

Section 2.0 Knowledge, Skills and Abilities Required by Technical Professional Level
City of Carlsbad Professional Engineering KSA Matrix

Job Title: Junior Engineer	Job Level Title: Assistant Engineer	Job Title: Associate Engineer	Job Title: Senior Engineer
<p><i>Complexity and Scope</i></p> <p>-Entry-level engineering professional.</p> <p>-Requires limited use and application of basic engineering principles, theories, and concepts, and a basic understanding of the City's relevant policies and procedures.</p> <p>-Independently completes routine tasks. In an accurate and timely manner.</p>	<p><i>Complexity and Scope</i></p> <p>-Experienced engineering professional.</p> <p>-Requires full use and application of standard engineering principles, theories, concepts and techniques used, and a solid understanding of the City's relevant policies and procedures.</p> <p>-Independently completes routine and non-routine tasks in an accurate and timely manner.</p>	<p><i>Complexity and Scope</i></p> <p>-Fully qualified engineering professional. This is the journey level for this series of engineers.</p> <p>-Requires both breadth and depth in full use and application of the engineering theories, concepts and techniques used, and a thorough understanding of the City's relevant policies and procedures.</p> <p>-Independently completes complex engineering projects and tasks. Work is thorough, accurate, timely, and on-budget.</p>	<p><i>Complexity and Scope</i></p> <p>-A seasoned and experienced professional recognized within the City as an emerging authority in engineering or similar/related technical discipline such as transportation. Usually supervises a staff of other engineering or technical professionals in an engineering or similar/related technical discipline division of a department.</p> <p>-Uses advanced engineering or related technical principles, theories and concepts to develop advanced solutions to complex opportunities or problems. Thorough understanding of the City's relevant policies and procedures.</p> <p>-Supervises or Independently plans, conducts and completes complex engineering or related/similar technical projects or programs. Work is thorough, accurate, timely and on-budget. May initiate and conduct innovative, exploratory programs as it is relevant to City objectives.</p>

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<p><i>Problem Solving, Innovation & Creativity</i></p> <p>-Identifies and provides solutions to routine problems of limited complexity and scope, using a rational, scientific approach.</p> <p>-Independently recognizes and eliminates technical inconsistencies or problems in assigned projects or products.</p> <p>-Demonstrates willingness and ability to be flexible, creative and innovative in daily work.</p>	<p><i>Problem Solving, Innovation & Creativity</i></p> <p>-Proactively identifies and solves a wide variety of problems of moderate complexity and scope, using a rational, scientific approach.</p> <p>-Independently recognizes and solves technical problem or issues in areas of expertise, applying sound business or technical judgment.</p> <p>-Demonstrates willingness and ability to be flexible, creative and innovative. Participates in implementing non-traditional solutions that create value. Recognizes and recommends new solutions or opportunities.</p>	<p><i>Problem Solving, Innovation & Creativity</i></p> <p>-Proactively identifies and provides solutions to a wide range of difficult and complex problems in a thorough and innovative, yet practical manner.</p> <p>-Responsible for key technical decisions in area of expertise. Applies sound business and technical judgment to problems. Identifies possible project or program ideas that impact existing infrastructure or services and the direction of engineering design. Provides and implements creative solutions that create value and meet organizational needs.</p> <p>-Demonstrates a strong capability in the area of creativity and innovation. Thinks “outside the box.” Originates change, makes things better with creative ideas and solutions.</p>	<p><i>Problem Solving, Innovation & Creativity</i></p> <p>-Proactively identifies and solves a wide range of difficult and complex problems in a thorough and innovative, yet practical manner. Supervises and assists with difficult engineering and design problems.</p> <p>-Directly contributes to the development of innovations which extend the existing boundaries of practice or knowledge in relevant fields. Identifies and provides ideas to exploit new technical opportunities through projects, programs or services. Proactively works with upper management to set and implement technical strategy in area of expertise.</p> <p>-Demonstrates an advanced capability in the area of creativity and innovation. Explores new technical directions. Originates change and creates value through proactively presenting and implementing creative ideas and solutions.</p>

