



REPORT OF ROOF CONDITION STUDY

YOUR FACILITY Your Facilities Location



Date

Prepared for
Your Company



1114 Grindstone, Union, Kentucky 41091
(859) 657-6677

[Report Date]

[Client]

[Client Address]

Attention: [Client Contact]

Subject: **Report of Roof Condition Study**
Project Identification
[Project Location]
HCI Project No. [HCI Project No.]

Gentlemen:

Hunt Consulting, Inc. (HCI) is pleased to present the attached report of a roof condition study at [Project Location]. The attached report presents our understanding of the project, our scope of services, our observations, and our recommendations. An opinion of costs for any recommended roof membrane repair and replacement work is also presented. The Appendix A of this report presents an *Area and Local Vicinity Map*, an annotated *Roof Plan*, and photographs of the conditions present. Appendix B presents results of laboratory testing for asbestos containing materials performed by others.

The work was authorized by [Client Representative] and was performed in general accordance with the contract between [Client] and HCI authorized on [Contract Date].

We appreciate the opportunity to provide you with this service. Please contact us with any questions you may have.

Sincerely,

Hunt Consulting, Inc.

Jeffrey A. Hunt, P.E.
President

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APPENDIX A

- Figure 1 - Area and Local Vicinity Map
- Figure 2 - Roof Plan
- Photographs 1 through 24

APPENDIX B

Professional Services Industries, Inc.-Report of *Asbestos Roof Survey*

1 PROJECT INFORMATION

The [Project] is located at [Project Location]. An *Area and Local Vicinity Map* is presented in Figure 1 of Appendix A of this report. Based on measurements completed with a measuring wheel, the building consists of approximately 83,900 square feet of plan area.

Based on information provided [Site Contact], the building was constructed in approximately 1978 and generally contains the roof system from the original construction. [Client] has occupied the building for approximately 10 years. [Previous Occupant] was the prior occupant of the building.

[Site Contact] indicated that the roof actively leaks in numerous locations and the majority of the active roof leaks are evidenced by stained ceiling tiles. A roof leak history was not available.

Building drawings were not available for our use in preparing this report.

2 SCOPE OF SERVICES

Our work was completed in accordance HCI's agreement with [Client] authorized on [Contract Date]. Briefly, our work included:

- observing each of roof areas and noting the condition of membrane and flashing;
- documenting the general location of roof repairs;
- documenting the drainage method and approximate slope;
- documenting the location of reported leak locations; and
- taking photos of the roof and general types of defects noted.

3 OBSERVATIONS

Our representative visited the site on [Site Visit Date]. The weather at the time of our site visit was partly cloudy, windy and with temperatures in the low-20 Degrees Fahrenheit. There had been a substantial rain the day prior to our visit. We visually inspected the conditions present on each roof surface. Observations were recorded as written notes and photographs. Representative photographs of our observations are included in Appendix A of this report. We also identified any areas that appeared visually different in material type or age. The location of photographs and noted roof leaks are presented in Figure 2, *Roof Plan* in Appendix A. The following describes our observations during our site visit.

3.1 ROOF DESCRIPTION

This [Client] facility is the northern part of a larger building. The roof over the [Project Name] consists of six roof sections divided by changes in roof level. These include the main roof area, the front canopy roof (standing seam metal), two (raised) roof areas adjacent to the west front canopy, the Garden Center, and the east loading area canopy. All of the roof areas except the west-central (front) canopy and the north Garden Center roofs consist of what appears to be a built-up roof membrane with an coal tar flood coat and inter-ply bitumen and an aggregate surfacing. We did not observe adhesive between the insulation and metal deck at our core location. Based on core samples taken, the membrane is installed over a nominal 7/8-inch thick layer of perlite board insulation. The front canopy roof consists of a vaulted standing seam roof. The Garden Center roof consists of what appears to be a smooth-surfaced asphalt built-up roof membrane (Reference Photographs 1 through 6).

