CITY OF DELRAY BEACH

DELRAY BEACH FLORIDA ★★★★★ All-America City 1993 2001

100 N.W. 1st AVENUE • DELRAY BEACH, FLORIDA 33444 • 561/243-7000

MEMORANDUM

TO: Mayor and Commissioners

FROM: Donald B. Cooper, City Manager

DATE: July 22, 2016

SUBJECT: Recommendation for Repair of Roof and Building Exterior of City Hall and the Community Center

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Pursuant to the repair and replacement program, an evaluation of City Hall and the Community Center roof systems and exterior walls was undertaken (report attached). The Garland Company has recommended significant repairs with an estimated cost of approximately $850,000+/- (see attached email from City Engineer). These repairs will need to be undertaken if the City intends to utilize the buildings for a period of five (5) years or longer.

The flat roof section of City Hall has failed and immediate replacement is recommended. The entire Community Center roof is recommended to be replaced. There are additional recommendations for exterior repairs to both building and upon completion repainting of same. This is an unbudgeted expense that needs to be addressed immediately if we are going to utilize the buildings (there are no planned alternatives) for the foreseeable future. Funds are available within the General Fund due to vacancies and other lower than expected expenditures which can be used to address this issue without impacting minimum balance in the contingency amount.

Consensus approval to expend unallocated fund balance (contingency) to repair and or replace roof at the Community Center and portions of the roof at City Hall, plus make necessary external repairs to the buildings. Contracts for the repairs will be presented to the Commission for approval pursuant to purchasing process. Estimated cost for the repairs $850,000 +/-.

DC/ss

cc: David Scott, Assistant City Manager – Operations
Francine Ramaglia, Assistant City Manager – Support
Jack Warner, Chief Financial Officer
Jeff Snyder, Assistant Chief Financial Officer
John Morgan, Director of Environmental Services
Isaac Kovner, City Engineer

(See Attachments)

Cooper, Donald

From: Kovner, Isaac
Sent: Tuesday, July 19, 2016 5:56 AM
To: Cooper, Donald
Cc: Morgan, John; Lara, Mauricio; Barletto, Missie; Scott, David; Ramaglia, Francine; Snyder, Jeff; Webb, Theresa; Chapman, Steven
Subject: RE: City Hall and Community Center Roof and Exterior Wall Repair Estimate

As Requested.

City Hall:

Roof Estimate $192,066 - Flat Roof Sections
Exterior Repairs & Coating - $78,813
Total: $270,879.75

With a 20% contingency I would recommend **$325,000**

Community Center:

Roof Estimate $337,446 - Flat Roof Sections and Tile
Exterior Repairs & Coating - $68,483
Total: $405,929

With a 20% contingency I would recommend **$487,000**

THEREFORE FOR THE CITY HALL & THE COMMUNITY CENTER BUILDING RENOVATIONS (EXTERIOR WALLS AND ROOFS) A BUDGET OF $825,000 IS REQUESTED FROM RESERVES.

Please inform me if we should move forward with the advertisement of the RFP as a priority. Thank you.

Isaac Kovner, P.E.
City Engineer

City of Delray Beach
Environmental Services Department
434 S. Swinton Ave., Delray Beach, Florida 33444
(561) 243-7341 Phone (561) 243-7060 Fax

kovner@mydelraybeach.com

PUBLIC RECORDS NOTE: Florida has a very broad public records law. Most written communications to or from local officials, employees, or the general public regarding city business are public records available to the public and media upon request. Your e-mail communications may therefore be subject to public disclosure. PLEASE NOTE: Pursuant to Florida's Government in the Sunshine Act (a.k.a. "Sunshine Law"), e-mails containing city business should be directed to either: all City Commissioners or only 1 City Commissioner at a time and should not include prior responses from other Commissioners in order to avoid the perception that a third party is acting as a liaison between Commissioners.

From: Kovner, Isaac
Sent: Friday, July 08, 2016 6:58 AM
To: Cooper, Donald
Cc: Morgan, John; Lara, Mauricio; Barletto, Missie; Scott, David; Ramaglia, Francine; Snyder, Jeff
Subject: FW: City Hall Roof and Exterior Wall Repair Estimate

As requested.

Roof Estimate $192,066-Flat Roof Sections
Exterior Repairs & Coating-$78,813
Total: $270,879.75

With a 20% contingency I would recommend a budget of **$325,000**

Isaac Kovner, P.E.
City Engineer

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From: Robert Moses [mailto:rmoses@garlandind.com]
Sent: Friday, July 08, 2016 6:55 AM
To: Kovner, Isaac
Subject: Re: City Hall

Roof Estimate $192,066-Flat Roof Sections
Exterior Repairs & Coating-$78,813
Total: $270,879.75

Robert Moses
South Florida Territory Manager
M. 305-807-2140
Rmoses@garlandind.com
www.garlandco.com

Gartalk (http://gartalk.garlandco.com)
Youtube (http://youtube.com/user/thegarlandco)
Facebook (http://facebook.com/GarlandCompany)

"Service is our best Product!"

American Public Works Association

On Fri, Jul 8, 2016 at 5:48 AM, Kovner, Isaac <kovner@mydelraybeach.com> wrote:

Please email me a budget estimate for the roof and wall repairs. Thank you.

Isaac Kovner, P.E.

City Engineer

City of Delray Beach

Environmental Services Department

434 S. Swinton Ave., Delray Beach, Florida 33444

(561) 243-7341 Phone (561) 243-7060 Fax

kovner@mydelraybeach.com

---------- Forwarded message ----------
From: "Kovner, Isaac" <kovner@mydelraybeach.com>
To: "abbas@wza-architects.com" <abbas@wza-architects.com>
Cc: "Shutt, Thuy" <shuttt@mydelraybeach.com>, "Lara, Mauricio" <LaraM@mydelraybeach.com>, "Barletto, Missie" <BarlettoM@mydelraybeach.com>, "Morgan, John" <morgan@mydelraybeach.com>
Date: Thu, 7 Jul 2016 22:57:00 +0000
Subject: Roof Specifications for Crest Theater (Addendum #1)
The City would like for WZA to consider to utilize a performance based specification with a 20-30 year warranty for the 3 roofs that are scheduled to be replaced. If you like we can meet next week before the Pre-Bid Meeting to discuss the roofing request. Thank you.

