

**PERSONAL SERVICE AGREEMENT**

CO-802A REV. 2/2000 (Electronic Version)

STATE OF CONNECTICUT  
OFFICE OF THE STATE COMPTROLLER  
ACCOUNTS PAYABLE DIVISION

1. PREPARE 5 COPIES.
2. THE STATE AGENCY AND THE CONTRACTOR AS LISTED BELOW HEREBY ENTER INTO AN AGREEMENT SUBJECT TO THE TERMS AND CONDITIONS STATED HEREIN AND/OR ATTACHED HERETO AND SUBJECT TO THE PROVISIONS OF SECTION 4-98 OF THE CONNECTICUT GENERAL STATUTES AS APPLICABLE.
3. ACCEPTANCE OF THIS CONTRACT IMPLIES CONFORMANCE WITH TERMS AND CONDITIONS SET FORTH AT SHEET 2 OF THIS FILE, AS ATTACHED HERETO AND INCORPORATED BY REFERENCE.

(1) <input checked="" type="checkbox"/> ORIGINAL <input type="checkbox"/> AMENDMENT	(2) IDENTIFICATION NO. P.S. #5689
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CONTRACTOR	(3) CONTRACTOR NAME University of New Hampshire	(4) ARE YOU PRESENTLY A STATE EMPLOYEE? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	CONTRACTOR ADDRESS Office of Sponsored Research Service Building, 51 College Road, Durham NH 03824	CONTRACTOR FEIN / SSN - SUFFIX 026000937

STATE AGENCY	(5) AGENCY NAME AND ADDRESS CT Department of Transportation, 2800 Berlin Trmpk., Newington, CT 06131-7546	(6) AGENCY NO. 5000
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CONTRACT PERIOD	(7) DATE (FROM) THROUGH (TO) 10/1/04 3/31/07	(8) INDICATE <input type="checkbox"/> MASTER AGREEMENT <input type="checkbox"/> CONTRACT AWARD <input checked="" type="checkbox"/> NEITHER	NO. 9.13-03(04)
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CANCELLATION CLAUSE	THIS AGREEMENT SHALL REMAIN IN FULL FORCE AND EFFECT FOR THE ENTIRE TERM OF THE CONTRACT PERIOD STATED ABOVE UNLESS CANCELLED BY THE STATE AGENCY, BY GIVING THE CONTRACTOR WRITTEN NOTICE OF SUCH INTENTION (REQUIRED DAYS NOTICE SPECIFIED AT RIGHT).	(9) REQUIRED NO. OF DAYS WRITTEN NOTICE: 60
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COMPLETE DESCRIPTION OF SERVICE	(10) CONTRACTOR AGREES TO: (Include special provisions - Attach additional blank sheets if necessary.)  Conduct a research study for NETC Project No. 04-4, entitled "Determining the Effective PG Grade of Binder in RAP Mixes."  (See Attached Proposal.)
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COST AND SCHEDULE OF PAYMENTS	(11) PAYMENT TO BE MADE UNDER THE FOLLOWING SCHEDULE UPON RECEIPT OF PROPERLY EXECUTED AND APPROVED INVOICES.  Maximum payment not to exceed \$130,876 for contract period. Payment shall be in accordance with the provisions of Sections 2.(C), 3.(B), 3.(C) and 3.(D).
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(12) ACT. CD.	(13) DOC. TYPE	(14) COMM. TYPE	(15) LSE. TYPE	(16) ORIG. AGCY.	(17) DOCUMENT NO.	(18) COMM. AGCY.	(19) COMM. NO.	(20) VENDOR FEIN / SSN - SUFFIX		
				5400						
(21) COMMITTED AMOUNT				(22) OBLIGATED AMOUNT			(23) CONTRACT PERIOD (FROM/TO)			
\$130,876				\$130,876			10/1/04 to 3/31/07			
(24) ACT. CD.	(25) COMM. LINE NO.	(26) COMMITTED AMOUNT	(27) COMM. AGENCY	(28) COST CENTER		(29) OBJECT	(30) FUNCTION (31) ACTIVITY (32) EXTENSION (33) F.Y.			
				FUND	SID					

An individual entering into a Personal Service Agreement with the State of Connecticut is contracting under a "work-for-hire" arrangement. As such, the individual is an independent contractor, and does not satisfy the characteristics of an employee under the common law rules for determining the employer/employee relationship of Internal Revenue Code Section 3121 (d) (2). Individuals performing services as independent contractors are not employees of the State of Connecticut and are responsible themselves for payment of all State and local income taxes, federal income taxes and Federal Insurance Contribution Act (FICA) taxes.

ACCEPTANCES AND APPROVALS	(34) STATUTORY AUTHORITY ConnDOT 13b-4 and 13b-28
(35) CONTRACTOR OWNER OR AUTHORIZED SIGNATURE <i>Andrew W. Shepard</i>	TITLE Andrew W. Shepard DATE 1/5/05 Sr. Grant & Contract Administrator and Co-Manager, Research Admin.
(36) AGENCY (AUTHORIZED OFFICIAL) <i>James M. Sime</i>	TITLE James M. Sime DATE 1/18/05 Manager of Research
(37) OFFICE OF POLICY & MGMT. / DEPT. OF ADMIN. SERV. <b>EXEMPT PER OPA/DIRECTIVE</b>	TITLE DATE
(38) ATTORNEY GENERAL (APPROVED AS TO FORM) <i>Will B. [Signature]</i>	DATE 1/28/05

DISTRIBUTION: ORIGINAL-CONTRACTOR PHOTOCOPY-COMPTROLLER PHOTOCOPY-OPM/DAS PHOTOCOPY-ATTORNEY GENERAL PHOTOCOPY-AGENCY

**EXECUTIVE ORDERS**

This contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill promulgated June 16, 1971, and, as such, this contract may be canceled, terminated or suspended by the State Labor Commissioner for violation of or noncompliance with said Executive Order No. Three, or any state or federal law concerning nondiscrimination, notwithstanding that the Labor Commissioner is not a party to this contract. The parties to this contract, as part of the consideration hereof, agree that said Executive Order No. Three is incorporated herein by reference and made a party hereof. The parties agree to abide by said Executive Order and agree that the State Labor Commissioner shall have continuing jurisdiction in respect to contract performance in regard to nondiscrimination, until the contract is completed or terminated prior to completion. The contractor agrees, as part consideration hereof, that this contract is subject to the Guidelines and Rules issued by the State Labor Commissioner to implement Executive Order No. Three, and that he will not discriminate in his employment practices or policies, will file all reports as required, and will fully cooperate with the State of Connecticut and the State Labor Commissioner. This contract is also subject to provisions of Executive Order No. Seventeen of Governor Thomas J. Meskill promulgated February 15, 1973, and, as such, this contract may be canceled, terminated or suspended by the contracting agency or the State Labor Commissioner for violation of or noncompliance with said Executive Order No. Seventeen, notwithstanding that the Labor Commissioner may not be a party to this contract. The parties to this contract, as part of the consideration hereof, agree that Executive Order No. Seventeen is incorporated herein by reference and made a part hereof. The parties agree to abide by said Executive Order and agree that the contracting agency and the State Labor Commissioner shall have joint and several continuing jurisdiction in respect to contract performance in regard to listing all employment openings with the Connecticut State Employment Service. This contract is also subject to provisions of Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, and, as such, this contract may be cancelled, terminated or suspended by the contracting agency of the State Labor Commissioner for violation of or noncompliance with said Executive Order No. Sixteen, notwithstanding that the Labor Commissioner may not be a party to this contract. The parties to this contract, as part of the consideration hereof, agree that Executive Order No. Sixteen is incorporated herein by reference and made a part hereof. The parties agree to abide by said Executive Order and agree that the contracting agency and the State Labor Commissioner shall have joint and several continuing jurisdiction in respect to contract performance in regard to listing all employment openings with the Connecticut State Employment Service.

**I. NON-DISCRIMINATION**

(a). For the purposes of this section, "minority business enterprise" means any small contractor or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Conn. Gen. Stat. subsection 32-9n; and "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations. "Good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements.

For purposes of this Section, "Commission" means the Commission on Human Rights and Opportunities.

For purposes of this Section, "Public works contract" means any agreement between any individual, firm or corporation and the state or any political subdivision of the state other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the state, including but not limited to, matching expenditures, grants, loans, insurance or guarantees.

(b) (1) The Contractor agrees and warrants that in the performance of the contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation or physical disability, including, but not limited to blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut. The Contractor further agrees to take affirmative action to insure that applicants with job related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation, or physical disability, including, but not limited to, blindness unless it is shown by the Contractor that such disability prevents performance of the work involved; (2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action - equal opportunity employer" in accordance with regulations adopted by the Commission; (3) the Contractor agrees to provide each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which the Contractor has a contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Contractor's commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Contractor agrees to comply with each provision of this section and Conn. Gen. Stat. subsections 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Conn. Gen. Stat. subsections 46a-56, 46a-68e and 46a-68f; (b) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor as relate to the provisions of this section and section 46a-56. If the Contract is a public works contract, the contractor agrees and warrants that he will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works projects.

c. Determination of the Contractor's good faith efforts shall include, but shall not be limited to, the following factors: The Contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.

d. The Contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission, of its good faith efforts.

e. The Contractor shall include the provisions of subsection (b) of this Section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Conn. Gen. Stat. subsection 46a-56; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

f. The Contractor agrees to comply with the regulations referred to in this Section as they exist on the date of this contract and as they may be adopted or amended from time to time during the term of this contract and any amendments thereto.

g. The Contractor agrees to follow the provisions: The contractor agrees and warrants that in the performance of the agreement such contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or of the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; the contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; the contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said commission pursuant to Section 46a-56 of the general statutes; the contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the contractor which relate to the provisions of this section and Section 46a-56 of the general statutes.

h. The Contractor shall include the provisions of the foregoing paragraph in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the commission. The contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Section 46a-56 of the general statutes; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission, the contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

**INSURANCE**

The contractor agrees that while performing services specified in this agreement he shall carry sufficient insurance (liability and/or other) as applicable according to the nature of the service to be performed so as to "save harmless" the State of Connecticut from any insurable cause whatsoever. If requested, certificates of such insurance shall be filed with the contracting State agency prior to the performance of services.

**STATE LIABILITY**

The State of Connecticut shall assume no liability for payment for services under the terms of this agreement until the contractor is notified that this agreement has been accepted by the contracting agency and, if applicable, approved by the Office of Policy and Management (OPM) or the Department of Administrative Services (DAS) and by the Attorney General of the State of Connecticut.

# University System of New Hampshire

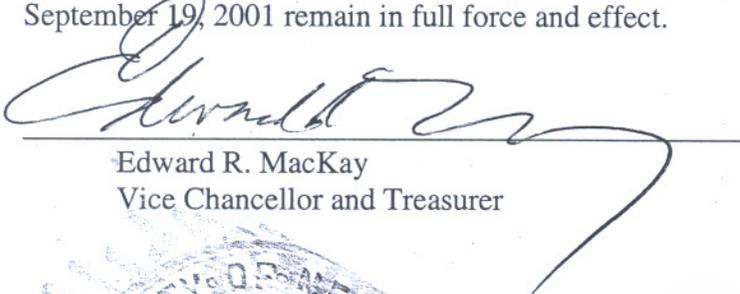


VICE CHANCELLOR AND TREASURER'S OFFICE

Myers Center  
27 Concord Road  
Durham, NH 03824-3546  
Phone: (603) 862-0954  
Fax: (603) 862-0909  
www.usnh.unh.edu

To Whom It May Concern:

All provisions of the "Delegation of Signature Authority" dated October 1, 2001 and the "Certificate" dated September 19, 2001 remain in full force and effect.



Edward R. MacKay  
Vice Chancellor and Treasurer

12/2/04  
Date



Delegation of Signature Authority

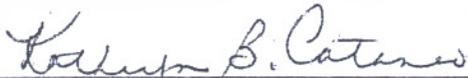
I, Kathryn B. Cataneo, Executive Director of Sponsored Research of the University of New Hampshire (UNH), acting pursuant to Delegation of Signature Authority dated August 25, 2003 and given by Edward R. MacKay, Vice Chancellor and Treasurer of the University System of New Hampshire (USNH), do hereby re-delegate to the following UNH officer:

Andrew Shepard, Senior Grant & Contract Administrator and Co-Manager, Research Administration, Office of Sponsored Research

the authority to execute on behalf of UNH certain contracts, agreements, and other legal documents related to the provision of research or consulting services, or other sponsored programs within the limitations on the attached pages, provided that such authority shall be exercised in compliance with applicable USNH and UNH policies, including those related to conflict of interest, insurance, additional pay, and competitive bidding.

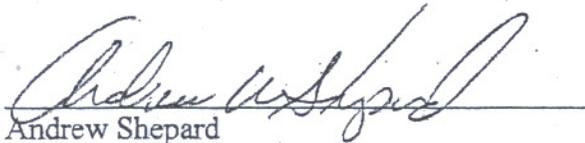
This delegation shall take effect upon the signed, dated acknowledgement below by the officer of acceptance of the responsibilities associated with this delegation and shall remain in effect until revoked.

The named officer may not re-delegate this authority.



Kathryn B. Cataneo  
UNH Executive Director of Sponsored Research

7/13/04  
Date



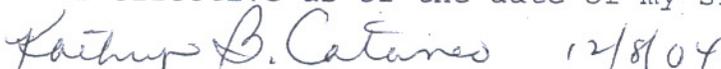
Andrew Shepard  
Senior Grant & Contract Administrator and Co-Manager,  
Research Administration,  
UNH Office of Sponsored Research

7/13/04  
Date

att: UNH Office of Sponsored Research Institutional Signature Authorities – September 19, 2001  
Signature Authority Limitations for Sponsored Agreements for Senior GCAs

cc: John Aber, UNH Vice President for Research & Public Service

This delegation of signature authority to Andrew Shepard is still effective as of the date of my signature below.



Kathryn B. Cataneo  
UNH Executive Director Sponsored Research



Office of the Secretary  
University System of New Hampshire  
Dunlap Center  
Durham, New Hampshire 03824-3545  
(603) 862-0970  
FAX (603) 868-3021  
<http://www.usnh.unh.edu>

### CERTIFICATE

I, Ronald F. Rodgers, do hereby certify that:

- (1) I am the duly appointed Secretary and General Counsel of the University System of New Hampshire (USNH);
- (2) I am familiar with the minute books, policies, and by-laws of the USNH. I am duly authorized to issue certificates with respect to the contents of such books, policies, and by-laws;
- (3) The policies and bylaws of the USNH Board of Trustees authorize the USNH Treasurer to sign all contracts, agreements, and other legal documents on behalf of the USNH and to re-delegate in writing that authority;
- (4) The USNH Treasurer has delegated to the University's Vice President for Research and Public Service, the Executive Director of Sponsored Research, and the Associate Director, Office of Sponsored Research, the authority to sign any contract, agreement or other legal document between the USNH or one of its component institutions and any New Hampshire state government agency concerning the provision of research, consulting services, or other sponsored programs;
- (5) The component institutions of the USNH are the University of New Hampshire, the College for Lifelong Learning, Keene State College, and Plymouth State College; and
- (6) The following individuals have been appointed to and now occupy the indicated offices and the signatures set forth below are their true signatures as executed in the performance of their official duties:

Donald C. Sundberg,  
Vice President for Research and Public Service:

Kathryn B. Cataneo,  
Executive Director of Sponsored Research:

Steven Bernstein,  
Associate Director, Office of Sponsored Research:

IN WITNESS WHEREOF, I have hereunto set my hand as the Secretary and General Counsel of the University System of New Hampshire, this 19th day of September, 2001.



Ronald F. Rodgers  
USNH Secretary and General Counsel

**UNIVERSITY SYSTEM OF NEW HAMPSHIRE**

University of New Hampshire • Keene State College • Plymouth State College • College for Lifelong Learning

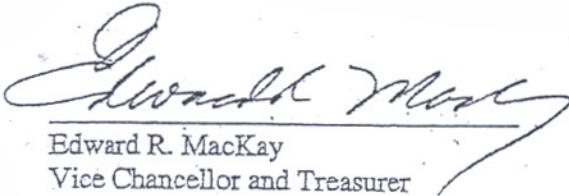
Delegation of Signature Authority

I, Edward R. MacKay, Vice Chancellor and Treasurer of the University System of New Hampshire (USNH), acting pursuant to the by-laws of USNH as amended by the Board of Trustees on March 8, 2000, do hereby delegate to the following officers of the University of New Hampshire (UNH):

1. The Vice President for Research and Public Service
2. The Executive Director of Sponsored Research
3. The Associate Director, Office of Sponsored Research

the authority to execute on behalf of USNH, or any component institution, contracts, agreements and other legal documents related to the provision of research or consulting services, or other sponsored programs, provided that such authority shall be exercised in compliance with applicable USNH and UNH policies, including those related to conflict of interest, insurance, additional pay, and competitive bidding.

The named officers may re-delegate this authority only as specifically noted on the "University of New Hampshire Office of Sponsored Research Institutional Signature Authority Form" dated September 19, 2001. This delegation shall take effect immediately and shall remain in effect until revoked.

  
Edward R. MacKay  
Vice Chancellor and Treasurer

October 1, 2001  
Date  
UNH01-02  
Delegation Number

Controller, USNH  
Director of Purchasing, USNI

President, UNH  
General Counsel, USNH

NETC Agreement No. 9.13-03(04)

Research Agreement for NETC Project No. 04-4,

"Determining the Effective PG Grade of Binder in RAP Mixes"

THIS AGREEMENT, concluded at Newington, Connecticut, by and between the State of Connecticut, Department of Transportation, Stephen E. Korta, II, Commissioner, acting herein by James M. Sime, Manager of Research, Bureau of Engineering and Highway Operations, duly authorized, hereinafter referred to as the "New England Transportation Consortium" or "NETC," and the University of New Hampshire, acting herein by Andrew W Shepard, Co = Mgr Res Admin, Office of Sponsored Research, hereunto duly authorized, hereinafter referred to as the University.

*Andrew W Shepard*  
Initial Here  
Andrew W Shepard  
1/15/13

WITNESSETH THAT:

WHEREAS, the New England Transportation Consortium (NETC) is a joint undertaking through which the transportation agencies of the six (6) New England states pool their professional, academic and financial resources to focus on the research, development and implementation of improved methods for dealing with common problems associated with transportation systems; and,

WHEREAS, the State of Connecticut, Department of Transportation (ConnDOT), has been authorized as the lead agency for the NETC for the purposes of entering into and administering this Agreement; and,

WHEREAS, the Commissioner of ConnDOT is authorized to undertake the foregoing activities under Sections 13b-4 and 13b-23 of the General Statutes of Connecticut, as revised.

NOW, THEREFORE, KNOW YE THAT:

1. **THE UNIVERSITY AGREES TO:**

- (A) Perform the study, delineated in the attached Proposal and Work Plan, hereinafter called the "Proposal."
- (B) Provide NETC with seven (7) copies of quarterly progress reports which are to be received no later than three (3) working days after the end of each calendar year quarter.
- (C) Provide NETC with seven (7) copies of draft interim reports on specified tasks for review by NETC and the Federal Highway Administration (FHWA). Within ninety (90) calendar days after acceptance of the interim report(s) by NETC, subject to action on review commentary, one hundred and twenty (120) copies of the interim report(s) shall be furnished to NETC. A set of reproducibles, as well as an electronic ADOBE™ Portable Document Format (PDF) document, used in the preparation of the interim report(s), will be provided to NETC within thirty (30) calendar days after the interim report(s) is(are) delivered to NETC.
- (D) At the conclusion of the study, provide NETC with seven (7) copies of a draft of the final report, for review by NETC and FHWA. Within ninety (90) calendar days after acceptance of the draft final report by NETC, subject to action on review commentary, one hundred and twenty (120) copies of the final report shall be furnished to NETC. A set of reproducibles, as well as an electronic ADOBE™ Portable Document Format (PDF) document, used in the preparation of the final report, will be provided to NETC within thirty (30) calendar days after the final report is delivered to NETC.
- (E) Permit NETC and the FHWA to review, during normal business hours, all work performed under the terms of this Agreement at any stage of the work.
- (F) Attend conferences at locations designated by NETC for consultation and discussion upon request of NETC.
- (G) Submit properly executed vouchers on ConnDOT invoices (Service Transfer Invoice) for payment for a billing period not to exceed a calendar quarter.

