DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

26 JUN 1996

FROM: HQ AFCESA/CES
139 Barnes Drive
Tyndall AFB FL 32403-5319

SUBJECT: **Engineering Technical Letter (ETL) 96-3: Typical Statement of Work for Airfield Pavement Condition Survey**

1. Purpose. AFR 93-5, *Procedures for Airfield Condition Surveys*, describes the procedure for conducting airfield condition surveys and calculating Pavement Condition Indices. Attachment 1 to this ETL provides a typical statement of work for contracting this effort to private firms.

2. Application. Guidance within this ETL is optional.

2.1. Authority: AFR 93-5, *Procedures for Airfield Condition Surveys.*

2.2. Effective Date: Immediately. Expires five years from date of issue.

3. Points of Contact: Capt Caren Ouellette, HQ AFCESA/CESC, DSN 523-6330; or Mr. Jim Greene, DSN 523-6334.

William G. Schauz, Colonel, USAF
Director of Technical Support

2 Atch
1. Sample Statement of Work for Airfield Pavement Condition Survey
2. Distribution List

Statement of Work
Airfield Pavement Condition Survey
Paver Pavement Management System
Anywhere AFB, USA

1.0 Purpose

This document sets forth the general requirements for the performance of the various services required under the contract. The Architect-Engineer (A-E) shall perform all of the following Title I and Other Services, more specifically identified in individual orders in the A-E Statement of Work.

1.1 Applicable Publications. The publications listed below form a part of this statement of work to the extent referenced. They are referred to in the text by short title only. Publications will not be furnished. They may be acquired from the Government Printing Office, other Federal agencies, or commercial microfilm sources.

1.1.1 US Army Construction Engineering Research Laboratory (CERL):

- TM 5-623, *Pavement Maintenance Management*, December 95
- CERL-TRM-294, *Pavement Maintenance Management for Roads and Parking Lots*, September 1980
- Micro PAVER Version 3.21 *User's Manual*, March 1995
- Technical Report M-86/04, *The Practical Use of PAVER in Planning, Programming, and Developing Projects for Pavement Maintenance and Repair*, by D. R. Uzarski and R. C. Soule, March 1986

1.1.2 Headquarters Department of the Air Force:

- AFR 93-5, *Procedures for US Army and USAF Airfield Pavement Condition Survey*, July 1989
- AFJMAN 32-8008 Vol 1, *General Provisions for Airfield/Heliport Pavement Design,* March 1994
- AFM 88-24 Ch 1, *Airfield Pavement Evaluation Program,* August 1988
- AFM 85-8, *Maintenance and Repair of Surface Areas*, March 1977
- ESL-TR-80-53, *Pavement Maintenance Management for Roads and Parking Lots*, September 1980

1.2 Explanation of Terms. The definitions and terms contained in ESL-TR-80-53/CERL-TRM-294 apply, except as amplified or modified below.

1.2.1 *Branch (or Feature):* A branch (feature) is any identifiable part of the pavement network which is a single entity and has a distinct function. For airfield pavements, a branch is synonymous with a feature.

1.2.2 *Lane Equivalent Mile:* The surfaced area equivalent to 1609 meters by 3.8 meters (5280 feet by 12.5 feet), or 6131.6 square meters (7333 square yards).

1.2.3 *Micro PAVER:* A pavement maintenance and repair management system developed for use on a microcomputer.

1.2.4 *Pavement:* A surface of a prepared or manufactured product superimposed on the base, subbase, or subgrade either as a structural member or as a weather and abrasive-resisting medium.

1.2.5 *Pavement Network:* All areas which provide access or parking for aircraft.

1.2.6 *Pavement Structure:* Any combination of subbase, base course, and surface course placed on a subgrade to support the traffic load and distribute it to the subgrade.

1.2.7 *Primary Airfield Pavements:* All mission essential pavement (Runway, Parallel Taxiway, Main Parking Apron, Arm-Disarm Pads, and Alert Pavement).

