

**ROOF INSPECTION CONDUCTED ON:**

**MC DADE ES  
8801 SOUTH INDIANA AVENEUE  
CHICAGO, ILLINOIS 6069**



**ROOF INSPECTION CONDUCTED ON:**

MC DADE ES  
8801 SOUTH INDIANA AVENUE  
CHICAGO, ILLINOIS 60619

**ROOF INSPECTION CONDUCTED FOR:**

MRS. JENNIE MILLER  
CHICAGO PUBLIC SCHOOLS  
42 WEST MADISON STREET  
CHICAGO, ILLINOIS 60602

**ROOF INSPECTION CONDUCTED BY:**

RRK ASSOCIATES, LTD.  
COMMERCIAL/INDUSTRIAL ROOF  
CONSULTANTS  
900 TRI-STATE PARKWAY, SUITE 800  
GURNEE, ILLINOIS 60031

GUY H. SNOWDEN JR.

**INSPECTION REPORT DATE:**

JUNE 2, 2018

## **RRK ASSOCIATES, LTD.**

**900 Tri-State Parkway, Suite 800, Gurnee, Illinois 60031  
Tel. (847) 856-8420 Fax (847) 856-8421  
www.rrkassociates.net**

**Commercial/Industrial Roof Consultants**

June 2, 2018

Mrs. Jennie Miller  
Chicago Public Schools  
42 West Madison Street  
Chicago, Illinois 60602

Subject: Roof Inspection and Analysis  
Mc Dade ES  
8801 South Indiana Avenue  
Chicago, Illinois 60619

Dear Mrs. Miller:

Per your request and authorization, a roof inspection and moisture survey was conducted on the multiple roofs of Mc Dade Elementary School located at 8801 South Indiana Avenue, Chicago, Illinois 60619. The roof inspection and moisture survey was conducted on Friday, May 18, 2018. The purpose of the roof inspection and moisture survey was to determine the roof composition on each roof area, determine the roofs general condition, determine the roofs remaining useful service life, and to determine the repair and replacement cost for each roof area based upon our findings.

This school has 2 independent roof areas comprising of one low sloped roof area and one steep sloped roof area. The approximate roof area for this school is 26,081sf. The penetrations on each of these roof areas is typical consisting of raised roof curbs, soil stacks, gas and electrical penetrations, and flue stacks. Perimeter detailing for both roof areas consisted of raised metal gravel stops. Along the west perimeter of the main roof area, the flashings are terminated under a metal counter flashing detail at the east wall of the steep sloped roof area.

Drainage of the main roof area was from the perimeter to the center of the roof to internal roof drains. The slope of the main roof area is positive and estimated to be 1/8" per foot slope. The drainage of the steep sloped roof was from the ridge of the roof to the north and south onto the main roof area. Slope on the steep sloped roof is estimated at 2.5/12 pitch. It was noted at the west perimeter of the steep sloped roof that water diverters were installed to push water toward the main roof area.

The roof deck for both the low sloped roof area and the steep sloped roof area consisted of gypsum decking supported by form boards and bulb tees. The bulb tees are supported by steel bar joist. The condition of the decking is not known as it is covered by roofing and could not be observed. Deck composition was confirmed at core locations. On the steep sloped roof area, wood insulation stops were noted extending east/west between the insulation board ends.

The following is a summary of our findings based upon the building section and then by individual roof area.

McDade Elementary - Capital Expense  
8801 South Indiana Avenue, Chicago, Illinois 60619

**ROOF REPLACEMENT BUDGET**

Roof Section ID	Activity Type	Allocation	Urgency	(Budget Amount) Replacement	Roof Area (sf.)	Estimated Age	Roof System	Insulation	Deck	Service Life	Replacement Year
Main Flat Roof	Replacement	Capital	High	\$310,635	20,709	16+ Years Old	Gravel Surfaecd BUR (Coal Tar Pitch)	1" Perlite over 1.5" Polyisocyanurate	Gypsum	2-4 Years	2022
West Steep Slope Roof	Replacement	Capital	High	\$80,580	5,372	18+ Years Old	Granule Surfaced Modified Bitumen	1" Perlite over 1.5" Polyisocyanurate	Gypsum	2-4 Years	2022
				<b>\$391,215</b>	<b>26,081</b>						

