Roof Inspection Report

Prepared for:

Mr. Greg Boettger Bellevue Schools & Mr. Ralph Gladbach GP Architecture, LLC.

Prepared by:

Roofing Solutions, Inc. 6728 W. 153rd Street Overland Park, KS 66223



Project Location

Lied Activity Center 2700 Arboretum Drive Bellevue, NE 68005 Facility: Lied Activity Center 2700 Arboretum Drive Bellevue Nebraska 68005 U.S.A.

Contact Name: Ralph Gladbach

Contact Telephone: (402) 934-7749 Ext:

Contact Fax: () -

Date of Last Inspection: Feb 28, 2017

Type of building: School

Type of Neighborhood: Residential



Roof Section List					
Photo	Section / Name / Year Installed	Size / Height	Roof Type	Condition Index/ *RCI/ ASLR(Yrs)	Estimated Replacement Value
	Roof A A 2002	34,472 sq. ft. 40 ft.	Built-Up Asphalt Roofing	Poor 40 2(Yrs)	\$241,304.00
	Roof B B 2002	3,553 sq. ft. 40 ft.	Built-Up Asphalt Roofing	Poor 40 2(Yrs)	\$24,871.00
	Roof C C 2002	6,936 sq. ft. 28 ft.	Built-Up Asphalt Roofing	Poor 33 0(Yrs)	\$104,040.00
		44,961			\$370,215.00
*RCI Rating 0 -100 where 100 is	excellent				

Recommendation Summary							
Section ID	Budget Year	Activity Type	Action Item ?	Allocation	Urgency	Budget Amount	
Roof A	2017	Repair	Yes	Expense	High	\$2,000	
Roof A	2019	Retrofit	Yes	Capital	Moderate	\$241,304	
Roof A	2019	Infrared Scan	Yes	Expense	High	\$2,000	
Roof B	2017	Repair	Yes	Expense	High	\$1,000	
Roof B	2019	Retrofit	Yes	Capital	Moderate	\$24,871	
Roof B	2019	Infrared Scan	Yes	Expense	High	\$500	
Roof C	2017	Replacement	Yes	Capital	High	\$104,040	
						\$375,715	

Facility:Lied Activity Center

Capital Budgets - 5 Years					
Section ID	2017	2018	2019	2020	2021
Roof A	\$0	\$0	\$241,304	\$0	\$0
Roof B	\$0	\$0	\$24,871	\$0	\$0
Roof C	\$104,040	\$0	\$0	\$0	\$0
	\$104,040	\$0	\$266,175	\$0	\$0

Expense Budgets - 5 Years					
Section ID	2017	2018	2019	2020	2021
Roof A	\$2,000	\$0	\$2,000	\$0	\$0
Roof B	\$1,000	\$0	\$500	\$0	\$0
	\$3,000	\$0	\$2,500	\$0	\$0

Total Budgets - 5 Years					
Section ID	2017	2018	2019	2020	2021
Roof A	\$2,000	\$0	\$243,304	\$0	\$0
Roof B	\$1,000	\$0	\$25,371	\$0	\$0
Roof C	\$104,040	\$0	\$0	\$0	\$0
	\$107,040	\$0	\$268,675	\$0	\$0

Roof Size: 34,472 sq. ft.

Est. replacement Cost: \$ 241,304.00

Existing System Type: Built-Up Asphalt Roofing

Year Installed: 2002

Assessed Service Life Remaining (Years) : 2

- Height: 40 Ft.
 - Slope: 1/4" per ft.
- Interior Sensitivity: Normal
 - Drainage: Adequate
- Currently Leaking? Unknown
- History of Leaking? Yes
- Drainage and Leak Details: Roof Section A slopes from a central ridge line towards the north and south and drains to ten (10) primary roof drains, each of which are accompanied by an overflow drain adjacent.

Ryan, RSI's contact at the facility, reported past leaks at the north and south walls and was not sure if the leaks have been resolved.