1.2.8 *Sample Units:* A sample unit is any identifiable area of the pavement section; it is the smallest component of the pavement network. Each pavement section is subdivided into sample units for pavement inspection. For asphalt or tar-surfaced pavements, sample units for airfield pavements are approximately 464.5 square meters (5000 square feet), ± 93 square meters (1000 square feet). For concrete pavements, the sample unit size is 20 slabs, ± 8 slabs. For slabs with joint spacing greater than 9.1 meters (30 feet), imaginary joints should be assumed. For example, if slabs have a joint spacing of 15.2 meters (50 feet), imaginary joints may be assumed at 7.6 meters (25 feet). Thus, each slab would be counted as two slabs for the purpose of pavement inspection.

1.2.9 *Secondary Airfield Pavements:* All occasional-use airfield pavement, engines running (Ladder Taxiway, Transient Apron).

1.2.10 *Section:* A section is a division of a branch (feature); it has certain consistent characteristics throughout its area or length. These characteristics are structural composition (thickness and materials), construction history, traffic, and pavement condition.

1.2.11 *Subgrade:* The natural soil or fill material on which the subbase or base is constructed. The upper part of the subgrade that is compacted to a greater density than the natural soil is termed "compacted subgrade."

1.2.12 *Tertiary Airfield Pavements:* All towed aircraft pavement (Hangar, Hush House, Washrack, Trim Pad).

1.3 Architect-Engineer Services. The A-E shall perform the required services in accordance with the requirements set forth herein. Total time of completion shall be as specified. When the

Government review process exceeds the given amount of time, then the time of completion will be extended the additional number of calendar days required by the review.

1.3.1 Synopsis of Work. The Contractor shall furnish all materials and perform all services required to conduct an airfield pavement condition survey and initiate Micro PAVER as specified in these performance requirements. All pavements used by aircraft are to be included. Maps of these areas are included in Attachments. Closed pavements, shoulders and overruns are not included. Work shall be accomplished in accordance with AFR 93-5, Micro PAVER User's Guide, CERL Report M-86/04, and AFM 85-8 as referenced, except as modified elsewhere in these specifications. The following items of work, explained more fully in the paragraphs that follow, are included:

1.3.1.1 Network, Zone, Branch (Feature), Section, and Sample Unit Identification. Divide the paved areas of the network shown on the maps provided at the time of each individual work order into zones, branches (features), and sections. Verify the uniformity of section divisions. Further divide the paved areas into sample units in accordance with AFR 93-5. For airfield pavements, a branch (feature) is synonymous with the term feature. This Statement of Work includes an estimated _____ lane equivalent miles of airfield pavements.

1.3.1.2 Network Maps. Furnish reproducible maps showing the pavement network, zones, branches (features), and sections for the areas indicated on maps provided at the time of each individual work order.

1.3.1.3 Pavement Distress Survey. Conduct Pavement Condition Index distress surveys on airfield pavements and record that data.

1.3.1.4 Surface Type and Age Data. Review existing as-built drawings and records of the installation to determine the pavement surface type and age data, and input the data into the Micro PAVER data base.

1.3.1.5 Data Entry. Enter the field data into the Micro PAVER data base and provide an error-free run. Furnish computer printouts of the reports specified in Section 7 showing the information input into the data base. Furnish with the final report.

1.3.1.6 Reports. Prepare a final report with a formal narrative section describing the work and method of accomplishment. The final report shall be presented to the BCE at an exit briefing.

1.4 Project Management

1.4.1 Project Supervisor. The supervisor shall serve as a single point of contact and liaison for all work required under this contract. Upon award of the contract, this individual and an alternate shall be immediately designated in writing by the Contractor. These designated individuals shall be approved by the Contracting Officer. One of these individuals shall be available at the installation whenever the Contractor is performing work under this contract.

1.4.2 Installation Assistance. The Contracting Officer or his duly authorized representative from within Base Civil Engineering will serve as the point of contact for obtaining available information and assisting in establishing contacts with the proper individuals and organizations, as necessary, in the accomplishment of the work required under this contract.

1.4.3 Public Disclosures. The Contractor shall make no public announcements or disclosures relative to information contained or developed in this contract, except as authorized by the Contracting Officer.

1.4.4 Conferences. Conferences shall be scheduled as shown on the Implementation Schedule based on work status or whenever requested by the Contractor or Contracting Officer for the resolution of questions or problems encountered in the performance of the work. The Contractor shall be required to attend and participate in all conferences pertinent to the work as directed by the Contracting Officer.

