

Continuous Friction Measurement Equipment

RQID1400054 - Verification of Availability

Estimated Cost: \$180,000.00

Find attached the “**Scopes of Work**” and “**Special Requirements**” for an upcoming **Invitation To Bid (ITB)**. Please review to determine if you would be able to **satisfy the requirements** (as applicable), and **interested in responding**; if so, please check the appropriate areas below and respond to this email confirming the same. Please pay “**CLOSE**” attention to the various sections and the “**SPECIAL & MINIMUM Requirements**”, being specified, and confirm your **ability** and **availability** to satisfy “**ALL**” sections/scopes.

See all **Sections** as listed below; paying very close attention to the “**minimum**” requirements of each. (While you are **not** bidding at this time, be mindful your response strongly influences SBD’s determination as it relates to a potential **SBE Measure**). So please be diligent in your review of the information and respond accordingly, based on your ability to meet **ALL** the applicable requirements.

- Are you able to meet the “Minimum Requirements” as described in Section 2.4 (2.4.1.1)? Yes ___ No ___
- Are you able to meet the “Minimum Requirements” as described in Section 2.4 (2.4.1.2)? Yes ___ No ___
- Are you able to meet the “Training” requirements/components as described in Section 2.12 (and all related sub-sections)? Yes ___ No ___
- Are you able to meet the “Compliance” requirements/components as described in Section 2.7 (and all related sub-sections)? Yes ___ No ___
- Are you able to meet the “Shipping” requirements/components as described in Section 2.8 (and all related sub-sections)? Yes ___ No ___
- Are you able to meet the minimum “Scope of Work” as described in Section 3.1? Yes ___ No ___
- Are you able to meet the “Vehicle” requirements as described in Section 3.2 (and all related sub-sections)? Yes ___ No ___
- Are you able to meet the “Test Method” requirements as described in Section 3.3 (and all related sub-sections)? Yes ___ No ___
- Please note “Test Wheel Assembly” specifications Section 3.4, (and all related sub-sections).
- Please note “Self-Watering Systems” Section 3.5.
- Please note “Water Tank” specifications Section 3.6.
- Please note “Operational Controls” specifications Section 3.7, (and all related sub-sections).
- Are you able to satisfy the “Computer” specifications/requirements Section 3.8? Yes ___ No ___
- Are you able to satisfy the “System Software” specifications/requirements Section 3.9 (and all the related sub-sections)? Yes ___ No ___

- Are you able to satisfy the “Mode of Measurement and Results Display” specifications/requirements Section 3.10 (and all the related sub-sections)?
Yes ___ No
- Are you able to satisfy the “Annual Calibration” specifications/requirements Section 3.11? Yes ___ No
- Are you able to satisfy the “Repair Service” requirements Section 3.12? Yes ___ No
- Are you able to satisfy the “Parts” requirements Section 3.14? Yes ___ No
- Are you able to meet the minimum “Delivery Requirements” as described in Section 2.5? Yes ___ No ___

___ I am “NOT” interested in this solicitation.

Name of Firm: _____ SBE Exp. Date: _____

Owner’s Name: _____ Signature: _____

Date: _____ Contact #: _____

Please respond by **12:00pm, Wednesday February 26, 2014** – (Providing References)

Any questions, feel free to contact me at the number below.

(Respond to the “**Verification**” whether you are interested or not (choosing “**Yes**” or “**No**” as applicable); this helps SBD in the determination of measures).

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 Small Business Development Division
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Continuous Friction Measurement Equipment

RQID1400054 - Verification of Availability

Estimated Cost: \$180,000.00

Please complete the following “**Reference Requirements**”:

Project Title:

Client Name

Contact No.:

Scope Description:

Project Title:

Client Name

Contact No.:

Scope Description:

Project Title:

Client Name

Contact No.:

Scope Description:

SECTION 2 - SPECIAL TERMS AND CONDITIONS

2.1 PURPOSE

The purpose of this solicitation is to establish a fixed price contract for the purchase of one (1) self-contained, computer controlled, Continuous Friction Measuring Equipment (CFME) vehicle, spare parts and services for the Miami-Dade County Aviation Department (MDAD).