Existing Roof System Construction					
Layer Type	Description	Method Of Attachment			
Deck	Metal	Spot Attached			
Insulation	Polyisocyanurate	Mechanically Fastened			
Cover board	Fiberboard5" (1/2")	Hot Asphalt			
Membrane	BUR - Multiply	Hot Asphalt			
Surfacing	Gravel	Hot Asphalt			



Overall Core Condition

One (1) core cut was performed. The deck is a steel decking and has an intricated acoustical ceiling panel. There is one (1) layer of 3" polyisocyanurate insulation board with a 1/2" wood fiber cover board. The membrane is a multiply BUR with a gravel surface. There is also a layer of fiberglass, sound absorption material in the flutes of the metal decking.

Core Photos					
Photos	Date	Description			
	Feb 28, 2017	Deck Underside			
	Feb 28, 2017	Roof System Core			

Overall Roof Inspection Assessments							
Date	Inspection Type	Inspecting Company	Inspector				
Feb 28, 2017	Phase 1 Roof Inspection	Roofing Solutions, Inc.	Garry Hendrickson				
Roof Section A fifteen (15) yea are flashed wir prefinished me Defects and co	Roof Section A refers to the low slope roof system over the gymnasium at the Lied Activity Center. The roof is a fifteen (15) year old BUR with a gravel surface. The perimeter sides of the roof area are a wall detail. The walls are flashed with a granular surfaced modified bitumen membrane flashing and the walls are topped with a prefinished metal coping cap.						
 Random areas with surface loss of the gravel roof surfacing There are what appears to be hail hits to the western side of the shingle roof area There are repair attempts to the BUR system One (1) torn ridge cap on the shingle roof area Random areas with open BUR flashing laps Random areas with split BUR flashing corners Split pitch pocket filler The BUR flashings on the roof hatch are sealed onto the counter flashing 							
Overall, the roof system is in poor condition due to past leak issues and the above referenced defects. With the aforementioned defects addressed, in addition to routine maintenance and regular inspection, the roof system should remain effective for the duration of its assessed service life, approximately two (2) years. There was no warranty information available for this roof section at the time of inspection.							

Recommendations Details						
Budget Year	Activity Type	Action Item ?	Allocation	Urgency	Quotation \$	
2017	Repair	Yes	Expense	High	\$2,000	
RSI recomme	ends repairs be completed in acco	rdance with th	e attached deficiency	list.		
2019	Infrared Scan	Yes	Expense	High	\$2,000	
RSI recommends an infrared scan be performed to locate any wet insulation present in the current roof system.						
2019	Retrofit	Yes	Capital	Moderate	\$241,304	
RSI recommends the installation of a new twenty (20) year design life retrofit roof system. We further recommend installation of new perimeter metal and projection details per the SMACNA Architectural Sheet Metal Manual.						
					\$245,304	

Roof Name: B	
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Roof Size: 3,553 sq. ft.

Est. replacement Cost: \$24,871.00

Existing System Type: Built-Up Asphalt Roofing

Year Installed: 2002

Assessed Service Life

Remaining (Years) :

- Height: 40 Ft.
 - Slope: 1/4" per ft.
- Interior Sensitivity: Normal
 - Drainage: Adequate
- Currently Leaking? Unknown
- History of Leaking? Yes
- Drainage and Leak
Details:Roof Section B slopes to the north and drains to a
primary roof drain with an overflow drain adjacent.

Ryan, RSI's contact at the facility, reported past leaks at the north and south walls and was not sure if the leaks have been resolved.

Existing Roof System Construction					
Layer Type	Description	Method Of Attachment			
Deck	Metal	Spot Attached			
Thermal barrier	5/8" Gypsum board	Laid - In -Place			
Insulation	Polyisocyanurate	Mechanically Fastened			
Cover board	Fiberboard5" (1/2")	Hot Asphalt			
Membrane	BUR - Multiply	Hot Asphalt			
Surfacing	Gravel	Hot Asphalt			



Overall Core Condition

One (1) core cut was performed. The deck is a steel decking and there is one (1) layer of 5/8" gypsum. The insulation consists of one (1) layer of 3" polyisocyanurate insulation board and 1/2" wood fiber cover board. The membrane is a multiply BUR with a gravel surface.