The invoice shall indicate the total costs incurred for the billing period in accordance with the provisions of Section 2.(C)(1) herein. These vouchers shall be submitted, no later than forty-five (45) calendar days after the end of each billing period, to:

NETC Coordinator  
Transportation Institute  
U-37-TI  
University of Connecticut  
Storrs, CT 06269-3037.

- (H) Not sublet any portion of the work required for the completion of this Agreement without the prior written approval of NETC. The form of the Subcontractor's Agreement shall be as developed by the University and be subject to approval by NETC.
- (I) Maintain an accounting system that is adequate to segregate and accumulate reasonable, allocable and allowable costs and maintain accounts and records in accordance with generally accepted accounting principles consistently applied.
- (J) Recognize the authority for determining allowable costs under the Agreement to be OMB Circular A-21, "Cost Principles for Educational Institutions," OMB Circular A-110, "Grants and Agreements with Institutions of Higher Education, Hospitals and other Nonprofit Organizations," which are incorporated herein by reference.
- (K) Permit the authorized representatives of NETC, the United States Department of Transportation and the Comptroller General of the United States to perform an annual inspection and audit of all data and records of the University relating to its performance under this Agreement.
- (L) In the event that this Agreement is terminated under the provisions of Section 3.(E), the University shall permit the authorized representatives of NETC, the United States Department of Transportation, and the Comptroller General of the United States to inspect and audit all data and records of the University relating to its performance under this Agreement until the expiration of three (3) years after termination of this project under this Agreement.

The University further agrees to include in all its subcontracts hereunder a provision to the effect that the Subcontractor agrees that NETC, the United States Department of Transportation and the Comptroller General of the United States, or any of their duly authorized representatives, shall, until the expiration of three (3) years after termination of the project under the subcontract, have access to and the right to examine any directly pertinent books, documents, papers, and records of such Subcontractor, involving transactions related to the subcontract. The term "subcontract" as used in this clause excludes work not exceeding \$25,000.

The periods of access and examination described above, for records which relate to (1) appeals for disputes, (2) litigation of the settlement of claims arising out of the performance of this Agreement, or (3) costs and expenses of this Agreement as to which exception have been taken by NETC, the Comptroller General, or any of their duly authorized representatives, shall continue until such appeals, litigation, claims, or exceptions have been disposed of.

(M) Preserve all of its records and accounts concerning the implementation of this Agreement including, but not limited to, any records, books, or other documents relative to charges, including charges for Extra Work, alleged breaches of Agreement, settlement of claims, or any other matter involving the University's or Subcontractor's demand for compensation by NETC for a period of not less than three (3) years from the date of the termination of this project under this Agreement. If any litigation, claim, or audit is started before the expiration on the three (3) year period, the records shall be retained until all litigations, claims, or audit findings involving the records have been resolved.

(N) In the event that a transfer of funds between budget categories, contained in this Agreement, is required, the University may make cumulative transfers among direct cost categories of up to ten percent (10%) of the total approved budget, without approval of NETC. Larger changes require prior approval of NETC. In no case, however, will NETC be responsible for expenses in excess of the approved total amount.

2. ConnDOT, ON BEHALF OF NETC, AGREES TO:

- (A) Furnish the University copies of any data it may have in its possession such as, but not limited to, plans, maps, reports, aerial photos, data, publications, organizational arrangements, directives, computer tapes, etc., which the University may deem of value for use and analysis.
- (B) Arrange and hold conferences upon reasonable notice as may be necessary to the University's activities covered by this Agreement.
- (C) Pay the University, in accordance with the approved Proposal, for all work authorized by NETC and performed in accordance with the terms specified herein. The University may request partial payments for work performed. These requests for payment may be submitted for a billing period not to exceed a calendar quarter and shall be made on voucher forms supplied by ConnDOT on behalf of NETC. Partial payment will be made by ConnDOT, on behalf of NETC, on the following basis:
  - (1) Partial payments will be equal to one hundred percent (100%) of the University's costs incurred for each billing period, in conformance with the Budget contained in the Proposal, until the cumulative total amount invoiced equals 95% of the total of the Agreement value. If an invoice is submitted which results in the cumulative total amount invoiced exceeding 95% of the total Agreement value, ConnDOT shall withhold payment of that invoice and any further invoices, in accordance with the provisions of Section 2.(C)(3).
  - (2) ConnDOT, on behalf of NETC, agrees to pay the University an amount not to exceed the total amount of the Budget contained in the Proposal, for the contract period, established in accordance with the provisions of Sections 1.(A) and 3.(A).
  - (3) Final payment will be processed following completion of all services called for in the Agreement, as well as receipt of all

project deliverables. The final payment to the University shall include the amount invoiced for the final billing period plus any amount withheld on previous billings, in accordance with the provisions of Section 2.(C)(1).

3. NETC AND THE UNIVERSITY FURTHER MUTUALLY AGREE TO:

- (A) The term of this Agreement shall be from October 1, 2004, to March 31, 2007.
- (B) Payments to the University for work specified shall be based upon the following dated and signed certification: "The undersigned hereby certifies that payment of the sum claimed under the cited Agreement is proper and due and that information on the fiscal report is correct and such detailed supporting information is on file, available for certification and/or audit purposes, and that all services called for by the Agreement to the date of this billing, \_\_\_\_\_, have been met."

Date

\_\_\_\_\_

Director or Appropriate

Title

\_\_\_\_\_

Date

- (C) Payrolls shall be supported by time and attendance or equivalent records for individual employees. Salaries and wages of employees chargeable to more than one grant program or other cost objective will be supported by appropriate time distribution records. The method used shall conform with O.M.B. Circular A-21, "Cost Principles for Educational Institutions," and O.M.B. Circular A-110, "Grants and Agreements with Institutions of Higher Education, Hospitals and Other Nonprofit Organizations."
- (D) Specific Items Costs:
  - (1) Authorized reproduction and printing (including drafts of reports), will be paid for at cost as indicated by vouchers. All costs in connection

with obtaining data such as, but not limited to, plans, maps, reports, aerial photos, traffic data, publications, computer tapes, etc., will be paid for at cost.

- (2) Costs for all travel and subsistence between the University's offices, meetings as well as other trips necessary in connection with the study, will be reimbursed in accordance with the University's approved Travel Regulations and rates.
- (3) Any and all costs and expenses for work in connection with and pertinent to this Agreement as approved by NETC, will be paid for at cost.
- (4) Mainframe computer charges will be based on actual machine time, whether for running programs or de-debugging new programs, and will include the cost of operators and key punchers and supervisors. Charges for outside and University computers will be reimbursed at cost. Salaries for programmers will be reimbursed as other direct salaries.
- (5) For outside consulting services, required in and provided for in the project proposal, direct reimbursement will be paid the University by NETC. The Agreement between the University and the Consultant governing the Consultant services shall be approved by NETC prior to execution.
- (6) To the certified payroll may be added a percentage to cover fringe payroll costs for: F.I.C.A., Health Benefits, Retirement, Longevity, Vacation, Holiday, Sick Leave, etc. Reimbursement for fringe benefits and indirect costs will be based on the rates in effect at the time expenses are incurred. The base against which each rate is applied will be that specified in the University's current Indirect Cost Agreement.
- (7) All equipment purchased with project funds, as listed below, shall remain the property of NETC upon completion or termination of the study:

N/A.

All equipment not listed shall remain the property of the University upon completion or termination of the study.

(E) Termination of Work:

Either party may terminate a project Agreement upon sixty (60) days written notice to the other party. The University will immediately act to minimize project costs upon issuing or receiving such notice, and will submit to NETC a report describing all work completed to date. NETC will reimburse the University a percentage of the total project cost that is equal to the percentage of work completed. Upon receipt of written notification from either party that this Agreement is to be terminated, the University shall immediately cease operations on work stipulated in this Agreement and assemble all material that has been prepared, developed, furnished or obtained under the terms of this Agreement, that may be in its possession or custody and shall transmit the same to NETC on or before the sixtieth (60th) day following the receipt of the written notice of termination. Said material shall include, but not be limited to, documents, plans, computations, drawings, notes, records and correspondence.

(F) Time Extensions:

NETC may extend the completion dates beyond the period specified when the work has been delayed for reasons beyond the control of the University. The University may present to NETC, in writing, requests for extension of allotted time for completion of work. NETC will evaluate such requests and if NETC determines such requests are based on valid grounds, shall grant such extension of time for completion of the work as NETC deems warranted. All requests by the University for extension of time must be made ninety (90) days prior to the scheduled expiration date.

The University further agrees that no charges or claim for damages shall be made by it for any delays or hindrances from any cause whatsoever during the progress of any portion of the services specified in this Agreement. Such delays or hindrances, if any, shall be compensated for by an extension of time for such reasonable period as NETC may determine, it being understood, however, that the permitting of the University to proceed to complete any services or any part of them after the date of completion or after the date to

which time of completion may have been extended, shall in no way operate as a waiver on the part of NETC of any of its rights herein.

- (G) The title to all products of research generated under this Agreement shall reside with the University. However, the University grants to NETC member departments, the United States Government, and the general public, a non-exclusive, irrevocable, royalty-free, worldwide license in such work products to use, reproduce and prepare derivative works. The University may use any of the data, plans and reports completed under the NETC program for whatever purpose and may distribute products in any way. However, the following text must appear on the inside front of any reports or publications: "This report was prepared by the University of New Hampshire for six New England states (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont), in cooperation with the United States Department of Transportation, Federal Highway Administration. The opinions, findings and conclusions expressed in the publication are those of the author(s) and not necessarily those of the six New England States or the Federal Highway Administration. This publication is based upon publicly supported research and is copyrighted. It may be reproduced in part or in full, but it is requested that there be customary crediting of the source."

(H) Publication Provisions:

- (1) The University shall be free to copyright material developed under this Agreement with the provision that NETC and FHWA reserve a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use the work for government purposes, as specified in Section 3.(G).
- (2) No reports, articles, papers or publications may be published by the University without the written authority of NETC except as provided for in the following items:
  - (a) All reports, articles, papers or publications shall contain the disclaimer: "This report [article, paper or publication], prepared in cooperation with the New England Transportation

Consortium, does not constitute a standard, specification or regulation. The contents of this report [article, paper or publication] reflect the views of the author(s) who is(are) responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the views of the New England Transportation Consortium or the Federal Highway Administration."

(b) It is anticipated that, in addition to interim and final reports that may be specified in this project Agreement, the University may wish to publish papers or articles based, in whole or in part, on information developed under this project Agreement. The University shall have the right to so publish provided the manuscript is submitted to NETC for concurrence. NETC will have forty-five (45) calendar days to review the manuscript. If no response is provided by NETC at the end of the specified period, the University may proceed with publication. In the event of nonconcurrence by NETC, the University may publish the manuscript provided the following statement is included: "The New England Transportation Consortium and the Federal Highway Administration do not concur with the findings and conclusions of the manuscript."

(I) Federal Requirements:

The University shall comply with the Regulations of the United States Department of Transportation (Title 49, Code of Federal Regulations, Part 21), issued in implementation of Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4, and Appendix CR attached hereto, both of which are hereby made a part of this Agreement.

(J) Patent Rights:

The terms "Invention" or "Discovery," as used herein mean any invention or discovery of the University conceived or first actually reduced to practice in the course of or under this Agreement, and includes any art, method, process,

machine or manufacture, design or composition thereof, or any variety of plant, which is or may be patentable under the Patent Laws of the United States of America or any foreign country.

23 CFR 420.121(j) of the "State Planning and Research Program Administration, Final Rule," and 37 CFR 401.14, "Standard Patent Rights Clauses," are herein by reference made part of this Agreement.

The quarterly report required in Section 1.(B) of this Agreement shall include disclosure of potentially patentable inventions or discoveries first conceived or reduced to practice since the prior report. The University shall have title to such inventions or discoveries. The University shall have the right to file patent applications on such inventions and discoveries. The University shall give written notice of its intention to file a patent application with respect to any such discovery or invention within sixty (60) days after disclosure to NETC. If the University becomes the owner of any patent with respect to any invention or discovery covered by this paragraph, it shall grant to NETC, its members and the Federal Government a paid-up, royalty-free, nonexclusive, irrevocable license, with the right to sublicense to practice or have practiced for or on the behalf of governmental agencies, either Federal, State, or municipal agencies including counties and townships, or quasi-governmental agencies, the patented invention or discovery. Any royalties from sales in the private sector or outside the United States shall be assigned to the University. With respect to inventions or discoveries covered by this paragraph which are not patented or patentable, such inventions or discoveries shall be jointly owned with each party having the unrestricted right to practice or have practiced the same on its behalf.

- (K) 37 CFR, Part 401, "Rights To Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," is herein by reference made part of this Agreement.
- (L) NETC assumes no liability for payment under the terms of a specific project Agreement until such Agreement has been approved and signed by both parties.

(M) Funding:

The University shall fund all work conducted under this Agreement in the first instance and bill NETC for reimbursement. In no case will NETC be liable for reimbursement of project costs in excess of the amount specified in the project Agreement.

(N) Schedule A is attached hereto and made a part of this Agreement hereof. To the extent permitted by law, NETC and each of the state universities which belong to NETC shall, as part consideration for the promises of the State, fully comply with each of the terms and conditions set forth within Schedule A. It is understood and agreed among the parties that nothing within this subparagraph of this Agreement may be construed as a waiver of or limitation upon the sovereign immunity, if any, of any of the state universities which belong to the NETC or the NETC membership itself.

(O) It is mutually understood and agreed by the parties hereto that any official notice from one such party to the other such party (or parties), in order for such notice to be binding thereon, shall:

(a.) be in writing addressed to:

(i) when ConnDOT is to receive such notice -

Mr. James M. Sime  
Manager of Research  
Connecticut Department of Transportation  
280 West Street  
Rocky Hill, CT 06067; or,

(ii) when the University is to receive such notice -

(1) For contractual matters:

Ms. Diane Hardy  
Grant and Contract Administrator  
University of New Hampshire  
Office of Sponsored Research  
Service Building, 51 College Road  
Durham, NH 03824,

(b.) be delivered in person or be mailed United States Postal Service - "Certified Mail" to the address recited herein as being the address of the party(ies) to receive such notice; and,

(c.) contain complete and accurate information in sufficient detail to properly and adequately identify and describe the subject matter thereof.

The term "official notice" as used herein, shall be construed to include, but not be limited to, any request, demand, authorization, direction, waiver, and/or consent of the party(ies) as well as any document(s) provided, permitted, or required for the making or ratification of any change, revision, addition to or deletion from the document, contract, or agreement in which this "official notice" specification is contained.

Further, it is understood and agreed that nothing hereinabove contained shall preclude the parties hereto from subsequently agreeing, in writing, to designate alternate persons (by name, title, and affiliation) to which such notice(s) is (are) to be addressed; alternate means of conveying such notice(s) to the particular party(ies); and/or alternate locations to which the delivery of such notice(s) is (are) to be made, provided such subsequent agreement(s) is (are) concluded pursuant to the adherence to this specification.

(P) Any standards (i.e., test methods, specifications, guidelines, suggested practices, recommended procedures, etc.) emanating from the research project shall be forwarded to the American Association of State Highway Transportation Officials (AASHTO) for consideration and possible adoption.

During the performance of this Agreement, the Second Party, for itself, its assignees and successors in interest agrees as follows:

(1) Compliance with Regulations: The Second Party shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the United States Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this Agreement.

(2) Nondiscrimination: The Second Party, with regard to the work performed by it during the Agreement, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Second Party shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the Agreement covers a program set forth in Appendix B of the Regulations.

(3) Solicitations for Subcontractors, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the Second Party for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Second Party of the Second Party's obligations under this Agreement and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

(4) Information and Reports: The Second Party shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Connecticut Department of Transportation or the appropriate Federal Agency directly involved therewith, to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a Second Party is in the exclusive possession of another who fails or refuses to furnish this information, the Second Party shall so certify to the Connecticut Department of Transportation, or the appropriate Federal Agency directly involved therewith, if appropriate, and shall set forth what efforts it has made to obtain the information.

(5) Sanctions for Noncompliance: In the event of the Second Party's noncompliance with the nondiscrimination provisions of this Agreement, the Connecticut Department of Transportation shall impose such sanctions as it or the appropriate Federal Agency directly involved therewith may determine to be appropriate including but not limited to:

- (a) withholding of payments to the Second Party under the Agreement until the Second Party complies, and/or
- (b) cancellation, termination or suspension of the Agreement, in whole or in part.

(6) Incorporation of Provisions: The Second Party shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The Second Party shall take such action with respect to any subcontract or procurement as the Connecticut Department of Transportation or the appropriate Federal Agency directly involved therewith, may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that, in the event a Second Party becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Second Party may request the Connecticut Department of Transportation to enter into such litigation to protect the interests of the State of Connecticut, and in addition, the Second Party may request the United States to enter into such litigation to protect the interests of the United States.

**SCHEDULE A**

**NETC AND THE UNIVERSITY MUTUALLY AGREE TO:**

- (A) The University hereby acknowledges and agrees to comply with the Connecticut Required Contract/Agreement Provisions entitled, "Specific Equal Employment Opportunity Responsibilities," dated March 6, 1998, a copy of which is attached hereto and made a part hereof.
- (B) The University hereby acknowledges and agrees to comply with the policies enumerated in "Connecticut Department of Transportation Policy Statement No. F&A-10 Subject: Code of Ethics Policy", July 30, 2004, a copy of which is attached hereto and made a part thereof.
- (C) The University agrees that the attached "Policy Statement, Policy No. ADMIN. - 19, May 12, 2003, Subject: Policy on Disadvantaged Business Enterprise Program," is hereby made a part of this Agreement. The State advises the University that failure to carry out the requirements set forth in this Policy Statement shall constitute a breach of contract and may result in termination of this Agreement by the State or such remedy as the State deems appropriate.
- The University shall comply with this provision in accordance with the "Agreements With Goals Special Provisions Disadvantaged Business Enterprises as Subcontractors and Material Suppliers or Manufacturers For Federal Funded Projects," dated October 16, 2000, attached hereto and hereby made a part of this Agreement.
- (D) The University hereby acknowledges and agrees to comply with the policies enumerated in Administrative Memorandum No. 104, dated August 28, 1984, Re: "Procurement and Property Management of Equipment Purchased by Construction Inspection Consultant Engineers."

- (E) The University hereby acknowledges and agrees to comply with Chapter 219 of the Connecticut General Statutes pertaining to tangible personal property or services rendered that is/are subject to sales tax. The attached copy of the "Governmental Agency Exemption Certificate" is hereby made a part hereof.
- (F) Suspended or debarred University suppliers, materialmen, lessors or other vendors may not submit proposals for a State contract or subcontract during the period of suspension or debarment regardless of their anticipated status at the time of contract award or commencement of work.
- (1) The signature on the Agreement by the University shall constitute certification that to the best of its knowledge and belief the University or any person associated therewith in the capacity of owner, partner, director, officer, principal investigator, project director, manager, auditor or any position involving the administration of Federal or State Funds:
- (a.) Is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b.) Has not within a three (3) year period preceding this Agreement been convicted of or had a civil judgment rendered against him/her for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction, violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of

records, making false statements or receiving stolen property;

(c.) Is not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b.) of this certification and,

(d.) Has not within a three (3) year period preceding this Agreement had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the University is unable to certify to any of the statements in this certification, such University shall attach an explanation to this Agreement.