The Garland Company, Inc.

Roof Asset Management Program

R A M P

City Hall & Community Center Inspection

Prepared By
Robert Moses

Prepared For
Isaac Kovner

Table of Contents

Client Data

Client: City of Delray Beach

Client Data			
Name	City of Delray Beach		
Address 1	434 S Swinton Ave.	Address 2	-
City	Delray Beach	State	Florida
ZIP	334444	Country	United States

Contact Info			
Contact Person	Isaac Kovner	Title	City Engineer
Mobile Phone:	-	Office Phone:	561-243-7341
Email:	kovner@mydelraybeach.com		

Facility Summary

Client: City of Delray Beach

Facility: City Hall

Facility Data

Address 1	100 NW 1st Ave.
Address 2	-
City	Delray Beach
State	Florida
ZIP	33444
Type of Facility	Municipal
Square Footage	10,298
Contact Person	Bob Diaz

Asset Information

Name	Date Installed	Square Footage	Roof Access
Exterior Wall	N/A	21,017	
Modified Roof Section	N/A	1,027	Ladder Needed
Single Ply Roof Section	N/A	9,271	Ladder Needed

Construction Details

Client: City of Delray Beach

Facility: City Hall

Wall: Exterior Wall

Information			
Year Installed	N/A	Square Footage	21,017

Photo Report

Client: City of Delray Beach
Facility: City Hall
Wall: Exterior Wall

Report Date: 06/28/2016
Title: 6/28 Inspection

Photo 1

Exterior cracks on the stucco surface. Signs of water intrusion.

Photo 2

Exterior cracks under the window frame.

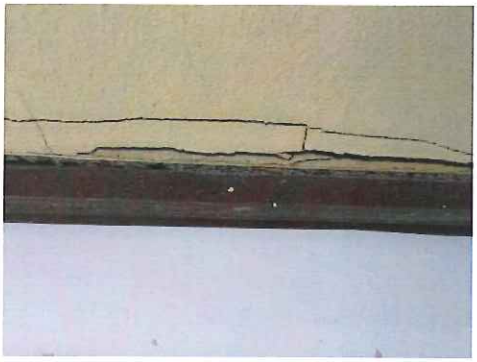

Photo 3

Severe stucco damage above the stucco stop. Signs of water intrusion.

Photo 4

Severe damage to the building exterior.

Photo 5

Photo 6

Cracking along the edge of the exterior.

Photo 7

Exterior cracks on the exterior stucco.

Photo 8

Photo 9

EIFS damage.

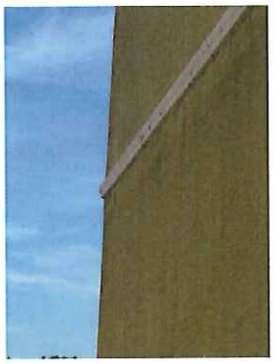

Photo 10

Photo 11

Photo 12

EIFS and stucco damage.

Photo 13

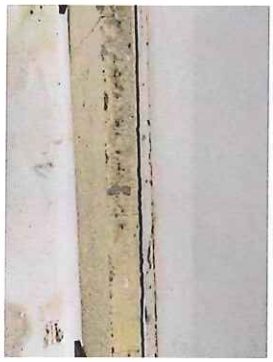

Photo 14

Photo 15

Sealant failure around the penthouse door.

Photo 16

Exterior stucco failure.

Photo 17

Photo 18

Photo 19

Exterior vertical cracking.

Photo 20

Photo 21

Photo 22

Photo 23

Adhesive failure.

Photo 24

Photo 25

Photo 26

Coating failure.

Photo 27

Solution Options

Client: City of Delray Beach

Facility: City Hall

Wall: Exterior Wall

Restore Options			
Solution Option:	Restore	Action Year:	2016
Square Footage:	21,017	Expected Life Years:	7
Budget:	$2.00		

Estimated cost is $2.00-$3.00 sqft for stucco repairs and full exterior coating.

Construction Details

Client: City of Delray Beach

Facility: City Hall

Roof Section: Modified Roof Section

Information			
Year Installed	N/A	Square Footage	1,027
Slope Dimension	1:12	Eave Height	18'
Roof Access	Ladder Needed	System Type	Modified Bitumen