	Со	re Photos
Photos	Date	Description
	Feb 28, 2017	Roof System Core

	Overall Roof In	spection Assessmen	ts
Date	Inspection Type	Inspecting Company	Inspector
Feb 28, 2017	Phase 1 Roof Inspection	Roofing Solutions, Inc.	Garry Hendrickson

Roof Section B refers to the low slope roof system over a 2nd floor, small room at the west end of the gymnasium at the Lied Activity Center. The roof is a fifteen (15) year old BUR with a gravel surface. The perimeter sides of the roof area are a wall detail. The walls are flashed with a granular surfaced modified bitumen membrane flashing and are topped with a prefinished metal coping cap.

Defects and conditions found during the inspection include the following:

- Previous repair attempts observed to the BUR system
- Minimal flashing height along the front wall
- Random areas with split BUR flashing corners
- Missing storm collars on pipe penetration flashings
- One (1) loose wall-mounted security camera stand

Overall, the roof system is in poor condition due to past leak issues and the above referenced defects. With the aforementioned defects addressed, in addition to routine maintenance and regular inspection, the roof system should remain effective for the duration of its assessed service life, approximately two (2) years. There was no warranty information available for this roof section at the time of inspection.

	Recom	mendati	ions Details		
Budget Year	Activity Type	Action Item ?	Allocation	Urgency	Quotation \$
2017	Repair	Yes	Expense	High	\$1,000
RSI recomm	ends repairs be completed in acco	rdance with th	e attached deficiency	list.	
2019	Infrared Scan	Yes	Expense	High	\$500
RSI recomm	ends an infrared scan be performe	d to locate an	y wet insulation preser	nt in the current r	oof system.
2019	Retrofit	Yes	Capital	Moderate	\$24,871
RSI recommon	ends the installation of a new twen f new perimeter metal and projection	ty (20) year de on details per	esign life retrofit roof sy the SMACNA Architec	vstem. We furthe tural Sheet Meta	er recommend I Manual.
					\$26,371

Roof	Name:	С
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Roof Size: 6,936 sq. ft.

Est. replacement Cost: \$ 104,040.00

Existing System Type: Built-Up Asphalt Roofing

Year Installed: 2002

Assessed Service Life Remaining (Years) :

- Height: 28 Ft.
 - Slope: 1/4" per ft.
- Interior Sensitivity: Normal
- Drainage: Adequate
- Currently Leaking? Yes
- History of Leaking? Yes
- Drainage and Leak Details: Roof Section C slopes from a central ridge line towards the north and south and drains to three (3) primary roof drains, each of which are accompanied by an overflow drain adjacent.

Ryan, RSI's contact at the facility, reported leaks at the south wall, some of which may be condensation leaks. One (1) active roof leak was reported below the blocked drain area.

Existing Roof System Construction				
Layer Type	Description	Method Of Attachment		
Deck	Precast concrete	Spot Attached		
Vapor retarder	2 ply hot	Hot Asphalt		
Insulation	Polyisocyanurate	Hot Asphalt		
Cover board	Fiberboard5" (1/2")	Hot Asphalt		
Membrane	BUR - Multiply	Hot Asphalt		
Surfacing	Gravel	Hot Asphalt		



Overall Core Condition

Two (2) core samples were taken to verify the roofing layers in place. The deck is a precast concrete panel decking and there is a mopped vapor barrier. Core #1 revealed two (2) layers of polyisocyanurate insulation board which appear to be part of a tapered insulation system. Core #2 revealed a single layer of polyisocyanurate board. Both core samples have one (1) layer of 1/2" wood fiber cover board and a multiply BUR system with a gravel surface.

