

STANDARD BID CONDITIONS

M-07-106P

1. **ACCEPTANCE AND REJECTION:** The Arkansas State Highway and Transportation Department (AHTD) reserves the right to reject any or all bids, to accept bids in whole or in part (unless otherwise indicated by bidder), to waive any informalities in bids received, to accept bids on materials or equipment with variations from specifications where efficiency of operation will not be impaired, and to award bids to best serve the interest of the State.
2. **PRICES:** Unless otherwise stated in the Bid Invitation, the following will apply: (1) unit prices shall be bid, (2) prices should be stated in units of quantity specified (feet, each, lbs., etc.), (3) prices must be F.O.B. destination specified in bid, (4) prices must be firm and not subject to escalation, (5) bid must be firm for acceptance for 30 days from bid opening date. In case of errors in extension, unit prices shall govern. Discounts from bid price will not be considered in making awards.
3. **BID BONDS AND PERFORMANCE BONDS:** If required, a **Bid Bond** in the form of a cashier's check, certified check, or surety bond issued by a surety company, in an amount stated in the Bid Invitation, must accompany bid. Personal and company checks are not acceptable as Bid Bonds. Failure to submit a Bid Bond as required will cause a bid to be rejected. The Bid Bond will be forfeited as liquidated damages if the successful bidder fails to provide a required Performance Bond within the period stipulated by AHTD or fails to honor their bid. Cashier's checks and certified checks submitted as Bid Bonds will be returned to unsuccessful bidders; surety bonds will be retained. The successful bidder will be required to furnish a **Performance Bond** in an amount stated in the Bid Invitation and in the form of a cashier's check, certified check, or surety bond issued by a surety company, unless otherwise stated in the Bid Invitation, as a guarantee of delivery of goods/services in accordance with the specifications and within the time established in the bid. Personal and company checks are not acceptable as Performance Bonds. In some cases, a cashier's check or certified check submitted as a Bid Bond will be held as the Performance Bond of the successful bidder. Cashier's checks or certified checks submitted as Performance Bonds will be refunded shortly after payment has been made to the successful bidder for completion of all terms of the bid; surety bonds will be retained. Surety bonds must be issued by a surety company authorized to do business in Arkansas, and must be signed by a Resident Local Agent licensed by the Arkansas State Insurance Commissioner to represent that surety company. Resident Agent's Power-of-Attorney must accompany the surety bond. Certain bids involving labor will require Performance Bonds in the form of surety bonds only (no checks of any kind allowed). In such cases, the company issuing the surety bond must comply with all stipulations herein and must be named in the U. S. Treasury listing of companies holding Certificates of Authority as acceptable sureties on Federal Bonds and as acceptable reinsuring companies. Any excess between the face amount of the bond and the underwriting limitation of the bonding company shall be protected by reinsurance provided by an acceptable reinsuring company. Annual Bid and Performance Bonds on file with E & P Division must have sufficient unencumbered funds to meet current bonding requirements, or the bid will be rejected, unless the balance is submitted as set forth above, prior to bid opening.
4. **TAXES:** The AHTD is not exempt from Arkansas State Sales and Use Taxes, or local option city/county sales taxes, when applicable, and bidders are responsible to the State Revenue Department for such taxes. These taxes should not be included in bid prices, but where required by law, will be paid by the AHTD as an addition thereto, and should be added to the billing to the AHTD. The AHTD is exempt from Federal Excise Taxes on all commodities except motor fuels; and excise taxes should not be included in bid prices except for motor fuels. Where applicable, tax exemption certificates will be furnished by the AHTD.
5. **"ALL OR NONE" BIDS:** Bidders who wish to bid "All or None" on two or more items shall so stipulate on the face of bid sheet; otherwise, bid may be awarded on an individual item basis.
6. **SPECIFICATIONS:** Complete specifications should be attached for any substitution or alternate offered, or where amplification is necessary. Bidder's name must be placed on all attachments to the bid.
7. **EXCEPTIONS TO SPECIFICATIONS:** Any exceptions to the bid specifications must be stated in the bid. Any exceptions to manufacturer's published literature must be stated in the bid, or it will be assumed that bidder is bidding exactly as stated in the literature.
8. **BRAND NAME REFERENCES:** All brand name references in bid specifications refer to that commodity or its equivalent, unless otherwise stated in Bid Invitation. Bidder should state brand or trade name of item being bid, if such name exists.
9. **FREIGHT:** All freight charges should be included in bid price. Any change in common carrier rates authorized by the Interstate Commerce Commission will be adjusted if such change occurs after the bid opening date. Receipted common carrier bills that reflect ICC authorized rate changes must be furnished.
10. **SAMPLES, LITERATURE, DEMONSTRATIONS:** Samples and technical literature must be provided free of any charge within 14 days of AHTD request, and free demonstrations within 30 days, unless AHTD extends time. Failure to provide as requested within this period may cause bid to be rejected. Samples, literature and demonstrations must be substantially the same as the item(s) being bid, unless otherwise agreed to by AHTD. Samples that are not destroyed will be returned upon request at bidders expense. Samples from successful bidders may be retained for comparison with items actually furnished.
11. **GUARANTY:** Unless otherwise indicated in Bid Invitation, it is understood and agreed that any item offered or shipped on this bid shall be newly manufactured, latest model and design, and in first class condition; and that all containers shall be new, suitable for storage or shipment and in compliance with all applicable laws relating to construction, packaging, labeling and registration.
12. **BACKORDERS OR DELAY IN DELIVERY:** Backorders or failure to deliver within the time required may constitute default. Vendor must give written notice to the AHTD, as soon as possible, of the reason for any delay and the expected delivery date. The AHTD has the right to extend delivery if reasons appear valid. If reason or delivery date is not acceptable, vendor is in default.
13. **DEFAULT:** All commodities furnished will be subject to inspection and acceptance by AHTD after delivery. Default in promised delivery or failure to meet specifications authorizes the AHTD to cancel award or any portion of same, to reasonably purchase commodities or services elsewhere and to charge full increase, if any, in cost and handling to defaulting vendor. Applicable bonds may be forfeited.
14. **ETHICS:** *"It shall be a breach of ethical standards for a person to be retained, or to retain a person, to solicit or secure a State contract upon an agreement of understanding for a commission, percentage, brokerage, or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies maintained by the contractor for the purpose of securing business."* (Arkansas Code, Annotated, Section 19-11-708).