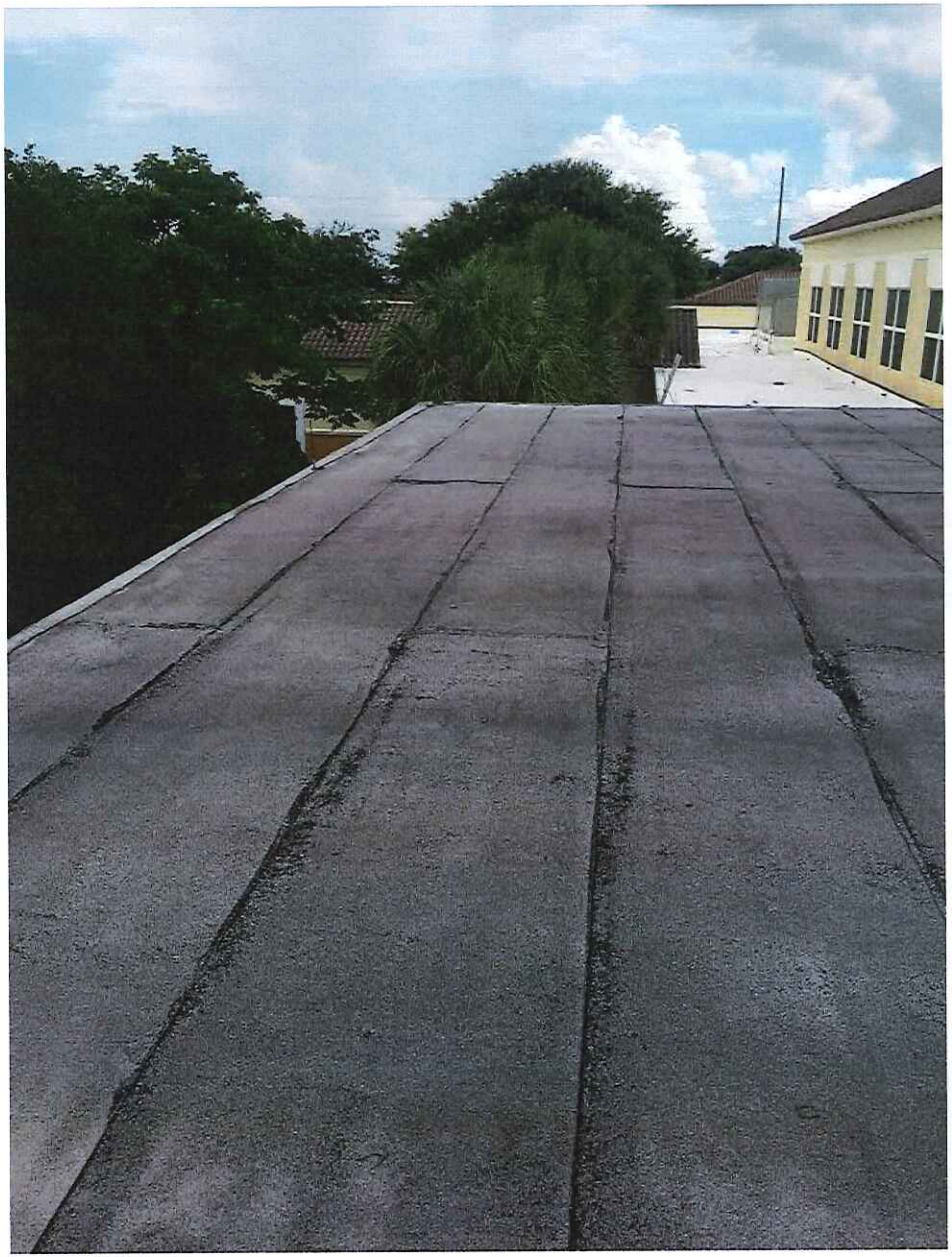

Photo Report

Client: City of Delray Beach
Facility: City Hall
Roof Section: Modified Roof Section

Report Date: 06/28/2016
Title: 6/28 Inspection

Photo 1

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

Photo 2

Excessive blisters over the entire roof surface. Possible installation of the membrane in below temperature asphalt.

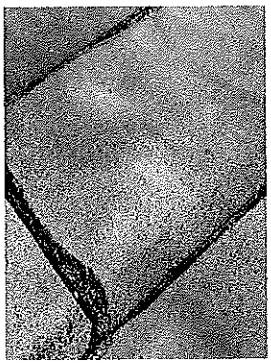

Photo 3

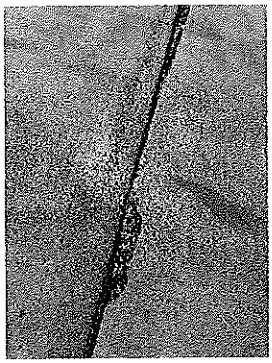

Photo 4

Photo 5

Photo 6

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Photo 7

Photo 8

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

Photo 9

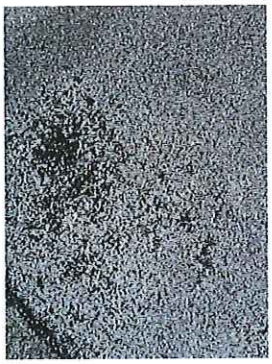

Photo 10

Bare or Exposed Felts: Weathering causes the roofs surfacing materials to oxidize and wear away after a period of time. Loss of protection from the surfacing material results in accelerated deterioration of the primary waterpoofer asphalt, along with the systems reinforcement plies which provide the strength for the system. Heat and UV rays dry out unprotected asphalt which then leave the bare reinforcement plies exposed to the elements. The exposed reinforcement will begin to absorb and wick moisture into the built up layers of the roof system. This condition leads to accelerated damage via blisters and interlayer delamination. Roof system damage occurs when these weakened areas of the roof system are affected by thermal shock, typical roof traffic and normal seasonal conditions.

Photo 11

Failed seam. Insufficient bleed out.

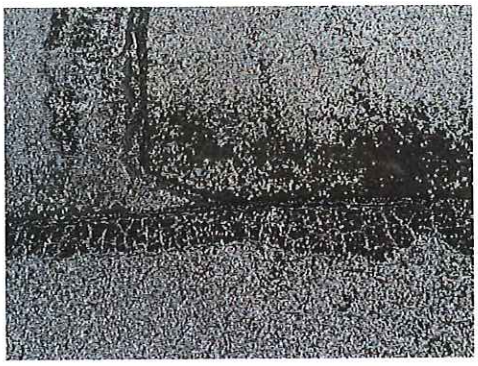

Photo 12

Photo 13

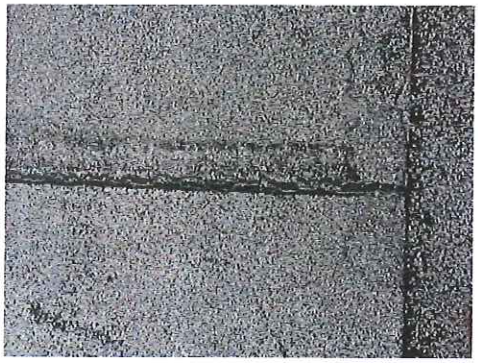

Photo 14

Photo 15

Photo 16

Insufficient bleed out of asphalt. Failed seam.

Photo 17

Failed seam.

Photo 18

Pitch Pocket Deterioration: Metal protrusions that penetrate the roof system to allow conduits to run from the rooftop into the building. Movement from the protrusion can break the waterproofing compound, creating cracks. Over time, the release of solvents from the compound can cause the material to shrink, leaving gaps along the edges of the pan and around structural support. Water can enter through a defective pitch pan and find its way into the interior of the building. Moisture can also penetrate into the roof system leading to premature failure.