3.2 DRAINAGE

The main roof drains at less than 1/8-inch vertically per horizontal foot to gutters and downspouts located on the east side of the building. The west roof areas drain over metal edge flashing east and onto the main roof. The Garden Center roof drains to gutters and downspouts located on the north side of the roof. The east loading area roof drains to gutters and a downspout on the east side of the roof section. The southwest, northwest, east loading area and Garden Center roofs are essentially flat.

Ponding water was noted along the majority of the east edge of the main roof and the majority of the north side of the Garden Center roof (Reference Photographs 6 and 7). Ponding water was also apparent at some repair areas (Reference Photograph 9).

The interiors of the gutters exhibited some rusting. One downspout on the east side of the building serving the main roof area was damaged (Reference Photograph 8).

3.3 REPAIRS

Numerous membrane repairs have been completed. The repairs generally consist of what appears to be applications of flood coat bitumen and replacement of the aggregate surfacing or replacement of the built-up roof membrane and aggregate surfacing and possibly the insulation. These repairs are apparent due to variations in the color of the aggregate surfacing (Reference Photographs 9 through 15). We noted blisters in many of the repair areas and piles of aggregate surrounding some of the repairs. As previously mentioned ponding water was present in some of the repair areas.

Some repairs had been completed by application of flood coat bitumen (most likely asphalt) over the existing gravel or with roofing mastic (Reference Photograph 16).

3.4 ROOF CONDITION AND DEFECTS

The following sections present a summary of general condition and items of concern noted for each roof area.

3.4.1 Northwest and Southwest Roof Areas

Each of these roof areas consists of an aggregate surfaced coal tar roof membrane. These roof areas were in generally good condition for their age and well maintained. We did note that some splits were present in the edge flashing strip-in plies.

3.4.2 North Garden Center Roof Area

This roof area consists of what appears to be a smooth surfaced, built-up roof membrane. This roof area was in poor condition and exhibited the following defects.

- *Base Flashing Holes:* There were several holes in the base flashing along the west parapet wall.
- *Missing Parapet Coping:* The parapet coping was missing from the east parapet wall exposing the wood nailers and the base flashing was open at the top (Reference Photograph 17).
- *Ponded Water:* There was substantial ponding water over the majority of the north side of the roof (Reference Photograph 5).

3.4.3 Main and East Canopy Roof Areas

Each of these roof areas consist of what appears to be an aggregate surfaced coal tar bitumen roof membrane. These roof areas are in fair to poor condition. As previously mentioned and presented in Figure 2, *Roof Plan*, there have been repairs made to the majority of the perimeter of the building and the majority of the north half of the main roof. The following defects were noted in the repair areas.

- *Blisters, Wrinkles and Exposed Felts:* Numerous large blisters, wrinkles and exposed felts were present in the repair areas along the east and west sides of the building and at some repair locations in the northern section of the main roof. Many of the blisters were damaged or open. We would expect that more and larger blisters would be apparent during the warmer periods of the year (Reference Photographs 7, 11, 15, 16, 18 and 19).
- *Deteriorated Edge Flashing Strip-in Plies:* The strip in plies for the edge flashing at the northeast corner of the building is deteriorated exposing the metal edge flashing (Reference Photograph 20).
- *Base Flashing and Counter Flashing Deterioration:* The base flashing at the west parapet wall is extensively deteriorated and the masonry wall is generally

exposed. Also inadequate base flashing and metal roof repairs have been completed with roofing cement at one location (Reference Photograph 21 and 22).

- *Ponded Water:* As previously mentioned water is present at the east main roof edge and at several locations where repairs have been completed.

4 LABORATORY TESTING

[Subcontractor] of Columbus, Ohio performed an asbestos survey of the roof over the [Client] section of this facility. The survey was performed on [Subcontractor Site Visit Date]. The information obtained from [Subcontractor] was utilized in preparing an opinion of costs for repairs. A copy of their report is included in Appendix B of this report.

5 OPINIONS AND RECOMMENDATIONS

The roofs at this facility are reported to be approximately 20 years old and original construction. It is our experience that an adequately maintained coal tar bitumen roof membrane can perform acceptably for 20 or more years. The following presents our opinions and recommendations for each the roof areas at this facility.

