CLASS SPECIFICATION
Senior Engineering Associate

FLSA Status: Exempt
Union Representation: Professional and Technical Employees (PTE)

GENERAL PURPOSE

Under general direction, performs intermediate to advanced professional project management, specialized engineering or developer/building plan reviews in one of several recognized engineering specialties; applies advanced technical engineering knowledge to the solution of design, construction, improvement and maintenance problems pertaining to the City's infrastructure and private development; carries projects through from inception to completion, manages several projects at once and/or manages a complex project in a specialty field; and performs related work as assigned. Incumbents may oversee, coordinate and review the work of support staff and technicians.

DISTINGUISHING CHARACTERISTICS

Incumbents of this class complete intermediate to complex engineering assignments requiring the application of engineering theory and the use of judgment and initiative in developing solutions to problems, applying laws, codes, policy and precedents. Incumbents are responsible for managing projects from inception to completion. Incumbents manage several projects at once and/or manage a complex project or projects requiring specialized technical expertise. Incumbents may oversee, coordinate, and review the work of support staff, technicians, and engineering associates.

The Senior Engineering Associate class is distinguished from Engineer in that incumbents in the latter class exercise a higher degree of independent judgment on diverse and specialized assignments with a greater degree of accountability and ongoing decision making. The latter class also requires registration as a Professional Engineer.

ESSENTIAL DUTIES AND RESPONSIBILITIES

Any one position in this class may not perform all the duties listed below, nor do the listed examples of duties include all similar and related duties that may be assigned to this class.

1. Plans projects by defining and/or reviewing the objectives of assigned project; considers variables including scope, methodology, tasks involved, initial requirements, available personnel and economic resources; forecasts budget, schedule and sequence of completion; conducts project meetings; coordinates with other organizations or projects; and develops a work plan or design process that will deliver a high-quality, cost-effective and timely product or completion of the project.

2. Performs, directs or reviews design functions; performs design calculations; presents

recommendations of design criteria and alternate methodologies.

3. Develops and interprets project drawings and specifications.

4. Prepares or directs preparation of written specifications for construction contracts; assists in evaluation of consultant engineering proposals and submittals, develop contract amendments, conduct pre-bid meetings; contractor pre-qualification proposals, qualifications of bidders, and schedules; and recommends selection of consultants.

5. Manages projects by coordinating and directing the delivery of services; coordinating work with other related projects and organizations; monitoring and adjusting projects work; tracking cost to ensure that project is completed successfully and on- time; and conduct project team and project oversight meetings; and prepares written engineering reports.

6. Conducts pre-construction and job site meetings; observes, analyzes work progress and directs contractors as the City Engineer's on-site representative; anticipates possible construction claims; provides timely written reports and directs appropriate actions; reviews and analyzes change order requests; reviews construction claims and recommends appropriate action; and negotiates with Contractor to resolve disputes.

7. Organizes, reviews and finalizes project record keeping for all job related activities; directs employees in record-keeping details.

8. Prepares correspondence related to assigned projects and responds to citizen inquiries.

9. Provides technical assistance and training and direction to technical and support staff.

10. Conducts meetings and makes presentation to citizen groups, property owners, contractors, consulting engineers, other bureau staff and outside agencies; oversees and participates in public involvement component of projects.

11. Attends meetings impacting City operations as City representative.

12. Reviews plans and specifications prepared by developers and contractors for municipal or private structures to ensure their compliance with all applicable codes and standards; reviews plans for structural integrity, safety, and site geological suitability.

13. Conducts engineering research studies related to the feasibility of proposed projects or methods, the evaluation of on-going projects, or the determination of solutions to existing field problems; assembles, evaluates and presents technical data; provides technical guidance or proposes solutions.

14. Reviews and interprets federal, state and local laws, regulations and code provisions that would impact engineering related work in order to ensure that the City and developers are in

compliance with all pertinent regulatory provisions.

