



Dirksen Elementary

ROOF ASSESSMENT REPORT

2018



8601 West Foster Ave.
Chicago, IL 60656

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TABLE OF CONTENTS

- 1 SUBJECTIVE NARRATIVE REPORT
- 2 ROOF COMPOSITION
 - ROOF AREA SUMMARY REPORT
 - DEFECT SUMMARY REPORT
- 3 SERVICEABILITY DRAWINGS
- 4 PHOTO REPORT
 - AERIAL IMAGE WITH IDENTIFIED ROOF AREAS
 - PHOTOS WITH COMMENTS
- 5 ROOF PLAN
- 6 MOISTURE SURVEY REPORT





1. SUBJECTIVE NARRATIVE REPORT

The **Subjective Narrative Report** is the roof evaluation reported conclusion of the data gathered from the field assessment by the BTA representative. The subjective narrative gives a brief outline of any major anomalies or issues that should be brought to the attention of upper management. The report can be incorporated into capital planning and budgeting for any future projects to repair or replace roof areas.

- **Executive Summary**- this section identifies the date, location, operations performed for the assessment, and initial impressions of the roof's condition.
- **Roof Composition Overview**- this section highlights the type of roof systems. *For more detail information of each specific roof area, see Tab 2- Roof Composition.*
- **Concerns and Issues** - this section lists the number of concerns and/or issues identified during the field assessment. *For visual representation of each concern or issue, see Tab 4- Photo Report.*
- **Recommendations**- this section highlights if there are any strategic repairs that can be made to extend the life of a roof, if there are roofs that need to be replaced, and identify if there is any wall or equipment conditions affecting the roof or building needing immediate attention.



ROOF EVALUATION REPORT

SUBJECTIVE NARRATIVE

Executive Summary:

BTA representative Mark Nichols visited the project site on Thursday, June 14, 2018 to conduct a Roof Evaluation. Mr. Nichols met with Genaro Flores to discuss the problems from water intrusion.

Based on the walkover roof inspection, the instances of leakage reported by the Building Engineer and the moisture survey, the roof system on the main building appears to be in generally “poor” condition. The moisture survey indicated that there are areas of moisture mainly on roof area A-01. The roofs on the mobile units are in fair condition and are repairable.

Overview:

The building’s roof areas are covered by two different types of roof systems. The main building has a built up roof system that consists of a base layer of polyisocyanurate insulation, a top layer of gypsum with a built up roof. All roof decks on the main building are steel. Roof cores were taken of the built up roof system on the main building and on one mobile unit. The mobile units have steel deck, a base layer of polyisocyanurate insulation a top layer of gypsum with 60 mil EPDM membrane. The EPDM membrane on roof A-08 is a white EPDM.

See Tab 2 - Roof Composition for detail information of each specific roof area.

Concerns and Issues:

1. On the main building the following items were observed.
 - a. Split and loose flashing were noted at the expansion joint.
 - b. The several of the skylights on the building are broken.
 - c. Open flashing laps were found.
 - d. Vegetation growth on the roof.
 - e. Ridges and blisters.
 - f. Repairs to the membrane.
2. On the modular building the following items were observed.
 - a. Holes
 - b. Debris in gutters.
 - c. Inadvisable repairs.

See Tab 4 – Photo Report for pictures of various examples of the Concerns and Issues.



ROOF EVALUATION REPORT SUBJECTIVE NARRATIVE

Recommendations:

1. The roofs on the main building and roof A-07 should be replaced. The skylights should also be replaced.
2. Repairs that could be done until the roof is replaced are:
 - a. Seal the open flashing laps and split flashing.
 - b. Seal the top of the flashings that are open.
 - c. Clean the clogged drain.
3. The roof on the modular building (A-08) can have the service life of the roof extended by over 8 years if the following repairs are completed.
 - a. Remove and replace wet insulation.
 - b. Keep the gutters clean.

Respectfully submitted,

BUILDING TECHNOLOGY ASSOCIATES (BTA)

Mark Nichols

Mark Nichols, RRC, CCS
Consultant



2. ROOF COMPOSITION

The **Roof Area Summary Report** is a brief description of each individual roof area, (one page per roof area), listing: general information, contractor/warranty information, roof construction, and basic roof details.

The **Defect Summary Report** is a detailed description of each individual roof area's deterioration based off roof defects observed during the inspection of the school.

This defect list provides a summary of all defects present on the roof area which includes the following:

- The code used to represent each defect type
- A description of each defect type
- The quantity of each defect by type
- The recommended repair strategy for each defect type (No work (blank), Temporary or Reconstructive)

*Each defect code located on the table is color coded to match the recommended repair strategy (No Work = Grey, Temporary = Red, Reconstructive = Blue).



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-01

Roof System Type: BUILT-UP

Roof Area General Information

Size (Square Ft):	7,888	Year Installed:	1997
Slope:	Less than or equal to .125 in	Area Use:	Gym
Drainage Type:	Internal Drains	Method of Roof Access	Interior Roof Hatch
Replacement Cost	\$98,501	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface	Aggregate					
Membrane	3 Ply	Organic Felt		Coal-tar Pitch		.18
Insulation Layer 1 (Top)	Lt. Wt. Insulating				Tapered	
Underlayment	Base Sheet			Adhered		
Deck	Steel					
Is there an underlying roof system?		No			Total R-Value	.27

Roof Area Details

Type of Base Flashing	Composition (Roofing Felt /	Base Flashing Coating	None
Type of Coping	None	Coping Panel Size (LxWxH)	
Number of Mechanical Units	2	Number of Penetrations	19
Is there Asbestos present in this roof area?		Are there leaks?	Yes, Reoccurring



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-02

Roof System Type: BUILT-UP

Roof Area General Information

Size (Square Ft):	10,412	Year Installed:	1997
Slope:	Less than or equal to .125 in	Area Use:	School
Drainage Type:	Internal Drains	Method of Roof Access	
Replacement Cost	\$130,020	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface	Aggregate					
Membrane	3 Ply	Organic Felt		Coal-tar Pitch		.18
Insulation Layer 1 (Top)	Lt. Wt. Insulating				Tapered	
Underlayment	Base Sheet			Adhered		
Deck	Steel					
Is there an underlying roof system?		No			Total R-Value	.27