5.1 East (Main) Roof Area

The majority of the east main roof area is in poor condition. The roof currently leaks extensively and reportedly has had leak problems for several years. There have been numerous repair attempts of the roof membrane. These repairs include nearly the entire perimeter and numerous locations within the northern portion of the roof. Many of these repairs and the majority of the eastern edge of the roof exhibit extensive blistering. Many of these blisters have been damaged from roof traffic. It has been our experience that blisters within the repair indicate inadequate repairs where moisture has been trapped within the plies and/or insulation. We would anticipate that the more and larger blisters would become apparent in warmer weather.

Other than the numerous repair attempts and blisters, we did not observe obvious inadequacies in the roof membrane that would result in the number and severity of roof leaks being experienced in the northern, central section of the roof. Based on the locations of the leaks in the northern section of the roof, orientation of the deck flutes, and condition of the roof membrane near the leaks, we believe many of the leaks may have been and may currently be associated with inadequacies in the existing rooftop package units.

Other leaks present along the western section of the building are most likely associated with base flashing inadequacies at the wall between the main roof and the western roof sections.

Therefore, we recommend that an additional study be performed to locate any leaks being experienced due to rooftop mechanical equipment inadequacies. This study should include water testing the individual units and observations from within the building at the leak locations. Once it is determined which, if any, leaks are associated with rooftop units, the need for repair or replacement can more appropriately be determined.

However, due to the age of the roof membrane, blisters, and numerous repair attempts we recommend that the roof be budgeted for replacement within the next five years.

5.2 Northwest and Southwest Roof Areas

These roofs are in good to fair condition for their age. Repair of leaks at the west wall of the main roof associated with base and counter flashing inadequacies will most likely require modifications of the east edge flashing at these roof areas.

5.3 East Loading and Garden Center Roof Areas

These roof areas are in fair condition for their age. The Garden Center roof area exhibits substantial ponding, base flashing defects and missing sections of coping. The east loading area roof exhibits some inadequate repairs and base flashing defects. Neither roof is reported to leak. However, we suspect the coping and base flashing defects at the Garden Center roof will ultimately result in leaks and may currently be causing interior wall damage.

The following tables present a *Roof Component Schedule* and an opinion of cost for replacement of the existing membrane with a similar built-up roof system (Option 1) or replacement with a fully adhered EPDM roof system (Option 2). The opinions of costs for replacement are intended for budgetary purposes, however, as previously indicated, we recommend that the feasibility for repair be determined through additional evaluation of the rooftop mechanical units.

6 COMPONENT SCHEDULE AND COST ESTIMATES

The table that follows presents the approximate quantity of roofing components present at this facility as determined with a measuring wheel, our observations and field measurements for budgeting purposes. Repair contractors should be instructed to verify the actual quantities for bidding purposes.

Table 1 Roof Component Schedule

Item	Main Roof	Northwest	Southwest	Garden Center	East Loading Area	Total
Roof Area, sf	78,818	911	754	1800	728	83,011
Edge Flashing, lf	762	176	148	100	80	1,266
Coping, lf	0	0	0	36	0	36
Counter Flashing, lf	303	8	8	100	28	447
Base Flashing, lf	303	8	8	136	28	483
Expansion Joint	153	0	0	0	0	153
Gutter, lf	283	0	0	100	28	411
Downspout, lf	364	0	0	60	22	446

The sections that follow present an opinion of costs for replacement of the existing roof membrane at each of the six roof areas for budgeting purposes. Costs for roof repair can more appropriately be determined once any leaks associated with rooftop mechanical units is determined. Estimates include the cost of removal of asbestos containing roofing materials where appropriate based on the results of asbestos sampling and testing and performed by others.

