



City of Phoenix
OFFICE OF THE CITY ENGINEER
DESIGN AND CONSTRUCTION PROCUREMENT
200 W. Washington Street, 5th Floor
Phoenix, Arizona 85003-1611

**STREET TRANSPORTATION
SOILS AND MATERIALS TESTING**

ON-CALL SERVICES

NOTIFICATION LETTER NO. 1

July 24, 2024

This notification letter shall become part of the Request for Qualifications for the above referenced project.

Exhibits Referenced in Section 1 – Scope of Work of the RFQ: (Attached)

- **EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS**
- **EXHIBIT B - EQUIPMENT, FIELD TESTING & REPORTING REQUIREMENTS**
- **EXHIBIT C - MINIMUM MATERIAL TESTING QUALIFICATIONS CONCRETE & CEMENT REFERENCE LABORATORY (CCRL) AND AASHTO Re-Source**
- **EXHIBIT D – PREFERRED ADDITIONAL MATERIAL TESTING QUALIFICATIONS BASED ON CONCRETE & CEMENT REFERENCE LABORATORY (CCRL) AND AASHTO Re-Source**
- **EXHIBIT E- MINIMUM TECHNICIAN EXPERIENCE REQUIREMENTS, QUALIFICATIONS & APPLICABLE CERTIFICATION**

All other terms and conditions remain unchanged.

A handwritten signature in black ink, appearing to read 'Anna York'.

Anna York
Contracts Specialist I
anna.york@phoenix.gov
CITY OF PHOENIX
DESIGN AND CONSTRUCTION PROCUREMENT

*****END OF NOTIFICATION*****



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STREET TRANSPORTATION DEPARTMENT
 DESIGN & CONSTRUCTION MANAGEMENT DIVISION
 MATERIALS LAB

EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 1
 BITUMINOUS MIXTURES**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
321, 710, 717	Asphalt Concrete Pavement	Volumetrics, Marshall, Rice & Air Voids	Hot Plant or In Place	One per day's production.
		Oil Content (Nuclear/ Ignition)	Hot Plant or In Place	One per 350 tons or fraction thereof. (Minimum one sample per day)
		Compaction (Nuclear)	Roadway	One per 500 linear feet or fraction thereof for each lift and lane or paver pass.
		Compaction (Nuclear)	Parking Lot	One per 2500 ft ² per lift per day.
		Compaction (Core)	In place	Cores will be taken at the discretion of the City of Phoenix Engineer.
	Cold Feed	Gradation	Hot Plant	One sample per day's production.
325, 326, 717, 719	Asphalt Rubber Asphalt Concrete (ARAC), Polymer Modified Asphalt Concrete (PMAC)	Volumetrics, Marshall, Rice & Air Voids	Hot Plant or In Place	One per day's production.
		Oil Content (Nuclear/ Ignition)	Hot Plant or In Place	One per 350 tons or fraction thereof. (Minimum one sample per day)
		Compaction (Nuclear)	Roadway	One per 500 linear feet or fraction thereof for each lift and lane or paver pass.
		Compaction (Nuclear)	Parking Lot	One per 2500 ft ² per lift per day.
		Compaction (Core)	In place	Cores will be taken at the discretion of the City of Phoenix Engineer.
	Cold Feed	Gradation	Hot Plant	One sample per day's production.

Remarks:

- All asphalt trench placement under 350 tons shall be sampled and tested at the discretion of a City of Phoenix representative. All asphalt trench placement 350 tons or more will be sampled at the asphalt plant by a City of Phoenix representative. Asphalt trench placement, regardless of tonnage, shall be tested for temperature and compaction during the duration of asphalt placement.
- All Planning and Development Department (PDD) projects will have a Hot Plant Inspector provided by The City of Phoenix Materials Lab for plant sampling when the cumulative quantity for the project is 350 tons or more per day.
- Asphalt deficient in oil content and/or density shall be cored 50' maximum on both sides of failed section when deemed necessary by the City of Phoenix. The results of the 2 cores shall be averaged with the previous test results.
- Minimum sampling and testing is required for each mix/plant per day.
- The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.
- Asphalt is full time observation (CIP projects only): Technician must verify mix code, test asphalt temperatures, perform nuclear compaction tests and sample asphalt in accordance to appropriate testing and sampling procedures.



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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 2
CEMENTITIOUS MIXTURES**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
340, 725	Portland Cement Concrete (Flatwork)	Compressive Strength	At discharge	One set of six cylinders per 50 cubic yards or fraction thereof.
		Slump, Time & Temperature	At discharge	One per set of cylinders.
505, 725	Portland Cement Concrete (Structures)	Compressive Strength	At discharge	One set of six cylinders per structure per 50 cubic yards or fraction thereof.
		Slump, Time & Temperature	At discharge	One per set of cylinders.
604, 728	Controlled Low Strength Material (CLSM)	Compressive Strength	At discharge	One set of three cylinders per 50 cubic yards or fraction thereof.
		Flow	At discharge	One per set of cylinders.
		Phenolphthalein	At any point of the load	One test per load.
776	Grout	Compressive Strength	At discharge	One set of four prisms.
		Slump, Time & Temperature	At discharge	One per set of prisms.
776	Mortar	Compressive Strength	At batch site	One set of 6 cylinders or cubes.
525	Shotcrete	Compressive Strength	At discharge	One panel per 50 cubic yards, nozzle man and/or shift. (whichever is greater)

Remarks:

- Concrete Specifications: Time in mixer (from batch time to finish unloading) is 90 minutes max; Allowable maximum concrete temperature is 90 degrees Fahrenheit.
- Shotcrete test panel forms should be wood or steel and a minimum of 24" x 24" x 4", generally shot vertically.
- For CSLM, compressive strength of all 3 test cylinders will be attempted at 28 days (for informational purposes only).
- The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.
- For CIP projects, concrete and CLSM placement requires full-time observation. Technician must verify batch plant and/or truck number, and mix code on every load.



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 DESIGN & CONSTRUCTION MANAGEMENT DIVISION
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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 3
 SOIL**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
601	Trench Backfill (including lateral trenches)	Compaction & Moisture Content	In-Place	One per 8" lift for every 500 linear feet; per pipe run; or day's production.
301, 304	Subgrade (Including Sidewalks)	Compaction & Moisture Content	In-Place	One per 500 linear feet or fraction thereof, per lift, <i>per lane (Roadway Only)</i> .
301	Subgrade (Parking Lot)	Compaction & Moisture Content	In-Place	One per 2500 ft ² or fraction thereof.
340, 206	Slab on Grade (Including Driveways and Ramps)	Compaction & Moisture Content	In-Place	One per 1000 ft ² or fraction thereof per slab per lift.
206, 301, 601	Structure Backfill	Gradation & P.I.	In-Place	One per soil type.
		Compaction & Moisture Content	In-Place	One per 500 linear ft. or fraction thereof per 8" lift per structure.
211	Roadway Fill & Embankments	Compaction & Moisture Content	In-Place	One per 500 ft. or fraction thereof per 8" lift.
210	Import	Proctor Density, Gradation & P.I. (See Remarks 1)	Onsite	One per soil type.
			Onsite	At the start of project and as material changes, per supplier/source and/or plant.
210, 211, 301	Native	Proctor Density, Gradation & P.I.	Onsite	One per soil type.
		Specific Gravity	Onsite	At the start of project and as material changes.