ARKANSAS STATE HIGHWAY & TRANSPORTATION DEPARTMENT
LITTLE ROCK, ARKANSAS
EQUIPMENT & PROCUREMENT DIVISION

Bid No. M-07-106P

BIDDER: _____

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	AMOUNT
1.	Wavelength-Dispersive X-Ray Fluorescence (XRF) Spectrometer	1	ea.	\$ _____
2.	Personal computer and components (including printer) necessary for Spectrometer's operation.	1	ea.	\$ _____
3.	Certified reference standards for testing and qualification of hydraulic cements per ASTM C114.	1	ea.	\$ _____

BID TOTAL: _____

Arkansas State Highway and Transportation Department
Specification for a Wavelength-Dispersive X-Ray Fluorescence Spectrometer

Introduction

This specification provides for a fully automated sequential wavelength-dispersive X-ray fluorescence (XRF) spectrometer for materials analysis. The unit is intended for use in quality control and research analyses. This unit shall be capable of performing analysis on portland cement, fly ash, slag, pressure-treated wood products, steel, paint components (liquid, powder, and film), liquid deicing chemicals and other items used in the construction and maintenance of highways. It shall perform analyses using calibrated analytical programs where certified standards exist, as well as perform quantitative "standardless" testing.

Unit Characteristics

All proposed equipment must be regular, serial production units. Used, prototype, experimental, or one-of-a-kind units are not acceptable. It must be equipped with all components necessary for the analysis of elements fluorine (F₉) to uranium (U₉₂), with the capability to upgrade to allow for elemental recognition of all elements from beryllium (Be₄) to uranium (U₉₂).