6.1 Option 1 - Cost for Replacing the existing roof membrane with a similar system.

Item	Quantity	Unit	Adjusted Unit Cost		Cost
<i>East (Main) Roof Section</i>					
Demolition Roofing	83,011	sf	\$ 0.50	\$	41,506
Insulation (1" Perlite Board)	83,011	sf	\$ 0.82	\$	68,069
Install Coal Tar Roofing Membrane	83,011	sf	\$ 2.20	\$	182,624
Base Flashing & Counterflashing	303	lf	\$ 7.30	\$	2,212
Edge Flashing	762	lf	\$ 1.31	\$	998
Expansion Joint Curbs and Flashing	153	lf	\$ 23.81	\$	3,643
Repair Downspout	1	repair	\$ 250.00	\$	250
Paint Gutter at South Edge	283	lf	\$ 0.58	\$	164
<i>Total</i>				\$	<u>299,466</u>
<i>Northwest Roof Section</i>					
Demolition Roofing	911	sf	\$ 0.50	\$	456
Insulation (1" Perlite Board)	911	sf	\$ 0.82	\$	747
Install Coal Tar Roofing Membrane	911	sf	\$ 2.20	\$	2,004
Base Flashing and Counter Flashing	8	lf	\$ 7.30	\$	58
Edge Flashing	176	lf	\$ 1.31	\$	231
Gutters and Downspouts	176	lf	\$ 5.44	\$	957
<i>Total</i>				\$	<u>4,453</u>
<i>Southwest Roof Section</i>					
Demolition Roofing	754	sf	\$ 0.50	\$	377
Insulation (1" Perlite Board)	754	sf	\$ 0.82	\$	618
Install Coal Tar Roofing Membrane	754	sf	\$ 2.20	\$	1,659
Base Flashing and Counter Flashing	8	lf	\$ 7.30	\$	58
Edge Flashing	148	lf	\$ 1.31	\$	194
Gutters and Downspouts	148	lf	\$ 5.44	\$	805
<i>Total</i>				\$	<u>2,906</u>

Item	Quantity	Unit	Adjusted Unit Cost	Cost
<i>Garden Center Roof Area</i>				
Demolition Roofing	1,800	sf	\$ 0.50	\$ 900
Demo. Asbestos Roofing Materials	1,800	sf	\$ 3.50	\$ 6,300
Insulation (1" Perlite Board)	1,800	sf	\$ 0.82	\$ 1,476
Install Coal Tar Roofing Membrane	1,800	sf	\$ 2.20	\$ 3,960
Base Flashing and Coping	36	lf	\$ 7.50	\$ 270
Edge Flashing	100	lf	\$ 1.31	\$ 131
<i>Total</i>				<u>\$ 13,037</u>
 <i>East Loading Area Roof</i>				
Demolition Roofing	728	sf	\$ 0.50	\$ 364
Insulation (1" Perlite Board)	728	sf	\$ 0.82	\$ 597
Install Coal Tar Roofing Membrane	728	sf	\$ 2.20	\$ 1,602
Base Flashing and Counter Flashing	28	lf	\$ 7.30	\$ 204
Paint Gutter at South Edge	28	lf	\$ 0.58	\$ 16
<i>Total</i>				<u>\$ 2,783</u>
 Total Option 1				 \$ 322,645

6.2 Option 2 - Cost for Covering with and EPDM Membrane

Item	Quantity	Unit	Adjusted Unit Cost		Cost
<i>East (Main) Roof Section</i>					
Demolition Roofing	83,011	sf	\$ 0.50	\$	41,506
Insulation (2"-Styrafoam)	83,011	sf	\$ 1.18	\$	97,953
Install EPDM Roofing Membrane	83,011	sf	\$ 1.78	\$	147,760
Base Flashing & Counterflashing	303	lf	\$ 6.88	\$	2,085
Edge Flashing	762	lf	\$ 1.31	\$	998
Expansion Joint Flashing	153	lf	\$ 2.67	\$	409
Repair Downspout	1	repair	\$ 250.00	\$	250
Paint Gutter at South Edge	283	lf	\$ 0.58	\$	164
<i>Total</i>				\$	<u>249,618</u>
<i>Northwest Roof Section</i>					
Demolition Roofing	911	sf	\$ 0.50	\$	456
Insulation (2"-Styrafoam)	911	sf	\$ 1.18	\$	1,075
Install EPDM Roofing Membrane	911	sf	\$ 1.78	\$	1,622
Base Flashing & Counterflashing	8	lf	\$ 6.88	\$	55
Edge Flashing	176	lf	\$ 1.31	\$	231
Gutters and Downspouts	176	lf	\$ 5.44	\$	957
<i>Total</i>				\$	<u>3,940</u>
<i>Soutwest Roof Section</i>					
Demolition Roofing	754	sf	\$ 0.50	\$	377
Insulation (2"-Styrafoam)	754	sf	\$ 1.18	\$	890
Install EPDM Roofing Membrane	754	sf	\$ 1.78	\$	1,342
Base Flashing & Counterflashing	8	lf	\$ 6.88	\$	55
Edge Flashing	148	lf	\$ 1.31	\$	194
Gutters and Downspouts	148	lf	\$ 5.44	\$	805
<i>Total</i>				\$	<u>3,286</u>