Remarks:

1. Import material shall meet the "X" value requirements of MAG Section 210.2 and verified prior to hauling into site.
2. Asphalt millings are not acceptable for use unless approved by the Engineer or their representative.
3. For material containing 25% or more rock larger than 6", refer to MAG Section 211.3.
4. The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.
5. For Planning and Development Department (PDD) projects only, testing frequencies are as follows:
 - a) Sewer Services & Water Services (30%)
 - b) Driveways, Aprons and ADA Ramps (50%)
 - c) Valley Gutters (100%)
 - d) Dry Utility, Fire Hydrant, Fire Line and Storm Drain (100%)
6. "Pipe Run" defined as any length of pipe between two consecutive structures along the pipeline. (ie. manholes, fire hydrants, change of directions, or other items)



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DESIGN & CONSTRUCTION MANAGEMENT DIVISION
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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

TABLE 4 AGGREGATE BASE (AB)				
MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
701, 702	Aggregate Base Coarse (ABC)	Proctor Density	Onsite	At the start of project and as material changes, per supplier and/or plant.
		Gradation, PI	Onsite	One per project, per source, and/or one per 1000 tons or fraction thereof.
		Specific Gravity	Onsite	At the start of project and as material changes, per supplier and/or plant.
206, 301, 306, 601, 701, 702	Roadway, Pipe Bedding, Trench Backfill	Compaction & Moisture Content	Onsite	One per 500' or fraction thereof per lift; per lane (Roadway only).
211, 301, 310, 702	Parking Lot	Compaction & Moisture Content	In-Place	One per 2500 ft ² or fraction thereof per lift.
206, 340, 701, 702	Slab on Grade (Including Driveways and Ramps)	Compaction & Moisture Content	In-Place	One per 1000 ft ² or fraction thereof per slab per lift.
206, 301, 601	Structure Backfill	Compaction & Moisture Content	In-Place	One per 8" lift per structure.
		Gradation, PI	Onsite	One per project, per source, and/or one per 1000 tons or fraction thereof.
Remarks: 1. Asphalt millings are not acceptable for use as AB. 2. The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.				



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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 5
CEMENT STABILIZED ALLUVIUM (CSA)**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
ADOT 241	Cement Stabilized Alluvium (CSA)	Proctor Density, SA, & PI	Point of Placement	At start of production and as material changes.
		Compaction & Moisture Content	In-Place	One every 500 L.F. per lift and per lane pass or one per day's production.
		Compressive Strength	Point of Placement	One set of 3 per 1500 Cubic Yards or 1 set of 3 per day's production.

Remarks:

1. Maximum of 90 minutes between time of mixing and final mold fabrication.
2. A rock correction shall be used for + #4 material, greater than 10%, to obtain Max Proctor Density.
3. The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.



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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 6
REINFORCEMENT**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
727	Steel Reinforcement	Certificate and/or Tests	Onsite	One sample for each size, grade & heat number per shipment & manufacturer. Certificate required.
Project Plans & Specifications	Post-Tensioned Steel	Certificate and/or Tests	On-Site	One sample for each size, grade & heat number per shipment & manufacturer. Certificate required.
Project Plans & Specifications	Pre-Stressed Steel	Certificate and/or Tests	Project or Fabrication Plant	One sample for each size, grade & heat number per shipment & manufacturer. Certificate required.

Remarks:

1. All steel and iron incorporated into Federal-Aid projects must conform to requirements of "Buy America" per 23 CFR 635.410.
2. The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.



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DESIGN & CONSTRUCTION MANAGEMENT DIVISION
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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 7
ELASTOMERIC BEARING PADS**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
ADOT 1013-2	Elastomeric Bearing Pad	ASTM D2240, D412, D573, D395-B, D1149, D746-B, D1043, D429	On-Site	Two samples of Bearing Pads selected at random by Engineer from every 100 Bearing Pads or portion thereof. Minimum of one sample tested per Lot.

Remarks:

1. Two sample bearing pads may be needed to complete the specified testing for smaller bearing pads.
2. Bearing pads will be selected at random by the Engineer at the project site for testing.
3. Bearing pads marked or otherwise presented as test bearing pads will not be tested.
4. **Bearing pads must be made available for testing at least four weeks in advance of intended use.**
5. Each bearing pad is to be marked in indelible ink or flexible paint. The marking shall consist of the order number, lot number, bearing identification number, and elastomer type and grade number. The marking shall be on the face that is visible after erection of the bridge.
6. The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.



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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

TABLE 8 PIPE				
MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
743 (ASTM C-700)	Vitrified Clay Pipe (VCP)	Visual Inspection	Pipe Plant	Each pipe.
		Hydro Static	Pipe Plant	1 per year, per size and/or at the Engineer's discretion.
		Shear Load	Pipe Plant	1 per year, per size and/or at the Engineer's discretion.
759 (AWWA Standard)	Steel Cylinder Pipe (SCP)	Visual Inspection	On-Site / Plant	Per shop drawings.
		Certification	Pipe Plant	Per lot.
		Hydro Static	Pipe Plant	1 per year, per size and/or at the Engineer's discretion.
735 (ASTM C-76)	Reinforced Concrete Pipe RGRCP	Visual Inspection	Pipe Plant	Each pipe & reinforcing cages.
		D-Load	Pipe Plant	1 per 100 pipes cast, per size, per day's production.
		Compressive Strength	Pipe Plant	One set of 6 cylinders when required by Engineer or their representative.
		Slump, Time & Temperature	Pipe Plant	When required by Engineer or their representative.
Remarks: 1. All RGRCP pipe shall be inspected, tested and marked with the City of Phoenix stamp, before shipment to site. 2. Annual plant inspection by City of Phoenix Materials Lab is required for each production plant. 3. Quarterly quality control inspection by City of Phoenix Materials Lab is required for each production plant. 4. The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.				



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DESIGN & CONSTRUCTION MANAGEMENT DIVISION
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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 9
CHIP SEAL and ALLEY COVER MATERIAL**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
330, 716 SPECIAL PROVISIONS	Aggregates Chip Seal (Roadway)	LA Abrasion	Source or Stockpile	One per source.
		Soundness	Source or Stockpile	One per source.
		Bulk Specific Gravity	Source or Stockpile	One per source.
	Aggregates Cover Material (Alley)	Fracture Faces	Source or Stockpile	One per source.
		Gradation	Stockpile	One per weeks production
		Moisture Content	Stockpile	One per weeks production
712-1 SPECIAL PROVISIONS	MC-800TR	Application Rate	Surface	One per weeks production
		Bituminous Material	Truck	One per weeks production
		Yield	Truck	One per days production

Remarks:

1. Yield to be determined by the City of Phoenix inspector or the designated representative.
2. A split sample of all materials may be required at an interval of one every four weeks.
3. The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.