	Со	re Photos
Photos	Date	Description
	Feb 28, 2017	Deck Underside
	Feb 28, 2017	Core cut #1
	Feb 28, 2017	Core cut #2

	Overall Roof In	spection Assessmen	ts
Date	Inspection Type	Inspecting Company	Inspector
Feb 28, 2017	Phase 1 Roof Inspection	Roofing Solutions, Inc.	Garry Hendrickson
Roof Section (fifteen (15) yea walls are flash prefinished me extends under Defects and co	C refers to the low slope roof system of ar old BUR with a gravel surface. The ed with a granular surfaced modified stal coping cap. The interior walls are an EIFS wall covering.	over the pool area at the Lied Activity perimeter sides of the roof area are bitumen membrane flashing and the flashed with the same type of memb include the following:	/ Center. The roof is a a wall detail. The exterior walls are topped with a orane flashing which
- Surface loss - One (1) block - Previous rep - The EIFS wa - Random area - Areas with sp	of the gravel roof surfacing <ed drain="" line<br="">air attempts observed to the BUR sys Il covering is installed close to the roc as with open BUR flashings olit BUR flashing corners</ed>	tem of elevation at numerous locations	
Overall, the root the observed of be neither feas available for th	of system is in poor condition due to r conditions, it is our opinion compreher sible nor cost effective. We recomme his roof section at the time of inspectic	eported leak issues and the above rensive repairs in an effort to extend th nd the roof be replaced. There was on.	eferenced defects. Given le life of the system would no warranty information

	Recom	mendati	ions Details		
Budget Year	Activity Type	Action Item ?	Allocation	Urgency	Quotation \$
2017	Replacement	Yes	Capital	High	\$104,040
RSI recommo roof system. SMACNA Ar	ends a complete tear-off of existing We further recommend the replace chitectural Sheet Metal Manual.	roof system a ement of all p	and the installation of a erimeter coping cap ar	a new twenty (20 ad projection det) year design life ails per

Prepared By: Roofing Solutions, Inc.

\$104,040



Defect Code:	8	Quantity:	Random	Priority:	Monitor
Description: Su	irface e	rosion.			
Repair: Prepare Apply new surfa surfaced system adhesive. Apply membrane on li surfaces. Trans appearance to r	e meml cing of ns appl granu ike syst sition s match t	brane surfac like materia ly gravel in h lated fibergla tems. Apply urfacing to p he existing s	e by thorough ls to eroded a ot asphalt or r ass cap sheet coating syste rovide for a sn surfacing.	ly cleaning a areas. On g ecommend a or modifed m on smoot nooth and n	and priming. ravel ed cold bitumen th asphalt eat finished



Defect Code:	23	Quantity:	Random	Priority:	Monitor
Description: Ph scrapes, scuffs	ysical o , or abra	damage to n asions.	nembrane incl	luding cuts,	holes, tears,
Repair: Apply re material a minir	epair m num 6'	embrane ov ' past damag	er damaged a ge.	irea, extendi	ng repair



Defect Code:	24	Quantity:	Random	Priority:	Monitor
Description: Ev	idence	of past prob	lem and previ	ous repair.	
•			·	·	
Repair: Investio	nate for	chronic leak	problems an	d repair any	areas that
are suspect	julo ioi	on one rour		a ropan any	arouo anat



Defect Code:	29	Quantity:	1	Priority:	Monitor
Description: Mi	ssing, l	oose, or bro	ken shingle	S	•
	g ,	,		-	
	رم ما ام		مامم منما مم		
Repair: Remov	/e all da	imaged shin	gies and re	place all dam	aded and
					agea ana
missing shingle	es with	shingles of I	ike kind and	d color.	
missing shingle	es with	shingles of I	ike kind and	d color.	
missing shingle	es with	shingles of I	ike kind and	d color.	



Defect Code:	45	Quantity:	Under 10 LF	Priority:	First Year
Description: Op	oen flas	hing lap			
Repair: Open lo or reweld lap pe with mimum 6" and mastic thre coat flashing re	pose la er the m wide m e-cours pairs.	p area and o nanufacturer embrane or se applicatio	clean thorough 's requiremen n single ply sys on on asphalt s	Ily. Prime a ts. Strip-in c stems or 6" systems. Re	nd reseam defective lap wide fabric egranulate or