1.4.5 Qualifications of Personnel. Field inspection shall be performed by technically trained personnel under the direct supervision of an engineer experienced in evaluating pavement distress. Measurements shall be made using techniques that give accuracy equal to that produced by a competent technician walking with a high-quality measuring wheel. Other methods used shall be approved by the Contracting Officer before the start of field inspection.

1.4.6 Scheduling. The Contractor shall at the start of the individual delivery order submit an implementation schedule using the format shown on Attachment 1 to this Statement of Work for approval by the Contracting Officer. In-progress reviews should be scheduled as follows:

- at the completion of establishing the network and prior to proceeding;
- at the completion of the field survey data input;
- at the final exit briefing during the presentation to the BCE of the completed Micro PAVER system.

Incremental Contractor-checked data shall be furnished to the Government for review and concurrence.

1.4.7 Points of Contact. Installation Project Officer point of contact is _____.

1.5 Coordination and Performance of Work

1.5.1 The Contracting Officer at the _____ AFB Contracting Office is responsible for the administration of the contract. The _____ Branch is designated as the office responsible for the technical and engineering matters pertaining to inspection, review, and acceptance of work. No changes will be made to the provisions of this contract, and any delivery orders issued against this contract, without approval of _____ and written authorization by the Contracting Officer.

1.5.2 In addition to any normal design review conferences, coordination conferences may be held as required when deemed necessary by either the A-E, Contracting Officer, and/or installation Project Officer. Correspondence both to and from the A-E and Project Officer will

be coordinated through the Contracting Officer. Submittals are to be sent directly to the installation Project Officer with a copy of the letter of transmittal to the Contracting Officer.

1.5.3 The A-E will be responsible for making all Memorandums of Record of any conversations and/or minutes of any meetings with the Contracting Officer and/or Project Officer personnel concerning this project, and for forwarding two copies of these memoranda/minutes to the Contracting Officer. Each memorandum issued will be numbered consecutively and dated accordingly.

1.5.4 During performance of the work, the A-E shall keep in close liaison with the Project Officer, who will coordinate the work with the Using Agency and other agencies. All requests made by the Using Agency and other agencies shall be referred to the Project Engineer for action by the Contracting Officer.

1.5.5 All work shall be in accordance with the Statement of Work, engineering instruction, directions, guide specifications, drawings, technical manuals and other instructions furnished by the Contracting Officer.

1.5.6 The A-E will be required to mail by express service (1-day service) or hand deliver any and all submittals.

1.6 Safety. The Contractor shall conduct his operations in a safe manner at all times. Safety provisions shall include wearing of reflective bright red or orange vests while conducting operations, and hearing protection in the vicinity of active airfield pavements. The Contractor's operation shall not cause a potential safety hazard to aircraft, aircrews, aircraft maintenance and servicing operations, drivers, pedestrians, Contractor and US Government personnel, or US Government property. Vehicles used in field surveys shall be equipped with suitable yellow flashing lights. The Contractor must comply with all operating and safety restrictions pertinent to operating on active airfields.

1.7 Contractor and Installation Work Hours. The normal hours of operation at the installations will be 0730 to 1700 hours, Monday through Friday, except on the following Federal holidays or the day the Federal Government observes these holidays:

- New Year's Day
- Martin Luther King Day
- President's Day
- Memorial Day
- Independence Day
- Labor Day
- Columbus Day
- Veteran's Day
- Thanksgiving
- Christmas

Other site conditions or security requirements may necessitate the required field work to be

performed outside of the normal hours of operation, particularly for field survey of runways and other high-use airfield pavements.

1.8 Permits. The A-E shall obtain necessary permits, licenses and approvals from all local, state, and Federal authorities as are necessary for the performance of the A-E's services.

2.0 Network and Section Identification. All work for airfield pavements shall be in accordance with AFR 93-5.

2.1 Division of the Paved Network Into Zones, Branches, Sections, and Sample Units. Divide all paved areas for airfields into zones, branches (features), sections, and sample units according to guidelines provided in AFR 93-5. Identify all branches (features) and sections on reproducible mylar maps drawn to a scale of 25 millimeters (1 inch) equals 122 meters (400 feet) in accordance with the guidelines in TM 5-623. Use branch (feature) identification corresponding to feature identification of the latest HQ AFCESA airfield pavement evaluation report for the respective base, as shown on the attached base airfield layout plans. Add new branch (feature) numbers as required. In identifying features/branches, follow traffic pattern definitions for various portions of airfields as outlined in AFJMAN 32-8008. For example, identify separate sections for the center 22.9-meter- (75-foot-) wide portion of the runway which receives the heaviest traffic to distinguish this portion from the runway outer edges which seldom have traffic. Verify that sections identified are uniform, based on field observations, as-built drawings, or other pavement information available, whether specified to be performed by the Contractor or others. Adjust section identification as needed.

