T. BROOKS &
ASSOCIATES

LIMITED ROOF SYSTEM EVALUATION

COMMERCIAL PROPERTY
887 FULTON MALL
FRESNO, CALIFORNIA

June 11, 2013

PREPARED FOR:

Mr. Enrique Mendez, Project Coordinator
Successor Agency to the
Redevelopment Agency of the City of Fresno
2344 Tulare Street, Suite 200
Fresno, California 93721

PREPARED BY:

T. BROOKS & ASSOCIATES, INC.
613 Harvard Avenue, Suite 201
Clovis, California 93612
(559) 298-9135
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Formed 1993

Troy F. Brooks, RRC, CAC, CIEC
Registered Roof Consultant
Certified Asbestos Consultant, #92-0186
DPH Inspector/Assessor for Lead, #1398
Certified Indoor Environmental Consultant

Roof Consulting / Asbestos, Lead & IAQ Consulting

TABLE OF CONTENTS

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June 11, 2013

Mr Enrique Mendez
Project Coordinator
Successor Agency to the Redevelopment Agency of the City of Fresno
2344 Tulare Street, Suite 200
Fresno, CA 93721

Re: Limited Roof System Evaluation
Commercial Property
887 Fulton Mall
Fresno, California

Dear Mr Mendez;

At your request, I conducted a limited, on-site investigation involving the commercial building at the above referenced location. I was requested to provide a general evaluation of the existing low-slope roofing system and to prepare a report which includes our findings and recommendations.

Our evaluation included an assessment of the following elements:

1. Current roof system type
2. Current condition of roof system
3. Roof deck composition.
4. Adequacy of roof drainage
5. Overall condition of roof flashings
6. Evaluation as to asbestos content of current roofing system
7. Recommendations

I. GENERAL INFORMATION

Building Structure:	Commercial Building
Construction Date:	Unknown
Roof Construction:	Plywood Roof Deck
Approx. Roof Slope:	Approximately 3/8" per foot
Type of Roof System:	Built-up Roofing System w/ mineral surface cap sheet
Drainage System:	Interior Roof Drains w/ thru-wall overflow drains
Mechanical Eqpt. Supports.	Metal frames
Roof Area:	Approximately 10,731 square feet

II. SCOPE OF INVESTIGATION

My investigation was limited to visual observation of existing roofing components with the exception of a representative core sample collected from the existing roof in order to determine the number of roofs on the structure, roof system composition, means of attachment, and possible asbestos content.

A collection of digital photographs was taken in conjunction with my investigation. Certain of these are enclosed to confirm some of my observations.

III. ROOF CONSTRUCTION

The structure includes a total of two (2) asphaltic built-up roofs with a layer of rigid insulation.

Drainage is provided by four (4) cast-iron drains located at each corner of the building. The structure includes thru-wall overflow drains as required by current building code. Large wood-frame crickets are located on each side of the roof and extend the length of the building between drains. Flow of water along the crickets is impeded by roof related elements resulting in ponding water

IV. DESCRIPTION OF FLASHING ELEMENTS

Sheet metal flashings represent a critical element of the roof system and are the most common source of leaks in low slope roofing. The flashings installed as part of the current built-up roofing system were observed to be in poor condition.

V. OBSERVED CONDITIONS

During the course of my limited field investigation, the following defective conditions were observed which may impact current and future performance of the roofing system:

1 The current built-up roof system was found to be in poor condition.
2. Drainage was observed to be inadequate due to obstruction of the drainage plane by roof related elements.
3. The current HVAC supports appear to be adequate.
4. Widespread repairs were observed in the field of the roofs.
5. Evidence of wide-spread leakage was observed at interior portions of the building.
6. Roof-mounted electrical conduits are not properly supported above the roof per industry standards. Current condition may result in an electrical outage.
7 Sealant on joints of sheet metal cap flashings on top of parapet walls has failed. Existing joint type is unreliable and represents an ongoing maintenance item.
8. Elongated splits are present throughout the roof area, certain of which have been repaired. Many of these splits are currently not in watertight condition.
9. Certain flashing elements have not been properly incorporated into the roofing system.

VI. ASBESTOS CONTENT

1 Based on the age of the subject structure, a representative core sample was collected from the field of the low-slope roofing system and submitted to an independent, accredited laboratory for analysis as to asbestos content.