Roof Area Details

Type of Base Flashing	Composition (Roofing Felt /	Base Flashing Coating	
Type of Coping	None	Coping Panel Size (LxWxH)	
Number of Mechanical Units	6	Number of Penetrations	30
Is there Asbestos present in this roof area?		Are there leaks?	Yes, Reoccurring



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-03

Roof System Type: BUILT-UP

Roof Area General Information

Size (Square Ft):	10,495	Year Installed:	1997
Slope:	Less than or equal to .125 in	Area Use:	School
Drainage Type:	Internal Drains	Method of Roof Access	
Replacement Cost	\$131,056	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface	Aggregate					
Membrane	3 Ply	Organic Felt		Coal-tar Pitch		.18
Insulation Layer 1 (Top)	Lt. Wt. Insulating				Tapered	
Underlayment	Base Sheet			Adhered		
Deck	Steel					
Is there an underlying roof system?		No			Total R-Value	.27

Roof Area Details

Type of Base Flashing	Composition (Roofing Felt /	Base Flashing Coating	
Type of Coping	None	Coping Panel Size (LxWxH)	
Number of Mechanical Units	6	Number of Penetrations	32
Is there Asbestos present in this roof area?		Are there leaks?	No



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-04

Roof System Type: PANEL

Roof Area General Information

Size (Square Ft):	2,369	Year Installed:	1997
Slope:	Less than or equal to .125 in	Area Use:	School
Drainage Type:	Internal Drains	Method of Roof Access	
Replacement Cost	\$22,128	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface						
Membrane	Flat Seam	Galvanized Steel				
Underlayment						
Deck	Steel					
Is there an underlying roof system?					Total R-Value	

Roof Area Details

Type of Base Flashing	Composition (Roofing Felt /	Base Flashing Coating	
Type of Coping		Coping Panel Size (LxWxH)	
Number of Mechanical Units	0	Number of Penetrations	9
Is there Asbestos present in this roof area?		Are there leaks?	No



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-05

Roof System Type: BUILT-UP

Roof Area General Information

Size (Square Ft):	6,315	Year Installed:	1997
Slope:	Less than or equal to .125 in	Area Use:	School
Drainage Type:	Internal Drains	Method of Roof Access:	
Replacement Cost	\$78,859	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface	Aggregate					
Membrane	3 Ply	Organic Felt		Coal-tar Pitch		.18
Insulation Layer 1 (Top)	Lt. Wt. Insulating				Tapered	
Underlayment	Base Sheet			Adhered		
Deck	Steel					
Is there an underlying roof system?		No			Total R-Value	.27

Roof Area Details

Type of Base Flashing	Composition (Roofing Felt /	Base Flashing Coating	
Type of Coping	None	Coping Panel Size (LxWxH)	
Number of Mechanical Units	1	Number of Penetrations	25
Is there Asbestos present in this roof area?		Are there leaks?	No



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-06

Roof System Type: BUILT-UP

Roof Area General Information

Size (Square Ft):	6,099	Year Installed:	1997
Slope:	Less than or equal to .125 in	Area Use:	School
Drainage Type:	Internal Drains	Method of Roof Access	
Replacement Cost	\$76,161	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface	Aggregate					
Membrane	3 Ply	Organic Felt		Coal-tar Pitch		.18
Insulation Layer 1 (Top)	Lt. Wt. Insulating				Tapered	
Underlayment	Base Sheet			Adhered		
Deck	Steel					
Is there an underlying roof system?		No			Total R-Value	.27

Roof Area Details

Type of Base Flashing	Composition (Roofing Felt /	Base Flashing Coating	
Type of Coping	None	Coping Panel Size (LxWxH)	
Number of Mechanical Units	1	Number of Penetrations	27
Is there Asbestos present in this roof area?		Are there leaks?	Yes, Reoccurring



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-07

Roof System Type: SINGLE-PLY

Roof Area General Information

Size (Square Ft):	4,053	Year Installed:	2001
Slope:	Less than or equal to .125 in	Area Use:	School
Drainage Type:	External Gutter	Method of Roof Access	
Replacement Cost	\$42,870	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface	Exposed Sheet					
Membrane	Reinforced Elasto			Fully Adhered		
Insulation Layer 1 (Top)	Lt. Wt. Insulating				Tapered	
Underlayment	Base Sheet			Adhered		
Deck	Steel					
Is there an underlying roof system?		No			Total R-Value	

Roof Area Details

Type of Base Flashing	Elastomeric / Thermoplastic	Base Flashing Coating	
Type of Coping		Coping Panel Size (LxWxH)	
Number of Mechanical Units	4	Number of Penetrations	10
Is there Asbestos present in this roof area?		Are there leaks?	No



Dirksen Elementary Roof Area Summary Report

Client: Chicago Public Schools

Building: Dirksen Elementary

Facility:

Roof Area ID: A-08

Roof System Type: SINGLE-PLY

Roof Area General Information

Size (Square Ft):	5,046	Year Installed:	2014
Slope:	Less than or equal to .125 in	Area Use:	School
Drainage Type:	External Gutter	Method of Roof Access:	
Replacement Cost	\$53,374	Roof Height:	

Roof Area Contractor/Warranty Information

System Manufacturer	Unknown	Manufacturer's ID	
Manufacturer's Agreement Type	Unknown	M.A. Expiration Year	
Contractor's Agreement Type	Unknown	C.A. Expiration Year	

Roof Area Construction

Layer Type	Description			Method of Attachment	Insulation Thickness	R-Value
Surface	Exposed Sheet					
Membrane	Reinforced Elasto			Fully Adhered		
Insulation Layer 1 (Top)	Lt. Wt. Insulating				Tapered	
Underlayment	Base Sheet			Adhered		
Deck	Steel					
Is there an underlying roof system?		No			Total R-Value	

Roof Area Details

Type of Base Flashing	Elastomeric / Thermoplastic	Base Flashing Coating	
Type of Coping		Coping Panel Size (LxWxH)	
Number of Mechanical Units	1	Number of Penetrations	7
Is there Asbestos present in this roof area?		Are there leaks?	No



Dirksen Elementary Defect Summary Report

Building: Dirksen Elementary
Subsystem: BUILT-UP
Area ID: A-05
Sqft: 6,315

Code	Description	Quantity	Action
R2	Wet insulation--Suspected	208sf	Reconstructive



Dirksen Elementary Defect Summary Report

Building: Dirksen Elementary
Subsystem: SINGLE-PLY
Area ID: A-08
Sqft: 5,046

Code	Description	Quantity	Action
DD3	Gutter filled with debris/vegetation	100 lf	Reconstructive
S2	Insulation wet - Suspected	623sf	Reconstructive



3. SERVICEABILITY DRAWINGS

- SERVICEABILITY ESTIMATE DRAWING
- ADJUSTED SERVICEABILITY ESTIMATE DRAWING

The **Serviceability Drawings** identifies the graphic projection of remaining life by roof area. Each separate color represents a different range of life expectancy. This allows the user to identify the overall condition of the inventory in various stages of remaining life at a glance.

