



STATE OF NEVADA
Department of Administration
Division of Human Resource Management

CLASS SPECIFICATION

<u>TITLE</u>	<u>GRADE</u>	<u>EEO-4</u>	<u>CODE</u>
PHOTOGRAMMETRIST/CARTOGRAPHER V	39	B	6.102
PHOTOGRAMMETRIST/CARTOGRAPHER IV	37	B	6.103
PHOTOGRAMMETRIST/CARTOGRAPHER III	35	B	6.107
PHOTOGRAMMETRIST/CARTOGRAPHER II	33	B	6.110
PHOTOGRAMMETRIST/CARTOGRAPHER I	30	B	6.116

SERIES CONCEPT

Photogrammetrist/Cartographers perform remote sensing work in the preparation of contour maps, terrain models, profile sheets; digital animated fly-through and related mapping materials which require the application of photogrammetric or cartographic techniques. They then apply photogrammetric or cartographic principles in the production and distribution of topographic maps, orthophotographs, planimetric maps and related products requiring the application of those techniques and principles. Work involves the scanning and analysis of aerial photographs and survey data applying standard mathematical formulas and mapping techniques to identify, scale, and orient geodetic survey control, elevations, and other planimetric or topographic features with associated cartographic detail in creating and preparing original maps, charts, and drawings. Work products must graphically delineate details such as survey control points, hydrography, topography and cultural features using digital workstations, specialized software, precision plotting apparatus, and other technical equipment. Incumbents re-project, create, revise and merge existing elevation models, orthophotographs, and mapping from disparate sources using specialized software. Transformation of map and photo data is performed utilizing a working knowledge of various coordinate systems.

Prepare photo flight requests for mapping projects; identify areas to be mapped showing area to be covered, altitude and flight path for low and high altitude photo flights; and select and use field Global Positioning System (GPS) points for control of mapping data, Geographic Information System (GIS) datasets and attributes using resource grade GPS collection units.

Create scalable plots and 3D digital animation fly-through products utilizing data from orthophotos, LiDAR point clouds, terrain models and other remote sensing data. Operate metric aerial camera system and maintain current camera calibration.

Analyze flight photos to determine specific overlap and quality, and perform aerial triangulations by analytic, semi-analytic or digital methods.

Perform map compilations based on horizontal and vertical positions which are compared to completed field survey files; prepare topographical maps, cross sections, profiles, and renderings through digital map compilations; review final mapping files for accuracy of contour intervals, elevations, grid coordinates, and planimetric features; calculate map accuracy, create statistical reports, and ensure agency standards are met using the National Standards for Spatial Data Accuracy method (NSSDA).

Consult with other divisions and outside entities to determine required mapping needs while exceeding minimum required standard mapping specification.

Collect and maintain GIS datasets.

Generate map compilations and create computer-aided design drafting (CADD) files in compliance with agency standards; convert existing mapping (rotate, scale and transform), create, re-project and incorporate existing graphical Public Land Survey System (PLSS) and administrative boundary data into design files, and establish

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SERIES CONCEPT (cont'd)

mapping parameters for other divisions within the agency or outside contractors.

Maintain and calibrate equipment to ensure proper and accurate operation; maintain equipment inventory, repair and maintenance records.

Provide training to lower level staff regarding digital mapping programs, accuracy, and mapping procedures.

Perform related duties as assigned.

CLASS CONCEPTS

Photogrammetrist/Cartographer V: Under limited supervision, incumbents manage the activities of the Photogrammetry Section by supervising and directing the work of section staff; preparing the section's budget; developing policies and procedures; ensuring completed work is in conformance with established engineering principles and practices, applicable agency policy and procedure as well as federal and State requirements; preparing and maintaining equipment maintenance agreements. Incumbents act as a liaison between the agency and other agencies, contractors and the general public regarding photogrammetric data; check adequacy of aerotriangulation control for photogrammetric projects and oversee the compilation of digital maps.

Photogrammetrist/Cartographer IV (Imagery): Under general supervision, incumbent manages the activities of the Imagery Section by supervising and directing the work of subordinate staff; providing training; coordinating work assignments; evaluating performance; developing policies and procedures; ensuring completed work is in conformance with established engineering principles and practices, applicable agency policies and procedures as well as federal and State requirements; preparing the section's budget; managing the working flight database and GIS workspace; responsible for supervising the creation of scalable plots and 3D digital animation fly-through products utilizing data from orthophotos, LiDAR point clouds, terrain models and other remote sensing data; maintaining aerial camera maintenance and calibration; creating RFPs and managing agreements; preparing cost and time estimates; scheduling and directing photo flight missions; ensuring the safety of staff and equipment during such missions; reviewing completed Imagery Services projects to ensure conformance to agency and NSSDA standards; acting as liaison between the agency and other agencies, contractors and the general public regarding all Imagery products.