15. Researches, uses and develops computerized management information systems, including those applicable to modeling, engineering options, construction, operations or maintenance.

16. Prepares or modifies computer programs; performs related programming work: flow-charting, program testing, problem solving.

17. Analyzes technical data to determine economic alternatives, environmental impact, efficiency of operation, cost-benefit ratios, depreciation rates, basis for utility rates, and estimates for bid prices.

18. Prepares written correspondence, technical reports and City documents such as work orders, purchase orders, contract specifications, City ordinances, or compliance reports for outside agencies.

OTHER DUTIES

1. Defines, initiates and assists in negotiating the acquisition of easements.

2. Assists in preparation of budget requests and justifications for section or unit; maintains records of cash flow for special projects or funds; assists in preparation of justifications for capital improvement projects; assists supervisor in development of projected staffing needs and other information needed in budget preparation.

3. Obtains all necessary federal, state and local permits.

4. Conducts field investigations and site reconnaissance to assess site conditions and identify potential problems or hazards.

5. Reviews technical data for new products, methods or systems.

6. Attends training sessions and conferences.

7. Reviews, maintains, updates and recommends changes to manuals, policies and procedures.

MINIMUM QUALIFICATIONS

Knowledge of:

1. Engineering concepts, procedures, principles and practices in field of engineering specialty.

2. Computer use, applications, languages and programming techniques pertaining to the work.

3. Federal, state and local laws, regulations and codes pertinent to area of specialty.

4. Math through calculus, including algebra, geometry and trigonometry.

5. Contracting and bidding procedures.

6. Principles and practices of project and construction management.

7. Theory and principles of environmental protection and control.

8. Currently accepted principles and practices in staff direction and training.

9. Drafting techniques, including basic computer-assisted drafting.

10. Soil mechanics, erosion control, and geotechnical principles.

11. Hydrology and hydraulics as applied to the design of water distribution, drainage collection and treatment and sewage treatment pipes and facilities.

12. Surveying terminology, practices, variables, and calculations.

13. Standard construction materials, specifications, techniques, equipment and testing methods.

14. Principles of physics, chemistry and mathematics applicable to engineering.

Ability to:

1. Plan and manage large or multiple construction, design, research or other engineering related projects.

2. Establish and maintain effective working relationships with a diversity of others.

3. Interact effectively, to problem solve and partner with citizens, community groups and/or contractors and to negotiate agreements with contractors and the public.

4. Speak in front of groups and cope with dissent and conflict.

5. Work independently and manage time efficiently.

6. Use specialized drafting, engineering, surveying or electronic tools, materials and equipment.

7. Derive information from plans, specifications, maps, complex laws, regulations and codes.

8. Write correct, clear and concise technical materials, such as project reports and specifications.

Training and Experience:

A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from a four-year college or university with a degree in civil, mechanical, electrical, chemical, structural or traffic engineering; and two years of responsible engineering experience; or an equivalent combination of training and experience. Experience in a public agency is preferred.

Licenses; Certificates, Special Requirements:

An Engineer-In-Training Certification, i.e., passed the State Fundamentals of Engineering (FE) examination at time of appointment.

A valid state driver's license may be required for certain assignments.

PHYSICAL AND MENTAL DEMANDS

Persons with disabilities may be able to perform the essential duties of this class with reasonable accommodation. Reasonable accommodation will be evaluated on an individual basis and depend, in part, on the specific requirements for the job, the limitations related to disability and the ability of the hiring bureau to accommodate the limitation.

SPECIALTIES

Positions in this class are assigned to one of the following specialties: Chemical/Environmental(CHEV), Civil (CIV), Electrical (ELEC), Geotechnical (GEO), Mechanical (MECH), Structural (STR), or Traffic (TRAF). Positions assigned to the Civil Specialty are defined under the Essential Duties and Responsibilities and Minimum Qualifications sections of the class specification.

