MINIMUM QUALIFICATIONS:
One year of experience equivalent to the Transportation Materials Technician II.
Special Selection Factors: None.
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CONSTRUCTION TECHNICIAN III

IDEAL CANDIDATE SHALL BE ATI AND ACI CERTIFIED – IF THIS CERITIFICATION IS NOT OBTAINED, NO COMPENSATION FOR THIS CLASS WILL BE MADE

Performs a variety of skilled activities for field and office including preparing weekly time reports, reviewing certified payrolls and developing the monthly progress estimate, etc. In addition, prepares all final documents to be submitted to Field Reports.

Example of duties assigned to this classification is:

Inspection of major construction work, such as structures, structural steel, concrete and asphaltic concrete.

Documents all phases of project progress, including material and equipment use.

Documents force account work and possible claims.

Calculates land areas, earth forms, circular curves, material quantities and other quantitative measurements.

Two years experience as a Tech II or equivalent is required. Tech III Office / Administrative personnel must have successfully completed SATS, CPE, Force Accounts, Certified Payroll, and PEN training.

Or

Possess a degree in Business / Project Administration or Education with an emphasis in Math or Science and completion of all training classes listed above.

CONSTRUCTION TECHNICIAN III, ADOT EQUIVALENT (S6)

CANDIDATE SHALL BE ATI AND ACI CERTIFIED OR AN ENGINEERING STUDENT WITH 90 SEMESTER HOURS AND 6 MONTHS HIGHWAY CONSTRUCTION EXPERIENCE.

Performs a variety of highly skilled activities

- TRANSPORTATION CONSTRUCTION TECHNICIAN III
- TRANSPORTATION MATERIALS LABORATORY TECHNICIAN III

NOTE: REFER TO HUMAN RESOURCES POSITION SPECIFICATIONS ATTACHED TO THIS SCOPE OF WORK

STATE OF ARIZONA POSITION SPECIFICATION
Class Title: Transportation Construction Technician III Class Code: 34398
Organizations/Work Settings: Department of Transportation Class Established: 05/08/92
FLSA: NE Highway Division Revised: 09/07/00

Pay Grade: S6

WORK DESCRIPTION:
Serves as a senior level technician performing variety of highly skilled technical work related to highway construction activities. Activities include the inspection of minor construction items such as fence, grade, as subgrade materials; acting as survey party chief; performing a full range of laboratory tests on soils, aggregate, asphalt products, and other highway construction materials; or performing the most complex engineering office work; documents types and amount of materials used for each phase of construction.
WORK CONDITIONS:
Depending on area of assignment, may be exposed to extreme weather conditions; required to travel frequently and/or required to lift heavy materials; subject to hazards of moving traffic when working in construction areas.
SUPERVISION:
Works under general supervision of a project engineer or first-line supervisor and exercises some independent judgment within well established program parameters.
KNOWLEDGES APPLIED:
Methods, procedures, and techniques used in highway construction project inspection, survey, materials testing, and documentation.
Federal, state statutes and agency standards, policies, and procedures applicable to the area(s) of assignment.
Approved record keeping and documentation methods, procedures, and techniques.
Materials and equipment used for highway construction purposes.
Principles and practices of office engineering, drafting, inspection, and mathematical calculations used in construction and land surveying.
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WORK RESULTS/PRODUCTS:
Completed work assignments within assigned area(s) of construction; completed documentation of all phases of assignments
RESPONSIBILITY:
For timely and accurate completion of assigned projects; proper use, operation, maintenance, and repair of assigned equipment; scheduling and assigning work activities to assigned staff.
AUTHORITY:
To issue stop work orders when project materials and procedures are not in compliance with agency specifications; determine appropriate surveying or material testing techniques to be used.
SKILLS APPLIED:
Operating and maintaining of a variety of construction, survey, materials testing, and quality control equipment.
Analyzing and evaluating a wide variety of technical engineering data, including construction plans, field survey and quality control documentation, and completed material test results.
Interpreting and implementing standards; policies, procedures, and regulations applicable to the area of assignment.
Interpersonal relations, as applied to contacts with contractors, representatives of other governmental agencies, and other agency employees.
Verbal and written communications.

Class Code: 34398

WORK ACTIVITIES (Characteristic Tasks) - MAJOR and minor:
INSPECTS HIGHWAY CONSTRUCTION ON AN ONGOING BASIS TO ASSURE COMPLIANCE WITH CONTRACT AND WITH STATE AND FEDERAL STANDARDS, INSPECTIONS AND EXAMINATIONS ARE MADE OF MATERIALS, SURFACE CONDITIONS, PROPER TRACKING, STRUCTURAL FEATURES, AND OTHER RELEVANT FACTORS.
INSPECTS AND EXAMINES ENGINEERING PROJECT RECORDS, FIELD NOTES, COMPUTATIONS, AND OTHER DOCUMENTATION TO ASSURE THAT METHODS OF MEASUREMENT AND BASES FOR PAYMENT ARE IN ACCORDANCE WITH PROJECTED TRENDS, SPECIFICATIONS, SPECIAL PROJECTS, AND OTHER EXTRA WORK ORDERS.
CONFERS WITH CONSTRUCTION ENGINEERS AND CONTRACTORS REGARDING CONSTRUCTION IN PROGRESS AND ITS CONFORMANCE TO SPECIFICATIONS AND CONSTRUCTION PLANS, ANSWERS QUESTIONS, AND RESOLVES PROBLEMS.
PERFORMS TESTS IN LABORATORY ON SOIL COMPOSITION, SURFACING MATERIAL AGGREGATES, OIL AND WATER CONTENT, EMBANKMENT COMPACTION, PLANT MIX DENSITY, AND OTHER FACTORS AS REQUIRED.
CONSULTS MANUAL, RULEBOOK CODES, OR REGULATIONS IN ORDER TO FIND EXACT REQUIRED COURSE OF ACTION, DETERMINATION OR AUTHORIZATION.
USING SURVEY INSTRUMENTS AND EQUIPMENT, PERFORMS LOCATION, STRATA, TOPOGRAPHIC, BOUNDARY, DRAINAGE, AND OTHER MEASUREMENTS AS REQUIRED IN THE CONSTRUCTION OF HIGHWAYS.
Logs or records all work flowing into the work unit, processed, or flowing out, in order to have accurate history of work or work performed.
Inspects sites on proposed highway facilities in order to review all factors relating to proposals and to confirm or verify data as presented.
Draws maps showing vegetation patterns, from notes based on visual observation.
Performs related work as required.

MINIMUM QUALIFICATIONS:
Three years journey level experience in operating survey equipment; OR inspecting minor highway constructions projects, hot mix plants and concrete plants; OR performing administrative or advanced engineering and construction records maintenance and related duties; OR performing construction related materials testing/inspections. 90 semester hours applicable toward a Bachelor degree in engineering technology or closely related curriculum may substitute for one year of the required experience.
Special Selection Factors:

A medical/physical evaluation is required prior to appointment.
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STATE OF ARIZONA POSITION SPECIFICATION
Class Title: Transportation Materials Laboratory Technician III Class Code: 97373
Organizations/Work Settings: Highways Division Class Established: 04/23/84
FLSA: NE Department of Transportation Revised: 10/02/87

Pay Grade: 17

WORK DESCRIPTION:
Supervises a staff of technicians engaged in inspection, sampling, and/or testing of highway construction materials on assigned projects; provides technical assistance to area project staff regarding materials sampling and testing techniques; conducts inspections of projects labs to ensure compliance with agency standards.
WORK CONDITIONS:
Frequent exposure to those hazards associated with laboratory testing; occasional exposure to those hazards associated with roadway construction.
SUPERVISION:
Works under the general direction of a first-line supervisor and exercises some independent judgment within agency standards.
KNOWLEDGES APPLIED:
Knowledge of materials inspection, sampling, and testing methods, procedures, and techniques used in highway construction.
Knowledge of Federal and State statutes and agency standards, policies, and procedures applicable to the area of assignment.
Knowledge of standard equipment and materials used for sampling and testing construction materials.
Knowledge of pertinent records and documentation required in the work unit.

WORK RESULTS/PRODUCTS:
Completed testing of construction materials for use on the highway construction project; proper documentation of test results.
RESPONSIBILITY:
Timely and accurate completion of all materials testing assigned; scheduling and prioritizing work assignments within established time frames.
AUTHORITY:
Decisions affecting acceptance or rejection of materials; make recommendations for revisions to work unit standards, policies and procedures.
SKILLS APPLIED:
Skill in operation and maintenance of a variety of materials sampling and testing equipment used in the area of assignment.
Skill in reading and interpreting highway construction plans and specifications.
Skill in the evaluation and interpretation of completed materials test results.
Skill in the operation of motorized vehicles.

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WORK ACTIVITIES (Characteristic Tasks) - MAJOR and minor:
DEVISES A SCHEDULE OF WORK OR ITINERARY, AGENDA, OR TIMETABLE OR ESTABLISHES PRIORITIES FOR SELF AND SUBORDINATE-LEVEL WORKERS ON A DAILY OR WEEKLY BASIS.
RESOLVES TECHNICAL OR WORK PROCEDURE PROBLEMS AND QUESTIONS PRESENTED BY

Class Code: 97373

PERFORMS TESTS IN LABORATORY ON SOIL COMPOSITION, SURFACING MATERIAL AGGREGATES, OIL AND WATER CONTENT, EMBANKMENT COMPACTION, PLANT MIX DENSITY, AND OTHER FACTORS AS REQUIRED.
MAKES CALCULATIONS BASED ON OBSERVABLE DATA IN LABORATORY.

SUBORDINATE-LEVEL WORKERS.
INSTRUCTS, GUIDES, AND COUNSELS SUBORDINATE-LEVEL WORKERS IN CARRYING OUT A VARIETY OF TASKS.
REVIEWS, VERIFIES, OR INSPECTS WORK OF SUBORDINATE-LEVEL WORKERS, FOR QUALITY CONTROL.
TRAINS NEW WORKERS ON THE JOB TO PERFORM TASKS THAT WILL BECOME PART OF EVERYDAY WORK ROUTINE.
CONSULTS MANUAL, RULE BOOK, CODES, OR REGULATIONS IN ORDER TO FIND EXACT REQUIRED COURSE OF ACTION, DETERMINATION, OR AUTHORIZATION.
OPERATES CORE DRILLING MACHINE TO TAKE MATERIALS SAMPLES FROM ROAD FOR ANALYSIS.
INSPECTS HIGHWAY CONSTRUCTION MATERIALS ON AN ONGOING BASIS TO ASSURE COMPLIANCE WITH CONTRACT AND WITH STATE AND FEDERAL STANDARDS; INSPECTIONS AND EXAMINATIONS ARE MADE OF MATERIALS, SURFACE CONDITION, PROPER TRACKING, STRUCTURAL FEATURES, AND OTHER RELEVANT FACTORS.

Attends work unit staff meetings; gives and receives information; participates in problem solving and decision-making.
Confers with superior, presenting and resolving difficult problems or questions, discussing plans and actions to be taken, making decisions.
Gives and receives information requiring considerable judgment and authority regarding current and specific business of the work unit by telephone or direct contact.
Using sieve scales and calculator, analyzes crushed aggregates for gradation requirements by finding the percentage of given aggregate sizes of materials sampled.
Takes soil samples of construction project and then analyzes samples in field laboratory to determine compaction and moisture content.
Performs related work as required.

MINIMUM QUALIFICATIONS:
One year of experience equivalent to a Transportation Materials Laboratory Technician II; OR a Bachelor of Science degree in civil engineering or a closely related field and six months of the required experience.
Special Selection Factors:
None.
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CONSTRUCTION TECHNICIAN IV

IDEAL CANDIDATE SHALL BE ATI AND ACI CERTIFIED – IF THIS CERITIFICATION IS NOT OBTAINED, NO COMPENSATION FOR THIS CLASS WILL BE MADE

Performs a variety of skilled activities for field and office including preparing weekly time reports, reviewing certified payrolls and developing the monthly progress estimate, etc. In addition, prepares all final documents to be submitted to Field Reports.

Exercises considerable independent judgement within general ADOT standards and guidelines.

Examples of duties assigned to this classification are:

Inspect highway construction on an ongoing basis to assure compliance with contract and in accordance with State and Federal standards.

Perform a variety of structural material tests and inspections.

Reviews construction plans and verified that these are in accordance with designated specifications and other requirements.

Participates in the preparation of completed work estimates, to determine compensation due contractor.

Examines and verifies numeric data and material specifications on project cost source documents, utilizing geometry and trigonometry calculations.

Supervises all work activities involved in construction projects, including survey, laboratory, and quality control work.

Recommends approval of proposed project changes.

Knowledge and skills required:
All knowledge and skills required of lower classifications.

Knowledge of the principles and practices of Civil Engineering as applied to the construction of state highways.

Skill in analyzing and evaluating a wide variety of highly technical engineering data, including construction plans, field survey and quality control documentation.

Skill in interpreting and implementing ADOT Standards, policies, procedures, and regulations.
Skill in interpersonal relations, as applied to contacts with contractors, representatives of other governmental jurisdictions, and other ADOT staff.

Two years as a Tech III or equivalent. Tech IV Office / Administrative personnel must have successfully completed SATS, CPE, Force Accounts, Certified Payroll, Business Writing, PEN training and be proficient in Power Point, Excel, Word, etc. **OR** Possess a degree in Business / Project Administration or Education with an emphasis in Math or Science and completion of all training classes listed above.

CONSTRUCTION TECHNICIAN IV, ADOT EQUIVALENT (S7)

CANDIDATE SHALL BE ATI AND ACI CERTIFIED or BSCE.

Exercises considerable independent judgment within general ADOT standards and guidelines.

- TRANSPORTATION CONSTRUCTION TECH IV
- TRANSPORTATION ENGINEERING ASSOCIATE
- TRANSPORTATION ENGINEERING SURVEY SENIOR TECHNICIAN
- TRAINING OFFICER I

NOTE: REFER TO HUMAN RESOURCES POSITION SPECIFICATIONS ATTACHED TO THIS SCOPE OF WORK

STATE OF ARIZONA POSITION SPECIFICATION
Class Title: Transportation Construction Technician IV Class Code: 34399
Organizations/Work Settings: Department of Transportation Class Established: 05/08/92
Intermodal Transportation Division Revised: 09/07/00

FLSA: NE Pay Grade: S7

WORK DESCRIPTION:
Serves as a lead technician, under the direction of Engineer-In-Charge or designated representative, coordinates activities on highway construction project(s), including survey, quality control, inspection, project lab, and project office. Inspects and documents the most complex contract items, such as structures and concrete or asphalt pavement; performs related duties as necessary due to staffing requirements. Oversees the activity of a project lab performing project-related tests, and the work activities of a construction project office. May function as the primary contact for contractors, consultants, and ADOT employees on either a minor project or a of a major project. May resolve issues of conflict with contractors, initiate change orders, or force accounts. Schedules and reviews completed work of other employees and provides training.

WORK CONDITIONS:
Frequent travel. Considerable exposure to extreme weather conditions and hazardous traffic conditions depending upon assignment.

SUPERVISION:
Works under the general supervision of an Engineer-In-Charge of a project or representative. Assigns and directs work of project employees.

KNOWLEDGES APPLIED:
Principles and practices of civil engineering related to the construction of state highway system roadways.
Construction inspection methods, procedures, and techniques.
Construction survey and materials testing and procedures.
Project-related contract, plans, specification and documentation
Verification and review procedures and practices.
Federal, state and agency standards, policies and practices.
Approved record-keeping and documentation procedures.

WORK RESULTS/PRODUCTS:
Highway construction projects completed in compliance with agency standards and specifications. Project documentation prepared and submitted within established timelines and conforming to accepted standards and practices. Materials tests and documents completed as required by applicable specifications and standards. Project-related surveys performed timely and to acceptable tolerances.

RESPONSIBILITY:
As delegated, for ensuring the safe completion of all work assigned personally and to subordinate employees. Timely completion of assignments to acceptable standards. Ensuring that materials, equipment, and procedures used comply with agency standards. Scheduling, assigning, and reviewing the daily work activities of other technicians

AUTHORITY:
As delegated within the area of assignment. Reject materials and workmanship not in compliance with agency specifications and plans. Approve or disapprove work performed under delegated direction.

SKILLS APPLIED:
Work scheduling and management.
Analysis and preparation of data.
Written and verbal communication.
Operation of equipment for completion of assigned duties.