Photogrammetrist/Cartographer III: Under general direction, incumbents perform the full range of duties in the series concept for their assigned unit and in addition, act as a first-line supervisor for subordinate professional and technical staff by providing training and direction, evaluating performance, coordinating work assignments, and reviewing completed photogrammetric or cartographic projects to ensure conformance to agency and NSSDA standards.

Photogrammetrist/Cartographer II: Under general supervision, incumbents perform the full range of duties in the series concept. Incumbents will be responsible for specific work duties unique to the assigned section. These specific duty sections include: Cartography, Imagery and Photogrammetry. This is the journey level in the series.

Photogrammetrist/Cartographer I: Under close supervision, incumbents receive training in the performance of all or part of the duties in the series concept. This is the entry level in the series and provides for progression to the Photogrammetrist/Cartographer II upon meeting the minimum requirements and with the recommendation of the appointing authority.

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MINIMUM QUALIFICATIONS

SPECIAL REQUIREMENT:

- * Some positions in this series require the ability to see stereoscopically.

PHOTOGRAMMETRIST/CARTOGRAPHER V

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, mapping, surveying, civil engineering or related field and four years of progressively responsible photogrammetric or cartographic work experience resolving complex mapping problems, preparing and/or reviewing photo flight mission plans, computer-aided design, and analyzing information and engineering specifications to ensure compliance with established policies, regulations and standards; **OR** an Associate's degree from an accredited college of university in photogrammetry, cartography, physical science, geography, mapping, surveying, civil engineering, or related field and five years of progressively responsible experience as described above; **OR** three years of experience as a Photogrammetrist/Cartographer III in Nevada State service of which two years have been in Photogrammetry; **OR** an equivalent combination of education and experience. (*See Special Requirement*)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):

Working knowledge of: survey, photogrammetry, and cartography principles and methods; map printing and publishing techniques, equipment and service; budget development and administration; technical surveying. **Ability to:** direct a variety of complex photogrammetry or cartography operations; review mapping work for compliance with engineering specifications; track multiple projects, prepare status reports, and ensure timely completion; prepare and maintain records, reports, statistics and other data; manage a variety of complex photogrammetric or cartographic operations; program workload; estimate costs; and develop policy on methods and procedures; *and all knowledge, skills and abilities required at the lower levels.*

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):

Working knowledge of: agency policy and procedures related to survey projects and mapping procedures; **General knowledge of:** management principles and practices; geodetic principles. **Ability to:** make oral group presentations to provide information and training.

PHOTOGRAMMETRIST/CARTOGRAPHER IV

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, civil engineering, surveying/geomatics or related field and three years of progressively responsible experience which included completing mapping projects in consultation with others; completing survey, triangulation, and other mathematical programs required for mapping projects; knowledge of photogrammetric, GIS, imagery processing software and computer-aided design; **OR** an Associate's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, mapping, surveying, civil engineering or related field and four years of progressively responsible experience; **OR** two years of experience as a Photogrammetrist/Cartographer III in Nevada State service of which one year is in Imagery; **OR** three years as a Photogrammetrist/Cartographer II in Nevada State service of which one year is in Imagery; **OR** an equivalent combination of education and experience. (*See Special Requirements*)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):

Detailed knowledge of: engineering, land surveying, aerial surveying/remote sensing methods, conventional symbols and sources of information; design techniques, tools, and principles involved in production of precision technical plans, drawings, and models. **Working knowledge of:** principles and practices of supervision; agency budget process; principles of cartography, map projections, national map accuracy standards and/or special map standards. **Skill in:** all forms of remote sensing data collection. **Ability to:**

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MINIMUM QUALIFICATIONS (cont'd)

PHOTOGRAMMETRIST/CARTOGRAPHER IV (cont'd)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application): (cont'd)
 manage and prosecute mapping and imagery projects utilizing various software and equipment to create orthophotography, digital fly-through animations, custom DTM/DEM creation, imagery based mapping and hardcopy photographic prints for display; complete survey, triangulation, and other mathematical programs required for mapping compilation and imagery processing; review mapping work for compliance with engineering specifications; solve complex data fusion and projection issues; create new designs, forms, procedures and methods to improve workflow; supervise professional and technical staff; maintain records and prepare reports and correspondence related to work produced.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: State personnel policies and practices; interpersonal skills and supervisory methods;
Ability to: organize and coordinate the work of others; manage budgets, multiple RFP's, and projects.