2 Based on the analysis, certain layers of the roofing system were found to contain "Chrysotile" asbestos in amounts ranging from 30-40%
3. The roof is classified as "Asbestos-Containing Material" under EPA and OSHA regulations. Workers engaged in work involving disturbance of the roofing system would fall under Cal/OSHA requirements.
4 Asphaltic roofing materials containing asbestos are classified as "non-friable" unless they are degraded to the point of being "friable" or are rendered friable by forces acting upon them. Non-friable ACM may be disposed of as non-hazardous in California.
5. Removal of asbestos-containing roofing material must be performed by a Contractor that is currently DOSH registered, has a State of California Contractors License with an ASB attachment, and has a C-39 Contractors license.

VII. REROOF REQUIREMENTS

According to the City of Fresno, the following is a summary of their requirements to obtain a permit for a reroof of the subject commercial property·

1 The presence of two (2) roof systems on the subject structure would disallow installation of a third roof under current building code and City of Fresno requirements.
2 Replacement of the current asphaltic roofing system will require removal of all existing roofing and related insulation down to the plywood substrate.
3. State of California Title 24 requires that any new roofing system installed on any building under the requirement provide a minimum of R-14 insulation value and that the roof system be Energy Star® compliant in terms of reflectivity/emissivity

VIII. SUMMARY

The current roof system on the subject commercial structure was observed to be in poor condition. The roof includes a variety of defects which threaten its current and long-term performance. It is critical that these elements be corrected as part of any proposed reroof design.

The current roof is deficient in terms of drainage and includes a variety of other elements which should be corrected as part of any future reroof project.

It is my opinion, based on my field observations, that the current roofing system has outlived its useful life and that further repairs will not be effective in providing a long-term, watertight condition.

IX. RECOMMENDATIONS

Based on its current condition, I recommend that the current roofing system be replaced with a new roof which complies with current code requirements.

If the roof will not be replaced during the upcoming reroof season, it should be repaired by a licensed roofing contractor in order to extend its useful life until such a time that it is replaced. I do not believe that completion of repairs will restore the long-term, watertight condition of the roofing system based on its current condition.

Redesign drainage system to provide proper drainage

Modify parapet coping joints to standing seam or drive joints to provide long-term, watertight condition and eliminate maintenance required by current joint configuration.

X. RECOMMENDED ROOF REPLACEMENT OPTIONS & COST ESTIMATES

Option 1: Single-Ply Roofing System

Scope of work: Installation of a single-ply roofing system. System would require insulation to provide code required fire rating.

Advantages:

1 System meets State of California Title 24 requirements in terms of reflectivity/emissivity
2. Can meet fire rating requirements when installed with approved insulation.
3 15 or 20-year manufacturer warranties are available.
4 Can be installed without use of hot asphalt or chemical compounds during application resulting in strong odors and potential hazards during construction

Disadvantages:

1 More susceptible to mechanical damage due to foot traffic associated with equipment maintenance or vandalism than traditional roofing systems.
2. Surface is slippery when wet or icy
3 Completion of repairs requires specialized materials and training.

Option 2: Sprayed-in-Place Polyurethane Foam Roof System

Scope of work: Installation of 1-1/2" spray-in-place polyurethane foam and coating system with granule finish.

Advantages:

1 System meets State of California Title 24 requirements
2. Does not utilize hot asphalt or chemicals during application resulting in strong odors and potential hazards during construction.
3. Typically includes a ten (10) year leak-proof warranty (at no additional cost).
4. Decreases energy use by providing insulation R-value of approximately 6.5 · 7 0 per inch of thickness
5 Foam can be applied in varying thickness to fill low areas and improve drainage.
6. Quicker installation than traditional roofing systems
7 System is sustainable if recoated (Recoat approximately 12 years after initial application; cost is 25-30% of original installation.
8. After being recoated, contractor will provide a new ten (10) year warranty
9 Repairs can easily be made using caulking

Disadvantages:

1 More susceptible to mechanical damage due to foot traffic associated with equipment maintenance than traditional roofing systems.
2. Quality of work is completely dependent upon applicator skill.

3. Application limitations: Requires dry weather and low humidity conditions for proper application
4. Potential for foam overspray onto adjacent areas, buildings, vehicles during installation
5 Acrylic coatings degrade under prolonged presence of ponding water, necessitating that ponding areas be corrected.