Class History:

Adopted:	01-01-90	Class created as a result of consolidating the following COPPEEA classes: 3162 Chemical 3162 Civil 3162 Electrical 3162 Geotechnical 3162 Industrial 3162 Mechanical 3162 Structural 3203 Traffic
Revised:	08-04-93	
Revised:	04-03-95	Spec reviewed for supervisory duties.
Revised:	07-01-01	Spec revised as part of the COPPEA Classification and Compensation study. Engineering Associate (6111) class created from the following COPPEA classes: 3153 Engineering Associate
Revised:	08-19-03	Note regarding specialties added.
Revised:	09-09-05	"Specialties" section added.
Revised:	04-26-06	Updated "Licenses" section with FE exam requirement.
Revised:	08-01-06	Spec history revised to reflect pre-2001 COPPEA Study history. Spec formatting modified.

June 2009 - Change Job Class number from 6111 to 30000357 (CHEM), due to system change.
June 2009 - Change Job Class number from 6111 to 30000358 (CIV), due to system change.
June 2009 - Change Job Class number from 6111 to 30000359 (ELEC), due to system change.
June 2009 - Change Job Class number from 6111 to 30000360 (GEO), due to system change.
June 2009 - Change Job Class number from 6111 to 30000361 (MECH), due to system change.
June 2009 - Change Job Class number from 6111 to 30000362 (STR), due to system change.
June 2009 - Change Job Class number from 6111 to 30000363 (TRAF), due to system change.
Revised: 03-31-17Modified Chemical specialty to include Environmental
July 2017 – Updated union name from COPPEA to PTE

30000357 – Chemical/Environmental Specialty (CHEV)

GENERAL PURPOSE

Under general direction, performs intermediate to advanced professional project management, specialized engineering or developer/building plan reviews; applies advanced technical chemical and/or environmental engineering knowledge to the solution of design, construction, improvement and maintenance problems pertaining to the City's infrastructure and private development; carries projects through from inception to completion, manages several projects at once and/or manages a complex project in a specialty field; and performs related work as assigned.

DISTINGUISHING CHARACTERISTICS

Duties are similarly described across this job class family. The distinguishing factors are the complexity, independence, project management and decision making authority of each level.

ESSENTIAL DUTIES AND RESPONSIBILITIES

1. Designs and reviews plans for chemical or physical processes to be used in potable water or wastewater treatment.

2. Evaluates effectiveness and options on treatment processes for water or wastewater treatment plants and processes; and makes recommendations for and implements change or improvements.

3. Trains operators in chemical aspects of treatment processes.

4. Prepares and reviews reports that analyze and interpret water quality data or wastewater contaminant data.

5. Designs and reviews plans for monitoring raw potable surface and groundwater supplies.

6. Reviews proposals for treating industrial waste; develops sound solutions to industrial waste disposal problems; monitors industry compliance with state, federal and local regulations.

7. Reviews qualitative chemical, physical, bacteriological and biological data concerning the quality of water.

8. Prepares or directs preparation of environmental assessments pertaining to new, potable water supplies or treatment of wastewater in conformance with federal laws and guidelines.

9. Evaluates and interprets data for sources of pollution to determine ambient conditions, trending, and cause and effect relationship between pollutants and impacts.

10. Directs field sampling and laboratory analysis.

OTHER DUTIES

1. Participates in emergency response planning processes.

2. Designs and reviews plans for new corrosion control installations; inspects, analysis operation and maintains corrosion control systems.

MINIMUM QUALIFICATIONS

Knowledge of:

1. Chemical and/or environmental engineering principles, practices and fundamentals that relate to potable water or wastewater treatment systems.

2. Chemistry, environmental, biological and bacteriological sciences.

3. Federal, state and local laws and regulations relating to environmental programs, wastewater treatment systems and/or drinking water systems.

4. Laboratory practices and field sampling techniques; commercial scale chemical processes and instrumentation.

5. Technical activities related to principles and practices of industrial pretreatment and spill control.

6. Water and wastewater distribution and treatment systems.

7. Water, hazardous or solid waste pollution, measurement and/or control principles, practices and equipment; groundwater pollution hazards and protection practices.