(G) The University agrees to insure that the following certification be included in each subcontract Agreement to which it is a party, and further, to require said certification to be included in any lower tier subcontracts and purchase orders:

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

(H) This clause applies to those Universities who are or will be responsible for compliance with the terms of the Americans with Disabilities Act of 1990 ("Act"), Public Law 101-336, during the

term of the Agreement. The University represents that it is familiar with the terms of this Act and that it is in compliance with the Act. Failure of the University to satisfy this standard as the same applies to performance under this Agreement, either now or during the term of the Agreement as it may be amended, will render the Agreement voidable at the option of the State upon notice to the University. The University warrants that it will hold the State harmless and indemnify the State from any liability which may be imposed upon the State from any liability which may be imposed upon the State as a result of any failure of the University to be in compliance with this Act, as the same applies to performance under the Agreement.

- (I) The term "date data" as used herein shall mean any program function that utilizes data or input which includes an indication of or reference to the date. The University represents that any hardware, software, data in a computer format and/or firmware [hereinafter referred to as "product(s)"] delivered to or developed for the State shall be capable of accurately processing (including, but not limited to, calculating, comparing and sequencing) date data from, into and/or between the twentieth and twenty-first centuries, including leap year calculations, when used in accordance with the purpose for which the State intends to use the product(s). Such processing shall employ an expanded character format using at least eight digits in the date fields, but shall not be based upon a sliding scale format or increase the processing time of the product(s). The accurate processing of date data by such product(s) from, into and/or between the twentieth and twenty-first centuries, including leap year calculations, shall hereinafter be referred to collectively as "Year 2000 compliant." In addition, said product(s) delivered to or developed for the State shall be capable of accurately

processing date data throughout the twenty-first century, as well as from, into and/or between centuries.

(J) Violence in the Workplace Prevention:

This contract is subject to the provisions of Executive Order No. 16 of Governor John G. Rowland, promulgated August 4, 1999 and, as such, the contract may be cancelled, terminated or suspended by the state for violation of or noncompliance with said Executive Order No. 16. The parties to this contract, as part of the consideration hereof, agree that said Executive Order No. 16 is incorporated herein by reference and made a part hereof. The parties agree to abide by such Executive Order.

(K) This Agreement shall be governed, interpreted and construed under and in accordance with the laws of the State of Connecticut, whether or not its conflict of laws principles would dictate otherwise. This Agreement shall be deemed to have been made in Hartford, Connecticut.

The University irrevocably consents with respect to any claims or remedies at law or in equity, arising out of or in connection with this Agreement to the jurisdiction of the Connecticut Superior Court (except as otherwise required by law or that Agreement), and, with respect to any claim between the Parties, to venue in Judicial District of Hartford-New Britain at Hartford or the United States Federal Court, District of Connecticut, and irrevocably waives any objections that it may have to such jurisdiction on the grounds of lack of personal jurisdiction of such court or the laying of venue of such court or on the basis of forum non conveniens or otherwise. Nothing herein shall be construed to waive any of the State's immunities.

STATE OF CONNECTICUT  
BY HIS EXCELLENCY  
THOMAS J. MESKILL  
GOVERNOR  
EXECUTIVE ORDER NO. THREE

WHEREAS, sections 4-61d (b) and 4-114a of the 1969 supplement to the general statutes require nondiscrimination clauses in state contracts and subcontracts for construction on public buildings, other public works and goods and services and

WHEREAS, section 4-61e (c) of the 1969 supplement to the general statutes requires the labor department to encourage and enforce compliance with this policy by both employers and labor unions, and to promote equal employment opportunities, and

WHEREAS, the government of this state recognizes the duty and desirability of its leadership in providing equal employment opportunity, by implementing these laws,

NOW, THEREFORE, I, THOMAS J. MESKILL, Governor of the State of Connecticut, acting by virtue of the authority vested in me under section twelve of article fourth of the constitution of the state, as supplemented by section 3-1 of the general statutes, do hereby ORDER and DIRECT, as follows, by this Executive Order:

I

The labor commissioner shall be responsible for the administration of this Order and shall adopt such regulations as he deems necessary and appropriate to achieve the purposes of this Order. Upon the promulgation of this Order, the commissioner of finance and control shall issue a directive forthwith to all state agencies, that henceforth all state contracts and subcontracts for construction on public buildings, other public works and goods and services shall contain a provision rendering such contract or subcontract subject to this Order, and that such contract or subcontract may be cancelled, terminated or suspended by the labor commissioner for violation of or noncompliance with this Order or state or federal laws concerning nondiscrimination, notwithstanding that the labor commissioner is not a party to such contract or subcontract.

II

Each contractor having a contract containing the provisions prescribed in section 4-114a of the 1969 supplement to the general statutes, shall file, and shall cause each of his subcontractors to file, compliance reports with the contracting agency or the labor commissioner, as may be directed. Such reports shall be filed within such times and shall contain such information as to employment policies and statistics of the contractor and each subcontractor, and shall be in such form as the labor commissioner may prescribe. Bidders or prospective contractors or subcontractors may be required to state whether they have participated in any previous contract subject to the provisions of this Order or any preceding similar Order, and in that event to submit on behalf of themselves and their proposed subcontractors compliance reports prior to or as an initial part of their bid or negotiation of a contract.

III

Whenever the contractor or subcontractor has a collective bargaining agreement or other contract or understanding with a labor organization or employment agency as defined in section 31-122 of the general statutes, the compliance report shall identify the said organization or agency and the contracting agency or the labor commissioner may require a compliance report to be filed with the contracting agency or the labor commissioner, as may be directed, by such organization or agency, signed by an authorized officer or agent of such organization or agency, with supporting information, to the effect that the signer's practices and policies, including but not limited to matters concerning personnel, training, apprenticeship, membership, grievance and representation, and upgrading, do not discriminate on grounds of race, color, religious creed, age, sex, or national origin, or ancestry of any individual, and that the signer will either affirmatively cooperate in the implementation of the policy and provisions of this Order, or that it consents and agrees that recruitment, employment and the terms and conditions of employment under the proposed contract shall be in accordance with the purposes and provisions of the Order.

IV

The labor commissioner may by regulation exempt certain classes of contracts, subcontracts or purchase order from the implementation of this Order, for standard commercial supplies or raw materials, for less than specified amounts of money or numbers of workers or for subcontractors below a specified tier. The labor commissioner may also provide by regulation for the exemption of facilities of a contractor which are in all respects separate and distinct from activities of the contractor related to the performance of the state contract, provided only that such exemption will not interfere with or impede the implementation of this Order, and provided further, that in the absence of such an exemption, all facilities shall be covered by the provisions of this Order.

V

Each contracting agency shall be primarily responsible for obtaining compliance with the regulations of the labor commissioner with respect to contracts entered into by such agency or its contractors. All contracting agencies shall comply with the regulations of the labor commissioner in discharging their primary responsibility for securing compliance with the provisions of contracts and otherwise with the terms of this Order and of the regulations of the labor commissioner issued pursuant to this Order. They are directed to cooperate with the labor commissioner and to furnish the labor commissioner such information and assistance as he may require in the performance of his functions under this Order. They are further directed to appoint or designate from among the personnel of each agency, compliance officers, whose duty shall be to seek compliance with the objectives of this Order by conference, conciliation, mediation, or persuasion.

VI

The labor commissioner may investigate the employment practices and procedures of any state contractor or subcontractor and the practices and policies of any labor organization or employment agency hereinabove described, relating to employment under the state contract, as concerns nondiscrimination by such organization or agency as hereinabove described, or the labor commissioner may initiate such investigation by the appropriate contract agency, to determine whether or not the contractual provisions hereinabove specified or statutes of the state respecting them have been violated. Such investigation shall be conducted in accordance with the procedures established by the labor commissioner and the investigating agency shall report to the labor commissioner any action taken or recommended.

VII

The labor commissioner shall receive and investigate or cause to be investigated complaints by employees or prospective employees of a state contractor or subcontractor or members or applicants for membership or apprenticeship or training in a labor organization or employment agency hereinabove described, which allege discrimination contrary to the contractual provisions specified hereinabove or state statutes requiring nondiscrimination in employment opportunity. If this investigation is conducted for the labor commissioner by a contracting agency, that agency shall report to the labor commissioner what action has been taken or is recommended with regard to such complaints.

VIII

The labor commissioner shall use his best efforts, directly and through contracting agencies, other interested federal, state and local agencies, contractors and all other available instrumentalities, including the commission on human rights and opportunities, the executive committee on human rights and opportunities, and the apprenticeship council under its mandate to provide advice and counsel to the labor commissioner in providing equal employment opportunities to all apprentices and to provide training, employment and upgrading opportunities for disadvantaged workers, in accordance with section 31-51 (d) of the 1969 supplement to the general statutes, to cause any labor organization or any employment agency whose members are engaged in work under government contracts or referring workers or providing or supervising apprenticeship or training for or in the course of work under a state contract or subcontract to cooperate in the implementation of the purposes of this Order. The labor commissioner shall in appropriate cases notify the commission on human rights and opportunities or other appropriate state or federal agencies whenever it has reason to believe that the practices of any such organization or agency violate equal employment requirements or state or federal law.

IX

The labor commissioner or any agency officer or employee in the executive branch designated by regulation of the labor commissioner may hold such hearings, public or private, as the labor commissioner may deem advisable for compliance, enforcement or educational purposes under this Order.

X

(a) The labor commissioner may hold or cause to be held hearings, prior to imposing ordering or recommending the imposition of penalties and sanctions under this Order. No order for disbarment of any contractor from further state contracts shall be made without affording the contractor an opportunity for a hearing. In accordance with such regulations as the labor commissioner may adopt, the commissioner or the appropriate contracting agency may

- (1) Publish or cause to be published the names of contractors or labor organizations or employment agencies as hereinabove described which it has concluded have complied or failed to comply with the provisions of this Order or the regulations of the labor commissioner in implementing this Order.
- (2) Recommend to the commission on human rights and opportunities that in cases in which there is substantial or material violation or threat thereof of the contractual provision or related state statutes concerned herein, appropriate proceedings be brought to enforce them, including proceedings by the commission on its own motion under chapter 563 of the general statutes and the enjoining, within the limitations of applicable law, of organizations, individuals or groups who prevent directly or indirectly or seek to prevent directly or indirectly compliance with the provisions of this Order.
- (3) Recommend that criminal proceedings be brought under chapter 939 of the general statutes.
- (4) Cancel, terminate, suspend or cause to be cancelled, terminated, or suspended in accordance with law any contract or any portion or portions thereof for failure of the contractor or subcontractor to comply with the nondiscrimination provisions of the contract. Contracts may be cancelled, terminated, suspended absolutely or their continuance conditioned upon a program for future compliance approved by the contracting agency.
- (5) Provide that any contracting agency shall refrain from entering into any further contracts or extensions or modifications of existing contracts with any contractor until he has satisfied the labor commissioner that he has established and will carry out personnel and employment policies compliant with this Order.
- (6) Under regulations prescribed by the labor commissioner each contracting agency shall make reasonable efforts within a reasonable period of time to secure compliance with the contract provisions of this Order by methods of conference, conciliation, mediation or persuasion, before other proceedings shall be instituted under this Order or before a state contract shall be cancelled or terminated in whole or in part for failure of the contractor or subcontractor to comply with the contract provisions of state statute and this Order.

(b) Any contracting agency taking any action authorized by this Order, whether on its own motion or as directed by the labor commissioner or pursuant to his regulations shall promptly notify him of such action. Whenever the labor commissioner makes a determination under this Order, he shall promptly notify the appropriate contracting agency and other interested federal, state and local agencies of the action recommended. The state and local agency or agencies shall take such action and shall report the results thereof to the labor commissioner within such time as he shall specify.

XI

If the labor commissioner shall so direct, contracting agencies shall not enter into contracts with any bidder or prospective contractor unless he has satisfactorily complied with the provisions of this Order, or submits a program for compliance acceptable to the labor commissioner, or if the labor commissioner so authorizes, to the contracting agency.

XII

Whenever a contracting agency cancels or terminates a contract, or a contractor has been disbarred from further government contracts because of noncompliance with the contract provisions with regard to nondiscrimination, the labor commissioner or the contracting agency shall rescind such disbarment, upon the satisfaction of the labor commissioner that the contractor has purged himself of such noncompliance and will thenceforth carry out personnel and employment policies of nondiscrimination in compliance with the provision of this Order.

XIII

The labor commissioner may delegate to any officer, agency or employee in the executive branch any function or duty of the labor commissioner under this Order except authority to promulgate regulations of a general nature.

XIV

This Executive Order supplements the Executive Order issued on September 28, 1967. All regulations, orders, instructions, designations and other directives issued heretofore in these premises, including those issued by the heads of various departments or agencies under or pursuant to prior order or statute, shall remain in full force and effect, unless and until revoked or superseded by appropriate authority, to the extent that they are not inconsistent with this Order.

This Order shall become effective thirty days after the date of this Order.

Dated at Hartford, Connecticut, this 16th day of June, 1971.

  
GOVERNOR

GUIDELINES AND RULES  
OF STATE LABOR COMMISSIONER  
IMPLEMENTING GOVERNOR'S EXECUTIVE  
ORDER NO. THREE

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SEC. 1. PERSONS AND FIRMS SUBJECT TO EXECUTIVE ORDER NO. THREE AND GUIDELINES AND RULES.

a. Every contractor, or subcontractor as defined in Sec. 2 hereof, supplier of goods or services, vendor, bidder and prospective contractor or subcontractor, having ten or more employees as defined in Sec. 3 of these Guidelines, having or entering into or bidding to enter into any type of contractual relationship with the State of Connecticut or any of its agencies, boards, commissions, departments or officers, and if the consideration, cost, subject matter or value of the goods or services exceeds \$5,000.00, shall be subject to the Governor's Executive Order No. Three and these Guidelines and Rules.

b. A copy of the Governor's Executive Order No. Three and of these Guidelines and Rules shall be available to each said contractor, subcontractor, supplier, vendor, bidder and prospective contractor and subcontractor, and the said Executive Order No. Three and these Guidelines and Rules shall be incorporated by reference and made a part of the contract, purchase order, agreement or document concerned. A copy of the Executive Order and of these Guidelines and Rules shall be furnished to a contracting party or bidder on request.

c. All persons, partnerships, associations, firms, corporations and other entities having less than ten employees as defined in Sec. 3 at the time of the bid and execution of the contract and continuing through the performance of the contract are exempt from the provisions of the said Executive Order and these Guidelines and Rules. All contracts, subcontracts, purchase orders and agreements wherein the consideration is \$5,000.00 or less shall be exempt from Executive Order No. Three and from these Guidelines and Rules.

SEC. 2. SUBCONTRACTORS.

As used herein, subcontractors are persons, partnerships, associations, firms or corporations or other entities having contractual relationship with a contractor who in turn has a contract with the State of Connecticut or any of its agencies, boards, commissions or departments. Subcontractors below this tier are exempt from the Executive Order and from these Guidelines and Rules.

SEC. 3 EMPLOYEES.

As used herein, employees are persons working full or part-time irrespective of personnel classification whose wages, salaries, or earnings are subject to the Federal Insurance Contribution Act and/or to Federal Withholding Tax as a matter of law (whether in fact or not any actual withholding occurs in a given case), in an employee-employer relationship at the time of bid, contract execution, or offer or acceptance, and/or during any time thereafter during the existence of the performance period of the contract to the conclusion thereof.

SEC. 4. REPORTS.

a. Prior to the execution of the contract or prior to acceptance of a bid, as the case may be, the contractor, subcontractor, bidder or vendor shall file a report with the State Labor Commissioner, which report shall be complete and contain all of the information therein prescribed. The report shall be on Form E.O. 3-1, a facsimile of which is attached hereto and made a part hereof, or in lieu thereof the contractor, subcontractor, bidder or vendor shall submit a detailed report containing all of the information required in Form E.O. 3-1.

b. The Labor Commissioner may require the filing of additional reports prior to final payment or prior to any renewal or extension of the contract and during the duration of the contract at such times as the Commissioner may, in his discretion, from time to time deem necessary. The Labor Commissioner may require the filing of additional information or reports, and the contractor, subcontractor, bidder or vendor shall furnish said information or reports within the times prescribed by the Labor Commissioner.

c. The Labor Commissioner may, at his discretion, also require timely statistical reports on the number of minority employees employed or to be employed in the performance of the contract, and the Labor Commissioner may define such minority groups or persons.

d. Reports filed pursuant to these Guidelines and Rules in implementation of Executive Order No. Three are not public records subject to public inspection, but may be inspected only by federal and state officials having jurisdiction and authority to investigate matters of this type. All federal and state agencies empowered by law to investigate matters relating to Executive order No. Three shall have access to these reports for inspection or copying during regular business hours.

e. Any person who wilfully, wantonly or through negligence destroys or permits to be destroyed, alters or allows to be altered after filing, any reports submitted in compliance herewith shall be subject to penalties as prescribed by law.

SEC. 5. MANDATORY CLAUSES IN DOCUMENTS.

a. All contracts shall contain the following provisions verbatim:

This contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill promulgated June 16, 1971 and, as such, this contract may be cancelled, terminated or suspended by the state labor commissioner for violation of or noncompliance with said Executive Order No. Three, or any state or federal law concerning nondiscrimination, notwithstanding that the labor commissioner is not a party to this contract. The parties to this contract, as part of the consideration hereof, agree that said Executive Order No. Three is incorporated herein by reference and made a part hereof. The parties agree to abide by said Executive Order and agree that the state labor commissioner shall have continuing jurisdiction in respect to contract performance in regard to nondiscrimination, until the contract is completed or terminated prior to completion.

The (contractor), (subcontractor), (bidder), (vendor) agrees, as part consideration hereof, that this (order) (contract) is subject to the Guidelines and Rules issued by the state labor commissioner to implement Executive Order No. Three, and that he will not discriminate in his employment practices or policies, will file all reports as required, and will fully cooperate with the State of Connecticut and the state labor commissioner.

These provisions are in addition to and not in lieu of other clauses required by law.\*

\* N.B. The above paragraphs contain requirements additional to those set forth in July 16, 1971 directive to state agencies.

b. Every purchase order or like form submitted by a vendor or bidder, as applicable shall contain the following clause verbatim:

Vendor agrees, as part of the consideration hereof, that this order is subject to the provisions of Executive Order No. Three and the Guidelines and Rules issued by the Labor Commissioner implementing said Order as to nondiscrimination, and vendor agrees to comply therewith.

c. Where preprinted contract forms have been prescribed by federal authority and the rules of the federal agency prohibit the alteration thereof, the compliance officer of the State agency concerned shall submit to the Labor Commissioner a suggested short form or addendum acceptable to the federal agency, and in such cases, after approval by the Labor Commissioner, said clause may be substituted.

SEC. 6. COOPERATION OF STATE AGENCIES, BOARDS AND COMMISSIONS.

Every agency, board, commission and department of the State of Connecticut shall cooperate with the Labor Commissioner in the implementation of Executive Order No. Three and shall furnish such information and assistance as the Labor Commissioner may from time to time request.

SEC. 7. INVESTIGATIONS, COMPLAINTS.

The Labor Commissioner may initiate an investigation upon receipt of a complaint alleging discrimination. The Labor Commissioner may request that an investigation be conducted by the State agency which is the party to the contract in question. Investigations shall be conducted in accordance with acceptable legal standards, safeguarding the rights of all parties involved, and obtaining all of the relevant facts necessary for a complete determination of the issues. If the Labor Commissioner is not satisfied with the investigation or any part thereof he may order it to continue or to proceed further.

SEC. 8. HEARINGS.

The Labor Commissioner or officers designated by the heads of the State agencies, boards and commissions may conduct hearings on complaints filed. Hearings shall be held only after a report of the complaint has been filed with the Labor Commissioner and after a hearing on the complaint has been authorized or directed by the Labor Commissioner. Hearings shall be conducted in accordance with the accepted principles of administrative law. All parties shall be afforded the opportunity to a full, fair, impartial and complete hearing, the opportunity to examine and cross examine witnesses and to be present at all sessions of the hearing. If any party is vulnerable to a charge of a violation of the law, he shall be afforded the opportunity to procure counsel who may be present at the hearing.