Defect Code:	46	Quantity:	10 LF	Priority:	First Year				
Description: Split in flashing									
Repair: Cut aw strip in of like m all directions pa	ay loos aterial ast prep	e flashing a centered ov ared area.	nd clean and p er split extendi	orime repair ng a minim	area. Apply um of 4" in				



Defect Code:	55	Quantity:	1	Priority:	First Year			
Description: Deteriorated or shrunken pitch pan filler.								
Repair: Clean p materials and d prepared pitch p	oocketa lebris. ban.	and penetrat Install manu	ions of all dirt facturer's rec	t, insulation, ommended	and other sealant in			



Defect Code:	58	Quantity:	20 LF	Priority:	Monitor			
Description: Inadequate, incomplete, nonconforming membrane flashings or flashing details.								
Repair: Comple recommendatic requirements o	ete men ons and n warra	nbrane flash good roofin nted system	ning repairs in ng practices. F ns.	accordance Follow manu	with NRCA Ifacturer			



Defect Code:	24	Quantity:	Random	Priority:	Monitor
Description: Ev	idence	of past prob	lem and previ	ous repair.	
Repair: Investig are suspect.	jate for	chronic leak	problems an	d repair any	areas that



Defect Code:	40	Quantity:	35 LF	Priority:	Monitor
Description: Lo	w flash	ning height.			
Repair: Raise f surface. Provid or counterflashi to concrete or b minimum heigh	lashing e appro ngs. P lock su it.	g height to a opriate termi rovide a corr rface if flash	minimum of a nation of flash pression ba ings cannot b	8" above finis hings with m r termination be maintaine	hed roof etal copings of flashings d at 8"



Defect Code:	46	Quantity:	10 LF	Priority:	First Year			
Description: Split in flashing								
Repair: Cut awa strip in of like m all directions pa	ay loos aterial ist prep	e flashing an centered ove ared area.	nd clean and p er split extendi	orime repair ing a minim	area. Apply um of 4" in			



Defect Code:	52	Quantity:	2	Priority:	First Year				
Description: Missing rain cap, rain collar, or hood.									
Repair: Install r	ain cap	o, hood, or co	ollar and sec	ure and seal	to pipe.				



Defect Code:	81	Quantity:	1	Priority:	First Year				
Description: Di	Description: Displaced antenna, sign, bracing, support, strap, etc.								
			3, , , , , , , , , , , , , , , , , , ,	- F F	,				
Repair: Reattac	ch equi	oment and r	epair damage	s to membr	ane and				
flashings.									
-									



Defect Code:	8	Quantity:	Random	Priority:	Monitor				
Description: Surface erosion.									
Repair: Prepare Apply new surfa surfaced system adhesive. Apply membrane on I surfaces. Trans appearance to r	e meml cing of ns appl granu ike syst sition su match th	brane surfac like materia ly gravel in h lated fibergla tems. Apply urfacing to p he existing s	e by thorough ls to eroded a ot asphalt or r ass cap sheet coating system rovide for a sn surfacing.	ly cleaning a areas. On g ecommend or modifed m on smoot nooth and n	and priming. ravel ed cold bitumen th asphalt eat finished				



Defect Code:	16	Quantity:	1	Priority:	First Year		
Description: Blocked drain, scupper, or downspout.							
Repair: Remov scupper is free	e all de flowing	bris from dr without res	ainage system trictions at stra	n and ensur liner or pipir	e drain or ng.		



Defect Code:	24	Quantity:	Random	Priority:	Monitor			
Description: Evidence of past problem and previous repair.								
·			•	•				
Repair: Investio	nate for	chronic leak	nroblems an	d renair anv	areas that			
are suspect	julo ioi	onionio iour		a ropan any				
ale suspeci.								