Serviceability Estimate (SE) Drawing: identifies life expectancy of the roof in its current condition.

Adjusted Serviceability Estimate (ASE) Drawing: indicates the adjusted remaining life if optimal repairs are performed, therefore, extending the life of the roof system.

Life Expectancy Ranges:

Red roof areas indicate an anticipated remaining financial life of 1-3 years.

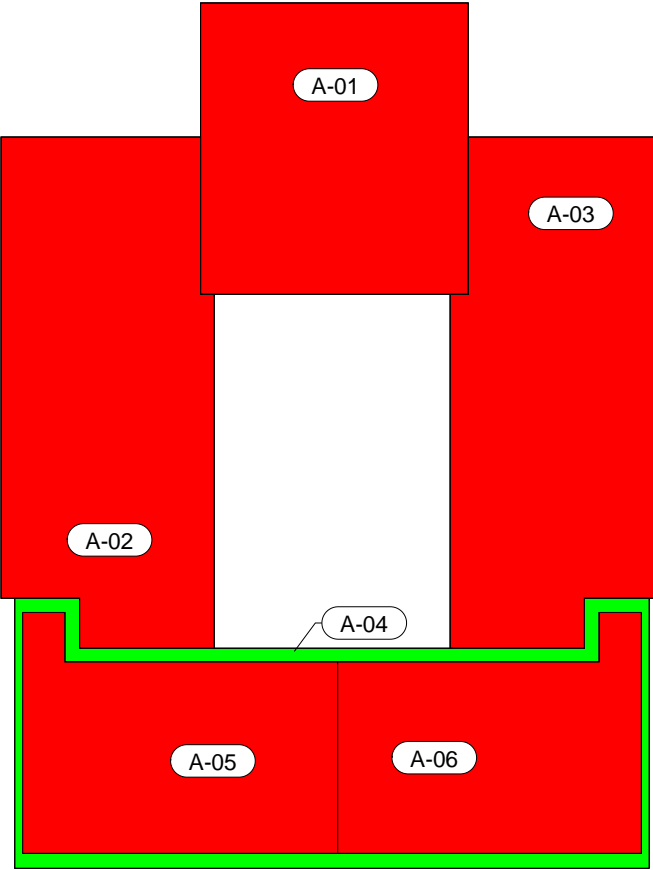
Yellow roof areas indicate an anticipated remaining financial life of 4-10 years.

Green roof areas indicate an anticipated remaining financial life of 11+ years.

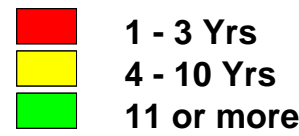
* Core cuts were not permitted during assessment, therefore unless data was provided all non-visible as-built data (i.e. insulation) was assumed based on minimum ASHRAE insulating standards (R=20). Replacement costs and service life projections may vary if actual as-builts are obtained.



Dirksen Elementary - Remaining Life Drawing

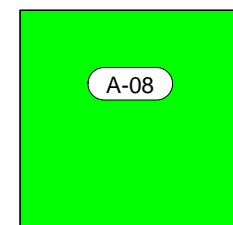
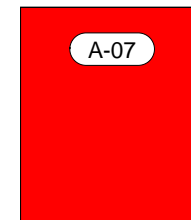


2018 Remaining Life (yrs)





Dirksen Elementary - Adjusted Serviceability Estimate Drawing



2018 ASE (yrs)

- 1 - 3 Yrs
- 4 - 10 Yrs
- 11 or more



4. PHOTO REPORT

The **Aerial Image with Identified Roof Areas** is the prequel to the Photo Report, which locates the roof areas on an overall aerial image of the school.

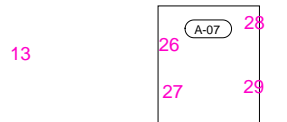
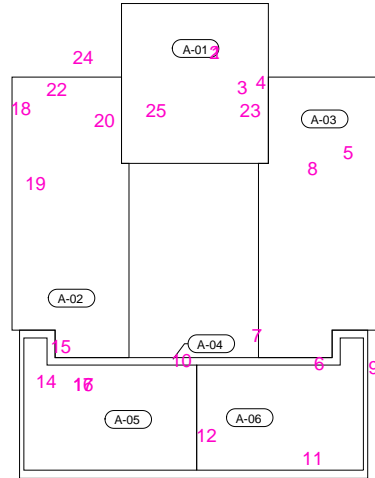
The **Photo Report** displays each captured photo that was taken during the on-site assessment. Each photo is labeled by number and includes a description. The first page of the Photo Report identifies the location of each photo on an overview drawing of the assessed school. The following pages are organized by Roof Area, which is listed in the upper left of each page. The photos on each page correspond with the identified Roof Area. In the upper right of each page is a small drawing of that Roof Area which includes the location of each photo.

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Size of Building: 52,677 sqft.



Building

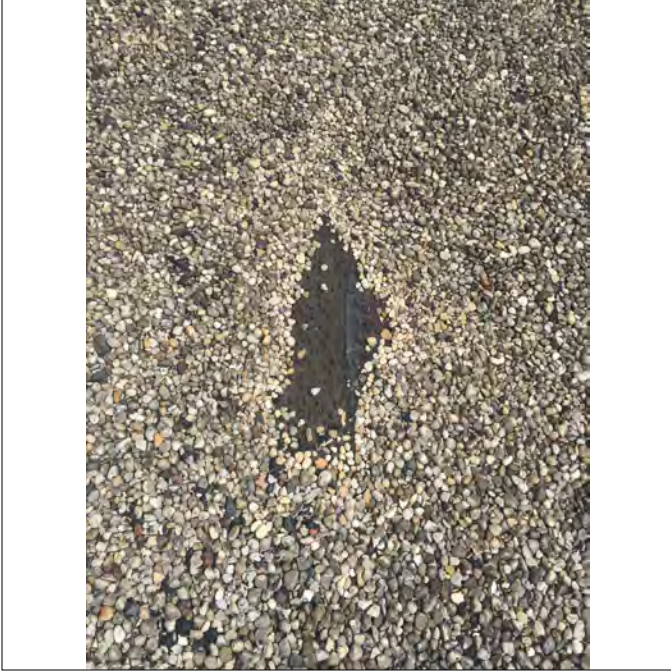
Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Size of Building: 52,677 sqft.