2.2 TERM OF CONTRACT: FIVE (5) YEARS

This contract will commence and be effective on the first calendar day of the month succeeding approval by the Board of County Commissioners, or designee, unless otherwise stipulated in the Blanket Purchase Order issued by the County's Internal Services Department, Procurement Management Division, and contingent upon the completion and submittal of all required documents. This contract shall expire on the last day of the last month of the five-year period.

2.3 OPTION TO RENEW FOR FIVE (5) ADDITIONAL YEARS

The County shall have the option to renew the contract for an additional five (5) year period. Continuation beyond the initial period, and any option subsequently exercised, is a County prerogative, and not a right of the awarded Bidder. This prerogative may be exercised only when such continuation is clearly in the best interest of the County.

Should the awarded Bidder decline the County's right to exercise the option period, the County may consider the awarded Bidder in default which decision shall affect the awarded Bidder's eligibility for future contracts.

2.4 METHOD OF AWARD: LOWEST RESPONSIVE, RESPONSIBLE BIDDER IN THE AGGREGATE

Award of this contract will be made to the responsive, responsible Bidder who submits an offer on all items listed in this solicitation and whose offer represents the lowest price when the extended pricing for all items is added in the aggregate and who meets the minimum requirements listed below:

The extended pricing for repair services will be calculated as follows: $\text{Extended Price} = \text{Unit Price} \times \text{Estimated Quantity}$

The extended pricing for purchase of parts will be calculated as follows:

$\text{Extended Price} = \text{Estimated Spend} - (\text{Estimated Spend} \times \text{Discount offered})$

2.4.1 Minimum Requirements

2.4.1.1 The Bidder shall be regularly engaged in the business of providing CFME vehicles, spare parts and services. A list of airports that are presently utilizing or have utilized the equipment being bid in the past five (5) years shall be submitted. The list shall include the agency name, contact name and title, e-mail address, telephone number, delivery date of equipment, and date(s) of service to verify that the Bidder has successfully provided the goods and services described herein.

2.4.1.2 The Bidder shall be an approved CFME manufacturer as per Federal Aviation Administration (FAA) Advisory Circular 150/5320-12C (current edition).

2.5 PRICES SHALL BE FIXED AND FIRM FOR EACH TWELVE (12) MONTH PERIOD WITH ADJUSTMENTS ALLOWED

If the Bidder is awarded a contract pursuant to this solicitation the initial contract prices resultant from this solicitation shall prevail for a twelve (12) month period from the contract's initial effective date. Prior to completion of each twelve (12) month period, the County may consider an adjustment to prices based on changes in the following price index: Consumer Price Index, Urban Wage Earners and Clerical Workers Miami-Ft. Lauderdale, Florida, Other Goods and Services, Series ID: CWURA320SAG,CWUSA320SAG. The adjustments may be upward or downward.

It is the awarded Bidder's responsibility to request any pricing adjustment under this provision. For any adjustment to commence on the first day of next twelve (12) month period, the request for adjustment should be submitted thirty (30) days prior to expiration of the then current twelve (12) month period. This adjustment request should not be in excess of the relevant pricing index change. If no adjustment request is received, the County will assume that the awarded Bidder has agreed to the current prices.

The adjustment will be applied by calculating the percentage change (increase or decrease) between the index value effective on the first day of the twelve (12) month period and the most recent index available on the date of adjustment. Day of adjustment will be the last business day of the twelve (12) month period. The County reserves the right to reject any price adjustments submitted by the awarded Bidder if they are not in accordance with the above.

2.6 METHOD OF PAYMENT: PERIODIC INVOICES FOR COMPLETED PURCHASES

The awarded Bidder shall submit an invoice to the County user department after purchase and/or service has been completed. Refer to Section 1.34 for details regarding invoice requirements.

2.7 COMPLIANCE WITH FEDERAL STANDARDS

2.7.1 All items to be purchased and/or services to be performed under this contract shall be in accordance with all governmental standards, to include, but not limited to, those issued by the FAA and International Civil Aviation Organization (ICAO).