Training and Experience:

A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from a four-year college or university with a degree in chemical or environmental engineering; and two years of responsible engineering experience; or an equivalent combination of training and experience. Experience in corrosion engineering may be preferred for some assignments.

30000359 - Electrical Specialty (ELEC)

GENERAL PURPOSE

Under general direction, performs intermediate to advanced professional project management, specialized engineering or developer/building plan reviews; applies advanced technical electrical engineering knowledge to the solution of design, construction, improvement and maintenance problems pertaining to the City's infrastructure and private development; carries projects through from inception to completion, manages several projects at once and/or manages a complex project in a specialty field; and performs related work as assigned.

DISTINGUISHING CHARACTERISTICS

Duties are similarly described across this job class family. The distinguishing factors are the complexity, independence, project management and decision making authority of each level.

ESSENTIAL DUTIES AND RESPONSIBILITIES

1. Design and review designs of electrical, instrumentation and control systems.

2. Prepare and review electrical, instrumentation and control system plans and specifications.

3. Inspect existing electrical, control and instrumentation systems and those under construction to determine needed improvements or ensure compliance with codes and specifications. Installations include electro-mechanical devices and ones linked to a computerized reporting system.

4. Perform programmable controller programming, simulation, debugging and start-up.

MINIMUM QUALIFICATIONS

Knowledge of:

1. Electrical engineering principles, practices and fundamentals that relates to municipal infrastructures.

2. Instrumentation, control panel design and PLC programming.

3. Electrical codes and standards relating to municipal infrastructures.

Training and Experience:

A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from a four-year college or university with a degree in electrical engineering; and two years of responsible engineering experience; or an equivalent combination of training and experience. Experience in a public agency is preferred.

30000360 - Geotechnical Specialty (GEO)

GENERAL PURPOSE

Under general direction, performs intermediate to advanced professional project management, specialized engineering or developer/building plan reviews; applies advanced geotechnical engineering knowledge to the solution of design, maintenance, improvement and construction problems pertaining to the City's infrastructure and private development; carries projects through from inception to completion, manages several projects at once and/or manages a complex project in a specialty field; and performs related duties as assigned.

DISTINGUISHING CHARACTERISTICS

Duties are similarly described across this job class family. The distinguishing factors are the complexity, independence, project management and decision making authority of each level.

ESSENTIAL DUTIES AND RESPONSIBILITIES

1. Performs the geotechnical design of public works structures and the review of private development including, but not limited to earthwork, grading, foundations, retaining walls, shoring, slope stabilization, ground improvement and erosion control.

2. Performs site inspections of development sites. Evaluates site conditions and potential geologic hazards. Determines whether geotechnical engineering, engineering geology and/or seismic site hazard studies are required for proposed development.

3. Performs analyses of construction plans having complex and unusual geotechnical features.

4. Develops technical standards for the geotechnical engineering features of construction.

5. Determines whether geotechnical engineering features of construction plans comply with applicable codes and regulations, and professional standards of practice.

6. Plans geotechnical exploration and testing programs, interprets results and incorporates them into design and plans.

7. Designs and manages construction of landslide mitigation measures; monitors measuring instruments; analyzes data; designs and oversees installation of shoring.

MINIMUM QUALIFICATIONS

Knowledge of:

1. Civil engineering principles and advanced current knowledge of geotechnical engineering concepts, principles and practices.

2. Standard construction methods, materials, equipment and testing methods.

3. Soil and rock exploration, sampling and testing methods.

4. Principles of design, construction and maintenance of the geotechnical features of construction as they relate to present-day building codes and professional standards of practice.