Photo 19

Photo 20

Photo 21

Photo 22

Photo 23

Photo 24

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

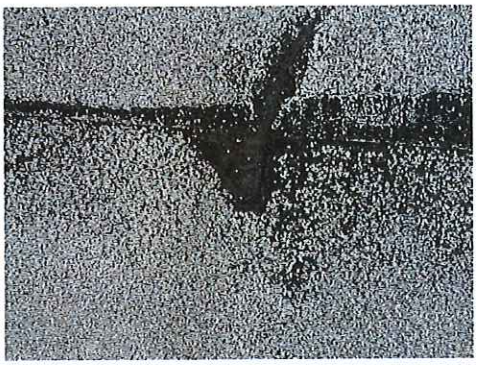

Photo 25

Photo 26

Photo 27

Failed membrane.

Photo 28

Solution Options

Client: City of Delray Beach

Facility: City Hall

Roof Section: Modified Roof Section

Replace Options			
Solution Option:	Replace	Action Year:	2016
Square Footage:	1,027	Expected Life Years:	25
Budget Range:	$15,405.00 - $19,513.00		

Complete replacement is necessary. The roof will need to be removed down the to the deck and replaced. Estimated budget is $15-$19sqft. This variation depends on on the system design of 20-30yr warranty.

Construction Details

Client: City of Delray Beach

Facility: City Hall

Roof Section: Single Ply Roof Section

Information			
Year Installed	N/A	Square Footage	9,271
Slope Dimension	1/12	Eave Height	15'
Roof Access	Ladder Needed	System Type	Single Ply

Roof Section Photo

Photo Report

Client: City of Delray Beach
Facility: City Hall
Roof Section: Single Ply Roof Section

Report Date: 06/28/2016
Title: 6/28 Inspection

Photo 1

Overview of roof section showing multiple patches.

Photo 2

Excessive patches on the single ply membrane.

Photo 3

Multiple patches and seam failure.

Photo 4

Photo 5

Photo 6

Photo 7

Membrane failure. The membrane has reached its life expectancy and has split wide open allowing water to penetrate the interior roofing structure and roof deck.

Photo 8

Photo 9

Membrane failure.

Photo 10

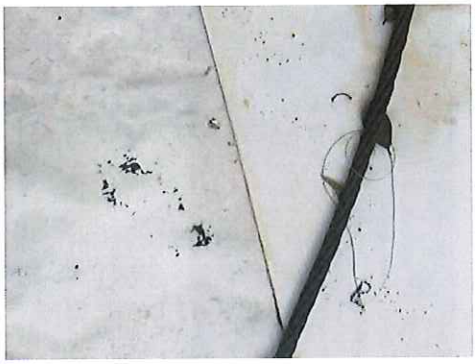

Photo 11

Membrane failure.

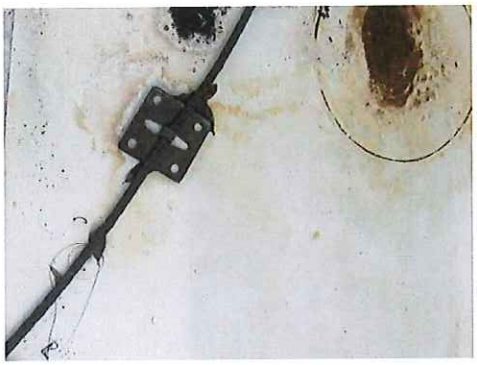

Photo 12

Photo 13

Open penetration.

Photo 14

Open penetration.

Photo 15

Photo 16

Photo 17

Photo 18

Photo 19

Membrane failure. Open penetration. Water intrusion onto the roof deck, insulation and interior of the building. The membrane has completely failed.

Photo 20

Single Ply Membrane Failure. Open penetration into the building interior.

Photo 21

Photo 22

Membrane failure.

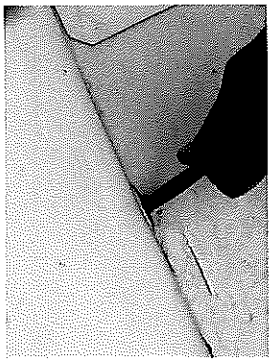

Photo 23

Open seams.

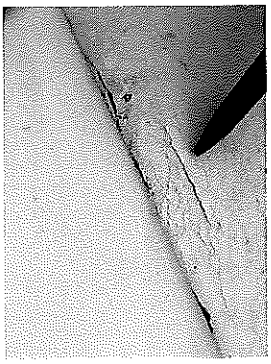

Photo 24

Photo 25

Failed single ply membrane.

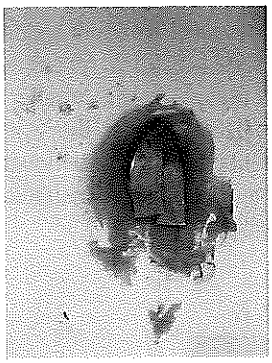

Photo 26

Improper patch .

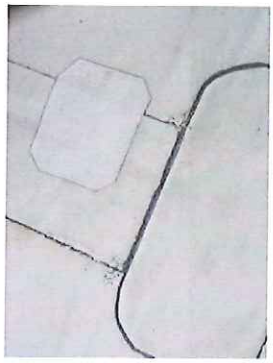

Photo 27

Single Ply Seam Deterioration: Due to the inherent nature of single ply membranes, which shrink with exposure to the elements, extreme pressure is present on the membrane seams. These seams are either heat welded or sealed with adhesive and cannot withstand the aforementioned pressure. Weather cycles and thermal shock provide additional forces that lead to lap seam deterioration and eventually complete failure. Once damaged, there are no additional redundant layers to keep moisture from damaging the investment in insulation or the buildings interior.

Photo 28

Open penetration, single ply failure

Photo 29

Photo 30

Photo 31

Photo 32

Seam failure.