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6/14/2018 10:19:42 AM



BLISTERED MEMBRANE

Photo #: 21

6/14/2018 10:55:03 AM



MEMBRANE REPAIR

Photo #: 24

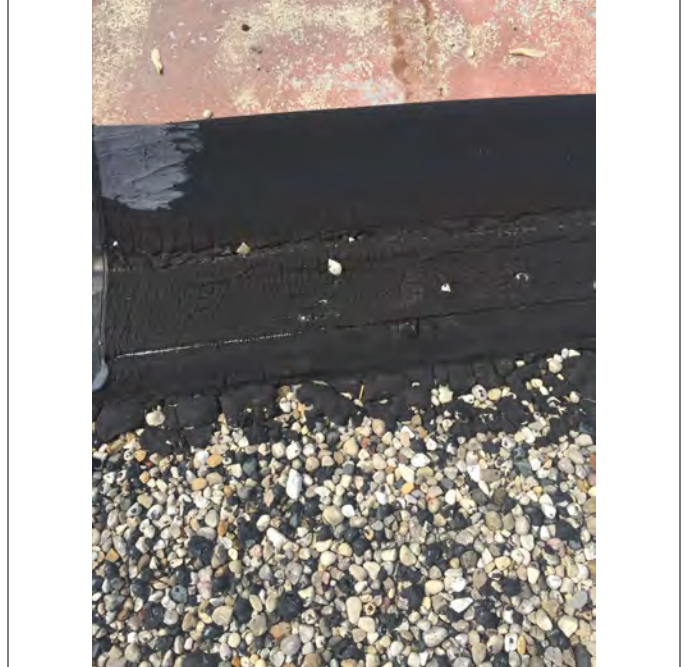
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MEMBRANE REPAIR

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SPLIT FLASHING

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Size of Building: 52,677 sqft.

Photo #: 9

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ROOF OVERVIEW

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-01

Subsystem: BUILT-UP

Size: 7,888 sqft.

Year Installed: 1997

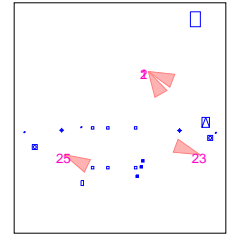


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ROOF OVERVIEW

Photo #: 2

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ROOF OVERVIEW

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ROOF OVERVIEW

Photo #: 25

6/14/2018 12:18:29 PM



PLUGGED DRAIN

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-01

Subsystem: BUILT-UP

Size: 7,888 sqft.

Year Installed: 1997

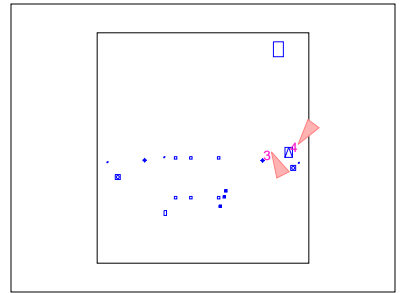
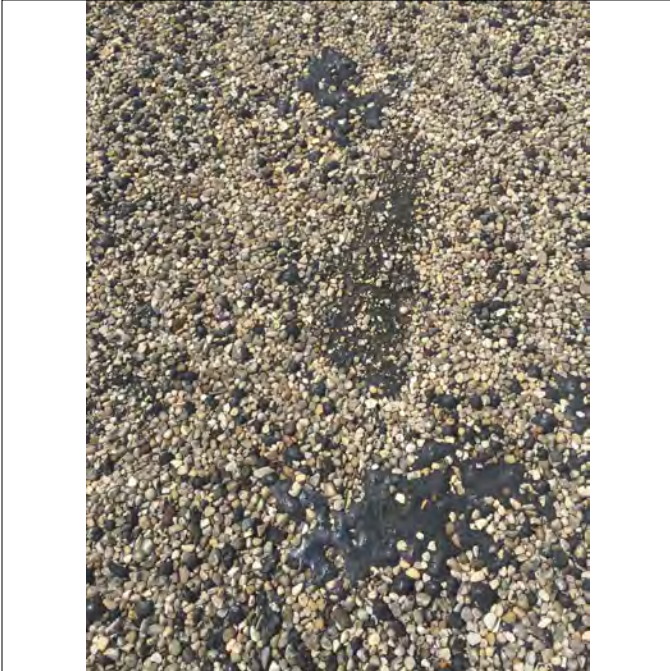


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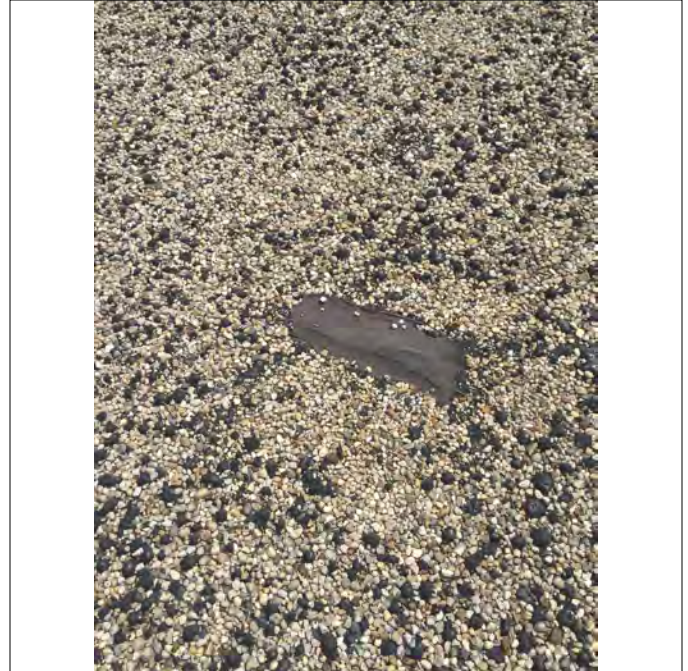
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BLISTERED MEMBRANE

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MEMBRANE REPAIR

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-02

Subsystem: BUILT-UP

Size: 10,412 sqft.