Defect Code:	40	Quantity:	Random	Priority:	Monitor
Description: Lo	w flash	ing height.			
Repair: Raise f surface. Provid or counterflashi to concrete or b minimum heigh	lashing e appro ngs. P lock su it.	height to a ppriate termi rovide a con rface if flash	minimum of 8 nation of flash ppression bar ings cannot b	" above finis ings with m termination e maintaine	hed roof etal copings of flashings d at 8"



Defect Code:	45	Quantity:	Under 10 LF	Priority:	First Year
Description: Open flashing lap					
Repair: Open lo or reweld lap pe with mimum 6" and mastic thre coat flashing re	oose la er the m wide m e-cours pairs.	p area and o anufacturer embrane or se applicatio	clean thorough 's requiremen n single ply sys on on asphalt s	ily. Prime a ts. Strip-in c stems or 6" systems. Re	nd reseam defective lap wide fabric egranulate or







Deficiency Legend

Defect #	FIELD MEMBRANE AND ROOF SURFACE
	Description: Deteriorated or missing sealant at counterflashing, termination bar, sealant lip, metal flashing,
1	expansion joint, etc.
2	Description: Fishmouth in field or flashing seam.
3	Description: Open lap in field membrane.
4	Description: Dry lap edge.
5	Description: Buckling or ridging of membrane.
6	Description: Split in membrane.
7	Description: Wrinkle in membrane.
8	Description: Surface erosion.
9	Description: Membrane deterioration.
10	Description: Tented membrane at fastener.
11	Description: Blister in field membrane or flashing.
12	Description: Alligatoring of asphalt surfacing.
13	Description: Tar boils/blueberries.
14	Description: Displaced ballast.
15	Description: Ponding of water.
16	Description: Blocked drain, scupper, or downspout.
17	Description: Missing or damaged drain/scupper strainer
18	Description: Unadhered membrane or inadequate membrane attachment.
19	Description: Unadhered insulation or inadequate insulation attachment.
20	Description: Displaced insulation
21	Description: Loose walkway pad or deteriorated paver.
22	Description: Debris, trash, construction materials, HVAC equipment, filters, motors, etc. on roof surface.
23	Description: Physical damage to membrane including cuts, holes, tears, scrapes, scuffs, or abrasions.
24	Description: Evidence of past problem and previous repair.
25	Description: Membrane slippage
26	Description: Membrane shrinkage
	Description: Missing or damaged membrane protection layer at sleeper, antenna, satellite sled, blocking,
27	pipe stand, paver, etc.
28	Description: Reported leak location
29	Description: Missing, loose, or broken shingles
30	Description: Open or missing tile eave stop.
31	Description: Missing or open mortar joints at the ridge or hip.
32	Description: Broken or missing tile.
33	Description: Loose, displace, or unsecured tiles.

All

Deficiency Legend

Defect #	ELASHINGS AND DENETRATIONS
40	Description: Low flashing height
41	Description: Missing or inadequate flashing attachment
42	Description: Loose or unadhered flashings
43	Description: Weathered and deteriorated flashing
44	Description: Bridged flashing
45	Description: Open flashing lap
46	Description: Split in flashing
47	Description: Racked flashings
48	Description: Missing termination
49	Description: Missing counterflashing
50	Description: Missing pipe flashing.
51	Description: Leaking or damaged gutters/downspouts.
52	Description: Missing rain cap, rain collar, or hood.
53	Description: Open lead flashing.
54	Description: Fallen or loose backer rod.
55	Description: Deteriorated or shrunken pitch pan filler.
56	Description: Abandoned and obsolete equipment.
57	Description: Expansion joint deficiencies.
58	Description: Inadequate or nonconforming membrane flashing detail.
70	
70	Description: Open joint in metal flashing.
71	Description: Open or missing joint cover.
72	Description: Signage penetration not sealed properly.
73	Description: Improper sneet metal detail.
74	Description: Inadequate overage of metal llange.
75	Description: Inadequate transition floabings.
70	Description: Inadequate transition liasnings.
79	Description: Looking or domaged auttors (downs pouts
70	Description: Cracks in walls
80	Description: Broken plugged or disconnected condensate line
81	Description: Displaced antenna sign bracing support strap etc
82	Description: Open or deteriorated wall joint
83	Description: Efflorescence
84	Description: Deck deflection
85	Description: Vegetation growth.
86	Description: Corrosion or rust
87	Description: Mechanical defect
88	Description: Skylight defect/cracked/deteriorated
89	Description: Missing wall covering or cladding materials.

All























































