Iowa Department of Administrative Services – Human Resources Enterprise
Classification Series Guidelines

Design Technician Series

Classes in the Series

Class Code	Class Title
04370	Design Technician Associate
04371	Design Technician
04372	Design Technician Specialist

Series Concept

Positions classified in this series perform paraprofessional engineering design work. Technicians work in various areas, including technical engineering design, engineering software, management of consultant services, geotechnical design, cartography, photogrammetry, property title determination pavement design, pavement management, or automation enhancement. Technicians prepare technical plans, detail drawings, or maps to plan and design of roadways, bridges, right of way, culverts, park facilities, bikeways and trails, lighting, drainage, and flood control systems, signing, safety improvements, pavement markings, traffic control devices, and related civil and transportation engineering projects.

Exclusions

Positions excluded from classification within this series include:

1. Positions that include full supervisory functions.
2. Positions that are not related to the planning or design of improvement projects.
3. Positions performing work classified in the Engineering Aide series, the Materials Technician series, the Planning Aide series, and the Right of Way Aide series.

Class Distinctions

The following areas for evaluation are applicable to the class distinctions:

1. Computer applications
2. Project management
3. Planning and design of projects
4. Education/training
5. Engineering studies/Research
6. Quality control

1. Computer Applications

- Creates and administers access privileges for Local Area Network-based (LAN) server project design for use by multiple offices.
- Develops, maintains, and customizes electronic files that generate the cross-section drawings and performs specific computer-aided design and drafting (CADD) tasks.
- Develops batch programs to control input of specific design information.
- Uses engineering software to calculate or modify roadway or bridge geometrics, quantities, or other project information.

- Inputs specific project detail information into the computer files to show complete representation of the project plans, quantities, and specifications for contract documents.
- Uses or creates computer-generated maps, plans, or displays to illustrate project details for other offices, agencies, or the general public.
- Manages LAN-based file systems, understands the file interrelationships, and customizes data within the files.
- Originates and generates all facets of the project plans from computer files.
- Develops and uses spreadsheets to automate design calculations, minimizing time for updates of project changes.
- Develops tools or programs to more efficiently use computer applications for computer-aided drafting and design (CADD) software and other applications.

NOTE: Everything is generated by computer. The computer is essential to the duties and responsibilities performed by Design Technicians.

Level	Complexity	Impact of Errors	Supervision Received	Scope of Impact	Technical/ Equipment
Associate	Entry level. Knows and understands computer file systems and management, Basic use of computer programs and has some basic programming skills. Assists Technicians, Specialists, and Engineers in project development.	Errors are detected in succeeding operations where work is verified. Errors affect rework and the work of others within the section.	Close supervision with frequent review of work.	The accuracy, consistency, and acceptability of work affect others within the work.	Trains in full use of computer applications, file management, and system usage. Technical design software training for each aspect of project development.
Technician	Production level expected to develop projects or portions of complex projects independently. Expected to set up and maintain computer files, develop engineering software code, select and input alignments, develop criteria per project guidelines, and produce finished design plans, maps or other displays.	Errors are detected in succeeding operations where work is verified. Errors affect rework and the work of others in other offices.	Minimal supervision; work is reviewed prior to submission to other offices. Quantities and project design criteria are checked prior to letting.	The accuracy, consistency, and acceptability of work effects other offices timely completion of work effort.	Uses full range of computers and software packages for project design and plan production.
Specialist	Expert in the development of complex projects or major portions of complex projects. Expected to create and administer computer files, develop engineering software code input and review alignments, project criteria and produce finished design plans, maps, or other displays. Uses initiative in solving complex questions related to proper use of software, and the resultant end product.	Errors can be reproduced in many projects, and cause rework for the office and other offices.	Receives general project guidelines and direction with end product review of work prior to letting.	Significantly affects the development effort of other offices, divisions, and consultants.	Recognized expert in using new computer technologies for plan production. Trains others in detailed use of computer software applications.