Item	Quantity	Unit	Adjusted Unit Cost	Cost
<i>Garden Center Roof Area</i>				
Demolition Roofing	1,800	sf	\$ 0.50	\$ 900
Dem. Asbestos Roofing Materials	1,800	sf	\$ 3.50	\$ 6,300
Insulation (2" Styrafoam)	1,800	sf	\$ 1.18	\$ 2,124
Install EPDM Roofing Membrane	1,800	sf	\$ 1.78	\$ 3,204
Base Flashing ad Coping	36	lf	\$ 7.07	\$ 255
Edge Flashing	100	lf	\$ 1.31	\$ 131
<i>Total</i>				<u>\$ 12,014</u>
<i>East Loading Area Roof</i>				
Demolition Roofing	728	sf	\$ 0.50	\$ 364
Insulation (2" Styrafoam)	728	sf	\$ 1.18	\$ 859
Install EPDM Roofing Membrane	728	sf	\$ 1.78	\$ 1,296
Base Flashing & Counterflashing	28	lf	\$ 7.07	\$ 198
Edge Flashing	28	lf	\$ 1.31	\$ 37
Paint Gutter at East Edge	28	lf	\$ 0.58	\$ 16
<i>Total</i>				<u>\$ 2,406</u>
Total Option 2				\$ 271,264

7 BASIS OF REPORT

The following sections present the basis of this report.

7.1 GENERAL

This report has been prepared for the use of [Client] in making decisions pertaining to the subject property and its intended renovation. The report or individual sections thereof should not be used by other parties for other reasons without prior written consent of HCI to determine the applicability of the report for those uses.

7.2 COST ESTIMATES

Cost estimates presented in this report should be considered as an opinion of costs for repair and replacement. They are based on our field observations, published information and our experience. The opinions of cost are intended to be used as an aid in making economic comparisons and budget projections and are not a bid to complete the work. Actual costs may vary due to seasonal constraints, number of bidders, union versus non-union construction, and available work force. Unless otherwise indicated, costs are presented in present dollars.