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MATERIALS LAB

EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 10
FRACTURED AGGREGATE SURFACE TREATMENT F.A.S.T. (FIELD)**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
330, 331, 712, 714, 716, SPECIAL PROVISIONS	Uncoated & Coated Aggregates	Gradation	Stockpile	One per day's production.
		Moisture Content	Stockpile	One per day's production.
		Rotational Viscosity	Blending Plant	One per batch/blend.
711, 712, 713, 714, 716, SPECIAL PROVISIONS	Scrub Seal & Modified Asphalt Rubber Binder	Resilience @ 77 Degrees F	Blending Plant	One per day's production.
		Cone Penetration @ 77 Degrees F	Blending Plant	One per day's production.
		Softening Point	Blending Plant	One per day's production.
330, 331, 714, 716, SPECIAL PROVISIONS	Asphalt Cement, Virgin Asphalt & Admixtures	PG Grade Asphalt	Blending Plant	One per week's production or lot.
		CRM	Blending Plant	One per week's production or lot.
		Polymer Additive	Blending Plant	One per week's production or lot.

Remarks:

- Design reviewing shall be completed prior to production.
- A split sample of all materials may be required at an interval of one every four weeks.
- The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.



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EXHIBIT A - ACCEPTANCE SAMPLING/TESTING REQUIREMENTS

**TABLE 11
 SLURRY SEAL / MICRO SEAL AND APPLICATION OF A PAVEMENT PRESERVATION
 PROCESS**

MAG/COP SUPPLEMENTS	MATERIAL	TYPE OF TEST(S) REQUIRED	SAMPLING POINT	MINIMUM SAMPLING/TESTING FREQUENCY
331, 715 Special Provisions	Aggregates	Gradation ASTM C136/C117	Production Stockpile	Sampled daily, tested weekly, while in production.
		Sand Equivalent ASTM D2419	Production Stockpile	Sampled daily, tested weekly, while in production.
		Moisture Content AASHTO T-255 or ASTM C566	Production Stockpile	Sampled daily, tested weekly, while in production.
713, 714 Special Provisions	Emulsion Testing ⁽⁴⁾	Sieve Test, % AASHTO T-59 or ASTM D6933	Emulsion Tanker	Sampled daily, 1 sample tested weekly, while in production.
		Residue, % AASHTO T-59 or ASTM D6997	Emulsion Tanker	Sampled daily, 1 sample tested weekly, while in production.
713, 714 Special Provisions	Emulsion Residue Testing ⁽⁴⁾	Penetration, 77°F (100g, 5sec, dmm) AASHTO T-49 or ASTM D5	Emulsion Tanker	Sampled daily, 1 sample tested weekly, while in production.
		Softening Point, °F AASHTO T-53 ⁽⁵⁾ or ASTM D36	Emulsion Tanker	Sampled daily, 1 sample tested weekly, while in production.
		Ductility, 77°F 5cm/min AASHTO T-51 or ASTM D113	Emulsion Tanker	Sampled daily, 1 sample tested weekly, while in production.
		Elastic Recovery, 77°F (25°C), % AASHTO T-301 ⁽⁵⁾	Emulsion Tanker	Sampled daily, 1 sample tested weekly, while in production.

Remarks:

- Mix design review shall be completed prior to production.
- A split sample of all materials may be required at an interval of one every four weeks.
- The City of Phoenix Engineer or their representative reserve the right to modify sampling and testing requirements as needed to ensure quality of materials.
- Percent Residue (ARIZ 512) to be used for polymer/latex modified emulsions and Residue shall be obtained from Vacuum Recovery of Asphalt Emulsion Residue (ARIZ 504).
- Softening Point (AASHTO T-53) or (ASTM D36) and Elastic Recovery (AASHTO T-301) for polymer/latex modified emulsions only.
- Residue by Distillation (AASHTO T-59) modified to 350 F will be used as referee in case of dispute.



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DESIGN & CONSTRUCTION MANAGEMENT DIVISION
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EXHIBIT B - EQUIPMENT REQUIREMENTS

**TABLE 1
TESTING EQUIPMENT REQUIREMENTS**

At all times, technician must have the following:
Calibrated sand cone equipment (sand and cone, jar, plate, calibrated sand)
Calibrated Speedy moisture gauge equipment (Speedy scale and reagent)
Calibrated scale(s)
Equipment to dig sand cone hole (spoon, screw driver, brush, hammer)
Screens (with acceptable opening tolerances): #10, #4, ¾", 3" for rock corrections
Calibrated concrete equipment (slump cone, slump plate, 5/8" diameter rod, 3/8" diameter rod, measuring device, small and large scoop)
Calibrated one-point Proctor equipment: 4" diameter mold, 5-lb Proctor hammer, metal straight edge, family of curves (For Aviation projects only include: 6" diameter mold, 10-lb Proctor hammer)
Calibrated nuclear density gauge (calibrated against sand cone and asphalt cores as required)
Shovels (square and spade)
Calibrated thermometers (asphalt and concrete)
Wheelbarrow
Sample containers (metal buckets for asphalt, plastic buckets/sample bags for soils, cylinder molds)
Sample plate for asphalt
Technician Expectations Packet
Laptop or Tablet Computer (with Internet Connection)
Current City of Phoenix card
Personal Protective Equipment: hard hat (ANSI/ISEA Z89.1), steel-toed boots (OSHA 1910.136), safety vest (ANSI/ISEA Z107-2004, Class 2 or 3), safety glasses (ANSI/ISEA Z87.1), gloves



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DESIGN & CONSTRUCTION MANAGEMENT DIVISION
MATERIALS LAB

EXHIBIT B - FIELD TESTING & REPORTING REQUIREMENTS

**TABLE 2
TESTING REQUIREMENTS**

Test per City of Phoenix procedures/ frequencies and all applicable ASTM, AASHTO, MAG, FAA, ADOT test methods.
It is each technician's responsibility to ensure all equipment is calibrated and running properly.
A nuclear density gauge correlated with a sand cone test at least one per day.
A new 1-Point proctor per material type is required until a full proctor is completed. Speedy moisture tests required for monitoring moisture content.
Establish a new rock correction values each day per material type.
A correlated nuclear gauge shall be used for acceptance testing. Any nuclear density tests disputed by the contractor or City inspector shall be verified by a sand cone test.
When a nuclear density gauge is operated within 24 inches of a vertical projection such as a trench wall, a trench correction is necessary.
When sampling Soils/ABC, Asphalt, etc. provide enough sample for appropriate lab testing. (Verify source product code is approved by City of Phoenix Materials Lab).
When sampling concrete, a minimum of 6 cylinders are required. If early breaks are requested, cast the appropriate amount in addition to the standard 6 cylinders. (Verify source product code is approved by City of Phoenix Materials Lab & verify slump spec from approved supplier list).
Inform the contractor, in the event of a concrete failure, that concrete will be placed at their own risk.
The technician's responsibility is to test the material being placed. Technicians will never provide recommendations for construction methods. If Inspection team is not available, contact the City of Phoenix Materials Lab for further construction recommendations.
It is the technician's responsibility to inform the inspector, the contractor, or the City of Phoenix Materials Lab immediately of any non-compliance item(s) during testing and all testing results each day.