2. Project Coordination

- Communicates with positions in other offices, departments, divisions, and other internal consultants as well as various federal, state, and local agencies, and the public to obtain information, facilitate project development, and keep improvement projects on schedule to construction.
- Provides detailed information on project schedules to management for tracking project development.
- Organizes workflow to effectively meet immediate and final project deadlines and ensure that all partners in the development process have current and timely information.
- Coordinates all aspects of the purchase of property needed for construction purposes and provide input to the most economical method to design the project.

Level	Complexity	Impact of Errors	Supervision Received	Scope of Impact	Technical/ Equipment
Associate	Entry level. Knows and understands project development process. Assists Technicians, Specialists, and Engineers in project development.	Errors affect timely completion of work.	Close supervision with frequent review of work progress.	Impacts the work effort of other workers in the section and other offices.	Technical design software training for each aspect of project development.
Technician	Production level expected to develop projects or portions of complex projects independently. Expected to communicate time requirements, project progress to supervisor and other departments.	Delay to the project due to other offices waiting on information to be completed.	Minimal supervision. Work is reviewed at major junctures of projects. Progress is monitored toward submittal of plans for letting.	Impacts the work effort of other offices within and outside of the division.	Knowledge of the development process. Uses full range of computers and software packages for project management.
Specialist	Expert in the management of complex projects or major portions of complex projects. Understands the development process used to produce finished design plans, maps, or other displays. Estimates time requirements for completion of project elements. Coordinates submittals to other offices of information to be incorporated into project plans.	Lack of providing information to other offices in a timely manner may result to delay to project lettings.	Receives general timelines and direction with end product review of work prior to letting.	May impact the 5-year program if projects are delayed past the start of the fiscal year.	Recognized expert in project development, and project management. Trains others in detailed use of computer software applications and the development process.

3. Planning and Design of Transportation Projects

- Selects specific design criteria for each individual project depending on the type of roadway, traffic volume, location of project, and review of existing roadway.
- Selects, creates, or modifies appropriate design information including typical cross-sections, or standards to meet project requirements.
- Identifies non-standard situations and creates alternate solutions to meet concept guidelines.
- Analyzes project materials, as-built plans, and existing conditions to economically meet geotechnical requirements, right of way constraints, and environmental constraints in designing project alignment and ultimately the construction plans.
- Creates specific plan details including structural plans, roadway intersection geometrics, traffic control layouts, and right of way that control what and how a project is constructed.

- Reviews and interprets right of way contracts, plots, and legal descriptions to determine property ownership and title and to review property titles accessed through the internet or by reviewing the abstract. Determines the necessary amount of property to acquire.

Level	Complexity	Impact of Errors	Supervision Received	Scope of Impact	Technical/ Equipment
Associate	Entry level. Assists Technicians, Specialists, and Engineers with the design of projects.	Errors detected in succeeding operations where work is verified. Errors affect rework and the work of others within the section.	Close supervision with frequent review of work.	Affects others in a section and completion of work efforts.	Trains in full use of computer applications, file management, and system usage. Technical design software training for each aspect of project development.
Technician	Production level expected to design projects or portions of complex projects independently. Expected to input typical cross sections as per project guidelines, meet all minimum requirements for a safe and economical design.	Errors found after major junctures in projects will cause delays and result in extensive rework for the office and for other offices.	Minimal supervision; work is reviewed at major junctures of projects. A final detail check of quantities and projects design criteria is done prior to letting.	The accuracy consistency and acceptability of work affects others within the work unit and affects other offices timely completion of work effort.	Uses full range of computers and software packages for project design and plan production.
Specialist	Expert in the design of complex projects. Expected to set up design criteria per project guidelines, and produce finished design plans, maps of other displays. Coordinates with other offices, receives and checks information to be incorporated into project plans. Uses initiative in solving complex questions related to proper design.	Possible delays that may cause extensive rework for the office and for other offices. If errors are not caught in the final detail check, they can result in costly extra work orders to change the project during construction, rework before or after letting, and may cause delays to other projects. Errors may affect the project timeline, contractors work and expose the public to extended construction. Project errors found during construction result in costly extra work orders.	Receives general project guidelines and direction with a general end product review of work prior to letting.	Changes affect contractors and the public. May impact the safety of the public resulting in accidents or lawsuits against the department.	Recognized expert in using computer technologies for plan design and production. Trains others in detailed design and the use of computer software for design.