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<p><i>Discretion and Impact:</i></p> <ul style="list-style-type: none"> -Exercises judgment within closely defined procedures and practices to determine appropriate action. -Errors typically have a minor effect on the organization. 	<p><i>Discretion and Impact:</i></p> <ul style="list-style-type: none"> -Exercises judgment within standard, defined procedures and practices to determine appropriate action. -Incorrect decisions or recommendations or failure to get results may cause delays in schedules and result in the allocation of more resources. 	<p><i>Discretion and Impact:</i></p> <ul style="list-style-type: none"> -Independently exercises judgment within generally defined practices and policies, selecting methods and techniques for obtaining solutions. -Incorrect decisions or recommendations, or failure to achieve objectives would normally have a serious effect upon the organization's results and citizen/customer relationships. 	<p><i>Discretion and Impact:</i></p> <ul style="list-style-type: none"> -Independently exercises judgment within generally defined practices and policies as well as areas that require expert interpretation. Selects and may design new methods and techniques for obtaining solutions. -Incorrect decisions or recommendations, or failure to achieve objectives would normally have a serious effect upon the organization's results and citizen/customer relationships. -May serve on external agencies or professional committees and impact standards, regulations or policies.

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<p><i>Contact and Communication:</i></p> <ul style="list-style-type: none"> -Contacts are primarily with immediate supervisors and other team members in department. Outside organization contacts are infrequent and/or on routine matters. May have direct customer contact within a routine environment. -Effective communicator, with both written and oral presentations. Writes technical reports. Formally presents results of work to small groups. -Good interpersonal and communication skills. Communicates with other project team members to achieve project objectives. -Effective team player. Understand how own work impacts the work of others. 	<p><i>Contact and Communication:</i></p> <ul style="list-style-type: none"> -Communicates outside division. Frequent inter-organizational contact and interaction with external organizations. Serves on cross-functional teams. -Effective communicator, with both written and oral presentations. Developing solid presentation, demonstration, and technical writing skills. -Strong interpersonal and communication skills. Communicates with other departments to accomplish objectives. -Effective team player and leader of small, local teams. 	<p><i>Contact and Communication:</i></p> <ul style="list-style-type: none"> -Frequent direct contact with citizens/customers, developers, contractor/suppliers, external agencies to understand issues and plan and implement solutions. Frequent cross-functional contact and coordination. -Skilled and effective communicator, with both written and oral presentations. Highly developed technical writing skills. May train other engineers in the use of tools, systems, and policies. -Strong interpersonal and communication skills. -Effective team player, and informal/formal team leader. -May present to Planning Commission and/or City Council. May represent the organization within the community and at professional meetings. 	<p><i>Contact and Communication:</i></p> <ul style="list-style-type: none"> - Frequent direct contact with citizens/customers, developers, contractor/suppliers, external agencies to understand issues and plan and implement solutions. Lead contact on strategic teams and on critical customer, consultant/contractor or partner issues. Works cross-functionally to develop strong and strategic contacts and partnerships. -Skilled, effective, and compelling communicator, with both written and oral presentations. Excellent presentation, demonstration, facilitation and technical writing skills. Communicates to a broad audience. -Highly developed interpersonal and communication skills. -Supervisor and effective team leader and coach. Actively contributes to creating an environment, which sustains motivation and the introduction/sharing of new ideas. -Presents to City Council. Represents the organization within the community and at professional meetings.

