

BID CANCELLATION
SP-27 Rev. 05/07
Prev. Rev. 11/97

Janet DelGreco Olson
Contract Specialist
(860)713-5079
Telephone Number

STATE OF CONNECTICUT

DEPARTMENT OF ADMINISTRATIVE SERVICES

PROCUREMENT DIVISION
165 Capitol Avenue, 5th Floor South
HARTFORD, CT 06106-1659

BID NO.: 11PSX0326

Bid Due Date: 12 January 2012

BID CANCELLATION

DESCRIPTION: **Joint and Crack Sealing for Airport Use ONLY**

FOR: **The Department of Transportation, All Using State of
Connecticut Agencies and Political Sub Divisions of the
State of Connecticut**

BIDDERS NOTE:

Bid #11PSX0326 has been cancelled. A new bid shall be issued in the future with updated specifications.

APPROVED _____

JANET DELGRECO OLSON

Contract Specialist

(Original Signature on Document in Procurement Files)

Date Issued: 22 December 2011

INVITATION TO BID
SP-11 Rev. 10/11
(Prev. Rev. 9/11)

Janet DelGreco Olson
Contract Specialist

(860)713-5079
Telephone Number

janet.delgreco@ct.gov
E-mail Address

(860) 622-2961
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STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
PROCUREMENT SERVICES
165 Capitol Avenue, 5th Floor South
HARTFORD, CT 06106-1659



NOTICE TO VENDORS: Logon to the DAS web page,
click on **Subscribe** (in the right-hand column) and
complete the form to automatically receive notification
of new Bids & RFP's **via e-mail.**

<http://das.ct.gov/Marketplace>
DAS CT State Web Site

Invitation to Bid

SPECIFICATIONS & BID DOCUMENTS ATTACHED

Bid Number: **11PSX0326** Bid Opening Date & Time: **27 December 2011 at 2:00 PM Eastern Time**

Bid Description: **Joint and Crack Sealing for Airport Use ONLY**

Special Instructions: Read bid in its entirety for completeness. Some documents may have changed since the last time you have filled out a DAS Invitation to Bid.

LOOK WHAT'S NEW!

Form SP-49 "Bidder's Guide" contains important information regarding new policies and procedures for submitting forms via BIZNET!

If hand delivering a bid, bring hand-delivered bids to:

DAS Procurement Services, Room 161, 165 Capitol Avenue, Hartford, CT between 1:30 and 2:00

If you hand deliver a bid to DAS Procurement Services at any other time, please call (860)713-5095 for further instruction.

Vendors cannot enter state buildings without a valid photo ID and should anticipate security delays.

Allow ample time for delivery as bids delivered after Bid Opening Date/Time cannot be accepted.

This contract replaces the following contract award(s) in part or in total: **09PSX0313**

SEALED BID NO.: 11PSX0326

**NOT TO BE OPENED UNTIL: 27 December 2011
2:00 PM Eastern Time**

Return Bid To:

PROCUREMENT SERVICES
DEPARTMENT OF ADMINISTRATIVE SERVICES
STATE OF CONNECTICUT
165 CAPITOL AVE 5th FLOOR SOUTH
HARTFORD CT 06106-1659

BID

NOTE: Always use mailing label at left on all packages when returning the ORIGINAL & ONE COPY of your bid response.

Bids must be time & date stamped by DAS Procurement Personnel. Receipt at the State's main mailroom does not constitute receipt by DAS Procurement.
Allow ample time for delivery as bids delivered after Bid Opening Date/Time cannot be accepted.

STATE OF CONNECTICUT

BIDDER'S GUIDE

READ CAREFULLY

GUIDE FOR COMPLETING STATE OF CONNECTICUT FORMS

I. INTRODUCTION TO BIZNET

It is now a requirement of DAS/Procurement Services that all Companies create a Business Network (BizNet) Account and add your company profile in our BizNet system. Companies are responsible for maintaining company information as updates occur. Please Note: If you are certified through the Supplier Diversity or the Pre-Qualification Program, you have already created a BizNet account.

The BizNet login is: <https://www.biznet.ct.gov/AccountMaint/Login.aspx>

New Companies: Create an account by clicking the link above and then clicking the button on the right. Once you have created your account, Login and select CT Procurement and Company Information.

Existing Companies Needing to Update Their Information: Login to BizNet and select CT Procurement and Company Information.

Note: If you are having difficulty connecting to your account or downloading/uploading forms, please call Procurement Services at 860-713-5095.

II. BUSINESS FRIENDLY LEGISLATION

As a result of Public Act 11-229, DAS/Procurement Services' goal is to make doing business with the State of Connecticut more business friendly. To eliminate redundancy, forms that were repetitively filled out with each invitation to bid are being automated in BizNet.

DAS/Procurement Services is also beginning the transition to on-line bidding by automating completion of Affidavits and Non-Discrimination forms effective October 1, 2011. Companies will submit forms electronically to their BizNet account if they haven't already done so and also on an annual basis rather than having to complete them with each bid submittal. Contractors that have already filed forms with DAS/Procurement Services will have the ability to view, verify and update their information prior to submitting responses to bids.

Instructions for Uploading Affidavits and Non-Discrimination Forms:

Click on the following link for instructions on how to upload Affidavits and Non-Discrimination forms:

<http://das.ct.gov/images/1090/Upload%20Instructions.pdf>

A. AFFIDAVITS

THE FOLLOWING FORMS MUST BE SIGNED, DATED, NOTARIZED, UPLOADED OR UPDATED ON BIZNET. TO OBTAIN A COPY OF THESE FORMS, YOU MUST LOGIN INTO BIZNET AND FOLLOW THE INSTRUCTIONS LISTED ABOVE.

1. OPM Ethics Form 1 – Gift & Campaign Contribution Certification
2. OPM Ethics Form 5 – Consulting Agreement Affidavit
3. OPM Ethics Form 6 – Affirmation of Receipt of State Ethics Laws Summary

For information regarding these forms, please access the Office of Policy & Management's website by clicking on the following link:

<http://www.ct.gov/opm/cwp/view.asp?a=2982&q=386038>

STATE OF CONNECTICUT

BIDDER'S GUIDE

B. NON-DISCRIMINATION –

CHOOSE ONE (1) FORM THAT APPLIES TO YOUR BUSINESS. COMPLETE AND UPLOAD OR UPDATE ON BIZNET ANNUALLY. TO OBTAIN A COPY OF THESE FORMS, YOU MUST LOGIN INTO BIZNET AND FOLLOW THE INSTRUCTIONS LISTED ABOVE.

1. Form A – Representation by Individual (Regardless of Value)
2. Form B – Representation by Entity (Valued at \$50,000 or less)
3. Form C – Affidavit by Entity (RECOMMENDED) (Valued at \$50,00 or more)
4. Form D – New Resolution by Entity
5. Form E – Prior Resolution by Entity

For information regarding these forms and on which form your company should complete, please access the Office of Policy & Management's website by clicking following link:

http://www.ct.gov/opm/cwp/view.asp?a=2982&q=390928&opmNav_GID=1806

III. OTHER BID FORMS

Forms listed below are those that are typically requested with each bid submittal and have not yet been automated. DAS/Procurement Services expects to automate additional forms as the on-line transition continues. Please note that the list is not meant to be all-inclusive of every form that may actually be required for a particular bid. Please be sure to read the document in its entirety and submit ALL required information with your submittal.

- A. Form SP-26 – Bidder Information
- B. Form DAS-45 – Employment Information Form / Commission on Human Rights & Opportunities (CHRO)
- C. Form SP-14 - Bidder's Statement of Qualifications
- D. Form SP-12 – OSHA Compliance
- E. Form SP-28 - Vendor Authorization Guidelines

This form must be signed by the person identified in the Corporate Resolution or By-Laws, as the party legally authorized to bind the company – a link to sample forms is provided below:

http://das.ct.gov/Purchase/Info/Vendor_Authorization_and_Guidance_081106.pdf

DO NOT RETURN WITH BID

BID
 SP-26 Rev. 4/11
 Prev. Rev. 5/10

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
PROCUREMENT DIVISION

Janet DelGreco Olson
 Contract Specialist
(860)713-5079
 Telephone Number

165 Capitol Avenue, 5th Floor South
HARTFORD, CT 06106-1659

BID NO. 11PSX0326

Read & Complete
Carefully

Page 1 of 3

Bidder Name: _____

BID NO: 11PSX0326	BID DUE DATE: 27 December 2011	BID DUE TIME: 2:00 PM Eastern Time	BID SURETY: \$0.00	DATE ISSUED: 7 December 2011
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DESCRIPTION: **Joint and Crack Sealing for Airport Use ONLY**

FOR: Department of Transportation, All Using State Agencies, and Political Subdivisions	TERM OF CONTRACT Date of Award through December 31, 2013
Agency Requisition Number(s): 0000061431	

INVITATION FOR BIDS: Pursuant to the provisions of Section 4a-57 of the Connecticut General Statutes as amended, Procurement Services is soliciting bids for the State of Connecticut, at the address above for the furnishing of the subject commodities and/or services to state agencies.

IMPORTANT: ALL pages of this form, Sections 1 through 4 must be completed, signed and returned by the bidder as part of the bid package. Failure to submit all pages of this form may constitute grounds for rejection of your bid.

Section 1 of 4 - **BIDDER INFORMATION**

COMPLETE BIDDER LEGAL BUSINESS NAME: PRINCIPAL PLACE OF BUSINESS:	Taxpayer ID # (TIN): <input type="checkbox"/> SSN <input type="checkbox"/> FEIN WRITE/TYPE SSN/FEIN NUMBER ABOVE
--	---

BUSINESS NAME , TRADE NAME, DOING BUSINESS AS (IF DIFFERENT FROM ABOVE) PRINCIPAL PLACE OF BUSINESS (IF DIFFERENT FROM ABOVE)
--

BUSINESS ENTITY: <input type="checkbox"/> LLC <input type="checkbox"/> NON-PROFIT <input type="checkbox"/> INDIVIDUAL/SOLE PROPRIETORSHIP <input type="checkbox"/> PARTNERSHIP (ATTACH NAMES AND TITLES OF ALL PARTNERS) <input type="checkbox"/> GOVERNMENT <input type="checkbox"/> CORPORATION TYPE OF CORPORATION: - STATE ORGANIZED IN:
--

NOTE: IF INDIVIDUAL/SOLE PROPRIETOR, INDIVIDUAL'S NAME (AS OWNER) MUST APPEAR IN THE LEGAL BUSINESS NAME BLOCK ABOVE.

BUSINESS TYPE: A. SALE OF COMMODITIES B. MEDICAL SERVICES C. ATTORNEY FEES D. RENTAL OF PROPERTY (REAL ESTATE & EQUIPMENT) E. OTHER (DESCRIBE IN DETAIL)

UNDER THIS TIN, WHAT IS THE PRIMARY TYPE OF BUSINESS YOU PROVIDE TO THE STATE? (ENTER LETTER FROM ABOVE)

UNDER THIS TIN, WHAT OTHER TYPES OF BUSINESS MIGHT YOU PROVIDE TO THE STATE? (ENTER LETTER FROM ABOVE)

AFFIRMATION OF BIDDER: The above named bidder fully acknowledges and agrees with all of the terms and conditions contained in this Bid Form SP-26, the accompanying invitation to bid, Form SP-19, entitled Standard Bid Terms and Conditions and Contract #11PSX0326. Further, if the above named bidder is awarded a contract for the goods and/or services called for in the invitation to bid, the bidder's signature on this Bid Form SP-26 shall mean that the bidder shall be bound by and perform fully in accordance with all of the terms and conditions set forth in the invitation to bid, Form SP-19 and Contract #11PSX0326 as if the bidder had actually executed Form SP-19 and Contract #11PSX0326 itself.

WRITTEN SIGNATURE OF PERSON AUTHORIZED TO SIGN BIDS ON BEHALF OF THE ABOVE NAMED BIDDER ← SIGN HERE	DATE EXECUTED
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TYPE OR PRINT NAME OF AUTHORIZED PERSON	TITLE OF AUTHORIZED PERSON
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Janet DelGreco Olson
Contract Specialist
(860)713-5079
Telephone Number

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
PROCUREMENT DIVISION

165 Capitol Avenue, 5th Floor South
HARTFORD, CT 06106-1659

BID NO.
11PSX0326

Read & Complete
Carefully

Bidder Name: _____

Section 1 of 4 - **BIDDER INFORMATION** (CONTINUED)

BIDDER ADDRESS	STREET	CITY	STATE	ZIP CODE
Add Additional Business Address information on back of this form, if needed.				

BIDDER E-MAIL ADDRESS	BIDDER WEB SITE
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REMITTANCE INFORMATION: INDICATE BELOW THE REMITTANCE ADDRESS OF YOUR BUSINESS. SAME AS BIDDER ADDRESS ABOVE.

REMIT ADDRESS	STREET	CITY	STATE	ZIP CODE
---------------	--------	------	-------	----------

Notice: Provision pursuant to Section #35. Notice, for all communications as required by Section #35 of Contract 11PSX0326, provide the Bidder Contact Information below.

BIDDER CONTACT INFORMATION: NAME (TYPE OR PRINT)

BIDDER ADDRESS	STREET	CITY	STATE	ZIP CODE
Add Additional Bidder Contact & Address information on back of this form, if needed.				

1 ST BUSINESS PHONE:	Ext. #	HOME PHONE:
2 ND BUSINESS PHONE:	Ext. #	1 ST PAGER:
CELLULAR:		2 ND PAGER:
1 ST FAX NUMBER:		TOLL FREE PHONE:
2 ND FAX NUMBER:		TELEX:

IS YOUR BUSINESS CURRENTLY A DAS CERTIFIED SMALL BUSINESS ENTERPRISE? YES (ATTACH CERTIFICATE COPY TO BID) NO

IS YOUR BUSINESS A MICROBUSINESS? YES NO

IF YOU ARE A **STATE EMPLOYEE**, INDICATE YOUR POSITION, AGENCY & AGENCY ADDRESS.

PURCHASE ORDER DISTRIBUTION:
(E-MAIL ADDRESS)

NOTE: THE E-MAIL ADDRESS INDICATED IMMEDIATELY ABOVE WILL BE USED TO FORWARD PURCHASE ORDERS TO YOUR BUSINESS.

ADD FURTHER BUSINESS ADDRESS, E-MAIL & CONTACT INFORMATION ON SEPARATE SHEET IF REQUIRED

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BID NO.
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Read & Complete
Carefully

Page 3 of 3

Bidder Name: _____

Section 2 of 4 - RESIDENT BIDDERS

In accordance with C.G.S. § 4e-48, "resident bidder" means a business that submits a bid in response to an invitation to bid by a state contracting agency has paid unemployment taxes or income taxes in Connecticut during the twelve calendar months immediately preceding submission of this bid, has a business address in the state and has affirmatively claimed such status in the bid submission.

The above signed bidder affirmatively claims that the bidder has paid unemployment taxes or income taxes in Connecticut during the twelve calendar months immediately preceding this bid submission.

YES NO

The above signed bidder affirmatively claims that the bidder has a business address in the State of Connecticut.

YES NO

If Yes, List Connecticut Business Address:

The above signed bidder affirmatively claims the status of a resident bidder.

YES NO

Section 3 of 4 - BIDDER DEBARMENT AND/OR SUSPENSION

Is the bidder, any company official, or any subcontractor to the bidder, currently debarred, disqualified or suspended from bidding or contracting with the State of Connecticut, the Federal Government or any other governmental entity?

YES NO

Does the bidder, any company official, or any subcontractor to the bidder, have a debarment, disqualification or suspension proceeding pending with the State of Connecticut, the Federal Government or any other governmental entity?

YES NO

If the above signed bidder, any company official or any subcontractor to the bidder *has* received notices of debarment and/or suspension from contracting with the State of Connecticut, the Federal Government or any governmental entity, said notices must be attached to this document when submitting this bid.

Number of notices attached _____

Section 4 of 4 - OTHER INFORMATION

Refer to "Guidance for Vendor Authorizations" at:

http://das.ct.gov/Purchase/Info/Vendor_Authorization_and_Guidance_081106.pdf

Refer to "Guide to the Code of Ethics for Current or Potential State Contractors" at:

http://www.ct.gov/ethics/lib/ethics/guides/contractors_guide_09_final.pdf

STATE OF CONNECTICUT
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Standard Bid Terms and Conditions - Page 1 of 3

The following Terms and Conditions govern the Invitation To Bid issued by the Department of Administrative Services (DAS). Incorporated by reference into these Terms and Conditions are applicable provisions of the Connecticut General Statutes, including but not limited to, those in Title 4a, Chapter 58 or Title 4d, Chapter 61 and applicable provisions of the Regulations of Connecticut State Agencies, including but not limited to, those that begin with and follow Section 4a-52-1 or 4d-3-1.

Bidders shall comply with the statutes and regulations as they exist on the date of their bid and as they may be modified from time to time during the term of the contract, as it may be amended.

Pursuant to Connecticut General Statutes 4a-60b,, The Department of Administrative Services, at its sole discretion, may elect to solicit Bid pricing through a Reverse Auction.

Submission of Bids

1. Bids must be submitted on forms specified by DAS and must be submitted no later than the date and time specified in the Invitation To Bid. Telephone or facsimile bids will not be accepted in response to an Invitation To Bid.
2. Bids received after the time and date of bid opening specified in each Invitation To Bid shall not be accepted for consideration. Bid envelopes must clearly indicate the bid number as well as the date and time of the opening of the bid. The name and address of the Bidder should appear in the upper left hand corner of the envelope.
3. Late bids shall be rejected. Incomplete bid forms may result in the rejection of the bid. Amendments to bids received by DAS after the time specified for opening of bids shall not be considered. With the exception of pricing submission through Reverse Auction participation, an original and one copy of the Price Schedule shall be returned to DAS. Bids shall be computer prepared, typewritten or handwritten in ink. Bids submitted in pencil shall be rejected. All bids shall be signed by a person duly authorized to sign bids on behalf of the bidder. Unsigned bids may be rejected. Errors, alterations or corrections on both the original and one copy of the Price Schedule to be returned must be initialed by the person signing the bid or their authorized designee. If an authorized designee initials the correction, there must be written authorization from the person signing the bid to the person initialing the erasure, alterations, or correction. Failure to do so shall result in rejection of bid for those items erased, altered or corrected and not initialed.
4. Conditional bids are subject to rejection in whole or in part. A "conditional bid" is defined as one limiting or modifying any of the terms and conditions and/or specifications of the Invitation to Bid.
5. Alternate bids will not be considered unless the Invitation to Bid specifically requests alternate bids. An alternate bid is one which is submitted in addition to and is not dependent upon the bidder's primary response to the Invitation To Bid.

6. In the event of a discrepancy between the unit price and the extension, the unit price shall govern. Prices should be extended in decimal form, not fractions, to be net, and shall include transportation and delivery charges fully prepaid by the Contractor to the destination specified in the Invitation To Bid, and subject only to cash discount.

7. Pursuant to Section 12-412 of the Connecticut General Statutes, the State of Connecticut is exempt from the payment of excise, transportation and sales taxes imposed by the Federal Government and/or the State. Such taxes must not be included in bid prices.

8. All bids will be opened publicly on the date specified in the Invitation To Bid and, upon award, are subject to public inspection.