SEC. 9. EQUAL EMPLOYMENT OPPORTUNITIES.

All State contracting agencies, employers, and labor unions shall use their best efforts to provide equal employment opportunities to all apprentices and to provide training, employment and upgrading opportunities for disadvantaged workers in accordance with section 31-51(d) of the General Statutes.

SEC. 10. DUTIES OF CONTRACTING AGENCIES.

All State contracting agencies shall be responsible for compliance with said Executive Order and with all state and federal laws relating to equal employment opportunities. All contracting agencies conducting investigations for the Labor Commissioner pursuant to Executive Order No. Three and these Guidelines and Rules shall report to the Labor Commissioner the action taken or recommended with regard to each complaint filed. Each officer of the executive department, every commissioner, and each executive head of each State agency, board and commission in the executive branch of the State government is expected to assume the responsibility of seeing to complete compliance with the Governor's Executive Order No. Three and shall forthwith take steps to assure and guarantee that there shall be no discrimination within their departments, agencies, boards or commissions in the performance of any state contract or subcontract on the basis of race, creed, color, sex, age, national origin or national ancestry, or in any way in violation of any state or federal law relating thereto.

BY VIRTUE OF THE AUTHORITY VESTED IN ME PURSUANT TO EXECUTIVE ORDER NO THREE EFFECTIVE JULY 16, 1971, AND THE GENERAL STATUTES OF CONNECTICUT

Dated at Wethersfield, Connecticut this 19<sup>th</sup> day of Nov., 1971.

JACK A. FUSARI  
LABOR COMMISSIONER

STATE OF CONNECTICUT

BY HIS EXCELLENCY  
THOMAS J. MESKILL

GOVERNOR

EXECUTIVE ORDER NO. SEVENTEEN

WHEREAS, Section 31-237 of the General Statutes of Connecticut as amended requires the maintaining of the established free services of the Connecticut State Employment Service to both employers and prospective employees and

WHEREAS, Section 31-5 of the General Statutes of Connecticut requires that no compensation or fee shall be charged or received directly or indirectly for the services of the Connecticut State Employment Service and

WHEREAS, large numbers of our citizens who have served in the Armed Forces of our nation are returning to civilian life in our state and seeking employment in civilian occupations and

WHEREAS, we owe a duty as well as gratitude to these returning veterans including the duty to find suitable employment for them and

WHEREAS, many of our handicapped citizens are fully capable of employment and are entitled to be placed in suitable employment and

WHEREAS, many of the citizens of our state who are unemployed are unaware of the job openings and employment opportunities which do in fact exist in our state and

WHEREAS, notwithstanding the free services of the Connecticut State Employment Service, many of our Connecticut employers do not use its free services or do not avail themselves fully of all of the services offered.

NOW, THEREFORE, I, THOMAS J. MESKILL, Governor of the State of Connecticut, acting by virtue of the authority vested in me under the fourth article of the Constitution of the State and in accordance with Section 3-1 of the General Statutes, do hereby ORDER and DIRECT, as follows, by this Executive Order:

I

The Labor Commissioner shall be responsible for the administration of this Order and shall do all acts necessary and appropriate to achieve its purpose. Upon promulgation of this Order, the Commissioner of Finance and Control shall issue a directive forthwith to all state agencies that henceforth all state contracts and subcontracts for construction on public buildings, other public works and goods and services shall contain a provision rendering such contract or subcontract subject to this Order, and that such contract or subcontract may be cancelled, terminated or suspended by the Labor Commissioner for violation of or noncompliance with this Order, notwithstanding that the Labor Commissioner is not a party to such contract or subcontract.

II

Every contractor and subcontractor having a contract with the state or any of its agencies, boards, commissions, or departments, every individual partnership, corporation, or business entity having business with the state or who or which seeks to do business with the state, and every bidder or prospective bidder who submits a bid or replies to an invitation to bid on any state contract shall list all employment openings with the office of the Connecticut State Employment Service in the area where the work is to be performed or where the services are to be rendered.

III

All state contracts shall contain a clause which shall be a condition of the contract that the contractor and any subcontractor holding a contract directly under the contractor shall list all employment openings with the Connecticut State Employment Service. The Labor Commissioner may allow exceptions to listings of employment openings which the contractor proposes to fill from within its organization from employees on the rolls of the contractor on the date of publication of the invitation to bid or the date on which the public announcement was published or promulgated advising of the program concerned.

IV

Each contracting agency of the state shall be primarily responsible for obtaining compliance with this Executive Order. Each contracting agency shall appoint or designate from among its personnel one or more persons who shall be responsible for compliance with the objectives of this Order.

V

The Labor Commissioner shall be and is hereby empowered to inspect the books, records, payroll and personnel data of each individual or business entity subject to this Executive Order and may hold hearings or conferences, formal or informal, in pursuance of the duties and responsibilities hereunto delegated to the Labor Commissioner.

VI

The Labor Commissioner or any agency officer or employee in the executive branch designated by regulation of the Labor Commissioner may hold such hearings, public or private, as the Labor Commissioner may deem advisable for compliance, enforcement or educational purposes under this Order.

VII

(a) The Labor Commissioner may hold or cause to be held hearings, prior to imposing, ordering, or recommending the imposition of penalties and sanctions under this Order. In accordance herewith, the Commissioner or the appropriate contracting agency may suspend, cancel, terminate, or cause to be suspended, cancelled, or terminated in accordance with law any contract or any portion or portions thereof for failure of the contractor or subcontractor to comply with the listing provisions of the contract. Contracts may be cancelled, terminated, suspended absolutely or their continuance conditioned upon a program for future compliance approved by the contracting agency.

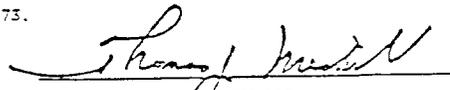
(b) Any contracting agency taking any action authorized by this Order, whether on its own motion or as directed by the Labor Commissioner, shall promptly notify him of such action. Whenever the Labor Commissioner makes a determination under this Order, he shall promptly notify the appropriate contracting agency of the action recommended. The agency shall report the results to the Labor Commissioner promptly.

VIII

If the Labor Commissioner shall so direct, contracting agencies shall not enter into contracts with any bidder or prospective contractor unless he has satisfactorily complied with the provisions of this Order.

This Order shall become effective sixty days after the date of this Order.

Dated at Hartford, Connecticut, this 15th day of February, 1973.

  
GOVERNOR

**CONNECTICUT REQUIRED CONTRACT/AGREEMENT PROVISIONS**  
**March 6, 1998**

Specific Equal Employment Opportunity Responsibilities

1. General

- A. Equal Employment Opportunity Requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246, Executive Order 11375, the Railroad Revitalization and Regulatory Reform Act of 1976 and other U.S. Department of Transportation nondiscrimination legislation are set forth in this Required Contract/Agreement Provision. The requirements set forth in these special provisions shall constitute the specific affirmative action requirements for project activities under this contract (or agreement) and supplement the equal employment opportunity requirements set forth in other related contract provisions.
- B. "Company" refers to any entity doing business with the Connecticut Department of Transportation and includes but is not limited to the following:
- |                |   |
|----------------|---|
| Contractors    | Vendors (where applicable)                |
| Subcontractors | Suppliers of Materials (where applicable) |
| Consultants    | Municipalities (where applicable)         |
| Subconsultants | Utilities (where applicable)              |
- C. The Company will work with the Connecticut Department of Transportation and the federal government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract or agreement.
- D. The Company and all their subcontractors or subconsultants holding subcontracts or subagreements of \$10,000 or more on federally-assisted projects and \$5,000 or more on state funded projects, will comply with the following minimum specific requirement activities of equal employment opportunity. The Company will physically include these requirements in every subcontract or subagreement meeting the monetary criteria above with such modification of language as is necessary to make them binding on the subcontractor or subconsultant.
- E. These Required Contract Provisions apply to all state funded and/or federally-assisted projects, activities and programs in all facets of the Connecticut Department of Transportation operations resulting in contracts or agreements.

2. Equal Employment Opportunity Policy

The Company will develop, accept and adopt as its operating policy an Affirmative Action Plan utilizing as a guide the Connecticut Department of Transportation Affirmative Action Plan Guideline.

3. Equal Employment Opportunity Officer

The Company will designate and make known to the State Department of Transportation contracting officers an equal employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

4. Dissemination of Policy

- A. All members of the Company's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the Company's equal employment opportunity policy and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
- (1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less than once every six (6) months thereafter, at which time the Company's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable Company official.

- (2) All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable Company official covering all major aspects of the Company's equal employment opportunity obligations within thirty (30) days following their reporting for duty with the Company.
  - (3) All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate Company official in the Company's procedures for locating and hiring protected class group employee.
- B. In order to make the Company's equal employment opportunity policy known to all employees, prospective employees and potential sources of employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the Company will take the following actions:
- (1) Notices and posters setting forth the Company's equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
  - (2) The Company's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

5. Recruitment

- A. When advertising for employees, the Company will include in all advertisements for employees the notation: "An Equal Opportunity Employees." All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
- B. The Company will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the Company will, through its EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the Company for employment consideration.
- In the event the Company has a valid bargaining agreement providing for exclusive hiring hall referrals, the Company is expected to observe the provisions of that agreement to the extent that the system permits the Company's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the Company to do the same, such implementation violates Executive Order 11246, as amended.)
- C. The Company will encourage its present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in the areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

6. Personnel Actions

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoffs, and termination, shall be taken without regard to race, color, religion, sex, or national origin, etc. The following procedures shall be followed:

- A. The Company will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- B. The Company will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

- C. The Company will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the Company will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- D. The Company will promptly investigate all complaints of alleged discrimination made to the Company in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the Company will inform every complainant of all of his avenues of appeal.
- E. The general contract provision entitled A(76) Affirmative Action Requirements is made part of this document by reference. In conjunction with this contract provision, only the job categories will change in order to be comparable with the job categories utilized by the Company proposing to do business with the Connecticut Department of Transportation. The goals and time tables will remain the same throughout the contract provision.

7. Training and Promotion

- A. The Company will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- B. Consistent with the Company's work force requirements and as permissible under Federal and State regulations, the Company shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event the Training Special Provision is provided under this contract, this subparagraph will be superseded.
- C. The Company will advise employees and applicants for employment of available training programs and entrance requirements for each.
- D. The Company will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

8. Unions

If the Company relies in whole or in part upon unions as a source of employees, it will use its best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the Company either directly or through an association acting as agent will include the procedures set forth below:

- A. The Company will use its best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- B. The Company will use its best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, or national origin, etc.
- C. The Company is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the Company, the Company shall so certify to the Connecticut Department of Transportation and shall set forth what efforts have been made to obtain such information
- D. In the event the union is unable to provide the Company with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the Company will, through independent recruitment efforts, fill

the employment vacancies without regard to race, color, religion, sex or national origin, etc. making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that it shall be no excuse that the union with which the Company has a collective bargaining agreement providing for exclusive referral failed to refer minority employees). In the event the union referral practice prevents the Company from meeting the obligations pursuant to Executive Order 11246, as amended, these provisions, such Company shall immediately notify the Connecticut Department of Transportation.

9. Subcontracting

- A. The Company will use its best efforts to solicit bids from and to utilize minority group subcontractors, or subcontractors with meaningful minority group and female representation among their employees. Companies shall obtain a list of applicable Disadvantaged Business Enterprises firms from the Division of Contract Compliance.
- B. The Company will use its best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.
- C. The General Contract Provisions entitled "Minority Business Enterprises as Subcontractors" is made part of this document by reference and its requirements are applicable to all entities proposing to do business with the Connecticut Department of Transportation.

10. Records and Reports

For the duration of the project, the company will maintain records as are necessary to determine compliance with the Company's equal employment opportunity obligations and Affirmative Action requirements. Additionally, the company will submit all requested reports in the manner required by the contracting agency.

- A. The number of minority and nonminority group members and women employed in each work classification on the project.
- B. The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women (applicable only to Companies which rely on whole or in part on unions as a source of their work force).
- C. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees, and
- D. The progress and efforts being made in securing the services of minority and female owned businesses.
  - (1) All such records must be retained for a period of three (3) years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the State Department of Transportation and the U.S. Department of Transportation including consultant firms.
  - (2) If on-the-job training is being required by the "Training Special Provision," the Company will be required to furnish a Monthly Training Report and Supplement Report (1409) for each trainee.

11. Affirmative Action Plan

- A. Contractors, subcontractors, vendors, suppliers, and all other Companies with contracts, agreements or purchase orders completely state funded will submit an Affirmative Action Plan if the contract value is \$5,000 or over.
- B. Contractors, subcontractors, vendors, suppliers, and all other Companies with federally-assisted contracts, agreements, or purchase orders valued at \$10,000 or more will submit an Affirmative Action Plan.
- C. Companies with contracts, agreements, or purchase orders with total dollar value under that which is stipulated in A and B above shall be exempt from the required submission of an Affirmative Action Plan unless otherwise directed by the Division of Contract Compliance.



# CONNECTICUT DEPARTMENT OF TRANSPORTATION

# POLICY STATEMENT

POLICY NO. F&A-10  
July 30, 2004

SUBJECT: Code of Ethics Policy

No employee of the Connecticut Department of Transportation shall, either individually (or as a member of a group), directly or indirectly, solicit or accept any gift or gratuity from any person or organization with whom the Department has, has had, or may expect to have, a business relationship which could cause, or create the appearance of, a conflict with or influence the performance of the employee's duties with the Department. Anything of value that any person or organization attempts to give to an employee of this Department shall be immediately returned. If such thing of value is received by other than personal delivery from the subject person or organization, it shall be taken to the Office of Personnel along with the name and address of the person or firm who gave the item. The Office of Personnel along with the recipient of the item of value will arrange for the donation of the item to a local charity (e.g., Foodshare, local soup kitchens, etc.). The Office of Personnel will then send a letter to the gift giver advising them of this donation.

No employee of this Department shall, either individually (or as a member of a group), directly or indirectly, solicit the sale of tickets for a charitable event or accept any gift for the benefit of a charitable organization from any person or organization with whom the Department has, has had, or may expect to have, a business relationship which would cause, or create the appearance of, a conflict with or influence the performance of the Department.

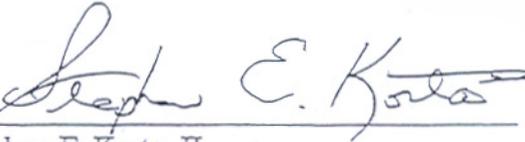
No employee of this Department shall use or distribute State information or use State equipment or materials for other than State business purposes.

No employee of this Department shall allow any private obligation of employment or enterprise to take precedence over his/her responsibility to the Department.

No employee of this Department shall accept employment with any consultant, contractor, appraiser, or any other organization or individual which is under contract or agreement with the State of Connecticut, nor shall any employee of this Department have, directly or indirectly, a financial interest in any business, firm, or enterprise doing business with the State of Connecticut, which could cause, or create the appearance of, a conflict with or influence the performance of the employee's duties with the Department.

In addition to the above, all employees of this Department are to comply with Sections 1-79 through 1-89 of the Connecticut General Statutes, as amended, entitled Code of Ethics for Public Officials.

(This Policy Statement supersedes Policy Statement No. F&A-10 dated March 25, 1999)

  
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Stephen E. Korta, II  
Commissioner

List 1 and List 3

(Managers and supervisors are requested to distribute a copy of this Policy Statement to all employees under their supervision.)



CONNECTICUT DEPARTMENT OF TRANSPORTATION

**POLICY STATEMENT**

Policy No. ADMIN.-19

May 12, 2003

SUBJECT: Policy on Disadvantaged Business Enterprise Program

The Department of Transportation (DOT) is committed to an effective implementation of a Disadvantaged Business Enterprise (D.B.E.) Program as defined in Title 49, Code of Federal Regulations, Part 26, and includes the following objectives:

- (a) To ensure nondiscrimination in the award and administration of DOT-assisted contracts in the Department's highway, transit, and airport financial assistance programs;
- (b) To create a level playing field in which D.B.E.s can compete fairly for DOT-assisted contracts;
- (c) To ensure that the Department's D.B.E. Program is narrowly tailored in accordance with applicable law;
- (d) To ensure only firms that fully meet this part's eligibility standards are permitted to participate as D.B.E.s;
- (e) To help remove barriers to the participation of D.B.E.s in DOT-assisted contracts; and
- (f) To assist the development of firms that can compete successfully in the marketplace outside the D.B.E. Program.

The Director of Equal Opportunity Assurance has been designated as the D.B.E. Liaison Officer. In that capacity, the Director of Equal Opportunity Assurance is responsible for implementing all aspects of the D.B.E. Program. Implementation of the D.B.E. Program is accorded the same priority as compliance with all other legal obligations incurred by the Connecticut Department of Transportation in its financial assistance agreements with the U.S. Department of Transportation.

As part of the requirements for Title 49, Code of Federal Regulations, Part 26, effective immediately, I am directing the following be included in all federal-aid contracts, all financial assistance agreements, and in all subcontracts.

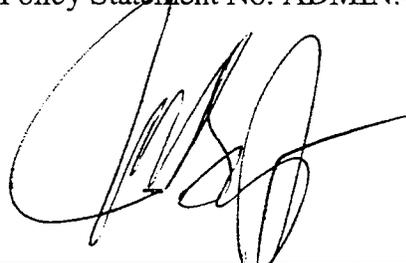
For all agreements with contractors, subcontractors, consultants, cities, towns, and all recipients of State or federal-assistance funds:

- 1) The contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

In addition to the above, all financial agreements shall also contain the following statement:

- 2) The recipient shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the administration of its D.B.E. Program or the requirements of 49 CFR Part 26. The recipient shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts. The recipient's D.B.E. Program, as required by 49 CFR Part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 et seq).

(This statement supersedes the Commissioner's Policy Statement No. ADMIN.-19, dated March 14, 2003.)



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James F. Byrnes, Jr.  
Commissioner

**AGREEMENTS WITH GOALS**  
**SPECIAL PROVISIONS**  
**DISADVANTAGED BUSINESS ENTERPRISES**  
**AS SUBCONTRACTORS AND MATERIAL SUPPLIERS OR MANUFACTURERS**  
**FOR FEDERAL FUNDED PROJECTS**

Revised – October 16, 2000

NOTE: Certain of the requirements and procedures stated in this special provision are applicable prior to the execution of the Contract document.

I. ABBREVIATIONS AND DEFINITIONS AS USED IN THIS SPECIAL PROVISION

- A. “CDOT” means the Connecticut Department of Transportation.
- B. “DOT” means the U.S. Department of Transportation, including the Office of the Secretary, the Federal Highway Administration (“FHWA”), the Federal Transit Administration (“FTA”), and the Federal Aviation Administration (“FAA”).
- C. “Broker” means a party acting as an agent for others in negotiating contracts, agreements, purchases, sales, etc., in return for a fee or commission.
- D. “Contract,” “agreement” or “subcontract” means a legally binding relationship obligating a seller to furnish supplies or services (including, but not limited to, construction and professional services) and the buyer to pay for them. For the purposes of this provision a lease for equipment or products is also considered to be a Contract.
- E. “Contractor,” means a consultant, second party or any other entity doing business with CDOT or, as the context may require, with another Contractor.
- F. “Disadvantaged Business Enterprise” (“DBE”) means a small business concern:
  - 1. That is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock of which is owned by one or more such individuals; and
  - 2. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.
- G. “DOT-assisted Contract” means any Contract between a recipient and a Contractor (at any tier) funded in whole or in part with DOT financial assistance, including letters of credit or loan guarantees.
- H. “Good Faith Efforts” means efforts to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement. Refer to Appendix A of 49 Code of Federal Regulation (“CFR”) Part 26 – “Guidance Concerning Good Faith Efforts,” a copy of which is attached to this provision, for guidance as to what constitutes good faith efforts.