XI. LIMITATIONS

A. The scope of this report is limited only to the existing roof system and related flashing elements and did not include an evaluation of supporting structural elements. Should an evaluation of structural elements be warranted, a licensed structural engineer should be consulted.

B. The information contained in this report is based on the results of our limited site investigation at the subject site location. Destructive test methods were not utilized as part of our investigation with the exception of a core sample from the roof

C Certain opinions and recommendations expressed in this report are based in part on our knowledge of and experience with accepted roofing industry practices, and do not reflect other possible adverse conditions a more extensive examination would reveal.

D. This report has been prepared for the confidential and exclusive use of our client This report may not be sold, transferred, or assigned to any other party

XII. PROFESSIONAL SERVICES

Our firm provides a full range of roof and environmental consulting services, including reroof design, environmental design, project management, air monitoring and other related services which may be of interest to the Client. We would be pleased to provide additional information upon request.

Please don't hesitate to contact me if I can answer any questions or be of further assistance.

Respectfully Submitted,
T Brooks & Associates, Inc.

Troy F. Brooks, RRC, CAC, CIEC
R.C.I. Registered Roof Consultant
Certified Asbestos Consultant, No. 92-0186
Certified Indoor Environmental Consultant
CDPH Inspector/Assessor for Lead

Appendix A

Laboratory Results for Asbestos

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0127324

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	T BROOKS ASSOCIATES, INC.	Job# / P.O #:	13-6755
Address:	613 HARVARD AVE, STE 201	Date Received:	06/05/2013
	CLOVIS CA 93612	Date Analyzed:	06/06/2013
Collected:	05/28/2013	Date Reported:	06/06/2013
Project Name:	COMMERCIAL BLDG-987 FULTON MALL	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	TROY BROOKS
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0127324-001 R-01	LOW-SLOPE ROOF	LAYER 1 Roof Coating, White	No	None Detected		Carbonates Quartz Binder/Filler	100%
		LAYER 2 BUR, White	Yes	Chrysotile	40%	Carbonates Gypsum Binder/Filler	60%
		LAYER 3 BUR, Black	Yes	Chrysotile	30%	Carbonates Binder/Filler	70%
		LAYER 4 BUR, Black	Yes	Chrysotile	30%	Carbonates Binder/Filler	70%
		Please see EMC Labs Sample Number 0127324-002 for Additional Layers					
0127324-002 R-01	LOW-SLOPE ROOF-ADDITIONAL LAYERS	LAYER 1 BUR, Brown/ Black	No	None Detected		Cellulose Fiber	85%
						Perlite Gypsum Binder/Filler	15%
		LAYER 2 BUR, Black	No	None Detected		Fibrous Glass	15%
						Carbonates Gypsum Binder/Filler	85%
		LAYER 3 BUR, Black	No	None Detected		Fibrous Glass	5%
						Gypsum Quartz Binder/Filler	95%

EMC LABS, INC.

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Laboratory Report
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Project Name:	COMMERCIAL BLDG-987 FULTON MALL	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	TROY BROOKS
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents

Analyst - Kenneth Scheske

Signatory Lab Director - Kurt Kettler

127324

PAGE 1 OF 1

DATE 5/28/13 TESTING LAB: **EMC**

CHAIN OF CUSTODY RECORD

TURN-AROUND TIME

☐ 6 HRS. ☒ 24 HRS. ☐ :

☒ EMAIL RESULTS TO: brooksconsult@sbcglobal.net

☐

BILL TO:

T. BROOKS & ASSOCIATES, INC

ROOF AND ENVIRONMENTAL CONSULTANTS

613 HARVARD AVE., STE. 201, CLOVIS, CA.93612

PHONE: (559) 298-9135 FAX: (559) 298-2281

PROJECT INFORMATION

PROJECT NAME:	Commercial Bldg.
ADDRESS:	887 Fulton Mall
PROJECT #	13-6755
CONTACT	☒ TROY B. ☐ TIM T. ☐ CHAD C. ☐ :
MOBIL # (559)	287-8357 284-5573 999-3417