Year Installed: 1997

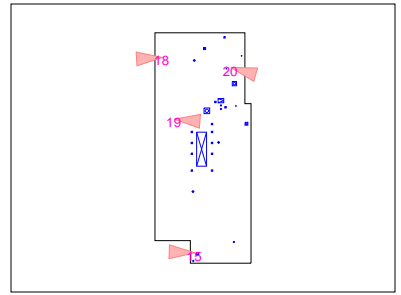
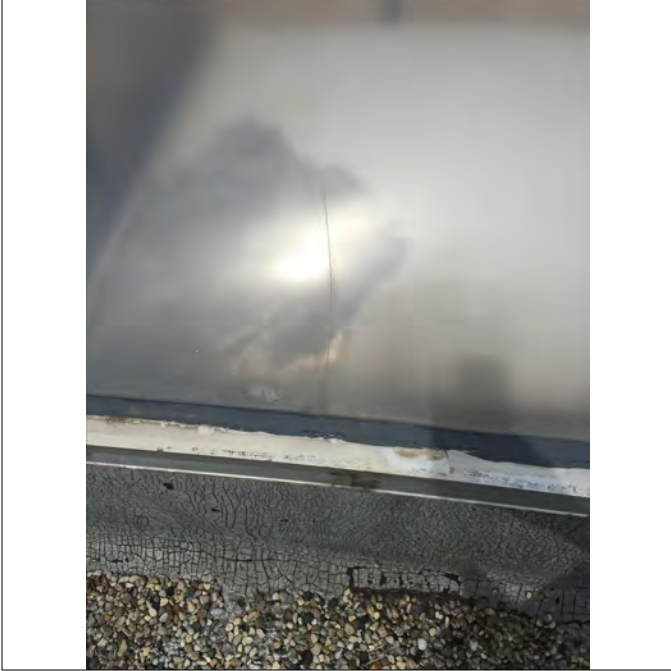


Photo #: 15

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BROKEN SKYLIGHT

Photo #: 18

6/14/2018 10:46:46 AM



VEGETATION GROWTH

Photo #: 19

6/14/2018 10:50:42 AM



MEMBRANE RIDGES

Photo #: 20

6/14/2018 10:51:28 AM



BLISTERED MEMBRANE

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-02

Subsystem: BUILT-UP

Size: 10,412 sqft.

Year Installed: 1997

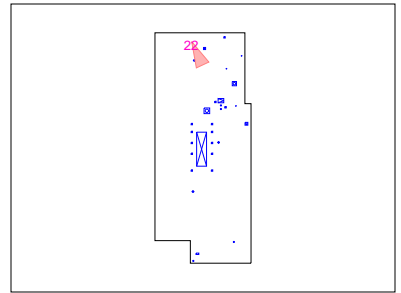


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LOW ELEVATION OF FLASHING

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-03

Subsystem: BUILT-UP

Size: 10,495 sqft.

Year Installed: 1997

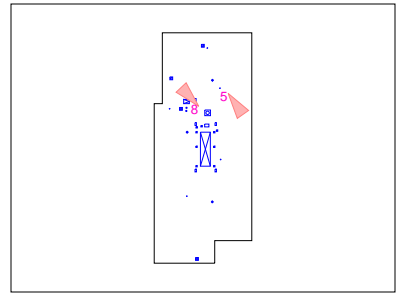


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VEGETATION GROWTH

Photo #: 8

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VEGETATION OVERGROWTH

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-04

Subsystem: PANEL

Size: 2,369 sqft.

Year Installed: 1997

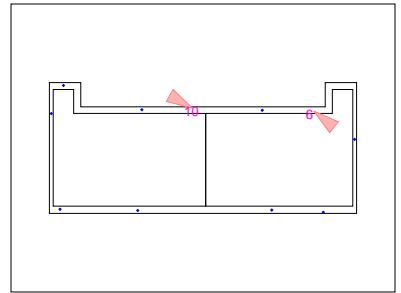
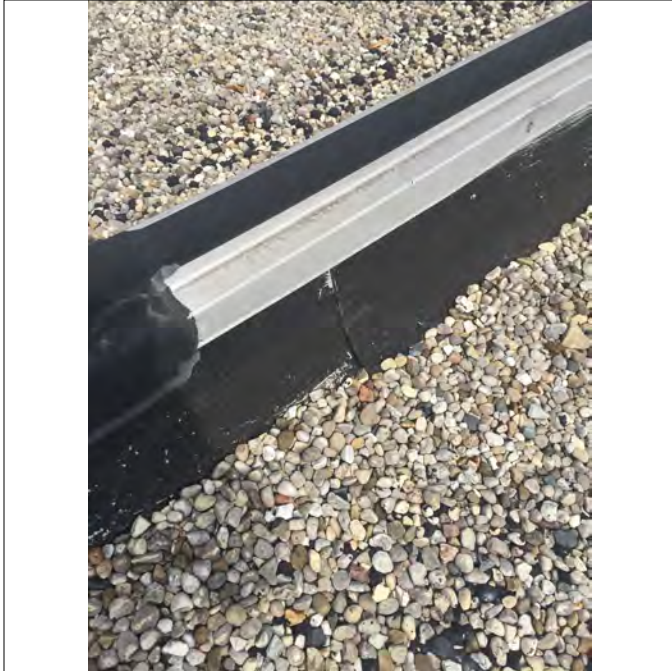