- I. “Small Business Concern” means, with respect to firms seeking to participate as DBEs in DOT-assisted Contracts, a small business concern as defined pursuant to Section 3 of the Small Business Act and Small Business Administration (“SBA”) regulations implementing it (13 CFR Part 121) that also does not exceed the cap on average annual gross receipts specified in 49 CFR Part 26, Section 26.65(b).
- J. “Socially and Economically Disadvantaged Individuals” means any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who is –
  - 1. Any individual who CDOT finds on a case-by-case basis to be socially and economically disadvantaged individual.
  - 2. Any individuals in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:
    - i. “Black Americans,” which includes persons having origins in any of the Black racial groups of Africa;
    - ii. “Hispanic Americans,” which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;
    - iii. “Native Americans,” which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;
    - iv. “Asian-Pacific Americans,” which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Burnei, Samoa, Guam, The U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kirbati, Juvalu, Nauru, Federated States of Micronesia, or Hong Kong;
    - v. “Subcontinent Asian Americans,” which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;
    - vi. Women;
    - vii. Any additional groups whose members are designated as socially and economically disadvantaged by the SBA, at such time as the SBA designation becomes effective.

## II. GENERAL REQUIREMENTS

- A. The Contractor, sub-recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted Contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of the Contract or such other remedy, as the DOT deems appropriate.

- B. The Contractor shall cooperate with CDOT and DOT in implementing the requirements concerning DBE utilization on this Contract in accordance with Title 49 of the Code of Federal Regulations, Part 26 entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs" ("49 CFR Part 26"), as revised. The Contractor shall also cooperate with CDOT and DOT in reviewing the Contractor's activities relating to this Special Provision. This Special Provision is in addition to all other equal opportunity employment requirements of this Contract.
- C. The Contractor shall designate a liaison officer who will administer the Contractor's DBE program. Upon execution of this Contract, the name of the liaison officer shall be furnished in writing to CDOT's Division of Contract Compliance.
- D. For the purpose of this Special Provision, DBEs to be used to satisfy the DBE goal must be certified by CDOT's Division of Contract Compliance for the type(s) of work they will perform.
- E. If the Contractor allows work designated for DBE participation required under the terms of this Contract and required under III-B to be performed by other than the named DBE organization without concurrence from CDOT's unit administering the Contract, CDOT will not pay the Contractor for the value of the work performed by organizations other than the designated DBE.
- F. At the completion of all Contract work, the Contractor shall submit a final report to CDOT's unit administering the Contract indicating the work done by, and the dollars paid to DBEs. If the Contractor does not achieve the specified Contract goals for DBE participation, the Contractor shall also submit written documentation to the CDOT unit administering the Contract detailing its good faith efforts to satisfy the goal that were made during the performance of the Contract. Documentation is to include but not be limited to the following:
  - 1. A detailed statement of the efforts made to select additional subcontracting opportunities to be performed by DBEs in order to increase the likelihood of achieving the stated goal.
  - 2. A detailed statement, including documentation of the efforts made to contact and solicit bids/proposals with CDOT certified DBEs, including the names, addresses, dates and telephone numbers of each DBE contacted, and a description of the information provided to each DBE regarding the scope of services and anticipated time schedule of work items proposed to be subcontracted and nature of response from firms contacted.
  - 3. Provide a detailed statement for each DBE that submitted a subcontract proposal, which the Contractor considered not to be acceptable stating the reasons for this conclusion.
  - 4. Provide documents to support contacts made with CDOT requesting assistance in satisfying the Contract specified goal.
  - 5. Provide documentation of all other efforts undertaken by the Contractor to meet the defined goal.

- G. Failure of the Contractor at the completion of all Contract work to have at least the specified percentage of this Contract performed by DBEs as required in III-B will result in the reduction in Contract payments to the Contractor by an amount determined by multiplying the total Contract value by the specified percentage required in III-B and subtracting from that result, the dollar payments for the work actually performed by DBEs. However, in instances where the Contractor can adequately document or substantiate its good faith efforts made to meet the specified percentage to the satisfaction of CDOT, no reduction in payments will be imposed.
- H. All records must be retained for a period of three (3) years following acceptance by CDOT of the Contract and shall be available at reasonable times and places for inspection by authorized representatives of CDOT and Federal agencies. If any litigation, claim, or audit is started before the expiration of the three (3) year period, the records shall be retained until all litigation, claims, or audits findings involving the records are resolved.
- I. Nothing contained herein, is intended to relieve any Contractor or subcontractor or material supplier or manufacturer from compliance with all applicable Federal and State legislation or provisions concerning equal employment opportunity, affirmative action, nondiscrimination and related subjects during the term of this Contract.

### III. SPECIFIC REQUIREMENTS:

- A. The Contractor shall assure that certified DBEs will have an opportunity to compete for subcontract work on this Contract, particularly by arranging solicitations and time for the preparation of proposals for services to be provided so as to facilitate the participation of DBEs regardless if a Contract goal is specified or not.
- B. Contract goal for DBE participation equaling 0 percent of the total Contract value has been established for this Contract. Compliance with this provision may be fulfilled when a DBE or any combination of DBEs perform work under Contract in accordance with 49 CFR Part 26, Subpart C, Section 26.55, as revised. **Only work actually performed by and/or services provided by DBEs which are certified for such work and/or services can be counted toward the DBE goal. Supplies and equipment a DBE purchases or leases from the prime Contractor or its affiliate cannot be counted toward the goal.**

If the Contractor does not document commitments, by subcontracting and/or procurement of material and/or services that at least equal the goal stipulated in III-B, or document a plan which indicates how the Contractor intends to meet the goal in the future phase(s) of the work, the Contractor must document the good faith efforts that outline the steps it took to meet the goal in accordance with VII.

- C. Prior to execution of the Contract the Contractor shall indicate, in writing on the forms provided by CDOT to the Director of Contract Administration or CDOT's unit administering the Contract, the DBE(s) it will use to achieve the goal indicated in III-B. The submission shall include the name and address of each DBE that will participate in this Contract, a description of the work each will perform and the dollar amount of participation. This information shall be signed by the named DBE and the Contractor. The named DBE shall be from a list of certified DBEs available from CDOT. **In addition, the named DBE(s) shall be certified to perform the type of work they will be contracted to do.**

- D. The prime Contractor shall provide a fully executed copy of each agreement with each DBE named to achieve the goal indicated in III-B to CDOT's unit administering the Contract.
- E. The Contractor is required, should there be a change in a DBE they submitted in III-C, to submit documentation to CDOT's unit administering the Contract which will substantiate and justify the change, (i.e., documentation to provide a basis for the change for review and approval by CDOT's unit administering the Contract) prior to the implementation of the change. The Contractor must demonstrate that the originally named DBE is unable to perform in conformity to the scope of service or is unwilling to perform, or is in default of its Contract, or is overextended on other jobs. **The Contractor's ability to negotiate a more advantageous agreement with another subcontractor is not a valid basis for change.** Documentation shall include a letter of release from the originally named DBE indicating the reason(s) for the release.
- F. Contractors subcontracting with DBEs to perform work or services as required by this Special Provision shall not terminate such firms without advising CDOT's unit administering the Contract in writing, and providing adequate documentation to substantiate the reasons for termination if the DBE has not started or completed the work or the services for which it has been contracted to perform.
- G. When a DBE is unable or unwilling to perform or is terminated for just cause the Contractor shall make good faith efforts to find other DBE opportunities to increase DBE participation to the extent necessary to at least satisfy the goal required by III-B.
- H. In instances where an alternate DBE is proposed, a revised submission to CDOT's unit administering the Contract together with the documentation required in III-C, III-D, and III-E, must be made for its review and approval.
- I. Each quarter after execution of the Contract, the Contractor shall submit a report to CDOT's unit administering the Contract indicating the work done by, and the dollars paid to the DBE for the current quarter and to date.

#### IV. MATERIAL SUPPLIERS OR MANUFACTURERS

- A. If the Contractor elects to utilize a DBE supplier or manufacturer to satisfy a portion or all of the specified DBE goal, the Contractor must provide the CDOT with:
  - 1. An executed "Connecticut Department of Transportation DBE Supplier/Manufacturer Affidavit" (sample attached), and
  - 2. Substantiation of payments made to the supplier or manufacturer for materials used on the project.
- B. Credit for DBE suppliers is limited to 60% of the value of the material to be supplied, provided such material is obtained from a regular DBE dealer. A regular dealer is a firm that owns, operates, or maintains a store, warehouse or other establishment in which the materials or supplies required for the performance of the Contract are bought, kept in stock and regularly sold or leased to the public in the usual course of business. To be a regular dealer, the firm must engage in, as its principal business, and in its own name, the purchase and sale of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone and petroleum products, need not keep such products in stock if it owns or operates distribution equipment. Brokers and packagers shall not be regarded as material suppliers or manufacturers.

- C. Credit for DBE manufacturers is 100% of the value of the manufactured product. A manufacturer is a firm that operates or maintains a factory or establishment that produces on the premises the materials or supplies obtained by the Department of Transportation or Contractor.

V. NON-MANUFACTURING OR NON-SUPPLIER DBE CREDIT:

- A. Contractors may count towards their DBE goals the following expenditures with DBEs that are not manufacturers or suppliers:
  - 1. Reasonable fees or commissions charged for providing a bona fide service such as professional, technical, consultant or managerial services and assistance in the procurement of essential personnel, facilities, equipment materials or supplies necessary for the performance of the Contract provided that the fee or commission is determined by the CDOT to be reasonable and consistent with fees customarily allowed for similar services.
  - 2. The fees charged for delivery of materials and supplies required on a job site (but not the cost of the materials and supplies themselves) when the hauler, trucker, or delivery service is a DBE but is not also the manufacturer of or a regular dealer in the materials and supplies, provided that the fees are determined by the CDOT to be reasonable and not excessive as compared with fees customarily allowed for similar services.
  - 3. The fees or commissions charged for providing bonds or insurance specifically required for the performance of the Contract, provided that the fees or commissions are determined by the CDOT to be reasonable and not excessive as compared with fees customarily allowed for similar services.

VI. BROKERING

- A. Brokering of work by DBEs who have been approved to perform subcontract work with their own workforce and equipment is not allowed, and is a Contract violation.
- B. DBEs involved in the brokering of subcontract work that they were approved to perform may be decertified.
- C. Firms involved in the brokering of work, whether they are DBEs and/or majority firms who engage in willful falsification, distortion or misrepresentation with respect to any facts related to the project shall be referred to the U.S. Department of Transportation's Office of the Inspector General for prosecution under Title 18, U.S. Code, Section 10.20.

VII. REVIEW OF PRE-AWARD GOOD FAITH EFFORTS

- A. If the Contractor does not document commitments by subcontracting and/or procurement of material and/or services that at least equal the goal stipulated in III-B before execution of the Contract, or document a plan which indicates how the Contractor intends to meet the goal in future phase(s) of the work, the Contractor must document the good faith efforts that outline the specific steps it took to meet the goal. Execution of the Contract will proceed if the Contractor's good faith efforts are deemed satisfactory and approved by CDOT. To obtain such an exception, the Contractor must submit an application to CDOT's Director of Contract Administration or CDOT's unit administering the Contract, which documents the specific good faith efforts that were made to meet the DBE goal. **Application forms for Review of Pre-Award Good Faith Efforts are available from CDOT's Division of Contract Administration.**

The application must include the following documentation:

1. a statement setting forth in detail which parts, if any, of the Contract were reserved by the Contractor and not available for subcontracting;
  2. a statement setting forth all parts of the Contract that are likely to be sublet;
  3. a statement setting forth in detail the efforts made to select subcontracting work in order to likely achieve the stated goal;
  4. copies of all letters sent to DBEs;
  5. a statement listing the dates and DBEs that were contacted by telephone and the result of each contact;
  6. a statement listing the dates and DBEs that were contacted by means other than telephone and the result of each contact;
  7. copies of letters received from DBEs in which they declined to bid or submit proposals;
  8. a statement setting forth the facts with respect to each DBE bid/proposal received and the reason(s) any such bid/proposal was declined;
  9. a statement setting forth the dates that calls were made to CDOT's Division of Contract Compliance seeking DBE referrals and the result of each such call; and
  10. Any information of a similar nature relevant to the application.
- B. All applications shall be submitted to the Director of Contract Administration or CDOT's unit administering the Contract. Upon receipt of the submission of an application for review of pre-award good faith efforts, CDOT's Director of Contract Administration or CDOT's unit administering the Contract shall submit the documentation to the Division of Contract Compliance who will review the documents and determine if the package is complete and accurate and adequately documents the Contractor's good faith efforts. Within fourteen (14) days of receipt of the documentation the Division of Contract Compliance shall notify the Contractor by certified mail of the approval or denial of its good faith efforts.

- C. If the Contractor's application is denied, the Contractor shall have seven (7) days upon receipt of written notification of denial to request administrative reconsideration. The Contractor's request for administrative reconsideration should be sent in writing to: Director of Contract Administration or CDOT's unit administering the Contract, P.O. Box 317546, Newington, CT 06131-7546. The Director of Contract Administration or CDOT's unit administering the Contract will forward the Contractor's reconsideration request to the DBE Screening Committee. The DBE Screening Committee will schedule a meeting within fourteen (14) days from receipt of the Contractors request for administrative reconsideration and advise the Contractor of the date, time and location of the meeting. At this meeting the Contractor will be provided with the opportunity to present written documentation and/or argument concerning the issue of whether it made adequate good faith efforts to meet the goal. Within seven (7) days following the reconsideration meeting, the chairperson of the DBE Screening Committee will send the contractor via certified mail a written decision on its reconsideration request, explaining the basis of finding either for or against the request. The DBE Screening Committee's decision is final. **If the reconsideration is denied, the Contractor shall indicate in writing to the Director of Contract Administration or CDOT's unit administering the Contract within fourteen (14) days of receipt of written notification of denial, the DBEs it will use to achieve the goal indicated in III-B.**
- D. Approval of pre-execution good faith efforts does not relieve the Contractor from its obligation to make additional good faith efforts to achieve the DBE goal should contracting opportunities arise during actual performance of the Contract work.

## APPENDIX A TO 49 CFR PART 26 – GUIDANCE CONCERNING GOOD FAITH EFFORTS

- I. When, as a recipient, you establish a Contract goal on a DOT-assisted Contract, a Bidder/Contractor must, in order to be responsible and/or responsive, make good faith efforts to meet the goal. The Bidder/Contractor can meet this requirement in either of two ways. First, the Bidder/Contractor can meet the goal, documenting commitments for participation by DBE firms sufficient for this purpose. Second, even if it doesn't meet the goal, the Bidder/Contractor can document adequate good faith efforts. This means that the Bidder/Contractor must show that it took all necessary and reasonable steps to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not fully successful.
- II. In any situation in which you have established a Contract goal, Part 26 requires you to use the good faith efforts mechanism of this part. As a recipient, it is up to you to make a fair and reasonable judgment whether a Bidder/Contractor that did not meet the goal made adequate good faith efforts. It is important for you to consider the quality, quantity, and intensity of the different kinds of efforts that the Bidder/Contractor has made. The efforts employed by the Bidder/Contractor should be those that one could reasonably expect a Bidder/Contractor to take if the Bidder/Contractor were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE Contract goal. Mere pro forma efforts are not good faith efforts to meet the DBE Contract requirements. We emphasize, however, that your determination concerning the sufficiency of the firm's good faith efforts is a judgment call: meeting quantitative formulas is not required.
- III. The Department also strongly cautions you against requiring that a Bidder/Contractor meet a Contract goal (i.e., obtain a specified amount of DBE participation) in order to be awarded a Contract, even though the Bidder/Contractor makes an adequate good faith efforts showing. This rule specifically prohibits you from ignoring bona fide good faith efforts.
- IV. The following is a list of types of actions which you should consider as part of the Bidder/Contractor's good faith efforts to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.
  - A. Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the Contract. The Bidder/Contractor must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The Bidder/Contractor must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.
  - B. Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out Contract work items into economically feasible units to facilitate DBE participation, even when the prime Contractor might otherwise prefer to perform these work items with its own forces.

- C. Providing interested DBEs with adequate information about the plans, specifications, and requirements of the Contract in a timely manner to assist them in responding to a solicitation.
- D. (1) Negotiating in good faith with interested DBEs. It is the Bidder/Contractor's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.  
  
(2) A Bidder/Contractor using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as Contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a Bidder/Contractor's failure to meet the Contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime Contractor to perform the work of a Contract with its own organization does not relieve the Bidder/Contractor of the responsibility to make good faith efforts. Prime Contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.
- E. Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The Contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids/proposals in the Contractor's efforts to meet the project goal.
- F. Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
- G. Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- H. Effectively using the services of available minority/women community organizations; minority/women Contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

- V. In determining whether a Bidder/Contractor has make good faith efforts, you may take into account the performance of other bidder/Contractors in meeting the Contract. For example, when the apparent successful Bidder/Contractor fails to meet the Contract goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts, the apparent successful Bidder/Contractor could have met the goal. If the apparent successful Bidder/Contractor fails to meet the goal, but meets or exceeds the average DBE participation obtained by other Bidder/Contractors, you may view this, in conjunction with other factors, as evidence of the apparent successful Bidder/Contractor having made good faith efforts.

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
DBE SUPPLIER/MANUFACTURER AFFIDAVIT

This affidavit must be completed by the State Contractor's DBE notarized and attached to the Contractor's request to utilize a DBE supplier or manufacturer as a credit towards its DBE Contract requirements; failure to do so will result in not receiving credit towards the Contract DBE requirement.

State Project No. \_\_\_\_\_

Federal Aid Project No. \_\_\_\_\_

Description of Project \_\_\_\_\_

I, \_\_\_\_\_, acting in behalf of \_\_\_\_\_  
(Name of person signing Affidavit) (DBE person, firm, association or organization)  
of which I am the \_\_\_\_\_ certify and affirm that \_\_\_\_\_  
(Title of Person) (DBE person, firm, association or organization)

is certified Connecticut Department of Transportation DBE. I further certify and affirm that I have read and understand 49 CFR, Sec. 26.55(e)(2), as the same may be revised.

I further certify and affirm that \_\_\_\_\_ will assume the actual and  
(DBE person, firm, association or organization)

contractual responsibility for the provision of the materials and/or supplies sought by \_\_\_\_\_.  
(State Contractor)

If a manufacturer, I produce goods from raw materials or substantially alter them before resale, or if a supplier, I perform a commercially useful function in the supply process.

I understand that false statements made herein are punishable by Law (Sec. 53a-157), CGS, as revised).

\_\_\_\_\_  
(Name of Organization or Firm)

\_\_\_\_\_  
(Signature & Title of Official making the Affidavit)

Subscribed and sworn to before me, this \_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

Notary Public (Commissioner of the Superior Court)

My Commission Expires

CERTIFICATE OF CORPORATION

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_ (Official)  
of the Organization named in the foregoing instrument; that I have been duly authorized to affix the seal of the Organization to such papers as require the seal; that \_\_\_\_\_, who signed said instrument on behalf of the Organization, was then \_\_\_\_\_ of said Organization; that said instrument was duly signed for and in behalf of said Organization by authority of its governing body and is within the scope of its organizational powers.

\_\_\_\_\_  
(Signature of Person Certifying) (Date)

State of Connecticut by His Excellency

John G. Rowland

Executive Order No. 16

WHEREAS, the State of Connecticut recognizes that workplace violence is a growing problem that must be addressed; and

WHEREAS, the State is committed to providing its employees a reasonably safe and healthy working environment, free from intimidation, harassment, threats, and /or violent acts; and

WHEREAS, violence or the threat of violence by or against any employee of the State of Connecticut or member of the public in the workplace is unacceptable and will subject the perpetrator to serious disciplinary action up to and including discharge and criminal penalties.