SAMPLE #	SAMPLE DESCRIPTION		TIME ON / TIME OFF	TOTAL TIME	START	STOP	VOLUME	PCM	PLM	TEM	LEAD WIPE	LEAD AIR	LEAD PAINT
R-01	MAT LOC.: Low-Slope Roof	WALL CLG. FL.							X				
	MAT DESC. Built-Up Roof - Bottom Layers												
	MAT LOC.:	WALL CLG. FL.											
	MAT DESC.												
	MAT LOC.:	WALL CLG. FL.											
	MAT DESC.												
	MAT LOC.:	WALL CLG. FL.											
	MAT DESC.												
	MAT LOC.:	WALL CLG. FL.											
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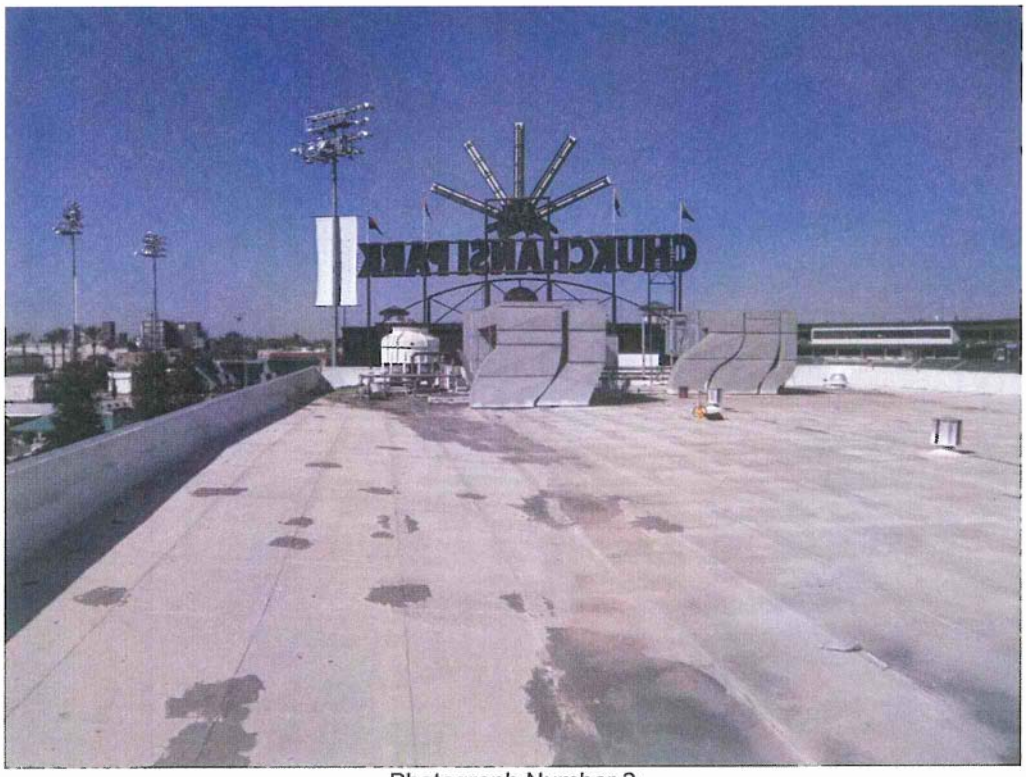
	MAT LOC.:	WALL CLG. FL.											
	MAT DESC.												
	MAT LOC.:	WALL CLG. FL.											
	MAT DESC.												

TRANSACTIONS	DATE	TRANSACTIONS	DATE	SHIPPING PAID BY
(RELINQUISHED BY SIGNATURE) [signature]	5/28/13	(RELINQUISHED BY SIGNATURE) Diana Federico	6/5/13	LAB X
(RELINQUISHED BY SIGNATURE) Diana Federico	6/5/13	(RELINQUISHED BY SIGNATURE) [signature]	6/5/13	CLIENT [illegible]
				BROOKS