**PREVENTATIVE MAINTENANCE BUDGET**

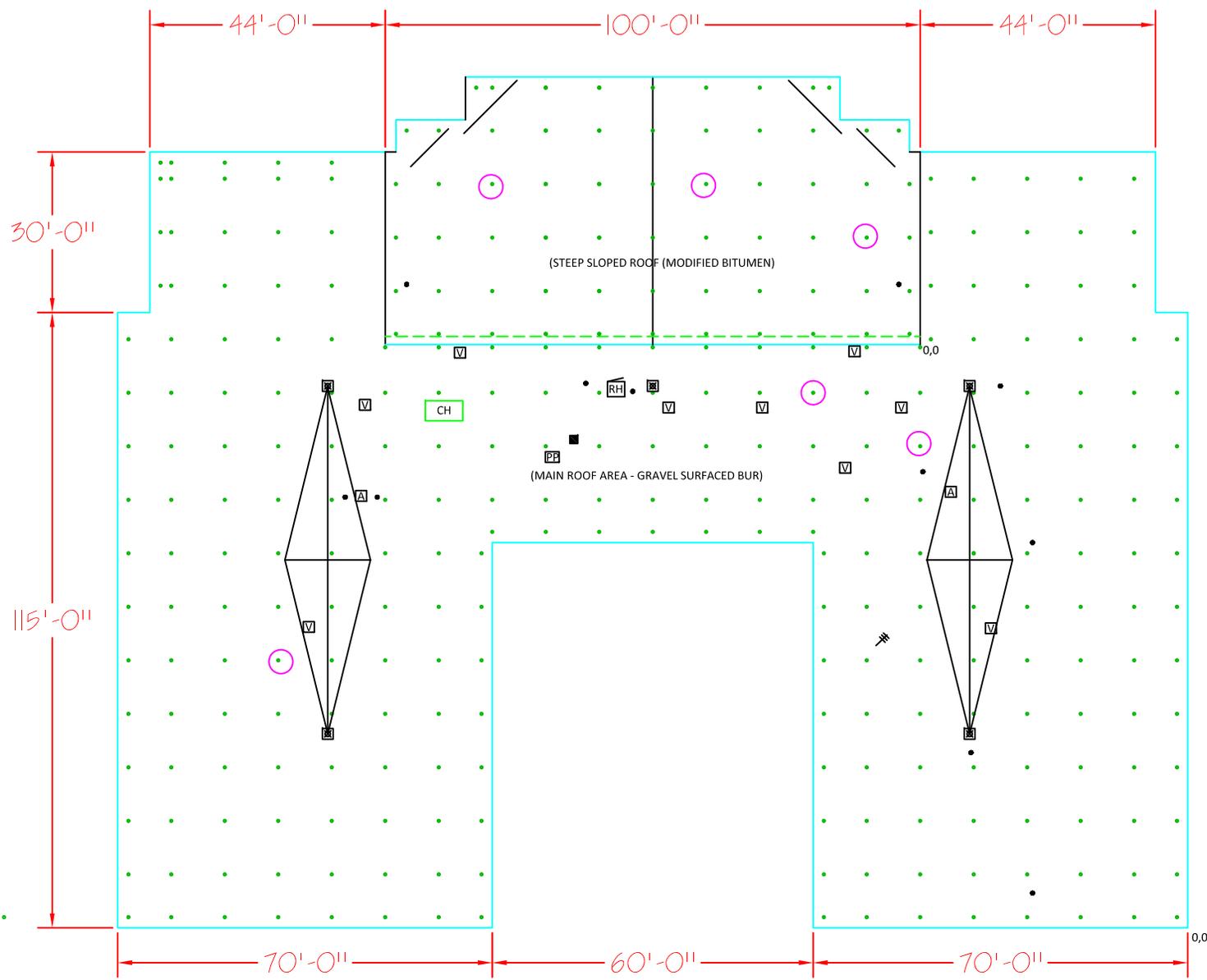
Roof Section ID	Activity Type	Allocation	PM Budget 2018	(Budget Amount) Maintenance (2018)	Roof Area (sf.)	Estimated Age	Roof System	Insulation	Deck	Service Life
Main Flat Roof	Preventative Maintenance	Expense	High	\$5,000	20,709	16+ Years Old	Gravel Surfaecd BUR (Coal Tar Pitch)	1" Perlite over 1.5" Polyisocyanurate	Gypsum	2-4 Years
West Steep Slope Roof	Preventative Maintenance	Expense	High	\$1,500	5,372	18+ Years Old	Granule Surfaced Modified Bitumen	1" Perlite over 1.5" Polyisocyanurate	Gypsum	2-4 Years
				<b>\$6,500</b>						