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<p><i>Supervision Given or Received:</i></p> <p>-Normally works under fairly close supervision, under the direction of a registered engineer, receiving detailed coaching and work instructions. Work usually supports or correlates with the work of others. Supervisor helps determine techniques and procedures for non-routine work</p> <p>-Work is closely reviewed for overall accuracy, completeness and soundness of technical judgments.</p> <p>-May lead functional problem solving teams.</p>	<p><i>Supervision Given or Received:</i></p> <p>-Works under general supervision, under the direction of a registered engineer. Supervisor typically determines goals/objectives. Receives instructions on specific assignment objectives, complex features and possible approaches.</p> <p>-May supervise, direct, or coach the work of engineering technicians or administrative personnel.</p> <p>- Work progress is reviewed upon completion of milestones for soundness of judgment and overall adequacy and effectiveness.</p> <p>-May lead functional problem solving teams.</p>	<p><i>Supervision Given or Received:</i></p> <p>-Works under very general direction. Receives assignments in the form of overall objectives and proposes goals and approaches to meet objectives. Independently determines approach to most problems or projects.</p> <p>-May supervise, direct or coach the work of engineering and/or administrative personnel.</p> <p>-Work is reviewed upon completion for adequacy in meeting objectives.</p> <p>-Leads cross-functional team of peers.</p>	<p><i>Supervision Given or Received:</i></p> <p>-This is the first management level in the Engineering Professional Series. Positions in this series may serve as the first-level supervisor over a small unit of technical and support staff in the implementation of their assigned projects and projects. This position typically reports to a division or department head.</p> <p>-Works under broad, general direction. Exercises considerable latitude in determining strategy and approach to assignments and projects.</p> <p>-Trains and supervises engineering or program staff, and assigns work priorities.</p> <p>-Completed work is reviewed for desired results from relatively long-term objectives. Assignments are often self-initiated.</p> <p>-Demonstrates leadership, coaching and mentoring skills.</p>

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<p><i>Project Management</i></p> <p>-Actively participates on project teams.</p>	<p><i>Project Management</i></p> <p>- Effective project team member.</p> <p>-Sets task schedules. Effectively uses resources</p> <p>-May manage basic capital projects.</p>	<p><i>Project Management</i></p> <p>-Leads technical project teams. Understands and effectively applies project management fundamentals.</p> <p>-Determines project approach, scheduling, costing and resource management. Identifies appropriate technical resources for a project. Sets priorities within projects.</p> <p>-May manage complex capital projects.</p> <p>-May be solely responsible for a project/program and/or simultaneously involved in multiple projects.</p>	<p><i>Project Management</i></p> <p>-Effectively leads large technical project teams on complex projects/programs, using advanced project management skills and techniques.</p> <p>-Determines project approach, scheduling, costing and resource management. Identifies appropriate technical resources for a project. Sets priorities within projects.</p> <p>-Supervises or may directly manage large and complex capital projects, including design, sourcing and construction.</p> <p>-May be solely responsible for a project/program and/or simultaneously involved in multiple projects.</p>
<p><i>Computer Skills</i></p> <p>-Microsoft Office Suite, Permits Plus, Plan Track, Document Management System, GIS Informational Systems, AutoCad, and any others specific to job duties.</p>	<p><i>Computer Skills</i></p> <p>-Microsoft Office Suite, Permits Plus, Plan Track, Document Management System, GIS Informational Systems, AutoCad, and any others specific to job duties.</p>	<p><i>Computer Skills</i></p> <p>-Microsoft Office Suite, Microsoft Project or other project management software, Permits Plus, Plan Track, Document Management System, GIS Informational Systems, AutoCad, ArcView Hansen, Crossroads and any others specific to job duties.</p>	<p><i>Computer Skills</i></p> <p>-Microsoft Office Suite, Microsoft Project or other project management software, Permits Plus, Plan Track, Document Management System, GIS Informational Systems, AutoCad, ArcView Hansen, Crossroads and any others specific to job duties.</p>