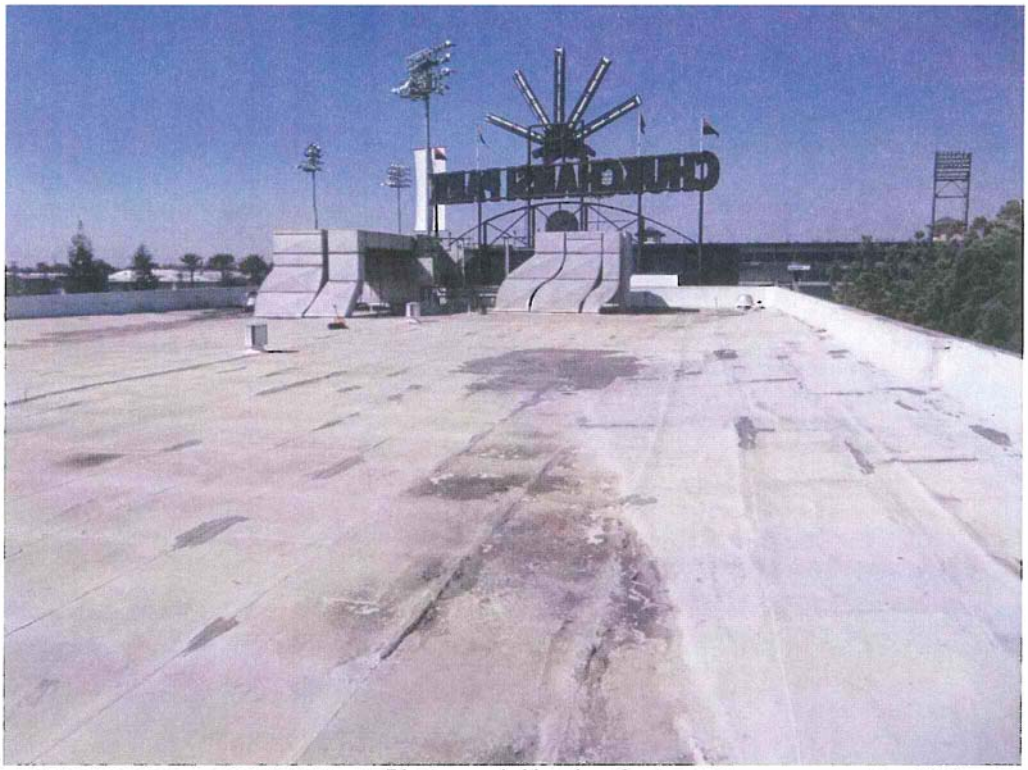
Appendix B

Collection of Photographs

Photograph Number 1
View of Large Cricket and Split Repairs



Photograph Number 2
View of Mechanical Equipment at West End of Roof



Photograph Number 3
View of Ponding Areas and Field Repairs

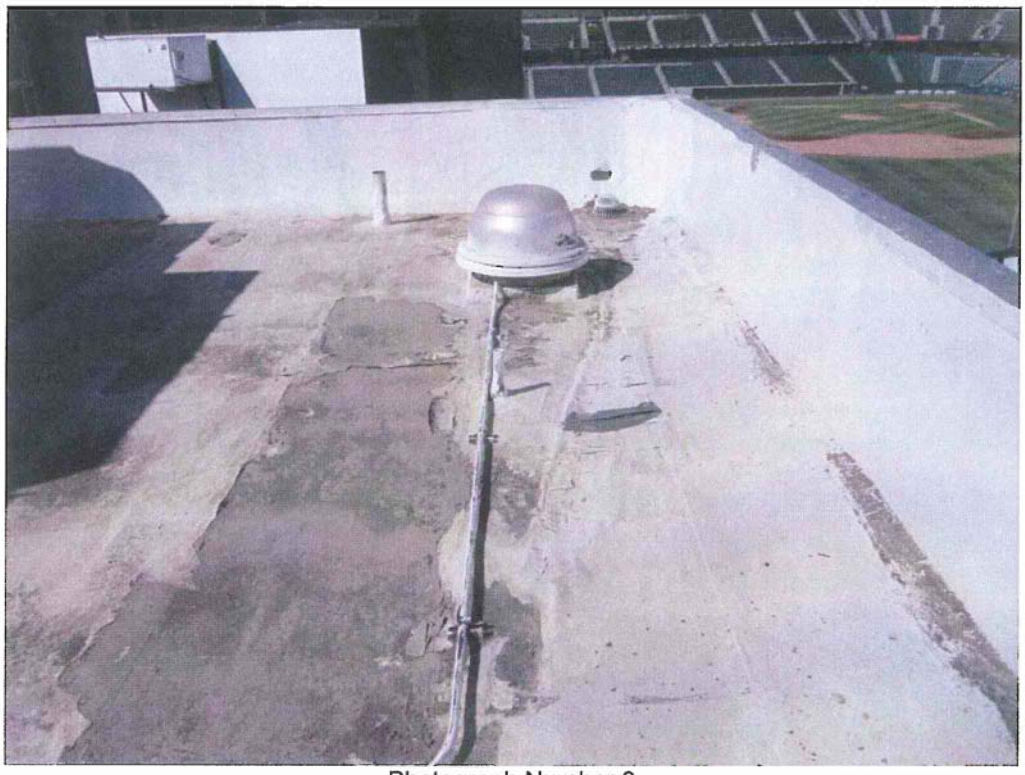