9. The Bidder fully acknowledges and agrees with all of the terms and conditions contained in this Bid Form SP-19, the accompanying Invitation To Bid, Form SP-26, and Contract #11PSX0326. Further, if the bidder is awarded a contract for the goods and/or services called for in the Invitation To Bid, the bidder's signature on Bid Form SP-26 shall mean that the bidder shall be bound by and perform fully in accordance with all of the terms and conditions set forth in the Invitation To Bid, this Form SP-19 and Contract #11PSX0326 as if the bidder had actually executed Form SP-19 and Contract #11PSX0326 itself.

Guaranty or Surety

10. Bid and or performance bonds may be required. Bonds must meet the following requirements: Corporation - must be signed by an official of the corporation above their official title and the corporate seal must be affixed over the signature; Firm or Partnership - must be signed by all the partners and indicate they are "doing business as"; Individual - must be signed by the owner and indicated as "Owner". The surety company executing the bond or countersigning must be licensed in Connecticut and the bond must be signed by an official of the surety company with the corporate seal affixed over their signature. Signatures of two witnesses for both the principal and the surety must appear on the bond. Power of attorney for the official signing the bond for the surety company must be submitted with the bond.

Samples

11. The quality of accepted bid samples does not supersede specifications for quality in the Invitation to Bid unless the sample is superior in quality. All deliveries shall have at least the same quality as the accepted bid sample.

12. Samples are furnished free of charge. Bidders must indicate if their return is desired, which DAS shall do provided that they are returned at Bidder's sole cost and expense, FOB Bidder's destination, and that they have not been made useless by testing. If they are made useless by testing, the State may dispose of the samples as it deems to be appropriate. Samples may be held for comparison with deliveries.

Award

13. Award of a contract will be made to the lowest responsible qualified bidder and shall be based on quality of the goods or

DO NOT RETURN WITH BID

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
PROCUREMENT DIVISION
165 Capitol Avenue, 5th Floor South
HARTFORD, CT 06106-1659

BID NO.:
11PSX0326

Janet DelGreco Olson
Contract Specialist
(860)713-5079
Telephone Number

Standard Bid Terms and Conditions - Page 2 of 3

services to be supplied, their conformance with specifications, delivery terms, price, administrative costs, past performance, and financial responsibility.

14. DAS may reject any bidder in default of any prior contract or guilty of misrepresentation or any bidder with a member of its firm in default or guilty of misrepresentation.

15. DAS may correct inaccurate awards resulting from clerical or administrative errors.

16. Bidders have ten days after notice of award of the contract to refuse acceptance. After ten days the contract will be binding on the Contractor. If the Contractor rejects the award within the ten day period, DAS will award the contract to the next lowest responsible qualified bidder.

Other Requirements

17. Section 4a-81 (the "Act") of the Connecticut General Statutes requires that the Invitation to Bid of which these Terms and Conditions are a part include a notice of the consulting affidavit requirements described in the Act. Accordingly, pursuant to the Act, vendors are notified as follows:

(a) No state agency or quasi-public agency shall execute a contract for the purchase of goods or services, which contract has a total value to the state of fifty thousand dollars or more in any calendar or fiscal year, unless the state agency obtains the written affidavit described in subsection (b) of this section.

(b) (1) The chief official of the vendor awarded a contract described in subsection (a) of this section or the individual awarded such contract who is authorized to execute such contract, shall attest in an affidavit as to whether any consulting agreement has been entered into in connection with such contract. Such affidavit shall be required if any duties of the consultant included communications concerning business of such state agency, whether or not direct contact with a state agency, state or public official or state employee was expected or made. "Consulting agreement" means any written or oral agreement to retain the services, for a fee, of a consultant for the purposes of (A) providing counsel to a contractor, vendor, consultant or other entity seeking to conduct, or conducting, business with the State, (B) contacting, whether in writing or orally, any executive, judicial, or administrative office of the state, including any department, institution, bureau, board, commission, authority, official or employee for the purpose of solicitation, dispute resolution, introduction or requests for information or (C) any other similar activity related to such contract. "Consulting agreement" does not include any agreements entered into with a consultant who is registered under the provisions of Chapter 10 of the Connecticut General Statutes concerning the State's Codes of Ethics, as of the date such affidavit is submitted. (2) Such affidavit shall be sworn as true to the best knowledge and belief of the person signing the certification on the affidavit and shall be subject to the penalties of false statement. (3) Such affidavit shall include the name of the consultant, the consultant's firm, the basic terms of the consulting agreement, a brief description of the services provided, and an indication as to whether the

consultant is a former state employee or public official. If the consultant is a former state employee or public official, such affidavit shall indicate his or her former agency and the date such employment terminated. (4) Such affidavit shall be updated no later than 30 days after the effective date of any such change contained in the most recently filed affidavit or upon submittal of any new bid or proposal, whichever is earlier. (c) If a vendor refuses to submit the affidavit required under subsection (b) of this section, then the state agency shall not award the Contract to such vendor and shall award the contract to the next highest ranked vendor or the next lowest responsible qualified bidder or seek new bids or proposals.

18. Section 4-252 (the "Statute") of the Connecticut General Statutes requires that the Invitation to Bid, of which these Terms and Conditions are a part, include a notice of the vendor certification requirements described in the Statute. Accordingly, pursuant to the Statute, vendors are notified as follows:

(a) The terms "gift," "quasi-public agency," "state agency," "large state contract," "principals and key personnel" and "participated substantially" as used in this section shall have the meanings set forth in the Statute.

(b) No state agency or quasi-public agency shall execute a large state contract unless the state agency or quasi-public agency obtains the written certifications described in this section. Each such certification shall be sworn as true to the best knowledge and belief of the person signing the certification, subject to the penalties of false statement.

(c) Any principal or key personnel of the person, firm or corporation submitting a bid or proposal for a large State contract shall certify on such forms as the State shall provide:

(1) That no gifts were made by (A) such person, firm, corporation, (B) any principals and key personnel of the person, firm or corporation, who participates substantially in preparing bids, proposals or negotiated State contracts, or (C) any agent of such person, firm, corporation or principals and key personnel, who participate substantially in preparing bids, proposals or negotiating state contracts, to (i) any public official or state employee of the state agency or quasi-public agency soliciting bids or proposals for state contracts, who participates substantially in the preparation of bid solicitations or requests for proposals for state contracts or the negotiation or award of state contracts, or (ii) any public official or state employee of any other state agency, who has supervisory or appointing authority over such state agency or quasi-public agency;

(2) That no such principals and key personnel of the person, firm or corporation, or agent of such person, firm or corporation or principals and key personnel, knows of any action by the person, firm or corporation to circumvent such prohibition on gifts by providing for any other principals and key personnel, official, employee or agent of the person, firm or corporation to provide a gift to any such public official or state employee; and

(3) That the person, firm or corporation is submitting bids or proposals without fraud or collusion with any person.

(d) Any bidder or proposer that does not make the certification required under this section shall be disqualified and the state agency or quasi-public agency shall award the contract to the next highest ranked proposer or the next lowest responsible qualified bidder or seek new bids or proposals.

STATE OF CONNECTICUT
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Standard Bid Terms and Conditions - Page 3 of 3

(e) Each state agency and quasi-public agency shall include in the bid specifications or request for proposals for a large state contract a notice of the certification requirement of this section.

19. The existence of the contract shall be determined in accordance with the requirements set forth above. However, the award of the contract is not an order to ship. Contractors may not begin to perform under the awarded contract until the Contractor and the State have executed the contract and thereafter the Contractor receives a written purchase order from an appropriate State entity.

20. With regard to a State contract as defined in Section 9-612 of the Connecticut General Statutes having a value in a calendar year of \$50,000 or more or a combination or series of such agreements or contracts having a value of \$100,000 or more, the authorized signatory to this submission in response to the State's solicitation expressly acknowledges receipt of the State Elections Enforcement Commission's notice advising

prospective state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice. See Contract Exhibit C, SEEC Form 11.

21. Public Act 11-55 and Public Act 11-229 have amended the nondiscrimination provisions of the Connecticut General Statutes to add gender identity or expression to the existing protected classes and to require State contractors to adopt policies in support of the new statutes by means of an affidavit or resolution. Accordingly, attached as Form NDC is a form certification that the successful contractor must deliver executed at the time that it executes the Contract. The execution and submittal of this affidavit or resolution is a condition precedent to the State's executing the Contract, unless the contractor is exempt from this statutory requirement, in which case the contractor must obtain a written waiver from the State's Commission on Human Rights and Opportunities.

STATE OF CONNECTICUT
COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES (CHRO)
WORKPLACE ANALYSIS AFFIRMATIVE ACTION REPORT
EMPLOYMENT INFORMATION FORM

Bid Number:
11PSX0326

Company Name Street Address City State	Contact Person	Phone Number	Date
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Report all permanent full-time or part-time employees, including apprentice and on-the-job trainees. Enter the number on all lines and in all columns.

JOB CATEGORY	A OVERALL TOTALS (Sum of all columns, A-F Male & Female)	B WHITE (NOT OF HISPANIC ORIGIN)		C BLACK (NOT OF HISPANIC ORIGIN)		D HISPANIC		E ASIAN / PACIFIC ISLANDER		F AMERICAN INDIAN OR ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Officials/Managers											
Professionals											
Technicians											
Sales Workers											
Office/Clerical											
Craft Workers (Skilled)											
Operatives(Semi-skilled)											
Laborers (Unskilled)											
Service Workers											
TOTALS ABOVE											

Do you use minority businesses as subcontractors or suppliers? <input type="checkbox"/> Yes <input type="checkbox"/> No	Explain:
If CT based, do you post all employment openings with the State of Connecticut Employment Service? <input type="checkbox"/> Yes <input type="checkbox"/> No	Explain:
Do you use an Affirmative Action Plan? <input type="checkbox"/> Yes <input type="checkbox"/> No	Explain:

Describe your recruitment, hiring, training and promotion anti-discrimination practices.

STATE OF CONNECTICUT

Certificate of Compliance with Connecticut General Statute Section 31 - 57b

Bid Number:
11PSX0326

I hereby certify that all of the statements herein contained below have been examined by me, and to the best of my knowledge and belief are true and correct.

The _____ **HAS / HAS NOT**
Company Name (Cross out Non-applicable)

been cited for three (3) or more willful or serious or serious violations of any Occupational Safety and Health Act (OSHA) or of any standard, order or regulation promulgated pursuant to such act, during the three year period preceding the bid, provided such violations were cited in accordance with the provisions of any State Occupational Safety and Health Act of 1970, and not abated within the time fixed by the citation and such citation has not been set aside following appeal to the appropriate agency of court having jurisdiction or **HAS / HAS NOT** (Cross out Non-applicable) received one or more criminal convictions related to the injury or death of any employee in the three-year period preceding the bid.

The list of violations (if applicable) is attached.

(Name of Firm, Organization or Corporation)

Signed:

Written Signature:

Name Typed: (Corporation Seal)

Title:

(Title of Above Person, typed)

Dated:

State of _____)

County of _____) **ss:** *A.D., 20* _____)

Sworn to and personally appeared before me for the above, _____,
(Name of Firm, Organization, Corporation)

Signer and Sealer of the foregoing instrument of and acknowledged the same to be the free act and deed of

_____, and his/her free act and deed as
(Name of Person appearing in front of Notary or Clerk)

_____.
(Title of Person appearing in front of Notary or Clerk)

My Commission Expires: _____
(Notary Public) (Seal)

STATE OF CONNECTICUT

DEPARTMENT OF ADMINISTRATIVE SERVICES

PROCUREMENT DIVISION

165 Capitol Avenue, 5th Floor South

HARTFORD, CT 06106-1659

BID NO.:

11PSX0326

Janet DelGreco Olson
Contract Specialist
(860)713-5079
Telephone Number

Vendor Authorization Guidelines- Page 1 of 2

All contracts must include appropriate vendor documentation that does the following three things:

- A. Authorizes the vendor to enter into contracts,
- B. Authorizes a particular officer to execute contracts on behalf of the vendor and
- C. Evidences that the officer signing in fact holds his/her office.

CORPORATIONS - Appropriate vendor documentation usually involves a certificate from the Secretary or other appropriate officer setting forth a copy of a board resolution. Sometimes this is not possible, in which case the vendor should observe the following:

- 1) In lieu of the secretary's certificate, the vendors must submit:
 - a) a current certified copy of the applicable section of the corporation's bylaws which authorizes the execution of contracts by the signing person and
 - b) a current certification that the officer signing the assignment agreement in fact holds that office.
- 2) In lieu of the certified resolution or bylaws, the vendor must include a certified copy of the corporate minutes of their respective boards of directors, which must specifically authorize the person signing the assignment agreement to execute it.

NOTE: If the bylaws or resolutions cannot be found, a formal legal opinion must be obtained attesting to:

- a. the authority of the company and
- b. the officer's ability to bind the company

to enter into a contract.

LIMITED LIABILITY COMPANIES (LLC'S) – LLC's that do not have boards of directors, must submit the following:

- 1) a document indicating unanimous consent from all members or managers or
- 2) a certified copy of all of those relevant portions of their management agreement or operations agreement that identify which members or managers have the authority to bind the LLC in contracts. The certification must also show that the signing party is in fact a manager/member or that a manager/member has duly (in accordance with the management agreement or operations agreement) delegated signatory authority to the signing person.

If the company can't find the management agreement or operations agreement, a formal legal opinion must be obtained attesting to:

- a. the authority of the company and
- b. the signing party's ability to bind the company

to enter into a contract.

Do not return this page with bid

STATE OF CONNECTICUT

DEPARTMENT OF ADMINISTRATIVE SERVICES

PROCUREMENT DIVISION

165 Capitol Avenue, 5th Floor South

HARTFORD, CT 06106-1659

BID NO.:

11PSX0326

Janet DelGreco Olson
Contract Specialist
(860)713-5079
Telephone Number

Vendor Authorization Guidelines- Page 2 of 2

PARTNERSHIPS – Partnerships, like LLC’s, do not have boards of directors. Generally, any general partner can bind the partnership. However, it is prudent to make every effort to obtain a partnership authorization that includes some evidence of a partner's authority to bind the partnership. This can include partnership resolutions that read very much like a corporation’s resolutions or a copy of the partnership agreement (or all relevant sections) that address the authority of partners to bind the partnership, again taking into account any limitations, or a consent from the appropriate partners. The partnership agreement governs in the same way as the LLC’s management or operations agreement.

SOLE PROPRIETORS - Sole Proprietors do not need to submit any documentation with regards to vendor authorization or certification. Sole Proprietors must submit a letter on company letterhead stating:

- 1) that the company holds Sole Proprietor status,
- 2) the name(s) of those authorized to execute contracts on behalf of the company and
- 3) the signature of Sole Proprietor.

NOTE: You may review and/or download the Vendor Authorization Guidelines and Samples from the DAS/Procurement website <http://das.ct.gov/mp1.aspx?page=8>. Scroll down until you see the heading “**Quick Links**” on the far right side of the screen. Click on “**Vendor Information**” then “**Vendor Authorization Guidelines and Sample**”.

STATE OF CONNECTICUT

BIDDER'S STATEMENT OF QUALIFICATIONS

Bid Number: 11PSX0326

Page 1 of 2

THIS FORM WILL BE USED IN ASSESSING A BIDDER'S QUALIFICATIONS AND TO DETERMINE IF THE BID SUBMITTED IS FROM A RESPONSIBLE BIDDER. STATE LAW DESIGNATES THAT CONTRACTS BE AWARDED TO THE LOWEST RESPONSIBLE QUALIFIED BIDDER. FACTORS SUCH AS PAST PERFORMANCE, INTEGRITY OF THE BIDDER, CONFORMITY TO THE SPECIFICATIONS, ETC. WILL BE USED IN EVALUATING BIDS. ATTACH ADDITIONAL SHEETS IF NECESSARY

COMPANY NAME: _____
&
ADDRESS: _____

NUMBER OF YEARS COMPANY HAS BEEN ENGAGED IN BUSINESS UNDER THIS NAME: _____ YEARS

LIST ANY CONTRACT AWARDS TO YOUR COMPANY BY THE STATE OF CONNECTICUT WITHIN THE LAST THREE (3) YEARS, **THAT YOU ACTUALLY PERFORMED SERVICE AGAINST**. INDICATE WHICH STATE AGENCY, AND PROVIDE CONTRACT NAME AND NUMBER, AND THE NAME AND TELEPHONE NUMBER OF THE PURCHASING AGENT ADMINISTERING THE CONTRACT.

<u>CONTRACT NO.</u>	<u>CONTRACT NAME</u>	<u>STATE AGENCY</u>	<u>PURCHASING AGENT</u>	<u>TEL. NO.</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

LIST ANY CONTRACT AWARDS TO YOUR COMPANY BY THE STATE OF CONNECTICUT WITHIN THE LAST THREE (3) YEARS. INDICATE WHICH STATE AGENCY, AND PROVIDE CONTRACT NAME AND NUMBER, AND THE NAME AND TELEPHONE NUMBER OF THE PURCHASING AGENT ADMINISTERING THE CONTRACT.

<u>CONTRACT NO.</u>	<u>CONTRACT NAME</u>	<u>STATE AGENCY</u>	<u>PURCHASING AGENT</u>	<u>TEL. NO.</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

LIST OTHER NAMES YOUR COMPANY GOES BY: _____

LIST PREVIOUS COMPANY NAME (S) _____

LIST AT LEAST THREE COMPLETED PROJECTS SIMILAR IN NATURE TO THIS **INVITATION FOR BIDS** WHICH DEMONSTRATES YOUR COMPANY'S ABILITY TO PERFORM THE REQUIRED SERVICES.

	<u>Company Name and Address</u>	<u>Telephone No.:</u>	<u>Dollar Value:</u>
1.	_____	_____	_____
	_____	_____	_____
2.	_____	_____	_____
	_____	_____	_____
3.	_____	_____	_____
	_____	_____	_____

STATE OF CONNECTICUT

BIDDER'S STATEMENT OF QUALIFICATIONS

Bid Number:
11PSX0326

Page 2 of 2

COMPANY NAME: _____

SIZE OF COMPANY
OR CORPORATION: NUMBER OF EMPLOYEES: FULL TIME _____ PART TIME _____

COMPANY VALUE: EQUIPMENT ASSETS _____ TOTAL ASSETS _____

IS YOUR COMPANY REGISTERED WITH THE OFFICE OF THE CONNECTICUT SECRETARY OF STATE? YES NO

REGISTRATION DATE, IF AVAILABLE: _____

IF REQUESTED, WOULD YOUR COMPANY PROVIDE A "GOOD STANDING" CERTIFICATE
ISSUED BY THE CONNECTICUT SECRETARY OF STATE'S OFFICE? YES NO

LIST OF EQUIPMENT TO BE USED FOR THIS SERVICE (INCLUDE MODEL, YEAR & MANUFACTURER):

<u>MODEL</u>	<u>YEAR</u>	<u>MANUFACTURER</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(Attach additional sheets if necessary)

LIST ANY RELEVANT CERTIFICATIONS, LICENSES, REGISTRATIONS, ETC. WHICH QUALIFY YOUR COMPANY TO MEET THE REQUIREMENTS OF THIS BID.

(Attach additional sheets if necessary)

LIST ANY CRIMINAL CONVICTIONS, GUILTY PLEAS OR NOLO CONTENDERES AGAINST YOUR COMPANY AND ANY OF YOUR COMPANY'S OFFICERS, PRINCIPAL SHAREHOLDERS, DIRECTORS, PARTNERS, LLC MEMBERS AND LLC MANAGERS.