2.2 Pavement Network Verification. Verify that all airfield pavement areas shown on the maps actually exist, and verify: dimensions, surface type, and pavement rank (primary, secondary, tertiary, other, and none).

2.2.1 Pavement zones and branch (feature) numbers selected shall be coordinated with Base Civil Engineering and approved by the Government's Project Officer.

2.2.2 Final network information, including data for Micro PAVER pavement definition shall be coordinated with Base Civil Engineering, input into Micro PAVER data base, checked for errors, and submitted to and approved by the Government's installation Project Officer prior to further data input into the data base.

2.3 Section Sketches. The Contractor shall prepare an individual sketch for each section showing the location of sample units. On the appropriately scaled drawings, indicate the length and width of the section and the numbering of sample units. Also indicate those sample units inspected, in accordance with AFR 93-5. Use feature numbers of the latest HQ AFCESA airfield pavement evaluation numbering system to the maximum extent possible.

2.4 Recording of Information. The Contractor shall input all information for zone, branch (feature), section, and sample units into the Micro PAVER data base, check for errors, and

provide an error free output to the Government's Project Officer and the Base Civil Engineering personnel.

2.5 Field Location of Section Boundaries. Sections identified in the field shall be marked with paint in a neat, inconspicuous and presentable manner, and approved by the Government's Project Officer for the installation.

3.0 Paved Area Condition Survey and Sample Selection. An estimated _____ lane equivalent miles of airfield pavements are in the airfield network. All work on the airfield pavements shall be in accordance with AFR 93-5.

3.1 Pavement Condition Survey. Perform a PCI condition survey on all sections of the paved areas defined under Section 2.0 of this Statement of Work. The pavement inspection for airfield pavements shall be in accordance with Appendix A of AFR 93-5.

3.2 Sample Unit Inspection Rate. Sampling rate and inspection of additional sample units shall be in accordance with AFR 93-5.

Note: *Paragraph 3.3 presents an optional method to allow a contractor to estimate the amount of work necessary for a survey. It does not follow AFR 93-5 and may not give accurate PCI numbers.*

3.3 Optional Method for Determining Sample Unit Inspection Rate. Determine the number of random sample units to be inspected based on the total number of sample units in section, as follows:

No. of Sample Units in Section	Minimum No. of Units to be Inspected
1-4	1
5-10	2
11-20	3
21-40	4
Over 40	10% rounded up

Additional sample units are to be inspected as needed in accordance with AFR 93-5 if deemed appropriate by the A-E as necessary to convey an accurate pavement condition index. Additional sample units are sample units which are not representative of the overall section condition. They may be in far worse or far better condition than the overall section condition. Random sample units shall be representative of the overall section condition based on engineering judgment.

4.0 Pavement Surface and Age Determination

4.1 Pavement Age

4.1.1 As-Built Drawings. The Contractor shall review as-built drawings and records for the construction date or date of last overlay, whichever occurred most recently, for all airfield pavements. The as-built drawings and records may be reviewed at the Base Civil Engineering Office.

4.1.2 Interviews. If the age information is not available from the records and drawings, interviews with Base Civil Engineering personnel will be conducted to determine additional age information as possible. If this information is not available, Base Civil Engineering personnel will provide an estimate of the date of construction or the last date of overlay or reconstruction.

4.2 Pavement Surface. The Contractor shall review as-built drawings as provided by Base Civil Engineering and conduct field surveys to obtain data for the surface type. The Contractor shall further interview Base Civil Engineering personnel to determine additional surface information. The pavement surface type shall accurately reflect the existing structure as in:

- AC (Asphalt Concrete)
- PCC (Portland Cement Concrete)
- ST (Surface Treatment)
- X (Other)
- APC (Asphalt Overlay Over PCC)
- AAC (Asphalt Overlay Over AC)

4.3 Data Entry. The Contractor shall record the data on forms and input the information into the Micro PAVER data base, check for errors, and correct as needed.