4. Education/Training

- Arranges and conducts individual training sessions in preliminary design and detail design procedures; use of manuals, policies and procedures, and specifications.
- Schedules and coordinates training for consultants.
- Arranges and conducts individual training sessions in detail computer applications.
- Gives guidance to employees using oral or written instructions or demonstrations.

Level	Complexity	Impact of Errors	Supervision Received	Scope of Impact	Technical/ Equipment
Associate	Entry level. Shares knowledge with others.	Some delay, impact and rework cost minimal.	Close supervision.	Limited, depending on extent of background knowledge.	Trains in increasingly complex use of computer applications, file management, and system usage. Technical design software training for each aspect of project development.
Technician	Provides one-on-one training for other technicians or consultants in specific areas of design or computer usage.	Delays are possible with extensive rework.	Minimal supervision.	Impacts the successful completion of projects.	Uses full range of computers and software packages for file management and system usage.
Specialist	Provides one-on-one or group training in specific areas of design or computer applications. Coordinates training with other offices and consultants. Receives training and passes on knowledge to other team members.	Errors may cause extensive rework for the office and for other offices on many projects, and can cause costly extra work order in construction or failure to deliver projects on time.	Receives general guidelines and direction.	Impacts the implementation and successful use of new technology or equipment.	Researches new software technologies. Recognized expert using new computer technology. Trains others in use of new technologies.

5. Engineering Studies/Research

- Researches standards, specifications, state and federal guidelines, historical project information, manuals, and/or material catalogs to determine specific project information.
- Researches plans, survey information, legal descriptions, or other historic project information to determine property ownership and the specific property boundaries, and to review property titles accessed through the Internet or by reviewing the abstract.
- Reviews ALAS (accident) data to determine cause and effect of accidents and specific accident patterns, and use the data to suggest alternate concepts or solutions for the accident location and justification for use of safety funding.
- Researches and evaluates specific software programs, for applicability to the design process.
- Prepares feasibility studies to determine the proper economic and practical design procedures, policies, specifications, and details for use in developing project concepts and location studies for projects.
- Researches project databases for similar project data to use as an example or reference to design a specific project or part of a project.
- Analyzes procedures within the design process to maximize efficiency and effectiveness.

Level	Complexity	Impact of Errors	Supervision Received	Scope of Impact	Technical/ Equipment
Associate	Entry level. Assists Technicians, Specialists, and Engineers with reviewing as-built plans, researching information in manuals, specifications, legal description and other areas.	Errors are usually detected during verification of information. Some delay, impact and rework cost minimal.	Close supervision with frequent review of work.	Supports the work of others in the section.	Trains in full use of computer applications, file management, and system usage. Uses the system to locate and research information related to the project.
Technician	Production level reviews as-built plans, researches information in manuals, specifications, legal description and other areas as needed to produce finished design plans, maps or other displays.	Errors are serious causing inaccuracy in the plans and extensive rework. May cause delays to project lettings.	Minimal supervision. Review of work is done at intermediate completions date for projects.	Affects the successful completion of construction projects. May delay or impede the work effort of other offices.	Uses full range of computers and software packages for project design and plan production. Uses the system to locate and research information related to the project.
Specialist	Expert in the interpretation of as-built plans, plats, manuals, specifications, legal descriptions, etc. Researches new areas and writes special provisions covering bid items not covered in the standard specifications.	Errors are serious and may not be found until construction resulting in extra work orders.	Receives general project guidelines and direction with end product review of work prior to letting.	Affects the project lettings and construction. Impacts the public.	Recognized expert using new computer technologies for research. Researches, reviews, and recommends final presentation of project. Trains others in detailed use of computer software applications, including Web use.