Materials and equipment used for highway construction and
Materials testing purposes.
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WORK ACTIVITIES (Characteristic Tasks) - MAJOR and minor:
DEVELOP WORK SCHEDULES AND ASSIGN AND DIRECT EMPLOYEES TO MEET OVERALL EXPECTATIONS RELATED TO ASSIGNMENTS.
REVIEW TECHNICAL PROBLEMS AND DEVELOP PROCEDURES AND RECOMMENDATIONS FOR RESOLUTION OF ISSUES RELATED TO ASSIGNMENTS.
REVIEW, VERIFY AND APPROVE CALCULATIONS, TEST RESULTS AND DOCUMENTATION FOR ASSIGNMENTS.
PERFORM INSPECTION, SURVEY, DOCUMENTATION, AND TESTING AS REQUIRED FOR CONSTRUCTION PROJECTS.
CONSULT WITH CONTRACTORS, LOCAL AGENCIES, AND CITIZENS TO DEVELOP ALTERNATIVE SOLUTIONS TO RESOLVE ISSUES IN CONFLICT AT THE LOWEST LEVEL IN THE FIELD, AND PREPARE RECOMMENDATIONS FOR PROJECT MANAGEMENT.
REVIEW CONSTRUCTION PLANS, SPECIFICATIONS, AND DOCUMENTATION TO ENSURE COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS.

WORK ACTIVITIES (CONTINUED) Class Code:34399
PREPARE PROJECT RELATED DOCUMENTATION TO ENSURE CONFORMANCE WITH ALL APPLICABLE LAWS, RULES, REGULATIONS, AND STANDARDS.
PROVIDE TRAINING, COACHING, AND GUIDANCE TO EMPLOYEES AS DIRECTED.
REVIEW AND VERIFY CONTRACTOR PAY QUANTITIES BEFORE DOWNLOADING INTO CPE PROGRAM.
REVIEW AND/OR PREPARE CONTRACT DOCUMENTS RELATED TO FORCE ACCOUNTS, CHANGE ORDERS, SUPPLEMENTAL AGREEMENTS, AND FINANCIAL DOCUMENTATION FOR COMPLETED PROJECTS.
Attend meetings and represent the Division as directed.
Perform related work as required.

MINIMUM QUALIFICATIONS:
Four years of experience in operating survey equipment, inspecting minor highway construction projects, hot mix and concrete plants, performing administrative or advance engineering and construction records maintenance or related duties; or a Bachelors degree in Engineering Technology or closely related profession may be substitute for the required experience.
SPECIAL SELECTION FACTORS: Employment is contingent upon passing a physical examination.
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STATE OF ARIZONA POSITION SPECIFICATION
Class Title: Transportation Engineering Associate Class Code: 75210
Organizations/Work Settings: Highways Division Class Established: 04/23/84
FLSA: NE Department of Transportation Revised: 01/01/94
Pay Grade: 18

WORK DESCRIPTION:
Performs a variety of engineering duties for a period not to exceed 24 months in any of the areas of the Highways Division including Highway Development, Highway Operations, Traffic Engineering, or the Districts as a training program for progression to entry/journey level classes in these areas.

WORK CONDITIONS:
May be required to travel and/or work outdoors occasionally, depending on area of assignment.

SUPERVISION:
Training will be provided in the area of assignment to provide the knowledges and skills required for advancement. Direct supervision will be provided during the training period.

KNOWLEDGES APPLIED:
Knowledge of principles and practices of civil engineering, as applied to the location, design, construction, and maintenance of a State highway system.
Knowledge of agency organization and functions of the work units.
Knowledge of Federal and State statutes and agency standards, rules, and regulations applicable to the area of assignment.
Knowledge of agency safety practices and procedures.

WORK RESULTS/PRODUCTS:
Completed work projects applicable to the area of assignment.

RESPONSIBILITY:
Timely and accurate completion of all assigned projects; scheduling and prioritizing work projects within established time frames.

AUTHORITY:
Decisions that affect the work assignment as delegated by the supervisor.

SKILLS APPLIED:
Skill in the evaluation and interpretation of technical engineering records and reports.
Skill in the operation and maintenance of a variety of equipment used in the area of assignment.
Skill in interpersonal relations, as applied to contacts with other agency personnel.

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Class Code: 75210

WORK ACTIVITIES (Characteristic Tasks) - MAJOR and minor:

INTEGRATED INTO WORK ROUTINE, OR IN TIME SET ASIDE FOR TRAINING, ACQUIRES KNOWLEDGE AND SKILLS NEEDED FOR ADVANCEMENT TO JOURNEYMAN WORKER LEVEL IN THE WORK SYSTEM.

ATTENDS PERIODIC WORKSHOPS OR TRAINING SESSIONS TO IMPROVE WORKING KNOWLEDGE AND

CHECKS OR VERIFIES CALCULATIONS ON QUANTITY SUMMARIES FOR HIGHWAY CONSTRUCTION BID ITEMS.

CALCULATES LAND AREAS, EARTH FORMS, CIRCULAR CURVES, MATERIAL QUANTITIES, AND OTHER QUANTITATIVE MEASUREMENTS, USING GEOMETRIC AND TRIGONOMETRIC COMPUTATIONS.

EXAMINES AND VERIFIES NUMERIC DATA AND SPECIFICATIONS ON SOURCE DOCUMENTS BY RECALCULATING COMPUTATIONS, USING

SKILLS AT ELEMENTARY WORKING LEVEL IN WORK SYSTEM.
READS AND STUDIES INSTRUCTIONAL OR INFORMATIONAL MATERIAL IN ORDER TO INCREASE AND EXPAND KNOWLEDGE BASE AT ELEMENTARY WORKING LEVEL IN THE WORK SYSTEM.
CALCULATES HORIZONTAL ALIGNMENT OF ROADWAY FOR HIGHWAY CONSTRUCTION, FROM PRELIMINARY SURVEY DATA; LAYS OUT FOR DRAFTING
CALCULATES VERTICAL ALIGNMENT (GRADE LINE) OF ROADWAY FOR HIGHWAY CONSTRUCTION, FROM PRELIMINARY SURVEY DATA; PLOTS AND CONNECTS POINTS OF INTERSECTION TO CONSTRUCT ORIGINAL GROUND AND CONSTRUCTION PROFILES.
DEVELOPS QUANTITY SUMMARIES OF BASIC LEVEL FOR HIGHWAY CONSTRUCTION BID ITEMS; SUBMITS FOR APPROVAL OF TEAM LEADER OR SUPERVISOR.
GEOMETRY OR TRIGONOMETRY.
INSPECTS CONSTRUCTION IN PROGRESS, TO ASSURE ITS CONFORMANCE WITH SPECIFICATIONS, AGREEMENTS, AND ESTABLISHED REQUIREMENTS.
REVIEWS CONSTRUCTION PLANS AND VERIFIES THAT THESE ARE IN ACCORDANCE WITH DESIGNATED SPECIFICATIONS AND OTHER REQUIREMENTS.
WRITES FINAL DESIGN PLAN FOR A HIGHWAY CONSTRUCTION PROJECT, INCORPORATING SUMMARIES OF QUANTITY COMPUTATIONS (MATERIALS AND SERVICES), CONTRACT DOCUMENTS, AND DESIGN DETAILS.
Performs related work as required.

MINIMUM QUALIFICATIONS:
Bachelor's degree from an accredited college or university with a major in civil engineering or closely related engineering field.
Special Selection Factors:
None.
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ARIZONA STATE PERSONNEL Class Code: 97313
FLSA: NE Pay Grade: 18
Transportation Survey Group
CLASS TITLE: Transportation Engineering Survey Senior Technician
CHARACTERISTIC OF THE CLASS:
Under the direction of a Transportation Engineering Survey Specialist, performs as a lead instrument person; prepares and surveys selected sites and assists in the supervision of a field survey crew and related duties.
EXAMPLES OF DUTIES:
Prepares and surveys assigned locations; directs and assists a field survey crew to locate existing survey monuments, sets traverse points for control, sets new survey monuments for use as control points, and paints and/or sets targets for aerial mapping; directs and assists a survey crew on multiple transportation construction projects; makes minor adjustments to the organizational structure, methods and workflow to accommodate changing conditions; verifies locations of construction project items in the field and in the plans; clarifies and interprets plans for subordinates, project field personnel and contractor personnel; provides advice to project personnel, keeping them informed of project construction plan changes; performs daily tasks by demonstrating proper procedures for using specialized equipment; operates a variety of survey equipment including Global Positioning System (GPS) Satellite Receiver, and electronic levels to establish horizontal and vertical control; compiles field survey books; prepares maps, diagrams, and sketches, annotates photographs and writes field survey notes; writes detailed descriptions of survey site control points and monuments for geodetic positions and later recovery; draws maps for each project, notes angles, distances, and calculates slopes; composes and completes a transit book to record all survey data; sets or directs others to set traffic control signals on job site for workers' safety; reviews subordinates' work in progress, or upon completion, to ensure the accuracy and completeness of computations and measurements; explains and demonstrates basic survey field methods to agency field personnel; and performs other related duties such as testing and maintaining survey equipment and operating and maintaining assigned vehicle(s).
KNOWLEDGE, SKILLS, AND ABILITIES:
Requires knowledge of construction, location, or photogrammetric surveying methods, procedures and techniques; uses and capabilities of a wide variety of survey equipment such as Global Positioning Systems, geodimeters, automatic and electronic levels and personal computers; mathematics as applied to reduce and adjust field and office survey calculations, and methods and procedures used in analyzing and evaluating a variety of surveying data; Federal and State statutes and agency standards, policies and procedures applicable to the area of assignment and agency safety standards, policies and procedures; principles of supervision, training, and leadership; and computer programs applicable to functional work unit.
Requires skill in the operation of survey instruments including electronic total stations, digital and automatic levels, Global Positioning Systems equipment and theodolites; reading and interpreting a variety of technical data including plans, specifications, topographic and plat maps and aerial photographs; drafting topographic information, recordkeeping, entering data in electronic surveying equipment, field books and computers; oral and written communications, leadership and management; and interpersonal relations.
Requires ability to interpret a variety of technical data from maps, plats and aerial photographs, write field notes and use surveying equipment.
CC# 97313
Transportation Engineering Survey Senior Technician Page 2
MINIMUM QUALIFICATIONS
Four years of experience in surveying, including experience as a technician functioning as a lead worker performing activities on a survey crew. Other combinations of experience, education and/or technical training that meet the minimum requirement may be substituted for the required experience.
Must be capable of lifting and carrying 35 pounds.
A medical/physical evaluation is required prior to appointment.
National Institute for Certification in Engineering Technologies (NICET) Level III in Highway Construction or Surveying; OR National Society of Professional Surveyors (NSPS) Level III: OR registration as a Land Surveyor in Training in Arizona (LSIT) must be obtained before permanent status can be granted.
Revised: 8/18/97
http://www.infoaccess.com/http://www.infoaccess.com/

ARIZONA STATE PERSONNEL Class Code: 73621
FLSA: NE Pay Grade: 19 (Equivalent to S7)
Management Group
Personnel Management Series
CLASS TITLE: Training Officer I
CHARACTERISTICS OF THE CLASS:
Under direction, is responsible for professional work of average difficulty assisting in the development of overall training program objectives and coordinating the execution and evaluation of training activities on a department wide basis; and performs related work as required.
EXAMPLES OF DUTIES:
Participates in preparation, review and coordination of formalized in-service and out-service training programs; writes training manuals, special training materials and prepares special studies; provides technical supervision over training activities, prepares budget recommendations for meeting agency training requirements including handbooks, manuals, audiovisual aids and other related training materials; establishes and maintains training records; assists in training line and staff officials in training strategies and methods; keeps supervisor informed of progress on training objectives.
KNOWLEDGE, ABILITIES AND SKILLS:
Considerable knowledge of training strategies and methods; good knowledge of administrative and management theory and practice; good knowledge of the principles of employee training; good knowledge of the nature of the learning process; good knowledge of trends in employee training. Ability to plan, organize, and coordinate the execution of training programs; ability to provide technical supervision in training matters; ability establish and maintain effective working relations with individuals, groups, and representatives of other organizations; ability to write training materials; and ability to speak and write effectively.
MINIMUM QUALIFICATIONS:
Bachelor's degree in business administration, public administration, a social or behavioral science or other acceptable field of study from an accredited college or university and one year experience in training; additional experience in training or other closely related personnel work may be substituted for the Bachelor's degree on a year-for-year basis.
Revised: October 1, 1998
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CONSTRUCTION TECHNICIAN (REGISTERED LAND SURVEYOR), CANDIDATE SHALL BE A REGISTERED LAND SURVEYOR

Exercises considerable independent judgment within General ADOT Standards and Guidelines

Examples of duties assigned to this classification are:

Reviews construction plans and verified that these are in accordance with designated specifications and other requirements.

Participates in the preparation of completed work estimates to determine compensation due contractor.

Examines and verifies numeric data on project cost source documents utilizing geometry, and trigonometry calculations.

Supervises all survey work activities involved in construction projects to include locating Right of Markers and lines.

Knowledge and skills required:

Knowledge of the principles and practices of Civil Engineering as applied to the construction of state highways.

Skill in analyzing and evaluating a wide variety of highly technical engineering data including construction plans, and field survey.

Skill in interpreting and implementing ADOT Standards, policies, procedures and regulations.

Skill in interpersonal relations as applied to contacts with contractors, representatives of other governmental jurisdictions, and other ADOT Staff.

CONSTRUCTION TECHNICIAN V

IDEAL CANDIDATE SHALL BE ATI AND ACI CERTIFIED.

Acts as a technical/engineering specialist performing a variety of journey level engineering technician duties in the areas of highway location, design, maintenance, traffic engineering or construction may act as supervisor for lower level staff assigned to work unit. Exercises considerable independent judgment within general ADOT standards and guidelines.

Examples of duties assigned to this classification are:

Under the general direction of a registered engineer, supervises or inspects highway construction on an ongoing basis to assure compliance with contract and in accordance with State and Federal standard.

Inspects and examines engineering project records, field notes, computations and other documentation to assure that methods of measurement and basis for payment are in accordance with projected requirements, specifications, special provisions and extra work orders.

Reviews construction plans and verified that these are in accordance with designated specifications and other requirements to include calculating of land areas, earth forms, circular curves; materials quantities and other quantitative measurements, using geometric and trigonometric computations.

Participates in the preparation of completed work estimates, to determine compensation due contractor. Attends work unit staff meetings, gives and receives information; participates in problem solving and decision making.

May supervise and or inspect all work activities involved in construction projects, including survey, laboratory, and quality control work. Recommends approval of proposed projects changes.

Knowledge and skills required:

All knowledge and skills required of lower classifications.

Knowledge of the principles and practices of Civil Engineering as applied to the development, construction, and maintenance of state highway system.

Skill in analyzing and evaluating a wide variety of engineering data, including construction plans, field survey and quality control documentation.

Skill in researching, reading and interpreting a variety of technical engineering documents such as survey data, highway plans and computer printout.

Skill in oral and written communications to include interpersonal relations, as applied to contracts with contractors, representatives of other governmental jurisdictions, and other ADOT staff.

Skill in organizing and prioritizing work assignments.

CONSTRUCTION TECHNICIAN V, ADOT EQUIVALENT (S9)
CANDIDATE SHALL BE ATI AND ACI CERTIFIED OR ENGINEERING IN TRAINING (E.I.T.) WITH 1 YEAR HIGHWAY EXPERIENCE

Project Supervisor reports directly to Resident Engineer.

- TRANSPORTATION ENGINEERING SPECIALIST
- TRANSPORTATION ENGINEERING SURVEY SPECIALIST
- TRAINING OFFICER II

NOTE: REFER TO HUMAN RESOURCES POSITION SPECIFICATIONS ATTACHED TO THIS SCOPE OF WORK

STATE OF ARIZONA POSITION SPECIFICATION
Class Title: Transportation Engineering Specialist Class Code: 75261
Organizations/Work Settings: Highways Division Class Established: 04/23/84
Department of Transportation Revised: 10/01/96
FLSA: NE Pay Grade: 20 $
WORK DESCRIPTION:
Acts as a technical specialist performing a variety of journey level engineering duties in the areas of highway location, design, maintenance, traffic engineering or construction; may act as lead worker for lower level staff assigned to the work unit.
WORK CONDITIONS:
No unusual work conditions.
SUPERVISION:
Works under the general supervision of a first-line supervisor and exercises some independent judgment within established program parameters, policies and procedures.
KNOWLEDGES APPLIED:
Knowledge of the principles and practices of civil engineering, as applied to the development, construction, and maintenance of State Highway systems.
Knowledge of computational and adjustment factors to be applied in the review and analysis of engineering data related to the area of assignment.
Knowledge of computer programs available for use within the work unit.
Knowledge of Federal and State statutes and agency standards, policies, and procedures applicable to the area of assignment.
WORK RESULTS/PRODUCTS:
Completed review of applicable engineering data; complete, current files of engineering data relating to the work unit.
RESPONSIBILITY:
Timely completion of assigned projects; may schedule and assign work to subordinate staff assigned to the work unit.
AUTHORITY:
Determines the accuracy and completeness of information under review; makes recommendations for approval or disapproval of work projects completed in the work unit.
SKILLS APPLIED:
Skill in analyzing and evaluating a wide variety of engineering data.
Skill in researching, reading and interpreting a variety of technical engineering documents such as survey data, highway plans and computer printouts.
Skill in oral and written communications.
Skill in organizing and prioritizing work assignments.
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WORK ACTIVITIES (Characteristic Tasks) - MAJOR and minor:
INSPECTS LAND IN FIELD AND COMPILES DETAILED DESCRIPTION OF LAND AND FACILITIES ON THE LAND.
INSPECTS AND EXAMINES ENGINEERING PROJECT RECORDS, FIELD NOTES, COMPUTATIONS AND OTHER DOCUMENTATION TO ASSURE THAT METHODS OF MEASUREMENT AND BASIS FOR PAYMENT ARE IN ACCORDANCE WITH PROJECTED TRENDS, SPECIFICATIONS, SPECIAL PROJECTS AND EXTRA WORK ORDERS.
ESTIMATES COSTS OF FUTURE CONSTRUCTION PROJECTS IN THE PLANNING PHASE, BASED ON CALCULATIONS FROM AVAILABLE DATA.
GATHERS DATA AND SUPPLIES DATA FOR COMPUTER INPUT IN ORDER TO RECEIVE PRECISE CALCULATIONS FOR DETAILED ENGINEERING DRAWINGS AND EVALUATIONS.