7.3 STUDY

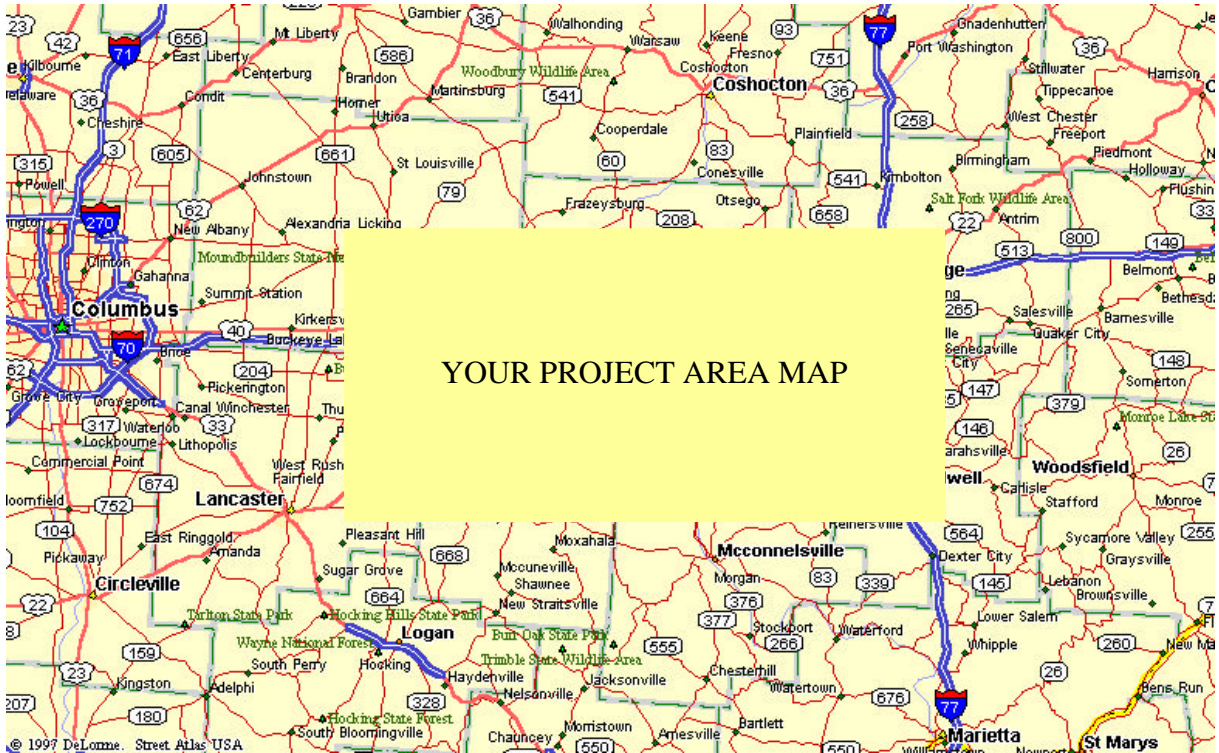
HCI was retained to perform a study of this complex. The conclusions presented in this report are based on our field observations, limited exploration and our experience with similar projects. Trained professionals, who use the degree of care and skill ordinarily exercised under similar conditions by reputable members of our profession, were used for this study.

Although “walk-through” observations were made, there may be defects which were not readily accessible, visible, or which were inadvertently overlooked. Other problems may develop with time that was not evident at the time of this study.