**5 YEAR CAPITAL**

Roof Section ID	2018	2019	2020	2021	2022	Total	Replacement Year
Main Flat Roof	\$5,000	\$3,000	\$3,000	\$3,000	\$310,653	\$324,653	2022
West Steep Slope Roof	\$1,500	\$1,500	\$1,500	\$1,500	\$80,580	\$86,580	2022
	<b>\$6,500</b>	<b>\$4,500</b>	<b>\$4,500</b>	<b>\$4,500</b>	<b>\$391,233</b>	<b>\$411,233</b>	

<b>Notes:</b>	Roof replacement cost of between \$13.00-\$15.00 sf. for tear off and replacement.
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REVISIONS	BY



LEGEND

	HVAC UNIT		VENT
	ROOF DRAIN		PORTAL HOOD
	SOIL STACK		SCUPPER
	PIPE PORTAL		ROOF HATCH
	FLUE STACK		ANTENNA
	ABANDONED PAN		PIPE PENETRATION
	PITCH PAN		CHIMNEY
	GRAVEL STOP		CORE LOCATIONS
	COUNTER FLASHING		MOISTURE READINGS

AREA

MAIN ROOF AREA	20,709 SF
WEST ROOF AREA	5,372 SF
TOTAL ROOF AREA	26,081 SF

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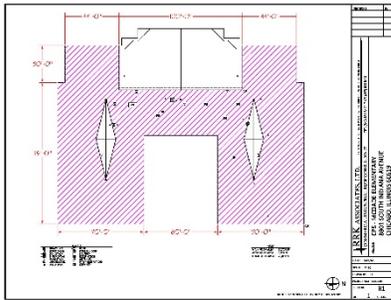
PROJECT: **CPS - MCDADE ELEMENTARY**  
**8801 SOUTH INDIANA AVENUE**  
**CHICAGO, ILLINOIS 60619**

DATE:	5/21/18
SCALE:	1"=30'
DRAWN BY:	JJD
PROJECT NO.:	18212.05
SHEET NO.	<b>R1</b>
OF	<b>1</b> SHEETS



NOTE: DO NOT SCALE, FIELD VERIFY ALL DIMENSIONS.

## **Main Roof Area (Low Sloped)**



Main Roof (Low Sloped) - Gravel Surfaced Built Up Roofing: 20,709 sf.

Roof Elevations: 12'

Roof System: Gravel Surfaced Coal Tar Pitch Built-up Roof  
Insulation: 1" Perlite  
Insulation: 1.5" Polyisocyanurate  
Base Sheet: Fiberglass Asphalt Base Sheet (Nailed)  
Deck: Gypsum  
Flashings: Granular Surfaced Modified Bitumen

Estimated Age: 16+ Years Old

Service Life: 2-4 Years

The following are conditions noted on these roof areas that require attention or monitoring:

1. In the field of the roof, blisters are common. The blisters will need to be monitored and foot traffic limited if possible. If a blister is ruptured, repair with like roofing is recommended.
2. There are areas of exposed and weathered membrane both in the field of the roof and at isolated areas at the perimeter and corners. The areas of exposed and weathered membrane should be covered with cold adhesive and surrounding gravel to protect further exposure.
3. At the base of the steep sloped roof area wall, located at the west side of the main roof, open caulk was noted along the top of the counter flashing detail and window sill counter flashing detail. Seal all areas of open caulk with new caulk.
4. There is a plastic Pate roof curb cap showing signs of deterioration near the roof hatch. The cap will need monitored and repaired should cracks develop. At a minimum, secure the cap in-place with rubber washered screws.
5. Clear all roof drain sumps of debris and gravel.
6. All roof drain details need to be checked and the existing clamping ring bolts reset and tightened where loose. Loose bolts are common at multiple drain locations.
7. At the chimney detail, caulk maintenance is required at the top of the counter flashing detail.

8. At the steam pipe penetration detail near the roof hatch, seal the top of the metal rain collar with a solid bead of caulk where the existing is open.
9. Clear the roof of all debris.
10. At the roof drain sumps, monitor the blisters and repair as needed should they rupture.
11. At roof curbs, repair open or deteriorated roofing cement used to seal the base flashing curb corners with new roofing cement and fabric reinforcement.
12. When the roofs are replaced, there are 5 soil stack details that are less than 8" in height that will need to be raised when the roofs are replaced.

