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ENGINEERING SERIES

Series Definition:

This is a multi-series, covering various recognized professional engineering series of classes which require application of professional engineering knowledge and abilities in the solution of engineering problems. Positions in this series have responsibility for supervision or performance of planning, design, construction, inspection, production, application, standardization, operation or maintenance of engineering facilities, structures, systems, processes, equipment, devices or materials.

Classes in this series all require a common core of professional engineering knowledge such as is acquired in a four-year course in engineering in a college or university, including courses in physics, chemistry, mathematics through integral calculus and engineering sciences such as statics, dynamics, strength of materials, thermodynamics and fluid mechanics, and in addition, specialized courses and/or experience in an area of specialization relating to the branch of engineering involved.

Determination of Levels:

Although the subject matter varies according to the requirements of each engineering specialty, the factors determining levels of difficulty and responsibility are essentially the same for all specialty areas; consequently, the numbering system is constant for all areas of specialization. The grade of an engineer position depends largely upon the following classification factors: scope and difficulty of the engineering projects that are assigned; nature of available guidelines for performance of the work; originality required; nature and purpose of personal contacts maintained with others; nature of supervisory controls exercised over the work, which reflects the extent to which the engineer's technical judgment is relied upon without detailed review; nature and scope of recommendations, decisions, commitments and conclusions; nature and extent of supervisory responsibility for the work of other employees; and qualifications required.

Use of Specialty Titles:

Grade levels for all professional engineering positions will be established by reference to this classification standard, with the required specialization indicated by the use of the appropriate descriptive title, for example, by reference to the criteria of this specification, the work of an electrical engineer warranting allocation to the IV level will

become Engineer (Electrical) IV. These titles do not represent mutually exclusive areas of specialization and overlap in certain instances. This is particularly noteworthy in the case of Engineer (Civil), which is a broad, general series which typically is to be used for trainee positions and for higher-level civil engineer classes not specifically requiring knowledge and/or experience in a narrow, more specialized field.

The following specialty titles are established:

Engineer (Civil) - Includes those professional engineering positions concerned with the planning, design and/or construction and maintenance of structures and facilities such as roads, airfields, bridges, tunnels, harbors, reservoirs, pipelines, power plants, water and sewage systems and buildings.

Engineer (Electrical) - Includes those professional engineering positions concerned with the design, planning, production, installation, operation and maintenance of electric or electronic components, equipment, systems, facilities and machinery used in the generation, transmission, distribution and utilization of electrical energy.

Engineer (Mechanical) - Includes those professional engineering positions concerned with the designing, production, installation and maintenance of tools and machines; typical sub-specializations are power generation and transmission, automotive engineering, heating and ventilation, air conditioning, machine design and research.

Engineer (Environmental) - Includes those professional positions engaged in the application of engineering principles and practices to the protection or improvement of public health and well-being. These positions involve the design, maintenance and operation of systems and facilities concerned with preservation and enhancement of environmental conditions, including air, water, shelter, food, disposal of liquid and solid wastes, vector and rodent control, industrial hygiene and institutional hygiene. In addition to a basic background of professional engineering, these classes require specialized knowledge, based on experience and/or training, in biological sciences such as bacteriology, organic chemistry and entomology.

Engineer (Safety) - Includes those professional engineering positions engaged in the control of physical conditions and practices, with the objective of eliminating the factors which are known or predicted to result in injury to persons or damage to property. These positions typically involve safety program management plus the generalized application of knowledge of several engineering disciplines (e.g., civil, electrical and mechanical engineering) where any one specialty area is not primary.

Engineer (Public Utilities) - Includes those professional engineering positions involved in the regulation and control of public utility services and facilities such as electricity, gas, water, communications and transportation, where one area of engineering specialization is not primary. These positions typically require general knowledge of more than one field of engineering (e.g., civil, electrical and mechanical engineering) as well as knowledge of the laws, rules and regulations governing the operational activities of franchised enterprises providing power, energy, communication and transportation services to the public.

Engineer (Structural) - Includes those professional engineering positions concerned particularly with application of the theories of structural dynamics, including distribution of loads, stresses and strength of materials to the planning, design and/or construction of buildings and other structures. Although this is an area of specialization within the general Civil Engineering discipline, a clearly defined body of knowledge required, based on specialized training and/or experience, is identifiable at the higher levels (i.e., IV and above).