Photo 33

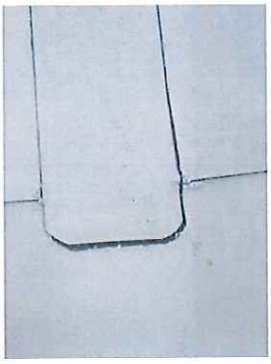

Photo 34

Photo 35

Seam deterioration.

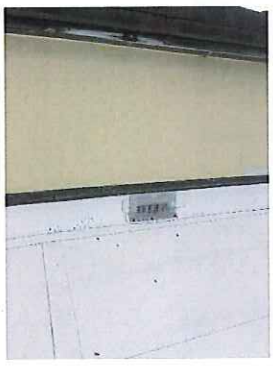

Photo 36

Photo 37

Photo 38

Photo 39

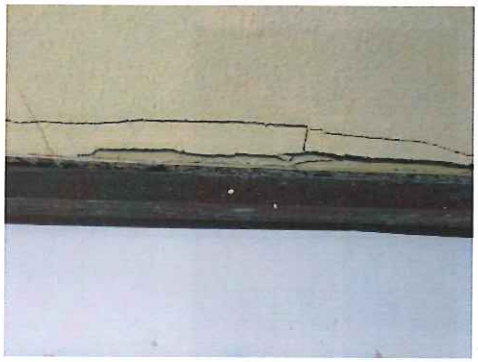

Photo 40

Photo 41

Photo 42

Photo 43

Photo 44

Photo 45

Seam Failure.

Photo 46

Photo 47

Seam failure.

Photo 48

Photo 49

Photo 50

Photo 51

Photo 52

Photo 53

Photo 54

Photo 55

Single ply seam deterioration.

Photo 56

Single ply seam deterioration.

Photo 57

Seam failure.

Photo 58

Photo 59

Seams coated with White Knight Plus. Proper mil thickness was not achieved. The White Knight Plus will slow down the seam deterioration but the recommended mil thickness was not met.

Photo 60

Photo 61

Solution Options

Client: City of Delray Beach

Facility: City Hall

Roof Section: Single Ply Roof Section

No Recommendations / Options Specified

Solution Options

Client: City of Delray Beach

Facility: City Hall

Roof Section: Single Ply Roof Section

Replace Options

Solution Option:	Replace	Action Year:	2016
Square Footage:	9,271	Expected Life Years:	25
Budget Range:	$139,065.00 - $176,168.00		

The single ply roof system has failed. The membrane has surpassed its life expectancy and is failing along all the seams and in the field. An immediate replacement is needed. Estimated budget is $15-$19sqft. This variation depends on on the system design of 20-30yr warranty.

Facility Summary

Client: City of Delray Beach

Facility: Community Center

Facility Data	
Address 1	50 NW 1st Ave.
Address 2	-
City	Delray Beach
State	Florida
ZIP	33444
Type of Facility	Municipal
Square Footage	18,317
Contact Person	Isaac Kovner

Asset Information

Name	Date Installed	Square Footage	Roof Access
Exterior Walls	1997	11,000	
Flat Roof Section	1997	18,317	Ladder Needed

Construction Details

Client: City of Delray Beach

Facility: Community Center

Wall: Exterior Walls

Information			
Year Installed	1997	Square Footage	11,000

Photo Report

Client: City of Delray Beach
Facility: Community Center
Wall: Exterior Walls

Report Date: 07/18/2016
Title: Visual Inspection

Photo 1

Photo 2

Window sealant failure.

Photo 3

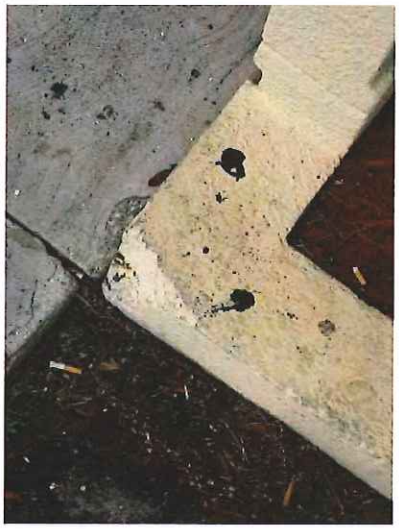

Photo 4

Concrete damage.

Photo 5

Sealant failure.

Photo 6

Photo 7

Missing joint sealant.

Photo 8

Cracks in the stucco walls.

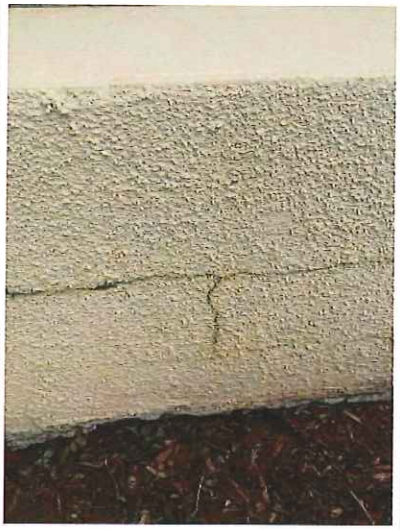

Photo 9

Crack in the stucco walls.

Photo 10

Crack in the stucco walls.

Photo 11

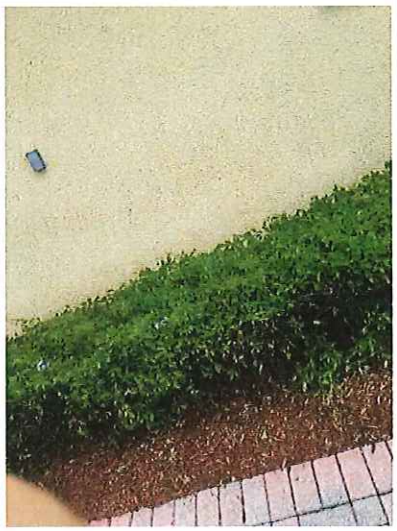

Photo 12

Crack in the stucco walls.