CALCULATES LAND AREAS, EARTH FORMS, CIRCULAR CURVES; MATERIAL QUANTITIES AND OTHER QUANTITATIVE MEASUREMENTS, USING GEOMETRIC AND TRIGONOMETRIC COMPUTATIONS.
EXAMINES AND VERIFIES NUMERIC DATA AND SPECIFICATIONS ON SOURCE DOCUMENTS BY RECALCULATING COMPUTATIONS, USING GEOMETRY OR TRIGONOMETRY.
REVIEWS AND ANALYZES ELECTRICAL BLUEPRINTS TO ENSURE CONFORMANCE OF STANDARDS AND SPECIFICATIONS OR TO PLAN ELECTRICAL INSTALLATIONS.
Class Code: 75261
OBTAINS RELIABLE MEASUREMENTS AND ENGINEERING DATA FOR USE IN ASSIGNED AREA.
PERFORMS A VARIETY OF ENGINEERING AND RELATED DUTIES IN ONE OF A NUMBER OF AREAS, INCLUDING LOCATION, DESIGN, CONSTRUCTION, MATERIALS, AND MAINTENANCE.
Attends work unit staff meetings; gives and receives information; participates in problem solving and decision making.
Confers with agency officials, staff members and representatives of other agencies to acquire information needed for immediate determinations or decisions.
Compiles information for and writes periodic reports on activities of a work unit.
Writes detailed reports based on research, investigation or inquiry, in prescribed format or on established forms provided.
Searches blueprints, maps, charts, records, and diagrams for specific information regarding current facilities buildings construction or past work done in a future work site.
Performs related work as required.
MINIMUM QUALIFICATIONS:
Bachelor of Science degree in civil engineering or a closely related field and two years experience equivalent to a Transportation Engineering Associate; OR three years experience at a Senior Transportation Engineering Technician level (grade 18 or above); OR completion of the Arizona Department of Transportation Engineer-In-Training (E.I.T.) program; OR registration as a professional civil engineer in the State of Arizona.
Special Selection Factors:
Some positions may require a B.S.C.E.
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http://www.infoaccess.com/ http://www.infoaccess.com/

ARIZONA STATE PERSONNEL Class Code:97308
FLSA: VA Pay Grade: 20 $
Transportation Survey Group
CLASS TITLE: Transportation Engineering Survey Specialist
CHARACTERISTIC OF THE CLASS:
Under the direction of a Transportation Engineering Chief Surveyor, provides specialized surveying services in highway design and construction; OR may supervise a work unit or survey crew.
EXAMPLES OF DUTIES:
Reviews construction projects including details specific to the area of assignment, such as, the placement of structures, rights-of-way, earthwork quantities, signing, and traffic engineering features; reviews project plans and specifications and verifies accuracy and assures compliance; participates in project meetings and field reviews; makes recommendations to ensure plans are in compliance with design intent and established standards; formulates design alternatives; analyzes survey data and summarizes findings and recommendations; reviews project documentation, quantities and correspondence; coordinates with other project teams and agency personnel; provides technical instruction and assistance to project personnel; monitors progress and evaluates work assignments; evaluates consultants' work; participates in project progress meetings; plans and schedules work of assigned staff; long and short term project planning; establishes project deadlines and accomplishes agency goals.
KNOWLEDGE, SKILLS, AND ABILITIES:
Requires knowledge of the principles and practices of civil engineering, and geodetic and/or land surveying as applied to the development, design and construction of Transportation Systems, and/or control, location, and construction field surveys; uses and capabilities of a wide variety of survey equipment; computational and adjustment factors applied in the review and analysis of engineering and/or field surveying data related to the area of assignment; Federal and State statutes and agency standards, policies and procedures applicable to the area of assignment; public, agency and personal safety standards, policies, and procedures, and first aid techniques; and principles of supervision, training, and leadership.
Requires skill in leadership and management; oral and written communications; analyzing and evaluating a wide variety of engineering and/or survey data; operation of a wide variety of surveying equipment.
Requires ability to organize and prioritize; research, read and interpret technical engineering documents such as survey data, highway plans and computer printouts; and interpret technical data from maps, plans and aerial photographs, write field notes and use surveying equipment.
MINIMUM QUALIFICATIONS
Bachelor of Science in Civil Engineering or a closely related field; OR two years experience as a lead instrument person or lead worker assisting in the supervision of field survey crew; OR completion of the Arizona Department of Transportation Engineer-in-Training (E.I.T.) program. National Institute for Certification in Engineering Technologies (NICET) Level IV in Highway Construction or Surveying; OR National Society for Professional Surveyors (NSPS) Level IV: OR registration as a Land Surveyor in Training (LSIT) must be obtained before permanent status can be granted.
Class Established: 08/18/97
http://www.infoaccess.com/http://www.infoaccess.com/

ARIZONA STATE PERSONNEL Class Code: 73622
FLSA: EX Pay Grade: 20 $
Management Group
Personnel Management Series
CLASS TITLE: Training Officer II
CHARACTERISTICS OF THE CLASS:
Under general direction, is responsible for difficult professional work in employee development and training including establishing training requirements and evaluation of training; and performs related work as required.
EXAMPLES OF DUTIES:
Supervises training staff; confers with line and staff officials concerning training needs and establishes a total staff training and development plan; supervises research and modifies or develops improved training strategies and methods; confers with representatives of educational or training institutions for establishment of specific training programs, seminars or courses; supervises development of training manuals, acquisition and use of audiovisual equipment, handbooks, and other training materials; coordinates and participates in special training activities; prepares reports of training for administrative review.
KNOWLEDGE, ABILITIES AND SKILLS:
Considerable knowledge of the principles of employee training; considerable knowledge of the nature of the learning process; considerable knowledge of trends in employee training; considerable knowledge of training strategies and methods; considerable knowledge of administrative and management theory and practices.
Ability to plan, organize, and coordinate execution of training programs; ability to evaluate and improve training programs' materials and courses; ability to establish and maintain effective working relations with individuals, groups and representatives of diverse agencies; ability to supervise; ability to speak and write effectively.
MINIMUM QUALIFICATIONS:
Bachelor's degree in business or public administration, a social or behavioral science or other acceptable field from an accredited college or university and three years of experience in the training field; OR a Master's degree in one of the above fields and one year of the required experience; additional experience in training administration or a position involving responsibility for a formal training program may be substituted for the required education on a month-for-month basis.
Revised: October 1, 1998
http://www.infoaccess.com/ http://www.infoaccess.com/

LANDSCAPE ARCHITECT

IDEAL CANDIDATE MUST BE REGISTERED IN THE STATE OF ARIZONA

Responsible for work of average difficulty in the design or supervision of design of landscaping projects in accordance with environmental planning concepts such as the preservation or enhancement of natural land features, and performs related work as required.

Knowledge, Abilities and Skills:

Considerable knowledge of principles, problems and methods used in landscape architecture and design, landscape construction and adaptability, requirements and use of plants, shrubs and trees, both native and cultivated in different landscaping situations; good knowledge of common plant diseases and pests and standard methods and materials used in their control and eradication; good knowledge of engineering as applied to landscaping features; good knowledge of Arizona soil conditions, soil preparation, planting, pruning techniques and tree surgery.

REGISTERED LANDSCAPE ARCHITECT, (T2 OR T3)
CANDIDATE MUST BE REGISTERED IN THE STATE OF ARIZONA

- REGISTERED LANDSCAPE ARCHITECT

NOTE: REFER TO HUMAN RESOURCES POSITION SPECIFICATIONS ATTACHED TO THIS SCOPE OF WORK

ARIZONA STATE PERSONNEL Class Code: 75561
FLSA: EX Pay Grade: 20 $

Professional Engineering and Architecture Group
General Engineering and Architecture Series

CLASS TITLE: Landscape Architect

CHARACTERISTICS OF THE CLASS:

Under direction is responsible for work of average difficulty in the design or supervision of design of landscaping projects in accordance with environmental planning concepts such as the preservation or enhancement of natural land features, and performs related work as required.

EXAMPLES OF DUTIES:

Develops preliminary and final design, plans and specifications for landscaping projects in highway roadside development, scenic, recreational or historic park or site development; assists in establishing design standards for highway roadside rest areas and historical sites; supervises initial planting,s follows through on maintenance programs, involving soil and moisture conditions, pruning practices, replacement, etc.; consults with persons within and without the department on matters involving project design development.

KNOWLEDGE, ABILITIES AND SKILLS:

Considerable knowledge of principles, problems and methods used in landscape architecture and design, landscape construction and adaptability, requirements and use of plants, shrubs and trees, both native and cultivated in different landscaping situations; good knowledge of common plant diseases and pests and standard methods and materials used in their control and eradication; good knowledge of engineering as applied to landscaping features; good knowledge of Arizona soil conditions, soil preparation, planting, pruning techniques and tree surgery.

Ability to select proper plant materials to achieve desired effects and prevent soil erosion; ability to prepare sketches and plans for beautification or other landscaping projects; ability to supervise the work of others.

MINIMUM QUALIFICATIONS:

Training and Experience:

Bachelor's degree in landscape architecture or a related field from an accredited college or university and four years experience in the field of landscape architecture; additional qualifying experience may be substituted for education on a month-for-month basis.

Licenses, Certificates or Registrations:

Registration as a landscape architect in the State of Arizona.

Revised: October 1, 1998

http://www.infoaccess.com/ http://www.infoaccess.com/

RESIDENT ENGINEER

IDEAL CANDIDATE MUST BE A REGISTERED PROFESSIONAL CIVIL OR HIGHWAY ENGINEER.

Acts as a project engineer performing a variety of engineering duties in the areas of highway location, design, maintenance, traffic engineering or construction; may act as supervisor for lower level staff assigned to the work unit. Exercises considerable independent judgment within general ADOT standards and guidelines.

Examples of duties assigned to this classification are:
Supervises or inspects highway construction on an ongoing basis to assure compliance with contract and in accordance with State and Federal standards. Inspects and examines Engineering Project Records, Field Notes, Computations and other Documentation to assure that methods of measurement and basis for payment are in accordance with projected requirements, specifications, special provisions, and extra work orders. Reviews construction plans and verifies that these are in accordance with designated specifications and other requirements to include calculating of land areas, using geometric and trigonometric computations. Prepares completed work estimates to determine the compensation due the contractor. Attends work unit staff meetings, gives and receives information; participates in problem solving and decision making. Supervises and or inspects all work activities involved in construction projects, including survey, laboratory, and quality control work. Recommend approval of proposed project changes.

PROJECT ENGINEER / RESIDENT ENGINEER, (T2 OR T3)
CANDIDATE MUST BE PROFESSIONAL CIVIL OR HIGHWAY ENGINEER REGISTERED IN ARIZONA.

- TRANSPORTATION ENGINEER I
- TRANSPORTATION ENGINEER II

NOTE: REFER TO HUMAN RESOURCES POSITION SPECIFICATIONS ATTACHED TO THIS SCOPE OF WORK

STATE OF ARIZONA POSITION SPECIFICATION
Class Title: Transportation Engineer I Class Code: 34110
Organizations/Work Settings: Department of Transportation - Highways Division Class Established: 11/22/93 FLSA: EX Revised: 10/01/96 Pay Grade: 22 $

WORK DESCRIPTION:
Supervises the work of technical-level, non-supervisory staff involving engineering analysis, highway or structures design, maintenance, construction, or traffic engineering; OR acts as technical staff engineer engaged in the performance of senior journey-level professional engineering work; OR coordinates programs, or projects, and represents the agency before the public, other governmental agencies, consultants and/or contractors; OR acts as team leader of a professional staff.

WORK CONDITIONS: Depending on work location and assignment, may be required to work full time outside exposed to cold and heat; considerable travel away from home base may be required.

SUPERVISION:
Works under the general direction of a higher level engineer. Exercises considerable and significant independent judgment within established program parameters, policies and procedures.

KNOWLEDGES APPLIED:
Principles and practices of civil engineering as applied to design, development, construction and maintenance of the state highway system.
Federal and State statutes, agency standards, regulations, policies and procedures pertaining to area of assignment.
Safety and public relations practices.
Methods, procedures and techniques utilized in management of assigned resources.
Computer applications as they pertain to area of assignment.
Research techniques related to highly complex assignments.

WORK RESULTS/PRODUCTS:
Produces a variety of engineering related solutions and/or studies; completed project plans and specifications; completed construction projects; properly maintained highway systems; engineering related materials, reports and documents.

RESPONSIBILITY:
Schedules and assigns work activities to subordinate staff; develops detailed technical solutions, studies, documents and reports; timely and accurate completion of assigned projects.

AUTHORITY:
Approves or disapproves work related to specific area of assignment; assigns priorities as required for area of assignment.

SKILLS APPLIED:
Work supervision and leadership
Interpreting and analyzing a wide range of technical engineering data.
Oral and written communications.
Writing technical reports pertaining to assignment.
Interpersonal relations, as applied to contacts with subordinate personnel, other governmental agencies, contractors, consultants, and the public.
Developing and implementing appropriate standards procedures and priorities related to area of assignment.
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WORK ACTIVITIES (Characteristic Tasks) - MAJOR and minor:
ATTENDS SUPERVISORY OR WORK SYSTEM RELATED MEETINGS; GIVES AND RECEIVES INFORMATION; PARTICIPATES IN PROBLEM SOLVING AND DECISION MAKING.
DIRECTS, INSTRUCTS AND COUNSELS SUBORDINATE PERSONNEL AS REQUIRED.
REVIEWS WORK PRODUCTS FROM SUBORDINATES, CONSULTANTS OR OTHER PERSONNEL, PROVIDING TECHNICAL DIRECTION AND GUIDANCE.

CALCULATES LAND AREAS, EARTH WORK HORIZONTAL AND VERTICAL ALIGNMENTS; MATERIALS QUANTITIES AND OTHER QUANTITATIVE MEASUREMENTS, USING GEOMETRIC AND TRIGOMETIC COMPUTATIONS.
EXAMINES AND VERIFIES COMPLEX NUMERIC DATA, CONSTRUCTION PLANS AND SPECIFICATIONS.
CONFERS WITH REPRESENTATIVES OF OTHER AGENCIES, COMMUNITIES, CONSULTANTS, CONTRACTORS AND THE PUBLIC AS THE REPRESENTATIVE OF THE DEPARTMENT.
PERFORMS PREVENTIVE MAINTENANCE INSPECTIONS ON HIGHWAY STRUCTURES GIVING SPECIAL ATTENTION TO POINTS OF STRESS, FATIGUE AND LOADING.
WRITES DETAILED TECHNICAL REPORTS, AGREEMENTS, RESEARCH, INVESTIGATION, OR INQUIRY IN PRESCRIBED FORMAT.
REVIEWS, ANALYZES AND EVALUATES RESULTS OF TECHNICALLY DIFFICULT TESTS RELATING TO STRUCTURES, CONSTRUCTION AND DESIGN.
SEARCHES PLANS, MAPS, RECORDS, TECHNICAL JOURNALS FOR INFORMATION REGARDING CURRENT PROFESSIONAL PRACTICES AND PROCEDURES.

Class Code: 34110

Attends professional work seminars, meetings, conferences as a participant and representative of the department.
Analyzes, evaluates and reviews work procedures, methods and rules to make and develop work related practices.
Gives and receives information requiring judgment and knowledge regarding current and specific business practices.
Confers with supervisors to discuss work processes, incidents, problems and plans.
Pursues self improvement training to further professional development.
Reads and interprets federal, state and local codes and regulations in order to prepare or utilize reports used in work activity.
Performs related work as required.

MINIMUM QUALIFICATIONS:

Registration as a Professional Engineer in Civil Engineering or closely related field is appropriate to the area of assignment in the State of Arizona; OR eligibility for reciprocity in the State of Arizona.

Special Selection Factors:

None.