5.0 Contractor's Computer and Data Input Responsibilities. The Contractor shall code for entry into the computerized pavement management system all data determined as a result of verification and condition surveys conducted in the field, from installation drawings and records, interviews or other sources. Coding for the computer shall be in accordance with the Micro PAVER Version 3.21 User's Guide.

5.1 Data Entry. The Contractor shall enter data into the data base on a Government-owned microcomputer. ------- shall provide a copy of the Micro PAVER program for the Contractor's use. The Contractor shall ensure and verify that the data stored in the data base corresponds with the field data. Care shall be taken to insure that data input into the data base follows a sequence that avoids duplication or omissions, and provides as a finished product an error free, complete data base ready for Micro PAVER pavement management operations.

5.2 Initial Data Checking. The branch (feature) identification and section (pavement definition) information shall be entered, checked, and corrected by the Contractor and approved by the Government's Project Officer for each installation prior to further data input into the data base. This information must correspond to the reproducible drawings covered in paragraph 2.1.

5.3 Data Checking. When the branch (feature) and section information is approved, the remainder of the data is entered, checked, and corrected by the Contractor, the Contractor shall produce one copy of the data stored in the computer for review by each respective installation

Project Officer. A final review session will be scheduled at the end of this period at each installation for the Government and Contractor to discuss the data. Any input errors discovered through the review of this "data dump" will be corrected by the Contractor within a two week period after the final review meeting.

5.4 Final Data Checking. If five percent or more of the data requires changes, a second "data dump" and review will be conducted. The Contractor will respond to changes of the second data dump within a one-week period. Review by installation Project Officer and A-E correction will continue until the data base is error free.

6.0 Maintenance and Repair Policy and Prioritization Scheme. The Contractor shall develop maintenance and repair policies for airfield areas as a result of the information collected from interviews with the installation personnel. The policies shall provide repair alternatives and associated cost of repairs for each distress type and severity level. The information shall be input into the Micro PAVER data base, checked for errors, and corrected as necessary. Pavement Maintenance Minimum PCI Values are in Attachment 2 for Contractor information.

7.0 Submittal of Data and Final Report

7.1 Report Format. Formal reports and tabular data shall be typed or printed on 216 x 279 millimeter (8-1/2 x 11 inch) bond paper with foldouts for maps, sketches, schematics, charts, graphs, and other illustrative material, as may be necessary. Data which cannot be clearly described in narrative form shall be shown graphically.

7.2 Report Binding. Formal documents shall be securely bound with a durable cover. The title of the document shall appear on the cover of all submittal documents. The final documents shall be bound in a manner which will facilitate repeated disassembly, unless otherwise specified herein.

7.3 Network Drawings. Pavement network drawings shall be reproducible mylar drawings. Pavement network drawings shall provide easy identification of the pavement network sections.

7.4 Blank Forms. The Contractor shall copy blank forms from referenced manuals or other references as necessary to perform work and submit with the final report as specified by this contract.

7.5 Report Submittal. Two preliminary copies of the final report shall be submitted to the Government for approval. Following the return of comments, the Contracting Officer will schedule a meeting for their discussion, if necessary. The Contractor shall furnish written notification of intended action on each comment within one week after this meeting. Intention of noncompliance with any comment shall substantiated in detail. Authorization to proceed with final submittal will be granted in writing with or after the Contracting Officer's approval of the Contractor's intended actions on the review comments.

7.6 Organization. Narrative contents shall be arranged in a logical sequence and organized by sections. Reproducible transparencies shall be submitted separately. The final report shall include the original and two copies, and shall include the following sections:

7.6.1 A formal narrative section describing the work that was done, how it was accomplished, and when it was accomplished. The narrative shall include a brief description of each of the following portions of this report.