PHOTOGRAMMETRIST/CARTOGRAPHER III

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, civil engineering or related field and two years of progressively responsible experience which included completing mapping projects in consultation with others; completing survey, triangulation, and other mathematical programs required for mapping compilation; preparing photo flight plans for mapping projects; and computer-aided design; **OR** an Associate's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, mapping, surveying, civil engineering or related field and three years of progressively responsible experience; **OR** one year of experience as a Photogrammetrist/Cartographer II in Nevada State service; **OR** an equivalent combination of education and experience. (*See Special Requirement*)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Detailed knowledge of: engineering methods, conventional symbols and sources of information; photo flight mission planning. **Ability to:** explain the mapping process and equipment used to various groups such as map consulting companies, public mapping agencies and other interested parties; complete survey, triangulation, and other mathematical programs required for mapping compilation; resolve complex mapping problems diplomatically with other divisions, agencies, private business and the general public; analyze information, problems, situations, practices, and procedures to define problem areas and formulate logical and objective solutions; train, supervise and evaluate the performance of professional and technical staff; create new designs, forms, procedures and methods to improve workflow; make group presentations to provide information or explain policies; identify complex problems and review related information to develop and evaluate options and implement solutions. **Skill in:** using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions and/or approaches to problems.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Ability to: review mapping work for compliance with engineering specifications.

PHOTOGRAMMETRIST/CARTOGRAPHER II

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, civil engineering, or related field and one year of photogrammetric and/or cartographic experience which included compiling digital map files from aerial photography and survey data; operating manual and computerized photogrammetric or cartographic equipment; **OR** an Associate's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, mapping, surveying, civil engineering or related field and two years

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MINIMUM QUALIFICATIONS (cont'd)

PHOTOGRAMMETRIST/CARTOGRAPHER II (cont'd)

EDUCATION AND EXPERIENCE: (cont'd)

of progressively responsible experience as described above; **OR** one year of experience as a Photogrammetrist/Cartographer I in Nevada State service; **OR** an equivalent combination of education and experience. (*See Special Requirement*)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):

Working knowledge of: photogrammetric or cartographic and related equipment; map accuracy standards; engineering methods, conventional symbols and sources of information; federal policy and procedures as applied to mapping procedures; map production service agencies and equipment such as printers, aerial photographers, surveyors and others; reproduction methods; reference and source materials; relevant computer applications. **Ability to:** operate a variety of manual and computerized photogrammetric or cartographic equipment; check aerial photography and ensure compliance with engineering specifications; establish and maintain project data files; compile digital map files from aerial photography and survey data; reach logical conclusions in interpreting data; perform assigned tasks competently and on time.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):

(*These are identical to the Entry Level Knowledge, Skills and Abilities for Photogrammetrist/Cartographer III.*)

PHOTOGRAMMETRIST/CARTOGRAPHER I

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, civil engineering, or related field; **OR** an Associate's degree from an accredited college or university in photogrammetry, cartography, physical science, geography, mapping, surveying, civil engineering, or related field and one year of experience which included completing digital map files from aerial photography and survey data and operating manual and computerized photogrammetric or cartographic equipment; **OR** graduation from high school and two years of experience as described above; **OR** an equivalent combination of education and experience. (*See Special Requirement*)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):

Working knowledge of: trigonometry, algebra, and geometry used in engineering calculations; engineering drafting methods, conventional symbols and sources of information; computer-aided design drafting hardware and software; mathematics of engineering theory; analytical values; and photogrammetric mapping techniques. **General knowledge of:** Geographic Information Systems software, files, and databases; datum, projections, and coordinate systems. **Skill in:** communicating effectively both orally and in writing; establishing and maintaining cooperative working relationships with co-workers and the public. **Ability to:** work effectively with frequent interruptions; communicate effectively to obtain information, describe data and explain problems or situations.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):

(*These are identical to the Entry Level Knowledge, Skills and Abilities for Photogrammetrist/Cartographer II.*)

This class specification is used for classification, recruitment and examination purposes. It is not to be considered a substitute for work performance standards for positions assigned to this class.

	<u>6.102</u>	<u>6.103</u>	<u>6.107</u>	<u>6.110</u>	<u>6.116</u>
ESTABLISHED:	4/26/74	08/16/13R	4/26/74	4/26/74	10/16/75

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REVISED:	10/16/75		10/16/75	10/16/75	
REVISED:			5/11/76		
REVISED:	7/1/93P		7/1/93P	7/1/93P	7/1/93P
REVISED:	8/31/92PC		8/31/92PC	8/31/92PC	8/31/92PC
REVISED;	10/8/96R		10/8/96R	10/8/96R	10/8/96R
REVISED;	8/18/97UC		8/18/97UC	8/18/97UC	8/18/97UC
REVISED:	12/19/03PC		12/19/03PC	12/19/03PC	12/19/03PC
REVISED:	08/16/13UC		08/16/13UC	08/16/13UC	08/16/13UC