The XRF unit shall meet those requirements contained in ASTM C 1118 that are necessary for safe and accurate analysis. This shall include, but not be limited to, a complete safety protection system which isolates the x-ray path from the operator. The unit shall be equipped with protective features that protect it in the event of voltage problems, tube leakage, abnormal temperature changes, and other failures that could harm the unit and/or the operator. The unit must include a system that indicates when the x-ray tube is energized. If the indicator system fails to operate the unit must not allow power to the x-ray tube. Emergency shut down systems must be provided to protect the spectrometer in the event of a power failure. The unit must meet all Federal, State and local radiation protection requirements. Safety interlock check procedures must be provide with the unit.

The unit shall be capable of demonstrating precise and repeatable analyses with a stability that allows for calibrations to be used for extended periods. The unit must be capable of qualification based on the "Performance Requirements for Rapid Test Methods" as stated in ASTM C 114, Chemical Analysis of Hydraulic Cement. The unit shall meet the requirements of Table 1 Column 3, "Maximum Difference of the Average of Duplicates from SRM Certificate Values," with the exception that the maximum difference for the following components shall be as stated. Any exceptions to these allowed differences must be stated by the bidder.

Component	Maximum Difference of the Average of Duplicated from SRM Certificate Values
Al ₂ O ₃	0.087
Fe ₂ O ₃	0.045
MgO	0.056
SO ₃	0.072
Na ₂ O	0.026
K ₂ O	0.013
TiO ₂	0.008
P ₂ O ₅	0.008
ZnO	0.003
Mn ₂ O ₃	0.002

Temperature Environment

The unit shall be equipped with a system for stabilizing the spectrometer with optimum design for thermal, mechanical and electrical isolation. The environment shall be stabilized to no less than $\pm 0.1^{\circ}\text{C}$ at operating temperatures.

X-ray Generator and Tube

The generator should consist of, but not be limited to, an output rating of at least 4 kW. The voltage should be adjustable from at 20kV to 60 kV in not greater than 5 kV increments. Tube current shall be adjustable from at least 10-100 mA in increments of no more than 5 mA steps. Stability and reproducibility of both the current and the voltage shall be at least 0.05% or better for a $\pm 10\%$ change in line voltage and for ambient temperature variation of 15°C . The switching of kV and mA on each individual element shall be quick and rapid.

The unit shall have at least a 4 kW end-window design rhodium (Rh) x-ray tube. The system shall have a tube-over design or be equipped with an additional protection system that will remove the potential of contamination of the spectrometer due to spills and dust. The additional protection system shall be stated in the bid.

Cooling System

The unit shall be supplied with a cooling system capable of protecting the components from overheating. All components necessary for operation of the unit with the system must be furnished.

Detection System

The unit shall be equipped with a detection system that will allow for the instrument to comply with the testing requirements stated earlier.

The unit shall be furnished with a scanning goniometer with a range of at least 5 to $147^{\circ} 2\theta$. The goniometer control shall have a selection of continuous scanning speeds with a slewing speed of at least $1400^{\circ} 2\theta$ per minute. The reading accuracy of the goniometer setting shall be 0.01° or better and the reproducibility of the goniometer setting shall be ± 0.0005 or better.

The unit shall have a minimum of 2 detectors, a scintillation counter and a flow proportional counter. The detectors shall be mounted in such a way that they may be used separately or in tandem. The flow proportional counter shall have an angular range of at least 40 to $147^{\circ} 2\theta$ and the scintillation counter shall have a range of at least 5 - $88^{\circ} 2\theta$. The minimum count linearity of the scintillation detector shall be 1000 kcps and 2000 kcps on the flow proportional counter.

The crystal chamber shall allow for a total of 8 crystals with a minimum of 4 crystals included. These crystals shall be selected by the manufacturer as needed to meet the testing requirement stated. The manufacturer shall state in the bid which crystals will be supplied and why they were selected for final approval by the Department.