Engineer (Buildings) - Includes those professional engineering positions concerned with the planning, design, construction and/or maintenance of buildings and ancillary facilities. These positions typically require general knowledge of more than one field of engineering (e.g., civil, architectural, electrical, mechanical and structural) as well as a thorough knowledge of the laws, codes, rules and regulations relating to the design and construction of buildings. Although this is an area of specialization within the general Civil Engineering discipline, a clearly defined body of knowledge is required, based on specialized training and/or experience, is identifiable at the higher levels (i.e., IV and above).

This is an amendment to the class specification for the ENGINEERING SERIES approved on August 28, 1968, due to incorporation of managerial level in EMCP in accordance with Act 254, SLH 1980.

DATE APPROVED: 10/13/1982

/s/ Clement L. Kamalu
for DONALD BOTELHO
Director of Personnel Services

Note: The class, Engineer VII, was deleted per Circular 95-2, dated April 20, 1995.

ENGINEER I

7.001

Duties Summary:

Performs routine professional engineering work requiring the application of basic engineering principles and techniques, according to specific instructions and following well-established practices; and performs other duties as required.

Distinguishing Characteristics:

This is the beginning or trainee level in the professional engineering series. The purpose of assignments at this level is to orient the employee in the practical application of theory and basic principles. Instructions are received in specific terms as to methods, procedures and the results expected. Specific duties and work assignments at this level may be similar to those of nonprofessional employees, but such assignments are primarily for training purposes to equip the incumbent to assume more responsible engineering duties. Supervision is continuous in most phases of activity, with detailed review on completion of assignments.

Examples of Duties:

The following are illustrative only, and not all inclusive: Under close supervision of a higher-level engineer, performs calculations, applying standard engineering formulas; prepares graphs, curves and tables; records factual data in tests and observation studies; performs drafting and minor detail design; performs inspection and surveying duties and searches technical reports and records to obtain information relating to work assignments.

Knowledge and Abilities Required:

Knowledge of the basic principles, theories and practices of engineering including higher mathematics, physical and engineering sciences and the application of basic sciences to engineering in general, such as may be acquired through completion of a full four-year engineering curriculum leading to the bachelor's degree in an accredited college or university. Ability to carry out under close supervision simple or routine tasks in support of higher-level professional work.

ENGINEER II

7.002

Duties Summary:

Performs specific and limited professional engineering assignments requiring application of standard professional methods and techniques, which may involve minor phases of a broad project; and performs other duties as required.

Distinguishing Characteristics:

Does routine professional engineering tasks, using prescribed methods and techniques, but with more latitude than is present at the next lower level, for using independent judgment in selecting appropriate guidelines and precedents for accomplishing individual assignments, as well as in recognizing discrepancies, omissions or deviations in technical data. An incumbent works under general supervision on repetitive assignments, with detailed calculations, findings and recommendations on such assignments generally accepted as technically accurate, although they may be spot-checked or verified. On new or more complex assignments, specific detailed instructions are initially given by the supervisor, advice and guidance are available during work progress, and completed work is reviewed in detail for technical accuracy, adequacy and conformance to prescribed policy and procedures. Person-to-person contacts at this level are ordinarily within the organization to present factual information directly applicable to individual assignments. An incumbent of this class may supervise or instruct subprofessional personnel or Engineers I on individual assignments or minor projects.

Examples of Duties:

The following are illustrative only and not all inclusive: Does routine professional engineering work in the planning, design, construction, maintenance, inspection and/or operation of civil engineering projects; assists higher-level engineers in preparing designs, plans, specifications, estimates and reports.

Under close supervision of a higher-level environmental engineer, makes field investigations and studies of sewage disposal systems, swimming pools and bathing places, water supply and distribution systems and similar facilities for the purpose of improving facilities and practices; makes reports of findings and recommendations; and assists higher-level engineers in broader aspects of public health environmental engineering work.

Knowledge and Abilities Required:

In addition to the knowledge and abilities required at the next lower level, this level requires: a sufficient working knowledge of the principles, practices and techniques in the area of assignment to perform a variety of repetitive tasks without detailed and specific instructions; a general knowledge of applicable regulatory and procedural issuances; and the ability to select and apply standard guides, methods and techniques within the area of assignment.

ENGINEER III

7.003

Duties Summary:

Performs moderately difficult professional engineering work in the planning, design, construction, maintenance, operation and/or evaluation of engineering projects or facilities or assists higher-level engineers on more complex projects; and performs other duties as required.