7.6.2 All maps and drawings necessary to identify the pavement network surveyed, including reproducible maps.

7.6.3 The following reports shall be generated from the completed data base and submitted as part of the final report.

BRANCH LISTING or LIST REPORT OF BRANCHES	A report showing a summary of all branches in the data base
INVENTORY	An inventory report showing all sections in the data base
PCI	Self explanatory
INSPECTION SCHEDULE	Provide an inspection schedule report on the branches and sections which should be reinspected during the next year based on minimum PCI, rate of deterioration, and the priority scheme developed as shown in Attachment 1.
PCI FREQUENCY	A pavement network condition frequency plot showing the current condition of the network and a frequency plot showing the projected condition of the network in five years with only routine maintenance accomplished.
INSPECTION SUMMARY or INSPECTION REPORT	Provides a summary of each sample unit surveyed

7.6.4 Prioritization scheme as developed for this installation.

7.6.5 Five-year plan for maintenance and rehabilitation based on the current and projected funding levels as determined by the BCE. This is a network level analysis for the period FY 96 through FY 2000. The Contractor shall make repair selection recommendations, provide

associated cost, and provide a schedule of pavement reinspection for FY 96 and FY 97. Recommendations should include preventive maintenance planning and major repair projects. Procedures are outlined in CERL Technical Report M-86/04.

7.6.6 Distribution of Condition Survey Reports is as follows:

Documents & Number of Copies

Agency	Mylars	Report	Data Base Disk (3 1/2")
Responsible BASE CE	1	2	1
Responsible MAJCOM	0	2	1
HQ ACC CES/ESO 11817 Cannon Blvd. Suite 213 Newport News, VA 23606-2558	0	2	1
HQ AFCESA/CESC 139 Barnes Dr. Suite 1 Tyndall AFB, FL 32403-5319	0	1	1
HQ AMC/CES 507 A Street Scott AFB, IL 62225-5022	0	1	0

ATTACHMENT 1

PAVEMENT MAINTENANCE MINIMUM VALUES

	CATEGORY															
	R	S	X	O	T	L	B	A	C	K	F	G	V	H	E	N	Z
RANK																	
P	70	+	+	+	70	+	+	70	+	+	70	70	+	+	+	+	+
S	+	55	+	+	+	55	+	+	+	55	+	+	40	+	+	+	+
T	+	+	+	+	+	+	+	+	55	+	+	+	+	55	+	40	+
D	+	+	+	+	+	+	+	+	+	+	+	+	+	+	40	+	+

SECTION CATEGORY:

R - Primary Runway
S - Secondary Runway
X - Abandoned Runway
O - Overrun

T - Primary/Parallel Taxiway
L - Ladder/Secondary Taxiway
B - Abandoned Taxiway

A - Primary Parking Apron
C - Hangar Access Pavement
K - Secondary/Transient Apron
F - Arm/Disarm Apron/Hot fueling pad
G - Alert Pavement
H - Hush House Pavement/Trim Pad/Washrack
V - Helipad

E - AGE/Storage/Non-aircraft Parking
N - Unassigned/Unused Pavement
Z - Other

PAVEMENT RANK:

P - Primary	MISSION ESSENTIAL PAVEMENT (Runway, Parallel Taxiway, Main Parking Apron, Alert Pavement)
S - Secondary	OCCASIONAL-USE PAVEMENT, ENGINES RUNNING (Ladder Taxiway, Transient Apron)
T - Tertiary	TOWED AIRCRAFT PAVEMENT (Hanger, Hush House, Washrack, Trim Pad)
D - Industrial	NON-AIRCRAFT PAVEMENT (AGE, POL, POV/GOV Parking)

ATTACHMENT 2

AIRFIELD LAYOUT FOR ANYWHERE AFB, STATE

ATTACHMENT 3

AIRFIELD LAYOUT FOR ANYPLACE AFB, STATE

DISTRIBUTION LIST

DEPARTMENT OF DEFENSE

Defense Commissary Service (1)
Director of Facilities
Bldg 8400
Lackland AFB TX 78236-5000

AAFES/ATTN: CFE (1)
PO Box 660320
Dallas TX 75266-0320

Defense Technical Information Center (1)
ATTN: DTIC-FDA
Alexandria VA 22034-6145

SPECIAL INTEREST ORGANIZATIONS

IHS (Shelby Carter) (1)
15 Inverness Way East Suite A-111
Englewood CO 80112

Construction Criteria Database (1)
National Institute of Bldg Sciences
1201 L Street NW, Suite 400
Washington DC 20005