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STATE OF ARIZONA POSITION SPECIFICATION
Class Title: Transportation Engineer II Class Code: 34111
Organizations/Work Settings: Department of Transportation - Highways Division Class Established: 11/23/93
FLSA: EX Revised: 10/01/96
Pay Grade: 23 $

WORK DESCRIPTION:
Manages, through non-professional level subordinate supervisors/professional level team leaders, work involving engineering analysis, highway or structures design, traffic engineering, maintenance, construction, or traffic engineering, which may include supervision of administrative units or function; OR acts as one of a small number of technical staff experts engaged in professional engineering consultative work requiring possession of special knowledge and application of advanced engineering practices and procedures, advising management and field staff on the most difficult, complex and technically demanding engineering assignments, and representing the agency before the public and other agencies, consultants, and contractors.

WORK CONDITIONS:
Depending on work location and assignment, may be required to work full-time outside, thus exposed to cold and heat; considerable travel away from home base may be required.

SUPERVISION:
Works under the direction of a Service Manager, District Engineer or Transportation Engineer III within established policies and procedures. Exercises considerable and significant independent judgment.

KNOWLEDGES APPLIED:
Principles and practices of civil engineering as applied to design, development, construction and maintenance of the state highway system.
Federal and State statutes, agency standards, regulations, policies and procedures pertaining to area of assignment.
Safety practices and of public relations practices.
Methods, procedures and techniques utilized in management of assigned resources.
Computer applications that pertain to area of assignment.
Research techniques related to highly complex assignments.

WORK RESULTS/PRODUCTS:
Produces a variety of engineering solutions and/or studies; completed complex project plans and specifications; completed construction projects; properly maintained highway systems; engineering materials, reports and documents.

RESPONSIBILITY:
Schedules and assigns work activities to subordinate staff; develops detailed technical solutions, studies, documents and reports; timely and accurate completion of assigned projects.

AUTHORITY:
Approves or disapproves work related to specific area of assignment; prioritizes assigned tasks as required for area assignment.

SKILLS APPLIED:
Work management and leadership.
Interpreting and analyzing a wide range of highly technical engineering data.
Oral and written communications.
Writing technical reports pertaining to assignment.
Interpersonal relations, as applied to contacts with subordinate personnel, other governmental agencies, contractors, consultants, and the public.
Developing and implementing appropriate standards, procedures and priorities related to area of assignment.
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WORK ACTIVITIES (Characteristic Tasks) - MAJOR and minor:

DIRECTS, INSTRUCTS AND COUNSELS SUBORDINATE PERSONNEL AS REQUIRED.
REVIEWS WORK PRODUCTS FROM SUBORDINATES, CONSULTANTS OR OTHER PERSONNEL PROVIDING TECHNICAL DIRECTION AND GUIDANCE.
CALCULATES LAND AREAS, EARTH WORK, HORIZONTAL AND VERTICAL ALIGNMENTS; MATERIALS QUANTITIES AND OTHER QUANTITATIVE MEASUREMENTS, USING GEOMETRIC AND TRIGOMETIC COMPUTATIONS.
EXAMINES AND VERIFIES COMPLEX NUMERIC DATA, CONSTRUCTION PLANS AND SPECIFICATIONS.
CONFERS WITH CONSTRUCTION AND OTHER CONSTRUCTION RELATED PERSONNEL AND DESIGNERS REGARDING, CONSTRUCTION, SPECIFICATIONS, PLANS AND STANDARDS
CONFERS WITH REPRESENTATIVES OF TO OTHER AGENCIES, COMMUNITIES, CONSULTANTS, CONTRACTORS AND THE PUBLIC AS THE REPRESENTATIVE OF THE DEPARTMENT.
PERFORMS PREVENTATIVE MAINTENANCE INSPECTIONS ON HIGHWAY STRUCTURES GIVING SPECIAL ATTENTION TO POINTS OF STRESS, FATIGUE AND LOADING.
WRITES DETAILED TECHNICAL REPORTS, AGREEMENTS, RESEARCH, INVESTIGATION, OR INQUIRY IN PRESCRIBED FORMAT.
REVIEWS, ANALYZES AND EVALUATES RESULTS OF TECHNICALLY DIFFICULT TESTS RELATING TO STRUCTURES, CONSTRUCTION AND DESIGN.

ATTENDS SUPERVISORY OR WORK SYSTEM RELATED MEETINGS; GIVES AND RECEIVES INFORMATION; PARTICIPATES IN PROBLEM-SOLVING AND DECISION-MAKING.
ATTENDS PROFESSIONAL WORK SEMINARS, MEETINGS, CONFERENCES AS A PARTICIPANT AND REPRESENTATIVE OF THE DEPARTMENT.
SEARCHES PLANS, MAPS RECORDS, TECHNICAL JOURNALS FOR INFORMATION REGARDING CURRENT PROFESSIONAL PRACTICES AND PROCEDURES.
TESTIFIES IN COURT OR INFORMAL HEARINGS AS AN EXPERT WITNESS.
Analyzes, evaluates and reviews work procedures, methods and rules to make and develop work related practices
Gives and receives information requiring considerable judgment and knowledge regarding current and specific business practices.
Confers with supervisors to discuss work processes, incidents, problems and plans.
Pursues self improvement training to other professional development.
Reads and interprets federal, state and local codes and
regulations in order to prepare or utilize reports used in work activity.
Performs related work as required.

MINIMUM QUALIFICATIONS:

Two years of experience equivalent to a Transportation Engineer I.
Special Selection Factors:
Registration as a Civil Engineer or closely related field which is appropriate for the area of assignment in the State of Arizona or proof of eligibility for reciprocity is required at the time of appointment.
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APPENDIX A-4'
Construction Inspection

Certifications Matrix Showing Certifications Required to Receive Permanent Status to the Following Grades

Construction Technician Name: _____ **Current Grade:** _____

Tr. Engineer Worker (S1)			Tr. Construction Tech. I (S4)		Tr. Construction Tech. II (S5)		Tr. Construction Tech. III (S6)		Tr. Construction Tech. IV (S7)		Tr. Engineer Specialist (S9)	
	R		ATI Field Cert. OR		ATI Field Cert CRT3400		ATI Field Cert CRT3400		ATI Field Cert CRT3400		ATI Field Cert CRT3400	
	C											
	R		ACI Field Cert CRT3400-3410		ACI Field Cert CRT3410		ACI Field Cert CRT3410		ACI Field Cert CRT3410		ACI Field Cert CRT3410	
	C											
	R		*Earthwork Series* Sampling and Test. Module 101 TCH3300		*Earthwork Series* Excavation/ Embankment 102 TCH3301		*Earthwork Series* Subgrade/ Base 104 TCH3303		*Earthwork Series* Coach one module (+ Constr. Man.) TCH3301C-03C		*Earthwork Series* Coach Series (+ Constr. Man.)	
	T											
	C											
	R				Pipe Module 103 TCH3302		Incidental Module 105 TCH3304					
	T											
	C											
	R		*Concrete Series* Sampling and Test. Module 201 TCH3306		*Concrete Series* Incidentals Module 202 TCH3307		*Concrete Series* Major Structures Module 204 TCH3309		*Concrete Series* Coach one module (+ Constr. Man.) TCH3306C-09C		*Concrete Series* Coach Series (+ Constr. Man.)	
	T											
	C											
	R				PCCP Module 203 TCH3308							
	T											
	C											
	R		*Bituminous Series* Sampling and Test. Module 301 TCH3311		*Bituminous Series* Prime/Flush/Tack Module 302 TCH3312		*Bituminous Series* Plant Inspection Module 304 TCH3314		*Bituminous Series* Coach one module (+ Constr. Man.) TCH3311C-15C		*Bituminous Series* Coach Series (+ Constr. Man.)	
	T											
	C											
Daily Diary Documentation TCH3058	R		Workmanship Checklists TCH3043		Seal Coat Module 303 TCH3313		Paving Module 305 TCH3315					
	T											
	C											
Highway Plans Reading TCH3002	R		Force Account Documentation TCH3000				Construction Office Quantities TCH3012		Applied Const.Statistics TCH3010		Asphalt Unit Price Adj TCH3014	
	T											
	C											
Basic Work Zone Traffic Control TCH3004	R		Pay Item Documentation TCH3001		Basic Surveying TCH3120		Adv Work Zone Traffic Control TCH3005		Coaching Techniques TCH3316		Supplemental Agreements TCH3039	
	T											
	C											
Intro Applied Math TCH3015	R		Inter Applied Math TCH3016		Adv Applied Math TCH3017		Erosion and Pollution Control TCH3055		CPE Construction Progress Estimate TCH3041		CMP Procedures (CEMMS) TCH3048	
	T											
	C											
	R		Fast Inspection Forms (Pen-based) TCH3037		Roadside Safety Devices TCH3116				Cost Estimating TCH3011		Complete Project Final (1)	
	T											
	C											
Introduction to Partnering GEN5179	R		How to Conduct Partnering in the Field GEN5157						S.A.T.S TCH3038			
	T											
	C											

Note: Qualification to coach requires certification in the corresponding module.

Legend: Dates R = Registered T = Training Completed C = Passed Certification *(Dates shown are targets for training and certification availability).*

(1)Federal Aid project must be greater than $1 million with asphaltic concrete. Project final must be submitted with accurate & complete documentation with no financial errors.

.April 2, 2007

Construction Lab Technician

Certifications Matrix Showing Certifications Required to Receive Permanent Status to the Following Grades

Laboratory

Technician Name: _____ **Current Grade:** _____

Tr. Engineer Worker (S1)			Tr. Construction Tech. I (S4)		Tr. Construction Tech. II (S5)		Tr. Construction Tech. III (S6)		Tr. Construction Tech. IV (S7)		Tr. Engineer Specialist (S9)	
Proficiency in 50% of the tests Required for ATI Soils/Agg certification (All Labs) *	R		ATI Soils/Agg certification (All Labs) CRT3401		ATI Soils/Agg certification (All Labs) CRT3401		ATI Soils/Agg certification (1,2,3,4,6,7) CRT3401		ATI Soils/Agg certification (1,2,3,4,6,7) CRT3401		ATI Soils/Agg certification (3,6) CRT3401	
	T											
	C											
Daily Diary Documentation (1) TCH3058	R				ATI Asphalt Certification (1) CRT3402		ATI Asphalt Certification (1,2,3,5,6) CRT3402		ATI Asphalt Certification (1,2,3,5,6) CRT3402		ATI Asphalt Certification (3,6) CRT3402	
	T											
	C											
	R				ACI Concrete Strength Testing Certification (1) CRT3412		ACI Concrete Strength Testing Certification (1,2,6,7) CRT3412		ACI Concrete Strength Testing Certification (1,2,6,7) CRT3412		ACI Concrete Strength Testing Certification (6) CRT3412	
	T											
	C											
	R				ACI Field Technician Grade 1 Certification (1) CRT3410		ACI Field Technician Grade 1 Certification (1,6,7) CRT3410		ACI Field Technician Grade 1 Certification (1,2,6,7) CRT3410		ACI Field Technician Grade 1 Certification (6) CRT3410	
	T											
	C											
Introductory Applied Math (All Labs) TCH3015	R		Intermediate Applied Math (All Labs) TCH3016		Advanced Applied Math (All Labs) TCH3017		Demonstrate Proficiency in PG Binder Testing (5)		ATI Field Technician Certification (2,6) CRT3400		ATI Field Technician Certification (6) CRT3400	
	T											
	C											
Basic Work Zone Safety (All Labs) TCH3004	R		Introduction to Partnering (All Labs) GEN5179		Advanced Work Zone Safety (All Labs) TCH3005		Demonstrate Proficiency in Asphalt Rubber Testing (5)					
	T											
	C											
	R						Demonstrate Proficiency in Asphalt Emulsion Testing (5)		Applied Construction Statistics (All Labs) TCH3010			
	T											
	C											
	R						Coaching Techniques (All Labs) TCH3316		Coach for 2 Certifications (All Labs)		Coach All Applicable Certifications (All Labs)	
	T											
	C											

Note: All elements in prior grades required to receive permanent status. (if applicable).
Qualification to coach requires certification in corresponding module. * Proficiency required in the following test procedures
R = Registered T = Training Completed C = Passed Certification for the S1 classification:

April 2, 2007

Survey Technician

Certification Matrix Showing Certifications Required to Promote to the Following Grades:

Survey Technician Name:_____ Current Grade:_____

Tr. Engineer Worker (S1)			Tr. Construction Tech. I (S4)		Tr. Engr. Survey Tech. (S5)		Tr. Engr. Senior Survey Tech. (S7)		Tr. Engr. Survey Spec. (S9)	
			NSPS Level I Certification CRT3020	Date Available	NSPS Level II Certification CRT3022	Date Available	NSPS Level III Certification CRT3025	Date Available	LSIT (AZ) or NSPS Level IV Certification CRT3027	
			Survey 101 (P) * TCH3121		Survey 201 (P) ** TCH3125		Survey 301 (P)*** TCH3129		Coach Survey 100 series	
			Survey 102 (P) * TCH3122		Survey 202 (P) ** TCH3126		Survey 302 (P) *** TCH3130		Coach Survey 200 series	
			Survey 103 (P) * TCH3123		Survey 203 (P)** TCH3127		Survey 303 (P) *** TCH3131		Coach Survey 300 series	
			Survey 104 (P) * TCH3124		Survey 204 (P) ** TCH3128		Survey 304 (P)*** TCH3132		Coaching Techniques TCH3316	
							Microstation Intro TCH3026		Intermediate Microstation TCH3027	
Basic Surveying TCH3120			Introduction to Partnering GEN5179				InRoads / Survey Select Intro.TCH3030		Intermediate InRoads / Survey Select TCH3249	
Highway Plans Reading TCH3002			Pay Item Documentation TCH3001		Excel Intro. GEN1306		Excel Intermediate GEN1307		Excel Advanced GEN1308	
Daily Diary Documentation TCH3058					Intro. To Word GEN1316		Intermediate Word GEN1317		Advanced Word GEN1318	
Introductory Applied Math TCH3015			Intermediate Applied Math TCH3016		Advanced Applied Math TCH3017					
Basic Work Zone Traffic Control TCH3004			Advanced Work Zone Traffic Control TCH3005		Intro to Access GEN1301		Intermediate Access GEN1302		Advanced Access GEN1303	

Note: Qualification to coach requires certification in corresponding module.

Legend: Dates R = Registered T = Training Completed C = Passed Certification N/A = Not Available (P) = Prerequisite Required

Introductory Applied Math, ** Intermediate Applied Math, * Advanced Applied Math.** **April 2, 2007**

Construction Office

Matrix Showing Certifications Required to Receive Permanent Status to the Following Grades

Name: _____ **Current Grade:** _____

Tr. Engineer Worker (S1)			Tr. Construction Tech. I (S4)			Tr. Construction Tech. II (S5)			Tr. Construction Tech. III (S6)			Tr. Construction Tech. IV (S7)		
Word Introduction: Creating Documents GEN 1315	R		Powerful Business Writing GEN 5170			Access Introduction: GEN 1301			Word Intermediate GEN 1315B			Word 97 Merge, Tables and Forms GEN 1316		
	T													
	C													
Excel Introduction: Creating Spreadsheets GEN 1305	R		**Advantage GEN 1200			**HRIS Training GEN 1242		04/03	Excel Intermediate GEN 1305B			Excel Charting GEN 1306		
	T							04/03						
	C							04/03						
Intro to Outlook 2000 GEN 1335	R		Pay Item Documentation TCH 3001			ZM, Communication Skills for Employees GEN 5200-5212 (3 Days)			Construction Office Qtys TCH 3012			Delivering Exceptional Customer Service GEN 5152		
	T													
	C													
**Payroll (BTS) GEN 1230	R		Introductory Applied Math TCH 3015			Intermediate Applied Math TCH 3016			Advanced Applied Math TCH 3017			Cost Estimating TCH 3011		
	T													
	C													
**2-Way Radio TCH 4808	R		Certified Payroll Workshop TCH3046			Highway Plans Reading TCH 3002			Asphalt Unit Price Adjustment TCH 3014			Complete Project Final (1)		
	T													
	C													
Daily Diary Documentation TCH3058	R		Construction Progress Estimate (CPE) TCH 3041			Force Account Documentation TCH 3000			Coaching Techniques TCH 3316		N/A	Construction Management Program (CMP) (CEMMS) TCH 3040		
	T										N/A			
	C										N/A			
	R											S.A.T.S Supplemental Agreements Tracking System TCH 3038		
	T													
	C													

Legend: Dates R = Registered T = Training Completed C = Passed Certification N/A = Not Available

**** Not required for Field Reports**

(1) Federal Aid Project must be greater than $1 million with asphalt concrete. Project final submitted with accurate and complete documentation and no financial errors.