2.7.2 CFME shall be capable, at a minimum, of meeting or exceeding all the performance requirements of FAA Advisory Circulars (AC) 150/5320-12 (current edition). CFME system must be specifically listed as approved in AC 150/5320-12 by manufacturer and model type.

2.7.3 CFME vehicle shall comply with OEM gross vehicle weight rating (GVWR) and/or gross axle weight rating (GAWR). Provide loaded and unloaded weight distribution charts for the type of vehicle with equipment, full water tank, and passengers as follows:

- vehicle weight with no equipment,
- vehicle weight with equipment and passengers, and
- vehicle weight with equipment, passengers, and liquid (water)

2.8 SHIPPING TERMS: F.O.B. DESTINATION

All Bidders shall quote prices based on F.O.B. Destination and shall hold title to the goods until such time as they are delivered to, and accepted by, an authorized County representative.

2.9 WARRANTY

The manufacturer shall guarantee each item delivered under the contract against defects in design, material or workmanship, and against any damage caused prior to delivery and acceptance by the County. Unless otherwise specified, this guarantee extends for a period of two (2) years from the date of first use, except those items of standard commercial design which carry the original manufacturers (OEM) standard warranty. As stated in warranty, upon notice, manufacturer shall promptly repair or replace all defective or damaged items delivered under the contract. The manufacturer may elect to have any replaced item returned to their plant, with freight charges paid by the manufacturer. Unless they fail as a result of improper application by the manufacturer, batteries, rubber tires and material normally consumed in operation are excluded from this guarantee, but shall in any event be guaranteed by the manufacturer to the extent of any guarantee received by the manufacturer from the supplier.

2.10 INDEMNIFICATION AND INSURANCE

2.10.1 Contractor shall indemnify and hold harmless the County and its officers, employees, agents and instrumentalities from any and all liability, losses or damages, including attorneys' fees and costs of defense, which the County or its officers, employees, agents or instrumentalities may incur as a result of claims, demands, suits, causes of actions or proceedings of any kind or nature arising out of, relating to or resulting from the performance of this Agreement by the Contractor or its employees, agents, servants, partners principals or subcontractors. Contractor shall pay all claims and losses in connection therewith and shall investigate and defend all claims, suits or actions of any kind or nature in the name of the County, where applicable, including appellate proceedings, and shall pay all costs, judgments, and attorney's fees which may issue thereon. Contractor expressly understands and agrees that any insurance protection required by this Agreement or otherwise provided by Contractor shall in no way limit the responsibility to indemnify, keep and save harmless and defend the County or its officers, employees, agents and instrumentalities as herein provided.

2.10.2 The Contractor shall furnish to the Internal Services Department, 111 N.W. 1st Street, Suite 1300 Miami, Florida 33128, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

- A. Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.
- B. Commercial General Liability Insurance in an amount not less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage. **Miami-Dade County must be shown as an additional insured with respect to this coverage.**
- C. Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than *\$1,000,000 combined single limit per occurrence for bodily injury and property damage.

***Under no circumstances are Contractors permitted on the Aviation Department, Aircraft Operating Airside (A.O.A) at Miami International Airport without increasing automobile coverage to \$5 million.**

Only vehicles owned or leased by a company will be authorized. Vehicles owned by individuals will not be authorized.

- 2.10.3** All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The company must be rated no less than "A-" as to management, and no less than "Class VII" as to financial strength by Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey, or its equivalent, subject to the approval of the County Risk Management Division.

or

The company must hold a valid Florida Certificate of Authority as shown in the latest "List of All Insurance Companies Authorized or Approved to Do Business in Florida" issued by the State of Florida Office of Insurance Regulation.

NOTE: CERTIFICATE HOLDER MUST READ:

**MIAMI-DADE COUNTY
111 NW 1ST STREET
SUITE 2340
MIAMI, FL 33128**

2.11 **MANUALS**

The awarded Bidder shall submit two (2) complete vehicle operation and maintenance instruction manuals including specifications and diagrams.