REPORTING REQUIREMENTS

The daily inspection report is to include the number of hours on site and the type of tests performed and shall be reviewed by private lab staff and turned into the City of Phoenix Materials Lab within 48 hours. Paperwork shall be filled out completely & correctly, (including sample cards). Revised paperwork shall be returned to the private lab and revisions shall be resubmitted within 48 hours
Daily inspection report is to include what was observed, means and methods used by the contractor to perform the work. (Example: what type of equipment, how many passes, moisture processing, concrete consolidation and placement methods,
Handwritten and/or incomplete paperwork submissions will not be accepted and shall be returned.
At all times keep City of Phoenix Materials Lab staff informed and involved as to what is happening on your projects either by phone, face to face communications, or on your daily reports.
Any changes made to specifications by the City of Phoenix inspection team shall be noted on your daily report. Provide the name of City Inspector and the directive that was given.
The same technician shall be maintained on a project. The City of Phoenix Materials Lab shall be notified of any substitutions prior to reassignments.
City of Phoenix Materials Lab contact information: Asphalt Lab: (602) 495-2074 Soils Lab: (602) 495-5318 Concrete Lab: (602) 534-7076 Rob Duvall, Materials Supervisor (Field): Cell: (602) 448-9191 robert.duvall@phoenix.gov Andrea Lynch, Materials Supervisor (Lab): Desk: (602) 495-2070 Cell: (602) 819-3201 andrea.lynch@phoenix.gov



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MATERIALS LAB

EXHIBIT B - FIELD TESTING & REPORTING REQUIREMENTS

**TABLE 3A
MINIMUM TEST SCHEDULE & FINAL REPORT**

Minimum Testing Schedule:

A Minimum Testing Schedule is to be created and submitted electronically to the City of Phoenix Materials Lab within **5 business days** of project assignment. Testing frequencies are to be calculated using an approved set of plans in conjunction with the bid tab items to create an accurate representation of the minimum testing needed for the project. Any notes, comments, special circumstances and/or assumptions made for quantity calculations should be listed at the bottom of the page.

Final Report Should Include the Following:

All laboratories must submit a Final Report after the completion of each project. Laboratories will be notified by the City of Phoenix Materials Lab, via email, that the project is complete and all lab results for soils, concrete & asphalt will be attached. A USB drive containing the final report must be delivered to the City of Phoenix Materials Lab within **10 business days** from the date of the email notification (**20 business days** for large projects).

Final reports are to include all field and lab tests/results, daily reports and samples taken for the entire project. **All final reports must be stamped and signed by a registered professional engineer** and shall verify that all materials, sampled and tested, were found to be in compliance with the latest City of Phoenix Standards and Specifications. Construction materials that fail to meet specification requirements, but were incorporated in the project, must be summarized in the final report with a detailed explanation listing penalties, corrective actions, or justification for acceptance.

**TABLE 3B
PLANNING & DEVELOPMENT DEPARTMENT (PDD) PROJECTS ONLY
MINIMUM TEST SCHEDULE & FINAL REPORT**

Minimum Testing Schedule:

A Minimum Testing Schedule shall be created and submitted to the City of Phoenix PDD Inspector, during the pre-construction meeting. Testing frequencies are to be calculated using an approved set of plans, in conjunction with the bid tab items, to create an accurate representation of the minimum testing needed for the project. Any notes, comments, special circumstances and/or assumptions made for quantity calculations, should be listed at the bottom of the page.

Final Report Should Include the Following:

All laboratories must submit a Final Report at the completion of each project. A spiral bound copy of the Final Report must be delivered to the City of Phoenix PDD Inspector along with final record drawings of the project.

Final Reports shall include all field and lab tests/results (including any acceptance/deficiency test results from the City of Phoenix Materials Lab), daily reports and samples taken for the entire project. **All Final Reports must be stamped and signed by a registered professional engineer** and shall verify that all materials, sampled and tested, were found to be in compliance with the latest City of Phoenix Standards and Specifications. Construction materials that fail to meet specification requirements, but were incorporated in the project, must be summarized in the final report with a detailed explanation listing penalties, corrective actions, or justification for acceptance.



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Date: _____

Technician Name: _____

Private Lab Name: _____

EXHIBIT B - EQUIPMENT, FIELD TESTING & REPORTING REQUIREMENTS

TABLE 4

TESTING EQUIPMENT REQUIREMENTS CHECKLIST

At all times, technician must have the following:	Yes	No
Calibrated sand cone equipment (sand and cone, jar, plate, calibrated sand)		
Calibrated Speedy moisture gauge equipment (Speedy scale and reagent)		
Calibrated scale(s)		
Equipment to dig sand cone hole (spoon, screw driver, brush, hammer)		
Screens (with acceptable opening tolerances): #10, #4, ¾", 3" for rock corrections		
Calibrated concrete equipment (slump cone, slump plate, 5/8" diameter rod, 3/8" diameter rod, measuring device, small and large scoop)		
Calibrated one-point Proctor equipment: 4" diameter mold, 5-lb Proctor hammer, metal straight edge, family of curves (For Aviation projects only include: 6" diameter mold, 10-lb Proctor hammer)		
Calibrated nuclear density gauge (calibrated against sand cone and asphalt cores as required)		
Shovels (square and spade)		
Calibrated thermometers (asphalt and concrete)		
Wheelbarrow		
Sample containers (metal buckets for asphalt, plastic buckets/sample bags for soils, cylinder molds)		
Sample plate for asphalt		
Technician Expectations Packet		
Current City of Phoenix Card		
Laptop or Tablet Computer (with internet connection)		
Personal Protective Equipment: hard hat (ANSI/ISEA Z89.1), steel-toed boots (OSHA 1910.136), safety vest (ANSI/ISEA Z107-2004, Class 2 or 3), safety glasses (ANSI/ISEA Z87.1), gloves		

Technician Signature: _____

City of Phoenix Representative: _____

Notes: _____



CITY OF PHOENIX

STREET TRANSPORTATION DEPARTMENT

DESIGN & CONSTRUCTION MANAGEMENT DIVISION

**EXHIBIT C - MINIMUM MATERIAL TESTING QUALIFICATIONS CONCRETE & CEMENT
REFERENCE LABORATORY (CCRL) AND AASHTO Re-Source**

QUALITY MANAGEMENT SYSTEM:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
	R18	Standard Recommended Practice for Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
C1077(Aggregate) C1077(Concrete)		Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
D3666(Aggregate) D3666 (Asphalt Mixture)		Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
D3740 (Soil)		Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
E329 (Aggregate) E329 (Asphalt Mixture) E329 (Concrete) E329 (Soil)		Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