April 2, 2007

Traffic Signal and Lighting

Certifications Matrix Showing Certifications Required to Receive Permanent Status to the Following Grades

Technician Name: _____ **Current Grade:** _____

Tr. Engineer Worker (S1)	Tr. Construction Tech. I (S4)	Traffic Signal & Lighting Technician I (S5)	Traffic Signal & Lighting Technician II (S6)	Traffic Signal & Lighting Crew Supervisor (S7)	Traffic Signal & Lighting Section Manager (S9)
		IMSA Work Zone Safety Specialist CRT3180	IMSA Work Zone Safety Specialist CRT3180	IMSA Work Zone Safety Specialist CRT3180	IMSA Work Zone Safety Specialist CRT3180
		IMSA Traffic Signal Technician Level I CRT3181	IMSA Traffic Signal Technician Level I CRT3181 or	IMSA Traffic Signal Technician Level I CRT3181	IMSA Traffic Signal Technician Level I CRT3181
		**Daily Diary Documentation TCH3058	IMSA Traffic Signal Inspector CRT3183	IMSA Traffic Signal Technician Level II CRT3182B or	IMSA Traffic Signal Technician Level II CRT3182B
		Basic Work Zone Traffic Control TCH3004	Advanced Work Zone Traffic Control TCH3005	IMSA Traffic Signal Electrician Level II CRT3182A	IMSA Traffic Signal Electrician Level II CRT3182A
		Introduction to Partnering GEN5179	**Fast Inspection Forms (Pen Based Operations) TCH3037	**Force Account Documentation TCH3000	
		Introductory Applied Math TCH3015	Intermediate Applied Math TCH3016	Advanced Applied Math TCH3017	**Applied Construction Statistics TCH3010
		Highway Plans Reading TCH3002	**Pay Item Documentation TCH3001	**Cost Estimating TCH3011	**Supplemental Agreements TCH3039

S1 and S4 are not used in this series

Legend: Dates R = Registered T = Training Completed C = Passed Certification

**Not required for maintenance only personnel

Landscape Inspection

Certifications Matrix Showing Certifications Required to Receive Permanent Status to the Following Grades

Construction Technician Name:_____ **Current Grade:**_____

Tr. Engineer Worker (S1)			Tr. Construction Tech. I (S4)		Tr. Construction Tech. II (S5)		Tr. Construction Tech. III (S6)		Tr. Construction Tech. IV (S7)		Tr. Engineer Specialist (S9)	
	R		ATI Field Cert. OR		ATI Field Certification		ATI Field Certification		ATI Field Certification		ATI Field Certification	
	C											
	R		ACI Field Certification		ACI Field Certification		ACI Field Certification		ACI Field Certification		ACI Field Certification	
	C											
	R		*Earthwork Series* Sampling and Test. Module 101		*Earthwork Series* Excavation/ Embankment 102		*Earthwork Series* Subgrade/ Base 104		*Earthwork Series* Coach one module (+ Constr. Man.)		*Earthwork Series* Coach Series (+ Constr. Man.)	
	T											
	C											
	R				Pipe Module 103		Incidental Modules 105					
	T											
	C											
	R		*Concrete Series* Sampling and Test. Module 201		*Concrete Series* Incidentals Module 202				*Concrete Series* Coach one module (+ Constr. Man.)		*Concrete Series* Coach Series (+ Constr. Man.)	
	T											
	C											
	R				*Irrigation Series* Basic Module _01		*Irrigation Series* Advanced Module _02		*Irrigation Series* Coach one module (+ Constr Man.)		*Irrigation Series* Coach Series (+ Constr. Man.)	
	T											
	C											
	R		*Landscape Series* Basic Module _01		*Seeding*		*Landscape Series* Advanced Module _02		*Landscape Series* Coach one module (+ Constr. Man.)		*Landscape Series* Coach Series (+ Constr. Man.)	
	T											
	C			6/08		12/07		12/08				
Highway Plans Reading	R		*Pay Item Documentation		*Force Account Documentation		*Construction Office Quantities		*Applied Construction Statistics		*Supplemental Agreements	
	T											
	C											
Basic Work Zone Traffic Control	R		*Fast Inspection Forms (Pen-based Operation)		Basic Surveying		Advanced Work Zone Traffic Control		*CPE Construction Progress Estimate		*CMP Procedures (CEMMS)	
	T											
	C											
Introductory Applied Math	R		Intermediate Applied Math		Advanced Applied Math				Cost Estimating			
	T											
	C											
Daily Diary Documentation	R				Roadside Safety Devices				Coaching Techniques			
	T											
	C											
	R				Introduction to Partnering							
	T											
	C											
	C											

Note: Qualification to coach requires certification in the corresponding module.

Legend: Dates R = Registered T = Training Completed C = Passed Certification *(Dates shown are targets for training and certification availability).*

***Not required for Maintenance only employees**

April 2, 2007

Transportation Engineering Associate (TEA)
Matrix showing Certifications Required to be Granted Permanent Status to TEA

Name _____ **Current Grade** _____

TEA: required within 2 years of hire date, regardless of assignment			**TEAs with BCSE assigned to or wanting to be assigned to Construction Orgs: These classes are required to be completed within 4 years from the date of hire. An asterisk (*) indicates specific classes that it is desirable to take within the first two years for personnel wanting to be assigned to Construction Orgs.**							
Highway Plans Reading	R		*Earthwork Series* Sampling and Test. Module 101		*Earthwork Series* Excavation/ Embankment 102		*Earthwork Series* Subgrade/Base Module 104		Teach one the following:	
	T									
	C									
Pay Item Documentation	R				*Earthwork Series* Pipe Module 103		*Earthwork Series* Incidental Module 105		Earthwork Series Concrete Series Bituminous Series	
	T									
	C									
Basic Work Zone Traffic Control	R		*Concrete Series* Sampling and Test. Module 201		*Concrete Series* Incidentals Module 202		*Concrete Series* Major Structures Module 204			
	T									
	C									
Roadside Safety Devices	R				*Concrete Series* PCCP Module 203					
	T									
	C									
Daily Diary Documentation	R		*Bituminous Series* Sampling and Test. Module 301		*Bituminous Series* Prime/Flush/Tack Module 302					
	T									
	C									
Introduction to Partnering	R		*Construction Office Quantities		*Bituminous Series* Seal Coat Module 303		*Bituminous Series* Paving Module 305			
	T									
	C									
Advanced Work Zone Traffic Control	R		*Applied Construction Statistic		Force Account Documentation					
	T									
	C									
Cost Estimating	R		*CPE		Asphalt Unit Price Adjustment					
	T									
	C									
Supplemental Agreements	R		*CMP Procedures		How to Make Partnering Work in the Field		Signing Inspection			
	T									
	C									

Note: Qualification to teach requires certification in the corresponding module.
Legend: Dates R = Registered T = Training Completed C = Passed Certification *(Dates shown are targets for training and certification availability).*

APPENDIX B

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
STATEWIDE PROJECT MANAGEMENT GROUP

PART B:

DICTIONARY
OF
STANDARDIZED WORK TASKS

June 27, 2008

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PART B: DICTIONARY OF STANDARDIZED WORK TASKS

SECTION 400 DESIGN WORK PERFORMED BY CONSULTANT

The Consultant shall be responsible for providing the engineering services required to accomplish the work products identified in the Project Scope of Work. The services may include the tasks of data preparation, data interpretation, and document preparation including scoping documents, reports, corridor management plans, contract plans, special provisions, construction estimate, and post-design services.

The Consultant shall be responsible for providing the engineering services that complies with the Local Government Project Manual Sections 200 and 500 attached at the end of this document.

402 Partnering Process

The Consultant and subconsultants shall participate in a Partnering Process consisting of the following items:

- ☐ Scope Clarification Meeting
- ☐ Design Partnering Kick-Off Workshop
- ☐ Participation in the Partnering Evaluation Program (PEP)
- ☐ Construction Partnering Workshop
- ☐ Project Close-Out

405 AASHTO Design Criteria Report

Any changes to the design criteria which result in the need for a design exception shall be submitted to the Roadway Design Group for approval. The request shall describe the deficiencies not previously approved which are not being corrected, and the justification for the design exception. The report shall be developed consistent with the Design Exception and Design Variance Process Guide that can be found in the Roadway Design Section website under design memorandums (dated 1/16/2007). ADOT will forward the design exception request to FHWA, if necessary. The Consultant is responsible for providing copies for ADOT and FHWA. The request shall be submitted a minimum of fifteen (15) calendars days prior to the Stage II design submittal, in accordance with Section 1060.

410 Surveys and Mapping

The Consultant shall review data provided by ADOT. Any field surveys required shall be suitable for contract documents preparation and meet the technical requirements of ADOT and the State Board of Technical Registration.

A. All surveys and mapping for projects utilizing existing roadway(s) shall be referenced and tied directly to the existing as-built roadway centerline. The centerline shall be re-established in its original position by locating, marking, staking and referencing the PC, PT, TS, SC, CS, ST, PI (if possible), and a minimum of fifty (50) feet station intervals along the curves and one hundred (100) feet station intervals on tangents. The use of offset baselines for re-establishing or defining the existing centerline is not permitted unless approved in advance by ADOT. The centerline stationing of the project shall be on ADOT's established field stationing.

B. Completed surveys shall be submitted in permanently bound books (3-ring binders are not acceptable) with the final plans. The surveys shall include locations, stakes and references of control points, (including the beginning and ending points of the project), PC's, PT's, TS's, SC's, CS's, ST's, and PI's (if possible) of curves, POT's with a maximum interval of one thousand (1,000) feet, and bench marks on alternate sides of the roadway with a maximum interval of five hundred (500) feet. Any survey data provided must be certified by an Arizona Registered Land Surveyor. Any coordinates used shall comply with the Arizona State Plane Coordinate System.

C. Surveys may include, as applicable:

1. Base line control

2. Control for aerial mapping

3. Right-of-Way surveys

   a) Section corner and land ties

   b) Existing right of way monumentation

   c) Staking of new right of way for appraisal purposes

   d) New right of way monumentation

   e) A "Results of Survey" map

4. Topographic surveys

5. Roadway drainage surveys

6. Utility locating - set control points with coordinates and elevations at five hundred (500) ft. maximum intervals adjacent to the road and along the utility lines (See Section 430)

7. Centerline staking, centerline of each roadway, as applicable for field review (lath stakes at PC, TS, SC, CS, ST, PT, and PI (if possible) at approximate two hundred (200) ft. intervals, and at selected locations if required to define the approximate limits of construction).

8. Centerline and edge elevations of existing pavement at fifty (50) ft. intervals

9. Ties to Arizona State Plane Coordinates

10. Final alignment staking

11. Crossroads tie-ins, turnouts and driveways

12. Above ground utilities

D. The Consultant shall obtain any permits that may be required prior to beginning field work. A traffic control plan may also be required. Preparation of surveys shall conform to applicable documents referenced in Section 200 of the scope of work, including (but not necessarily limited to) procedures, record-keeping requirements, equipment use, and safety precautions.

E. Unless otherwise directed by the ADOT project manager, the Consultant shall be responsible for selecting a scale that results in good plan clarity. The following scales are suggested:

1. 1" = 500' (Drainage map and R/W key sheet)

2. 1" = 50' (Construction Plans and R/W maps)

3. 1" = 30' (Landscape and Irrigation Plans)

4. 1" = 20' (Intersections, urban streets, and other items of considerable detail)

F. The Consultant may be responsible for setting R/W markers. R/W markers shall be set by an Arizona Registered Land Surveyor after acquisition of R/W, or, in some instances, after construction. All R/W drawings and legal instruments shall be approved and sealed by an Arizona Registered Land Surveyor.

G. The Consultant may be responsible for delineating the R/W so that utility companies may prepare relocation plans. Delineation with strips of plastic flagging attached to lath located at intervals shall provide a clear delineation of the R/W; this work shall be completed immediately prior to the date that utility company personnel are scheduled to conduct a field survey of the project.

H. Completed surveys and maps shall be recorded in an acceptable format. Upon final approval, the books, maps and CADD files, shall be submitted to the ADOT project manager.

In addition to the CADD requirements stated in section 1040, all designers of ADOT projects shall provide the following information, if applicable to the project, to the Engineering Survey Section:

- Ground Adjustment Factor (G.A.F.):
- Contour Interval (C.I.):
- Project Scale:
- Horizontal and Vertical Datums:
- Arizona Zone:
- Hard copy of reports including any plots

Based on the Scope of Work, the consultant should select the items, from the list below, to be included with the project information previously described:

a. Hard Copies shall consist of the following:

- Field notes
- Sketches
- Transit and Level books
- Plots
- Reports

b. (.DGN) file containing graphical representation of the project (i.e. Planimetrics and contours).

c. (.3D) file containing graphical representation (i.e. breaklines and random points) to produce the DTM.

d. (.DTM) containing Engineering Surveys approved features that make up a correct surface

representation.

e. (.ALG) file containing the project alignments (.RPT) file including curve data from the alignment.

f. ASCII (.CSV) files shall contain the following:

1. File Header information:
   - Project GAF
   - Project Datums
   - Arizona Zone
   - Basis of Alignment
   - Basis of Stationing
   - Basis of Horizontal Control
   - Basis of Elevation
   - Basis of Bearing

2. All Project Control
3. Section Corners
4. R/W Monumentation
5. Structures
6. Edge of pavement
7. Centerline and driving stripes
8. Other features as requested

Note: Two (.CSV) files shall be submitted, one containing the RAW survey data and another containing the Edited survey data.

g. All film negatives used to map a project

h. Scanned images and/or diapositives used to map project

i. Aerotriangulation files used to control photography

j. Orthophotos produced for the mapping project

k. Record of Survey: When requested, Record of Survey shall be in electronic (.DGN / .PDF) format with a stamped original.

l. Pictures: Upon Request pictures shall be taken for all structures including end of pipes and headwalls, caps, and any unnatural terrain feature in a (.JPG or .BMP) file format (check scope of work).

If unclear about items needed for your project, please contact the Engineering Survey Section.

<u>ADOT PROJECT MANAGER:</u>
All survey and photogrammetry projects shall be submitted to the Engineering Survey Section through the ADOT and Consultant Project Manager, for verification of deliverables and archiving purposes. A notification of findings shall be sent to the Project Manager after completion of project review.

415 Materials Design

416 Geotechnical Investigation

Geotechnical requirements contained in the Materials Preliminary Engineering and Design (MPE & D) Manual and AASHTO Manual (Reference Section 200 of the scope of work) on Subsurface Investigations shall be considered as minimum requirements. These requirements are not intended to preclude innovative methods of Geotechnical investigations and testing the Consultant may propose. Laboratories selected by the Consultant to perform construction materials testing and analyses must meet the requirements of ADOT's "System for the Evaluation of Testing Laboratories." The Geotechnical Investigation will include appropriate reports, as required, for bridge and retaining/sound barrier wall designs and pavement design.

Prior to submitting a proposal for geotechnical services, the ADOT Project Manager will schedule a meeting with the prime designer, the geotechnical consultant and the ADOT Geotechnical Design Section project team member. Project geotechnical issues will be discussed at this meeting and a consensus geotechnical work plan will be developed. Any subsequent changes due to access limitations, environmental restrictions, etc., will be reviewed and approved by the ADOT Geotechnical Design Section team member prior to the changed work being performed.

The Consultant Geotechnical Engineer is responsible, but not limited, for the following:

A. The Consultant shall perform a Geotechnical investigation of the project in accordance with the requirements of ADOT - the MPE & D and Materials Testing Manuals. (Reference Section 200 of the scope of work).

B. The Consultant shall secure an access permit from the appropriate agency, if required, which may at a minimum require the preparation of an equipment access plan, description of equipment types, a plan of the test hole locations, etc. The Consultant shall adhere to all traffic control requirements when taking samples on existing roadways. A traffic control plan may be required.

C. The results of the Geotechnical investigation shall be contained in the Geotechnical Report and the Bridge Foundation Report, if applicable. The Geotechnical investigation shall include all necessary sampling and laboratory testing and analyses of materials.

   Upon approval of the Geotechnical report, the Consultant may proceed with preparation of the pavement and/or foundation designs and the Materials Design Memorandum.

D. The Consultant's Geotechnical investigation shall include, but not be limited to the following as appropriate:

   1. Roadway structural section requirements and the availability of structural section materials

   2. Location and depths of topsoil

   3. Soil shrinkage/swell characteristics

   4. Slope stability in embankment/excavation locations

   5. Groundwater pH and resistivity conditions requiring design considerations

   6. Design values for active, at rest, and passive soil pressures

7. Allowable design loads or pressures for each foundation type

8. Design methods for shallow and deep foundations

9. Potential imported borrow site(s) meeting the requirements for the material(s) required (see also Section 417)

10. Design alternatives based on Geotechnical findings

E. The Consultant shall include in the Special Provisions all notes related to materials found on the final construction plans and not already covered by the Specifications.

F. The Geotechnical Consulting Engineer shall submit the following CADD requisites to ADOT Materials Group:

1. One (1) Electronic Copy of the final Geotechnical Design sheets submitted on CD-ROM.
2. One (1) half-size (11"x17") print of the Geotechnical sealed and signed final design sheets.