2.12 **TRAINING**

- 2.12.1** The awarded Bidder shall provide training in accordance with FAA AC 150/5320-12, Appendix 5 within seven (7) days of the actual delivery of the CFME. Training sessions shall be conducted at MDAD. Each training session will cover all aspects of the maintenance, service and operation of the CFME, as well as the use of all software systems in the vehicle and off line. The training outline is as follows:

A. Classroom Instruction.

- (1) Purpose of Training Program.
- (2) General Discussion on Pertinent Federal Aviation Regulations.
- (3) General Discussion on Pertinent ACs.
- (4) General Discussion on Pertinent ASTM Standards.
- (5) General Overview of Program.
- (6) Review of Requirements in AC 150/5320-12:
 - (i) Coefficient of Friction Definition.
 - (ii) Factors Affecting Friction Conditions.
 - (iii) ASTM Standards for CFME.
 - (iv) ASTM Standards for Friction Measuring Tires.
 - (v) Operation of CFME.
 - (vi) Programming the Computer for FAA and ICAO Formats.
 - (vii) Maintenance of CFME.

- (viii) Procedures for Reporting Friction Numbers.
- (ix) Preparation and Dissemination of NOTAMS.
- (7) Orientation to the Calibration, Operation, and Maintenance of CFME.

B. Field Experience.

- (1) Operation and Maintenance of CFME.

C. Testing.

- (1) Solo Test and Written Examination on All Items Covered in Course.

D. Award Of Training Certificate

- 2.12.2 Multiple sessions may be required to accommodate all staffing assignments and schedules. In addition, refresher training sessions may be necessary to ensure that the operator maintains a high level of proficiency.

2.13 DEMONSTRATION OF EQUIPMENT MAY BE REQUIRED PRIOR TO ACCEPTANCE

Prior to acceptance of the delivered equipment by County personnel, the awarded Bidder may be required to demonstrate the equipment to cognizant County personnel, at no separate cost. The purpose of this demonstration is to observe the equipment in an operational environment and to verify its capability, suitability, and adaptability in conjunction with the performance requirements stipulated in this solicitation. If a demonstration is required, the County will notify the awarded Bidder of such in writing and will specify the date, time and location of the demonstration. If the awarded Bidder fails to perform the demonstration on the specified date stipulated in the notice, the County may elect to cancel the contract on a default basis, or to re-schedule the demonstration, whichever action is determined to be in the best interests of the County. The County shall be the sole judge of the acceptability of the equipment in conformance with the specifications and its decision shall be final.

2.14 AVAILABILITY OF CONTRACT TO OTHER ENTITIES

It is hereby agreed and understood that any County department or agency may avail itself of this contract and purchase any and all services specified herein from the awarded Bidder(s) at the contract price(s) established herein. Under these circumstances, a separate purchase order shall be issued by the County, which identifies the requirements of the additional County department(s) or agencies.

2.15 CONTACT PERSON

For any additional information regarding the terms and conditions of this solicitation and resultant contract, contact: Jocelyn R. Fulton, at (305) 375-4735 or email – fultonj@miamidade.gov.

SECTION 3 – TECHNICAL SPECIFICATIONS

3.1 SCOPE OF WORK

The awarded Bidder shall provide on (1) Continuous Friction Measuring Equipment vehicle, parts and services as required by the County. The awarded Bidder shall provide repair services inclusive of labor, supplies, tools, equipment, parts, etc., to test, calibrate, repair and maintain the CFME equipment and computer system. The awarded Bidder shall provide training services covering all aspects of the maintenance, service and operation of the CFME, as well as the use of all software systems in the vehicle and off line.

3.2 VEHICLE

3.2.1 MDAD is interested in purchasing only proven technology. The CFME being offered must be in "Commercial Production" for not less than five (5) years with a minimum of ten (10) units produced, delivered, and in place at an Airport and approved by the FAA in the United States. Bidders submitting bids on non-production, prototype equipment or equipment that has a track record of less than five (5) year service will be deemed non-compliant.