HOT-MIX ASPHALT REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
D5444	T30	Mechanical analysis of extracted aggregates
D2726	T166	Bulk specific gravity of non-absorptive compacted bituminous mixes using SSD specimens
D2041	T209	Theoretical maximum specific gravity and density of bituminous paving mixes
D6927	T245	Resistance to plastic flow of bituminous mixes using Marshall apparatus
D6926	R68	Preparation of Bituminous Specimens Using Marshall Apparatus
D6925	T312	Preparation and Determination of the Relative Density of Asphalt Mix Specimens using SGC
D3203	T269	Percent air voids in compacted dense and open bituminous mixes
D4125	T287	Asphalt binder content of asphalt mixtures by the nuclear method
D6307	T308	Asphalt binder content of asphalt mixtures by the ignition method

HOT-MIX ASPHALT AGGREGATE REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
C136	T27	Sieve analysis of fine and coarse aggregate
C702	R76	Reducing samples of aggregate to testing size
C566	T255	Total evaporable moisture content of aggregate by drying
C127	T85	Specific gravity and absorption of coarse aggregate

SOIL REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
D421	R58	Dry preparation of soil samples for particle size analysis and determination of soil constants
D422	T88	Particle size analysis of soils
D4318	T89	Determining the liquid limit of soil
D4318	T90	Determining the plastic limit of soil
D698	T99	Moisture density relations of soil using a 5.5lb rammer
D1557	T180	Moisture density relations of soil using a 10lb rammer
D2216	T265	Laboratory determination of moisture content of soils and rock by mass

PORTLAND CEMENT CONCRETE REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
C39/C39M	T22M/T22	Compressive strength of cylindrical concrete specimens
C31	R100M/R100	Making and curing concrete test specimens
C143/C143M	T119/T119M	Slump of hydraulic cement concrete
C138/C138M	T121/T121M	Density (unit weight), yield, and air content (gravimetric) of concrete
C172	R60/R60M	Sampling fresh mixed concrete
C617/C617M	T231	Capping cylinders of concrete specimens
C117	T11	Materials finer than 75mm (#200) sieve in mineral aggregate by washing

PORTLAND CEMENT CONCRETE AGGREGATE REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
C136/C136M	T27	Sieve analysis of fine and coarse aggregate
C702/C702M	R76	Reducing samples of aggregate to testing size
C566	T255	Total evaporable moisture content of aggregate by drying
D2419	T176	Plastic fines in graded aggregates and soils by the SE Test



CITY OF PHOENIX

STREET TRANSPORTATION DEPARTMENT
DESIGN & CONSTRUCTION MANAGEMENT DIVISION

**EXHIBIT D – PREFERRED ADDITIONAL MATERIAL TESTING QUALIFICATIONS BASED ON
CONCRETE & CEMENT REFERENCE LABORATORY (CCRL) AND AASHTO Re-Source**

ASPHALT BINDER REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
D2171/D2171M	T202	Viscosity of Asphalts by Vacuum Capillary Viscometer
D2170/D2170M	T201	Kinematic Viscosity of Asphalts
D4402/D4402M	T316	Viscosity of Asphalt at Elevated Temperatures Using a Rotational Viscometer
D244		Methods and Practices for Emulsified Asphalts
D6937	T59	Density of Emulsified Asphalt
D2939		Emulsified Bitumen Used as Protective Coatings
D402	T78	Distillation of Cutback Asphalt
D7175	T315	Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer
D113	T51	Ductility of Asphalt Materials
D6084	T301	Elastic Recovery of Asphalt Materials by Ductilometer
D7405	T350	Multiple Stress Creep and Recovery (MSCR) of Asphalt Binder Using a Dynamic Shear Rheometer
D7497	R78	Recovering Residue from Emulsified Asphalt Using Low-Temperature Evaporative Technique
D6934	T59	Residue by Evaporation of Emulsified Asphalt
D6997	T59	Residue by Distillation of Emulsified Asphalt
D7403		Residue of Emulsified Asphalt by Low Temperature Vacuum Distillation
D8078		Ash Content of Asphalt Binder and Emulsified Asphalt Residues
D92	T48	Flash and Fire Points by Cleveland Open Cup Tester
D3143/D3143M	T79	Flash Point and Fire Point of Liquids by Tag Open-Cup Apparatus
D7741/D7741M		Apparent Viscosity of Asphalt-Rubber or Other Asphalt Binders by Using a Rotational Handheld Viscometer
D946/D946M	M20	Penetration-Graded Asphalt Binder for Use in Pavement Construction
D6373	M320	Performance-Graded Asphalt Binder
D5/D5M	T49	Penetration of Bituminous Materials
D70/D70M	T228	Specific Gravity of Semi-Solid Asphalt Materials
D2872	T240	Effect of Heat and Air on a Moving Film of Asphalt Binder (Rolling Thin-Film Oven Test)
D6521	R28	Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
D6648	T313	Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
D7175	T315	Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
D7496	T59	Viscosity of Emulsified Asphalt by Saybolt Furol Viscometer
D7226	T382	Viscosity of Emulsified Asphalt by a Rotational Paddle Viscometer
D2042	T44	Solubility of the Residue in Trichloroethylene
D5	T49	Penetration of the Residue
D6084	T301	Elastic Recovery of residue from vacuum distillation
D88/D88M	T72	Saybolt Viscosity
D4124		Separation of Asphalt into Four Fractions
D36/D36M	T53	Softening Point of Bitumen (Ring-and-Ball Apparatus)
ARIZ504		Vacuum Recovery of Asphalt Emulsion Residue (An Arizona Method)
D95	T55	Water in Petroleum Products and Bituminous Materials by Distillation

CRACK SEALANT MATERIAL REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
D5167		Melting of Hot-Applied Joint and Crack Sealant and Filler for Evaluation
D5329		Sealants and Fillers, Hot-Applied, for Joints and Cracks in AC and PCC Pavements

SLURRY/MICRO SYSTEMS (SMS) MATERIAL REQUIRED TESTS:

<u>ASTM</u>	<u>ISSA</u>	<u>DESCRIPTION</u>
D6372		Design, Testing and Construction of Microsurfacing
D3910	TB-100	Design, Testing and Construction of Slurry Seal/Wet Track Abrasion of Slurry Seal
	TB-106	Measurement of Slurry Seal Consistency
	TB-109	Excess Asphalt in Mixtures by Loaded Wheel Tester and Sand Adhesion
	TB-113	Trial Mix Procedure of Slurry Design
	TB-114	Wet Stripping of Cured Slurry Surfacing Mixtures
	TB-139	Set and Cure Development by Cohesion Tester
	TB-147	Vertical and Lateral Displacement by Loaded Wheel Tester

