SENIOR MATERIALS TECHNICIAN

JOB DESCRIPTION

Classification Responsibilities: A Senior Materials Technician, under general supervision, performs a variety of technical and skilled materials testing work in the field and laboratory. This class performs related work as required. Assumes leadership capacity during the absence of the Chief Materials Technician.

Distinguishing Features: An employee of this class performs a variety of difficult and complex materials testing work to ensure conformance with established standards. This class performs the full-range of materials testing on asphaltic concrete, soil and aggregate, and slurry and chip seals. A significant element of the work includes: reviewing the submittals of the annual asphalt and concrete mix-designs and advising a contractor or a City of Mesa Construction Inspector of sampling and testing results. The work also involves working with and around hazardous materials and chemicals, operating light-to-heavy laboratory equipment, and working in a construction-oriented environment, often during inclement weather conditions. The Senior Materials Technician is distinguished from the Materials Technician by the former possessing a broader knowledge of materials testing principles and practices, exercising greater independent judgment, and supervisory responsibility. Incumbents are required to use appropriate safety equipment and procedures in performing assignments. An employee of this class exercises technical assignments independently, and reports to the Chief Materials Technician who reviews work through conferences and overall results achieved. This class is FLSA nonexempt.

QUALIFICATIONS

Employee Values: All employees of the City of Mesa are expected to uphold and exhibit the City's shared employee values of Knowledge, Respect, and Integrity.

Minimum Qualifications Required. Graduation from high school or GED. A minimum of three (3) years experience in construction materials testing and/or paraprofessional engineering work.

Special Requirements. Must possess a valid Class D Arizona Driver's License by hire date. Certification in the operation and safety procedures of nuclear densitometer equipment and certification by the American Concrete Institute (ACI), with a Concrete Field Testing Technician, Grade I is also required by hire date. Arizona Technical Testing Institute (ATTI) certification in soils and asphalt is also required within one year of hire.

Substance Abuse Testing. Due to the safety and/or security sensitive nature of this classification, individuals shall be subject to pre-employment or pre-placement alcohol, drug and/or controlled substance testing as outlined in City policy and procedures.

Preferred/Desirable Qualification. Coursework in drafting, mathematics, construction, surveying, materials testing is preferred.

ESSENTIAL FUNCTIONS

Communication: Communicates with other City departments and management to train and ensure proper sampling procedures of construction materials and their placement pertaining to job projects. Discusses, recommends, schedules, and reviews results, etc., for many aspects of lab/field work and review of mix-designs and specifications. Communicates with other municipalities, government agencies, independent labs, various organizations to coordinate sampling and testing procedures, review mix-designs, and test results. Communicates with vendors to obtain information concerning materials, equipment, and procedures for repair and operation of equipment. Instructs and trains subordinates in an in-house and field classroom setting regarding sampling and testing procedures, scheduling, and purpose of test and results. Prepares written documents with clearly organized thoughts for test result reports, and to provide summarized work histories of suppliers, materials, or test results. Makes recommendations for corrective action that may be needed, and research reports for management concerning new products or methods and procedures.