6. Quality Control

- Uses engineering software, CADD, or a calculator to verify calculations, detailed drawings, aerial photography, survey data, shop drawings, and finished plans or maps developed by co-workers, consultants, or contractors to ensure completeness, accuracy, and adherence to design concept, specifications, and contract provisions.
- Identifies errors, problems, or non-standard situations and suggests alternate solutions.
- Analyzes potential damage to properties caused by the proposed property acquisition, suggests alternate design details or changes to minimize damage to the property and reduce the cost of the acquisition.
- Analyzes various bridges or structures to select the most cost effective structure to meet site specifics.
- Follows guidelines in creating CADD file data to ensure consistency such that information used by others is located correctly within the files

Level	Complexity	Impact of Errors	Supervision Received	Scope of Impact	Technical/ Equipment
Associate	Entry level. Assists Technicians, Specialists, and Engineers in project development. Associates may check work of other Associates.	Some delay, impact and rework cost minimal.	Close supervision with frequent review of work.	Impacts team members work effort.	Trains in full use of computer applications.
Technician	Production level expected to develop projects or portions of complex projects independently. Review of Associates and other technicians work for accuracy and completeness.	Possible delay to other offices due to errors found by other offices causing extensive rework.	Minimal supervision; work is reviewed at major junctures of projects. Quantities and project design criteria checked prior to letting.	Impacts team members and other offices immediate work effort.	Uses full range of computers and software packages to check project quantities and ensure accuracy on project plans.
Specialist	Expert in the development of complex projects or major portions of complex projects. Verifies, for other Design Technicians, and the Design Technician Associate's accuracy of project design and quantities. Coordinates with other offices all information needed to complete the project plans for letting.	Possible delay to letting construction projects. Costly extra work orders and changes during construction. Errors could impact the safety of the public resulting in the accidents or lawsuits against the department.	Receives general project guidelines and direction with end product review of work prior to letting.	Affects the timely completion of projects. Impacts the work efforts of inspectors and contractors using the plans.	Recognized expert using new computer technologies for quality control and plan production. Uses software to verify the accuracy of project design and quantities. Researches, reviews, and recommends new uses of the computer for checking quantities and maintaining quality through file transfer methods. Trains others in detailed use of computer software applications.

Design Technician Associate

This is the trainee level of the series. Positions in this class work under close supervision assisting other design technicians and engineers by working on a part of a project. The work performed is reviewed for accuracy by other technicians; impact of errors is associated with minor delays due to rework. Associates generally work in Computer Applications, Design of Projects, Engineering Studies/Research, and Quality Control areas. Following a minimum trainee period of 18 months, employees in this class are eligible for trainee/journey reclassification to the Design Technician.

Design Technician

Positions at this level perform journey-level work on a total project. Minimal supervision is required with only intermediate checks to work at key points in the development process by an equal or by a Design Technician Specialist. Errors will affect the mission of the department in creating delays to projects and affecting the quality of the finished product. Undetected errors could pose a safety hazard to the public. Technicians at this level work in all areas.

Design Technician Specialist

The following types of positions are found at this level:

1. Positions assigned to work with major urban projects that typically involve making decisions with regard to minimizing damage to the property owner, rerouting of traffic while road construction is underway, etc. The Specialist must deal with legal and politically sensitive issues as well. This often times requires presenting information at public hearings.
2. Positions that are assigned to work on multiple projects at this same time requiring the position to act as a lead worker over Design Technician Associates and Design Technicians.
3. Positions that involve skill and expertise in very specialized areas including photogrammetric stereoplotter operations, soils analysis, pavement design, computer application support, etc.
4. Analyzes systems, programming, or engineering problems and develops software solutions. Coordinates with other offices necessary information to be incorporated in project plans.

Positions at this level are the primary educator for Design Technician Associates and Design Technicians. Design Technician Specialists work with minimal supervision and direction. At this level, positions have the authority to give final approval of a project for the engineer's or supervisor's signature and are considered to be experts in design details, project management, quality control, and computer usage. Errors at this level adversely affect the mission of the department by creating delays to projects, the quality of the finished product, and costly extra work orders during construction. Undetected errors could pose a safety hazard to the traveling public and litigation against the state.

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