HOT-MIX ASPHALT REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
D6752/D6752M	T331	Bulk Specific Gravity of Compacted Hot Mix Asphalt using Vacuum Sealing Method
D3549/D3549M		Thickness or Height of Compacted Asphalt Mixture Specimens
	R47	Reducing Samples of Asphalt Mixtures to Testing Size
D2172/D2172M	T164	Quantitative Extraction of Asphalt Binder from Asphalt Mixtures
	T324	Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
D8225		Cracking Tolerance Index of AC Using the Indirect Tensile Cracking Test at Intermediate Temperature
	T393	Fracture Potential of Asphalt Mixtures Using the Illinois Flexibility Index Test (I-FIT)
	T319	Quantitative Extraction and Recovery of Asphalt Binder from Asphalt Mixtures
D8159		Automated Extraction of Asphalt Binder from Asphalt Mixtures
D1856	R59	Recovery of Asphalt Binder from Solution by Abson Method
D5404		Recovery of Asphalt from Solution Using the Rotary Evaporator

HOT-MIX ASPHALT AGGREGATE REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
C128	T84	Specific gravity and absorption of fine aggregate
C1252	T304	Uncompacted void content of fine aggregate
C29/C29M	T19M/T19	Bulk Density (Unit Weight) and Voids in Aggregate
C131	T96	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the LA Machine
	T103	Soundness of Aggregates by Freezing and Thawing
C88	T104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
D6928	T327	Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
D7428		Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

SOIL REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
D7928		Particle-Size Distribution of Fine-Grained Soils by Hydrometer
D4943		Shrinkage Factors of Soils by Wax Method
D854	T100	Specific Gravity of Soils
D2974	T267	Organic Content in Soils by Loss on Ignition
	T288	Minimum Soil Resistivity
G187		Soil Resistivity Using the Two-Electrode Soil Box
D4972	T289	pH of Soils for Corrosion Testing
	T290	Water-Soluble Sulfate Ion Content in Soil
	T291	Water-Soluble Chloride Ion Content in Soil
D1140	T11	The amount of Material Finer than 75- μ m in Soils by Washing
D3441		Mechanical Cone Penetration Testing of Soils
D4944		Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Gas Pressure Tester
	T265	Determination of Moisture Content of Soils
D4972		pH of Soils
D2844/D2844M	T190	Resistance R-Value and Expansion Pressure of Compacted Soils
D1883	T193	The California Bearing Ratio

D2419 T176 Sand Equivalent Value of Soils and Fine Aggregate
ARIZ 236 pH and Minimum Resistivity of Soils and Aggregates

PORTLAND CEMENT CONCRETE REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
C231	T152	Air Content of Freshly Mixed Concrete by the Pressure Method
C173/C173M	T196/T196M	Air Content of Freshly Mixed Concrete by the Volumetric Method
C1064/C1064M	T309	Temperature of Freshly Mixed Portland Cement Concrete
C1231/C1231M		Determination of Compressive Strength of Hardened Cylindrical Concrete Specimens (Unbonded cap)

PORTLAND CEMENT CONCRETE AGGREGATE REQUIRED TESTS:

<u>ASTM</u>	<u>AASHTO</u>	<u>DESCRIPTION</u>
C40/C40M	T21/T21M	Organic Impurities in Fine Aggregates for Concrete



CITY OF PHOENIX

STREET TRANSPORTATION DEPARTMENT
DESIGN & CONSTRUCTION MANAGEMENT DIVISION

**EXHIBIT E- MINIMUM TECHNICIAN EXPERIENCE REQUIREMENTS, QUALIFICATIONS &
APPLICABLE CERTIFICATION**

The Request for Qualification (RFQ) specifies the minimum staffing requirements for firms, which include the following positions:

- Material Technician
- Senior Material Technician
- Chief Material Technician
- Chief Plant Inspector
- Material Supervisor

Guidelines regarding minimum experience and qualification for each position are provided in the accompanying exhibit as a reference. Applicable ATTI and ACI certifications, and valid City of Phoenix cards will also be required. City of Phoenix staff will make the final decision on technician qualifications for a given assignment. Additional background screening and badging will apply on certain assignments including projects for the Aviation, Water Services and Street Transportation Department. Firms are encouraged to propose additional positions as they see fit.



City of Phoenix

MATERIALS TECHNICIAN

JOB CODE 19160

Effective Date: 12/92

DISTINGUISHING FEATURES OF THE CLASS:

The fundamental reason this classification exists is to perform materials testing engineering work of average difficulty in the Street Transportation Department. Work is performed under the direct supervision of the Materials Supervisor who checks for technical accuracy and production.

ESSENTIAL FUNCTIONS:

- Performs physical tests on concrete, asphalt, and soils in the field and laboratory;
- Employs testing apparatus such as scales, nuclear gauges, compression machines, sieves, and other laboratory equipment;
- Records test results and compares them with applicable standards;
- Assists in the operation and use of a drill rig;
- Notifies appropriate personnel when sampling indicates failure in product quality;
- Maintains regular and reliable attendance.
- Demonstrates superior seamless customer service, integrity, and commitment to innovation, efficiency, and fiscally responsible activity.

Required Knowledge, Skills and Abilities:

Knowledge of:

- Basic fundamentals of materials controls and testing.
- Basic materials used in public works construction projects.

Skill in:

- Use of basic laboratory materials testing equipment.

Ability to:

- Understand and follow oral and written instructions in the English language.
- Observe, compare or monitor data and objects to determine compliance with prescribed operating standards.
- Bend or stoop repeatedly or continually over time.



City of Phoenix

- Move rock, sand, dirt or other material from one place to another using a shovel, rake or other tool.
- Work around testing equipment that employs a radioactive source using only normal protective equipment.
- Work in a variety of weather conditions with exposure to the outdoor elements.
- Work cooperatively with others.
- Communicate orally in the English language with customers, clients, and the public in face-to-face, one-to-one settings.
- Make precise arm-hand positioning movements and maintain static arm-hand position to use laboratory equipment.
- Perform algebraic computations.
- Establish priorities for own workload based upon such factors as need for immediate action, work objectives, work schedule, etc.
- Make decisions in normal routine situations in accordance with rules, regulations, and policies.

Additional Requirements:

- Some positions require the use of personal or City vehicles on City business. Individuals must be physically capable of operating the vehicles safely, possess a valid driver's license and have an acceptable driving record. Use of a personal vehicle for City business will be prohibited if the employee is not authorized to drive a City vehicle or if the employee does not have personal insurance coverage.
- Some positions will require the performance of other essential and marginal functions depending on work assignment, location or shift.

ACCEPTABLE EXPERIENCE AND TRAINING:

One year of experience in materials testing engineering work. Other combinations of experience and education that meet the minimum requirements may be substituted.



City of Phoenix

SENIOR MATERIALS TECHNICIAN

JOB CODE 19170

Effective Date: 12/92

DISTINGUISHING FEATURES OF THE CLASS:

The fundamental reason this classification exists is to perform technical materials testing work of increasing difficulty in the laboratory and field. Employees in this classification perform the full range of materials testing activities including asphalt plant inspection and testing, and work more independently than do Materials Technicians. Work is ordinarily performed under the general supervision of the Materials Supervisor who makes assignments, sets priorities, and periodically reviews work for production and to ensure that it is performed according to instructions and in conformity with sound engineering principles.