417 Earthwork

The Consultant shall attempt to achieve an approximate earthwork balance for the project consistent with good engineering practice based upon the type of material and with consideration given to environmental mitigation measures unless otherwise directed. This may be accomplished by: a) refining roadway geometry (alignment and/or profile) utilizing ADOT Standard Drawings C-02 for slopes; b) adjustment of ditch widths and/or back slope rates to obtain excavation of additional suitable material; c) flattening of embankment slopes or creation of 'false cuts' to dispose of excess material; or combinations of a), b) and c). Adjustments shall not adversely affect water quality and must be coordinated with the project team, including the USFS coordinator, if applicable. Cost of additional right-of-way and environmental concerns must be weighed in determining the most feasible solution for the project.

When a project requires borrow or waste sites, the Consultant shall investigate and recommend the site requirements as outlined under paragraphs A, B, C and/or D below:

A. Current ADOT Borrow Pits

The investigation shall begin with a review of current borrow pit information available in the ADOT Material Section. "Current" in this context means that ADOT has or is expected to have licenses for any recommended pits that will not expire until after the estimated construction completion date. Note that ADOT is not necessarily licensed for wasting at all current borrow pits. The results of the investigation shall be included in the Consultant's Geotechnical investigation (see Section 416).

B. Commercial Borrow Pits

Commercial borrow pits are an acceptable alternative to ADOT borrow pits. If recommended, the analysis and test results of the commercial borrow materials shall be included in the Consultant's Geotechnical investigation (see Section 416).

C. New Borrow Pits

The licensing of new borrow pits for ADOT use is a lengthy process and should be considered only in the absence of acceptable current ADOT or commercial borrow pits. If the location, testing and environmental analysis of any new borrow pit is required to complete the design of the project, this work will be added to the contract by contract modification. The analysis and test results shall be contained in a separate report submitted by the Consultant not later than the Stage III submittal.

D. Waste Sites

If it is determined that a designated waste site is required, the Consultant shall investigate and recommend the nearest site where material can be wasted. (See Section 455)

418 Special Materials

In the case where a special material(s), i.e. a material with characteristics and design values out of the normal range, is required to meet exacting design requirements, the Consultant shall coordinate with the ADOT Project Manager, Materials Section, and/or the Engineering District before changing the design or researching the location of such material(s).

419 Pavement Design

A. The Consultant shall prepare a pavement design in accordance with the requirements of the ADOT MPE & D Manual and/or LPA.

B. New pavement design shall conform to the approved AASHTO method. Structural overlay design shall conform to the Structural Overlay Design for Arizona (SODA) method.

C. The Consultant's proposed pavement design recommendation shall be included in the Pavement Design Summary as described in the ADOT MPE & D Manual, section 505.00. "Materials Section Design Report Standard Items" shall be used in the preparation of the pavement design report.

D. The Material Design Memorandum shall contain the Consultant's final recommendations for the proposed pavement design, including recommendations for special provisions and construction procedures, as described in the ADOT MPE & D Manual section 505.00, including the use of "Material Section Design Report Standard Items".

420 Environmental Studies

Activities that require soil and/or vegetation disturbance such as Geotechnical investigations, surveys, etc. may not begin until the appropriate environmental clearance (i.e., cultural resources, hazardous materials, or biological evaluations) is issued. The project's environmental footprint shall consider all utility relocation work required for the project. ADOT Environmental and Enhancement Group, in coordination with the affected federal, state and local agencies and jurisdictions, will issue the required clearance.

425 Public Information Meetings and Public Hearings

The Consultant shall provide staff and/or materials for public information meetings as outlined below if they are found to be necessary. ADOT will be responsible for advertisement and will make arrangements for the public information meeting. ADOT will provide a moderator and any liability insurance required.

A. Public Information Meetings

The Consultant and staff shall be available, at five (5) workdays notice, to attend meetings or make presentation at the request of ADOT. The purpose of these meetings shall be to inform the public of and answer questions regarding the scope, details, and anticipated schedule of the project. Such meetings and presentations may be held at any hours between 8:00 AM and 12:00 midnight on any day of the week, except legal holidays. The Consultant will be responsible, as applicable, for the preparation of graphics, hand-out materials, minutes of the meetings, audiovisual displays and similar material for such meetings. All such materials shall prominently identify ADOT. The Consultant shall expect to work with the team to finalize the agenda for any public meetings.

B. Public Information News Releases

The Consultant and staff shall be available, with one workday of notice, to support the ADOT preparation of newspaper articles, newsletters, flyers, radio and TV announcements, etc. and to assist ADOT with responses to verbal and written questions from the media and the general public. The purpose of these news releases shall be to provide the media and public with the latest information on the project scope, details and schedule of the project.

430 Utilities and Railroads

A. General

All work shall be performed in accordance with ADOT's *Guide for Accommodating Utilities on Highway Right-of-Way* and *Utility Coordination Guide for Design Consultants.*

B. Definitions

Utility - A facility which transmits or distributes communication, cable television, electricity, heat, gas, oil, crude products, water, sewer, waste or any other similar commodity which directly or indirectly serves the public.

Utility Company - A municipality, public service corporation, utility district, etc., which owns and operates utilities that serve the general public. Unless otherwise noted, the procedures to be used with railroad companies will be the same as those used with utility companies.

Prior Rights documentation - Documents showing that the utility company's facility predates the acquisition of the property for highway purposes, or that it occupies an easement or other compensable land right. Such documents provide verification that the State is obligated to compensate the utility company for the cost of relocations or adjustments required to accommodate the highway project.

U & RR - Utility and Railroad Engineering Section of the Arizona Department of Transportation.

C. Previous Information

The Consultant shall use all available utility location information including that obtained during the DCR phase; this information, and additional information gathered later, shall be shown on the plans prior to submittal to the utility companies for review.

D. Identification of Utilities

1. By Design Consultant - The Design Consultant shall contact and coordinate with all the utility companies serving the project area to obtain utility facility location records and as-built information.

2. By Locating Consultant - The Design Consultant shall prepare and furnish a base map with ground controls at intervals of no more than five hundred (500) feet together with a description of the desired area to U & RR for horizontal utility designation. This mapping will be used by the locating consultant for identification and horizontally locating all utilities. This will be accomplished prior to the completion of Stage II plans. The map shall be presented on CDs using current ADOT CADD standards. The Design Consultant shall provide a list of requested potholes to U & RR, for use by the Locating Consultant, for utilities that may conflict with the project. This pothole data will be obtained prior to completion of the Stage III plans.

3. Railroad information - The design Consultant shall request U & RR to make the initial contact with the railroad company to obtain railroad information if railroads are involved in the project prior to the design kickoff meeting.

431 Utilities Conflicts and Adjustments

A. The Consultant shall determine all utility conflicts which require the utility to be relocated or adjusted and shall advise U & RR and the utility company.

B. The Consultant shall advise U & RR of upgrades or betterments requested by utility companies.

C. When property is acquired for a highway project, private utility issues are resolved as part of the right of way acquisition. The Consultant shall coordinate these and any private utility issues with the ADOT Right of Way Coordinator and Project Manager.

D. The Consultant shall arrange and conduct utility coordination meetings to facilitate identification and resolution of conflicts based on project needs as requested by the ADOT Project Manager and the U & RR Coordinator.

E. The Consultant shall be responsible for reviewing relocation plans produced by utility companies to assure that all utility conflicts with project plans and with planned utility relocations are eliminated, that proposed utility installations conform to ADOT's *Guide for Accommodating Utilities on Highway Right-of-Way* and that the plans meet ADOT permit requirements.

F. The Consultant shall solicit submittal of and verify that prior rights documentation submitted by utility companies represent the correct relocation area and shall submit this reviewed documentation to the U & RR coordinator. The request for prior rights shall take place after the Stage II submittal. Complete prior rights documentation shall be submitted to U & RR no later than the Stage III submittal.

G. Only U & RR will authorize utility companies to start design for relocation of their facilities where they have prior rights and want reimbursement for their design.

H. The Consultant shall prepare draft Utility Special Provisions and submit them to U & RR for comment. This includes Section 107, Force Accounts and Line Item Specifications. Specifications shall be drafted starting at Stage III and progress with the project to the PS&E Stage.

I. With each stage submittal listed below the Consultant shall submit a Utility Report. The Report shall detail the recent events with regard to the progress of the utility conflicts and mitigation effort. The efforts made shall be in accordance with a sequence of events established in the *"Utility Coordination Guide For Design Consultants"*.

Within the first thirty (30) days after Notice to Proceed (NTP) the Consultant shall prepare a Utility Report containing a list of all utility companies in the project area, the utility company contact person and their phone number for submittal to U & RR.

At Stage II the Utility Report shall contain an update of the listing provided in item 1 above plus an initial cost evaluation. All right of way necessary for utility relocations shall also be identified.

At Stage III the Utility Report shall contain all of the above plus a list by prior rights of who is responsible for payment of relocation work, a list of the mitigation measures by utility, a summary of the meetings held with each utility company - what was discussed and when, what actions were taken to arrive at the selected mitigation measure, what pothole data were requested and provided, a copy of all correspondence between the Consultant and each utility company, a preliminary estimate of ADOT's cost for utility relocations and betterment requests by utility company for work to be included into the ADOT project. Final mitigation measures shall be approved by the Utility and Railroad Engineering Section.

At Stage IV the Utility Report shall contain all of the above plus any changes to what was previously presented, a notification of approval of utility company relocation plans as to conformity with the project design and standard ADOT procedures and practices, a construction schedule for each utility, a final cost estimate for each utility with approved prior rights, a final cost estimate for each utility desiring betterments be included in with the project design and the Final Utility Clearance Letter.

J. The Consultant is to work closely with the utility company and the U & RR coordinator to determine the relocation requirements of the utility facility. The Consultant shall inform ADOT Right of Way on or before the Stage II submittal if new right of way is required which exceeds what is needed for the highway improvements.

K. ADOT's Roadside Development Section (landscape and irrigation), Transportation Planning Division (Traffic Counter Systems) and Transportation Technology Group (FMS) shall be treated as utilities and consulted about their needs during the project development process. New electric service drops and water connections for planned landscape irrigation systems, lighting, traffic signals and FMS facilities shall be included in the scope of the project.

432 Utility Plans

A. The Consultant shall indicate all existing utilities in plan view on the Stage II plans; this should include utility poles, pedestals and other aboveground appurtenances with an indication of overhead line direction and all underground utilities, including drainage facilities.

B. The Consultant shall indicate potential areas of conflict between utility facilities and project improvements. The Consultant shall work with the utilities to resolve all conflicts. Project plans are to be adjusted as much as possible to avoid utility conflicts without impacting the needs of the project or public safety. Vertical locations of underground utilities shall be shown in profiles and on cross

sections or details at Stage II at approximate normal elevation. Pothole data will be made available to utility companies no later than Stage III plans.

C. The Consultant shall furnish copies of the Stage II, III, IV and PS&E project plans to U & RR and each utility which has facilities in the area. The Consultant shall furnish copies of cross sections to U & RR and, upon request, to the utility company. Cross section plans will be required when existing utility facilities have been installed parallel to the roadway centerline within ADOT's right of way. Cross section plans shall show the location and depth of utilities running parallel to the roadway centerline. The size of the plans, 1/2 size or full size, shall be as requested by the utilities. In all cases, plans shall be scaleable, i.e., full size or true half-size. The Consultant shall send plans to the utility companies, receive the comments and responses, and provide U & RR copies of all correspondence to and from the utility companies. Utility comments and their resolutions shall be included on the appropriate Stage Comment Resolution Form and distributed to all team members ten working days after the Comment Resolution Meeting.

D. The Consultant shall include utility relocation plans no later than the Stage IV submittal.

433 Utility Relocations and Adjustments

Where a utility relocation may be required:

A. The Consultant shall identify possible alternatives (including joint use of trenches) to minimize the number of utility conflicts and minimize the cost of mitigating conflicts.

B. The Consultant shall notify U & RR promptly upon determination that relocation of a utility company facility is required. Where the utility relocation is to be included as part of the project and where the ADOT contractor will perform the work, the Consultant shall provide U & RR with design cost details, drawings and a summary of the construction costs for the work to be billed. The Consultant shall use input and drawings supplied by the utility company to the extent possible.

C. U & RR will determine, by examination of prior rights documentation provided by the utility company, the utility's rights to occupy the area of conflict and who is responsible for the cost of the relocation. U & RR will notify the utility company to relocate at its own expense, or will obtain the necessary cost estimates and prepare the necessary utility agreements to allow for payment of utility relocation work when it is at ADOT expense.

D. At the request of the utility and/or the U & RR coordinator, utility adjustments or installations may be included in the plans and specifications for work to be performed by ADOT's contractor. This may require a JPA or Utility Agreement between the utility and ADOT. The Project Manager will prepare a JPA and the U & RR coordinator will prepare a Utility Agreement. The decision to include this work shall be determined no later than the Stage III submittal date. Initial cost estimates shall be provided with the Stage III submittal to assist programming and budgeting efforts.

1. Utilities with prior rights--ADOT is responsible for cost:

   a. Consultant shall advise U & RR of utility company's request for work to be included with ADOT's contract.

   b. Consultant shall provide an estimate of the cost, or review and comment on cost estimates provided by the utility company.

c. Consultant shall cooperate with each utility company to ensure that adequate information is included in the bid package.

2. Additions, betterments, and utilities lacking prior rights--utility company is responsible for cost:

a. Consultant shall advise U & RR of utility company's request, and shall advise the utility company that approval of its request is subject to concurrence by ADOT.

b. Consultant shall provide an estimate of the cost, or review and comment on cost estimates provided by the utility company.

c. Consultant shall cooperate with utility company to ensure that adequate information is included in the bid package.

d. The Consultant shall provide U & RR and the Project Manager the actual cost of design and expenses for utility relocation and adjustments for inclusion in the JPA or Utility Agreement.

434 Utility Special Provisions and Clearance Letter

A. Special Provisions

The Consultant shall prepare Special Provisions and submit them to each affected utility company and U & RR for comment at Stage III, IV and at PS&E.

The Utility Special Provisions shall include the following:

1. List of utility companies in the area, and contact person's name and telephone number.

2. A statement that there are no utility conflicts or a list of utilities that are in conflict.

3. Work to be performed by utility companies in conjunction with the contractor during project construction.

4. Completion date or schedule for each utility conflict to be resolved by each utility company.

5. Work to be performed for each utility company by the Contractor.

Utility license, permit, insurance, or right of entry requirements.

Indication of all workday windows or any restrictions required by the utility the contractor should be aware of for construction scheduling purposes, including utility outage/shut-down limitations.

Indicate special conditions, locations or clarifications in direction related to utility facilities or work that might affect a contractor's bid or schedule.

B. Clearance Letter

The Consultant shall prepare a Utility Clearance Letter prior to Stage IV and submit it at Stage IV, together with copies of correspondence from utility companies verifying the information, to U & RR for review and concurrence; this shall include the Consultant's final review and submittal of Section 107 or other Special Provisions related to utility work.

1. If there are no conflicts:

   A statement that there are no utility conflicts with the project shall be used only when there are no utility facilities needing adjustment or when all adjustments have been completed prior to writing the Clearance Letter.

2. If adjustments are needed:

   The Clearance Letter shall list each utility company separately, showing:

   a. The name of the company, address, contact name and phone number.

   b. The nature of required adjustment

   c. The status of Agreements and applicable permits (City, County, Forest, State Land, etc.)

   d. The status of the utility adjustment

      (1) Completed

      (2) To be done by contractor during construction

      (3) To be done by utility company during construction, with estimated completion date or number of working days required following milestone achievement

      (4) In progress, with estimated completion date

435 Establishing Utility Service Connection

Utility service connections are required to facilitate operation of lighting, signals, irrigation controllers, pump stations and FMS systems, etc. The Consultant is responsible for securing establishment of service connections prior to construction.

A. Steps for securing service:

Consultant shall determine service need(s) based upon concept and preliminary work; this shall be done shortly after Stage II submittal.

Consultant shall determine which utility serves the area and who the utility's coordinator is; this shall be done within thirty (30) days after NTP.

Consultant shall meet with the utility's Coordinator to review the project's proposed construction and determine how service can be brought to the desired location(s). Preferred location for service Load Centers and meters is just inside ADOT right of way and outside Controlled Access; this shall be done shortly after the Stage III submittal.

Consultant shall prepare a service request letter on ADOT letterhead for ADOT signature to the utility with a copy to U & RR that contains the following:

a. Number of electrical services required

b. The address of each service

c. The required voltage/volume/pressure of each service

d. The load breakdown for each service

e. A brief description of the work required

f. Who is responsible for signing the utility's service agreement and who will pay connection/extension charges.

g. Who is responsible for paying the utility bills and to whom and where to send the monthly billings

The Consultant shall receive and review the service agreement from the utility company which will provide service at the location(s) requested in the service request letter.

The Consultant shall forward service agreements to the ADOT utility coordinator to complete the agreement signing process and prepare the applicable payment agreement.

The Consultant shall include the name and phone number of the utility contact person responsible for arranging the new service in the Special Provisions with instruction to the Resident Engineer to contact the utility for scheduling the work when service is desired.

Consultant shall place the service address on the plans adjacent to the appropriate Load Center and/or meter.