(Attach additional sheets if necessary)

LIST ANY ADMINISTRATIVE ACTIONS EITHER PENDING REVIEW BY THE STATE OR DETERMINATIONS THAT THE STATE HAS MADE REGARDING YOUR COMPANY OR ANY OF YOUR COMPANY'S OFFICERS, PRINCIPAL SHAREHOLDERS, DIRECTORS, PARTNERS, LLC MEMBERS OR LLC MANAGERS. THIS WOULD INCLUDE COURT JUDGEMENTS, ACTIONS, SUITS, CLAIMS, DEMANDS, INVESTIGATIONS AND LEGAL, ADMINISTRATIVE OR ARBITRATION PROCEEDINGS PENDING IN ANY FORUM. INCLUDE A LISTING OF OSHA VIOLATIONS AND ANY ACTIONS OR ORDERS PENDING OR RESOLVED WITH ANY STATE AGENCY SUCH AS THE DEPARTMENT OF CONSUMER PROTECTION, THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, ETC. DETAIL THIS INFORMATION ON A SEPARATE SHEET OF PAPER. SUCH INFORMATION SHOULD BE FOR THE LAST THREE (3) YEARS.

I HEREBY CERTIFY UNDER PENALTY OF FALSE STATEMENT THAT ALL THE INFORMATION SUPPLIED IS COMPLETE AND TRUE.

SIGNATURE

DATE

TITLE

INVITATION TO BID

Joint and Crack Sealing for Airport Use ONLY

Contract Specialist: **Janet DelGreco Olson**

Date Issued: **7 December 2011**

Due Date: **27 December 2011**



Department of Administrative Services



State of Connecticut
Department of Administrative Services
Announcement of Invitation to Bid to provide
Joint and Crack Sealing for Airport Use ONLY
Date 7 December 2011
Bid No. 11PSX0326

Pursuant to the provisions of Section 4a-57 of the General Statutes of Connecticut as amended, sealed bids will be received by Procurement Services for the State of Connecticut, at the address provided in this Invitation to Bid (“Bid”) for furnishing the commodities and/or services herein listed.

The Department of Administrative Services welcomes the opportunity to work with our customers and suppliers to provide Joint and Crack Sealing for Airport Use ONLY to the State of Connecticut as outlined throughout this Bid document.

We invite you to be part of this effort.

TABLE OF CONTENTS

OVERVIEW _____	4
SCOPE _____	7
BID / CONTRACT REQUIREMENTS _____	8
INDEX OF ABBREVIATIONS/DEFINITIONS AND OTHER RELATED COMMENTS ____	12
CONTRACT _____	13

Invitation to Bid

Joint and Crack Sealing for Airport Use ONLY

Overview

The Department of Transportation is soliciting bids for the Repair of Seal Joint damage in Bituminous Concrete and Portland Concrete Routing and Sealing of Joints and Cracks in Airport Pavements, and Cleaning and Sealing Joints and Cracks in Airport Pavements per specifications contained herein. The planning date for this procurement began June 9, 20 and has a contract value of approximately \$100,000.00.

CONTRACT TERM:

The Contract term is from date of Award through December 31, 2013. The State reserves the right to extend this Contract up to the full original contract term or part thereof.

QUESTIONS: Any questions pertaining to these bid documents must be submitted in writing and emailed or faxed to Janet DelGreco Olson, Contract Specialist, Department of Administrative Services/Procurement Services no later than December 12, 2011. Questions will be answered and posted via an addendum on the State of Connecticut, Department of Administrative Services website, www.das.state.ct.us/mp1.aspx?page=9 by December 13, 2011. Contractor must download, print and sign the addendum and submit this addendum and any other addendums issued for this bid with your bid package. Failure to do so may result in rejection of bid. Email address: janet.delgreco@ct.gov. Fax number: 860 622-2961. Verbal responses shall be considered non binding.

BID OPENINGS: This bid is scheduled to open on December 27, 2011 in Room 161. Contractors are encouraged to attend the public bid opening of this bid. A photo i.d. will be required to gain access to the building.

If a Contractor is unable to attend the bid opening and wishes to have the results of the bid Contractor may schedule an appointment with the Contract Specialist to review the bid documents ONLY after an award is made. Due to the numerous bids issued, it isn't always possible to read bid results over the telephone.

PERFORMANCE MONITORING: Throughout the term of this agreement the Agent and the Department of Administrative Services (DAS) will monitor the performance of the contractor. After receipt of a Vendor Performance Report, each specific incident will be addressed as follows:

- The first incident report of a specific requirement within an evaluation period will produce the DAS-Procurement contract specialist to investigate a formal complaint regarding contractual breaches or poor performance issues for the purpose of validating such complaints. After the first *validated* report of poor performance or noncompliance, the contractor will be given a reasonable opportunity to cure the performance and compliance issues.

- A second *validated* incident report of poor performance or noncompliance of the same specific requirement within an evaluation period may result in a conference involving the contract vendor, the contracting state agency and DAS Procurement. The contractor will then be given a second opportunity to cure poor performance and compliance issues.
- **A THIRD VALIDATED INCIDENT REPORT OF POOR PERFORMANCE OR NONCOMPLIANCE COMPLAINT OF THE SAME SPECIFIC REQUIREMENT WITHIN AN EVALUATION PERIOD MAY RESULT IN TERMINATION OF THE CONTRACT.** The Department of Administrative Services will employ another Contractor to fulfill the requirements of the contract. The terminated contractor shall be liable to the State of Connecticut for all additional costs incurred as a result of the termination pursuant to Sections #9 and #11 of this contract.

In the event of termination, all keys, drawings, plans, sketches and all specifications, any data pertaining to the contract, and any unused material supplied by the State must be delivered to the State upon demand.

For the purposes of this agreement, an “evaluation period” is defined as three (3) consecutive months. Specific incidents from one evaluation period may not extend into another evaluation period. After two (2) consecutive evaluation periods, the State may review the results of the contractor’s performance and may, at the State’s option, revise the length of the evaluation period.

Instructions to the agency on where to find the Vendor Performance Report:
Go to the DAS/Procurement Services website – www.biznet.ct.gov/DASProcurement

Both the agency and the provider must “create an account” if you are new. Follow instructions to create an account on the website address listed above. If you are not new, login and follow prompts to complete the report.

In the event that the contract award has been terminated, the awarded contractor will complete all work currently underway, and the agency will make payments for all services received and completed.

ASSESSMENT OF DAMAGES:

In the event that the CONTRACTOR provides unsatisfactory service(s) or fails to comply with the specifications, which has to be remedied by the use of State forces or by the use of other contractors; the State will assess CONTRACTOR the full amount expended to correct the deficiencies.

If CONTRACTOR fails to attend all scheduled meetings, then the CONTRACTOR may be liable for monetary damages, as determined by DAS Procurement Services, payable to Treasurer, State of Connecticut or the State may authorize a deduction from payment due to CONTRACTOR.

In the event the CONTRACTOR and/or its contractors' performance and/or equipment is not in proper working condition, causing delays in the performance of services rendered, the State reserves the right to negotiate and assess damages. The negotiation of damages will be discussed by all parties. Final determination will be made by DAS Procurement Services (reference Section #9 and #11 of this contract).

Scope

The specifications herein are for the Repair of Seal Joint damage in Bituminous Concrete and Portland Concrete, Routing and Sealing of Joints and Cracks in Airport Pavements, and Cleaning and Sealing Joints and Cracks in Airport Pavements at the State of Connecticut, Department of Transportation's (ConnDOT's) airports: Bradley International; Hartford Brainard; Waterbury-Oxford and Groton-New London

I. Mandatory Extension to State Entities

Contractors are required to offer and extend this contract (including pricing, terms and conditions) to Political Sub-Divisions of the State (Towns and Municipalities), Schools, and Not-For-Profit Organizations.

When a Political Sub-Division, School, and/or Not-For-Profit Organization utilizes this contract all references to the "State" are hereby replaced with the Name of the Using Sub-Division, School, or the name of the Not-For-Profit Organization.

II. Set Aside Participation - not applicable

III. Motor Carrier Safety Review.

If the performance of the Contract requires the use and operation of any commercial motor vehicle, as defined in section 14-1 of the Connecticut General Statutes, or other motor vehicle with a gross vehicle weight rating (GVWR) of 18,000 pounds or more, each bidder will be the subject of an evaluation, conducted by the Connecticut Department of Motor Vehicles (CTDMV) of its motor carrier safety fitness. The primary factor in the evaluation is the current SAFESTAT score, calculated by the U.S. Federal Motor Carrier Safety Administration (FMCSA) in accordance with the provisions of Title 49, Section 385.1, et seq., of the Code of Federal Regulations.

To be deemed qualified, the bidder must have an overall SAFESTAT category rating of "D" or better, on the date of evaluation. In addition, the bidder's driver and vehicle out-of-service rates will be consulted. The rates are determined by the number of out-of-service violations cited to the motor carrier in the course of all official, reported vehicle and/or driver inspections conducted during the preceding thirty (30) months. To be deemed qualified, the bidder must not have either a vehicle or driver out-of-service rate, by percentage of out-of-service violations per the total number of inspections reported, that is more than twice the national average. In addition, the bidder must have a current federal safety management practices rating of "Satisfactory," as defined in 49 CFR section 385.3, as amended.

Further information concerning the motor carrier safety evaluation, to which a bidder is subject, may be obtained from CTDMV, at <http://www.ct.gov/dmv/cwp/view.asp?a=798&q=413206&dmvPNavCtr=|#49068>. All official inspection and rating data that is used in the performance of each evaluation is available to any motor carrier through the federal SAFESTAT website, at <http://www.ai.volpe.dot.gov/>.

IV. Quantities and/or Usages

These are estimated quantities and/or usages only and in no way represent a commitment and/or intent to purchase. Actual quantities may vary and will be identified on individual purchase orders issued by the requesting state entity.

V. Contract Separately / Additional Savings Opportunities

The State reserves the right to either seek additional discounts from the contractor(s) or to contract separately for a single purchase, if in the judgment of DAS/Procurement Services, the quantity required is sufficiently large, to enable the State to realize a cost savings, over and above the published contract prices, whether or not such a savings actually occurs.

VI. Brand Name Specifications and/or References

The use of the name of a manufacturer or of any particular make, model or brand in describing an item does not restrict bidders to that manufacturer or specific article unless limited by the term "no substitute". However, the article being offered must be of such character and quality so that it will serve the purpose for which it is to be used equally as well as that specified, and the bidder shall warrant to the State that it is fit for that purpose. Bids on comparable items must clearly state the exact article being offered including any and all applicable options and the bidder shall furnish such other information concerning the article being offered as will be helpful in evaluating its acceptability for the purpose intended. If the bidder does not indicate that the article offered is other than as specified, it will be understood that the bidder is offering the article exactly as specified. Bidders must submit complete documentation on the specifications and quality levels of the proposed products. Bids submitted that do not contain this documentation are subject to rejection.

VII. P-Card (Purchasing Credit Card)

Purchases for all state agencies that are less than \$1,000 shall be made using the State of Connecticut Purchasing Card (MasterCard) in accordance with Memorandum No. 2011-11 issued by the Office of the State Comptroller.

Contractor shall be equipped to receive orders issued from this Contract using the purchasing card. The Contractor shall be responsible for the credit card user-handling fee associated with credit card purchases. The Contractor shall only charge to the State's MasterCard upon delivery of goods or rendering of services.

The Contractor shall capture and provide to their Merchant Bank, Level 3 reporting at the line item level for all orders placed by State purchasing cards.

Questions regarding the state of Connecticut MasterCard Program should be directed to Ms. Kerry DiMatteo, Procurement Card Program Administrator at (860)713-5072.

VIII. Contract Award

The State reserves the right to award this Contract in a manner deemed to be in the best interest of the State and may include, but not be limited to:

- A. by item, group of items, or in its entirety

- B. geographic location to adequately service the entire State of Connecticut in the best possible manner
- C. Multiple Contractor Award

IX. Bonds

PERFORMANCE BOND: Contractor may either provide a Performance Bond in the amount of 100% of each Purchase Order **or** a Performance Bond in the **minimum** amount of \$100,000.00. With regard to the latter Performance Bond, when the total value of the awarded work meets or exceeds the \$100,000.00 bond value, the bond requirement will be increased in **minimum** increments of \$25,000.00 beyond the value listed on the current bond. ConnDOT will notify the Contractor when a new bond is required. The required bond must be received prior to the Purchase Order being issued. Failure to submit bond in a form satisfactory to ConnDOT prior to the Purchase Order being issued shall result in ConnDOT issuing the Purchase Order to the next lowest Contractor responsive to ConnDOT's bond request. Other offers of surety will be viewed on a case by case basis.

PAYMENT BOND: Contractor may either provide a Payment Bond in the amount of 100% of each Purchase Order **or** a Payment Bond in the **minimum** amount of \$100,000.00. With regard to the latter Payment Bond, when the total value of the awarded work meets or exceeds the \$100,000.00 bond value, the bond requirement will be increased in **minimum** increments of \$25,000.00 beyond the value listed on the current bond. ConnDOT will notify the Contractor when a new bond is required. The required bond must be received prior to the Purchase Order being issued. Failure to submit bond in a form satisfactory to ConnDOT prior to the Purchase Order being issued shall result in ConnDOT issuing the Purchase Order to the next lowest Contractor responsive to ConnDOT's bond request. Other offers of surety will be viewed on a case by case basis.

Such bond shall be:

1. Corporation: The Bond must be signed by an official of the Corporation above its official title and the corporate seal must be affixed over its signature.
2. Firm or Partnership: The Bond must be signed by all the partners and indicate they are "Doing Business As (name of firm)".
3. Individual: The Bond must be signed by the individual owning the business and indicated "Owner".
4. The Surety Company executing the Bond must be licensed to do business in the State of Connecticut, or Bond must be countersigned by a company so licensed.
5. The Bond must be signed by an official of the Surety Company and the corporate seal must be affixed over its signature.
6. Signatures of two witnesses for both principal and the Surety must appear on the bond.
7. A Power of Attorney for the official signing of the Bond for the Surety Company must be submitted with the Bond, unless such Power of Attorney has previously been filed with the Bureau of Finance & Administration.

X. PREVAILING WAGES:

Payment of prevailing wages is not required due to the low dollar value of the Contract.

XI. Subcontractors

DAS must approve any and all subcontractors utilized by the successful bidder prior to any such subcontractor commencing any work. Bidders acknowledge by the act of submitting a proposal that any work provided under the contract is work conducted on behalf of the State and that the Commissioner of DAS or his/her designee may communicate directly with any subcontractor as the State deems to be necessary or appropriate. It is also understood that the successful bidder shall be responsible for all payment of fees charged by the subcontractor(s). A performance evaluation of any subcontractor shall be provided promptly by the successful bidder to DAS upon request. The successful bidder must provide the majority of services described in the specifications.

Index of Abbreviations/Definitions and Other Related Comments

DAS	Department of Administrative Services
ConnDOT	Connecticut Department of Transportation
GVWR	Gross Vehicle Weight Rating
CTDMV	Connecticut Department of Motor Vehicle
FMSCA	Federal Motor Carrier Safety Administration
P-Card	Purchasing Credit Card
FOIA	Freedom of Information Act
ITB	Invitation to Bid

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EXHIBIT A

DESCRIPTION OF GOODS AND SERVICES

ENVIRONMENTAL COMPLIANCE:

Contractors shall be required to be in compliance with the environmental regulations promulgated by the State of Connecticut, Department of Energy and Environmental Protection (DEEP) at all times. During any period that a Contractor is found to be in noncompliance, no new purchase orders shall be issued. The Contractor shall comply with Form 816, Article 1.07.16.

FORM 816:

Reference is made in these bid documents to FORM 816, which is the State of Connecticut, Department of Transportation's "**Standard Specifications for Roads, Bridges and Incidental Construction**". Work is to be in accordance with FORM 816 including all supplements and other applicable standards. Copies of these Standard Specifications, FORM 816 may be purchased from the Connecticut Department of Transportation, Manager of Contracts, P.O. Box 317546, 2800 Berlin Turnpike, Newington, CT. 06131-7546.

The price is twenty dollars (\$20.00) if the FORM 816 is mailed and sixteen dollars (\$16.00) if the FORM 816 is picked up. Checks are to be made out to: Treasurer – State of Connecticut.

OR

You may go to the following: <http://www.ct.gov/dot/cwp/view.asp?a=1385&Q=319212>

EXHIBIT A

DESCRIPTION OF GOODS AND SERVICES

SPECIAL PROVISIONS

INSPECTION OF EQUIPMENT:

Equipment to be used under the terms of this Contract shall be available for inspection at a location within the State of Connecticut. The State reserves the right to inspect Contractor's equipment prior to the issuance of the Contract Award.

WORK PERIODS:

Work will be performed during the daylight hours unless otherwise allowed or directed by the Airport Manager or Representative. In the result of extreme aircraft traffic disruption, ConnDOT shall limit the hours of Contractor's operation. When night work is performed, Contractor shall furnish all lighting to illuminate the work area. Additional payment shall be made under the appropriate item for periods of night work, Saturday work or Sunday work. The definition of these periods is:

NIGHT WORK PERIOD:

The additional rate per pound (LB) or linear foot (LF) shall be added to the base bid price for all work starting after 6:00 p.m., and ending at 6:00 a.m. on a specific date.

SATURDAY WORK PERIOD:

The additional rate per pound (LB) or linear foot (LF) shall be added to the base bid price for all work to be performed on a Saturday. In the case of night work on Saturday, the night rate shall also be added to the base price.

SUNDAY WORK PERIOD:

The additional rate per pound (LB) or linear foot (LF) shall be added to the base bid price for all work to be performed on a Sunday. In the case of night work on Sunday, the night rate shall also be added to the base price.

SAMPLING, INSPECTING AND TESTING:

No joint seal material shall be applied until it has been tested and approved by ConnDOT, Division of Materials Testing. Samples submitted by Contractor for testing shall consist of a 50 pound segment Contractor is required to furnish samples at no charge to:

Bureau of Engineering & Construction
Division of Materials Testing
280 West Street
Rocky Hill, CT 06067

Samples shall be submitted to the Division of Materials Testing whenever the Contractor is so instructed by the State.

EXHIBIT A

DESCRIPTION OF GOODS AND SERVICES

Samples submitted to the Division of Materials Testing shall be identified in the following manner: A label shall be affixed to the sample containing the following information: Contractor's company name and address, the Contract number and the batch number that the sample was manufactured under.

Tests shall be made by and at the expense of ConnDOT.

Batches of material equaling 10,000 pounds or greater shall be tested by the Division of Materials Testing.

Batches of material less than 10,000 pounds shall be covered by certified test reports and material certificates in accordance with FORM 816, Article 1.06.07.

TRAFFIC CONTROL:

The airport shall provide all traffic control. This shall include the provision of a radio control vehicle where applicable and any necessary items to mark, barricade or protect the work area.

EXHIBIT A

DESCRIPTION OF GOODS AND SERVICES

TECHNICAL SPECIFICATIONS FOR SAWING, ROUTING & CLEANING

CRACK SEALING LONGITUDINAL, TRANSVERSE, REFLECTION & BLOCK CRACKING

Pavement types shall consist of Portland Cement Concrete and bituminous concrete.