APPENDIX A

FIGURES, TABLE AND PHOTOGRAPHS

AREA VICINITY MAP



LOCAL VICINITY MAP

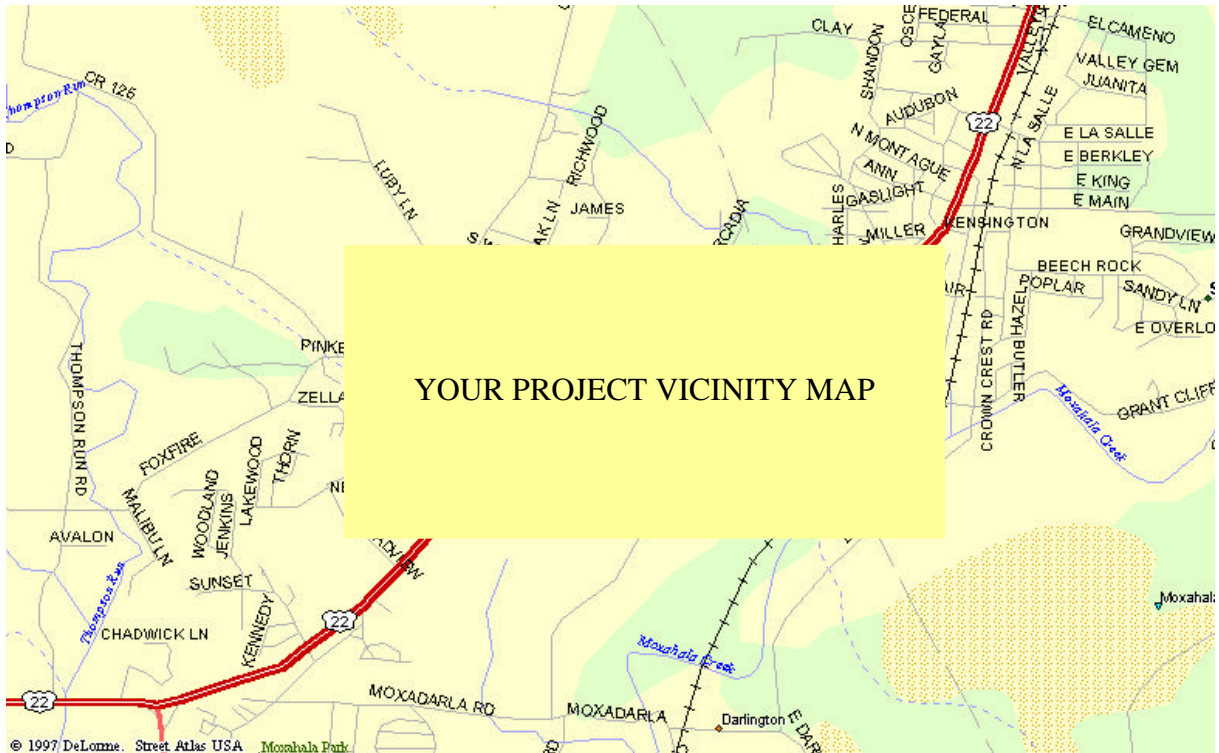


FIGURE 1

Area and Local Vicinity Map

[Project Name]/[Project Location]

Source: Delorme, Street Atlas USA Version 5.0

Scale: None

HCI Consulting
Group, Inc.

TABLE A1 - ROOF SAMPLE SUMMARY

[Project Name]

[Project Location]

Core No.	Location	Description
RC-1	East Main Roof Area Field of roof	Gravel surfaced built-up roofing (probably coal tar flood coat and inter-ply bitumen) 7/8-inch thick perlite (type) insulation (dry) over metal deck
RC-2	East Main Roof Area Base flashing west wall	Modified bitumen roofing material (dry).
RC-3	East Main Roof Area Base flashing west wall	Base flashing material.
RC-4	North Garden Center Roof Area Edge flashing	Roofing cement at edge flashing joint.



PHOTOGRAPH 1
[Project] identification looking east.



PHOTOGRAPH 2
Overview of main roof area looking northwest from southeast corner.



PHOTOGRAPH 3
Main roof overview looking northeast.



PHOTOGRAPH 4
View of east roof over loading dock area.



PHOTOGRAPH 5

View of north garden center roof area looking northwest. Note ponding water along north edge.



PHOTOGRAPH 6

Southwest upper roof area looking north toward entrance canopy.



PHOTOGRAPH 7

Ponding water present along east edge of main roof area. Note blisters



PHOTOGRAPH 8

Damaged downspout on east side of building serving the main roof area.



PHOTOGRAPH 9

Membrane repair apparent by aggregate surfacing color variation.



PHOTOGRAPH 10

Deteriorated seam sealant and open seam at field membrane lap. Note ponding water within repair area.



PHOTOGRAPH 11

Repair area on north side of main roof. Note blisters in membrane.



PHOTOGRAPH 12

Repair area apparent due to variation in aggregate color.



PHOTOGRAPH 13
Edge repairs along north side of main roof.



PHOTOGRAPH 14
Repairs along south side of roof and at membrane tie-in to adjacent EPDM roof membrane.



PHOTOGRAPH 15

Repairs and blisters along west (front) standing seam canopy roof.



PHOTOGRAPH 16

Repair completed with roofing cement on main roof. Note blisters in repair.



PHOTOGRAPH 17

Missing coping on east parapet wall of north Garden Center roof.



PHOTOGRAPH 18

Extensive blisters in repair along east side of main roof area (typical condition).



PHOTOGRAPH 19

Damaged blister in repair along east edge of main roof



PHOTOGRAPH 20

Deteriorated strip-in plies and exposed metal edge flashing at northeast corner of main roof. Note rusted gutter.



PHOTOGRAPH 21

Exposed masonry wall and deteriorated sealant at counter flashing at west parapet wall.



PHOTOGRAPH 22

Inadequate repairs completed with roofing cement at base flashing and standing seam metal roof at west side of building.



PHOTOGRAPH 23

Base flashing open at top at access hatch on main roof.



PHOTOGRAPH 24

Suspended plastic at leaks within store.

APPENDIX B

ASBESTOS REPORT



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