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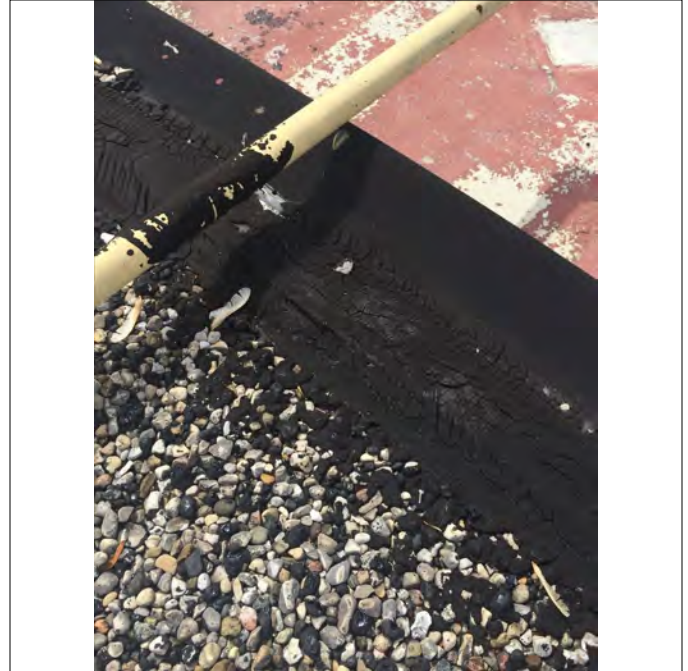
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LOOSE LAP

Photo #: 6

6/14/2018 9:47:08 AM



OPEN FLASHING

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-05

Subsystem: BUILT-UP

Size: 6,315 sqft.

Year Installed: 1997

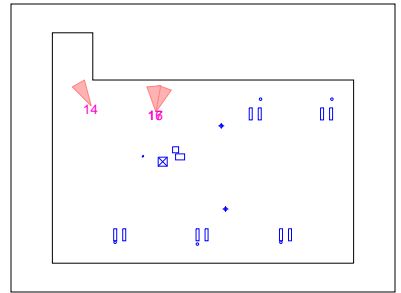


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LOOSE FLASHING

Photo #: 16

6/14/2018 10:28:47 AM



REPAIRED SKYLIGHT

Photo #: 17

6/14/2018 10:31:28 AM



ROOF OVERVIEW

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-06

Subsystem: BUILT-UP

Size: 6,099 sqft.

Year Installed: 1997

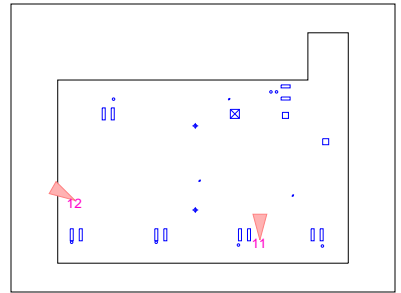
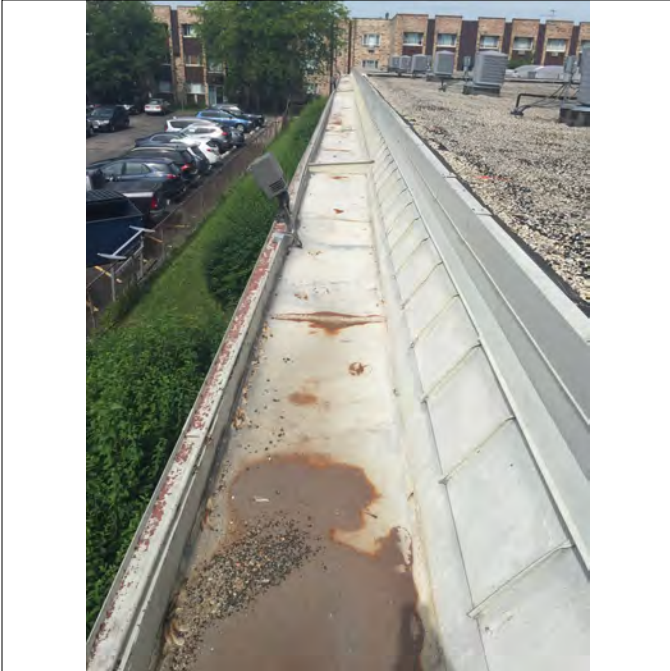


Photo #: 11

6/14/2018 9:56:40 AM



ROOF AREA OVERVIEW

Photo #: 12

6/14/2018 10:18:57 AM



ROOF OVERVIEW

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-07

Subsystem: SINGLE-PLY

Size: 4,053 sqft.

Year Installed: 2001

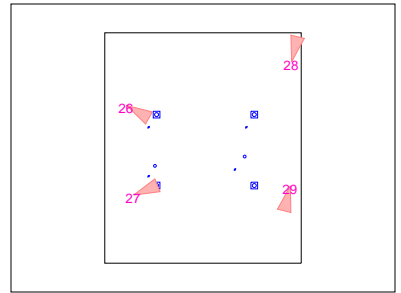


Photo #: 26

6/14/2018 1:21:23 PM



ROOF OVERVIEW

Photo #: 27

6/14/2018 1:21:50 PM



HOLE IN MEMBRANE

Photo #: 28

6/14/2018 1:23:53 PM



LOOSE MEMBRANE REPAIR

Photo #: 29

6/14/2018 1:25:59 PM



ROOF OVERVIEW

Building

Name: Dirksen Elementary

Address: 8601 West Foster Ave. Chicago, IL 60656

Roof Area

Name: A-08

Subsystem: SINGLE-PLY

Size: 5,046 sqft.

Year Installed: 2014

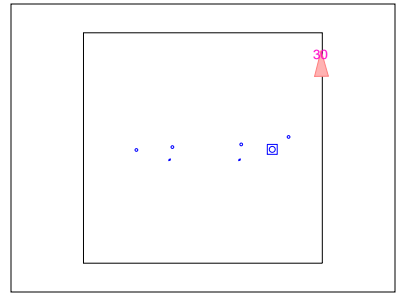
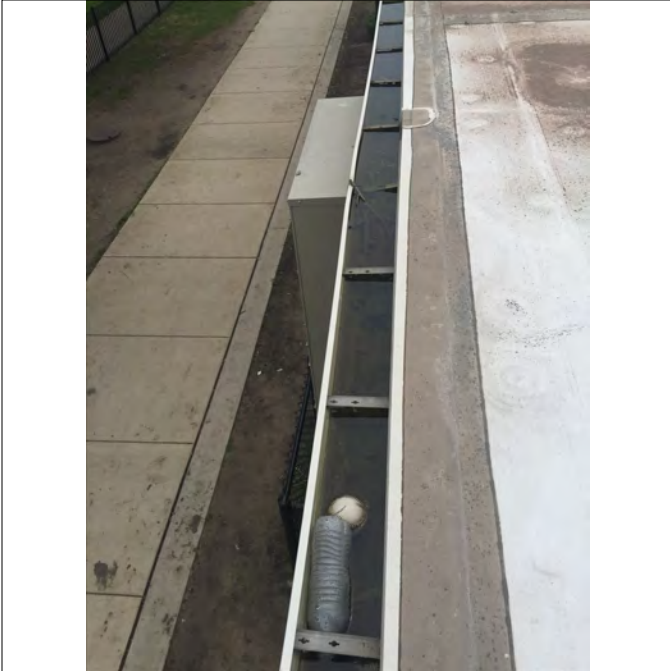