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<p><i>Technical, Organization, and Business Knowledge:</i></p> <p>Requires a basic understanding of:</p> <ul style="list-style-type: none"> -Principles, practices and methods of civil engineering. -Methods of preparing designs, plans, specifications, estimates, reports and recommendations relating to engineering projects. -Applicable federal, state and local codes, design standards, laws and regulations affecting the assigned area of responsibility. -Methods and techniques of research, quality improvement methods and problem solving tools, statistical analysis and report presentation, technical software. -The basics of the City's Vision and Strategy, and annual operating goals, and how their area and work supports the Vision/Strategy/Goals. -The organizational structure of the City and the roles and responsibilities of functions related to their position. 	<p><i>Technical, Organization, and Business Knowledge:</i></p> <p>Requires a thorough understanding of:</p> <ul style="list-style-type: none"> -Principles, practices and methods of civil engineering. -Methods of preparing designs, plans, specifications, estimates, reports and recommendations relating to engineering projects. -Applicable federal, state and local codes, design standards, laws and regulations affecting the assigned area of responsibility. -Methods and techniques of research, quality improvement methods and problem solving tools, statistical analysis and report presentation, technical software. -The basics of the City's Vision and Strategy, and annual operating goals, and how their area and work supports the Vision/Strategy/Goals. -The organizational structure of the City and the roles and responsibilities of functions related to their position. 	<p><i>Technical, Organization, and Business Knowledge:</i></p> <p>Requires an advanced understanding of:</p> <ul style="list-style-type: none"> -Principles, practices and methods of civil engineering. -Methods of preparing designs, plans, specifications, estimates, reports and recommendations relating to engineering projects. -Applicable federal, state and local codes, design standards, laws and regulations affecting the assigned area of responsibility. -Methods and techniques of research, quality improvement methods and problem solving tools, statistical analysis and report presentation, technical software. -The basics of the City's Vision and Strategy, and annual operating goals, and how their area and work supports the Vision/Strategy/Goals. -The organizational structure of the City and the roles and responsibilities of functions related to their position. 	<p><i>Technical, Organization, and Business Knowledge:</i></p> <p>Requires an expert understanding of:</p> <ul style="list-style-type: none"> -Principles, practices and methods of civil and traffic engineering. -Methods of preparing designs, plans, specifications, estimates, reports and recommendations relating to engineering projects. -Applicable federal, state and local codes, design standards, laws and regulations affecting the assigned area of responsibility. -Principles, practices and techniques of public administration, including budget and personnel administration. -Methods and techniques of research, quality improvement methods and problem solving tools, statistical analysis and report presentation, technical software. -The basics of the City's Vision and Strategy, and annual operating goals, and how their area and work supports the Vision/Strategy/Goals. -The organizational structure of the City and the roles and responsibilities of most functions.

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<p>Typical guidelines:</p> <p>-A bachelor's degree in engineering or a closely related field, from an accredited college or university, with no significant related work experience.</p> <p><i>License or Certificate:</i></p> <p>Possession of, or ability to obtain, an appropriate valid California driver's license.</p>	<p>An equivalent combination of the education and experience listed below:</p> <p>-A bachelor's degree in engineering or a closely related field, from an accredited college or university, plus a minimum of two years of related work experience.</p> <p>A master's degree in engineering or a related field may be substituted for work experience.</p> <p><i>License or Certificate:</i></p> <p>Engineer-In-Training Certificate or</p> <p>Possession of, or ability to obtain, an appropriate valid California driver's license.</p>	<p>An equivalent combination of the education and experience listed below:</p> <p>-A bachelor's degree in engineering or a closely related field, from an accredited college or university, plus a minimum of five years of related experience.</p> <p>A master's degree in engineering or a related field may be substituted for work experience.</p> <p><i>License or Certificate:</i></p> <p><i>Engineering-In-Training Certificate</i></p> <p>Preferred: Registration as a professional civil engineer or depending on assignment a licensed traffic engineer.</p> <p>Possession of, or ability to obtain, an appropriate valid California driver's license.</p>	<p>An equivalent combination of the education and experience listed below:</p> <p>-A bachelor's degree in engineering or a closely related field in area of assignment, from an accredited college or university, plus 7 or more years of related experience. Additional coursework in Public Administration is desirable.</p> <p>A master's degree in engineering or a related field may be substituted for work experience.</p> <p><i>License or Certificate:</i></p> <p>Registration as a professional civil engineer or licensed traffic engineer in the state of California.</p> <p>Or,</p> <p>PTP (Professional Transportation Planner) Certification if assigned to transportation demand programs. Possession of, or ability to obtain, an appropriate valid California driver's license.</p>