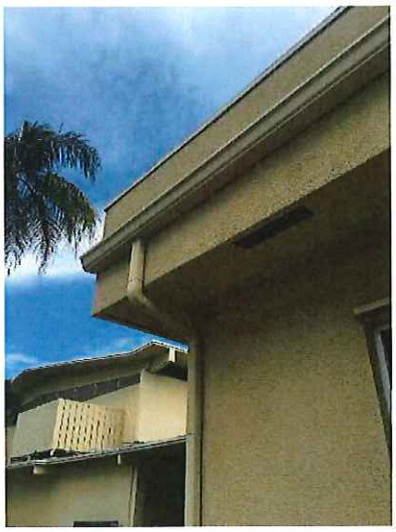

Photo 13

Photo 14

Photo 15

Stucco damage.

Photo 16

Concrete and stucco damage along the perimeter.

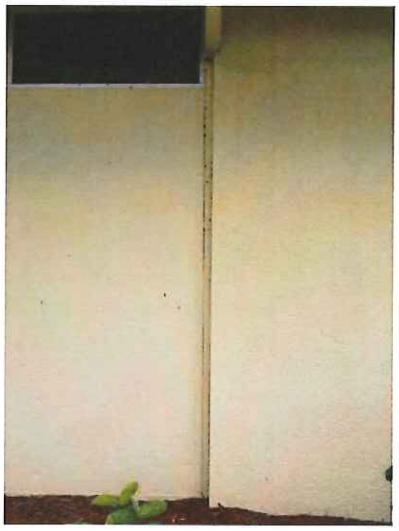

Photo 17

Photo 18

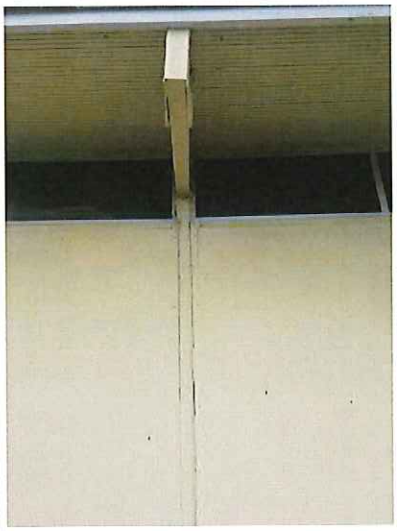

Photo 19

Broken glass.

Photo 20

Cracks in the stucco.

Photo 21

Broken glass.

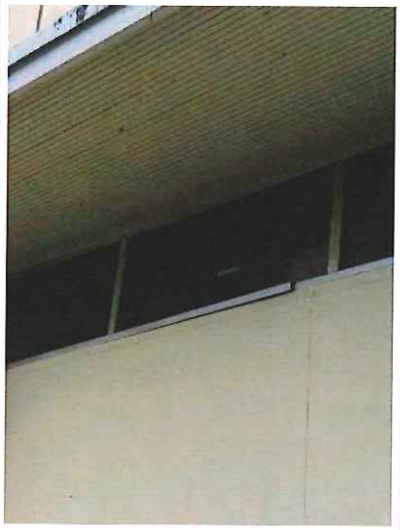

Photo 22

Photo 23

Concrete deterioration.

Photo 24

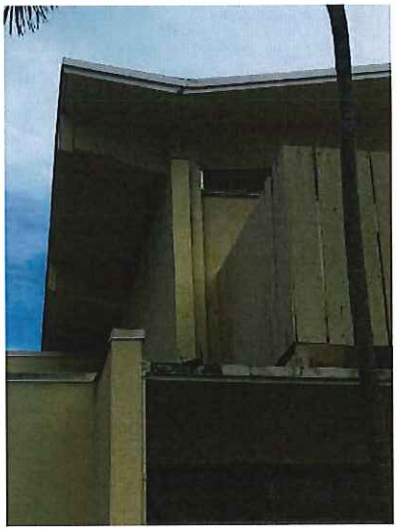

Photo 25

Truss and soffit damage.

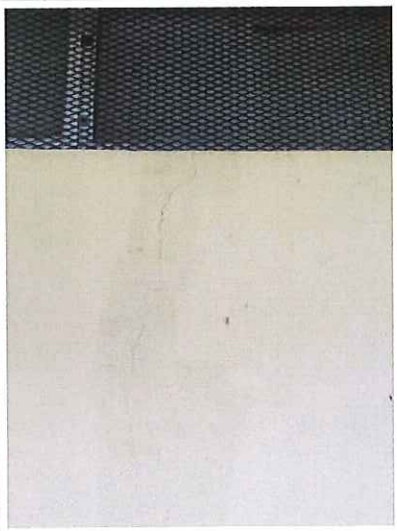

Photo 26

Vertical wall cracks.

Photo 27

Photo 28

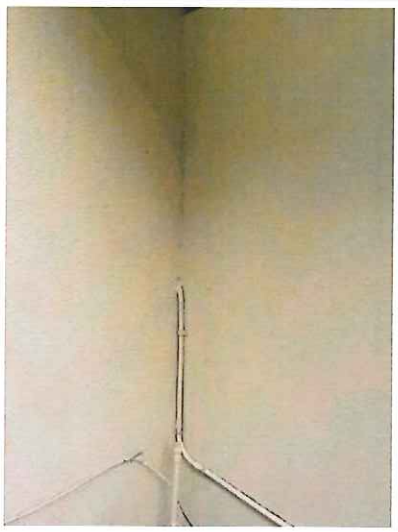

Photo 29

Photo 30

Vertical wall repairs made previously.

Photo 31

Piping not properly sealed.

Photo 32

Photo 33

Thru wall penetration not properly sealed.

Photo 34

Photo 35

Photo 36

Vegetation growth.

Photo 37

Photo 38

Vertical wall crack.

Photo 39

Photo 40

Vertical wall crack and field crack on concrete slab.