1. Clean out crack with compressed air to remove all loose particles. If routing is required, the router shall be the vertical spindle or rotary type cutter.
2. Fill cracks with approved joint sealer. Any depression in the seal greater than 1/8 inch shall be brought up to the specified limit by further addition of Hot Seal Material. Care shall be taken during the sealing operation to ensure that the final appearance shall present a neat line.

REPAIR OF JOINT SEAL DAMAGE: (Exhibit B, Price Schedule#1)

Repair of joint seal damage using either jet fuel resistant or non resistant joint materials shall be paid by the linear foot complete in place as determined by the State Inspector.

The sequence of operations for preparing joints for resealing is as follows:

1. Use joint router or joint plow if applicable to remove the joint sealing material to a depth of at least 1 inch.
2. Reface the sides of the joint to expose sound concrete bituminous that is free of old sealer. This may be accomplished with a power saw.
3. Use a power wire brush to remove debris.
4. Blow out the joints with compressed air.
5. Seal joints by injection into the joint through nozzles shaped to penetrate into the joint and fill the reservoir from the bottom. On small jobs, hand pouring pots may be used with the approval of the Airport Manager or Representative.

ROUTING AND SEALING JOINTS AND CRACKS: (Exhibit B, Price Schedule #2)

Shall be measured for payment by the actual number of linear feet of routed and sealed cracks in the Portland or bituminous pavement surface as determined by the State Inspector. Daily records shall be kept by both the Contractor and State Inspector with daily accomplishment, in linear feet, agreed upon at the close of each workday.

CLEANING AND SEALING OF JOINTS AND CRACKS: (Exhibit B, Price Schedule #3)

Shall be measured for payment by measuring the actual number of pounds of joint seal material in place, as determined by the State Inspector. This is cleaning and sealing in both bituminous and Portland Cement concrete surfaces. Jet fuel resistant type material may be required. Daily records shall be kept by both the Contractor and the State Inspector with the daily accomplishment, in pounds, agreed upon at the close of each workday. The price to include all equipment, labor and materials (including paper rope and cover material). The minimum crew size shall be four (4) people, two (2) of which shall be pourers. No daily average production quantity guarantees are made or implied as surface characteristics will vary from area to area. Sections to be sealed may not be contiguous.

EXHIBIT A

DESCRIPTION OF GOODS AND SERVICES

The correct application rate for **JOINT MATERIAL** is: **FOUR (4) LINEAR FEET to ONE (1) POUND** of material for the cleaning and sealing aspects of the Contract. Application of product shall be carefully monitored by the State.

APPLICATION OF COVER MATERIAL IN AIRPORT PAVEMENT:

When traffic conditions or slow drying time occurs, a light application of approved cover material may be allowed by the Airport Manager or Representative. Prices for cover materials shall be included in the complete in place price for the item.

COVER MATERIAL:

Cover material where allowed by the Airport Manager or Representative, used to prevent the pickup of material by vehicle or aircraft tires prior to complete set-up and hardening is the liquid cover material, trade name Detak or an approved equal.

SEALING MATERIALS:

Material for sealing cracks and joints shall meet the ASTM standard for the type of pavement and service to which the pavement is to be subjected. The Airport Manager or Representative shall determine the criteria where jet fuel resistant type sealant is required.

The materials are:

ASTM D 3405, Joint Sealants, Hot Poured For Concrete and Asphalt Pavements

ASTM D 3581, Joint Sealants, Hot Poured, Jet Fuel Resistant Type For Portland Cement Concrete and Tar-Concrete Pavements.

CONTROL OF JOINT SEAL MATERIAL:

The material is to be applied within the temperature range specified by the manufacturer. Material that is heated or cooled beyond the manufacturer's specified temperature range shall be discarded at the expense of Contractor. The joint seal material shall be poured as soon as possible after the recommended pouring temperature has been reached. Only as much material as can be poured in a given day shall be melted that day. The weight of each container of material shall be stamped or marked by the manufacturer. The material shall be shrink wrapped from the manufacturer and not opened without the presence of a ConnDOT Representative.

KETTLE:

This unit is to be a combination melter and pressurized applicator. It shall be constructed as a double boiler with space between the inner and outer shells filled with oil or other material for heat transfer having a flash point of not less than 600 degrees F. Positive temperature control and mechanical agitation shall be provided. Direct heating shall not be used. A thermometer is to be suitably mounted for indicating the temperature of the sealing compound in the melter. The kettle shall be capable of maintaining the material at a temperature within 15 degrees of the sealant manufacturer's specified temperature.

EXHIBIT A

DESCRIPTION OF GOODS AND SERVICES

COMPRESSOR:

This unit shall have a minimum rated capacity of 90 p.s.i. and shall have sufficient hose to maintain a continuous sealing operation without interruption.

JOINT SAW:

Shall be an approved power-driven saw capable of providing a straight cut of uniform depth and width.

POURING POTS:

Shall be equipped with mobile carriage and rubber shoe and have a low control valve which allows all cracks to be filled to refusal so as to eliminate all voids or entrapped air and **not** leave surplus on pavement surface.

LIMITATION OF OPERATION:

Work hours and schedule shall be subject to the availability of runway, taxiway, ramp and apron areas without interference with the normal operation of the airport. Work on ramp and apron areas shall require scheduling in advance with the airport tenants.

The Airport Manager or Representative shall order the suspension of work if in ConnDOT's opinion; the work operation is disrupting the operation of the airport or causing an adverse impact on the timely departure and arrival of aircraft. A description of the joints to be sealed shall be furnished to Contractor with each purchase order. This description shall include sufficient detail so that Contractor can estimate its requirements for the operation.



U.S. Department
of Transportation

**Federal Aviation
Administration**

Advisory Circular

Subject: GUIDELINES AND PROCEDURES FOR
MAINTENANCE OF AIRPORT PAVEMENTS

Date: 7/14/03

AC No: 150/5380-6A

Initiated by: AAS-100

Change:

- 1. PURPOSE.** This Advisory Circular (AC) provides guidelines and procedures for maintaining rigid and flexible airport pavements.
- 2. CANCELLATION.** This AC cancels AC 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*, dated 12/3/82.
- 3. APPLICATION.** The Federal Aviation Administration (FAA) recommends these guidelines for airport pavements, as appropriate.
- 4. RELATED READING MATERIAL.** The publications in Appendix 2, Bibliography, provide further guidance and technical information.

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

David L. Bennett
Director of Airport Safety and Standards

CONTENTS

Paragraph	Page
CHAPTER 1. INTRODUCTION TO AIRPORT PAVEMENT MAINTENANCE.....	1
1-1. PURPOSE OF ADVISORY CIRCULAR	1
1-2. BACKGROUND OF ADVISORY CIRCULAR	1
CHAPTER 2. AIRPORT PAVEMENTS: COMPOSITION AND FUNCTION.....	3
2-1. INTRODUCTION TO AIRPORT PAVEMENTS	3
2-2. CLASSIFICATION OF AIRFIELD PAVEMENTS	3
2-3. RIGID PAVEMENT COMPOSITION AND STRUCTURE	3
FIGURE 2-1. TYPICAL RIGID PAVEMENTS STRUCTURE	3
FIGURE 2-2. TRANSFER OF WHEEL LOAD TO FOUNDATION IN RIGID PAVEMENT	4
FIGURE 2-3. FORMATION OF ICE CRYSTALS IN FROST SUSCEPTIBLE SOIL	4
2-4. FLEXIBLE PAVEMENT COMPOSITION AND STRUCTURE	5
FIGURE 2-4. TYPICAL FLEXIBLE PAVEMENT STRUCTURE	6
FIGURE 2-5. DISTRIBUTION OF LOAD STRESS IN FLEXIBLE PAVEMENT	6
2-5. AIRPORT PAVEMENT OVERLAYS	6
2-6. RECYCLED PAVEMENT STRUCTURES	6
CHAPTER 3. PAVEMENT DISTRESS	7
3-1. GENERAL	7
3-2. TYPES OF PAVEMENT DISTRESS	7
3-3. CONCRETE PAVEMENT DISTRESSES	7
3-4. BITUMINOUS PAVEMENT DISTRESSES	9
3-5. DRAINAGE OF AIRPORT PAVEMENTS	10
CHAPTER 4. GUIDELINES FOR INSPECTION OF PAVEMENTS	12
4-1. INTRODUCTION TO PAVEMENT INSPECTION	12
4-2. INSPECTION PROCEDURES	12
4-3. FRICTION SURVEYS	12
4-4. NONDESTRUCTIVE TESTING	13
4-5. DRAINAGE SURVEYS	13
4-6. PAVEMENT MANAGEMENT SYSTEMS	13
4-7. PAVEMENT PERFORMANCE	14
4-8. PAVEMENT MAINTENANCE MANAGEMENT PROGRAM	14
CHAPTER 5. MATERIALS AND EQUIPMENT.....	15
5-1. GENERAL	15
5-2. COMMON MATERIALS FOR MAINTENANCE AND REPAIR	15
5-3. EQUIPMENT USED FOR PAVEMENT MAINTENANCE	16

CHAPTER 6. METHODS OF REPAIR	19
6-1. GENERAL	19
6-2. REPAIR METHODS FOR PORTLAND CEMENT CONCRETE PAVEMENTS	19
6-3. TEMPORARY PATCHING OF CONCRETE PAVEMENTS	22
6-4. REPAIR METHODS FOR BITUMINOUS CONCRETE PAVEMENTS	23
6-5. ADDITIONAL REPAIR METHODS	25
TABLE 1. MAINTENANCE AND REPAIR OF PAVEMENT SURFACES	26
APPENDIX 1. PAVEMENT MAINTENANCE MANAGEMENT PROGRAM.....	A1-1
APPENDIX 2. BIBLIOGRAPHY.....	A2-1

CHAPTER 1. INTRODUCTION TO AIRPORT PAVEMENT MAINTENANCE.

1-1. PURPOSE OF ADVISORY CIRCULAR. Airport managers and technical/maintenance personnel responsible for the operation and maintenance of airports continually face problems with pavement distress and deterioration. This advisory circular (AC) provides information on the types of pavement distress that occur and recommends corrective actions to undertake during preventive and remedial maintenance. The FAA recommends that airports follow ASTM D 5340, *Standard Test Method for Airport Pavement Condition Index Surveys*, when conducting preventive maintenance inspections. This standard employs the visual distress identification and rating system known as the Pavement Condition Index (PCI).

1-2. BACKGROUND OF ADVISORY CIRCULAR. The aviation community has a large investment in airport pavements. The major objective in the design and construction of these pavements is to provide adequate load-carrying capacity and good ride quality necessary for the safe operation of aircraft under all weather conditions. Immediately after completion, airport pavements begin a gradual deterioration that is attributable to several factors. Traffic loads in excess of those forecast during pavement design can shorten pavement life considerably. Normal distresses in the pavement structure result from surface weathering, fatigue effects, and differential movement in the underlying subbase over a period of years. In addition, faulty construction techniques, substandard materials, or poor workmanship can accelerate the pavement deterioration process. Consequently, airport pavements require continual routine maintenance, rehabilitation, and upgrading.

a. Many pavements were not designed for servicing today's aircraft, which impose loads much greater than those initially considered. Also, the frequency of takeoffs and landings at many airports has increased considerably. Both factors result in accelerated deterioration of the pavement structure. To assure safe operations, airports must make special efforts to upgrade and maintain pavement serviceability.

b. The most effective means of preserving airport runways, taxiways, and apron pavement areas is to implement a comprehensive maintenance program. To be effective, such a program must take a coordinated, budgeted, and systematic approach to both preventive and remedial maintenance. Many airports using this approach have experienced tangible benefits. The comprehensive maintenance program should be updated annually and feature a schedule of inspections and a listing of required equipment and products. The airport should systematically make repairs and take preventive measures, when necessary, on an annual basis. A systematic approach assures continual vigilance and permits the stockpiling of maintenance materials, which assures their availability for routine and emergency maintenance.

Special Airport Improvement Program grant conditions now require many airports to develop and maintain an effective airport pavement maintenance management program. The FAA, however, also encourages airports that are not specifically required to develop maintenance programs to do so as a means of preserving their facilities. An effective pavement maintenance program can take many forms but must include several basic items, which are listed in Appendix 1. These items must be present in maintenance programs required by the FAA. They provide the core for an effective program, which can then be tailored and customized for the specific needs of the facility.

c. Two major elements contribute to pavement deterioration: the gradual effects of weathering and the action of aircraft traffic. Early detection and repair of pavement defects is the most important preventive maintenance procedure. Failure to perform routine maintenance during the early stages of deterioration may eventually result in serious pavement distresses that require extensive repairs that will be costly in terms of dollars and closure time. In all cases of pavement distress manifestations, the causes of the problem should first be determined. If the causes are known, an airport can select a repair method that will not only correct the present damage, but also prevent or retard its progression.

d. The selection of a specific rehabilitation method involves considering both economic and engineering impacts. Airports should prioritize long-term effects rather than focusing on immediate short-term remedies. They should compare the cost of rehabilitation alternatives over some finite period of time (life cycle) and consider the future economic consequences of a repair method as well as the initial rehabilitating maintenance costs.

e. The present or immediate costs of a pavement rehabilitation/maintenance project include actual costs of the repairs and the estimated costs that airport users will incur because of the project. Airport user costs include those experienced by airlines, fixed base operators, concession operators, and others due to traffic delays, re-routings, etc.

Future costs include those incurred later in the life cycle (depending on the life expectancy of the repair) plus the routine maintenance costs expected over the same period. A comparative analysis of these costs for the various alternatives will suggest the most economical rehabilitation scheme.

CHAPTER 2. AIRPORT PAVEMENTS: COMPOSITION AND FUNCTION.

2-1. INTRODUCTION TO AIRPORT PAVEMENTS. Airport pavements are designed, constructed, and maintained to support the critical loads imposed on them and to produce a smooth, skid-resistant, and safe-riding surface. The pavement must be of such quality and thickness to ensure it will not fail under the loads imposed and be durable enough to withstand the abrasive action of traffic, adverse weather conditions, and other deteriorating influences. To ensure the necessary strength of the pavement and to prevent unmanageable distresses from developing, the airport should consider various design, construction, and material-related parameters. This chapter helps airports assess these parameters by providing information on the composition of pavement sections and the functional aspects of flexible and rigid pavement components.

2-2. CLASSIFICATION OF AIRPORT PAVEMENTS. Generally, pavements fall into two classes:

- a. Rigid pavements
- b. Flexible pavements

Combinations of different pavement types and stabilized layers form complex pavements that can be classified as variations of the normal rigid and flexible types. Overlay pavements—existing pavement structures that are overlaid by either of the pavement types—are also common.

2-3. RIGID PAVEMENT COMPOSITION AND STRUCTURE. Rigid pavements normally use Portland cement concrete as the prime structural element. Depending on conditions, engineers may design the pavement slab with plain, lightly reinforced, continuously reinforced, prestressed, or fibrous concrete. The concrete slab usually lies on a compacted granular or treated subbase, which is supported, in turn, by a compacted subgrade. The subbase provides uniform stable support and may provide subsurface drainage. The concrete slab has considerable flexural strength and spreads the applied loads over a large area. Figure 2-1 illustrates a typical rigid pavement structure. Rigid pavements have a high degree of rigidity. Figure 2-2 show how this rigidity and the resulting beam action enable rigid pavements to distribute loads over large areas of the subgrade. Better pavement performance requires that support for the concrete slab be uniform. Rigid pavement strength is most economically built into the concrete slab itself with optimum use of low-cost materials under the slab.

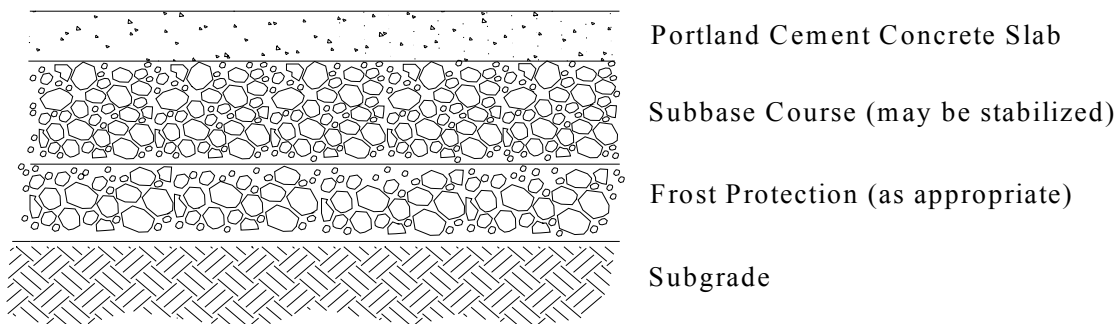


FIGURE 2-1. TYPICAL RIGID PAVEMENT STRUCTURE.

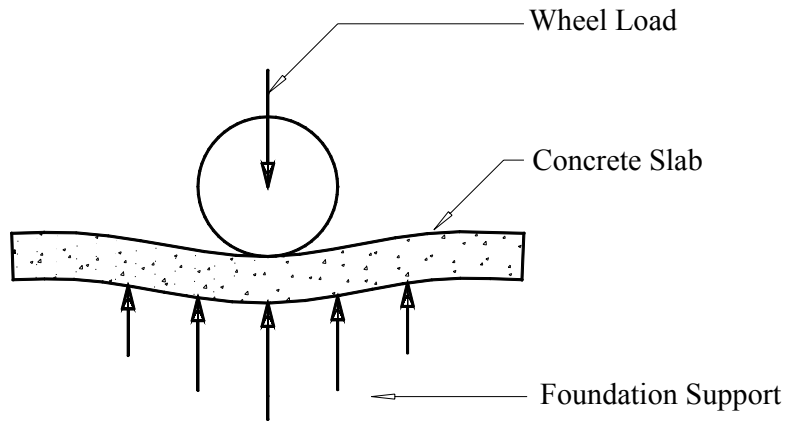


FIGURE 2-2. TRANSFER OF WHEEL LOAD TO FOUNDATION IN RIGID PAVEMENT STRUCTURE.

a. Concrete Slab (Surface Layer). The concrete slab provides structural support to the aircraft, provides a skid-resistant surface, and prevents the infiltration of excess surface water into the subbase.

b. Subbase. The subbase provides uniform stable support for the pavement slab. The subbase also serves to control frost action, provide subsurface drainage, control swelling of subgrade soils, provide a stable construction platform for rigid pavement construction, and prevent mud pumping of fine-grained soils. Rigid pavements generally require a minimum subbase thickness of 4 inches (100 mm).

c. Stabilized Subbase. All new rigid pavements designed to accommodate aircraft weighing 100,000 pounds (45,000 kg) or more must have a stabilized subbase. The structural benefit imparted to a pavement section by a stabilized subbase is reflected in the modulus of subgrade reaction assigned to the foundation.

d. Frost Protection Layer. In areas where freezing temperatures occur and where frost-susceptible soil with a high ground water table exists, engineers must consider frost action when designing pavements. Frost action includes both frost heave and loss of subgrade support during the frost-melt period. Frost heave may cause a portion of the pavement to rise because of the nonuniform formation of ice crystals in a frost-susceptible material (see Figure 2-3). Thawing of the frozen soil and ice crystals may cause pavement damage under loads. The frost protection layer functions as a barrier against frost action and frost penetration into the lower frost-susceptible layers.