3.2.2 All required equipment and watering tank shall be accommodated in a new and unused standard rear wheel drive highway pick-up truck of sufficient size, and modified to accept the testing instruments. The pick-up truck shall be manufactured by Ford or Chevrolet.

3.2.3 The vehicle shall meet all applicable Federal and State laws and regulations for use on public highways. It shall have the largest stock gasoline powered engine available with operating and driving characteristics similar to a standard passenger vehicle. Front and rear axle ratings shall be adequate for required loadings and hauling capability.

3.2.4 The vehicle shall be designed to sustain rough usage, high speed testing and still function properly and provide efficient and reliable methods of equipment calibration.

3.2.5 The vehicle shall be the latest model year available at time of purchase and equipped with all standard and specified components as listed in factory data books and brochures. If not listed as standard equipment the following items shall be furnished and installed:

- Automatic transmission
- Air conditioning
- Bucket seats for driver and passenger/operator
- Cruise control
- AM/FM Radio
- Power disc brakes with four (4) wheel anti-lock brake system (ABS)
- Tinted windows
- Heavy duty shock absorbers and suspension to adequately handle imposed loads and give positive directional stability during all phases of operation.
- Power steering
- Power windows

- Inverter 12 volt 120 VAC power supply
- Low profile bed cover
- Vinyl floor mats
- Inside rear view mirror
- Tinted glass
- Full size spare tire
- GVWR greater than 10,000 pounds

3.2.5.1 MATERIALS:

Materials shall conform to the specifications listed herein. When not specifically listed, materials shall be of the best quality used for the purpose in commercial practice. Materials shall be free of all defects and imperfections that might affect the serviceability of the finished product.

3.2.5.2 DESIGN:

The equipment and components shall be designed for long life and stability in accordance with the best engineering practices. The equipment design and accessory installation shall permit accessibility for use, maintenance and service. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks or other elements which could cause injury to personnel or equipment. All oil, hydraulic and water lines and electrical wiring shall be located in protected positions, properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members, except where a through-frame or body connector is necessary.

3.2.5.3 CONSTRUCTION:

The vehicle and self-contained testing equipment, along with its electronic, hydraulic and/or pneumatic systems shall be constructed of quality, dependable components, recognized for their reliability and durability.

The vehicle shall be constructed so that no part can work loose in service. The vehicle shall be built to withstand the strains, jars, vibrations and other conditions incident to service intended.

3.2.5.4 ELECTRICAL:

All electrical circuits shall be fused. Provide an independent 12-volt auxiliary battery and charging system securely mounted in the vehicle.

3.2.5.5 SPEED RANGE:

The CFME vehicle must be able to conduct friction surveys at speeds of 40 and 60 mph (65 and 95 km/hr), with a tolerance of ± 3 mph (± 5 km/hr). The vehicle, when fully loaded with water, shall be capable of accelerating to these speeds within 500 and 1000 feet (150 and 300 m) from the starting position, respectively.

3.2.5.6 LIGHTING:

Two (2) internally controlled spot lights mounted on each side of the vehicle and controlled from the driver's position. A Light Emitting Diode (LED) amber strobe light bar shall be mounted on the roof of the CFME vehicle. The LED light bar shall be visible from any direction, day and night, including the air. The LED light bar shall meet or exceed the most current version of FAA AC 150/5210-5.

3.2.5.7 COMMUNICATION:

The CFME shall be equipped with a TECHNISONIC VHF/AM Model TiL-91-DE, 7W transceiver; and PA/Siren system with top mounted external speaker, wired by switch so that output from the radio may be directed to the outside speaker.

3.2.5.8 MARKINGS:

Shall conform to the requirements of FAA AC 150/5210-5, Painting, Marking, and Lighting of Vehicles Used on an Airport, for airfield service vehicles.

3.2.5.9 PAINT AND FINISH:

FAA Chrome Yellow as specified in FAA AC 150/5210-5, Appendix A.