Photo #: 30

6/14/2018 1:33:13 PM



DEBRIS IN GUTTER



5. ROOF PLAN

The **Roof Plan** is an overall drawing of the entire school's roof plan with graphic representation of each roof area identifying roof subsystem (BUR, SINGLE-PLY, PANEL, FOAM, or SHINGLE), square footage (SF), and the locations of all visible roof features on the roof.

Symbol Legend: located on the roof plan to describe the various equipment/penetration symbols, roof core locations, and moisture content within the insulation.

Moisture Survey Identification (*if applicable*): located on the roof plan in **Red** are the locations where moisture was discovered.



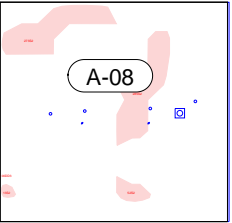
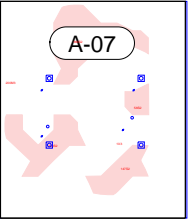
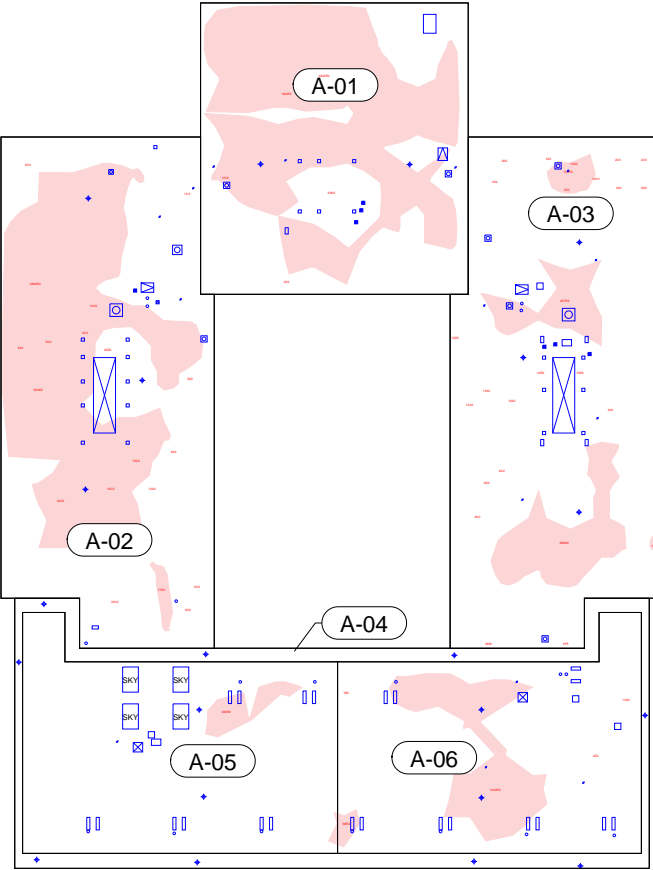
Dirksen Elementary

Equipment Legend

- Drain
- Insulation Vent
- Pitch Pan
- Vent Pipe
- Small Round Penetration
- Medium Round Penetration
- Large Round Penetration
- Hatch
- Square Penetration
- Mechanical Unit
- Power Vent
- Column Support
- Scupper
- Ladder
- Plugged Drain

Symbol Legend

- Wet Insulation





6. MOISTURE SURVEY REPORT

The **Moisture Survey Report**, through our subcontractor Flood Testing Laboratories, inc. is the evaluation of any moisture content that is located within the roof membrane and its components. The survey is recorded through roof cores analysis and roof plan mapping, *if applicable*. The report can be incorporated into capital planning and budgeting for any future projects to repair or replace roof areas.

- **Roof Moisture Test Results:** this section defines what actions were taken during the survey as well as the moisture results of individual cores at identified roof areas, following a brief summary of what was identified.
- **Moisture Mapping (*if applicable*):** this section displays a table of the moisture survey as well as a roof plan of the moisture results. The roof plan displays a grid spacing of approx. 10' used to lists the amount of moisture discovered at each location, **Blue** showing minimal moisture and **Red** showing heavy moisture.

June 21, 2018

Mark Nichols, RRC, CCS
Regional Director
Building Technology Associates, Inc.
21850 Greenfield Rd.
Oak Park, MI 48237

Re: Nuclear Roof Moisture Test Results
Dirksen ES

Dear Mr. Nichols:

Attached are the results from the roof moisture inspection performed on June 14, 2018 at the Dirksen Elementary School. Grids were created with 10-foot spacing in order to take accurate readings on the roof areas. The grids were assigned coordinates based on the extents of the roof areas and began at the northwest corner of each roof. Results were logged and taken back to the laboratory for statistical analysis. Additionally, roof cores were taken at various gauge readings to determine moisture content. Insulation contents were followed up by Gravimetric Analysis in the laboratory.

The cores taken during the survey revealed a similar construction in certain roof areas. Additional cores were not taken in these areas due to the same roof construction and/or location and the determination that any additional would be unnecessary for purposes of the survey.

Cores taken on the main building roofs revealed an asphalt built-up roof over tapered lightweight insulating concrete with EPS insulation. EPS was approximately 6.0" thick in one of the areas cored but is assumed to vary with slope. The LWC was over a steel roof deck. The annex roofs revealed EPDM membrane over 0.5" gypsum cover board over 2.5" poly iso over a steel roof deck.

Moisture content of the insulation of the roof cores are provided below as well as core locations and data on separate sheets. A roof plan is also attached to this report:

Roof A-02

Core #1 – 29.7% moisture (27)
Core #2 – 37.0% moisture (42)

Roof A-07

Core #1 – 10.5% moisture (8)

Typically, a normal distribution is used to analyze the moisture data. Moisture plots are attached to this report. Based on the overall data; readings for each roof section are assumed:

June 21, 2018

For Roof A-01 through A-06, it appears that data readings of up to 26 are relatively dry. Data readings above 26 are likely to have a higher moisture content, beginning at slightly damp and transitioning to wet. A-04 could not be scanned due to its small size.