NOW, THEREFORE, I, John G. Rowland, Governor of the State of Connecticut, acting by virtue of the authority vested in me by the Constitution and by the statutes of this state, do hereby ORDER and DIRECT:

1. That all state agency personnel, contractors, subcontractors, and vendors comply with the following **Violence in the Workplace Prevention Policy**:

The State of Connecticut adopts a statewide zero tolerance policy for workplace violence.

Therefore, except as may be required as a condition of employment —

- No employee shall bring into any state worksite any weapon or dangerous instrument as defined herein.
- No employee shall use, attempt to use, or threaten to use any such weapon or dangerous instrument in a state worksite.
- No employee shall cause or threaten to cause death or physical injury to any individual in a state worksite.

Weapon means any firearm, including a BB gun, whether loaded or unloaded, any knife (excluding a small pen or pocket knife), including a switchblade or other knife having an automatic spring release device, a stiletto, any police baton or nightstick or any martial arts weapon or electronic defense weapon.

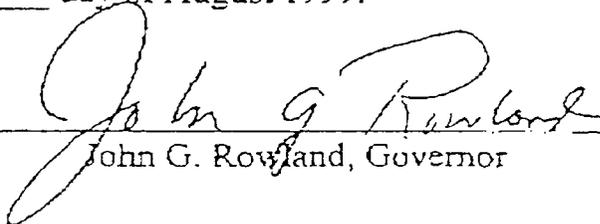
Dangerous instrument means any instrument, article, or substance that, under the circumstances, is capable of causing death or serious physical injury.

Violation of the above reasonable work rules shall subject the employee to disciplinary action up to and including discharge.

2. That each agency must prominently post this policy and that all managers and supervisors must clearly communicate this policy to all state employees.

3. That all managers and supervisors are expected to enforce this policy fairly and uniformly.
4. That any employee who feels subjected to or witnesses violent, threatening, harassing, or intimidating behavior in the workplace immediately report the incident or statement to their supervisor, manager, or human resources office.
5. That any employee who believes that there is a serious threat to their safety or the safety of others that requires immediate attention notify proper law enforcement authorities and his or her manager or supervisor.
6. That any manager or supervisor receiving such a report shall immediately contact their human resources office to evaluate, investigate and take appropriate action.
7. That all parties must cooperate fully when questioned regarding violations of this policy.
8. That all parties be advised that any weapon or dangerous instrument at the worksite will be confiscated and that there is no reasonable expectation of privacy with respect to such items in the workplace.
9. That this order applies to all state employees in the executive branch.
10. That each agency will monitor the effective implementation of this policy.
11. That this order shall take effect immediately.

Dated in Hartford, Connecticut this 4<sup>th</sup> day of August 1999.

  
\_\_\_\_\_  
John G. Rowland, Governor

Filed this 4<sup>th</sup> day of August 1999



  
\_\_\_\_\_  
Susan Byskiewicz, Secretary of the State



Proposal for NETC Project No. 04-4,  
"Determining the Effective PG Grade of  
Binder in RAP Mixes"

# **Determining the Effective PG Grade of Binder in RAP Mixes**

A Research Proposal Submitted to:

**New England Transportation Consortium  
Project No. NETC 04-4**

By

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April 2004

## **1.0 Introduction**

The use of reclaimed asphalt pavement (RAP) material is increasing as local, state and federal transportation agencies make more efficient use of their resources. RAP material is generated when old, damaged pavement materials are milled and crushed for addition as a component to new mixtures placed in the pavement structure. Historically, old pavement material was removed and disposed of in landfills. As landfilling these materials has become less practical and more expensive and the availability of quality virgin materials declines, the addition of RAP to pavement mixtures has become more and more prevalent. Recycling of pavement material can be done as an in-place process or a central plant process. The in-place process combines the reclamation, mixing, laydown, and compaction procedures into a single paving train in the field. In-place recycled materials are typically used for base or binder courses and are typically overlaid with a surface course. The central plant process involves stockpiling RAP at the asphalt plant, which is then mixed with virgin materials at the plant and trucked to the construction site for laydown and compaction.

The addition of RAP to an asphalt mixture changes the mechanistic properties (i.e., strength) of the mixture and affects its performance (i.e., resistance to cracking and deformation) in the field. The mechanistic properties change as a result of the aged binder introduced to the mixture as part of the RAP. The binder in the RAP will have a different chemical composition and different properties than the virgin binder added during the mixing process. Various studies (1-7) have shown that these two binders will mix to some extent, changing the properties of the mixture containing RAP from one that contains only virgin material. The actual extent of the blending is unknown and may be different for various RAP sources and virgin binders. The actual, or effective, properties of the binder in mixtures containing RAP cannot be tested directly, as the process of extracting the binder for testing results in complete blending of the virgin and RAP binder. Therefore, testing must be performed on the mixtures to determine the effective binder properties.

## **2.0 Research Objectives**

The main objective of this research is to develop a method to determine or estimate the binder grade in mixtures designed with RAP from the properties of the mixture itself.

## **3.0 Methodology**

This section describes in detail the principal tasks that will be performed to accomplish the objective of this project. The tasks have been modified slightly from the NETC scope of work to facilitate presentation and organization of the proposal.

### **Task 1: Literature Review**

In this task, the research team will conduct a thorough literature review related to the testing of RAP mixtures. Papers published in the Transportation Research Record and the Journal of the Association of Asphalt Pavement Technologists will be reviewed and a search will be performed using TRIS and ISI Web of Science (available at UNH) to obtain information. The research team will also contact the New England State Departments of Transportation to get information on their current practices and

specifications for using RAP mixtures. A summary of the findings from the literature review will be included in the final report.

**Task 2: Materials Selection**

In Task 2, the research team will select the specific materials to be used in this project with the input of the Technical Committee. The team anticipates that a single source of virgin aggregate, three RAP percentages, three RAP sources, and two virgin binders will be selected for testing. A full testing matrix is proposed for one of the virgin binders and a partial matrix with the other binder, as shown in Table 1 below.

**Table 1. Proposed Testing Matrix**

RAP Source	PG 58-34				PG 64-28			
	0% RAP	15% RAP	25% RAP	40% RAP	0% RAP	15% RAP	25% RAP	40% RAP
Source A		X	X	X		X		
Source B	X	X	X	X	X		X	
Source C		X	X	X				

The two binder grades are selected as representative for the New England region and to give two different high temperature grades and two different low temperature grades for evaluation. The RAP percentages are selected to cover percentages that are commonly used in practice and to cover the range of percentages where various adjustments to the virgin binder grade are recommended in NCHRP Report 452 (2). The RAP sources will be selected to represent a variety of asphalt content and RAP binder grade. In a current project funded by the Recycled Materials Resource Center (RMRC) at UNH, the PI has conducted testing on RAP mixtures containing a processed RAP (approx. 3% ac, PG 94-14) and grindings (approx. 5% ac, PG 82-22). The research team is proposing to select at least one of these materials as a RAP source for this project to make use of the data that has been collected in the RMRC study. This data includes dynamic modulus measured in compression and creep flow tests (proposed Simple Performance Tests).

If possible, at least one RAP source will be selected such that cores can be taken from the pavement prior to milling so that a 100% RAP condition can be tested.

**Task 3: Formulate Mix Designs**

In this task, Superpave mix designs will be performed on the mixtures selected in Task 2. The recommendations for developing the mix design outlined in NCHRP Report 452 will be followed except that a single aggregate structure (instead of three trial blends) will be targeted for the different RAP mixtures to expedite the mixture design process. A prior study by researchers at the University of Connecticut (6) have made use of reclaimed aggregate in the control mixture in an attempt to create identical aggregate structures between the control and RAP mixtures. In this project, the research team is proposing to use 100% virgin materials in the control mixture, as this more accurately reflects the true situation in the field.

#### Task 4: Binder Testing

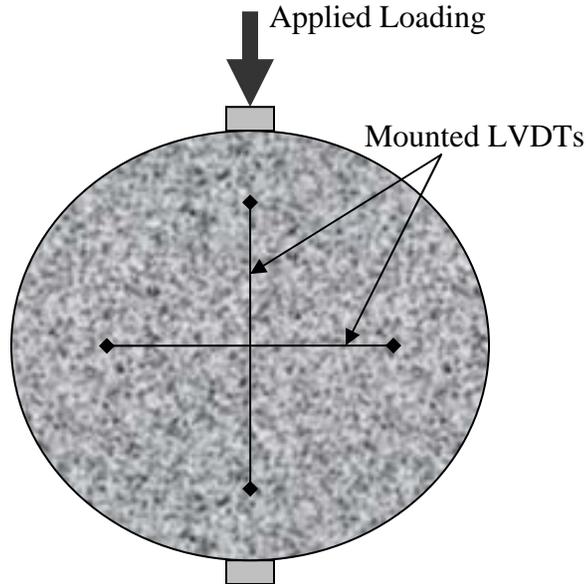
Task 4 will involve extraction and PG grading of binders. Extractions will be performed according to AASHTO test method T319 for each of the RAP sources (total of 3 sources). In addition, binder will be extracted from each RAP mix (total of 11 mixes) for testing. The loose RAP mixtures for extraction will be prepared at the same time as the specimens for mix testing are fabricated.

The extracted RAP binders and the virgin binders will be tested according to AASHTO MP1a. The continuous grade of the binder will be recorded in addition to the superpave grade. These will serve as a guide by which to evaluate the results of the mixture testing. The binder grade that is estimated from mixture testing must fall somewhere between the virgin binder grade and the RAP binder grade. The testing on the blended asphalt from the RAP mixtures will locate the point between the two where complete blending of the virgin and RAP binders happens. It is anticipated that the effective grade of the mixture will fall somewhere between the virgin binder grade and the completely blended binder grade.

#### Task 5: Mixture Testing

Specimens for mixture testing will be fabricated using a Superpave Gyrotory Compactor (SGC). In the process of fabricating test specimens, the constructability of the mixtures will be evaluated using data collected from the SGC. Test specimens 150 mm in diameter and 38 mm high will be cut from the center of SGC specimens 150 mm in diameter and 60 mm high to achieve test specimens with a consistent air void distribution along the thickness.

Specimens will be tested in the indirect tensile (IDT) mode, as shown in Figure 1, to allow for the testing of cores from the field.



**Figure 1. Schematic of IDT Test Setup**

### *Complex Modulus Test*

The complex modulus test measures the response of the material to cyclic loading at different frequencies (usually ranging from 1-30 Hz) in the undamaged state. The complex modulus test consists of applying a haversine load history to the specimen at different frequencies. The load amplitude is adjusted based on the material stiffness, temperature, and frequency to keep the strain response within the linear viscoelastic range.

The dynamic modulus,  $|E^*|$ , at each frequency is calculated by dividing the steady state stress amplitude ( $\sigma_{amp}$ ) by the strain amplitude ( $\epsilon_{amp}$ ) as follows:

$$|E^*| = \frac{\sigma_{amp}}{\epsilon_{amp}}$$

The phase angle,  $\phi$ , is related to the time lag,  $\Delta t$ , between the stress input and strain response and the frequency of testing:

$$\phi = 2\pi f \Delta t$$

where  $f$  is the loading frequency. As the testing temperature decreases or the rate (frequency) increases, the dynamic modulus increases and the phase angle decreases due to the time dependence or viscoelasticity of the material. The dynamic modulus is a measure of the stiffness of the material at a particular frequency and temperature whereas the phase angle indicates the relative amount of viscous or elastic response. A material with a phase angle of zero is purely elastic (instantaneous strain response to load) and a phase angle of  $90^\circ$  indicates a purely viscous material. The dynamic modulus and phase angle will be used to describe the linear viscoelastic material properties under various loading and environmental conditions. The complex modulus test is also one of the recommended Simple Performance Tests (8) for predicting performance with respect to fatigue and thermal cracking. The proposed simple performance tests involve measuring fundamental material properties in the laboratory that are related to performance of the mixtures in the field. A closed-loop servo-hydraulic testing system, computer data acquisition system, and an environmental chamber are required to perform these tests.

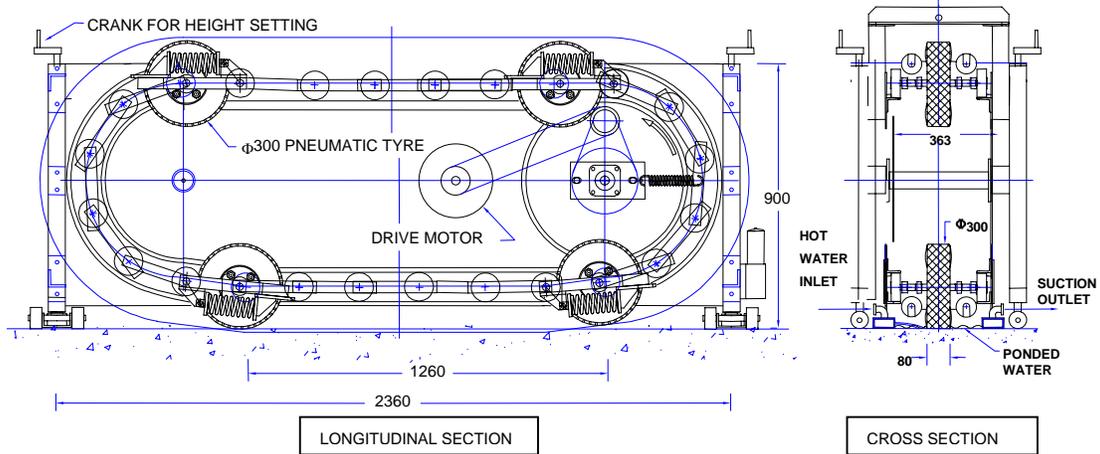
### *Constant Crosshead Rate Test*

In this test, a constant rate of deformation is applied until the specimen fails (splits in two). The constant crosshead rate test measures the indirect tensile strength and provides information on the pre- and post-peak behavior of the asphalt mixture for evaluation. It has also been shown (9,10) that cyclic fatigue behavior and thermal cracking can be predicted from this test data.

### *Model Mobile Load Simulator (MMLS3)*

The SGC specimens will be fabricated and tested using a Third-Scale Model Mobile Load Simulator (MMLS3). The MMLS3 is an accelerated pavement testing device that applies realistic trafficking (Figures 2 & 3 below). The load is scaled but tire pressures are at the same level as in full scale trucks. Accordingly, the results are transferable to conventional real life trafficking. The device can be used directly to explore performance of the upper 125 mm of asphalt pavements in the laboratory and in the field. The MMLS3 can characterize a material/mix and predict actual performance if

factors such as load frequency, temperature, and lateral wander (no wander for rutting testing and wander for fatigue testing) of load applications and aging are taken into account. Specimens fabricated using the SGC will be tested using the MMLS3 to evaluate performance with respect to rutting. Testing will be performed at above ambient temperatures. The rut depths at various numbers of load applications will be measured in addition to the number of load applications to failure.



**Figure 2. Schematic Diagram of MMLS3**



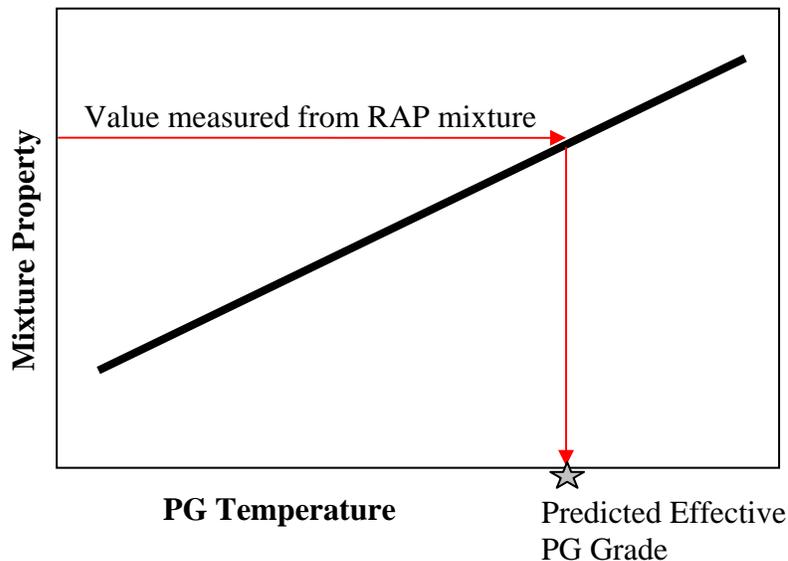
**Figure 3. Photograph of MMLS3**

### Task 6: Determine Effective PG Grade

In this task, the binder and mixture properties measured in Tasks 4 and 5 will be analyzed to develop a method of estimating the effective binder grade from the measured properties of the mixture. The high temperature grade and the low temperature grade estimation will require separate analyses. The research team is proposing a fundamental approach to both the high and low temperature grade estimations using existing viscoelasticity theories and models that have been developed by various research teams. The advantage of fundamental approach to this problem is that the recommended procedure can be applied to various types of materials (RAP and binders) that are not a part of the particular testing program used to develop the methodology. However, in the interest of practicality and simplicity, the team will also be investigating a purely empirical approach and comparing the results with those from the fundamental analysis. It is anticipated that the final recommended procedure will contain components from both approaches.

#### *Empirical Approach*

In this approach, various properties measured from the RAP mixtures will be compared to those measured from the control mixtures. The control mixtures will provide a reference curve relating the mixture property (i.e. tensile strength) to the upper and lower PG grade for that virgin binder. The effective PG grade of the RAP mixture can then be estimated by determining the PG grade that corresponds to the value of the mixture property measured on the RAP mix, as illustrated in Figure 4 below. Researchers at the University of Connecticut showed promising results using this approach with the indirect tensile strength for a small set of materials (6). In this project, various material properties will be investigated in this manner. It is also important to note that the actual temperatures at which the specs are met will be used in the analysis and not the PG grade, which is only in 6° increments.



**Figure 4. Schematic of Empirical Approach**

### *Fundamental Approach*

Different approaches proposed for estimating the high and low temperature PG grades are described below.

#### High Temperature PG Grade

To determine the high temperature PG grade from the mixture properties, existing models relating the mixture stiffness to binder properties will be investigated. Over the last several decades, several researchers (11-13) have developed empirically based models to estimate the modulus of asphalt concrete mixtures from mix composition and binder properties. Witczak's model has been shown to be reasonably accurate, however the relationship requires the binder viscosity and not the binder modulus ( $|G^*|$ ) as an input, making it difficult to apply for this research. Christensen et. al. (14) have recently developed an approach using the Hirsch model. The advantage to this approach is that the model requires the standard performance graded binder data and mixture volumetrics as an input. The Hirsch equation for estimating the mixture modulus at a particular temperature and loading frequency is as follows:

$$|E^*|_{mix} = P_c \left[ 4,200,000 \left( 1 - \frac{VMA}{100} \right) + 3|G^*|_{binder} \left( \frac{VFA \times VMA}{10,000} \right) \right] + (1 - P_c) \left[ \frac{1 - \frac{VMA}{100}}{4,200,000} + \frac{VMA}{3VFA|G^*|_{binder}} \right]$$
$$P_c = \frac{\left( 20 + \frac{VFA \times 3|G^*|_{binder}}{VMA} \right)^{0.58}}{650 + \left( \frac{VFA \times 3|G^*|_{binder}}{VMA} \right)^{0.58}}$$

where:

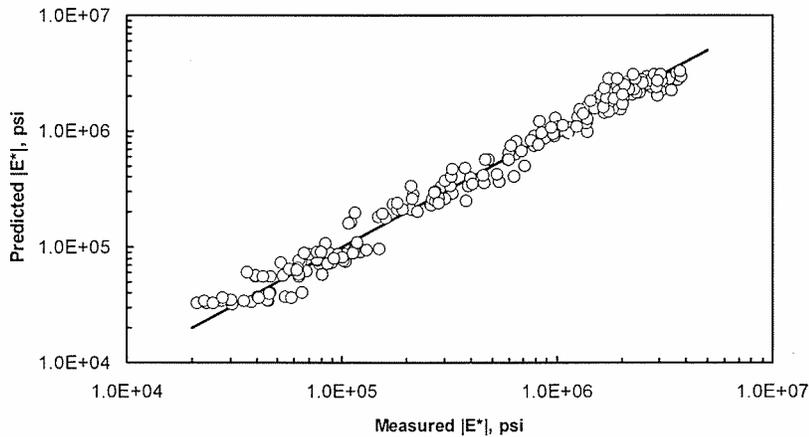
$|E^*|_{mix}$  = Dynamic modulus of the mixture (psi)

$|G^*|_{binder}$  = Dynamic shear modulus of binder (psi) at the desired temperature and loading frequency

VFA = percent voids filled with asphalt

VMA = percent voids in mineral aggregate

Figure 5 (14) shows good agreement between measured dynamic modulus values and those predicted using the Hirsch model. It should be noted that the Hirsch model was developed using dynamic modulus values measured in axial compression. However, research by Kim et. al. (15) shows that the dynamic modulus values obtained from axial compression and IDT testing are comparable, if the data from the IDT test is analyzed properly. The research team will use this model to estimate the shear modulus of the binder by inputting the dynamic modulus and volumetric properties of the mixture measured in the lab. The approach suggested by Kim et. al. for calculating dynamic modulus from IDT tests will be used.