3.2.5.10 ADDITIONS TO VEHICLE:

- Dash mounted display providing speed and Mu for real time test monitoring.
- Industrial hardened system electronics vehicle control unit (VCU)
- Fire extinguisher
- Pavement temperature sensor
- Ambient air temperature sensor
- Optional: Differential Global Positioning System (DGPS)
- Optional: Pavement texture sensor for real time Mean Profile Depth (MPD)

3.3 TEST METHOD:

3.3.1 The measuring system shall consist of a retractable fifth-wheel assembly (test wheel) with a two-axis force transducer that accurately measures both true horizontal traction (drag) force and vertical load to eliminate the variations in torque radius due to test tire deflection under dynamic bouncing load, effects of tire wear and drag force footprint shift effects.

3.3.2 The system must be capable of ensuring constant down pressure and load to maintain positive contact with the ground, adjusting for both profile variance in pavement surfaces and disturbance from movement in the vehicle.

3.3.3 The dynamic vertical load and horizontal drag force shall be measured continuously and the resulting coefficient of slip friction (Mu) instantly calculated in real time during the test. The recorded friction value shall be proportional to the ratio of the instantaneous longitudinal slip tractive force to the instantaneous vertical wheel load. Data shall be stored at a minimum of one foot (0.3 m) intervals.

3.3.4 The system shall be designed to withstand the high speed testing over rough surfaces, bad weather conditions and extreme temperature variations while maintaining calibration accuracy.

3.4 **TEST WHEEL ASSEMBLY:**

3.4.1 The CFME vehicle shall be furnished with measuring tires which are designed for determining runway friction values in accordance with FAA Advisory Circular (AC) 150/5320-12 (current edition) and ASTM E1551.

3.4.2 Two (2) nonribbed (smooth) tires, meeting ASTM E1551 shall be furnished on split rims and tubes with curved inflation valve stems. The spare tire shall be mounted in the rear of the vehicle. A calibrated tire pressure dial gauge shall be provided with the test system as standard equipment. The test tire shall have remote tire pressure monitoring capability.

3.4.3 Test equipment including hydraulic pump (for instant raise/lower of test tire) shall be mounted below rear of vehicle.

3.4.4 A digital encoder for speed and distance shall be provided. The encoder shall provide speed resolution and accuracy of $\pm 1.5\%$ of the indicated speed or ± 0.5 mph (± 0.8 km/h), whichever is greater. The encoder shall be capable of operating under all weather conditions.

3.5 **SELF-WATERING SYSTEM:**

The CFME shall contain a self-wetting system that includes a positive displacement water pump with a laminar flow water nozzle. The nozzle and pump system shall distribute a uniform water layer thickness of 0.04 inch (1.0 mm) in front of the friction measuring wheel at all test speeds without the need for vehicle operator interaction. The system shall include a flow meter to record real time water flow. The water tank shall have a digital water volume sending unit and be visible in the operating software of the system.

3.6 **WATER TANK:**

The water tank shall be constructed of strong lightweight non-corrosive material, with sufficient capacity to test 42,000 feet of runway without refilling. It shall be fully baffled to prevent side and forward water movement during high speed turns and fast braking. Provide external large capacity quick fill for water tank and overflow beneath the CFME vehicle.

3.7 **OPERATIONAL CONTROLS:**

3.7.1 A detachable swivel mounted computer that interfaces with solid-state electronic instrumentation. An operator's central console with master controls for power, water system, test wheel, emergency test stoppage including remote, hand-held test start button.

3.7.2 The interior of the CFME is to be laid out for easy one-person operation and access to system functions.

3.7.3 All test functions such as lowering the test wheel, water application and friction measurement shall be sequentially controlled by the computer. The system software must be capable of performing automated electronic self-tests, diagnostics and automatic calibration at start-up.

3.8 COMPUTER:

The computer shall be a Lenovo laptop with Windows 7 operating system (64 bit), minimum 128 GB hard drive, I5 processor, minimum 2.70 GHz, 4 GB RAM, USB 2 port, and Ethernet port. Accessories shall include an onboard Lexmark or Hewlett Packard (HP) inkjet color printer mounted behind the operator within easy reach.