The collimating system shall have a minimum of 3 collimators, with a fine and a coarse provided. The 3rd collimator shall be selected by the manufacturer as needed to meet the testing requirements. The manufacturer shall state in the bid the 3rd collimator that will be supplied for final approval by the Department.

The unit shall include a programmable limiting diaphragm system to allow for the size of the aperture to be varied. The unit will be supplied with 6 automatically selectable sizes, which shall be stated in the bid for final approval by the Department.

The unit must contain a programmable primary beam filter system of not less than 4 positions with a filter configuration optimized for Rh radiation. Combinations of primary beam filters must allow for operation of the unit without compromise of accuracy. The filter system shall be stated in the bid for final approval by the Department.

Vacuum and Helium Flush System

The unit shall be equipped with vacuum and helium flush systems allowing for the analysis of solids, liquid, and/or powders. All components necessary for the analysis shall be included. This shall include but is not limited to vacuum pumps, vacuum gages, gas regulators and all tubing, valves, fittings, flow monitors and controls necessary to provide automatic analysis while maintaining a controlled pressure.

The system will provide for a dual design air lock mechanism that shall pump down the specimen chamber before opening it to the spectrometer and control the environment during analysis. The design of the system must use a stable and rapid pump vacuum system with automatic pressure control. The airlock system must result in minimum disturbance of the specimen. It will be designed to reduce introduction of particles to the analysis chamber.

The helium system shall have an airlock for flushing the specimen chamber with helium before introducing the specimen into the spectrometer. The system will be automated to control the switch between vacuum and helium and will not require equipment modifications for use.

Specimen Chamber and Introduction System

The unit will be equipped with a specimen changer that will accept solid or liquid samples or both. It shall allow for different sizes and shapes of specimens at the same time without disassembly of the changer. It shall allow for automatic loading of the specimens. It shall be equipped with a sensor capable of differentiating between liquid and solid samples. Safeguards shall be employed to allow for the proper analysis and to prevent the inadvertent introduction of liquid or loose powder into a vacuum environment by the system. A particulate collection system shall be provided to remove any loose particulate matter from the loading chamber. Designs that incorporate a vacuum seal to allow part of the spectrometer optical path to be kept under vacuum during the measurement of liquid or loose powdered samples are unacceptable unless a lifetime unconditional full warranty of the optical system including cleaning and replacement of collimators, crystals, window, seals, pumps, x-ray tubes and other related items are provided in the event of failure.

The design of the system must use a 2 position specimen chamber turret for loading and measuring. The unit will allow for a minimum of 3 specimen slots, with the capability to be expanded. All trays or supports necessary for analysis of solids and liquids shall be supplied. The design of the specimen changer will allow for ease of use and identification of specimens.

Holders shall be included for various type samples, and the instrument shall be able to recognize the type of medium required from the holder presented at the time of loading. Two holders for the analysis of glass bead and pressed powder samples will be supplied for each available sample spots (minimum of 6). Inserts to allow for the adjustment of the viewing diameter shall be supplied for the analysis of the glass bead and pressed powder samples. Holders for liquid samples (minimum of 6) and any additional consumables necessary for the analysis of 1000 samples using these holders will be supplied.

Software

The unit shall have the capability to be operated from a computer software interface. All connections and software necessary for operation by computer shall be supplied. Software shall allow for qualitative and quantitative analysis. The supplied version shall be compatible with Windows 2000, XP or NT and shall be upgradeable. It shall be capable of running under an internal management system. All data gathering routines shall be thoroughly documented. Upgrades to the software shall be supplied for the life of the instrument. Special programming knowledge shall not be required to utilize the software. The software must allow for easy-to-follow preset routines that can readily be carried out by an inexperienced operator after minimal instruction but also allow for the user to set up routines designed for special applications. The software shall allow for quick and easy qualitative measurement of all configured elements on an unknown material without the need for standards. This set up shall require minimal input of preset information.