**Figure 5. Predicted and Measured values for Dynamic Modulus (14)**

To determine the effective high temperature PG grade of the RAP mix, the phase angle of the binder must also be estimated. The Hirsch model also provides a prediction of the mixture phase angle. However, the phase angle for the binder can be very different than the phase angle measured from a mixture due to the effects of the aggregate structure, especially at higher temperatures. The research team will investigate both the Christensen-Anderson and the Christensen-Anderson-Marasteanu (CAM) models (16) for estimating binder shear modulus and phase angle. Existing research will also be reviewed and the binder and mixture data generated in this project will be analyzed to establish a method of estimating the binder phase angle from mixture properties.

#### Low Temperature PG Grade

The effective low temperature PG grade for the RAP mixture will be determined using both the dynamic modulus and tensile strength data measured from the mixtures. At lower temperatures, the properties of the binder, rather than the aggregate structure, control the behavior of the overall mixture. Therefore, the properties of the mixture at low temperatures will be highly correlated to the binder properties.

The dynamic modulus is a rheological property of the asphalt mixture and can be related to other rheological properties, such as creep compliance, through linear viscoelastic theory. The dynamic modulus master curves generated for each mixture will be used to determine the creep compliance master curves for the same mixtures, from which the creep stiffness and slope (m-value) of the curves can be obtained. The constant crosshead rate tests on the mixture will provide a measure of tensile strength and strain at failure, which can be related to Direct Tension Test results from binder testing.

## **4.0 Implementation**

The implementation plan will be developed in conjunction with all state DOTs involved in this project to outline the actions that need to be taken to ensure that the results of this research are put into practice. This will include an explicit, step by step procedure for the calculations and tests that will be recommended for estimating the effective PG grade of RAP mixtures. The research team will be available to provide assistance with implementation of this research as well.

## **5.0 Significance of Work and Benefits**

The anticipated results of the proposed study will provide the New England State DOTs with a method to estimate the effective PG grade of RAP mixtures by measuring the properties of the mixture itself. This study will give the states a means by which to predict the performance of the RAP mixtures in the field and adjust the type and/or percentages of RAP and virgin materials in the mixture as deemed necessary for desired performance. This research will also provide the first step in developing a rational performance-based mix design method for RAP mixtures.

## **6.0 Technical Meetings and Dissemination of Results**

The research project team will meet with the Technical Committee for this project a minimum of three times over the course of the project. It is anticipated that these meetings will take place at the start of the project, midway through Task 5 to discuss progress, and midway through Task 6 to discuss progress and any need for further testing.

Quarterly progress reports will be submitted to the NETC Coordinator. A Draft Final Report will be submitted to the Project Technical Committee for review prior to the completion of the Final Report. Upon approval from the Chairman of the Project Technical Committee, one hundred copies of the Final Report will be prepared and submitted to the NETC Coordinator.

The project results will be disseminated through the final report, and presentations and publications at regional and national level meetings. These include meetings for the North Eastern State Materials Engineers Agency (NESMEA), Region 1 pavement management conference, Asphalt Recycling and Reclaiming Association (ARRA) meetings, Transportation Research Board (TRB) meetings, and Local Technical Assistance Program (LTAP) conferences.

## **7.0 Proposed Research Team**

The proposed team will consist of Jo Sias Daniel (PI) from University of New Hampshire and Walaa Mogawer (Co-PI) from University of Massachusetts at Dartmouth, Professor Daniel will conduct the mixture testing and analysis with graduate and undergraduate students and provide overall supervision and guidance in the execution of the tasks and preparation of reports. Professor Walaa Mogawer will conduct the binder extractions and binder grading tests with graduate and undergraduate students and analyze results.

## **8.0 Facilities**

Laboratory facilities at the University of New Hampshire include a 5 kip servo-hydraulic testing machine (Instron) with computer control and data acquisition and a temperature chamber for conducting IDT testing, a mixing lab with a SGC (IPC Servopac) to fabricate specimens and measure mixture volumetrics, and an MMLS3 machine for rut testing.

The UMass Dartmouth Materials lab, located at the Advanced Technology Manufacturing Center (ATMC), is AASHTO accredited to perform various binder, aggregate, and hot mix asphalt (HMA) testing. The binder equipment includes a Rotovap binder extraction device, Brookfield rotation viscometer, TA Instruments AR2000

Dynamic Shear Rheometer (DSR), Instron Direct Tension (DT) test device, and the Instron Bending Beam Rheometer (BBR). The lab is in the final stages of ordering the James Cox & Sons Rolling Thin Film Oven (RTFO) and Prentex Pressure Aging Vessel (PAV). All these binder equipment are necessary to perform Superpave Performance Grading (PG) and the binder extractions required for this project.

The UMass Dartmouth lab is also equipped with two SGC's (Pine Brovold AFGB1A and a Troxler) and the other related testing equipment required to design or verify a Superpave mix. For HMA performance testing, the lab is equipped with the Asphalt Pavement Analyzer (APA) which is an accelerated pavement tester (APT). Currently, the MMLS3 system is being built for the lab and will be the second APT located at the lab. This system will include the MMLS3 load simulator, test bed, profilometer, HMA slab compactor, environmental chamber, wet pavement heater, and dry heating and cooling unit. Finally, the lab is equipped with a MTS servo-hydraulic testing system required for indirect tensile, creep, and resilient modulus testing.

## 9.0 References

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2. McDaniel, R., and R.M. Anderson. "Recommended Use of Reclaimed Asphalt Pavement in the Superpave Mix Design Method: Technician's Manual", NCHRP Report 452, Transportation Research Board- National Research Council, National Academy Press, Washington, D.C., 2001.
3. McDaniel, Rebecca and R.M. Anderson. "Recommended Use of Reclaimed Asphalt Pavement in the Superpave Mix Design Method: Guidelines". NCHRP Research Results Digest, Number 253, 2001.
4. McDaniel, Rebecca S., H. Soleymani, R.M. Anderson, P. Turner, R. Peterson. "Recommended Use of Reclaimed Asphalt Pavement in the Superpave Mix Design Method". Contractor's Final Report, NCHRP Web Document 30 (Project D9-12), 2000.
5. Soleymani, H., M. Anderson, R. McDaniel, and M. Abdelrahman "Investigation of the Black Rock Issue for Recycled Asphalt Mixtures", Journal of the Association of Asphalt Paving Technologists, Vol. 69, p. 366-390, 2000.
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7. Stroup-Gardiner, M., and C. Wagner "Use of Reclaimed Asphalt Pavement in Superpave Hot-Mix Asphalt Applications", Transportation Research Record 1681, 1999.

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9. Daniel, J.S. and Y.R. Kim, “Development of a Simplified Fatigue Test and Analysis Procedure Using a Viscoelastic, Continuum Damage Model”. Journal of the Association of Asphalt Paving Technologists, Vol 71, pp. 619-645, 2002.
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11. Andrei, D., M. Witczak, and W. Mirza, “ Development of a Revised Predictive Model for the Dynamic (Complex) Modulus of Asphalt Mixtures”, NCHRP 1-37A Technical Report, University of Maryland, 1999.
12. Bonnaure, F., G. Gest, G. Gravois, and P. Uge, “A New Method of Predicting the Stiffness of Asphalt Paving Mixtures”, Association of Asphalt Paving Technologists, Vol. 46, p. 64, 1977.
13. Van der Poel, C., “Time and Temperature Effects on the Deformation of Asphaltic Bitumens and Bitumen Mineral Mixtures”, Society of Petroleum Engineers Journal, September 1955.
14. Christensen, D.W., T. Pellinen, R. Bonaquist “Hirsch Model for Estimating the Modulus of Asphalt Concrete”, Journal of the Association of Asphalt Paving Technologists, Vol. 72, pp. 97-121, 2003.
15. Kim, Y.R., Y. Seo, M. King, and M. Momen “Dynamic Modulus Testing of Asphalt Concrete in Indirect Tension Mode”. Transportation Research Board preprint, 2004.
16. Christensen, D. and D. Anderson, “ Interpretation of Dynamic Mechanical Test Data for Paving Grade Asphalt Cements”, Journal of the Association of Asphalt Paving Technologists, Vol. 61, pp. 67-98, 1992.

## **10.0 Schedule**

The proposed project schedule is shown in Table 2. A more precise schedule of activities with absolute dates will be developed upon funding.

**Table 2. Proposed Schedule of Activities**

Activity	Month																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Task 1: Literature Review	█	█	█																												
Task 2: Materials Selection	█	█	█	█																											
Task 3: Mix Designs		█	█	█	█	█	█																								
Task 4: Binder Testing			█	█	█	█	█	█	█	█	█	█	█	█	█	█															
Task 5: Mixture Testing				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█							
Task 6: Analysis					█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		
Quarterly Reports			█			█			█			█			█			█			█			█				█			
Final Report																												█	█	█	█

## 11.0 Budget and Total Cost

The budget for the work to be performed at UNH and UMass Dartmouth is shown below.

### Indirect and Total Project Cost

Item	Direct Cost	Indirect Cost at 35%
UNH Direct (not including tuition)	51,259	17,941
UMass Dartmouth subcontract	39,483	8,750
<b>Total Indirect Cost</b>		<b>26,691</b>
<b>Total Project Cost (Direct and Indirect)</b>		<b>130,876</b>

### University of New Hampshire Budget

Item	Year 1	Year 2	Total
Jo Daniel, PI (summer)	3,859	8,106	11,965
Grad Student (academic year)	13,060	6,825	19,885
Grad Student (summer)	5,360	5,600	10,960
Fringe Benefits (8.5%)	784	1,165	1,949
Tuition Waivers (grad student)	8,812	4,631	13,443
Travel		800	800
Materials and Supplies	3,000	2,500	5,500
Publication Costs		200	200
Subcontract to UMass Dartmouth	39,483		39,483
<b>Total Direct Costs</b>			<b>130,876</b>

### UMass Dartmouth Sub-Contract Budget

Item	Total
Walaa Mogawer, PI (summer)	10,000
Grad Student (academic year)	9,000
Research Engineer	5,444
PI Fringe Benefits (1.75%)	175
Grad Student Fringe Benefits (24.75%)	1,347
<b>Indirect Costs (55.3% of Salaries)</b>	<b>13,517</b>
<b>Total Costs</b>	<b>39,483</b>

## APPENDIX

### **Relevant Experience of the Principal Investigators:**

*Dr. Jo Sias Daniel, PI*, has extensive experience in the constitutive modeling and characterization of asphalt mixtures in the laboratory. She received a Ph.D. in civil engineering from North Carolina State University in May of 2001 before joining the faculty at the University of New Hampshire (UNH) in August of that year. Currently, she is working on a project funded by the Recycled Materials Resource Center (RMRC) at UNH on characterizing the material properties of mixtures containing various percentages of RAP. Dr. Daniel has authored and co-authored several papers that have been published in the Transportation Research Record, ASCE Journal of Materials in Civil Engineering, and Journal of the Association of Asphalt Paving Technologists. She is a member of Transportation Research Board (TRB) Committee A2D04, Association of Asphalt Paving Technologists (AAPT), International Society for Asphalt Pavements (ISAP), and ASCE.

*Dr. Walaa S. Mogawer, Co-PI*, has extensive experience in the design of different types of asphalt mixtures, Superpave technology, and asphalt mixtures modifiers. Currently, he is working to develop several maintenance hot mix asphalt mixes. These mixes include, Open Graded Friction Course, Stone Matrix Asphalt, and a Reflective Crack Relief layer. a moisture damage test that is compatible with the weather conditions of Massachusetts. He is working on assisting the State of Massachusetts in its efforts to implement Superpave – this includes preparing Superpave mixtures, verifying plant produced mixtures, and train state and industry engineers on the Superpave. Dr. Mogawer is working with the six states of New England to evaluate the permeability of HMA, in particular, Superpave asphaltic plug joints. In the past several years he has served as a consultant to the Federal Highway Administration (FHWA) on several studies. The most recent study determines the benefits of adding polymers to asphalt binders and validates asphalt binder tests and asphalt mixture tests that provide the relative performance of these materials. Other studies involved the use of the FHWA's Accelerated Loading Facility (ALF) to validate Superpave binder and mixture tests and other mixture tests that have been developed to predict rutting and fatigue of HMA, the evaluation of the effect of coarse aggregate content and mineral fillers on stone matrix asphalt and the evaluation of test methods that are used to quantify sand shape and texture.

## **EDUCATION**

Ph.D., Civil Engineering, North Carolina State University, *May 2001*  
M.S., Civil Engineering, North Carolina State University, *August 1996*  
B.S., Civil Engineering, University of New Hampshire, *May 1994*

## **PROFESSIONAL EXPERIENCE**

Assistant Professor, UNH, *August 2001-present*  
Post-Doctoral Research Associate, NCSU, *Summer 2001*  
Graduate Research Assistant, NCSU, *1998-2001*  
Graduate Teaching Assistant, NCSU, lab instructor, *1997-8*  
Graduate Research Assistant, NCSU, *1994-7*  
Undergraduate Research Assistant, NCSU NSF REU Program, *Summer 1993*  
Undergraduate Research Assistant, UNH, *1992-3*

## **PROFESSIONAL DEVELOPMENT**

NCAT Professor Training Course in Asphalt Technology, *June 2003*  
ASCE ExCEED Teaching Workshop, *July 2002*  
Engineering Education Scholars Program, *Summer 2001*  
New Faculty Workshop, NCSU College Of Engineering, *August 2000*  
Graduate Teaching Workshop, NCSU Graduate School, *April 1998*

## **HONORS**

Tau Beta Pi Outstanding Civil Engineering Faculty Award, *2003*  
Runner-up for AAPT Walter J. Emmons Best Paper Award, *2003*  
Dwight D. Eisenhower Transportation Graduate Fellowship, National Highway Institute, *2000-1*  
GE Faculty for the Future Teaching Fellowship, NCSU College of Engineering, *2000-1*  
Mentored Teaching Assistant Program, NCSU College of Engineering, *Fall 2000*  
Preparing the Professoriate Program, NCSU Graduate School, *1998-9*  
Ward K. Parr Scholarship, Association of Asphalt Paving Technologists, *1995*  
NSF Graduate Fellowship Honorable Mention, *1995*  
Russell Stearns Scholarship Award, ASCE New Hampshire Chapter, *1993-4*  
Civil Engineering Alumni Achievement Award, University of New Hampshire, *1993-4*

## **HONOR SOCIETIES**

Chi Epsilon  
Tau Beta Pi  
Phi Kappa Phi  
Golden Key

## **PROFESSIONAL SOCIETY MEMBERSHIPS**

### Transportation Research Board

- Member of Committee AFK50: Characteristics of Bituminous Paving Mixtures to Meet Structural Requirements
- Chair of AFK50(1) Subcommittee on Advanced Models to Understand Behavior and Performance of Asphalt Mixtures
- Member of Committee AFD80: Strength and Deformation Characteristics of Pavement Sections

### Association of Asphalt Paving Technologists

### American Society of Civil Engineers

- UNH Student Chapter Adviser
- NH Section Newsletter Editor

### International Society for Asphalt Pavements

### National Society of Professional Engineers

### American Society for Engineering Education

### New England Transportation Technician Certification Program – Board Member

### Northeast Asphalt User/Producer Group

### Society of Women Engineers

### Order of the Engineer

## **AWARDS**

“Bailey Method for NH Mixtures”, New Hampshire DOT project 13733F, \$63,941, 06/04-10/06.

“CAREER: Relating Fundamental Viscoelastic Material Properties and Strengths Measured Using Various Testing Geometries”, National Science Foundation, 7/04-06/09, \$400,720.

“Endurance Limit of Hot Mix Asphalt Mixtures to Prevent Fatigue Cracking in Flexible Pavements”, Project 9-38 National Cooperative Highway Research Program, 03/04-02/06, \$750,000. (Co-PI with National Center for Asphalt Technology and Asphalt Institute)

“Evaluation of a Field Permeameter as a Longitudinal Joint Quality Indicator”, New England Transportation Consortium Project 03-5, 9/03-2/06, \$77,646.

“Relating Hot Mix Asphalt Pavement Density to Performance”, New England Transportation Consortium Project 02-1, 9/03-8/05, \$103,797. (Co-PI with UMass-Dartmouth and WPI)

“ExCEED 2002 Fellow”, ASCE ExCEED Teaching Workshop, United States Military Academy at West Point, 7/28/02-8/02/02, \$2250.

“Petersen Asphalt Research Conference 2002”, Faculty Development Grant, UNH 2002, \$500.

“Mechanistic Properties of Asphalt Mixtures Containing Recycled Asphalt Pavement”, Graduate School Summer Faculty Fellowship, UNH 2002, \$4625.

“Changes in Asphalt Mixture Properties with the Addition of Recycled Asphalt Pavement Material”, Vice President for Research and Public Service Discretionary Research Fund, UNH 2002, \$6850.

“Properties of Asphalt Mixtures Containing RAP”, UNH Recycled Materials Resource Center, 7/01/02-5/31/04, \$103,449.

## **PUBLICATIONS**

### **Journal Papers**

1. Daniel, J.S., and Y.R. Kim, “A Simplified Test and Analysis Procedure for Fatigue Characterization of Asphalt Mixtures”, accepted to Fifth RILEM International Conference, May 2004, to be published in the International Journal of Road Materials and Pavement Design.
2. Daniel, J.S., W. Bisirri, and Y.R. Kim, “Fatigue Evaluation of Asphalt Mixtures Using Dissipated Energy and Viscoelastic Continuum Damage Approaches”, Journal of Association of Asphalt Paving Technologists, 2004.
3. Daniel, J.S., G.R. Chehab, and Y.R. Kim, “Issues Affecting Measurement of Fundamental Asphalt Mixture Properties”, ASCE Journal of Materials in Civil Engineering, in press.
4. Daniel, J.S., and Y.R. Kim, “Development of a Simplified Fatigue Test and Analysis Procedure using a Viscoelastic Continuum Damage Model”, Journal of the Association of Asphalt Pavement Technologists, Vol. 71, pp. 619-650, 2002.
5. Daniel, J.S., and Y.R. Kim, “Laboratory Evaluation of Fatigue Damage Growth and Healing of Asphalt Concrete Mixtures Using the Impact Resonance Method”, ASCE Journal of Materials in Civil Engineering, Vol. 13, No.6, Nov/Dec 2001, pp. 434-440.
6. Lee, H.J., J.S. Daniel, and Y.R. Kim, “Laboratory Performance Evaluation of Modified Asphalt Mixtures for Incheon Airport Pavements,” International Journal of Pavement Engineering, Vol. 1, No. 2, April 2000
7. Lee, H.J., J.S. Daniel, and Y.R. Kim, "Continuum Damage Mechanics-Based Fatigue Model of Asphalt Concrete," ASCE Journal of Materials in Civil Engineering, Vol. 12, No. 2, May 2000, pp. 105-112.
8. Daniel, J.S., Y.R. Kim, and H.J. Lee, “Effects of Aging on Viscoelastic Properties of Asphalt-Aggregate Mixtures”, Transportation Research Record 1630, TRB, National Research Council, Washington, D.C., 1998, pp. 21-27.
9. Daniel, J.S., and Y.R. Kim, “Relationships Among Rate-Dependent Stiffnesses of Asphalt Concrete Using Laboratory and Field Test Methods”, Transportation Research Record 1630, TRB, National Research Council, Washington, D.C., 1998, pp. 3-9.