ESSENTIAL FUNCTIONS:

- Performs construction materials testing in the field and in the laboratory on materials such as concrete, asphalt, and soils used in the city right-of-way, on City property, or for City contracts;
- Inspects and tests asphalt produces at various plants for use on City controlled projects;
- Employs testing apparatus such as scales, nuclear gauges, compression machines, sieves, and other laboratory equipment;
- Computes percentages, ratios, and proportions of product quality in order to prepare engineering reports and analyses;
- Notifies appropriate personnel when sampling indicates failure in product quality where correction is needed;
- Records test results on standard forms;
- Keeps project inspector informed as to the status of tests performed;
- Compares test results with applicable standards;
- Performs routine maintenance of equipment used in the field, plant, and laboratory for the testing of materials;
- Ensures that a supply of work materials is on hand at assigned work station in order to have the supplies necessary to effectively complete assigned tasks;
- Compiles detailed information and arranges in prescribed order for records;
- Maintains regular and reliable attendance.
- Demonstrates superior seamless customer service, integrity, and commitment to innovation, efficiency, and fiscally responsible activity.



City of Phoenix

Required Knowledge, Skills and Abilities:

Knowledge of:

- Materials testing.
- The properties, characteristics, strengths, and weaknesses of materials.
- Standard detail and specifications.

Skill in:

- The operation of equipment used in the field, plant, and laboratory for the testing of materials.

Ability to:

- Perform mathematical computations required by individual tests.
- Work cooperatively with other City employees, engineers, contractors, and the public.
- Complete forms to record or report information in standard format as specified by the form.
- Exercise sound judgment in completing assignments.
- Make decisions in formal routine situations in accordance with rules, regulations, and policies.
- Comprehend and make inferences from written material in the English language such as Material Safety Data Sheets (MSDS) and technical manuals.
- Travel across rough, uneven, or rocky surfaces at construction sites.
- Bend or stoop repeatedly or continually over time to pound stakes into the ground or perform materials tests.
- Communicate orally with customers, clients, or the public in face-to-face, one-on-one settings or using a telephone.
- Observe, compare, or monitor testing equipment or data to determine if materials tested meet prescribed standards.
- Make precise arm-hand positioning movements and maintain static arm-hand position to use laboratory equipment.
- Understand and follow oral and written instructions in the English language.
- Learn job-related material primarily through oral instruction and observation to effectively perform job duties. This learning takes place mainly in an on-the-job training setting.
- Climb ladders to get into and out of trenches at construction sites.
- Lift arms above shoulder level to climb ladders.
- Work in a variety of weather conditions with exposure to the outdoor elements and dust.



City of Phoenix

- Move heavy objects such as bags of sand (50 pounds or more) long distances (more than 20 feet).
- Use tools such as picks, shovels, and hammers.
- Work around testing equipment that employs a radioactive source using only normal protective equipment.
- Work irregular shifts, weekends, and holidays as required.
- Work safely without presenting a direct threat to self or others.

Additional Requirements:

- Some positions will require the performance of other essential and marginal functions depending upon work location, assignment or shift.
- Some positions require the use of personal or City vehicles on City business. Individuals must be physically capable of operating the vehicles safely, possess a valid driver's license and have an acceptable driving record. In addition, individuals may be required to pass an Arizona Department of Transportation physical exam and possess the appropriate commercial driver's license (CDL). Pre-employment drug testing is required for CDL positions. Employees in CDL positions will be subject to unannounced alcohol and drug testing as a condition of continued employment. Use of a personal vehicle for City business will be prohibited if the employee does not have personal insurance coverage.

ACCEPTABLE EXPERIENCE AND TRAINING:

Three years of experience in materials quality control engineering work, including one year of experience in the construction materials testing field. Other combinations of experience and education that meet the minimum requirements may be substituted.



City of Phoenix

CHIEF MATERIALS TECHNICIAN

JOB CODE 19180

Effective Date: 12/92

DISTINGUISHING FEATURES OF THE CLASS:

The fundamental reason this classification exists is to perform highly specialized and complex paraprofessional materials testing work and direct Senior Materials Technicians, Materials Technicians, or Materials Aides engaged in various technical duties in the field and laboratory. Work is performed under the general supervision of a Civil Engineer III or Materials Supervisor who evaluates performance based upon results obtained.

ESSENTIAL FUNCTIONS:

- Performs construction materials quality testing in the field and laboratory;
- Employs testing apparatus such as scales, nuclear gauges, compression machines, sieves, and other laboratory equipment;
- Notifies appropriate personnel when sampling indicates failure in product quality;
- Records test results and compares them with applicable standards;
- Assists in the inspection and testing of asphalt produced at various plants for use on City controlled projects;
- Computes percentages, ratios, and proportions of product quality in order to prepare engineering reports and analyses;
- Assists in training Senior Materials Technicians, Materials Technicians or Materials Aides in quality control tests and reporting;
- Keeps project inspector informed as to status of tests performed;
- Serves as the lead worker on major projects by coordinating the work of assigned employees;
- Maintains regular and reliable attendance.
- Demonstrates superior seamless customer service, integrity, and commitment to innovation, efficiency, and fiscally responsible activity.

Required Knowledge, Skills and Abilities:

Knowledge of:

- Properties, characteristics, strengths, and weaknesses of materials, items or products used in public works construction.
- Materials testing.



City of Phoenix

- Basic construction methods and techniques.
- Standard detail and specifications.

Skill in:

- Use of basic laboratory materials testing equipment.

Ability to:

- Exercise sound judgment in completing assignments.
- Compile detailed information and arrange in prescribed order for records.
- Understand and follow oral and written instructions in the English language.
- Observe, compare or monitor data and objects to determine compliance with prescribed operating standards.
- Work around testing equipment that employs a radioactive source using only normal protective equipment.
- Work in a variety of weather conditions with exposure to the outdoor elements.
- Work cooperatively with others.
- Communicate orally in the English language with customers, clients, and the public in face-to-face, one-to-one settings.
- Make precise arm-hand positioning movements and maintain static arm-hand position to use laboratory equipment.
- Perform higher level mathematical calculations such as calculus, algebra, and trigonometry using a calculator.
- Make decisions in normal routine situations in accordance with rules, regulations, and policies.
- Comprehend and make inferences from materials written in the English language.
- Climb ladders or steps to get into and out of trenches at construction sites.
- Moves objects weighing 50 pounds or more long distances (more than 20 feet).
- Work irregular shifts, weekends or holidays.

Additional Requirements:

- Some positions require the use of personal or City vehicles on City business. Individuals must be physically capable of operating the vehicles safely, possess a valid driver's license and have an acceptable driving record. Use of a personal vehicle for City business will be prohibited if the employee is not authorized to drive a City vehicle or if the employee does not have personal insurance coverage.
- Some positions will require the performance of other essential and marginal functions depending on work assignment, location, or shift.



City of Phoenix

ACCEPTABLE EXPERIENCE AND TRAINING:

Five years of experience in materials quality control engineering work. Other combinations of experience and education that meet the minimum requirements may be substituted.