A standardless analysis software shall be supplied to allow for the analysis of materials where there are no suitable reference materials available or where the composition of the sample is unknown. The software must handle a variety of sample materials. The software will generate quantitative results for all elements capable of being tested by the unit.

Software must be supplied to monitor the status of all mechanical systems; power supplies, gas and cooling water flow during the run including diagnosis capability in the software via link to the vendor.

The unit shall be supplied with manuals (paper(2 copies) and electronic) covering operation, maintenance and software. These manuals must be supplied in English and contain information covering the repair and safe operation of the unit and all components. Complete part lists, and exploded diagrams of the all components must be provided. Online help software for operation and applications must be supplied.

Any special connection cables or computer interface cards necessary for operation shall be supplied.

Incidentals

The unit will be on maneuverable wheels to allow for easy placement and access to rear and side components.

A list of needed spare parts and consumables including order number information and price will be supplied. This list shall be based on the anticipated operation of the unit for a period of 6 months with a minimum of 100 samples per month analysis.

Installation and Training

Bidder shall supply the Department with all needed information related to utilities and accommodations for installations. This information shall be provided to the Department within 14 days of award of bid. All parts, cabling, harnesses, wires, connections and accessory items must be provided for installation. Installation of the unit shall be provided by a trained manufacturer's representative at the Department's facility. This shall include complete installation and verification of the operation of the instrument. Additionally, a minimum of 3 days initial training for up to 4 personnel on the equipment and software shall be performed following the installation and verification. Training will be customized to meet the Department's needs.

During the initial training, establishment of the accuracy per the requirements of ASTM C 114 and the Department's exceptions to this standard will be demonstrated for glass beads and pressed

powder using Department supplied samples. Establishment of the unit to meet the requirements of this testing at the Department's facility will be used as a condition of acceptance. Analysis time for the ASTM C 114 glass bead samples for all applicable elements must be to the Department's satisfaction.

An additional 2 days of training at the Department's facility 6 months to 1 year after installation will be provided, scheduled at the Department's request. Training shall also be available for a two year period following completed installation for up to 2 people at a regularly scheduled XRF training class at a manufacturer's site in the United States.

Warranty and Support

The manufacturer will have an established Service Department in the United States with extensive experience in installing and servicing of the unit. The bidder shall provide free telephone support covering instrument, software and application issues between the hours of 9:00 am – 4:00 pm Central time for the life of the unit. Remote diagnostics for the unit will be allowed and provided free of charge for the life of the unit.

The unit will include a 6 month satisfaction guarantee. If in this 6 month period, the manufacturer is unable to successfully install and qualify the instrument to the Department's satisfaction, the unit will be returned with no cost to the Department.

The unit shall include a 1 year warranty covering all parts, labor and travel and living expenses for repair on-site beginning upon instrument acceptance. Spare parts must be available for all systems for at least a period of not less than 12 years from the date of purchase. Consumables must be available for all systems for a period of not less than 12 years. Any necessary warranty work will be completed within 21 calendar days of notification.

The x-ray tube shall have at least a 2 year nonprorated warranty effective following installation and acceptance of the instrument. X-ray tube warranty must also apply to all replacement tubes.

Warranty provisions for the x-ray power supply must be a minimum of 2 years without limitation for hours of use.

Service purchase agreement information for the second through fourth years must be supplied to the Department upon bid. The Department shall have the entire one-year warranty period to accept or decline a service agreement.

Delivery

Delivery and installation shall be completed within a maximum of a 120 calendar days after award of bid.

Price of delivery to door shall be included.

Separate Bid Items

Computer

A personal computer and the components (including printer) necessary for its operation will be supplied as a separate bid item to allow the Department to purchase the bid computer or to supply an equal item prior to or during the installation. Minimum specifications for this computer shall be provided.

3/6/2007

Certified Cement Standards

Certified reference standards developed specifically for the testing and qualification of hydraulic cements per ASTM C 114 shall be listed as an individual bid item to allow for evaluation separately. The bid must include a complete list of items supplied and their quantities.