Based upon our inspection and findings on this roof area, with repairs and preventative maintenance as listed above, these roof areas should provide a useful service life of 2-4 years. The built-up roof is in fair/marginal condition. The moisture scan of these roof areas indicated no areas of wet insulation. In regards to the blisters in the field of the roof and at drain sump locations, foot traffic should be limited and if a blister is ruptured, repair immediately conducted. Blisters are generally formed by moisture vapor trapped in voids in the membrane. It does not appear the insulation has been compromised.

When this roof area is replaced, a completed tear off of the roofing down to the gypsum decking will be required.

Cost of Preventative Maintenance 2018:	\$5,000	<b>(High)</b>
Cost of PM 2019-2022:	\$3,000	(Annually)
Replacement Budget 2022:	\$311,000	<b>(High)</b>

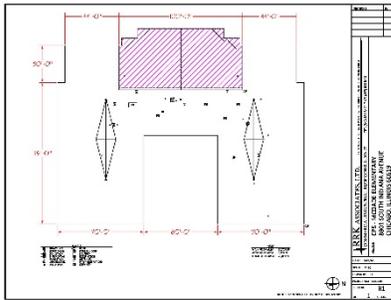
### Moisture Map for Roof

<b>Location:</b>	<b>McDade ES - BUR</b>
<b>Date:</b>	<b>Measured May 18, 2018</b>
<b>Customer:</b>	<b>RRK</b>
<b>Grid Spacing:</b>	Each square represents 10 Ft
Grid measured from the northeast corner of roof and notated in feet below and alongside the grid line identification	

**Input Data**

		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
Dist		142	132	122	112	102	92	82	72	62	52	42	32	22	12	2	
<b>A</b>	<b>192</b>	0	2	0	13	17	16	15	16	19	15	16	12	13	14	14	
<b>B</b>	<b>182</b>	22	16	17	9	15	16	13	11	11	10	15	12	10	13	17	
<b>C</b>	<b>172</b>	12	15	13	11	16	11	11	14	10	12	14	11	10	12	15	
<b>D</b>	<b>162</b>	14	14	13	11	13	12	16	11	12	9	15	12	12	10	13	
<b>E</b>	<b>152</b>	14	14	14	20	13	15	15	12	13	12	11	12	13	10	14	
<b>F</b>	<b>142</b>	0	0	0	10	12	12	13	12	12	12	11	12	14	10	16	
<b>G</b>	<b>132</b>	0	0	0	18	20	11	13	14	14	16	17	13	14	15	15	
<b>H</b>	<b>122</b>	0	0	0	12	17	11	16	14	0	0	0	0	0	0	0	
<b>I</b>	<b>112</b>	0	0	0	11	12	13	13	18	0	0	0	0	0	0	0	
<b>J</b>	<b>102</b>	0	0	0	19	15	12	16	15	0	0	0	0	0	0	0	
<b>K</b>	<b>92</b>	0	0	0	16	19	12	12	11	0	0	0	0	0	0	0	
<b>L</b>	<b>82</b>	0	0	0	14	15	14	14	15	0	0	0	0	0	0	0	
<b>M</b>	<b>72</b>	0	0	0	17	16	13	13	15	0	0	0	0	0	0	0	
<b>N</b>	<b>62</b>	0	0	0	17	18	13	12	14	9	11	11	11	13	16	19	
<b>O</b>	<b>52</b>	0	0	0	16	24	14	12	12	9	12	10	12	12	13	15	
<b>P</b>	<b>42</b>	15	11	10	13	14	13	14	12	13	13	20	15	13	12	19	
<b>Q</b>	<b>32</b>	12	10	10	11	11	13	12	14	13	11	12	12	15	15	12	
<b>R</b>	<b>22</b>	14	12	11	11	13	13	10	12	11	10	11	15	14	10	16	
<b>S</b>	<b>12</b>	12	15	13	13	12	14	13	12	13	10	12	13	14	14	15	
<b>T</b>	<b>2</b>	0	0	0	0	9	14	16	15	19	14	13	16	18	13	15	

## **Steep Slope Roof Area - Granule Surfaced Modified Bitumen**



Granule Surfaced Modified Bitumen (Steep Sloped): 5,372 sf.