Photograph Number 4
Typical Roof Drain

Photograph Number 5
Failed Coping Joint and Repair at Base of Wall

Photograph Number 6
Failed Split Repair in Field of Roof

Photograph Number 7
Failed Split Repair

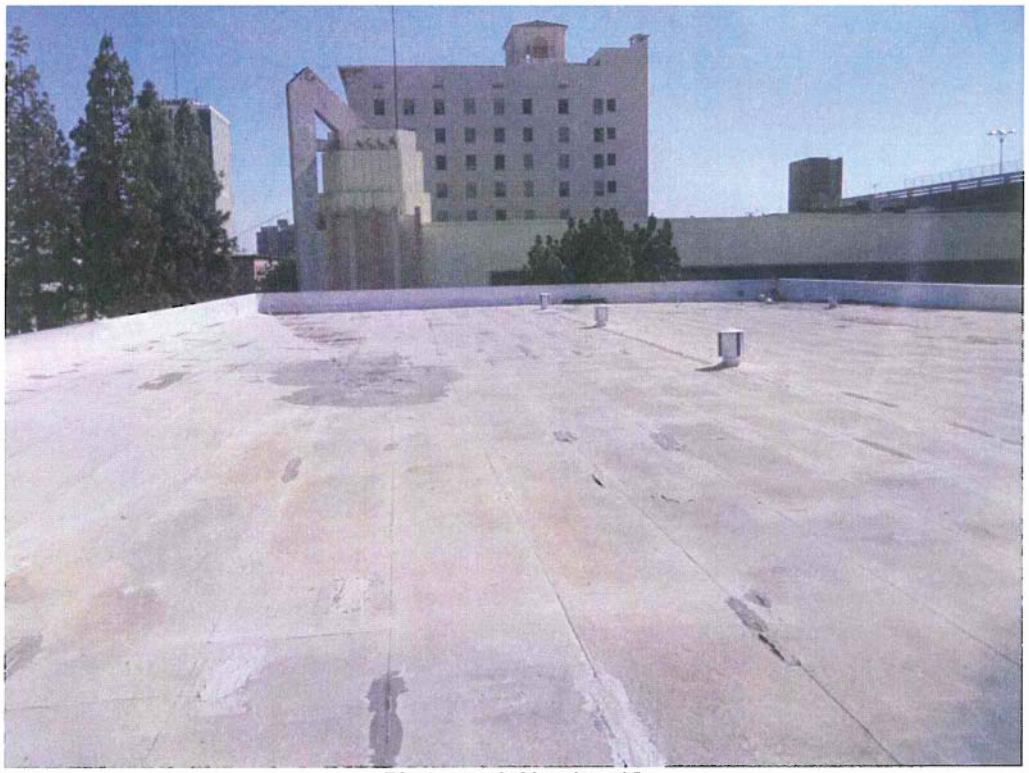
Photograph Number 8
Mechanical Equipment Area