Consultant shall show the location of the utility service source so the contractor will know where to excavate to/from.

The service agreement shall be signed shortly after the Stage IV (95%) submittal

B. The Consultant shall assist in the development of exhibits for transfer of right of way to utilities with prior rights.

440 Roadway Design

The Consultant shall prepare design plans on ADOT standard sheets and construction documents for the roadway improvements including but not limited to the following:

A. Face sheet and List of Standard Drawings (ADOT will provide these sheets for incorporation into the design plans)

B. General notes

C. Design sheet and index

D. Typical roadway and detour sections

E. Roadway and detour plans and profiles

F. Intersection plans and profiles, including staking plans

G. Cross road and frontage road plans and profiles

H. Retaining wall and sound barrier wall plans and profiles

I. Earthwork quantities

J. Details

K. Special provisions

L. Annotated cross sections

L. Arizona State Plane Coordinate Ties

NOTES:

Standard plan sheet size is 22" x 34" (ANSI "D" Size) with borders as specified by ADOT. All plan sheets shall be suitable for plotting at true half scale.

Cross sections will not be part of the plans, but will be reviewed and made available to contractor's bidding on the project. Therefore, the cross sections must be suitable for reproduction. Horizontal and vertical scales shall be the same. Preferred scale: 1"=10', (1"=5' or 1"=20' are also acceptable if special conditions warrant). Each cross section shall show the plotted finished grade roadway template(s) including the subgrade superimposed on the plotted natural terrain (dashed line) and shall include as a minimum the following annotation: centerline finished grade elevation and station value of controlling roadway template on each cross section, R/W limits indicated with symbol. Slope rates (X:1) should be shown on the cross sections, on each side of the controlling roadway, on the last slope that connects to the existing ground. Connecting slopes from adjoining roadways, such as median slopes, should have both connecting slopes annotated, if applicable. The slope rate information may be provided separately in a station by station listing as an alternative. Construction phasing, temporary roadways and detours shall be shown on cross sections, if applicable. CADD computer generated cross sections shall be plotted with a 1" grid and shall have an appropriate horizontal and vertical tick marks (10 tick marks per inch) with 1" datum annotations (elevation on vertical and distance on horizontal) and shall be plotted on vellum paper suitable for reproduction. The final submittal shall be on standard 22"x 34" sheets submitted with a copy of the work on CD as stated in section 1040. Cross sections shall normally be prepared at one hundred (100) foot intervals, as a minimum, with additional sections at breaks in the terrain unless otherwise directed by the ADOT project manager. Cross sections shall be included in all submittals to utility companies and as requested by other members of the team.

3. All designs shall conform to the latest Americans with Disabilities Act Accessibility Guidelines Title I and II.

4. The Consultant shall provide the various ADOT Technical Sections involved in the design of this project with roadway base sheets as required.

445 Bridge Design

The Consultant shall prepare design and construction documents for structural design including, but not necessarily limited to:

A. General plan

B. General notes and quantities

C. Foundation sheets

D. Abutment details

E. Pier details

F. Superstructure sheets

G. Screed elevations

H. Special details (if applicable)

I. Stage construction sequencing details (if applicable)

J. Pile records (if applicable)

K. Special provisions and cost estimates

In addition to the general CADD requirements (See section 1040), the consultant shall use the following identification labeling in ALL CADD files:

a. Structure Number (4 digit number)
b. Structure Name (i.e. Apprentice Wash Bridge)
c. Type of work category:
- Major Structure – New Bridge
- Bridge Replacement
- Minor Structure
- Deck Rehabilitation
- Hinge, Deck or Joint Repair
- Barrier Replacement
- Bridge Widening
- Scour Protection
- Seismic Retrofit

446 Bridge Selection Report

During Stage II, prior to preparation of final design and construction documents, the Consultant shall submit a Bridge Selection Report for the new bridge and/or for renovation of the existing bridge. The report shall be prepared in accordance with the ADOT Bridge Designing and Detailing manual. ADOT must approve the report prior to the Consultant beginning the final design of the bridge.

The final structural plans shall reflect the most current design standards, specifications and ADOT policy. Therefore, the Consultant shall be responsible for studying revisions to the plans made

during the development of the project and ascertaining how the structural design will be affected. The Consultant shall work with the ADOT project manager, who will give the final authorization, in determining the propriety of modifying the design to accommodate the revised standards, specifications and ADOT policy. The Consultant will be compensated by Contract Modification for any significant redesign resulting from this requirement. A final review of the applicable standards and specifications will be conducted by the Consultant at Stage IV.

450 Drainage Design

451 Drainage Reports

A. The Consultant shall be responsible for preparing the Initial and Final Drainage Reports for drainage.

B. The Consultant shall conduct hydrologic and hydraulic analysis and/or obtain available public information to identify flood plains and probable flood plain impacts. The Consultant shall determine existing and developed conditions, discharges for all pertinent drainage systems, and existing flow patterns; assess possible drainage problems, identify possible solutions, and propose tentative hydraulic improvements.

   Part A of the Initial Drainage Report, hydrologic information, may be submitted and informally discussed with the ADOT Drainage Section prior to detailed hydraulic analysis in order to facilitate proper progress of the study. The Drainage Report may require additional data as it relates to NPDES, i.e., flow analysis in ditches, intersecting drainage's, etc., in order to adequately design temporary erosion control structures.

   Following Part A, Hydrologic Information Review, the Consultant shall conduct hydraulic analyses of proposed flood plain modifications, hydraulic structures, and drainage-related improvements which are proposed. The Consultant will then prepare an Initial Drainage Report consisting of both Part A, Hydrologic, and Part B, Hydraulic, studies and their supporting documentation.

C. The Consultant shall prepare a Final Drainage Report, pursuant to comments and approval of the Initial Drainage Report, based on refined hydraulic structure selections and sizing. The report shall provide analysis of changes to existing flow patterns and the design of channels, culverts and other drainage structures.

D. The Consultant shall submit to ADOT Roadway Drainage Section one electronic copy containing all final drainage reports of the project in digital format (PDF) on a CD-ROM or DVD and one hard copy of the final sealed and signed reports. The reports will include not only the analytical data and computations, but the entire report, including but not limited to texts and graphics.

The Final Drainage Report shall be submitted concurrent with the Stage III Design submittal unless other arrangements are made with the ADOT Project Manager.

452 Drainage Designs

The Consultant shall prepare designs and construction documents for drainage features including, but not limited to:

A. Drainage culverts and underpass structures for cattle/game crossings

B. Catch basins, manholes and connector pipes

C. Drainage Pipe and Concrete Box Culvert Summary Sheets

D. Drainage details

E. Drainage culvert profiles

F. Retention/Detention Basins

453 Section 404 Permit

ADOT with the Consultant, as appropriate, in consultation with the Corps of Engineers, will determine the need for a Section 404 permit. If a permit is required, ADOT will process the permit application. The Consultant shall be responsible for providing ADOT with technical data for the roadway cross drainage-ways (i.e. typical sections, location and approximate areas of cut and fill within each drainage way) to support the determination of need for a permit and/or the permit application.

454 Evaluation of Alternative Pipe Culvert Materials

The Consultant shall be responsible for evaluating all forms of ADOT approved pipe culverts. Evaluation documentation shall be included with the design calculations per Section 1040. Valid designs shall be indicated on the New Pipe Summary Sheet.

455 Landscape Architectural Practice and Design

A. The Landscape Architect shall be responsible for performance of professional services such as investigation, reconnaissance, research, planning, design or responsible supervision in connection with the development of land and incidental water areas where the dominant purpose of such services is the preservation, landscape ecological restoration, enhancement of proper land uses, natural land features ground cover and planting, naturalistic and aesthetic values, the settings and approaches to building, structures, facilities or other improvements, natural drainage and the consideration and the determination of inherent problems of the land relating to erosion wear and tear, light or other hazards.

B. Landscape Architecture services to accomplish the above, may result in the preparation of the following work products including: Reports for Site Analysis and Planning; Visual Analysis; Resource Planning Inventory and Evaluation; Research Information and Documentation; Design and Construction Documents, Specifications, Constructability Reviews, Post Design and Responsible Construction Supervision.

C. Investigation, Reconnaissance Research, Planning, Design and Responsible Supervision Work may include but not be limited to: Aesthetic evaluations and Visual Quality and Impact Analysis to determine appropriate mitigations; Design of Structure and Wall Aesthetic Treatments; Landscaping and Irrigation Systems and when possible Sustainable Landscaping; Landform Grading and Graphics; Water Conservation Measures, Audits and Water Harvesting; Landscape Ecological planning involving Resource Conservation and Protection; Habitat Mitigation Restoration; Reclamation and Revegetation; Native Plant Inventory, Salvage, Replanting and Establishment; Noxious Weed Control; application of Best Management Practices (BMPs) for Erosion and Sediment Control, Water Quality Protection; Storm Water Pollution Prevention Plan (SWPPP) Index Sheet, Erosion and Sediment Control Plans; preparation of Design Construction Plans Documents, Specifications and Estimates.

D. The Landscape Architect consultant shall be responsible for coordination of work with Roadside Development Section during all design phases. Work completed shall be in accordance with AASHTO, ADOT Design Manuals, Guidelines and Policies.
E. The consultant shall complete and Seal Project Plans, Specifications and Estimates necessary for project design development for use by other team members and for bidding and construction. The consultant may be required to provide Responsible Construction Supervision or Construction Contract Administration.

460 Traffic Engineering Design

461 Traffic Engineering Study

The Consultant shall perform a Traffic Engineering Study which addresses those concerns that are appropriate for the project. The study shall provide all necessary data not already furnished by the Department. It is expected that the Consultant will make one or more visits to the project site to familiarize themselves with any issues that may have any bearing on the success of the project.

The Traffic Study should also address the items listed below. The items listed are intended only as a guide and are not meant to necessarily limit the scope of the study:

A. Average Daily Traffic

B. Turning movements at each intersection

C. Accident Data and Analysis

D. Access Control

E. Signing

F. Pavement Markings

G. Pass/No Pass Zones

H. Speed Zones

I. Signal Warrants

J. Left and Right Turn Warrants

K. 30th Hour Design Hour Volume

L. Peak Hour Volume

M. Bicycle Activity

N. Pedestrian Activity (ADA Requirements)

O. Parking

P. School Zones

Q. Appurtenances (guardrail, barriers, etc.)

R. Channelization, Turning Templates

S. Signal Phasing & Timing

T. Capacity

Note: The need for these items will vary depending on the nature and locale of the work.

462 Traffic Control Plans

When required by the complexity of the project, the Consultant shall prepare an appropriate phasing plan for the project. The plan shall be consistent with good constructability, taking into account the contractor's probable approach to the work and the cost and inconvenience to local businesses and residents. Phasing and project duration should be coordinated through the Project manager, the Construction District and Contract & Specifications Services.

Once the project phasing has been determined, the Consultant shall prepare a traffic control plan which may be as simple as a few paragraphs in the Special Provisions outlining which setups in Part VI of the MUTCD or the ADOT supplement are to be used or may be a set of detailed plans showing exact configurations of traffic control devices for the project. A summary of quantities and duration along with an estimate of costs and any special provisions shall be provided by the Consultant at each stage of the project beginning with Stage II.

New construction, reconstruction, pavement rehabilitation, overlays, bridge widening or repairs and other similar work generally will have a significant impact on traffic operations and will normally require a set of Traffic Control Plans with quantities, duration, unit prices, and special provisions.

The following categories of projects generally have a low impact on traffic operations and do not normally require traffic plans:

A. Landscaping projects of short duration

B. Signal projects

C. Scour protection projects

D. Fencing projects

E. Sound wall projects

F. Signing projects

G. Lighting and other electrical projects

H. Sidewalk and ADA ramp projects

I. Bike lane projects

J. Rest area construction projects

K. Minor surface treatments (Chip Seals)

Special Provision 701 DETRM can be used for projects that fall into the low impact categories. This special provision provides pre-determined unit prices for all of the likely pay items. There are, however, two lump sum items which must be computed. Item 7010001 is intended to provide a summary of the anticipated cost of the devices to be used on the project; this item shows in the bid schedule as a fixed price. The second lump sum item, 7010006, allows the contractor to recover his costs for furnishing, placing, and removing the various devices during the construction.

Two other pay items may be included in the bid schedule, when appropriate. Both items require the contractor to provide a bid amount. The items are 7010010, Temporary Concrete Barrier and 7010012, Temporary Impact Attenuation Devices.

Upon final design approval for any and all work that involves Traffic Engineering/Design, the Traffic Engineering Group requires that the following CADD related deliverables be submitted to the Design Project Manager as indicated in the General Specifications for adherence to ADOT's CADD Standards:

a. All SignCad files shall be submitted in ADOT's current version of SignCad (.SGN).
b. All design CADD files associated with Traffic Design, including Traffic Signals, Signing, Pavement Marking, Traffic Control, Pre-Design, HES Projects, and Permit Designs, shall be submitted in ADOT's current version of MicroStation 2D format (.DGN)(2D).

In addition, a copy of the Letter of Transmittal indicating all Traffic related deliverables have been submitted to ADOT shall be forwarded to the Traffic Engineering Project Manager for approval.

463 Intersection Signalization and Roadway Lighting

The designer shall prepare construction documents for installation of traffic signals. Installations for future signals may require only conduits and pullboxes.

The designer shall comply with ADOT's current lighting policy and provide a complete set of roadway lighting construction documents including, but not limited to:

A. Complete freeway lighting including mainline, entrance and exit gore areas, ramps, and crossroads.

B. Underdeck Lighting.

C. Sign Lighting.

The designer shall in accordance with Section 430 of the Dictionary of Standardized Work Tasks and the project scope of work coordinate with the local electric utility to provide electric service. If warranted, the designer shall advise the project manager of the need for an IGA with the local jurisdiction for funding, maintenance, and energy costs.

464 Signing Plans

The Consultant shall prepare designs for signing that are consistent with current signing practice and in conformance with the Manual on Uniform Traffic Control Devices (MUTCD), the Traffic Engineering Design Manual, the Manual of Approved Signs (MOAS), and Traffic Group's Sign Sheeting

Guidelines, dated May 31, 1996. Freeway signing within the MAG system shall in addition conform to the MAG network Signing Plan, dated January 1992.

A signing summary shall be provided in the project plans. Non-standard signs shall be detailed on the project plans following the formats given in the above referenced documents. The signing summary, a detailed estimate of costs, and any special provisions shall be included with each submittal beginning with Stage II.

465 Pavement Marking Plans

The Consultant shall prepare permanent pavement marking designs for the roadways within the project limits to show center, edge and lane line striping, stop lines, crosswalks, arrows, legends, and symbols, raised or recessed pavement markers, object markers, delineation or other markings as may be consistent with the needs of the project and in conformance to the requirements of the MUTCD, the Traffic Design Manual, and the Standard Drawings. The Consultant shall confer with the district representative and Traffic Group to determine which types of marking or delineation materials are appropriate for the project. The summary of quantities, a detailed estimate of costs, and any special provisions shall be included with each submittal beginning with Stage II.

466 Intelligent Transportation Infrastructure

The designer shall prepare construction documents for elements to be included in the project for accommodation of the Intelligent Transportation Infrastructure in accordance with the ADOT Freeway Management System Design Guidelines.

470 Right-of-Way

471 Right-of-Way Requirements Determination

The Consultant shall determine the requirements for new right-of-way (R/W) and easements, including, but not limited to, new roadway R/W, slope easements, drainage easements, temporary construction easements, waste site R/W, access control R/W, borrow source R/W and haul road R/W.

The Consultant shall submit to ADOT, in writing, the preliminary R/W requirements on or before the Stage II design submittal and the final R/W requirements on or before the Stage III design submittal. No revisions or additions to the R/W requirements will be allowed after the Stage III submittal without the approval of the ADOT Project Manager.

The new R/W requirements shall be submitted in triplicate to ADOT for review and shall include the following as a minimum:

A. A letter indicating the project name, contract number, project location, originator of report (Firm's Name), submittal date and submittal type (Stage II or III).

B. A plan of sufficient scale and detail to show the existing and proposed roadway R/W and proposed easements.

C. Type of acquisition required:

At the Stage II submittal, the new requirements may be estimates of the final R/W with enough definition to identify all ownership's that will be affected. The preliminary requirements should be large enough to cover all possible R/W needs.

At the Stage III submittal, the new requirements shall be accurately defined with widths, lengths, stations, offsets, etc.