Distinguishing Characteristics:

Assignments at this level usually consist of work similar to that previously done in the organization, and can be performed without substantial adaptation or with only minor modifications to standard designs, practices or criteria. An engineer at this level often carries out portions of more complex projects assigned to a higher-level engineer. Assignments are given in terms of specific objectives, with instructions as to possible complex features and the means of their solution. Standard technical methods, computations and details are seldom reviewed by supervisor; completed work is reviewed for soundness of technical engineering judgment and to ensure completion of assignments. Where there is serious consequence of errors, a complete review may be made. Person-to-person contacts at this level are generally limited to an exchange of factual, technical information with coworkers, except for field positions and those concerned with cooperative programs with the public, which may involve contacts with engineers and inspectors of other government agencies or jurisdictions, contractors, property owners, utility companies and other employees to give and receive factual information. An incumbent may supervise lower-level engineers or subprofessional personnel in the performance of routine engineering duties.

Examples of Duties:

The following are illustrative only and not all inclusive:

Engineer (Civil) - Assumes responsibility for civil engineering projects of a well-defined, routine or uncomplicated nature or assists a civil engineer of higher level on more complex projects, such as the designing of reservoirs, retaining walls, bridges, culverts, tunnels, pipelines, sidewalks, highways, wharves and other structures, by computing grades and alignments, loading and stresses and determining the size, proportions and dimension of structures. May supervise a small group of lower-level professional and subprofessional engineering personnel engaged in civil engineering activities.

Engineer (Environmental) - Makes field investigations and studies of sewage disposal systems, water supply systems and the pollution of water by sewage and industrial wastes and makes reports and recommendations for improvement of plant operations or waste discharge practices to eliminate or reduce pollution. May survey the engineering features of and make recommendations relating to milk and food processing plants, vector control programs, industrial sanitation, building lighting, ventilation and plumbing, air pollution, noise and residential sewage disposal. Assists higher-level environmental engineers with the preparation of designs, plans and specifications for public health engineering projects.

Engineer (Electrical) - Conducts investigations and studies of electrical systems for the purpose of controlling and preventing radio and television interference, using standard testing equipment and makes recommendations for corrective action; may assist higher-level electrical engineers in planning, designing and overseeing the installation and maintenance of illumination and power transmission systems and electrical machinery and apparatus in public buildings.

Knowledge and Abilities Required:

In addition to the knowledge and abilities required at lower levels, this level requires: a good knowledge of standard guides, precedents, methods and techniques in the specialization or area of assignment; a sound working knowledge of applicable regulatory material, established procedures and policies of the department and of other sources of information useful in developing work assigned, such as is supplied by manufacturers and other establishments working in the same field.

The ability to recognize interrelationships with related engineering assignments in the organization; locate, evaluate, select and apply standard guides, precedents, methods

and techniques; and supervise and instruct lower-level personnel engaged in routine engineering activities.

ENGINEER IV

7.004

Duties Summary:

Performs difficult and complex professional engineering work in the planning, design, construction, maintenance and/or operation of specialized engineering projects; or plans and conducts research, development or other work in a specialized engineering field for the purpose of improving, extending or validating precedents, data, methods or techniques; and performs other duties as required.

Distinguishing Characteristics:

A position in this class is a fully-operating specialist in all the conventional aspects of subject matter or functional area of assignment. An engineer at this level assumes responsibility for a major and complex engineering project, or several less complex projects. Assignments are usually given with a statement of the objectives, limits of the assignment, suggested overall plan of work and nature of results expected. The incumbent determines the criteria and techniques to be applied in accomplishing the assignment and usually carries the work through to completion with little guidance from his supervisor, except in cases of controversial or complex problems involving untried or unusual techniques and methods, or questions of policy. Completed work is reviewed for overall technical adequacy and conformance with the objectives of the assignment, with technical correctness of standard calculations, analyses, methods and techniques usually accepted by the supervisor. Recommendations and findings are often used as a basis for action by others. Guidelines include all those indicated at the previous levels; however, since complex features normally occur in assignments at this level, an incumbent must apply experienced judgment in modifying, adapting or deviating from standard guidelines. Originality is required in the application of standard engineering practices to new situations and in relating new work situations to precedent ones. In dealing with the public and outside agencies, an incumbent makes commitments on matters covered by precedents, agency regulations, policies and accepted engineering practices. A field position or one concerned with cooperative programs affecting the public frequently involves contacts with other government agencies, contractors, private industry and public groups to explain and interpret applicable laws, regulations and procedures. An incumbent may supervise or be assisted by and give technical guidance to lower-level professional

and subprofessional engineering personnel, who make investigations, collect data, perform detailed computations, or do simple design or analysis work.