Photograph Number 9
Vent at Corner of Roof Obstructing Drainage

Photograph Number 10
Large Air Handling Unit

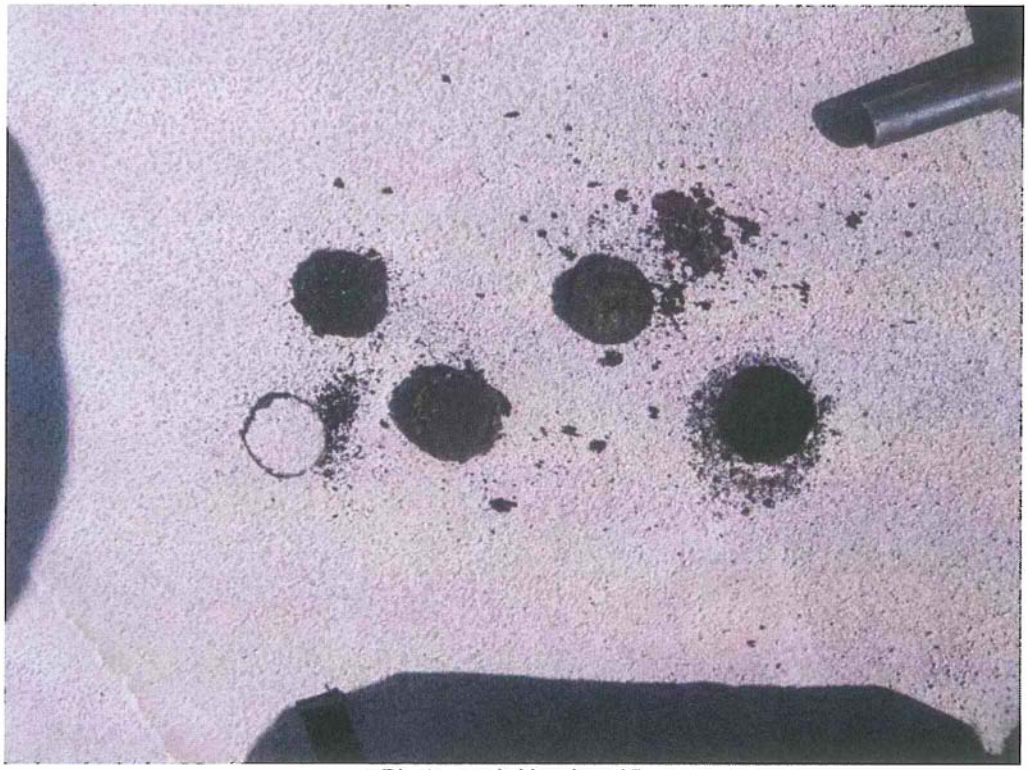
Photograph Number 11
Penetration Flashing Not Incorporated into Roof System



Photograph Number 12
General View of Roof Area

Photograph Number 13
Electrical Conduits Not Properly Supported Above Roof

Photograph Number 14
Field Repairs at Mechanical Area



Photograph Number 15
Roof Core Sample - 2 Roofs

Photograph Number 16
Close-Up of Roof Core

Appendix C

Professional Certification

Roof Consultants Institute

Board of Registration

Be it known that

TROY F. BROOKS

having given satisfactory evidence of necessary qualifications with regard to character, education, and experience as required by the Roof Consultants Institute, was examined - duly registered - awarded this certificate and is henceforth recognized as a

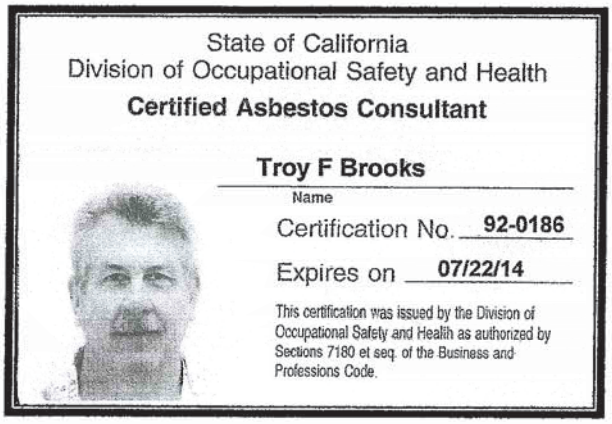
Registered Roof Consultant

In testimony whereof Registration Number 80 *is issued under the Seal of the Institute and the signatures of the President and Secretary, this* 30th *day of* March, 19 93.

Chairperson, Advisory Panel

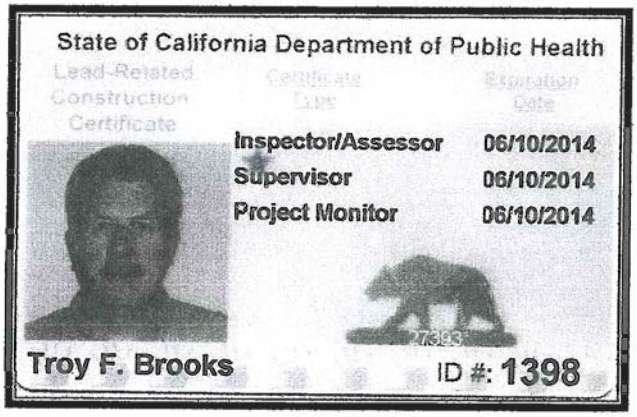
Secretary of the Institute

President of the Institute



Troy F. Brooks

Certified Asbestos Consultant



Troy F. Brooks

CDPH Lead Accredited
- **Inspector / Assessor**
- **Supervisor**
- **Project Monitor**