In addition, all R/W plans shall conform to current Right of Way Plans Standards and Manual. When all comments have been addressed, the designers of ADOT projects shall submit the following:

a. Beginning and Ending Mileposts in tenths of a mile.
b. Revised Calculation Book sheets and Point ID sheets, if necessary.
c. An ASCII coordinate electronic file in the following format: Point Number, Northing, Easting and Description using commas as delimiters. Designers of ADOT projects shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. The file shall be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. Only numeric numbers shall be accepted.
d. One (1) half-size print of the Final Right of Way Plans set.
e. One (1) full-size set of sealed and signed Mylars trimmed to 22" x 34"

472 Right-of-Way Acquisition

If new R/W is required for the project, ADOT will acquire all necessary R/W and easements. Based on the requirements provided by the Consultant, ADOT will:

A. Prepare final R/W plans and associated documents necessary for R/W acquisition (Final plans may be prepared by others)

B. Acquire necessary R/W including easements, material sites and waste sites

C. Obtain the necessary authority to proceed with the various phases of property acquisition

D. Prepare the necessary data for Transportation Board resolutions and project clearance letters

473 Temporary Entry Documents

A temporary entry document for entry to each parcel for any or all of the following activities is required: Geotechnical investigations, and design or construction survey work. The Consultant shall notify ADOT of the need for any temporary entry documents no later than thirty (30) days after the notice to proceed. ADOT will obtain the appropriate owner's signature. The Consultant may not enter any such property prior to approval of the temporary entry documents by ADOT.

480 Cost Estimates

The Consultant shall prepare combined and detailed estimates (cost estimates) in the format recommended by Contracts and Specifications Section. The cost estimate shall include a recapitulation sheet concurrent with each review submittal. Computer generated estimate forms may be used, provided the format is approved by the Contracts and Specifications Section. At the Stage II

review, the Consultant shall prepare a bidding schedule and concurrently with each review submittal thereafter. ADOT will provide the necessary format.

The budgeted cost for the project is indicated in Section 140 of the Scope of Work. The Consultant shall immediately advise ADOT, in writing, if there is any reason to believe the project cannot be constructed within the allocated budget. The Consultant shall identify options to maintain the project within budget, including shortening the project, revising criteria, or phasing changes.

485 Specifications

The Consultant shall be responsible for identifying critical elements of construction, including, but not limited to, construction limits, access requirements, potential night construction, coordination with affected local agencies (police, fire, USFS, etc.), traffic lanes open, scheduling of work time (bar chart format illustrating estimated construction time), utility trench close ups, incentives and liquidated damages, State-furnished materials, critical materials requiring pre-bid purchase, and limitations specifically addressed in the environmental, right-of-way, and utility clearances.

490 Special Provisions

The Consultant shall prepare Special Provisions for items, details, and procedures not adequately covered by ADOT's Standard Specifications and Stored Specifications. Unusual requirements necessary for obtaining permits for hauling materials shall also be included. Special Provisions shall be submitted at the Stage III and Stage IV project reviews. Final Special Provisions shall be sealed by the Engineer in responsible charge. The Consultant shall be responsible for incorporating any specifications provided by ADOT technical sections into the draft and final Special Provisions. ADOT shall review all submittals of Special Provisions and the Consultant will prepare the final Special Provisions.

495 Contracts and Specifications Process

The Consultant shall, under the direction of ADOT, support the Contracts and Specifications process after completion of the Final Submittal stage leading to the complete bid documents as follows:

A. Promptly answer questions relative to the plans, quantities, and Special Provisions.

B. Make any necessary corrections to the plans, typical sections, Special Provisions, quantities, notes, etc. as required.

C. Prepare any addenda required to clarify the work included in the contract documents as requested by the Contracts & Specifications section. The addenda shall be prepared immediately upon request. Addenda may be required based on the project inspection with the assigned ADOT Resident Engineer, questions developed in the pre-bid conference, or conditions discovered by bidders during the bid period.

D. The Consultant shall, prior to the pre-bid conference be prepared to walk the project with the assigned ADOT Resident Engineer to discuss the plans and details.

E. The Consultant shall be prepared to attend the pre-bid conference, if one is scheduled, and present an appropriately-sized display showing the project layout, proposed traffic control and construction phasing, and shall be prepared to discuss other constraints so that the potential bidders

will be better able to relate to the intent of the construction of the project. The Consultant shall respond to questions related to the plans, details and special provisions.

F. The Consultant shall be prepared to assist in the analysis of bids, including: determination of reasonableness and justification of cost variances, analysis of original cost estimate compared to contractor bid costs.

SECTION 600 POST DESIGN SERVICES

ADOT will coordinate all post-design services and will act as the principal initial contact for post-design questions. The Consultant shall be responsible for the post-design services described below. Post-design services will be added to the contract by contract modification.

A. The Consultant shall be available, within twenty-four (24) hours of notification, to respond to questions in the field that may arise relative to the plans, details, or special provisions during construction.

B. The Consultant shall review and approve shop drawings, erection procedure plans, and form work details, review proposals for substitutions or "approved alternates," assist the resident engineer in developing change orders, and provide other engineering services required to facilitate construction of the project.

C. The Consultant shall appoint a responsible member of the firm to be the contact person for all post-design services; this person shall be continually available during the course of construction for review and updating of design plans.

D. The Consultant shall make every reasonable effort to process any material presented for review in a prompt manner.

E. The Consultant may be required to attend the Pre-Construction Partnering Workshop and/or utility coordination meetings.

F. The Consultant shall submit sealed and properly signed required construction modifications (change orders) of the original design in a hard copy as well as in electronic format as stated in section 1040.

G. The Consultant shall prepare the As Built plans for the project based on redlined construction plans provided by the ADOT Resident Engineer. The As Built submittal shall also include electronic files consistent with ADOT's electronic archiving process. The Consultant shall submit the following:

1. Two (2) half-size (11" by 17") prints of the final prepared As Built plans set.
2. One (1) full-size print set of the prepared As Built plans sheets trimmed to 22" x 34".
3. One (1) electronic copy of the CADD design files containing the submitted As Built Plans on compact disk(s) (CD) or DVD(s).
4. Two (2) electronic copies containing the prepared As Built Plans scanned onto CD(s) or DVD(s) in PDF format (Adobe Portable Document Format).
5. The original set containing the field redlines sent by the Resident Engineer.

The cover sheet of each As Built Plan set shall contain the following information transcribed onto the original cover sheet:

- Project Number and Tracs number (if applicable).
- Name of the Construction Company who built the project.
- The name of the Professional Registered Engineer or Certified Professional who oversaw the As Built Plans Procedure.
- The date the process was completed.
- The name of the Resident Engineer (and consulting firm if applicable) who supervised the project field construction.
- The date when the Resident Engineer approved submittal of the field redline information.

SECTION 700 MATERIALS FURNISHED BY ADOT

710 Surveys and Mapping

ADOT will provide the following materials, as available:

A. Horizontal and vertical control for existing alignments

B. Descriptions and values for Geodetic control

C. Field Survey

1. Planimetric maps
2. Topographic maps
3. Digital Terrain Model
4. Profile maps

D. Control for aerial maps

E. Photogrammetric Mapping (Contour Interval = 2 ft.)

1. 1" = 50' photogrammetric mapping
2. 1" = 100' photogrammetric mapping
3. 1" = 50' Digital Terrain Model
4. 1" = 100' Digital Terrain Model

F. Photo mosaic

G. Aerial photos

H. ADOT State Plane Coordinate Grid Adjustment Factor(s)

720 Materials Investigation

ADOT will provide the following materials:

A. Geotechnical Report if applicable

B. Pavement Design Summary if applicable

C. Materials Design Report if applicable

D. Review of all submitted reports prepared by others for this project.

730 Record Documents

The Consultant shall obtain the following ADOT drawings:

A. Available "as built" plans, of existing conditions

B. Available right-of-way plans of existing conditions

740 Traffic Data

The Consultant shall obtain from ADOT the following design traffic data:

A. Current and design year ADT

B. K, D, and T factors

750 Environmental Studies

In addition to the Final Environmental documents, ADOT will provide, at the Consultant's request, any available environmental data prepared for the project (such as cultural resource surveys and investigations).

760 Base Sheets

ADOT will provide the Consultant with one (1) reproducible copy of each of the following base sheets as required for completion of the project plans. For other compatible CADD systems, these items shall be provided on computer CDs.

A. Roadway Design Section sheet

B. New Pipe Summary sheet

C. Barrier Summary sheet

D. Reinforced Concrete Box Culvert Summary sheet

E. Roadside Development Section sheet

F. Corrugated Aluminum Pipe Extensions Summary sheet

G. Corrugated Steel Pipe Extensions Summary sheet

H. Combination Barrier and Pipe Summary sheet

I. Cell Libraries (CADD only)

J. Font Libraries (CADD only)

K. Face sheet

L. List of Standard Drawings sheets

M. Traffic Design Section sheets

N. Traffic Operations Section sheets

O. Right-of-Way Plans Section sheet

770 Final Design Concept Report

The Final Design Concept Report will be provided to the Consultant.

SECTION 1000 CONTRACT ADMINISTRATION

1010 Arizona Department of Transportation

ADOT's Project Manager shall:

A. Conduct ongoing reviews of the Consultant's progress in performing the work and ensure timely comments from the technical units.

B. Direct design consensus status and team building meetings with all appropriate partners at the start and on a monthly basis during the project development period.

C. Review the Consultant's billings

D. Review and evaluate the Consultant's requests for extension of time and supplemental agreements

E. Review all correspondence with public agencies prior to the Consultant's mailing of any correspondence

F. Coordinate the distribution of public information

G. Provide a focal-point contact for all questions, requests, and submittals

H. Coordinate project scheduling with the Consultant, ADOT sections, and ADOT Program and Project Management Section.

1020 Consultant

The Consultant shall:

A. Establish, furnish and maintain suitable office facilities to serve as the project office for the duration of the project in the location specified in the Consultant's technical proposal

B. Maintain an adequate staff of qualified support personnel to perform the work necessary to complete the project

C. Establish internal accounting methods and procedures for documenting and monitoring project costs

D. Establish and maintain contract administration procedures, which will include supplemental agreements, time extensions and subcontracts

E. Include the complete TRACS number and project name on all correspondence related to the contract.

F. Participate in design consensus, status and team building meetings with all appropriate partners at the start, on a monthly basis during the project development period and as needed to maintain the design schedule. If requested by the ADOT Project Manager, the Consultant shall act as the lead.

The Consultant is responsible for the accuracy and completeness of contract documents and related design prepared under the project. The plans will be reviewed by the project team including representatives of ADOT technical sections for conformity with ADOT procedures and the terms of the contract. **Review by ADOT does not include detailed review or checking of design of major components and related details or the accuracy with which such designs are depicted on the plans.**

1021 Project Control

The Consultant shall provide data, in the format specified by ADOT, upon request to monitor costs and manpower and to report progress.

The project control system may include features to:

A. Determine and highlight critical path work from initial plans as work progresses

B. Identify progress against schedule for each identified work item

C. Forecast completion dates from current progress

D. Highlight rescheduled work in any area which is out of the required sequence

E. Determine any physical area that requires more resources than originally allocated

F. Forecast future conflicts in any area

G. Provide estimates of time, manpower, and dollars required at the lowest work element tracked, based upon current expenditures versus schedule

H. Provide the capability of random inquiry concerning the status of any work element in terms of schedule, manpower, and dollars

1022 Subcontract Services

Due to the nature and scope of the required services, it may be desirable for the Consultant to subcontract portions of the work. However, the subcontracting firms must be approved in writing prior to initiation of any work. The volume of work performed by the subcontractors shall not exceed 49 percent (49%) of the total contract value.

1023 Project Related Correspondence

The Consultant shall furnish written documentation of communications between the Consultant and any party, pertaining specifically to the project, to ADOT for record keeping within one week of the communication. The Consultant is responsible for recording and distributing to the participants the minutes of all meetings pertaining to the project within one (1) week of the meeting.

1024 Quality Control

The Consultant is responsible for the accuracy and completeness of the plans and related design prepared under the contract and shall check all such material accordingly. The Consultant shall have a quality control plan in effect during the entire time work is being performed under the contract. The plan shall establish a process whereby plans, calculations and documents submitted for review shall be clearly marked as being fully checked by a qualified individual other than the originator. Non-compliance will be sufficient cause for rejection of submittal. Periodic Quality Control audits may be performed by the ADOT Project Manager.

The Consultant shall submit the quality control plan to ADOT for approval within fifteen (15) working days of receipt of written Notice to Proceed. The plan shall comply with the requirements of Section 1025. The plan shall address as a minimum: checking procedures, training of employees in quality requirements, methods of monitoring and documenting quality control activities.

1025 Quality Control Plan Requirements

A. Identification of key personnel and definition of specific responsibilities:

The plan will identify, by name, the specific project personnel and their individual responsibilities relative to the project and the Quality Control process.

B. Technical review process:

Technical review shall be distinguished from checking. Checking is for verification of the accuracy of the documents; technical review is for the verification of the overall design concept of the project. As a minimum, technical review will do the following:

1. Determine the adequacy of the design process to achieve the desired goals
2. Evaluate the general selection and sizing of materials and equipment
3. Determine if all viable alternatives have been considered
4. Determine the practicality of the design concept
5. Determine if legal and physical restraints were considered
6. Determine if the design theory, concepts, and project layout are logical
7. Determine applicability of computer programs used
8. Determine if the technical specifications are sufficiently comprehensive

9. Determine the constructability of the selected design

C. Checking procedures:

The checking process should assure that all documents produced, including, but not limited to, plans, reports, calculations, specifications, special provisions, estimates, and schedules, are thoroughly checked by an individual equally competent to the originator of the document to verify accuracy. The process will address resolution of conflict and assure agreement of computer programs and procedures for checking computer input and output. Checking shall not only confirm the accuracy of calculations, but shall include a thorough review of the proper use of Standard Drawings, Drafting Guide, Project Design Guidelines, and other manuals and documents referenced under Section 200 of the scope of work.

D. Program to train employees in the quality control requirements:

The training program should provide an opportunity for all project staff to become familiar with the design and the quality control process that will be required on the project. Particular attention should be directed to defining specific individual responsibilities and assuring their understanding.

E. Process to monitor and document quality control activities:

A method for monitoring and documenting the required processes is essential to achieve desired results; this process should easily and quickly verify the entire Quality Control process. A checklist should be developed for quick reference and periodic review by the Project Principal and ADOT.

1026 Consultant Personnel

The Consultant's work shall be performed and/or directed by the key personnel identified in the technical/fee proposal presentations by the Consultants. Any changes in the indicated key personnel or the Consultant's officer-in-charge of the work, as identified in the Consultant's proposal, shall be subject to review and approval by ADOT.

1027 Site Visit

The Consultant shall make arrangements to visit the project site, with agency representatives as appropriate (ADOT, FHWA, National Forest and other interested persons), at least two (2) weeks prior to the visit. The visit will be held within fifteen (15) working days of the receipt of written Notice to Proceed, or as otherwise instructed by the ADOT Project Manager. Within seven (7) calendar days of the site visit, the Consultant shall issue to ADOT a brief written report including observations, discussions, and any questions pertaining to the scope or level of effort of the project. The purpose of the site visit is to acquaint key personnel with the details and features of the project to facilitate the design process.

1030 Acceptability of the Work

The plans, design, requested calculations, reports and other documents furnished under the Scope of Work shall conform to "standards-of-the industry" quality. Criteria for acceptance shall be a product of neat appearance, well organized, accurate and complete, technically and grammatically correct,

checked in accordance with the approved Quality Control program, and with the designer, maker and checker identified.

1040 Design Documentation

A. If requested, the Consultant shall submit any design notes, sketches, worksheets, and computations to document the design conclusions reached during the development of the contract documents to ADOT for review.

B. Structural calculations will only be submitted when requested by the Bridge Group and for specific elements.

C. At the project completion (immediately prior to the bid advertisement), a final set of project documentation sheets, sealed by a Professional Engineer, Landscape Architect, or Architect, registered in the State of Arizona, shall be submitted to ADOT with the record set of plans.

D. Project Documentation shall include, but are not necessarily limited to, the following data:

1. Design criteria used for the project
2. Right-of-Way calculations (including easements)
3. Geotechnical reports for the pavement and/or bridge design
4. Documentation of decisions reached resulting from meetings, telephone conversations or site visits
5. Drainage reports
6. Field survey notes and computations
7. Calculation of quantities

E. Computer-Aided Design and Drafting (CADD) Standards for all Projects related Deliverables. ADOT shall retain all rights and ownership of all Electronic Files and Hardcopy Deliverables throughout the Design Phases.

F. During project construction, and as part of the post-design services rendered by the Consultant, any modification(s), redlines shall be prepared in accordance with the as built procedure stated in section 600 (G). ADOT retains all rights and ownership of the Electronic Files and Hardcopy Deliverables throughout the Construction Phase.

CADD General Specifications

All drawings to be archived shall conform to ADOT drafting and CADD standards, including CADD file naming convention. The current ADOT approved version of Bentley's MicroStation software will be used. All graphic files shall be provided in MicroStation's native design file format (.dgn), and contain data in vector format only. Digital Terrain Model (.dtm) files shall be produced with Bentley's InRoads/Site/Survey Select CAD compatible file formats. Raster data shall not be accepted unless otherwise stated by ADOT. Use of non-MicroStation vector format and subsequent translation of graphic files to the .dgn format shall not be acceptable. No zipped files will be accepted. Reference files are not to be copied into the plan sheets master file. All electronic "design sheets" will be