Photo 41

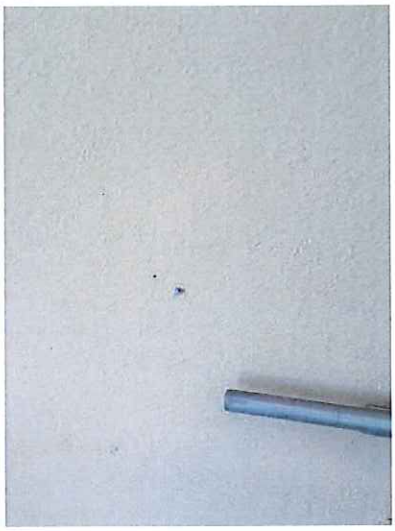

Photo 42

Photo 43

Photo 44

Soffit deterioration.

Photo 45

Drip edge damage and vertical wall crack.

Photo 46

Previous damage to wall not properly fixed.

Photo 47

Soffit and truss damage.

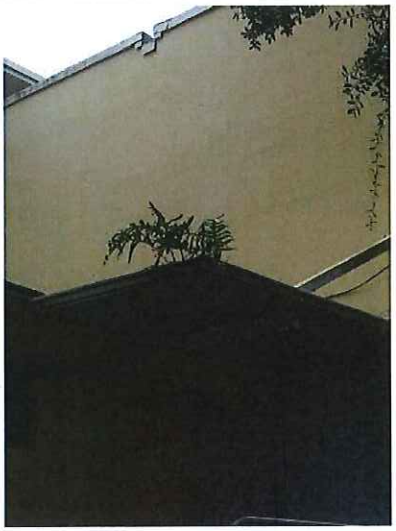

Photo 48

Photo 49

Vegetation growth.

Photo 50

Photo 51

Vertical wall cracks and stucco damage.

Photo 52

Photo 53

Photo 54

Cracks along the stucco stop.

Photo 55

Improper stucco installation.

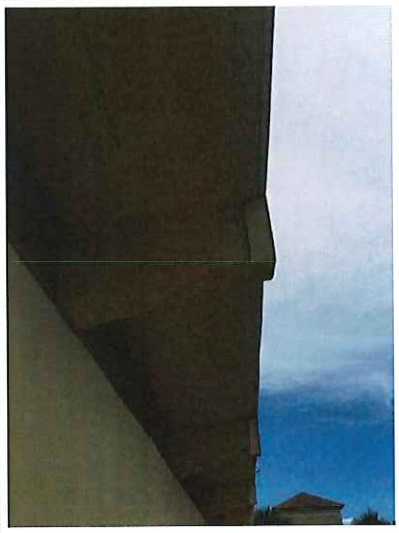

Photo 56

Soffit damage.

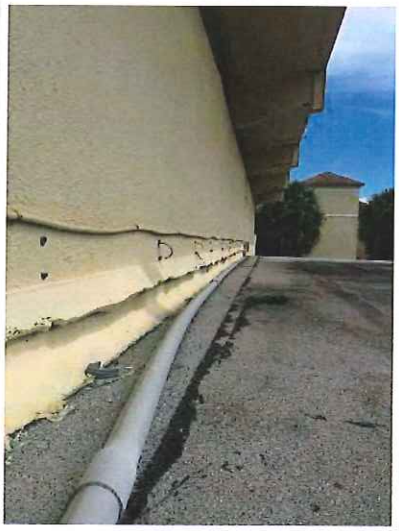

Photo 57

Improper detail.

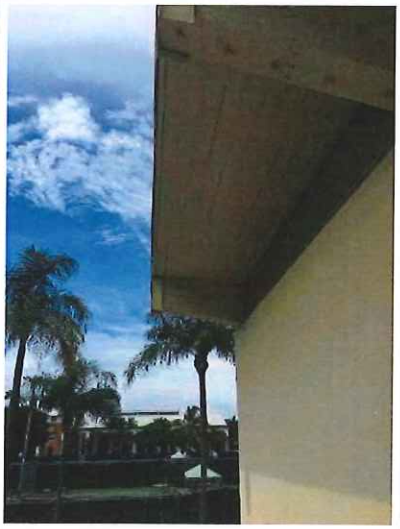

Photo 58

Photo 59

Photo 60

Photo 61

Photo 62

Wood damage.

Photo 63

Photo 64

Photo 65

Wood fascia damage.

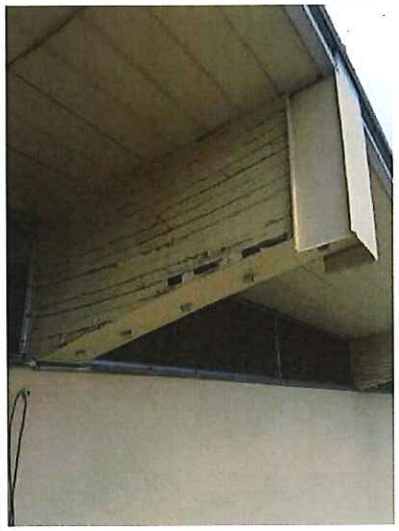

Photo 66

Photo 67

Photo 68

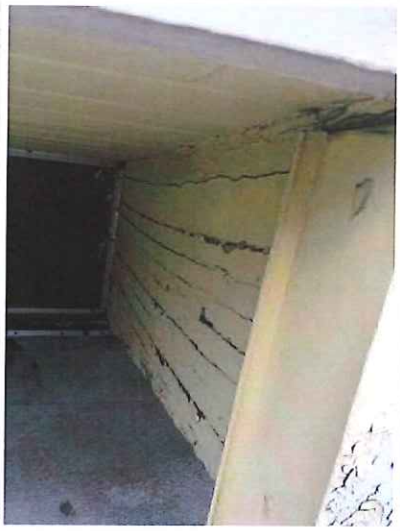

Photo 69

Improper wood sealant.

Photo 70

Photo 71

Solution Options

Client: City of Delray Beach

Facility: Community Center

Wall: Exterior Walls

Restore Options			
Solution Option:	Restore	Action Year:	2016
Square Footage:	11,000	Expected Life Years:	10
Budget:	$68,000.00		

Immediate re-coating of the building exterior is needed. Stucco, concrete and wood repairs are needed. Window replacement, window sealant, door frame sealant, floor joints are all needed.

