologies and virtual platforms to produce collaborative behaviour and achieve technological savviness in virtual collaboration.





# Wage Information

Job Roles	Gross Wage	
	25th Percentile (\$)	75th Percentile (\$)
<b>Project Financing</b>		
Executive (Project Financing)	3,872	5,784
Senior Executive (Project Financing)	7,427	9,978
Manager (Project Financing)	6,500	12,836
Director (Project Financing)	6,775	25,505
<b>Project Development</b>		
Assistant Engineer / Officer (Project Development)	2,780	4,562
Engineer (Project Development)	3,631	4,860
Assistant Manager / Senior Engineer (Project Development)	5,350	7,641
Manager (Project Development)	6,561	11,129
<b>Engineering Procurement</b>		
Assistant Engineer / Officer (Engineering Procurement)	2,780	4,562
Engineer (Engineering Procurement)	4,500	6,200
Senior Engineer (Engineering Procurement)	5,874	8,215
Manager (Engineering Procurement)	9,102	13,361
<b>Engineering Design</b>		
Junior Designer (Engineering Design)	3,304	4,417
Designer (Engineering Design)	3,500	4,568
Engineer (Engineering Design)	3,705	5,838
Senior Engineer (Engineering Design)	5,140	7,351
Principal Engineer/Manager (Engineering Design)	7,926	11,773
<b>Engineering Construction and Commissioning</b>		
Technician / Coordinator (Engineering Construction)	4,103	4,935
Assistant Engineer / Senior Technician (Engineering Construction)	4,437	5,475
Engineer / Supervisor (Engineering Construction)	5,058	8,135
Senior Engineer / Assistant Manager (Engineering Construction)	6,907	9,500
Principal Engineer / Manager (Engineering Construction)	8,937	13,500
Technician / Coordinator (Commissioning)	4,500	5,500
Assistant Engineer / Senior Technician (Commissioning)	2,563	3,410
Engineer / Supervisor (Commissioning)	4,400	7,000
Senior Engineer / Assistant Manager (Commissioning)	7,427	9,914
Principal Engineer / Manager (Commissioning)	7,708	13,875
<b>Operations and Maintenance</b>		
Technician / Coordinator (Operations and Maintenance)	4,033	5,089
Assistant Engineer / Senior Technician (Operations and Maintenance)	3,265	5,115
Engineer / Supervisor (Operations and Maintenance)	4,657	6,663
Senior Engineer / Assistant Manager (Operations and Maintenance)	7,210	8,758
Principal Engineer / Manager (Operations and Maintenance)	8,828	12,203
Director (Operations and Maintenance)	10,446	17,585
<b>Director (Engineering)</b>		
Director (Engineering)	12,610	21,175
<b>Chief Executive Officer / Managing Director / General Manager / President</b>		
Chief Executive Officer / Managing Director / General Manager / President	13,960	35,085

Wage survey conducted by Ernst & Young Advisory, commissioned by SkillsFuture Singapore Agency

**Notes:**

- 1) Data pertain to full-time resident employees in the private sector establishments each with at least 25 employees.
- 2) Monthly Gross Wage refers to the sum of the basic wage, overtime payments, commissions, allowances, and other regular cash payments. It is before deduction of employee CPF contributions and personal income tax, and excludes employer CPF contributions, bonuses, stock options, other lump sum payments and payments-in-kind.
- 3) 25th Percentile Wage refers to the wage level which divides the bottom 25% of wage earners from the rest.
- 4) 75th Percentile Wage refers to the wage level which divides the top 25% of wage earners from the rest.



# SKILLS FRAMEWORK FOR ENGINEERING SERVICES Career Pathways



Scan this QR code to find out more  
about the Skills Framework for  
Engineering Services

SKILLS *future* SG

*W*sg  
Workforce  
Singapore

**EDB**  
singapore