5. Principles and terminology of hydrology and hydraulics.

6. Geotechnical principles and practices and soil mechanics applicable to earthquake engineering.

7. Current computer programs and computer technology used in solving geotechnical engineering problems.

8. Erosion control methods.

9. Provisions of the current editions of the Uniform Building Code.

Training and Experience:

A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from a four-year college or university with a degree in civil engineering with an emphasis in geotechnical engineering; and two years of responsible engineering experience; or an equivalent combination of training and experience.

30000361 - Mechanical Specialty (MECH)

GENERAL PURPOSE

Under general direction, performs intermediate to advanced professional project management, specialized engineering or developer/building plan reviews; applies advanced technical mechanical engineering knowledge to the solution of design, construction, improvement and maintenance problems pertaining to the City's infrastructure and private development; carries projects through from inception to completion, manages several projects at once and/or manages a complex project in a specialty field; and performs related work as assigned.

DISTINGUISHING CHARACTERISTICS

Duties are similarly described across this job class family. The distinguishing factors are the complexity, independence, project management and decision making authority of each level.

ESSENTIAL DUTIES AND RESPONSIBILITIES

1. Design and review plans for heating, ventilating and air conditioning (HVAC) systems in public buildings; and plans for mechanical equipment and instrumentation systems with mechanical components used in public works systems, primarily in wastewater treatment facilities.

2. Write specifications for mechanical equipment, participate in the bidding process and work with contractors.

3. Direct the installation, testing and maintenance of HVAC devices and other mechanical systems.

MINIMUM QUALIFICATIONS

Knowledge of:

1. Principles and practices of mechanical engineering.

2. HVAC systems in public buildings, and mechanical devices and equipment commonly used in public works construction and maintenance, water or wastewater collection and treatment systems.

3. Hydraulics and hydrology applicable to water distribution systems or wastewater collection and treatment systems.

4. Federal, state and local laws and regulations relating to the design, installation and maintenance of HVAC systems.

Training and Experience:

A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from a four-year college or university with a degree in mechanical engineering; and two years of responsible engineering experience; or an equivalent combination of training and experience. Experience in a public agency is preferred.

30000362 - Structural Specialty (STR)

GENERAL PURPOSE

Under general direction, performs intermediate to advanced professional project management, specialized engineering or developer/building plan reviews; applies advanced technical structural engineering knowledge to the solution of design, construction, improvement and maintenance problems pertaining to the City's infrastructure and private development; carries projects through from inception to completion, manages several projects at once and/or manages a complex project in a specialty field; and performs related work as assigned.

DISTINGUISHING CHARACTERISTICS

Duties are similarly described across this job class family. The distinguishing factors are the complexity, independence, project management and decision making authority of each level.

ESSENTIAL DUTIES AND RESPONSIBILITIES

1. Performs the structural design of public works structures and the review of private development structures, including but not limited to bridges, buildings, culverts, retaining walls, sewer lines, water lines and underground structures such as pump stations and large manhole chambers.

2. Plans land surveying requests detailing all information needed from the land survey; and interprets land survey results and incorporates them into design and plans.

3. Selects structure type for design, taking into consideration factors that include: soil conditions, cost effectiveness, available funding, and visual impact.

4. Interprets information from geotechnical exploration to perform foundation design and analysis.

5. Designs and manages construction of landslide mitigation measures; monitors measuring instruments; analysis data; and designs and oversees installation of shoring.

6. Selects components of structures; calculates performance of each structural member through analysis using the appropriate working stress and/or ultimate stress methods; considers the effects of shrinkage, creep, thermal forces, sidesway, and drift on structures.

7. Designs bridges in conformance with state and federal rules and regulations.

8. Performs site inspections to verify compliance with the erosion control requirements on previously approved plans and specifications.

9. Plans and conducts bridge inspections.

MINIMUM QUALIFICATIONS

Knowledge of:

1. Principles and practices of structural engineering.

2. Standard construction material specifications and testing methods.

3. Principles of design, construction and maintenance of buildings and structures as they relate to present-day building codes, including bridges.