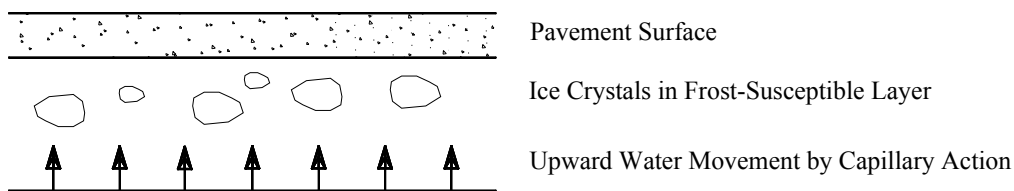


FIGURE 2-3. FORMATION OF ICE CRYSTALS IN FROST-SUSCEPTIBLE SOIL.

e. Subgrade. The subgrade is the compacted soil layer that forms the foundation of the pavement system. Subgrade soils are subjected to lower stresses than the surface and subbase courses. These stresses decrease with depth, and the controlling subgrade stress is usually at the top of the subgrade unless unusual conditions exist. Unusual conditions, such as a layered subgrade or sharply varying water content or densities, may change the locations of the controlling stress. The soils investigation should check for these conditions. The pavement above the subgrade must be capable of reducing stresses imposed on the subgrade to values that are low enough to prevent excessive distortion or displacement of the subgrade soil layer.

Since subgrade soils vary considerably, the interrelationship of texture, density, moisture content, and strength of subgrade material is complex. The ability of a particular soil to resist shear and deformation will vary with its density and moisture content. In this regard, the soil profile of the subgrade requires careful examination. The soil profile is the vertical arrangement of layers of soils, each of which may possess different properties and conditions. Soil conditions are related to the ground water level, presence of water-bearing strata, and the properties of the soil, including soil density, particle size, moisture content, and frost penetration. Since the subgrade soil supports the pavement and the loads imposed on the pavement surface, it is critical to examine soil conditions to determine their effect on grading and paving operations and the need for underdrains.

2-4. FLEXIBLE PAVEMENT COMPOSITION AND STRUCTURE. Flexible pavements support loads through bearing rather than flexural action. They comprise several layers of carefully selected materials designed to gradually distribute loads from the pavement surface to the layers underneath. The design ensures the load transmitted to each successive layer does not exceed the layer's load-bearing capacity. A typical flexible pavement section is shown in Figure 2-4. Figure 2-5 depicts the distribution of the imposed load to the subgrade. The various layers composing a flexible pavement and the functions they perform are described below:

a. Bituminous Surface (Wearing Course). The bituminous surface, or wearing course, is made up of a mixture of various selected aggregates bound together with asphalt cement or other bituminous binders. This surface prevents the penetration of surface water to the base course; provides a smooth, well-bonded surface free from loose particles, which might endanger aircraft or people; resists the stresses caused by aircraft loads; and supplies a skid-resistant surface without causing undue wear on tires.

b. Base Course. The base course serves as the principal structural component of the flexible pavement. It distributes the imposed wheel load to the pavement foundation, the subbase, and/or the subgrade. The base course must have sufficient quality and thickness to prevent failure in the subgrade and/or subbase, withstand the stresses produced in the base itself, resist vertical pressures that tend to produce consolidation and result in distortion of the surface course, and resist volume changes caused by fluctuations in its moisture content. The materials composing the base course are select hard and durable aggregates, which generally fall into two main classes: stabilized and granular. The stabilized bases normally consist of crushed or uncrushed aggregate bound with a stabilizer, such as Portland cement or bitumen. The quality of the base course is a function of its composition, physical properties, and compaction of the material.

c. Subbase. This layer is used in areas where frost action is severe or the subgrade soil is extremely weak. The subbase course functions like the base course. The material requirements for the subbase are not as strict as those for the base course since the subbase is subjected to lower load stresses. The subbase consists of stabilized or properly compacted granular material.

d. Frost Protection Layer. Some flexible pavements require a frost protection layer. This layer functions the same way in either a flexible or a rigid pavement. (See paragraph 2-3d.)

e. Subgrade. The subgrade is the compacted soil layer that forms the foundation of the pavement system. Subgrade soils are subjected to lower stresses than the surface, base, and subbase courses. Since load stresses decrease with depth, the controlling subgrade stress usually lies at the top of the subgrade. The combined thickness of subbase, base, and wearing surface must be great enough to reduce the stresses occurring in the subgrade to values that will not cause excessive distortion or displacement of the subgrade soil layer. (See paragraph 2-3e for factors affecting subgrade behavior.)

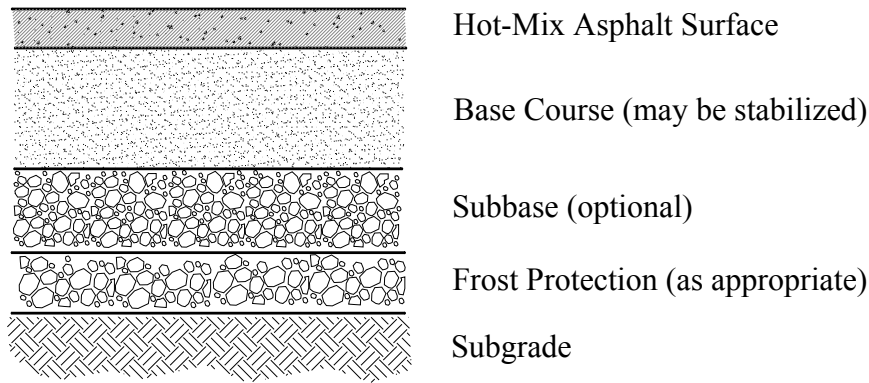


FIGURE 2-4. TYPICAL FLEXIBLE PAVEMENT STRUCTURE.

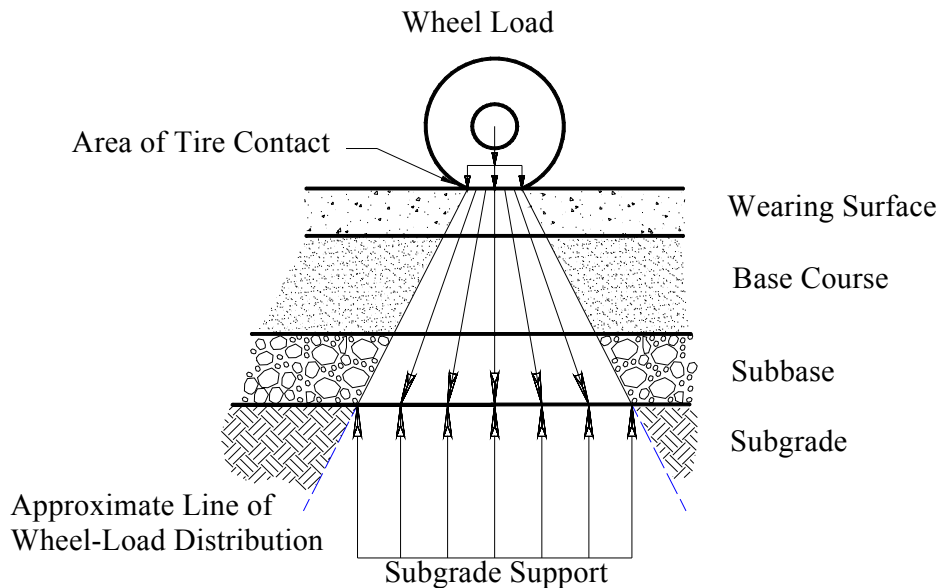


FIGURE 2-5. DISTRIBUTION OF LOAD STRESS IN FLEXIBLE PAVEMENT.

2-5. AIRPORT PAVEMENT OVERLAYS. Airport pavement overlays may correct deteriorating pavement surfaces, improve ride quality or surface drainage, maintain structural integrity, or increase pavement strength. Overlays are used when a pavement is damaged by overloading, requires strengthening to serve heavier aircraft, shows severe ponding because of uneven settling, or has simply served its design life and is worn out. Airport pavement overlays generally consist of either Portland cement concrete or bituminous concrete, and the resulting pavement system may be classified as either rigid or flexible for load-support purposes.

2-6. RECYCLED PAVEMENT STRUCTURES. The pavement elements discussed in paragraphs 2-4 and 2-5 also apply to pavements composed of recycled layers except that in-situ materials are recycled and used in place of importing selected materials. In-situ materials may be crushed, blended, rehandled, and/or treated to produce a controlled pavement layer. Recycled layers may make up the entire pavement structure or be used in combination with existing and/or new pavement layers.

CHAPTER 3. PAVEMENT DISTRESS.

3-1. GENERAL. Various external signs or indicators make the deterioration of a pavement apparent, and often reveal the probable causes of the failure. This chapter provides a detailed discussion and description of the types of pavement distress and relates them to likely causal factors.

3-2. TYPES OF PAVEMENT DISTRESS. The discussions of problems related to pavement distress are generally based on whether the pavement has a concrete or bituminous surface type. However, while different distresses possess their own particular characteristics, the various types generally fall into one of the following broad categories:

- a. Cracking
- b. Distortion
- c. Disintegration
- d. Loss of skid resistance

ASTM D 5340, *Test Method for Airport Pavement Condition Surveys*, provides detailed examples of each distress. The Pavement-Transportation Computer Assisted Structural Engineering (PCASE) software package and the Department of Defense Unified Facilities Guide include similar examples. The PCASE software is available from the U.S. Army Corp of Engineers at <http://www.pcase.com>. The Unified Facilities Guide is available from several sources, including <http://www.ccb.org/ufgs/ufgs.htm> and http://65.204.17.188/report/doc_ufc.html.

3-3. CONCRETE PAVEMENT DISTRESSES.

a. Cracking. Cracks in concrete pavements often result from stresses caused by expansion and contraction or warping of the pavement. Overloading, loss of subgrade support, and insufficient and/or improperly cut joints acting singly or in combination are also possible causes. Several different types of cracking can occur:

(1) Longitudinal, Transverse, and Diagonal Cracks. A combination of repeated loads and shrinkage stresses usually causes this type of distress. It is characterized by cracks that divide the slab into two or three pieces. These types of cracks can indicate poor construction techniques or weak underlying pavement layers.

(2) Corner Breaks. Load repetition, combined with loss of support and curling stresses, usually causes cracks at the slab corner. The lack of support may be caused by pumping or loss of load transfer at the joint. This type of break is characterized by a crack that intersects the joints at a distance less than or equal to one-half of the slab length on both sides, measured from the corner of the slab. A corner crack differs from a corner spall in that the crack extends vertically through the entire slab thickness; a corner spall intersects the joint at an angle.

(3) Durability "D" Cracking. "D" cracking usually appears as a pattern of cracks running in the vicinity of and parallel to a joint or linear crack. It is caused by the concrete's inability to withstand environmental factors such as freeze-thaw cycles because of variable expansive aggregates. This type of cracking may eventually lead to disintegration of the concrete within 1 to 2 feet (30 to 60 cm) of the joint or crack.

(4) Joint Seal Damage. Joint seal damage is any condition that enables soil or rocks to accumulate in the joints or that allows infiltration of water. Accumulation of materials prevents the slabs from expanding and may result in buckling, shattering, or spalling. Water infiltration through joint seal damage can cause pumping or deterioration of the subbase. Typical types of joint seal damage include stripping of joint sealant, extrusion of joint sealant, hardening of the filler (oxidation), loss of bond to the slab edges, and absence of sealant in the joint. Joint seal damage is caused by improper joint width, use of the wrong type of sealant, incorrect application, and/or not properly cleaning the joint before sealing.

(5) Shattered Slab. A shattered slab is defined as a slab where intersecting cracks break up the slab into four or more pieces. This is caused by overloading and/or inadequate foundation support.

b. Disintegration. Disintegration is the breaking up of a pavement into small, loose particles and includes the dislodging of aggregate particles. Improper curing and finishing of the concrete, unsuitable aggregates, and improper mixing of the concrete can cause this distress. Disintegration falls into four categories:

(1) Scaling, Map Cracking, and Cracking. Scaling is the disintegration and loss of the wearing surface. A surface weakened by improper curing or finishing and freeze-thaw cycles can lead to scaling. Map cracking or crazing refers to a network of shallow hairline cracks that extend only through the upper surface of the concrete. Cracking usually results from improper curing and/or finishing of the concrete and may lead to scaling of the surface. Alkali-Silica Reactivity (ASR) is another source of distress associated with map cracking. ASR is caused by an expansive reaction between aggregates containing silica and alkaline pore solutions of the cement paste.

(2) Joint Spalling. Joint spalling is the breakdown of the slab edges within 2 feet (60 cm) of the side of the joint. A joint spall usually does not extend vertically through the slab but intersects the joint at an angle. Joint spalling often results from excessive stresses at the joint or crack caused by infiltration of incompressible materials or weak concrete at the joint (caused by overworking) combined with traffic loads. Joint spalling also results when dowels, which can prevent slab movement, become misaligned either through improper placement or improper slippage preparation.

(3) Corner Spalling. Corner spalling is the raveling or breakdown of the slab within approximately 2 feet (60 cm) of the corner. It differs from a corner break in that the spall usually angles downward to intersect the joint, while a break extends vertically through the slab. The same mechanisms that causes joint spalling often causes corner spalling, but this type of distress may appear sooner because of increased exposure.

(4) Blowups. Blowups usually occur at a transverse crack or joint that is not wide enough to permit expansion of the concrete slabs. Insufficient width may result from infiltration of incompressible materials into the joint space or by gradual closure of the joint caused by expansion of the concrete due to ASR. When expansive pressure cannot be relieved, a localized upward movement of the slab edges (buckling) or shattering will occur in the vicinity of the joint. Blowups normally occur only in thin pavement sections, although blowups can also appear at drainage structures (manholes, inlets, etc.). The frequency and severity of blowups may increase with an asphalt overlay due to the additional heat absorbed by the dark asphalt surface. They generally occur during hot weather because of the additional thermal expansion of the concrete.

c. Distortion. Distortion refers to a change in the pavement surface's original position, and it results from foundation settlement, expansive soils, frost-susceptible soils, or loss of fines through improperly designed subdrains or drainage systems. Two types of distortion generally occur:

(1) Pumping. The deflection of the slab when loaded may cause pumping, which is characterized by the ejection of water and subgrade (or subbase) material through the joints or cracks in a pavement. As the water is ejected, it carries particles of gravel, sand, clay, or silt with it, resulting in a progressive loss of pavement support that can lead to cracking. Evidence of pumping includes surface staining and base or subgrade material on the pavement close to joints or cracks. Pumping near joints indicates poor joint-load transfer, a poor joint seal, and/or the presence of ground water.

(2) Settlement or Faulting. Settlement or faulting is a difference in elevation at a joint or crack caused by upheaval or nonuniform consolidation of the subgrade or subbase material. This condition may result from loss of fines, frost heave, loss of load transfer device (key, dowel, etc.), or swelling soils.

d. Skid Resistance. Skid resistance refers to the ability of a pavement to provide a surface with the desired friction characteristics under all weather conditions. It is a function of the surface texture or the buildup of contaminants.

(1) Polished Aggregates. Some aggregates become polished quickly under traffic. Naturally polished aggregates create skid hazards if used in the pavement without crushing. Crushing the naturally polished aggregates creates rough angular faces which provide good skid resistance.

(2) Contaminants. Rubber deposits building up over a period of time will reduce the surface friction characteristics of a pavement. Oil spills and other contaminants will also reduce the surface friction characteristics.

3-4. BITUMINOUS PAVEMENT DISTRESSES.

a. Cracking. Cracks in bituminous pavements are caused by deflection of the surface over an unstable foundation, shrinkage of the surface, thermal expansion and contraction of the surface, poorly constructed lane joints, or reflection cracking. Five types of cracks commonly occur in these types of pavements:

(1) Longitudinal and Transverse Cracks. Longitudinal and transverse cracks often result from shrinkage or contraction of the bituminous concrete surface. Shrinkage of the surface material is caused by oxidation and age hardening of the asphalt material. Contraction is caused by thermal fluctuations. Poorly constructed lane joints may accelerate the development of longitudinal cracks.

(2) Alligator or Fatigue Cracking. Alligator cracks refer to interconnected cracks that form a series of small blocks resembling alligator skin. They may be caused by fatigue failure of the bituminous surface under repeated loading or by excessive deflection of the asphalt surface over a weakened or under-designed foundation. The weakened support is usually the result of water saturation of the bases or subgrade.

(3) Block Cracking. Shrinkage of the asphalt concrete and daily temperature cycling, which results in daily stress/strain cycling, causes block cracking. These are interconnected cracks that divide the pavement into approximately rectangular pieces. This type of distress usually indicates that the asphalt has hardened significantly. Block cracking generally occurs over a large portion of the pavement area and may sometimes occur only in nontraffic areas.

(4) Slippage Cracks. Slippage cracks appear when braking or turning wheels cause the pavement surface to slide and deform. This usually occurs when there is a low-strength surface mix or poor bond between the surface and the next layer of the pavement structure. These cracks are crescent or half-moon-shaped with the two ends pointing away from the direction of traffic.

(5) Reflection Cracking. Vertical or horizontal movements in the pavement beneath an overlay cause this type of distress. These movements may be due to expansion and contraction caused by temperature and moisture changes or traffic loads. The cracks in asphalt overlays reflect the crack pattern in the underlying pavement. They occur most frequently in asphalt overlays on Portland cement concrete pavements. However, they may also occur on overlays of asphalt pavements wherever cracks in the old pavement have not been properly repaired.

b. Disintegration. Disintegration in a bituminous pavement is caused by insufficient compaction of the surface, insufficient asphalt in the mix, loss of adhesion between the asphalt coating and aggregate particles, or overheating of the mix. The most common type of disintegration in bituminous pavements is raveling. Raveling is the wearing away of the pavement surface caused by the dislodging of aggregate particles and the loss of asphalt binder. As the raveling continues, larger pieces are broken free, and the pavement takes on a rough and jagged appearance.

c. Distortion. Distortion in bituminous pavements is caused by foundation settlement, insufficient compaction of the pavement courses, lack of stability in the bituminous mix, poor bond between the surface and the underlying layer of the pavement structure, and swelling soils or frost action in the subgrade. Four types of distortion commonly occur:

(1) Rutting. A rut is characterized by a surface depression in the wheel path. In many instances, ruts become noticeable only after a rainfall when the wheel paths fill with water. This type of distress is caused by a permanent deformation in any one of the pavement layers or subgrade, resulting from the consolidation or displacement of the materials due to traffic loads.

(2) Corrugation and Shoving. Corrugation results from a form of plastic surface movement typified by ripples across the surface. Shoving is a form of plastic movement resulting in localized bulging of the pavement surface. Corrugation and shoving can be caused by a lack of stability in the mix and a poor bond between material layers.

(3) Depression. Depressions are localized low areas of limited size. In many instances, light depressions become noticeable only after a rain, when ponding creates "birdbath" areas. Depressions may result from traffic

heavier than that for which the pavement was designed, localized settlement of the underlying pavement layers, or poor construction methods.

(4) Swelling. An upward bulge in the pavement's surface characterizes swelling. It may occur sharply over a small area or as a longer gradual wave. Both types of swell may be accompanied by surface cracking. A swell is usually caused by frost action in the subgrade or by swelling soil.

d. Loss of Skid Resistance. Factors that decrease the skid resistance of a pavement surface and can lead to hydroplaning include too much asphalt in the bituminous mix, too heavy a tack coat, poor aggregate subject to wear, and buildup of contaminants. In bituminous pavements, a loss of skid resistance may result from the following:

(1) Bleeding. Bleeding is characterized by a film of bituminous material on the pavement surface that resembles a shiny, glass-like, reflecting surface that usually becomes quite sticky. It is caused by excessive amounts of asphalt cement or tars in the mix and/or low air-void content and occurs when asphalt fills the voids in the mix during hot weather and then expands out onto the surface of the pavement. Bleeding may also result when an excessive tack coat is applied prior to placement of the asphalt surface material. Since the bleeding process is not reversible during cold weather, asphalt or tar will accumulate on the surface. Extensive bleeding may cause a severe reduction in skid resistance.