Roof Elevations: Ridge – 20'

Roof System: Granule Surfaced Modified Bitumen

Insulation: 1" Perlite

Insulation: 1.5" Polyisocyanurate

Base Sheet: Fiberglass (Nailed)

Deck: Gypsum

Flashings: Granular Surfaced Modified Bitumen

Estimated Age: 16+ Years Old

Service Life: 2-4 Years

The following are conditions noted on these roof areas that require repair or monitoring:

1. At the north side of the steep sloped roof at the northeast corner, a field seam at a t-lap was open. Repair with like modified bitumen membrane.
2. Monitor the field of the roof where ridges and blisters exists and make repairs as needed should side laps or end laps fail or blisters rupture.
3. Seal all delaminated flashings at the water diverters along the west perimeter on both the north and south slopes.
4. On the south side of the steep sloped roof, monitor the split marks occurring at the insulation board joints that are extending north/south. Premature failure of the membrane resulting in leaks could occur at these locations.
5. At the perimeter gravel stop details at the east and west perimeters of the roof, isolated delamination of the flashings was noted. Adhere the delaminated areas of flashings with cold adhesive compatible with modified bitumen.
6. At the east wall face of the steep sloped roof area just above the windows, a closure plate is needed to cover the gap noted in the wall paneling.
7. At the southwest perimeter of the roof, trim the tree from the roof surface to prevent premature damage.

Based upon our inspection of this roof, the overall condition of the granule surfaced modified bitumen roof should be considered fair and performing as expected for a roof of

its age. The roof is showing signs of blistering and ridging that will need to be monitored. Also, areas of open field seams and delaminated flashings at the water diverters and gravel stop will need to be repaired to extend the life of the roof and prevent water entry. The moisture scan of this roof area revealed no indication of wet insulation. Due to the blistering and ridging, the service life of this roof is only expected to reach an additional 2-4 years.

Cost of Preventative Maintenance 2018:	\$1,500	<b>(High)</b>
Cost of PM 2019-2022:	\$1,500	<b>(Annually)</b>
Replacement Budget 2022:	\$81,000	<b>(High)</b>



Based upon our inspection and moisture survey of the roofs located at McDade Elementary School, the overall conditions of the roofs are considered to be in fair to marginal condition. With regular inspection and maintenance this roof should provide an additional 2-4 years of service life.

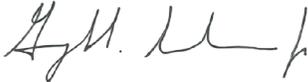
The blistering noted in the field of the main and steep sloped roof area is of concern and will need to be monitored. The blisters as long as not ruptured should not be a source of water entry and on the flat roof area will need to be kept covered by gravel set into cold adhesive to prevent further deterioration of the membrane.

Leaks if occurring at this school are most likely related to the open caulk noted at the counter flashing details and the roof drain details where the clamping ring bolts are loose and need to be reset.

When these roof require replacement, a full tear off of the roofing down to the gypsum decking will be required and then a new roofing system installed at an estimated cost of between \$13.00-\$15.00 sf. or \$319,215 for 26,081 sf. of roof area.

Should you have any questions regarding the findings in this report, please contact our office directly.

Report Submitted By:



Guy H. Snowden Jr.  
Principal  
RRK Associates, Ltd.  
Commercial/Industrial Roof Consultants

Attachment: Roof Plan  
Roof Capital Expense Summary Spread Sheet  
Photographic Exhibits  
Moisture Scan Data

**PHOTOGRAPHIC EXHIBITS / McDADE ES  
8801 SOUTH INDIANA AVENUE  
CHICAGO, ILLINOIS 60619**



**PHOTOGRAPH #1 (Main Roof)**  
Overview of the main roof area facing west from the northeast corner of the roof.



**PHOTOGRAPH #2 (Main Roof)**  
Another view of the main roof area facing south along the east perimeter of the roof.

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**PHOTOGRAPH #3 (Main Roof)**

View of noted exposed and blistered membrane in the field of the roof. Blisters are common throughout the field of the main roof area.



**PHOTOGRAPH #4 (Main Roof)**

View of exposed and deteriorated field membrane at the perimeter corner of the roof.

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**PHOTOGRAPH #5 (Main Roof)**  
View of a large blister in the field of the roof. Blisters are common throughout the field of the main roof area.



**PHOTOGRAPH #6 (Main Roof)**  
View of the tie in between the main roof area and steep sloped roof area. There are noted blisters in the roofing at this transition.

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**PHOTOGRAPH #7 (Main Roof)**  
View of the base flashing termination along the west side of the main roof area at the base of the steep sloped roof area wall.