4. Federal, state and local laws and regulations relating to structural design of municipal buildings and structures including bridge inspections and correct methods for conducting these inspections.

5. Principles and terminology of hydrology and hydraulics; geotechnical principles and practices and soil mechanics applicable to seismic design.

6. Standard practices for welding structural steel.

7. Erosion control methods.

8. Provisions of the current editions of the Uniform Building Code, Building Code Requirements for Reinforced Concrete, Manual of Steel Construction, American Welding Society Code and AASHTO Standard Specifications for Highway Bridges.

Training and Experience:

A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from a four-year college or university with a degree in structural engineering; and two years of responsible engineering experience; or an equivalent combination of training and experience. Experience in a public agency is preferred.

30000363 - Traffic Specialty (TRAF)

GENERAL PURPOSE

Under general direction, performs intermediate to advanced professional project management, specialized engineering or developer/building plan reviews; applies advanced technical traffic engineering knowledge to the solution of design, construction, improvement and maintenance problems pertaining to the City's infrastructure and private development; carries projects through from inception to completion, manages several projects at once and/or manages a complex project in a specialty field; and performs related work as assigned.

DISTINGUISHING CHARACTERISTICS

Duties are similarly described across this job class family. The distinguishing factors are the complexity, independence, project management and decision making authority of each level.

ESSENTIAL DUTIES AND RESPONSIBILITIES

1. Designs and reviews plans for the physical layout of traffic control devices for signalized intersections.

2. Designs and reviews plans for electrical wiring and selects control equipment for signalized intersections.

3. Determines locations for installation of new traffic signals and removal of existing signals.

4. Manages street lighting location, construction or maintenance projects.

5. Performs analysis and selects phasing and timing of traffic signals to maximize efficiency and safety of arterial system.

6. Designs sign and pavement marking installations including type and location.

7. Performs technical traffic analysis including street and intersection capacity, travel time and delay, gap availability, turning movements, collision analysis and diagrams, and origin/destination surveys; and make recommendations related to traffic problems and issues.

8. Reviews and approves detour routings for street repair, requests for street use and/or street and sidewalk closures.

9. Assists other bureaus by performing geometric design of streets, including selection of design speed, curb radius, taper distances, and design of neighborhood traffic management devices such as circles and diverters.

10. Reviews major land use development projects for traffic impact to adjacent street system and

recommends or requires improvements.

11. Reviews commercial buildings plans for driveway locations, off-street parking and loading space for compliance with bureau policies and code requirements.

12. Works with City Attorney's Office and Risk Management on defense of City in traffic cases; investigates street safety complaints regarding trucks, buses, autos, bikes and pedestrians.

13. Maintains records of drawings, diagrams and inventory of signals and street lighting,

OTHER DUTIES

1. Develops parking and traffic control plans for special events.

2. Approves traffic or parking related permits for films, street vacation, angle loading, and over-dimensional trucks.

3. Advise external customers regarding City policy and standards regarding operation and construction in the public right of way.

4. Research, evaluate and provide recommendations on traffic calming issues, devices and methods.

MINIMUM QUALIFICATIONS

Knowledge of:

1. Fundamentals of traffic engineering principles, practices and procedures.

2. Traffic control equipment design, operation, materials and construction techniques including the provisions of the Manual on Uniform Traffic Control Devices.

3. Electronic computer capabilities and operating principles as applied to traffic control.

Ability to:

1. Apply relevant traffic regulatory laws, ordinances, codes, standards and specifications applicable to work design.

2. Interpret and prepare traffic engineering designs and specifications.

3. Analyze and modify the design of streets, intersections and traffic control devices in order to reduce collisions and congestion.

4. Analyze the effects on traffic conditions of proposed annexations, zone changes, new

constructions and other projects.

Training and Experience:

A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from a four-year college or university with a degree in traffic engineering; and two years of responsible engineering experience; or an equivalent combination of training and experience. Experience in a public agency is preferred.