For Roof A-07 and A-08, it appears that data readings up to 7.5 are relatively dry. Data ranges above 7.5 are likely to have a higher moisture content.

The grid used to survey the roofs and the actual readings obtained during the moisture survey are also attached. Core locations are indicated by a yellow box on the grid/data reading pages. Please feel free to contact me if you have any questions.

Respectfully submitted,



Raymond A. Makiejus, RRC, RRO

Moisture Map for Roof

Location:		Dirksen - A-01													
Date:		Measured 6/14/18													
Customer:		BTA													
Grid Spacing:		Each square represents 10 Ft													
Input Data		Grid measured from the northwest corner of roof and notated in feet below and alongside the grid line identification													
		1	2	3	4	5	6	7	8						
Distance		2	12	22	32	42	52	62	72						
A	2	22	40	40	34	33	20	19	18						
B	12	35	40	42	29	33	25	20	27						
C	22	20	39	62	58	36	29	22	30						
D	32	26	25	18	24	21	47	37	40						
E	42	14	39	41	41	36	26	20	26						
F	52	25	28	29	0	0	26	28	22						
G	62	19	25	26	24	16	27	25	30						
H	72	16	23	25	33	27	24	25	26						
I	82	16	22	23	19	26	22	20	21						

Moisture Map for Roof

Location:		Dirksen - A-02
Date:		Measured 6/14/18
Customer:		BTA
Grid Spacing:		Each square represents 10 Ft
Input Data		Grid measured from the northwest corner of roof and notated in feet below and alongside the grid line identification

		1	2	3	4	5	6	7							
Distance		2	12	22	32	42	52	62							
A	2	18	20	13	17	18	20	24							
B	12	16	26	26	30	27	24	20							
C	22	12	26	40	35	22	24	26							
D	32	28	48	44	34	24	24	13							
E	42	41	42	39	37	19	21	19							
F	52	30	35	35	23	17	18	15							
G	62	31	28	30	36	32	24	24							
H	72	71	62	71	0	0	36	32							
I	82	70	69	66	0	0	31	21							
J	92	32	27	31	0	0	24	18							
K	102	33	48	42	30	39	27	16							
L	112	22	22	27	35	30	23	22							
M	122	20	27	32	32	26	22	17							
N	132	17	25	29	34	27	22	16							
O	142	16	26	27	18	25	24	16							
P	152	0	0	0	19	22	27	19							

Moisture Map for Roof

Location:		Dirksen - A-03
Date:		Measured 6/14/18
Customer:		BTA
Grid Spacing:		Each square represents 10 Ft
		Grid measured from the northwest corner of roof and notated in feet below and alongside the grid line identification

Input Data

		1	2	3	4	5	6	7							
Distance		2	12	22	32	42	52	62							
A	2	17	14	12	10	21	16	15							
B	12	18	24	23	35	24	25	14							
C	22	19	24	19	23	19	19	20							
D	32	21	20	17	25	18	20	12							
E	42	23	25	26	20	26	21	18							
F	52	25	23	11	36	19	19	17							
G	62	19	31	28	37	26	22	17							
H	72	17	23	0	0	26	21	16							
I	82	21	19	0	0	22	20	14							
J	92	24	22	0	0	19	17	16							
K	102	18	24	26	22	24	23	15							
L	112	11	18	24	20	30	17	15							
M	122	18	17	26	21	27	23	13							
N	132	20	24	27	23	27	23	14							
O	142	22	28	29	31	34	24	28							
P	152	24	27	25	37	0	0	0							

Moisture Map for Roof

Location:		Dirksen - A-05/A-06																			
Date:		Measured 6/14/18																			
Customer:		BTA																			
Grid Spacing:		Each square represents 10 Ft																			
		Grid measured from the northwest corner of roof and notated in feet below and alongside the grid line identification																			
Input Data																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Dist		2	12	22	32	42	52	62	72	82	92	102	112	122	132	142	152	162	172	182	192
A	2	18																			16
B	12	19																			18
C	22	24	18	18	0	23	0	23	25	28	25	18	22	31	33	27	29	26	14	25	22
D	32	17	20	19	0	24	0	31	26	18	20	26	19	23	20	27	24	21	22	20	22
E	42	19	18	21	20	23	18	20	15	17	17	19	24	21	22	21	27	20	21	19	17
F	52	20	17	17	13	21	21	21	26	24	22	19	23	26	23	30	26	30	18	23	19
G	62	18	16	21	22	21	22	21	18	16	19	28	24	22	25	25	31	25	21	17	17
H	72	19	22	21	18	20	20	20	21	16	24	25	21	17	17	21	19	17	19	21	18

Moisture Map for Roof

Location:		Dirksen - A-07													
Date:		Measured 6/14/18													
Customer:		BTA													
Grid Spacing:		Each square represents 10 Ft													
<u>Input Data</u>		Grid measured from the northwest corner of roof and notated in feet below and alongside the grid line identification													
		1	2	3	4	5	6								
Distance		2	12	22	32	42	52								
A	2	6	6	8	7	6	6								
B	12	7	7	8	8	8	7								
C	22	7	6	8	6	6	7								
D	32	7	7	7	6	8	7								
E	42	8	7	8	6	7	7								
F	52	6	8	7	7	8	6								
G	62	7	7	6	8	7	7								

Moisture Map for Roof

Location:		Dirksen - A-08													
Date:		Measured 6/14/18													
Customer:		BTA													
Grid Spacing:		Each square represents 10 Ft													
		Grid measured from the northwest corner of roof and notated in feet below and alongside the grid line identification													
<u>Input Data</u>			1	2	3	4	5	6	7						
	Distance	2	12	22	32	42	52	62							
A	2	6	7	8	8	6	6	7							
B	12	8	8	7	7	7	8	7							
C	22	7	7	7	7	7	8	6							
D	32	7	6	6	6	8	7	6							
E	42	7	7	7	7	8	7	8							
F	52	6	5	6	7	6	6	5							
G	62	8	6	6	7	8	7	6							