### **Conference Proceedings**

1. Daniel, J.S., and A. Lachance, “Rheological Properties of Asphalt Mixtures Containing Recycled Asphalt Pavement (RAP)”, Transportation Research Board, January 2004.

2. Chehab, G.R., J.S. Daniel, and Y.R. Kim, "Development of a Constitutive Model for Fatigue Cracking in Asphalt Concrete", ASCE EM 2003 Conference, July 2003.
3. Daniel, J.S. and A. Lachance, "Rheological Properties of Asphalt Mixtures Containing RAP", Petersen Asphalt Research Conference, July 2003.
4. Lachance, A., and J.S. Daniel, "Properties of Asphalt Mixtures Containing RAP", TRB A1F07 Committee Summer Workshop, June 2003.

### **Major Research Reports**

1. Kim, Y.R., J.S. Daniel, H.Wen, "Fatigue Performance Evaluation of WestTrack Asphalt Mixtures Using Viscoelastic Continuum Damage Approach", Final Report to North Carolina Department of Transportation/FHWA, July 2001.
2. Kim, Y.R., and J.S. Daniel, "Development of a Mechanistic Fatigue Prediction Model for Aging Asphalt-Aggregate Mixtures", Final Report to Western Research Institute/FHWA, January 1998.
3. Kim, Y.R., Y. Kim, J.S. Daniel, and E. Katzke, "Laboratory and Field Evaluation of Fatigue Damage and Microdamage Healing", Final Report to Texas A&M Research Foundation/Western Research Institute/FHWA, January 1998.

### **TECHNICAL PRESENTATIONS**

1. "Fatigue Evaluation of Asphalt Mixtures Using Dissipated Energy and Viscoelastic Continuum Damage Approaches", AAPT, Baton Rouge, LA, March 2004.
2. "Rheological Properties of Asphalt Mixtures Containing Recycled Asphalt Pavement (RAP)", TRB, January 2004.
3. "Development of a Constitutive Model for Fatigue Cracking in Asphalt Concrete", ASCE EM 2003 Conference, Seattle, WA, July 2003.
4. "Rheological Properties of Asphalt Mixtures Containing RAP", Petersen Asphalt Research Conference, Laramie, WY, July 2003.
5. "Development of a Simplified Fatigue Test and Analysis Procedure Using a Viscoelastic, Continuum Damage Model." UNH Materials Science Seminar, February 6, 2003.
6. "Laboratory Evaluation of the Effects of Aggregate Gradation and Binder Type on Performance of Asphalt Mixtures", International Society for Asphalt Pavements Conference, Copenhagen, Denmark, 2002.
7. "Application of the Bailey Method to NH Mixtures", NH DOT Research Advisory Council, April 2002.
8. "Development of a Simplified Fatigue Test and Analysis Procedure using a Viscoelastic Continuum Damage Model", Association of Asphalt Paving Technologists Annual Meeting, Colorado Springs, CO, 2002.
9. "Relationships Among Rate-Dependent Stiffnesses of Asphalt Concrete Using Laboratory and Field Test Methods", Transportation Research Board Meeting, Washington, D.C., 1998.
10. "Effects of Aging on Viscoelastic Properties of Asphalt-Aggregate Mixtures", Transportation Research Board Meeting, Washington, D.C., 1998.

## RESUME

**WALAA S. MOGAWER, Ph.D., P.E.**  
**Department of Civil & Environmental Engineering**  
**University of Massachusetts Dartmouth**  
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(508) 999-8964 (*fax*)  
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### **PERSONAL DATA:**

Professor, Civil and Environmental Engineering	– September 2001 to Present
Associate Professor, Civil and Environmental Engineering	– September 1996 to Present
Assistant Professor, Civil and Environmental Engineering	– September 1989 to September 1996

### **EDUCATION:**

- Ph.D. Civil Engineering: Studying the effects of deicing additives on the properties of asphaltic materials in terms of their resistance to permanent deformation, moisture damage and low temperature cracking.  
University of Rhode Island, Kingston, RI, May 1989.
- M.Sc. Civil Engineering  
University of Rhode Island, Kingston, RI, May 1984.
- B.Sc. Civil Engineering  
Kuwait University, Kuwait, May 1981.

### **ADDITIONAL EDUCATION:**

SUPERPAVE Mixture Test Equipment, The Asphalt Institute, Lexington, Kentucky, March 6-10, 1995.

SUPERPAVE Binder Test Equipment, The Asphalt Institute, Lexington, Kentucky, November 7-11, 1994.

AutoCAD Level One - Operating Systems and Applications, New England Institute of Technology, Warwick, Rhode Island, August 11-18, 1992.

NHI course 13114 - Highway Pavements, Michigan State University, East Lansing, Michigan, March 4-29, 1991.

Professor Training Program in Asphalt Technology, National Center for Asphalt Technology, Auburn University, Auburn, Alabama, June 11-22, 1990.

Instron's Operator Training Course, No. 2150 OP-0121, Canton, Massachusetts, December 12-16, 1988.

## PROFESSIONAL EXPERIENCE

### Research Experience:

#### Sponsored Research:

**Research Project: "Evaluation of Asphaltic Expansion Joints"**

Sponsored by: New England Transportation Consortium.

Duration: 2001-2003

Amount: 62,236

Role in Project: Principal Investigator

**Research Project: "Development Of Testing Protocol for Quality Control/Quality Assurance of Hot Mix Asphalt"**

Sponsored by: New England Transportation Consortium.

Duration: 2001-2002

Amount: 127,000

Role in Project: Principal Investigator

**Research Project: "Design of Superpave HMA for Low Volume Roads"**

Sponsored by: New England Transportation Consortium.

Duration: 2001-2002

Amount: 99,755

Role in Project: Principal Investigator

**Research Project: "Phase II: Implementation of Superpave"**

Sponsored by: MassHighway Department.

Duration: 2001-2004

Amount: 360,000

Role in Project: Principal Investigator

**Research Project: "Evaluation of Permeability of Superpave Mixes"**

Sponsored by: New England Transportation Consortium.

Duration: 2000-2001

Amount: 100,002

Role in Project: Principal Investigator

**Research Project: "Evaluation of Use of Manufactured Waste Shingles in HMA"**

Sponsored by: Chelsea Center for Recycling and Economic Development, UMASS.

Duration: 2000-2001

Amount: 17,791

Role in Project: Co-Principal Investigator

**Research Project: "Updating Mass Highway Distress Manual"**

Sponsored by: Massachusetts State Highway Department.

Duration: 2000-2001

Amount: 30,162

Role in Project: Principal Investigator

**Research Project: "Implementation of Superpave™ Technology"**

Sponsored by: Massachusetts State Highway Department.  
Duration: 1997-2000  
Amount: 404,000  
Role in Project: Principal Investigator

**Research Project: "A Procedure for Correlating Distress/Ride Indices"**

Sponsored by: Massachusetts State Highway Department.  
Duration: 1995-1997  
Amount: 100,396  
Role in Project: Principal Investigator

**Research Project: "Freeze and Thaw Study"**

Sponsored by: Massachusetts State Highway Department  
Duration: 1996-1997  
Amount: 60,000  
Role in Project: Principal Investigator

**Research Project: "Evaluation of the Road System in Massachusetts"**

Sponsored by: Massachusetts State Highway Department  
Duration: 1996-1997  
Amount: 100,000  
Role in Project: Principal Investigator

**Research Project: "Phase Two: ADA Compatible Soft-Surface Multi-Use Trail"**

Sponsored by: Massachusetts State Highway Department  
Duration: 1996-1997  
Amount: 40,000  
Role in Project: Principal Investigator

**Research Project: "ADA-Compatible and Environmentally Sensitive Soft-Surface  
Trail Materials for Construction of Multi-Use Trails"**

Sponsored by: Massachusetts State Highway Department  
Duration: 1994-1995  
Amount: 60,000  
Role in Project: Principal Investigator

**Research Project: "Structural Numbers for Reclaimed Base Course Mix"**

Sponsored by: Massachusetts State Highway Department  
Duration: 1994-1995  
Amount: 45,000  
Role in Project: Co-Principal Investigator

**Research Project: "Enhancing the Materials Testing Laboratory"**

Sponsored by: National Science Foundation  
Duration: 1993-1994  
Amount: 120,000  
Role in Project: Principal Investigator

**Consulting:**

Project: **“Existing Conditions and Pavement Design Recommendations for Route 3 North Transportation Improvement Project”**

Company: VHB/Vanasse Hangen Brustlin, Inc. Middletown, Connecticut.

Project: **“Evaluation of Complex Polymer-Modified Asphalt Binders Using The FHWA ALF”**

Company: SaluT, Inc.

Project sponsored by: Federal Highway Administration

Project: **“Evaluation of Complex Polymer-Modified Asphalt Binders”**

Project sponsored by: Federal Highway Administration

Duration: 5/2000 to 3/2001

Project: **“Preparing Superpave Specimens using Different SGC Angles”**

Project sponsored by: The Asphalt Institute

Duration: 8/2000 – 11/2000

Project: **“Validation of Superpave Binder and Mixture Tests and Other Mixture Tests Using the FHWA’s Accelerated Loading Facility”**

Project sponsored by: Federal Highway Administration

Duration: 5/1995 to 9/1995, 5/1996 to 3/1997, 5/1997 to 3/1998, and 5/1998 to 3/1999

Project: **"Effects of Different Mineral Fillers on Stone Matrix Asphalt Properties"**

Project sponsored by: Federal Highway Administration

Duration: 5/1994 to 9/1994.

Project: **"Study of Stone Mastic Asphalt Gradations"**

Project sponsored by: Federal Highway Administration

Duration: 05/1993 to 09/1993.

Project: **"Evaluation of Stone Mastic Asphalt Mixtures versus Dense Graded Mixtures"**

Project sponsored by: Federal Highway Administration

Duration: 05/1992 to 09/1992.

Project: **"Evaluation of Test Methods Used to Quantify Sand Shape and Texture"**

Project sponsored by: Federal Highway Administration

Duration: 05/1991 to 09/1991.

### **Publications:**

#### **Refereed Publications**

Mogawer W. and Stuart, K.D. Performance of Modified Asphalt Binders with Identical High-Temperatures PG’s but Varied Chemistries. Presented at the 82.nd Annual Meeting of the Transportation Research Board, Washington, D.C., 2004.

Mogawer W. and Stuart, K.D. Evaluation of the Superpave Asphalt Binder Fatigue Binder  $G^*/\sin\delta$ . Journal of the Association of Asphalt Pavement Technologists, 2002.

P. Romero, K. D. Stuart, and W. S. Mogawer, "Fatigue Response of Asphalt Mixtures Tested by the Federal Highway Administration's Accelerated Loading Facility," *Asphalt Paving Technology 2000*, Volume 69, Association of Asphalt Paving Technologists, St. Paul, MN, pp. 212-235.

K. D. Stuart, W. S. Mogawer, and P. Romero, "Evaluation of the Superpave Asphalt Binder Specification for High-Temperature Pavement Performance," *Asphalt Paving Technology 2000*, Volume 69, Association of Asphalt Paving Technologists, St. Paul, MN, pp. 148-176.

J. A. Sherwood, X. Qi, P. Romero, K. D. Stuart, and W. S. Mogawer, "Full-Scale Pavement Testing from FHWA Superpave Validation Study," *International Conference on Accelerated Pavement Testing*, Reno, NV, October 18-20, 1999.

K. D. Stuart, W. S. Mogawer, and P. Romero, "Validation of the Superpave Asphalt Binder Rutting Parameter," *American Society of Civil Engineers, Proceedings of the Fifth ASCE Materials Engineering Congress*, Cincinnati, OH, May 10-12, 1999.

K. D. Stuart and W. S. Mogawer, "Validation of Asphalt Binder and Mixture Tests that Predict Rutting Susceptibility Using the Federal Highway Administration's Accelerated Loading Facility," *Asphalt Paving Technology 1997*, Volume 66, *Journal of the Association of Asphalt Paving Technologists*, Salt Lake City, UT, pp 109-152.

K. D. Stuart and W. S. Mogawer, "Effect of Compaction Method on Rutting Susceptibility Measured by Three Laboratory Wheel-Tracking Devices," Presented at the 76th Annual Meeting of the Transportation Research Board, Washington, D.C., 1997.

W. S. Mogawer and K. D. Stuart, "Effects of Mineral Fillers on the Properties of Stone Matrix Asphalt (SMA) Mixtures," *Transportation Research Record 1530, Recycled Rubber, Aggregate, and Filler in Asphalt Paving Mixtures*, Transportation Research Board, Washington, D.C., 1995, pp 86-94.

K. D. Stuart and W. S. Mogawer, "Effect of Coarse Aggregate Content on Stone Matrix Asphalt Durability and Low-Temperature Cracking," *Transportation Research Record 1492, Hot-Mix Asphalt Design, Testing, Evaluation, and Performance*, Transportation Research Board, Washington, D.C., 1995, pp 26-35.

W. S. Mogawer and K. D. Stuart, "Effect of Coarse Aggregate Content on Stone Matrix Asphalt Rutting and Draindown," *Transportation Research Record 1492, Hot-Mix Asphalt Design, Testing, Evaluation, and Performance*, Transportation Research Board, Washington, D.C., 1995, pp 1-11.

W. S. Mogawer and K. D. Stuart, "Evaluation of Stone Matrix Asphalt Versus Dense-Graded Mixtures," *Transportation Research Record 1454, Asphalt Concrete Mixture Design and Performance*, Transportation Research Board, Washington, D.C., 1994, pp 58-65.

K. D. Stuart and W. S. Mogawer, "Evaluation of Natural Sands Used in Asphalt Mixtures," Transportation Research Record 1436, Asphalt Concrete Mix Materials, Transportation Research Board, Washington, D.C., 1994, pp 115-123.

W. S. Mogawer and K. D. Stuart, "Evaluation of Test Methods Used to Quantify Sand Shape and Texture," Transportation Research Record 1362, Aggregate and Pavement-Related Research, Transportation Research Board, Washington, D.C., 1992, pp 28-37.

K. D. Stuart and W. S. Mogawer, "Laboratory Evaluation of Verglimit and PlusRide," Public Roads, Volume 55, Number 3, Federal Highway Administration, McLean, VA, December 1991, pp 79-86.

W. S. Mogawer, K. D. Stuart, and K. W. Lee, "Evaluation of the Effects of Deicing Additives on Properties of Asphalt Mixtures," Transportation Research Record 1228, Asphalt Mixtures and Asphalt Chemistry, Transportation Research Board, Washington, D.C., 1989, pp 41-53.

K. D. Stuart and W. S. Mogawer, "Laboratory Evaluation of Verglimit and PlusRide," FHWA-RD-90-013, Federal Highway Administration, McLean, VA, March 1991, 119 pp.

Bonaquest, R., Roger, S., and Mogawer, W.S., "Effect of Tire Pressure on Flexible Pavement and Performance", Transportation Research Record, No. 1227, Transportation Research Board, 1989, pp. 97-106.

Lee, K.W., and Mogawer, W.S., "Utilization of Oil Spill Cleanup Debris into Bituminous Concrete Mixtures", Australian Road Research Board, 1988, pp. 54-64.

### Technical Reports

Mogawer W. S., et al., "Evaluation of Permeability of Superpave Mixes". Final Report. NETC July 3, 2002.

Mogawer W. S., et al., "Implementation of Superpave in Massachusetts". Final Report. MassHighway December 2001.

K. D. Stuart, W. S. Mogawer, and P. Romero, *Validation of Asphalt Binder and Mixture Tests That Measure Rutting Susceptibility Using the Accelerated Loading Facility*, Publication No. FHWA-RD-99-204, Federal Highway Administration, McLean, VA, November 1999, 348 pp.

K. D. Stuart, W. S. Mogawer, and P. Romero, *Validation of the Superpave Asphalt Binder Fatigue Cracking Parameter Using The FHWA's Accelerated Loading*, Publication No. FHWA-RD-01-093, Federal Highway Administration, McLean, VA, April 2001, 87 pp.

Mogawer, W.S., "Freeze and Thaw Study." UMTC-97-17, December 1997.

Mogawer, W.S., "Evaluation of the Road System in Massachusetts." UMTC-97-11, December 1997.

Mogawer, W.S., "Phase Two: ADA Compatible Soft-Surface Multi-Use Trail." UMTC-97-19, December 1997.

Mogawer, W.S., "Correlation of Pavement Distress/Ride Indices." UMTC-96-7, December 1997.

K. D. Stuart and W. S. Mogawer, "Evaluation of Natural Sands Used in Asphalt Mixtures," FHWA-RD-93-070, Federal Highway Administration, McLean, VA, August 1993, 56 pp.

Mogawer, W.S., and Stuart K.D., "Laboratory Evaluation of Verglimit and PlusRide", FHWA/RD-91/013.

Kim, T.J., Lee, K.W., Veyera, G.E., Mogawer, W.S. and J. Zheng, "Utilization of a Waterjet Cutting Unit for Infrastructure Management." Final Report to the Region One University Transportation Center, Department of Civil and Environmental Engineering, University of Rhode Island, Kingston, RI, January, 1990.

#### Invited Papers/Presentations:

" A New look at the Use of Open Graded Friction Course in Massachusetts," NESMEA, 2002.

" Evaluation of the Superpave Asphalt Binder Fatigue Binder  $G^*/\sin\delta$ ," Association of Asphalt Paving Technologists Journal, 2000.

"Evaluation of the Superpave Asphalt Binder Specification for High-Temperature Pavement Performance," Association of Asphalt Paving Technologists Journal, 2000.

"Validation of Asphalt Binder and Mixture Tests that Predict Rutting Susceptibility Using the Federal Highway Administration's Accelerated Loading Facility." Association of Asphalt Paving Technologists Journal, 1997.

"Effect of Coarse Aggregate Content on Stone Matrix Asphalt (SMA) Rutting and Draindown." The 74th Annual Meeting of Transportation Research Board, Washington, DC, January 1995.

"Evaluation of Stone Matrix Asphalt Mixtures versus Dense-Graded Mixtures." The 73rd Annual Meeting of Transportation Research Board, Washington, DC, January 1994.

"Evaluation of Test Methods Used to Quantify Sand Shape and Texture," the 71st Annual Meeting of Transportation Research Board, Washington, DC, January 1992.

"An Evaluation of Deicing Additives on Properties of Asphalt Mixtures," The 68th Annual Meeting of the Transportation Research Board, Washington, DC, January 1989.

**Professional registration:**

Registered Professional Engineer in the State of Rhode Island.

**Honor society:**

Member of Tau Beta Bi Engineering Honor Society.

Member of Tau Alpha Pi National Honor Society.

**Professional awards:**

The Eisenhower Faculty Fellowship, U.S. Department of Transportation, 1994 & 1995.

The FHWA 1989 Outstanding Technical Accomplishment Award, Federal Highway Administration. Graduate Research Fellowship, National Highway Institute 9/87 – 7/88: Conducted and directed research projects to examine the effects of higher tire pressures on flexible pavement using the Accelerated Loading Facility (ALF), and to study the effects of PlusRide and Verglimit deicing additives on asphalt pavement performance.

**Technical society memberships:**

Asphalt Association of Pavement Technology (AAPT), Member.

American Association for Testing Materials (ASTM).

American Society of Civil Engineers (ASCE), Member. **Member, Bituminous Materials Committee**