3.9 SYSTEM SOFTWARE:

3.9.1 The software shall be Windows based running in the latest environment. The software shall have on-line Help functions. All selections shall be mouse and hot-key selectable. The software shall be capable of operating in both Metric and US Standard units.

3.9.2 Software shall ensure that calibration must be performed prior to testing by locking out the test section of the software until field calibration has been completed.

3.9.3 Software shall allow for diagnostics of all digital encoders, analog devices, and analog to digital encoders and timers in the system.

3.9.4 Software shall allow the operator to select and configure all devices on the system including selection of test type, test watering, test cycling, test cycle times, measurement units, data display options and formats, data storage and printer options.

3.9.5 Software shall provide for on board printing of the test data both during the testing sequence and after testing is complete.

3.9.6 Software shall provide test information templates which are customizable by the user and allow multiple templates to be stored and recalled from the test screen. All information shall be stored with the test data.

3.9.7 Software shall allow the operator to calibrate the force transducer, distance encoders, flow meters and temperature sensors on the system. The screens shall provide details on the values determined by the calibration system.

3.9.8 Software shall allow for the real time display of speed, Mu, water tank volume, temperature sensor(s) output, test cycle completion, test data values such as Mu average traction values and load values from the two axis transducer. The software shall allow the user to select what data is displayed during the test sequence.

3.9.9 All data shall be stored in ASCII format

3.10 MODE OF MEASUREMENT AND RESULTS DISPLAY:

3.10.1 The CFME shall measure and record runway friction values (with or without water) in accordance with Federal Aviation Administration (FAA) and International Civil Aviation Organization (ICAO) requirements.

3.10.2 The test results shall be continuously displayed to the operator on the laptop as a permanent trace and as friction numbers. The test data shall be recorded and stored on the computer hard drive for reprinting and viewing or for transfer to permanent storage and future retrieval.

3.10.3 Each printout produced shall include the following recorded information:

- Time and date of test, airport name, runway designation, test speed, weather notations, temperature, and calibration verification.
- A continuous trace of friction measurements versus pavement length at a scale of at least one inch equals 300 feet (90 m) minus the required acceleration/deceleration distances at the runway ends.
- Printed marks depicting each 50 foot (15 m) increment of the runway length.
- Average friction values for both 250, 500 foot intervals per FAA or one-third segments of the runway length per ICAO as selected by the operator.
- Color graphics providing identification of acceptable, marginal and unacceptable areas in green, yellow and red, respectively.

3.10.4 The CFME shall be capable of consistently repeating friction averages throughout the friction range on all types of pavement surfaces. Friction averages for each 500 foot (150 m) segment located on the pavement surface must be within a confidence level of 95.5 percent, or two standard deviations of ± 0.06 Mu numbers.

3.11 **ANNUAL CALIBRATION**

The awarded Bidder shall calibrate the CFME annually and issue a calibration certificate to MDAD.

3.12 **REPAIR SERVICE**

Upon notification (by phone or e-mail) of items needing repair, the awarded Bidder shall come to MDAD within five (5) business days to inspect the item(s) and provide a written report of the problem with correction recommendation(s) and a detailed cost estimate within one (1) business day. This written cost estimate shall be based on the hourly rate of the awarded Bidder and shall include a breakdown of material costs and the number of days needed to repair the items for the County. Once the County reviews and approves the written estimate, the repair services may commence.

3.13 **HOURLY RATE FOR REPAIR SERVICE**

The hourly rate shall be deemed to provide full compensation to the awarded Bidder for labor, equipment used for repairs (provided by awarded Bidder), travel time, and any other element of cost or price to repair the CFME.

3.14 **PARTS:**

Parts to be used for repair services shall be invoiced at the percentage discount offered from the Manufacturer's Suggested Retail Price (MSRP). The awarded Bidder shall submit a copy of the parts list showing the MSRP with each invoice. Spare parts ordered by MDAD shall be delivered to the County within two (2) business days of the order being placed.