(2) Polished Aggregate. Aggregate polishing is caused by repeated traffic applications. It occurs when the aggregate extending above the asphalt is either very small, of poor quality, or contains no rough or angular particles to provide good skid resistance.

(3) Fuel Spillage. Continuous fuel spillage on a bituminous surface will soften the asphalt. Areas subject to only minor fuel spillage will usually heal without repair, and only minor damage will result.

(4) Contaminants. Accumulation of rubber on the pavement surface will reduce the skid resistance of a pavement. Buildup of rubber deposits in pavement grooves will reduce the effectiveness of the grooves and increase the likelihood of hydroplaning.

3-5. DRAINAGE OF AIRPORT PAVEMENTS.

a. A proper drainage system is essential to preventive maintenance. Probably no other factor plays such an important role in determining the ability of a pavement to withstand the effects of weather and traffic. The drainage system collects and removes surface water runoff, removes excess underground water, lowers the water table, and protects all slopes from erosion. An inadequate drainage system can cause saturation of the subgrade and subbase, damage to slopes by erosion, and loss of the load-bearing capacity of the paved surfaces. Whenever pavement failure occurs, the airport should investigate the possibility of deficient drainage.

b. The damage mechanism of free water in the pavement system is related to the amount of free water in the boundaries between the structural layers of the pavement system. When water fills the voids and spaces at the boundaries between layers, heavy wheel loads applied to the surface of the pavement produce impacts on the water comparable to a water-hammer type of action. The resulting water pressure causes erosion of the pavement structure and ejection of the material out of the pavement.

c. There are two general classes of drainage systems: surface and subsurface. Classification depends on whether the water is on or below the surface of the ground at the point where it is first intercepted or collected for disposal. Where both types of drainage are required, it is generally good practice for each system to function independently.

(1) Surface Drainage. Surface drainage controls, collects, and disposes of water from rainstorms and melting snow and ice that accumulate on the surface of the pavement and nearby ground. Surface drainage of pavements is achieved by constructing the pavement surface and adjacent ground in a way that allows for adequate runoff. The water may be collected at the edges of the paved surface in ditches, gutters, and catch basins. Surface water should not be allowed to enter a subdrainage system as it often contains soil particles in suspension. As the water percolates through the granular material of the subdrain, these particles cause it to silt up. Inevitably, some water will enter the pavement structure through cracks, open joints, and other surface openings, but this penetration may be kept to a minimum by proper surface maintenance procedures.

(2) Subsurface Drainage. Subsurface drainage is provided for the pavement by a permeable layer of aggregate or permeable stabilized layers—such as cement-treated or asphalt-treated layers under the full width of the traveled way—with longitudinal pipes for collecting the water and outlet pipes for rapid removal of the water from the subsurface drainage system. Subsurface drains may also consist of perforated collection pipes or conduits in a permeable sand or gravel trench encased in geotextiles with outlet pipes. These systems remove excess water from pavement foundations to prevent weakening of the base and subgrade and to reduce damage from frost action. Subsurface drainage trenches placed at the pavement edge also prevent surface runoff moisture from entering the pavement structure from the pavement perimeter.

d. The current version of AC 150/5320-5, *Airport Drainage*, contains additional guidance and technical information.

CHAPTER 4. GUIDELINES FOR INSPECTION OF PAVEMENTS.

4-1. INTRODUCTION TO PAVEMENT INSPECTION. This chapter presents guidelines and procedures for inspection of airport pavements. Airports should prioritize the upkeep and repair of all pavement surfaces in the aircraft operating areas of the airport to ensure continued safe aircraft operations. While deterioration of the pavements from usage and exposure to the environment cannot be completely prevented, a timely and effective maintenance program can minimize this deterioration. Adequate and timely maintenance is the greatest single means of controlling pavement deterioration. Many cases exist where inadequate maintenance characterized by the absence of a vigorously followed inspection program directly attributed to failures of airport pavements and drainage features. It should be noted that maintenance, no matter how effectively carried out, cannot overcome or compensate for a major design or construction inadequacy. However, it can prevent the total and possibly disastrous failure that can result from such deficiencies. The maintenance inspection can reveal at an early stage where a problem exists and thus provide enough warning and time to permit corrective action. Postponement of minor maintenance can develop into a major pavement repair project.

Although there are numerous distress types associated with airfield pavements, a particular concern on airfield pavements is the possibility that pavement distress will generate loose material that may strike aircraft propellers or be ingested into jet engines. This loose material and the resulting damage are commonly labeled as foreign object debris/damage (FOD). FOD can cause considerable damage to an aircraft and increase the cost of maintaining the aircraft in a safe operating condition. More important, FOD can cause undetected damage to an aircraft, making it unsafe to operate. In addition to the pavement inspection procedures noted below, all pavement inspections should address the issue of FOD to minimize its potential hazard. The most recent version of AC 150/5380-5, *Debris Hazards at Civil Airports*, provides guidance on reducing FOD hazards.

4-2. INSPECTION PROCEDURES. Maintenance is an ongoing process and a critical responsibility of airport personnel. Truly effective maintenance programs require a series of scheduled, periodic inspections or surveys, conducted by experienced engineers, technicians, or maintenance personnel. These surveys must be controlled to ensure that each element or feature being inspected is thoroughly checked, potential problem areas are identified, and proper corrective measures are recommended. The maintenance program must provide for adequate followup of the inspection to ensure that the corrective work is expeditiously accomplished and recorded. Although the organization and scope of maintenance activities will vary in complexity and degree from airport to airport, the general types of maintenance required are similar, regardless of airport size or extent of development.

a. Inspection Schedules. The airport is responsible for establishing a schedule for pavement inspections. Inspection schedules should ensure that all areas, particularly those that are not observed daily, are thoroughly checked. All paved areas should be inspected at least twice a year. In temperate climates, inspections should occur once in the spring and once in the fall. Severe storms or other conditions that may adversely affect the pavement may necessitate additional thorough inspections. Airport personnel should also solicit reports from airport users and conduct daily drive-by-type inspections.

b. Record keeping. The airport should prepare and maintain complete records of all inspections and maintenance performed. These records should document the severity level of existing distress types, their locations, their probable causes, remedial actions, and results of follow up inspections and maintenance. In addition, the files should contain information on potential problem areas and preventive or corrective measures identified. Records of materials and equipment used to perform all maintenance and repair work should also be kept on file for future reference. Such records may be used later to identify materials and remedial measures that may reduce maintenance costs and improve pavement serviceability.

4-3. FRICTION SURVEYS. Airports should maintain runway pavements that provide surfaces with good friction characteristics under all weather conditions. Parameters that affect the skid resistance of wet pavement surfaces include the following:

- a. Texture depth
- b. Rubber deposits
- c. Paint marking

d. Pavement abnormalities, such as rutting, raveling, and depression

Visual observations made during a pavement inspection are an inadequate predictor of skid resistance. The current version of AC 150/5320-12, *Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces*, provides guidance on frequency and procedures for conducting friction surveys.

4-4. NONDESTRUCTIVE TESTING. In addition to collecting information from visual inspections of the pavement area and about runway history, airports should consider collecting data from nondestructive testing. Such data are used to evaluate the pavement load-carrying capacity. Loads are applied to the pavement through loading plates or wheels, and the pavement deflection response is recorded. The stiffness or strength of the airport pavement can be related to the magnitude of these deflections. Nondestructive testing involves a large number of readings, and a statistical average is used. Instructions for taking the measurements and evaluating the test results to determine the load-carrying capacity of the pavement structure are contained in the current version of AC 150/5370-11, *Use of Nondestructive Testing Devices in the Evaluation of Airport Pavements*.

4-5. DRAINAGE SURVEYS. The maintenance program should take into account the importance of adequate drainage of surface and ground water because water is directly or partly responsible for many pavement failures and deterioration. Sufficient drainage for collection and disposal of surface runoff and excess ground water is vital to the stability and serviceability of pavement foundations. Trained personnel should conduct periodic and complete inspections of drainage systems and record and correct defective conditions of surface and subsurface drainage systems. Runway and taxiway edge drains and catch basins should be inspected at intervals (i.e., spring, summer, fall, and winter) and monitored following unusually heavy rainfall. The personnel making the inspection should look for distress signals that may indicate impending problems. These distress signals include the following:

- a. Ponding of water
- b. Soil buildup at pavement edge preventing runoff
- c. Eroded ditches and spill basins
- d. Broken or displaced inlet grates or manhole covers
- e. Clogged or silted inlet grates and manhole covers
- f. Blocked subsurface drainage outlets
- g. Broken or deformed pipes
- h. Backfill settlement over pipes
- i. Erosion around inlets
- j. Generally poor shoulder shaping and random erosion
- k. Discoloration of pavement at joints or cracks

4-6. PAVEMENT MANAGEMENT SYSTEMS. Pavement management systems (PMSs) provide airports with one method of establishing an effective maintenance and repair system. A PMS is a systematic and consistent procedure for scheduling maintenance and rehabilitation based on maximizing benefits and minimizing costs. A pavement management system not only evaluates the present condition of a pavement, but also can predict its future condition with a pavement condition indicator. By projecting the rate of deterioration, a PMS can facilitate a life-cycle cost analysis for various alternatives and help determine when to apply the best alternative.

a. The primary component of any PMS is the ability to track a pavement's deterioration and determine the cause of the deterioration. This requires an evaluation process that is objective, systematic, and repeatable. One such process is the Pavement Condition Index (PCI). The PCI is a rating of the surface condition of a pavement and measures functional performance but will also provide some indication of structural performance. Periodic PCI determinations on the same pavement will show the change in performance level over time. The PCI is determined

in accordance with procedures contained in ASTM D 5340, *Standard Test Method for Airport Pavement Condition Index Surveys*.

b. The current version of AC 150/5380-7, *Pavement Management System*, outlines the basic concepts of a PMS.

4-7. PAVEMENT PERFORMANCE. Airports can use the pavement condition survey in conjunction with the PCI to develop pavement performance data. Distress intensity recorded over time helps determine how the pavement is performing. The rate at which the distress intensity increases is a good indicator of the pavement performance.

4-8. PAVEMENT MAINTENANCE MANAGEMENT PROGRAM. Any airport requesting Federal funds for a project to replace or reconstruct a pavement under the airport grant assistance program must have implemented a pavement maintenance program. Appendix 1 contains the minimum requirements for such a program.

CHAPTER 5. MATERIALS AND EQUIPMENT.

5-1. GENERAL. Normal day-to-day pavement maintenance requires only hand tools, but some maintenance necessitates specialized equipment. For example, cleaning out joints in PCC pavements is best accomplished with hand-operated, motor-driven machines especially designed for the task. Specialized sawing equipment may be required to establish the proper joint sealant shape dimension when sealing cracks in asphalt pavement. Equipment to apply nontoxic herbicides may be necessary to prevent weeds from growing until sealant materials can be applied. Expedient plow-type devices also aid in removing old joint material. Joint sealing can be accomplished by hand pouring from kettles with narrow spouts, but some sealing materials require pressure application with specialized equipment.

Most normal maintenance projects, however, require the following:

a. Mechanical Hammers. Mechanical hammers can be used to break concrete slabs for easy removal. These hammers can also drill slabs. When using mechanical hammers, maintenance staff should take precautions to avoid damaging adjacent slabs.

b. Trailer-Type Asphalt Kettles. The use of trailer-type asphalt kettles can expedite patching and spot sealing. Kettles equipped with a powered hand-spray bar are valuable maintenance and repair items.

c. Compaction Equipment. Compaction of asphalt patches and subbase repairs can be accomplished with hand tampers, but small vibrating compactors produce better and more-uniform results. These vibrating compactors are easy to operate, are transportable in small vehicles, work well in confined areas, and do an excellent job.

d. Distributors. A large-scale project such as seal coating an extensive area requires specialized equipment, including pressure distributors for bitumen, aggregate spreaders, and rollers. Generally, contractors or others organized for such large-scale activities should perform this type of work.

e. Work Crew. Two to six people, trained in the various techniques of repairing and familiar with the tools available to them, can perform the routine maintenance required by pavement surfaces. If the work requires more staff, it will probably be a major repair and require methods, materials, and equipment beyond those used for normal maintenance.

5-2. COMMON MATERIALS FOR MAINTENANCE AND REPAIR. The materials listed below are commonly used for maintenance and repair of pavements.

a. Bituminous Concrete. Bituminous concrete is a blend of asphalt cement and well-graded, high-quality aggregates. The materials are mixed in a plant and placed and compacted while hot. Bituminous concrete is used for patching and overlay of airfield pavements.

b. Tack Coat. A tack coat, usually a light application of emulsified asphalt, is applied to an existing pavement to provide a bond with an overlying course, such as a bituminous overlay. A tack coat is also used on the sides of an existing pavement that has been cut vertically before patching. Asphalt emulsions are manufactured in several grades and are selected by the desired setting time.

c. Prime Coat. A prime coat of emulsified or cutback asphalt is applied to a nonbituminous base course for the following purposes:

- (1) To waterproof the surface of the base
- (2) To plug capillary voids
- (3) To promote adhesion between the base and the surface course

d. Fog Seal. A fog seal is a light application of emulsified asphalt used to rejuvenate the surface of a bituminous pavement.

e. Aggregate Seal. Used to seal the surface of weathered pavements, aggregate seals consist of sprayed asphalts that are immediately covered with aggregate and rolled. The FAA does not recommend aggregate seals for airfield pavements because of the potential for propeller and engine damage caused by loose aggregates.

f. Slurry Seal. A slurry seal is a mixture of asphalt emulsion, fine aggregate, mineral filler, and water. The mixture is prepared in slurry form and applied in a film approximately 1/8 inch (3 mm) thick. Slurry seals are used to seal small cracks, correct surface conditions, and improve the skid resistance of pavement surfaces.

g. Coal-Tar Sealer. Coal-tar sealer is a coal-tar-base product designed to coat the surface and protect the pavement against fuel spill damage and the intrusion of air and water. It is cold applied and should be periodically reapplied and maintained.

h. Crack and Joint Sealing Material for Bituminous Pavement. Material for sealing cracks should meet ASTM standards for the type of pavement and service for which the pavement is intended.

(1) ASTM D 3405, *Joint Sealants, Hot-Poured, for Concrete and Asphalt Pavements.*

(2) ASTM D 3581, *Joint Sealants, Hot-Poured, Jet-Fuel Resistant Type, for Portland Cement Concrete and Tar-Concrete Pavements,* is satisfactory for areas subject to fuel spillage.

(3) Some airports have used silicone sealants to seal cracks and joints in bituminous pavements. Proper use of silicone sealants requires that the material modulus be matched to the application.

i. Crack and Joint Sealing Material for Concrete Pavement. Material for sealing joints in Portland cement concrete pavement may be hot- or cold-applied compounds, as long as they meet the following standards:

(1) ASTM D 1854, *Jet Fuel-Resistant Concrete Joint Sealer, Hot-Poured Elastic Type.*

(2) ASTM D 3405, *Joint Sealants, Hot-Poured, for Concrete and Asphalt Pavements.*

(3) ASTM D 3406, *Joint Sealants, Hot-Poured, Elastomeric Type for Portland Cement Concrete Pavements.*

(4) ASTM D 3569, *Joint Sealant, Hot-Poured, Elastomeric, Jet-Fuel Resistant Type for Portland Cement Concrete Pavements.*

(5) Federal Specification SS-S-200, *Sealing Compounds, Two Component, Elastomeric, Polymer Type, Jet-Fuel Resistant, Cold Applied.*

(6) ASTM D 5893, *Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.*

j. Concrete. Concrete is a blend of Portland cement, fine and coarse aggregate, and water, with or without additives. Concrete is used to repair a distressed Portland cement concrete pavement so it may be used at its original designed capacity.

k. Epoxy Grouts and Concretes. There are many types of epoxy resins; the type to be used depends on the intended application. Under normal conditions, mixed resins may be workable up to 1 hour after mixing. Repairs with epoxy materials are costly, so their use should be limited to small areas and their application left to experienced personnel.

5-3. EQUIPMENT USED FOR PAVEMENT MAINTENANCE. There are many different types and models of equipment airports can use for pavement maintenance. Maintenance crews commonly use the equipment listed below for the following types of projects:

a. Pavement Removal.

(1) **Power Saws.** A pavement power saw is usually a one-person-operated, dolly-mounted unit with an abrasive circular blade. This type of saw can cut a straight line through asphalt or concrete pavements and leave vertical sides.

(2) **Cutting Disks.** A cutting disk is a circular, heavy-duty steel plate with a sharpened edge. The disk is usually attached to a motor grader or other piece of equipment capable of pushing the disk through an asphalt pavement. It is limited to approximately 3 inches (8 cm) in cutting depth. Since the cutting disk is much faster than a saw, its use should be considered when larger areas must be removed.

(3) **Jackhammers.** Jackhammers with a chisel head are commonly used for cutting pavement surfaces.

(4) **Pavement Grinders.** A pavement grinder may be a one-person-operated, dolly-mounted unit with an abrasive cylindrical head 4 inches (10 cm) or more wide, or it may be variable-width diamond grinding equipment. Diamond grinding is a common rehabilitation technique used for tasks as varied as paint removal and pavement texturing.

(5) **Cold Milling Machines.** Cold milling machines use a rotating mandrel with cutting bits to remove various depths of pavement material. Bits can be added or removed to vary the cutting width and roughness. Advantages of cold milling include speed of removal, precision of removal, and grade control.

(6) **Hand Tools.** Hand tools can be used to make vertical cuts through pavements and to break up deteriorated pavement. Chisels, sledgehammers, shovels, pry bars, and picks all into this category of equipment.

(7) **Front-end Loaders and Skid-steer Loaders.** Front-end loaders are useful when loading trucks with removed pavement. Skid-steer loaders are small versatile loaders that can be equipped with numerous attachments. Their small size and maneuverability make them ideal for maintenance activities.

(8) **Dump Trucks.** Dump trucks are used to haul removed pavement and repair materials.

b. Maintenance Equipment.

(1) **Asphalt Kettle.** Asphalt kettles are usually small-tractor-mounted units that have the capacity to heat and store 40 to 500 gallons (150 – 2000 liters) of bituminous material. A pump forces the liquid material through spray nozzles located on a hand-held hose. These units are used for priming and tacking on small jobs and for crack or surface sealing of bituminous surfaces.

(2) **Aggregate Spreaders.** Aggregate spreaders can be either truck-mounted or separate units. They are used to evenly place a controlled amount of sand or aggregate on an area.

(3) **Hand Tools.** Rakes, lutes, and other such hand tools are used to move and level material placed in a patch area.

c. Compaction Equipment.

(1) **Vibratory Plate Compactors.** Vibratory plate compactors are hand-operated units used to compact granular base or bituminous plant-mix materials.

(2) **Vibratory and Non Vibratory Steel-Wheel Rollers.** Steel-wheel rollers are used to compact material, including bituminous concrete in patchwork areas. Smaller rollers can be hand operated, while large rollers are self-powered.