Manual/Physical: Reviews the work products of others to ensure compliance with standard operating procedures, federal regulations (Environmental Protection Agency [EPA], Chemical Federal Registry [CFR], American Association of State Highway and Transportation Officials [AASHTO], Federal Specifications and Standards [FSS]), state regulations (Arizona Radiation Regulatory Agency [ARRA], Arizona Department of Environmental Quality [ADEQ], Arizona Department of Transportation [ADOT], Maricopa Association of Governments [MAG], Arizona Rock Products Association [ARPA]), and other standards and guidelines (American Concrete Institute [ACI], American Concrete Pipe Association [ACPA], Asphalt Institute [AI], American National Standards Institute [ANSI], American Society for Testing Materials [ASTM], etc.). Inspects, monitors, and evaluates information to determine compliance with prescribed operating, safety, or other standards, regulations, and guidelines. Distinguishes colors (example: uses Phenolphthalein which creates a color change when applied to asphalt sample to indicate presence of cement or lime in mix). Must be able to distinguish color change of emulsion when it breaks (cures). Detects toxic gases and other hazardous material odors within the lab environment such as: excessive methylene chloride fumes, Sulphur compound when used for capping of concrete test specimens, xylene used for moisture test on asphalt, etc. Detects traffic sounds when working near moving traffic and detects backup warning devices when working around moving equipment while curing or sampling/testing materials. Operates a motor vehicle (1/2- or 3/4-ton pickup truck) requiring a standard Arizona Driver's License to transport sampling and testing equipment needed on various projects. Operates power driven machinery such as: a jack hammer, tamper, concrete compression machine, core drill, Marshall apparatus, sieve shakers, marshal compaction hammer, and drill press. Uses common hand tools such as: a hammer, saw, and screwdriver to sample and test materials, and for equipment maintenance. Operates a variety of standard office equipment (copier, calculator, computer, facsimile, two-way radio, etc.). Enters data or information into a computer in order to process reports, forms, etc. Prepares and updates maps, schedules, and graphs to correlate results, correct materials, and verify mix-designs. Installs and replaces filters, ribbons, belts, sieves, masonry saw blades, and core barrels on coring unit when worn or when a different size is needed. Assists with distribution of test results, and supplier data history, etc. Sorts, files, and distributes test results, reports, research, mix designs, East Valley Asphalt Committee (EVAC) data, supplies, etc. Performs physical inventories of equipment, supplies, forms, etc., needed for lab and field operations. Moves aggregates, concrete, asphalt, soils, lab/field test equipment, etc., from one place to another using truck, two-wheel dolly, carts, hand carry, etc. Digs up ground using a pick, shovel, spade, or coring unit to sample and test construction materials. Moves nuclear gauge at 30 pounds for various distances at construction sites and into trenches, etc. Cleans work area and equipment on a variety of lab/field

test/sampling equipment. Works with cleaning fluids and agents, and chemicals (examples: lime away, phenolphthalein solution, calcium carbide) using normal protective equipment to clean sieves of build-up of cement and lime, check asphalt sample for cement or lime presence, and for speedy moisture field test of soils. Sets up and removes arrow board and traffic cones when working in congested or traffic areas to sample/test construction materials or its placement. Works in a variety of weather conditions while performing sampling/testing of construction materials and their placement. Works in small, cramped areas while performing sampling/testing in trenches and lab area. Works at construction sites that are rough graded, with open trenches, and stock piled materials. Meets scheduling and attendance requirements.

Mental: Plans, organizes, and directs the activities of other technicians, temporary technicians, inspectors, interns, and material suppliers for field and lab sampling and testing. Resolves procedural, operational, and other work-related problems by comparison sampling/testing. Coordinates work activities with other City departments. Develops departmental procedures, and short- and long-term objectives.

Knowledge and Abilities:

Knowledge of:

quality materials and workmanship on City construction projects and new subdivisions;
ASTM, AASHTO standards, and MAG specifications;
the properties, characteristics, strengths, and weaknesses of the materials used in public works construction;
laboratory and field tests required for the quality control of construction projects;
mechanical soil properties;
civil engineering and construction related terminology; and
formulas, calculations, and techniques used for plotting and graphing mix designs to conform with City design standards.

Ability to:

perform nuclear density tests in order to determine the in-place density of the material being tested (examples: soil, asphalt, concrete) and moisture content;
collect field samples;
visually inspect materials and test characteristics of asphalt; concrete, grout, shotcrete, slurry, mortar, soils, and aggregates;
perform percent binder by ignition furnace gradations, Marshall plugs, unit weights, stability, and flow;
calculate unit weight, yield, and air entrainment;
perform gradations of coarse and fines;
calculate moisture content;
perform liquid limit and plasticity limit tests to determine if suitable for specific functions;
perform the full-range of testing on soils, slurry seal, mortar, grout, and chip seal including speedy moisture tests, sieve gradations, and sand cone densities, etc.;
compute percentages, ratios, and proportions of materials being tested;
assist in a comprehensive review of the annual asphalt and concrete mix-design submittals;
record test results and advise contractor or the City's Construction Inspector of results;
read construction plans and specifications in order to determine locations and materials criteria;

work effectively in the lab and field with minimal supervision;
work effectively with contractors and construction personnel under such circumstances as conflict of values and short time frames;
coordinate work sequences and schedules with contractors, utilities, and other City departments;
employ practical mathematical and algebraic applications;
design computer spreadsheets for lab use;
analyze data and write clear and concise reports; and
train and supervise subordinate employees.

The duties listed above are intended only as general illustrations of the various types of work that may be performed. Specific statements of duties not included does not exclude them from the position if the work is similar, related, or a logical assignment to the position. Job descriptions are subject to change by the City as the needs of the City and requirements of the job change.

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JOB FCTN-TEC	SWORN-No
INCREMENTS 64-200	