City of Phoenix

CHIEF MATERIALS PLANT INSPECTOR

JOB CODE 19190

Effective Date: 12/92

DISTINGUISHING FEATURES OF THE CLASS:

The fundamental reason this classification exists is to perform highly specialized and complex paraprofessional materials plant inspection engineering work. Work is performed under the general supervision of a Civil Engineer III or Materials Supervisor who evaluates performance based upon results obtained.

ESSENTIAL FUNCTIONS:

- Inspects plants manufacturing concrete pipe, concrete manholes, clay pipe, water line pipe, and corrugated metal pipe to be used on City projects;
- Performs hydro, compression, and D-Load tests;
- Inspects asphalt and concrete plants to ensure quality control and conformance to City standards;
- Performs cement treated base inspections and testing to measure moisture, cement content, mixing, depth, and strength of product;
- Rejects or accepts materials tested;
- Trains and directs Senior Materials Technicians or Materials Technicians in the inspection, testing, and reporting of inspections performed on pipe, concrete, and asphalt plant production;
- Computes percentages, ratios, and proportions of product quality deviations in order to prepare engineering reports and analyses;
- Keeps project inspector informed as to status of tests performed;
- Compares test results with applicable standards;
- Maintains regular and reliable attendance.
- Demonstrates superior seamless customer service, integrity, and commitment to innovation, efficiency, and fiscally responsible activity.

Required Knowledge, Skills and Abilities:

Knowledge of:

- Properties, characteristics, strengths, and weaknesses of materials, items and products used in public works construction.
- Concrete, pipe, and asphalt plant production.



City of Phoenix

Ability to:

- Communicate orally in the English language with customers, clients, and the public using a telephone and in face-to-face, one-to-one settings.
- Complete forms to record or report information in standard format.
- Perform routine maintenance on equipment used in the field, plant, and laboratory for testing of materials.
- Produce written documents in the English language using proper sentence construction, punctuation, grammar, and spelling.
- Exercise sound judgment in completing assignments.
- Understand and follow oral and written instructions in the English language.
- Observe, compare or monitor data and objects to determine compliance with prescribed operating standards.
- Work around testing equipment that employs a radioactive source using only normal protective equipment.
- Work in a variety of weather conditions with exposure to the outdoor elements.
- Work cooperatively with others.
- Make precise arm-hand positioning movements and maintain static arm-hand position to use laboratory equipment.
- Perform higher level mathematical calculations such as calculus, algebra, and trigonometry using a calculator.
- Comprehend and make inferences from materials written in the English language.
- Climb ladders or steps to get into and out of trenches at construction sites.
- Move objects weighing 50 pounds or more long distances (more than 20 feet).
- Work irregular shifts, weekends, or holidays.

Additional Requirements:

- Some positions require the use of personal or City vehicles on City business. Individuals must be physically capable of operating the vehicles safely, possess a valid driver's license and have an acceptable driving record. Use of a personal vehicle for City business will be prohibited if the employee is not authorized to drive a City vehicle or if the employee does not have personal insurance coverage.
- Some positions will require the performance of other essential and marginal functions depending on work assignment, location, or shift.

ACCEPTABLE EXPERIENCE AND TRAINING:

Five years of experience in materials testing engineering work. Other combinations of experience and education that meet the minimum requirements may be substituted.



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MATERIALS SUPERVISOR

JOB CODE 19200

Effective Date: 06/12

DISTINGUISHING FEATURES OF THE CLASS:

The fundamental reason this classification exists is to supervise the performance of material quality control engineering work in the laboratory and/or field. Supervision is exercised over the Chief Materials Plant Inspectors and/or Chief Materials Technicians, and Senior Materials Technicians. Assignments in this class are allocated to the Street Transportation Department. Work is performed under the supervision of a professional engineer who reviews work and develops design criterion on the basis of results obtained.

ESSENTIAL FUNCTIONS:

- Plans, coordinates and supervises all physical testing assigned to the materials laboratory, including any testing requiring environmental issues, agronomy testing, and hazardous waste.
- Supervises all field testing and inspection activities of materials in both the field and laboratory.
- Maintains required city and state certifications and licenses relating to materials sampling and testing.
- Oversees on-call contract technicians and laboratories to ensure they are testing to City, state, and lab standards, and Maricopa Association of Governments (MAG) standards.
- Ensures all suppliers maintain equipment and materials to meet City and MAG specifications.
- Supervises the inspection of asphalt, concrete and pipe plants where manufacturing of products will be used for City projects.
- Oversees all activities concerned with the application and maintenance of quality standards for processing materials used on City contract and permit projects for other City departments.
- Calibrates and maintains all machinery and instrumentation used in both the field and laboratory.
- Maintains regular and reliable attendance;
- Demonstrates superior seamless customer service, integrity, and commitment to innovation, efficiency, and fiscally responsible activity;



City of Phoenix

- Works more than forty hours in a workweek without additional compensation to perform assigned job duties, including weekends, evenings, early morning hours, and holidays as required.

Required Knowledge, Skills and Abilities:

Knowledge of:

- Phases of materials testing including determination of characteristics, strengths and weaknesses of materials, in order to approve all materials used in public works construction from the submittal phase through the design and construction phase.
- Quality control and Quality assurance testing on asphalt and concrete and soils, in the areas of structural, environmental, and civil engineering.
- Civil Engineering terminology.
- Standard details and specifications.
- Technical materials certification process.
- Federal requirements.
- Supervisory techniques.
- Standard computer programs.

Ability to:

- Perform a broad range of supervisory responsibilities.
- Prepare comprehensive analytical reports.
- Obtain technical materials certifications.
- Review various types of technical reports and plans.
- Qualify field and laboratory technicians to work within City Of Phoenix Right-of-Way protocols.
- Certify all suppliers operations according to MAG Standards.
- Communicate effectively and professionally with engineers, public officials, and the general public.
- Employ the practical applications of fractions, percentages, ratios and proportions, mensuration, practical algebra, geometric construction and essentials of trigonometry.
- Demonstrate the full range of quality control tests on asphalt, concrete, soils and other construction materials in the field and/or laboratory.
- Demonstrate and educate other departments on materials testing and proper use of laboratory and field testing equipment.
- Work cooperatively with others.
- Work safely without presenting a direct threat to self or others.



City of Phoenix

- Perform daily work safely, aware of dangers associated with any construction project.
- Apply OSHA standards when necessary in both the field and laboratory.

Additional Requirements:

- Some positions require the use of personal or City vehicles on City business. Individuals must be physically capable of operating the vehicles safely, possess a valid driver's license and have an acceptable driving record. Use of a personal vehicle for City business will be prohibited if the employee is not authorized to drive a City vehicle or if the employee does not have personal insurance coverage.
- Some positions will require the performance of other essential or marginal functions depending upon work assignment, location, or shift.

ACCEPTABLE EXPERIENCE AND TRAINING:

Six years of experience in materials quality control engineering work, including one year of experience at a chief materials technician level or chief materials plant inspector level. Other combinations of experience and education which meet the minimum requirements may be substituted.