Examples of Assignments:

The following illustrative examples of assignments, while not all inclusive, are illustrative of work performed in this class:

Engineer (Civil) - Does professional engineering work in the planning, design, construction, maintenance and/or operation of major civil engineering projects.

Engineer (Buildings) - Does professional engineering work in the planning, design, construction and/or maintenance of public buildings and ancillary facilities. Coordinates the work of private consultants on planning projects such as master plans for a minor complex or a limited system of buildings or project development reports for individual buildings. May supervise lower-level professional and/or subprofessional engineering personnel, as assigned, in the inspection of buildings and related facilities construction.

Engineer (Electrical) - Prepares designs, plans, specifications and estimates for illumination, power and intercommunications for schools and other public buildings; reviews electrical plans and specifications prepared by contract architects or engineers for compliance with electrical code and departmental standards and inspects electrical work in progress.

Engineer (Environmental) - Performs professional engineering work and supervises professional and nonprofessional personnel in one or more phases of a general environmental sanitation and health program; examines and evaluates plans and specifications for environmental engineering structures, systems and operations; makes studies and investigations of general sanitation conditions affecting stream and shore water pollution, community and industrial waste disposal, adequacy of drainage and potable water systems, air pollution control and industrial hygiene, involving, when necessary, laboratory services; makes reports and recommendations relating to such studies; reviews proposed plans for public and private buildings and facilities for conformance to public health standards, rules and regulations.

Engineer (Public Utilities) - Conducts technical studies, investigations and analyses relating to the regulation of electrical, gas, telephone, water and transportation operations, functions and services provided by public utility companies; assists in the preparation and review of standards and criteria; regulations and proposed legislation relating to operation and requirements of utility systems and facilities.

Engineer (Safety) - Performs professional engineering services in a program of industrial safety, including reviewing blueprints and specifications of industrial installations for compliance with State safety codes, laws and regulations; examining and testing equipment, machinery, safety devices and protective equipment and reviewing safety practices; recommends necessary changes or revisions; serves as a technical advisor on safety inspectional and educational activities; may supervise several subprofessional safety inspectors.

Knowledge and Abilities Required:

In addition to the knowledge and abilities indicated at the lower levels, this level requires: a thorough knowledge of standard guides, precedents, methods and techniques in the area of specialization and a good working knowledge of established methods and procedures used in related areas; a thorough knowledge of applicable laws, regulations, policies and procedures of the agency and of other sources of information, such as that supplied by other government agencies, private industry and educational institutions.

The ability to function independently, under only general supervision, in performing normal work assignments; modify, adapt and make compromises with standard guides, precedents, methods and techniques; develop effective coordination and secure cooperation with others and plan and prepare complete and comprehensive engineering reports; the ability to supervise and instruct lower-level professional and nonprofessional personnel as required for certain positions.

ENGINEER V

7.005

Duties Summary:

Supervises the planning, design, construction, maintenance and/or operation of a number of major and complex engineering projects; or works independently on advanced planning, design or research projects involving elements of a highly critical or unprecedented nature; and performs other duties as required.

Distinguishing Characteristics:

This level is characterized by the performance of work which requires the application of intensive and diversified knowledge of engineering principles and practices in a broad area of assignment. An incumbent is given assignments in terms of general objectives and relative priority and works with considerable independence in carrying assignments

through to completion. Projects typically contain complex problems requiring adaptation, modification or compromise of standard principles, theory, procedures, techniques, methods, guides and/or precedents. Completed work is reviewed for adequacy in terms of broad objectives and for conformance to policy. Technical decisions and recommendations are rarely changed by the superior except for reasons of policy, public relations or budgetary considerations. Controversial policy questions, as well as novel or critical aspects or approaches, are discussed with the supervisor. The same guidelines used by engineers at lower levels are also available at this level; however, since they are often inadequate, controversial or incomplete, a position at this level requires the use of initiative, originality and judgment in the interpretation, application and adaptation of standard guides to varying situations and in devising alternative solutions to unusual problems.

A position in this class is typically (but not exclusively) a supervisory position involving planning, directing, advising on and reviewing the engineering activities of a small organizational group assigned a substantial amount of work of the Engineer IV level, or of several small groups headed by intermediate supervisors in which a substantial amount of the non-supervisory work is of the III level.