(3) **Rubber-Tired Rollers.** Rubber-tired rollers are self-powered and used to compact bituminous concrete.

d. Crack and Joint Sealing Equipment.

(1) **Joint Plow.** A joint plow is used to remove old sealer from joints. This is usually a specially made tool attached to a skid-steer loader.

(2) **Joint Router.** A joint router is used to clear existing cracks or joints to be resealed. A router is usually a self-powered machine operating a rotary cutter or revolving cutting tool. A rotary routing tool with a V-shaped end can be used for cleaning out random cracks. The FAA does not recommend rotary cutting tools for Portland cement concrete pavements.

(3) **Power Brush.** A power-driven wire brush may be used to clean joints after all of the old joint sealer has been removed.

(4) **Air Compressor and Sand Blasting.** Sand blasting may be used for final removal of old joint sealant, and the FAA recommends it as the final cleaning method for concrete surfaces prior to application of new sealant. Joints and cracks should be blown out with clean compressed air immediately before applying new sealer. Air compressors should be equipped with oil and moisture traps to prevent contaminating the cleaned surface.

(5) **Pavement Sweeper.** A pavement sweeper can be used for cleaning the pavement surface and removing excess aggregate. Cleaning operations are necessary in preparation for seal coating and crack filling.

(6) **Heating Kettle.** A heating kettle is a mobile, indirect-fired double boiler used to melt hot-applied joint sealing material. It is equipped with a means to agitate and circulate the sealer to ensure uniform heating and melting of the entire charge in the kettle. Sealants may be applied to joints with a pressure base attached directly to a pump unit on the kettle.

(7) **Pouring Pot.** A pouring pot is hand carried and used to pour hot sealing materials into a previously prepared crack or joint.

(8) **High-pressure Water Sprayer.** A water sprayer can be used to clean out joints prior to resealing and to clean vertical faces of pavement to be patched.

(9) **Hot Air Lance.** A hot air lance enhances adhesion by drying and heating cracks in existing bituminous material while removing debris prior to crack sealing.

e. Removal of Pavement Markings.

(1) **High Pressure Water Jet.** A high-pressure water jet, with proper selection of spray nozzle and pressure, can be highly effective in removal of pavement markings.

(2) **Abrasive Blasting.** Pavement markings can be removed by the impact of edged particles accelerated by pressurized air, although care must be exercised to avoid damage to the pavement surface.

(3) **Solvent Cleaning.** Chemical agents can be employed to remove markings from pavement, but proper attention must be paid to environmental concerns and cleanup.

CHAPTER 6. METHODS OF REPAIR.

6-1. GENERAL. This chapter describes various methods airports can use to correct airfield pavement distress. While these repair methods apply to specific types of distress and pavements, they should all take into account the possibility of foreign object damage (FOD) to aircraft. Untidy repair activities may leave potential FOD at or near the repair sites. Improperly constructed repairs may disintegrate and cause a FOD potential. All maintenance activities must include quality control monitoring to assure that repairs are conducted properly and clean-up activities undertaken to remove this potential. The current version of AC 150/5380-5, *Debris Hazards at Civil Airports*, provides additional guidance to help eliminate debris hazards associated with maintenance activities.

a. Visible evidence of excessive stress levels or environmental distress in pavement systems may include cracks, holes, depressions, and other types of pavement distresses. The formation of distresses in airport pavements may severely affect the structural integrity, ride quality, and safety of airport pavements. To alleviate the effects of distresses and to improve the airport pavement serviceability, airports should adopt an effective and timely maintenance program and adequate repair procedures.

b. In all cases of pavement distress, the first step in rehabilitating a pavement is to determine the causes of distress. Then, the proper procedures for repair—which will not only correct the damage, but also prevent or retard its further occurrence—may be applied. Pavement repairs should be made as quickly as possible after the need for them arises to ensure continued and safe aircraft operations. Airports should perform repairs at early stages of distress, even when the distresses are considered minor. A delay in repairing pavements may allow minor distresses to progress into major failures. While deterioration of pavements due to traffic and adverse weather conditions cannot be completely prevented, maintenance and repair programs can significantly reduce the rate of deterioration and minimize the damage.

c. Weather conditions may limit repair measures undertaken to prevent further pavement damage. For example, rehabilitation by crack filling is more effective in cool and dry weather conditions, whereas pothole patches, seal coats, and other surface treatments require warm, dry weather for best results. This does not mean that resurfacing work cannot be performed under cold and damp conditions or that crack filling cannot be done in warm weather. Rather, these repairs just require much greater care when made during such periods.

d. The minimum depth of repair for Portland cement concrete should be 2 inches (5 cm). Repairs made thinner than 2 inches (5 cm) usually deteriorate quickly on an airfield pavement. (Most distresses needing repair will extend at least 2 inches (5 cm) into the pavement.) Concrete pavement repairs which are thinner than 2 inches (5 cm) may benefit from the use of epoxy materials.

6-2. REPAIR METHODS FOR PORTLAND CEMENT CONCRETE PAVEMENTS.

a. Crack Repair and Sealing. Sealing cracks prevents surface moisture from entering the pavement structure. This type of repair first requires establishing a properly shaped sealant reservoir, which should be done with a saw rather than with router equipment because routers use a mechanical impact to remove material and can cause micro-cracks in the concrete.

(1) Longitudinal, Transverse, and Diagonal Cracks. The procedures for repairing these types of cracks are as follows:

(a) Saw a groove to the width and depth recommended by the sealant manufacturer. The width needs to be sufficient to allow the material to stretch and contract with movement in the pavement. Common hot-pour materials typically require a width equal to the depth. Silicone materials typically require a width twice the dimension of the depth. The FAA does not recommend widths smaller than 3/8 inches (10 mm) because such widths are difficult to fill with sealant material.

(b) Sand blast both sides of the sealant reservoir, and clean it out with compressed air. The groove must be dry and free of dirt, dust, and other material that might prevent bonding of the sealant.

(c) Place a bond breaker at the proper depth to establish the joint sealant reservoir. Bond breakers are necessary to prevent bonding of the sealant material to the bottom of the crack. Improper bonding restricts the expansion and contraction of the sealant material and can cause premature failure. Backer rod is commonly used to

prevent bonding and to establish the proper joint reservoir dimensions. Backer rod is an extruded, chemically inert, closed-cell polyethylene "rope" designed to effectively fill in the gaps in the joint. The backer rod is sized slightly larger than the width of the joint and is simply pushed to the desired depth.

(d) Fill the joint reservoir with sealant, recessing the sealant approximately ¼ inches (6 mm) below the pavement surface. Excess sealant on the pavement surface does not assist in sealing the crack and is prone to tracking and damage from wheels and snow removal equipment.

(2) Corner Cracks. Structural distress requires full-depth repairs. Corner cracks (cracking of the panel between two adjacent joints), cracks more than ¾-inches (19 mm) wide with spalling, cracks more than 1-1/2-inches (38 mm) wide, and/or cracks associated with loss of subgrade support typically signify the presence of structural distress. The procedures for repairing these types of cracks are as follows:

(a) Make full-depth saw cuts at constructed joints. The FAA recommends that full-depth cuts be made at a distance of at least 2 feet (60 cm) beyond the limits of the crack. Make the saw cuts so the repair area is rectangular when the repair is for wide cracks that transect a panel. For corner cracks, cut the repair area square.

(b) Use a jackhammer to remove material within the limits of the sawcuts. When using a tractor-mounted hammer or removing the concrete by lifting, make a second saw cut inside the perimeter cuts to provide expansion. Remove by hand any loose materials that remain. During the repair, try to minimize any disturbance to the subgrade soils or base materials.

(c) Restore subgrade or subbase materials to the base elevation of the panel being repaired.

(d) Use tie-bars consisting of #4 deformed bars (#5 bars for pavements more than 12-inches (30 cm) thick) in the faces of the parent panel. Install by drilling into the face and using an epoxy bonding agent. Use equidistant spacing of the bars, but do not install them more than 24-inches (60 cm) apart. When spacing bars, do not allow their ends to overlap with those of other tie-bars or dowels.

(e) Use dowel bars in the joint that parallels the direction of traffic. On aprons and areas where traffic may be oblique to joints, install dowels in both joint faces. Dowels are installed by drilling and spaced at least one bar spacing away from faces parallel to the dowel bar. Space dowel bar ends at least one bar spacing apart at corners of intersecting joints. Oil exposed dowel bar ends prior to backfilling with concrete.

(f) Install nonabsorbent board within the limits of the joint seal reservoirs along the adjacent concrete panels. When repairing multiple panels, restore the joint seal reservoirs with the nonabsorbent filler board.

(g) Backfill the repair area with concrete, being sure to consolidate the concrete along the limits of repair. Exercise caution when working adjacent to existing concrete faces during consolidation, and watch for segregation of the concrete.

(h) After the concrete cures, remove the filler board by sawing. Reinstall joint seal material.

(3) "D" Cracking. This type of distress usually requires repairing the complete slab since "D" cracking will normally reappear adjacent to the repaired areas. Temporary repairs can be made using the technique noted in paragraph 6-2a(2) or 6-2b(1).

(4) Joint Seal Damage. The sequence of operations for preparing joints for resealing is as follows:

(a) Use a joint plow or diamond saw blade to remove the joint sealing material to the full depth of the reservoir for contraction and construction joints. As a minimum, remove the joint sealant material to a depth sufficient to establish a proper shape factor for the new sealant material.

(b) When changing the material type of the joint seal, the FAA recommends removing old material from the reservoir by re-facing the side walls. Re-facing will result in a change to the reservoir shape factor (width to depth ratio). Consult the manufacturer of the replacement joint seal material about the recommended shape factor. If a saw is used to reface the joint, flush the joint with water immediately after sawing. Remove any remaining debris by sand blasting each face of the joint reservoir.

(c) If the same material will be used to replace the existing joint seal, clean the reservoir with high-pressure water or sand blasting.

(d) Immediately prior to sealing, blow out the joint with clean, oil-free compressed air to remove sand, dirt, and dust.

(e) Install new dry backer rod.

(f) Seal joints with hot or cold compounds. Sealants should be placed as noted in paragraph 6.2a(1).

b. Disintegration. If not impeded in its early stages, disintegration can progress rapidly until the pavement requires complete rebuilding.

(1) Scaling, Map Cracking, and Cracking. This distress is often noticeable with little or no surface deterioration. Severe cases of scaling, map cracking, or crazing can produce considerable FOD, which can damage propellers and jet engines. If the distress is severe and produces FOD, the repair method is to remove the immediate surface and provide a thin bonded overlay. The procedures for repairing these types of distress are as follows:

(a) Make a vertical cut with a concrete saw 2 inches (5 cm) in depth and approximately 2 inches (5 cm) back of the affected area.

(b) Remove all unsound concrete until sound, intact material has been reached. Remove the unsound concrete with air hammers, pneumatic drills, shot blasters, or grinding equipment, and blow out the area with compressed air.

(c) Clean the area to be repaired with high-pressure water. Allow the patch area to dry completely if required by the patch material specification.

(d) Treat the surface with a grout mixture to ensure a good bond between the existing pavement and the new concrete. Apply the grout immediately before placing the patch mixture and spread with a stiff broom or brush to a depth of 1/16 inch (2 mm).

(e) If the repair crosses or abuts a working joint, place a thin strip of wood or metal coated with bond-breaking material in the joint groove, and tamp the new mixture into the old surface. The mix should be air-entrained and designed to produce a no slump concrete, which will require tamping to place in the patch.

(f) After edging the patch, finish it to a texture matching the adjacent area.

(g) After a proper cure period, fill any open joints with joint sealant prior to opening to traffic.

(2) Joint Spalling and Corner Spalling. The procedure for the repair of spalls is as follows:

(a) Make a vertical cut with a concrete saw 2 inches (5 cm) in depth and approximately 2 inches (5 cm) back of the spalled area.

(b) Remove all unsound concrete until sound, intact material has been reached. Break out the unsound concrete with air hammers or pneumatic drills and blow out the area with compressed air.

(c) Clean the area to be repaired with high-pressure water. Allow patch area to dry completely if required by the patch material specification.

(d) Treat the surface with a grout mixture to ensure a good bond between the existing pavement and the new concrete. Apply the grout immediately before placing the patch mixture and spread with a stiff broom or brush to a depth of 1/16 inch (2 mm).

(e) Place a thin strip of wood or metal coated with bond-breaking material in the joint groove and tamp the new mixture into the old surface. The mix should be air-entrained and designed to produce a no slump concrete, which will require tamping to place in the patch.

(f) After edging the patch, finish it to a texture matching the adjacent area.

(g) After a proper cure period, fill the open joint with joint sealant prior to opening to traffic.

(3) Blowups. Blowups may be repaired using the following procedures:

(a) Make a full-depth vertical cut with a concrete saw approximately 6 inches (15 cm) outside of each end of the broken area.

(b) Break out the concrete with pneumatic tools, and remove concrete down to the subbase/subgrade material.

(c) Add subbase material, if necessary, and compact.

(d) In reinforced pavement construction, use joint techniques to tie the new concrete to the old reinforced material. Dowel any replacement joints, and build them to joint specifications.

(e) Dampen the subgrade and the edges of the old grout.

(f) Place concrete on the area to be patched. Ready-mixed concrete may be used if it is satisfactory and can be obtained economically. Consider using a mixture providing high early strength in order to permit the earliest possible use.

(g) Finish the concrete so the surface texture approximates that of the existing pavement.

(h) Immediately after completing finishing operations, properly cure the surface with either a moist cure or a curing compound.

(4) Shattered Slab. A shattered slab requires replacing the full slab. Follow the same procedures used for blowup repairs except remove unstable subgrade materials and replace with select material. Correct poor drainage conditions by installing drains for removal of excess water.

c. Distortion. If not too extensive, some forms of distortion, such as that caused by settlement, can be remedied by raising the slab to the original grade. Slabjacking procedures may be used to correct this type of distress. In slabjacking, a grout is pumped under pressure through holes cored in the pavement into the void under the pavement. This creates an upward pressure on the bottom of the slab in the area around the void. The upward pressure lessens as the distance from the grout hole increases. Thus, it is possible to raise one corner of a slab without raising the entire slab. Because of the special equipment and experience required, slabjacking is usually best performed by specialty contractors.

d. Loss of Skid Resistance. Rehabilitation treatment includes resurfacing, milling, diamond grinding, shot peening, and surface cleaning. Grooving may be considered when a loss of skid resistance is observed. Grooving does not impact the surface texture but does provide a channel for water that becomes trapped between a pavement and the tire to escape. Grooving thus minimizes the potential for hydroplaning during wet conditions.

(1) Polished Aggregate. Since polished aggregate distress normally occurs over an extensive area, consider milling or diamond grinding the entire pavement surface. Concrete or bituminous resurfacing may also be used to correct this condition.

(2) Contaminants. Remove rubber deposits with high-pressure water or biodegradable chemicals.

6-3. TEMPORARY PATCHING OF CONCRETE PAVEMENTS. Broken concrete areas can be patched with bituminous concrete as an interim measure. Full-depth bituminous repairs will interrupt the structural integrity of the rigid pavement and may lead to additional failures. Consequently, such full-depth repairs should be considered

temporary, and corrective long-term repairs should be scheduled. Temporary repair for corner cracks, diagonal cracks, blowups, and spalls can be made using the following procedures:

- a. Make a vertical cut with a concrete saw completely through the slab.
- b. Break out the concrete with pneumatic tools, and remove broken concrete down to the subbase/subgrade material.
- c. Add subbase/subgrade material if required, and compact.
- d. Apply a prime coat to the subbase material.
- e. Apply a tack coat to the sides of the slab.
- f. Place bituminous concrete in layers not exceeding 3 inches (75 mm).
- g. Compact each layer with a vibratory-plate compactor, roller, or mechanical rammers.

For partial-depth repairs, make a vertical cut approximately 3 inches (75 mm) deep, apply tack coat, and place bituminous concrete in one layer. Normal traffic may be permitted on bituminous patches immediately after completion of the patch.

6-4. REPAIR METHODS FOR BITUMINOUS CONCRETE PAVEMENTS.

a. Crack Sealing. Cracking takes many forms. In some cases, simple crack filling may be the proper corrective action. Some cracks, however, require complete removal of the cracked area and the installation of drainage.

(1) Longitudinal, Transverse, Reflection, and Block Cracking. Narrow cracks, less than 1/4 inch (6 mm), are too small to seal effectively. In areas where narrow cracks are present, a seal coat, slurry seal, or fog coat may be applied. Narrow cracks can also be widened by sawing or routing. Wide cracks, greater than 1/4 inch (6 mm), should be sealed using the following procedure:

(a) Clean out the crack with compressed air to remove all loose particles. If necessary, rout to widen the crack prior to utilizing compressed air. Also, address any required weed prevention.

(b) Fill cracks with a prepared crack sealer.

(2) Alligator Cracking. Permanent repairs by patching may be carried out as follows:

(a) Remove the surface and base as deep as necessary to reach a firm foundation. In some cases, a portion of the subgrade may also have to be removed. Use a power saw to make vertical square or rectangular cuts through the pavement.

(b) Replace base material with material equal to that removed, but if the base material has proved problematic, replace it with a more appropriate material. Compact each layer placed.

(c) Apply a tack coat to the vertical faces of the existing pavement.

(d) Place bituminous concrete and compact.

(e) If necessary, saw and seal the joints around the perimeter of the patch area.

(3) Slippage Cracks. One repair method commonly used for slippage cracks involves removing the affected area and patching with plant-mixed asphalt material. Specific steps are given below:

(a) Remove the affected area and at least 1 foot (30 cm) into the surrounding pavement. Make the cut faces straight and vertical. A power pavement saw makes a fast and neat cut.

(b) Clean the surface of the exposed underlying layer with brooms and compressed air.

(c) Apply a light tack coat.

(d) Place sufficient hot plant-mixed asphalt material in the cutout area to make the compacted surface the same grade as that of the surrounding pavement.

(e) Compact the asphalt mixture with steel-wheel or rubber-tire rollers until the surface is the same elevation as the surrounding pavement.

b. Disintegration. If not impeded in its early stages, disintegration can progress rapidly until the pavement requires complete rebuilding. Sealer-rejuvenator products can be applied to retard disintegration. The products help reverse the aging process of the surface asphalt. Deterioration from raveling may also be impeded by applying a light fog seal or a slurry seal. The basic procedures for either surface treatment are as follows:

(1) Sweep the surface free of all dirt and loose aggregate material.

(2) Apply the surface treatment.

(3) Close to traffic until the seal has cured.

c. Distortion. Repair techniques for distortion range from leveling the surface by filling with new material to completely removing of the affected area and replacing with new material. Cold milling can be employed prior to overlaying for many of these distresses.

(1) **Rutting.** The repair procedures are as follows:

(a) Determine the severity of the rutting with a straightedge or stringline. Outline the areas to be corrected on the pavement surface.

(b) Mill or grind down the identified area to provide a vertical face around the edge. The FAA recommends a minimum patch depth of 2 inches (5 cm).

(c) Thoroughly clean the entire area.

(d) Apply a light tack coat of asphalt emulsion to the area to receive asphalt material, including the vertical face of the patch area.

(e) Spread enough dense-graded asphalt concrete in the prepared area to bring it to the original grade when compacted. Deeper patches may require multiply lifts to allow proper compaction of each lift.

(f) Thoroughly compact the asphalt patch material with a roller or vibratory plate compactor.