Construction Details

Client: City of Delray Beach

Facility: Community Center

Roof Section: Flat Roof Section

Information			
Year Installed	1997	Square Footage	18,317
Slope Dimension	1/12	Eave Height	15'
Roof Access	Ladder Needed	System Type	Modified Bitumen

Photo Report

Client: City of Delray Beach
Facility: Community Center
Roof Section: Flat Roof Section

Report Date: 07/18/2016
Title: Visual Inspection

Photo 1

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

Photo 2

Bad detail, failing cap sheet.

Photo 3

Bare or Exposed Felts: Weathering causes the roofs surfacing materials to oxidize and wear away after a period of time. Loss of protection from the surfacing material results in accelerated deterioration of the primary waterpoofer asphalt, along with the systems reinforcement plies which provide the strength for the system. Heat and UV rays dry out unprotected asphalt which then leave the bare reinforcement plies exposed to the elements. The exposed reinforcement will begin to absorb and wick moisture into the built up layers of the roof system. This condition leads to accelerated damage via blisters and interlayer delamination. Roof system damage occurs when these weakened areas of the roof system are affected by thermal shock, typical roof traffic and normal seasonal conditions.

Photo 4

View of roof section.

Photo 5

Photo 6

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

Photo 7

Blisters and granule loss.

Photo 8

Failing seams.

Photo 9

Photo 10

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

Photo 11

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

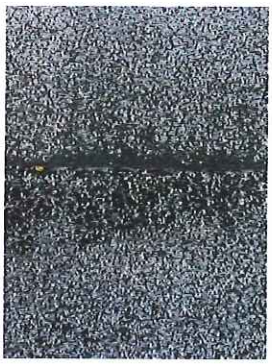

Photo 12

Failing seam, granule loss.

Photo 13

Photo 14

Photo 15

Photo 16

Bad details.

Photo 17

Bad detail not to code.

Photo 18

Bad detail, not to code.

Photo 19

Bad detail.

Photo 20

Granule loss.

Photo 21

Failing membrane, ponding water.

Photo 22

Temporary patch.

Photo 23

No sealant on the fast setting concrete. Pitch pocket was never completed.

Photo 24

Improper pitch pockets, not sealed.

Photo 25

Photo 26

Photo 27

Photo 28

Open penetrations.

Photo 29

Photo 30

Photo 31

Previously repaired section.

Photo 32

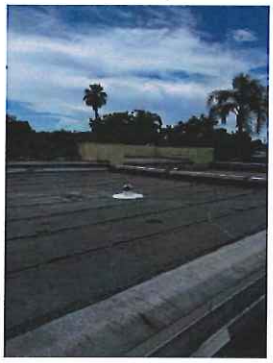

Photo 33

Photo 34

Improper detail. Membrane has been replaced.

Photo 35

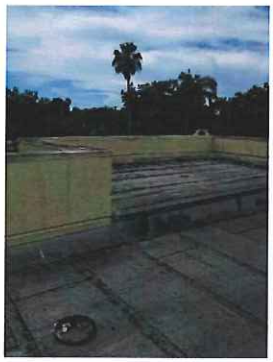

Photo 36

Photo 37

Photo 38

Blisters: Soft spongy pockets or swellings in the roofing material. They occur between layers of felt or between the roof membrane and substrate. Air or moisture vapor entrapped within a blister expands as the roof and outside air temperatures rise. This results in sufficient pressure to push the roofing felts upwards and apart. Blisters may be ruptured by roof traffic, expanding frozen water, or hail (especially during colder weather). Some blisters may become so large as to affect drainage, which may then cause ponding water. Laps could also be pulled apart, resulting in leakage. A ruptured blister will immediately allow water to penetrate and damage the roof system.

Photo 39

Photo 40

Bare or Exposed Felts: Weathering causes the roofs surfacing materials to oxidize and wear away after a period of time. Loss of protection from the surfacing material results in accelerated deterioration of the primary waterpoofer asphalt, along with the systems reinforcement plies which provide the strength for the system. Heat and UV rays dry out unprotected asphalt which then leave the bare reinforcement plies exposed to the elements. The exposed reinforcement will begin to absorb and wick moisture into the built up layers of the roof system. This condition leads to accelerated damage via blisters and interlayer delamination. Roof system damage occurs when these weakened areas of the roof system are affected by thermal shock, typical roof traffic and normal seasonal conditions.

Photo 41

Photo 42

Photo 43

Photo 44

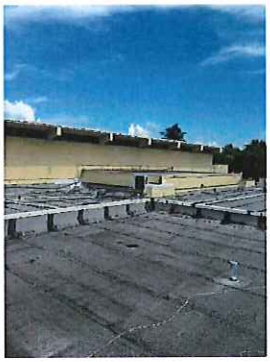

Photo 45

Photo 46

Photo 47

Photo 48

Photo 49

Photo 50

Photo 51

Photo 52

Photo 53

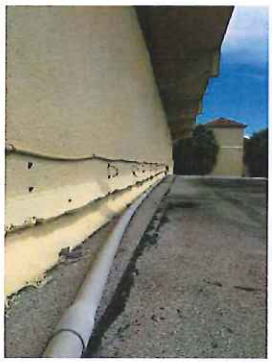

Photo 54

Photo 55

Photo 56

Photo 57

Photo 58

Improper detail, not to code.

Photo 59

Granule loss.

Photo 60

Photo 61

Photo 62

Heavy granule loss, ponding water.

Photo 63

Photo 64

Photo 65

Photo 66

Solution Options

Client: City of Delray Beach

Facility: Community Center

Roof Section: Flat Roof Section

Replace Options			
Solution Option:	Replace	Action Year:	2016
Square Footage:	18,317	Expected Life Years:	30
Budget:	$329,706.00		

Full roof replacement of all roof sections. New coping cap, metal edge, soffit and fascia replacement where needed. Remove all non essential roof top vents, units, stands etc. Properly fasten all roof top wires, cables, condensation lines etc. per code.