Assignments carried out individually by an engineer at this level deal with systems, facilities or structures characterized by some of the following conditions: (a) they encompass a broad range of elements, some of which are conflicting and difficult to reconcile or accommodate, (b) they pose critical problems of performance requirements vs. costs under application of standard materials and criteria, or (c) they require designs and plans which must deal with factors of an undetermined or unprecedented nature.

An engineer at this level normally has more frequent and wider contacts than those at the preceding level in coordinating the activities of his section with those of organizational segments having related assignments, and in dealing with other government agencies, contractors, utility companies and the general public. Such duties may constitute a substantial portion of the work of a position at this level.

Examples of Duties:

The following duties are characteristic of all supervisory positions at this level irrespective of the area of specialization: Initially reviews projects received, plans methods of approach and makes work assignments to employees supervised for most effective use of abilities and time; keeps informed on latest developments in the area of specialization and advises employees supervised of current data; solves engineering problems referred for help, advising on appropriate methods and techniques to be used and applicability of precedents, but recognizing when problems should be referred to other

engineers or higher authority; ensures coordination of the work with related projects both within and outside the section; reviews technical reports, project data and completed work submitted by subordinates for technical accuracy, adequacy, validity of conclusions, conformance to policies and regulations, consistency of test results and feasibility of recommendations made; recommends priority and duration of assigned work; prepares budget estimates for major and long-range projects; performs personnel management functions such as selecting employees and evaluating performance, taking disciplinary action as required and training new employees in the methods and techniques to be followed in accomplishing assignments; initiates and prepares technical reports and correspondence.

The following are examples of assignments of engineers at this level; these are illustrative only, and are not all inclusive:

Engineer (Civil) - Supervises the construction, maintenance or operation of several civil engineering projects operating simultaneously; prepares or supervises the preparation of designs, plans, specifications and estimates for highways, tunnels, bridges, reservoirs, retaining walls, culverts, pipelines, sewers, sidewalks, wharves and other concrete steel or timber structures; assigns resident engineers and inspectors to construction projects; approves changes during construction; makes special investigations and studies; prepares or supervises the preparation of reports, work schedules and records of civil engineering projects.

Engineer (Buildings) - Supervises a small group of professional and subprofessional architectural and engineering personnel engaged in planning, design, construction, maintenance and/or inspection of buildings and related facilities; assigns engineers and inspectors to construction projects and recommends changes during construction; or coordinates and manages the work of private consultants on planning projects (including master plans for systems of buildings) or in the preparation of construction plans, specifications and cost estimates for individual buildings or complexes of buildings and facilities and ensures that subsequent phases are completed expeditiously and efficiently in order to meet project deadlines and budgets.

Engineer (Electrical) - Is responsible for an electrical engineering program or function, including the supervision and coordination of work of lower-level electrical engineers engaged in preparation of designs, plans, specifications and estimates for illumination, power and intercommunications for schools and other public buildings and inspecting electrical work in progress; reviews electrical plans and specifications prepared by contract architects or engineers for compliance with electrical code and departmental standards and recommends necessary changes; serves as technical consultant to departmental and contract engineers and architects on electrical engineering problems.

Engineer (Environmental) - Develops and administers an environmental engineering program as head of a large section or assistant to the chief of a major branch including one or more specialized programs of environmental engineering. Gives leadership, advice and guidance in the field of environmental engineering to local officials and the general public; guides and directs educational and regulatory activities pertaining to environmental health program; provides supervision and technical advice to engineers and other employees engaged in surveys, inspections and preparation of plans, specifications, reports and recommendations; cooperates with other phases of the environmental engineering program and with other services of the Department of Health in areas where joint action is appropriate.

The following is an example of the duties of a technical expert in a specialized area or program function: Performs staff advisory, consulting and reviewing duties and directs and works with a staff of specialists as assigned in long-range planning, research and/or development of specific projects, programs and functions such as harbors, airports or highways.

Knowledge and Abilities Required:

In addition to the knowledge and abilities required at lower levels, this level requires: A thorough and extensive knowledge of standard guides, precedents, methods and techniques in the area of specialization and a good knowledge of the principles, practices, methods and techniques of other branches of engineering and other organizational units as they relate to the area of assignment; in positions requiring significant supervisory responsibility, a knowledge of supervisory principles and practices.

The ability to plan and organize large-scale assignments containing many problems and variables; to develop new lines of approach and new or improved techniques and to solve problems where critical gaps occur in data or precedents. In supervisory positions, ability to supervise and direct effectively the work of others; to relate the program to overall departmental objectives and to deal tactfully with public and other officials.