(2) **Corrugation and Shoving.** The repair procedure for this type of distress is the same as for patch repair of alligator cracking.

(3) **Depressions.** The repair procedures are as follows:

(a) Determine the limits of the depression with a straightedge or stringline. Outline the depression on the pavement surface.

(b) Mill or grind down the area to provide a vertical face around the edge. The FAA recommends a minimum patch depth of 2 inches (5 cm).

(c) Thoroughly clean the entire area to be repaired.

(d) Apply a light tack coat of asphalt emulsion to the area to receive asphalt material, including the vertical face of the patch area.

(e) Spread enough bituminous concrete in the depression to bring it to the original grade when compacted. Deeper patches may require multiply lifts to allow proper compaction of each lift.

(f) If the pavement was not ground down, feather the edges of the patch by careful raking and manipulation of the material. However, in raking, take care to avoid segregation of the coarse and fine particles of the mixture. With additional effort, a more suitable and longer-lasting patch can result by vertically grinding the edges down or sawing and using a light jackhammer to create a vertical edge with no feathering and little raking required.

(g) Thoroughly compact the patch with a roller or vibratory-plate compactor.

d. Swelling. The repair procedure is the same as for patch repair of alligator cracking.

e. Loss of Skid Resistance. Treatment for loss of skid resistance includes removal of excess asphalt, resurfacing, grooving to improve surface drainage, and removing of rubber deposits.

(1) Bleeding. A pavement milling or grinding machine may be used to remove the excess asphalt by milling off 1/8 inch to 1/4 inch (3 to 6 mm) of pavement. Repair procedures using hot sand or aggregate are as follows:

(a) Apply slag screenings, sand, or rock screenings to the affected area. Heat the aggregate to at least 300° F (150° C) and spread at the rate of 10 to 15 pounds per square yard (4 to 9 kg per m²).

(b) Immediately after spreading, roll with a rubber-tired roller.

(c) When the aggregate has cooled, broom off loose particles.

(d) Repeat the process if necessary.

(2) Polished Aggregate. One means of correcting this condition is to cover the surface with an aggregate seal coat. Grooving, milling, or diamond grinding the pavement surface are also useful techniques.

(3) Fuel Spillage. Permanent repairs for areas subjected to continuous fuel spillage consist of removal of the damaged pavement and replacement with Portland cement concrete or bituminous asphalt, and application of a coal-tar emulsion seal coat or other fuel-resistant coating.

(4) Contaminants. Rubber deposits may be removed by use of high-pressure water or biodegradable chemicals.

6-5. ADDITIONAL REPAIR METHODS. The following documents describe repair procedures in greater detail:

MS-16, Asphalt in Pavement Maintenance. Asphalt Institute

Unified Facilities Criteria (UFC) O&M: Asphalt Maintenance and Repair. USCOE, NFEC, AFCESA

Unified Facilities Criteria (UFC) O&M: Concrete Repair. USCOE, NFEC, AFCESA

Unified Facilities Criteria (UFC) O&M: Concrete Crack and Partial-Depth Spall Repair. USCOE, NFEC, AFCESA

The Unified Facilities Criteria manuals can be accessed at <http://www.ccb.org/ufgs/ufgs.htm>, <http://www.hnd.usace.army.mil/techinfo/index.htm>, <http://criteria.navfac.navy.mil/criteria>, or at http://65.204.17.188/report/doc_ufc.html. Table 1 summarizes maintenance and repair procedures for rigid and flexible pavements.

TABLE 1. MAINTENANCE AND REPAIR OF PAVEMENT SURFACES.

PROBLEM	PROBABLE CAUSE	REPAIR
Crack and joint sealer missing or not bonded to slabs	Faces of joints (cracks) not clean when filled; incorrect application temperature of sealer; wrong kind of seal material; improper joint width.	Remove old material sealer if extensive areas affected; sandblast joints and cracks; reseal properly.
Random cracking	Uncontrolled shrinkage (improper joint spacing); overstressed slabs; slab support lost; subgrade settlement; bitumen too hard or overheated in mix.	Seal newly formed cracks; replace subbase to establish support; if pavement being overloaded, probably will require overlay.
Surface scaling or breakup	Rigid Pavement - Overworked finishing operation; inadequate curing. Flexible Pavement - Overheated binder; poor aggregate gradation; insufficient binder; incorrect binder or aggregate; fuel spillage, stripping.	Rigid Pavement - Remove and replace panel; resurface with thin bonded concrete; resurface area with a bituminous concrete. Flexible Pavement - Apply seal coat; overlay.
Joint (1) faulting or (2) spalling	(1) Variable support for un-bonded slabs; loss of load-transfer capability. (2) Incompressible matter in joint spaces; excessive joint finishing.	(1) Remove problem slab; replace slab (dowel to existing pavement). (2) Clean joint; refill with bituminous-sand mix; reseal.
Pumping	Saturated pavement foundation; lack of subbase.	Prevent entrance of water (correct the drainage problem); pump slurry under slabs to reseal; replace slabs and slab foundation; install drainage.
Surface irregularities (rutting, washboarding, birdbaths, undulations)	Rigid Pavement - Poor placing control; broken slabs; poor finishing. Flexible Pavement - Non-uniform settlement from inadequate compaction of pavement components or fill; unstable mix (poor aggregate gradation, too rich, etc.); poor laying control.	Rigid Pavement - Patch local areas, or overlay if widespread. Flexible Pavement - Patch local areas; apply leveling course; roto-mill.
Bleeding of bituminous binder	Too much binder in mix (overly rich mix).	Scrape off excess material; blot with sand. NOTE: Bleeding is usually an indication that other surface deformities (rutting, washboarding, etc.) will occur.
Potholes	Water entering pavement structures; segregation in base course material.	Remove and replace base (and subbase if required); replace surface and seal.
Oxidation of bituminous binder	Lack of timely seal coat; binder overheated in mixing; wrong grade of asphalt for climate.	Apply seal coat; heater planer; resurface.
Map cracking, crazing, alligator cracking	Rigid Pavement - Excessive surface finishing; Alkali-Aggregate Reactivity. Flexible Pavement - Overload; oxidized binder; underdesigned surface course (too thin).	Rigid Pavement - If surface deforms or breaks, resurface, grind. Flexible Pavement - Overlay; apply seal coat.
Popouts at joints	Dowel misaligned.	Fill popout hole with bituminous concrete or bituminous sand mix (if recurring, may require replacement of slabs).
Slab blowup	Incompressible material in joints preventing slab from expanding; Alkali-Aggregate Reactivity.	Replace slab in blowup area; clean and reseal joints.
Slipperiness	Rigid Pavement - Improper finish (too smooth); improper type of curing membrane; excessive curing membrane; polished aggregate, rubber deposits. Flexible Pavement - Overly rich mix; poorly designed mix; polished aggregate; improperly applied seal coat; wrong kind of seal coat; rubber deposits.	Rigid Pavement - If finish too smooth, resurfacing required to provide texture; wire broom to remove curing membrane; grooving; remove rubber. Flexible Pavement - Apply textured seal coat; grooving; remove rubber.

APPENDIX 1. PAVEMENT MAINTENANCE MANAGEMENT PROGRAM.

An effective pavement maintenance management program specifies the procedures to be followed to assure that proper preventative and remedial pavement maintenance is performed. An airport sponsor may use any format it deems appropriate, but the program must, as a minimum, include the following:

1. Pavement Inventory. The following must be depicted in an appropriate form and level of detail:

- a. Location of all runways, taxiways, and aprons
- b. Dimensions
- c. Type of pavement
- d. Year of construction or most recent major rehabilitation
- e. Whether Federal financial assistance was used to construct, reconstruct, or repair the pavement.

2. Inspection Schedule.

a. Detailed Inspection. Trained personnel must perform a detailed inspection of airfield pavements at least once a year. If a history of recorded pavement deterioration in the form of a Pavement Condition Index (PCI) survey as set forth in ASTM D5340, *Standard Test Method for Airport Pavement Condition Index Surveys*, is available, the frequency of inspections may be extended to 3 years.

b. Drive-By Inspection. A drive-by inspection must occur a minimum of once per month to detect unexpected changes in the pavement condition.

3. Record Keeping. The airport must record and keep on file for a minimum of 5 years complete information about all detailed inspections and maintenance performed. The types of distress, their locations, and remedial action, scheduled or performed, must be documented. The minimum information to be recorded is listed below:

- a. Inspection date
- b. Location
- c. Distress types
- d. Maintenance scheduled or performed

For drive-by inspections, records must include the date of inspection and any maintenance performed.

4. Information Retrieval. An airport sponsor may use any form of record keeping it deems appropriate, so long as the information and records produced by the pavement survey can be retrieved as necessary for any reports required by the FAA.

5. Program Funding. The program should identify funding and other resources available to provide remedial and preventive maintenance activities.

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STATE OF CONNECTICUT

PROCUREMENT DIVISION

BID NO.: 11PSX0326

Contract Specialist
Janet DelGreco Olson

(860) 713-5079
Telephone Number

PRICE SCHEDULE
for Bid #
11PSX0326

DELIVERY:

TERMS: CASH DISCOUNT:
% Days

Page 1 of 3

BIDDER NAME:

**DOT ID # _____ THIS INFORMATION IS MANDATORY FOR VEHICLE-RELATED SERVICES OVER 18,000GVWR.
FAILURE OF PROPOSER TO INDICATE THIS NUMBER MAY RESULT IN REJECTION OF THE BID.**

PRICE SCHEDULE #1

REPAIR OF JOINT SEAL DAMAGE IN PORTLAND CEMENT CONCRETE AND BITUMINOUS/PORTLAND ABUTMENTS.
1 INCH DEEP AND 3/4 INCH WIDE

COMPLETE-IN-PLACE: PRICE PER LINEAR FOOT TO INCLUDE EQUIPMENT, LABOR AND MATERIALS.

<u>AIRPORTS</u>		<u>PRICE PER LINEAR FOOT</u>			<u>ADDITIONAL PER UNIT PRICE</u>		
		1 TO 1,500 LF.	1,501 TO 5,000 LF.	OVER 5,001 LF.	*NIGHT HOURS	*SATURDAY	*SUNDAY
Bradley	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Brainard	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Groton	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Oxford	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____

*(for night, Saturday and Sunday hours, show adjustment only, not compound price)

KEY: A - For Portland concrete and Bituminous/Portland abutments using ASTM D 3405 Material.
B - For Portland concrete and Bituminous/Portland abutments using ASTM D 3581 Jet Fuel Resistant Material.

Number Of Operational Units Available To Perform Service: _____
(a unit consists of equipment, tools and labor).

Prior to the issuance of a purchase order, the Airport Manager or a designated representative shall confer and agree with Contractor as to the quantity and location of the work to be performed.

(NOTE: All airports are shown for use of Political Subdivision Clause, and if Political Subdivisions use contract, prices for closest airport will prevail).

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	%	Days

Page 2 of 3

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FAILURE OF PROPOSER TO INDICATE THIS NUMBER MAY RESULT IN REJECTION OF THE BID.**

PRICE SCHEDULE # 2

ROUTING, AND SEALING OF JOINTS AND CRACKS IN AIRPORT PAVEMENTS

COMPLETE-IN-PLACE: PRICE PER LINEAR FOOT TO INCLUDE EQUIPMENT, LABOR AND MATERIALS.

	<u>AIRPORTS</u>	<u>PRICE PER LINEAR FOOT</u>			<u>ADDITIONAL PER UNIT PRICE</u>		
		<u>1 TO 1,500 LF.</u>	<u>1,501 TO 5,000 LF.</u>	<u>OVER 5,001 LF.</u>	<u>*NIGHT HOURS</u>	<u>*SATURDAY</u>	<u>*SUNDAY</u>
Bradley	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Brainard	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Groton	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Oxford	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____

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DELIVERY:	
TERMS:	CASH DISCOUNT: <div style="text-align: right;">% Days</div>
BIDDER NAME:	

Page 3 OF 3

PRICE SCHEDULE # 3

**DOT ID # ----- THIS INFORMATION IS MANDATORY FOR VEHICLE-RELATED SERVICES OVER 18,000GVWR.
FAILURE OF PROPOSER TO INDICATE THIS NUMBER MAY RESULT IN REJECTION OF THE BID.**

CLEANING AND SEALING OF JOINTS AND CRACKS IN AIRPORT PAVEMENTS. COMPLETE-IN-PLACE: PRICE PER POUND TO INCLUDE EQUIPMENT, LABOR AND MATERIALS.

	<u>AIRPORTS</u>	<u>PRICE PER POUND</u>					<u>ADDITIONAL PER UNIT PRICE</u>		
		<u>1 TO 1,500 LBS.</u>	<u>1,501 TO 5,000 LBS</u>	<u>5,001 TO 10,000 LBS.</u>	<u>10,001 TO 15,000 LBS.</u>	<u>OVER 15,001 LBS.</u>	<u>*NIGHT HOURS</u>	<u>*SATURDAY</u>	<u>*SUNDAY</u>
Bradley	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	
Brainard	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	
Groton	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	
Oxford	A	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	
	B	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	

*(for night, Saturday and Sunday hours, show adjustment only, not compound price)

KEY: A - For Portland concrete and Bituminous/Portland abutments using ASTM D 3405 Material.

B - For Portland concrete and Bituminous/Portland abutments using ASTM D 3581 Jet Fuel Resistant Material.

Number Of Operational Units Available To Perform Service: _____
(a unit consists of equipment, tools and labor).

Prior to the issuance of a purchase order, the Airport Manager or a designated representative shall confer and agree with Contractor as to the quantity and location of the work to be performed.

(NOTE: All airports are shown for use of Political Subdivision Clause, and if Political Subdivisions use contract, prices for closest airport will prevail).



Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations

This notice is provided under the authority of Connecticut General Statutes §9-612(G)(2), as amended by P.A. 10-1, and is for the purpose of informing state contractors and prospective state contractors of the following law (italicized words are defined on the reverse side of this page).

CAMPAIGN CONTRIBUTION AND SOLICITATION LIMITATIONS

No *state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor*, with regard to a *state contract* or *state contract solicitation* with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee (which includes town committees).

In addition, no holder or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of State senator or State representative, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

On and after January 1, 2011, no state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor, with regard to a state contract or state contract solicitation with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall **knowingly solicit** contributions from the state contractor's or prospective state contractor's employees or from a *subcontractor* or *principals of the subcontractor* on behalf of (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

DUTY TO INFORM

State contractors and prospective state contractors are required to inform their principals of the above prohibitions, as applicable, and the possible penalties and other consequences of any violation thereof.

PENALTIES FOR VIOLATIONS

Contributions of solicitations of contributions made in violation of the above prohibitions may result in the following civil and criminal penalties:

Civil Penalties – Up to \$2,000 or twice the amount of the prohibited contribution, whichever is greater, against a principal or a contractor. Any state contractor or prospective state contractor which fails to make reasonable efforts to comply with the provisions requiring notice to its principals of these prohibitions and possible consequences of their violations may also be subject to civil penalties of up to \$2,000 or twice the amount of the prohibited contributions made by their principals.

Criminal penalties – Any knowing and willful violation of the prohibition is a Class D felony, which may subject the violator to imprisonment of not more than 5 years, or not more than \$5,000 in fines, or both.

CONTRACT CONSEQUENCES

In the case of a state contractor, contributions made or solicited in violation of the above prohibitions may result in the contract being voided.

In the case of a prospective state contractor, contributions made or solicited in violation of the above prohibitions shall result in the contract described in the state contract solicitation not being awarded to the prospective state contractor, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

The State shall not award any other state contract to anyone found in violation of the above prohibitions for a period of one year after the election for which such contribution is made or solicited, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

Additional information may be found on the website of the State Elections Enforcement Commission, www.ct.gov/seec. Click on the link to "Lobbyist/Contractor Limitations."



DEFINITIONS

“State contractor” means a person, business entity or nonprofit organization that enters into a state contract. Such person, business entity or nonprofit organization shall be deemed to be a state contractor until December thirty-first of the year in which such contract terminates. “State contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Prospective state contractor” means a person, business entity or nonprofit organization that (i) submits a response to a state contract solicitation by the state, a state agency or a quasi-public agency, or a proposal in response to a request for proposals by the state, a state agency or a quasi-public agency, until the contract has been entered into, or (ii) holds a valid prequalification certificate issued by the Commissioner of Administrative Services under section 4a-100. “Prospective state contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Principal of a state contractor or prospective state contractor” means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a state contractor or prospective state contractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a state contractor or prospective state contractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a state contractor or prospective state contractor, which is not a business entity, or if a state contractor or prospective state contractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any state contractor or prospective state contractor who has *managerial or discretionary responsibilities with respect to a state contract*, (v) the spouse or a *dependent child* who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the state contractor or prospective state contractor.

“State contract” means an agreement or contract with the state or any state agency or any quasi-public agency, let through a procurement process or otherwise, having a value of fifty thousand dollars or more, or a combination or series of such agreements or contracts having a value of one hundred thousand dollars or more in a calendar year, for (i) the rendition of services, (ii) the furnishing of any goods, material, supplies, equipment or any items of any kind, (iii) the construction, alteration or repair of any public building or public work, (iv) the acquisition, sale or lease of any land or building, (v) a licensing arrangement, or (vi) a grant, loan or loan guarantee. “State contract” does not include any agreement or contract with the state, any state agency or any quasi-public agency that is exclusively federally funded, an education loan, a loan to an individual for other than commercial purposes or any agreement or contract between the state or any state agency and the United States Department of the Navy or the United States Department of Defense.

“State contract solicitation” means a request by a state agency or quasi-public agency, in whatever form issued, including, but not limited to, an invitation to bid, request for proposals, request for information or request for quotes, inviting bids, quotes or other types of submittals, through a competitive procurement process or another process authorized by law waiving competitive procurement.

“Managerial or discretionary responsibilities with respect to a state contract” means having direct, extensive and substantive responsibilities with respect to the negotiation of the state contract and not peripheral, clerical or ministerial responsibilities.

“Dependent child” means a child residing in an individual’s household who may legally be claimed as a dependent on the federal income tax of such individual.

“Solicit” means (A) requesting that a contribution be made, (B) participating in any fund-raising activities for a candidate committee, exploratory committee, political committee or party committee, including, but not limited to, forwarding tickets to potential contributors, receiving contributions for transmission to any such committee or bundling contributions, (C) serving as chairperson, treasurer or deputy treasurer of any such committee, or (D) establishing a political committee for the sole purpose of soliciting or receiving contributions for any committee. Solicit does not include: (i) making a contribution that is otherwise permitted by Chapter 155 of the Connecticut General Statutes; (ii) informing any person of a position taken by a candidate for public office or a public official, (iii) notifying the person of any activities of, or contact information for, any candidate for public office; or (iv) serving as a member in any party committee or as an officer of such committee that is not otherwise prohibited in this section.

“Subcontractor” means any person, business entity or nonprofit organization that contracts to perform part or all of the obligations of a state contractor’s state contract. Such person, business entity or nonprofit organization shall be deemed to be a subcontractor until December thirty first of the year in which the subcontract terminates. “Subcontractor” does not include (i) a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or (ii) an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Principal of a subcontractor” means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a subcontractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a subcontractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a subcontractor, which is not a business entity, or if a subcontractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any subcontractor who has managerial or discretionary responsibilities with respect to a subcontract with a state contractor, (v) the spouse or a dependent child who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the subcontractor.