**PHOTOGRAPH #8 (Main Roof)**  
View of the deteriorated and open caulk noted along the base of the windows at the west side of the main roof area.

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**PHOTOGRAPH #9 (Main Roof)**  
Another view of the open caulk and poor termination of the metal edge detail at the window sill at the west side of the main roof area. Caulk maintenance is required.



**PHOTOGRAPH #10 (Main Roof)**  
View of a typical roof drain sump that needs to be cleared of gravel and debris. Blistering of the sump flashings noted.

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**PHOTOGRAPH #11 (Main Roof)**  
View of a portal curb detail where the cap needs to be secured to the curb with neoprene washered screws.



**PHOTOGRAPH #12 (Main Roof)**  
View of another noted exposed blister in the field of the roof. Membrane deterioration due to exposure noted. Cover with cold adhesive and gravel until the roof is replaced.

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**PHOTOGRAPH #13 (Main Roof)**  
Another view of a large blister in the field of the roof.



**PHOTOGRAPH #14 (Main Roof)**  
View of more common blisters in the field of the roof.

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**PHOTOGRAPH #15 (Main Roof)**  
View of exposed and deteriorated membrane at the perimeter corner of the roof.  
Cover with cold adhesive and gravel until the roof can be replaced.



**PHOTOGRAPH #16 (Main Roof)**  
View of another typical roof drain where the sumps flashing is showing signs of blistering. The sumps also need to be cleared of gravel and debris.

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**PHOTOGRAPH #17 (Main Roof)**  
View of one of the roof drains where the clamping ring bolts are not secured and require tightening.



**PHOTOGRAPH #18 (Main Roof)**  
View of the deteriorated caulk along the base of the steep sloped roof area wall counter flashings where caulk maintenance is required.

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**PHOTOGRAPH #19 (Main Roof)**  
View of a metal rain collar at a roof penetration near the hatch where caulk maintenance is required.



**PHOTOGRAPH #20 (Main Roof)**  
View of another roof drain where the clamping ring bolts need to be tightened.

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**PHOTOGRAPH #21 (Main Roof)**  
View of a typical roof drain that needs to be cleared of debris.



**PHOTOGRAPH #22 (Main Roof)**  
Another drain sump that needs to be cleared of debris and gravel.

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**PHOTOGRAPH #23 (Main Roof)**  
View of debris on the roof that needs to be removed.



**PHOTOGRAPH #24 (Main Roof)**  
View of open and deteriorated roofing cement at a roof curb corner. Preventative maintenance is required until the roof is replaced at these locations.

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**PHOTOGRAPH #25 (Steep Slope Roof)**  
View of an open seam at the north side of the steep sloped roof area.



**PHOTOGRAPH #26 (Steep Slope Roof)**  
View of the north side of the steep sloped roof area. Note blistering in the field of the roof.

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CHICAGO, ILLINOIS 60619**



**PHOTOGRAPH #27 (Steep Slope Roof)**  
View of the water diverters installed along the west perimeter of the steep sloped roof area.



**PHOTOGRAPH #28 (Steep Slope Roof)**  
View of the typical delaminated flashing membrane at the water diverters.

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CHICAGO, ILLINOIS 60619**



**PHOTOGRAPH #29 (Steep Slope Roof)**  
Another open flashing seam at one of the water diverters.



**PHOTOGRAPH #30 (Steep Slope Roof)**  
View of noted delaminated flashing along the west perimeter gravel stop edge of the steep sloped roof area.

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CHICAGO, ILLINOIS 60619**



**PHOTOGRAPH #31 (Steep Slope Roof)**  
View of the south side of the steep sloped roof area where ridges and blisters in the field of the roof was noted.



**PHOTOGRAPH #32 (Steep Slope Roof)**  
View of ridges in the field of the roof at insulation side laps. Monitor for splitting of the membrane at these locations.

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**PHOTOGRAPH #33 (Steep Slope Roof)**  
View of an open flashing seam noted at one of the water diverters.



**PHOTOGRAPH #34 (Steep Slope Roof)**  
View of the tree overgrowth along the west perimeter of the steep sloped roof area that needs to be trimmed back and off the roofing.

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CHICAGO, ILLINOIS 60619**



**PHOTOGRAPH #35 (Steep Slope Roof)**

View of an open gap in the wall paneling over the windows of the east wall face of the steep slope roof area. A closure strip is required.