ENGINEER VI

7.006

Duties Summary:

Supervises the professional and nonprofessional personnel of a major engineering activity; develops procedures and standards for carrying out his specialty in the

organization, and represents the organization with authority on technical engineering matters within the area of specialization; may direct a large engineering section or assist in directing a large engineering division or district office as a technical specialist in planning, development, design and/or research, may lead the efforts of a team engaged in carrying out difficult or critical project assignments with emphasis in the area of specialization; or serves as a staff specialist responsible for overall control and coordination of a number of major and complex engineering projects or programs; and performs other duties as required.

Distinguishing Characteristics:

This class is distinguished by its responsibility for a wide variety of complex engineering programs or projects. An engineer at this level works under very general administrative direction; assignments are typically received in terms of broad, general objectives and the incumbent is responsible for determining methods, procedures, scheduling of work activities and assignment of personnel to accomplish the work most effectively. The supervisor is consulted on unusual or controversial situations and on administrative and budgetary matters. Completed work is reviewed for adequacy in terms of broad objectives and for conformance with policy, but is seldom subject to technical review.

An engineer in this class plans, directs, advises on and reviews the engineering activities of a small group of technical engineering specialists, or several groups headed by intermediate supervisors in which a substantial amount of the non-supervisory work is of the journeyman engineer level. Much of the engineering work supervised is characterized by non-applicability of established criteria and technical precedents and by inadequacy or unavailability of data. These problem situations require originality and judgment in the skillful application of engineering knowledge to develop appropriate techniques or to evaluate those developed by subordinates.

An engineer at this level carries out the more difficult person-to-person relationships for the work group supervised. The majority of such contacts are of a technical nature with key officials in various echelons of the State government and with other jurisdictions, private industry, research institutions and the public, in the area of specialization.

At this level an engineer makes decisions and commitments in planning, directing, interpreting and coordinating complex engineering work typical of his area of responsibility, which often necessitates skillful improvisation, deviation and important engineering compromises and which frequently influence ultimate actions and decisions of the supervisor or other higher authority and may serve as the basis for developing or changing governing policy or regulations.

Examples of Duties:

Supervisory responsibilities at this level typically include: Planning, directing, advising on and reviewing the work of subordinate professional and nonprofessional engineering personnel through subordinate supervisors; formulating procedures and work priorities and making broad work assignments, developing new criteria, techniques or approaches to guide subordinates in overcoming problems which cannot be solved by application of conventional techniques or procedures; analyzing and reviewing work of subordinates in terms of technical results and for conformance with departmental policies and regulations and with legal requirements; coordinating activities of his section with other sections or departments, other government agencies, private industry and the public; assisting in the development of broad work programs and policies and in preparing and justifying budgets; initiating and reviewing engineering investigations and research studies; recommending organizational and operational changes; preparing contracts, technical and administrative reports and correspondence.

The following are examples of assignments of engineers at this level; these are illustrative only, and are not all inclusive:

1. Supervises a large engineering section, or assists with the direction of a division or major branch or district office responsible for such engineering projects as design and construction of buildings, highways, sewers, flood control projects, waterworks, harbors and other public works structures and facilities.
2. Directs one or more specialized environmental engineering programs or assists in the administration of a broad program for environmental sanitation and health.
3. Directs a small section of engineering specialists of the Engineer V level, in advanced and complex planning, development, research, design and/or investigative activities.
4. Serves as staff specialist in the area of project management by scheduling, monitoring, controlling and expediting major and complex engineering projects.

Knowledge and Abilities Required:

In addition to the knowledge and abilities required at lower levels, this level requires: A well-grounded and versatile background knowledge of engineering theory and precedent application both in general and in the area of specialization; a comprehensive knowledge of pertinent laws, policies, regulations and procedures; familiarity with other

branches of engineering as they affect and relate to the area of specialization; extensive knowledge of the latest technological advances in the specialization and knowledge of supervisory principles and practices.

The ability to function as a specialist and provide expert technical information and advice concerning the area of specialization; interpret, organize, execute and coordinate assignments which are typically unique and complex and to apply and adapt broad technical knowledge to the independent solution of unprecedented problems having a direct impact on extensive and important engineering programs; represent the organization in high-level conferences and meetings and serve as an authority in the area of specialization; function as the technical and administrative head of an organizational segment and plan, implement and review the work of others; provide technical assistance in overcoming problems which cannot be solved by application of conventional theory and evaluate the significance and applicability of technical results obtained.