



# **Report of Roof System Condition Assessment**

**Incubator Building – North Roof Area**  
6345 Grand Blvd.  
New Port Richey, FL 34652

Issue Date:  
December 2, 2016

BillerReinhart Project No. 16-502



December 2, 2016

Mr. Scott Fish  
City of New Port Richey – Public Works  
6132 Pine Hill Rd.  
Port Richey, FL 34668

**Subject: Report of Roof System Condition Survey  
Incubator Building – North Roof Area  
6345 Grand Blvd.  
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## **Introduction**

Michael H. Biller, PE, RRC and Joel Brown, Project Engineer of Biller Reinhart Engineering Group, Inc. performed a visual survey of the New Port Richey Public Works Incubator Building new roof system, located at 6345 Grand Blvd. New Port Richey, Florida on Friday, November 18, 2016. Mr. Scott Fish from the City of New Port Richey Public Works Department was present during the site visit.

BillerReinhart understands that Professional Roof Services Inc., replaced the north portion of the Incubator Building's roof with a thermoplastic polyolefin (TPO) roofing system commencing in July of 2016 and ending in September 2016. The purpose of this project is to review the existing conditions that may affect the warranty or life of the TPO roof and to generate a report to document our findings and communicate opinions regarding the replacement roof's condition.

The visual survey by BillerReinhart was of the structure's current state and did not involve further destructive activity to view inaccessible areas. Photographs were taken during the site assessment and are included in Appendix A of this report.

## **Documentation Reviewed**

The following documentation was provided to and reviewed by BillerReinhart:

1. Photographs, dated July 12, 2016 – August 31, 2016 taken by the City of New Port Richey Department of Public Works.
2. Mule-Hide Products Co., Inc. TPO-c Membrane 60-mil Product Data and Specifications dated revised January 2016.
3. Mule-Hide Products Co., Inc. Reinforced TPO Membranes Technical Guide dated revised October 2013.

4. Mule-Hide Products Co., Inc. TPO Systems Installation Details revised dated January 2013.
5. Invitation to Bid – Business Incubator Roof Replacement ITB 16-010.
6. Contract and Supplemental Forms 00-50-00 dated June 7, 2016.
7. Letter to Contractor listing corrective work items dated September 6, 2016.
8. Mule-Hide Products Co., Inc. 20-Year Single-Ply Roof System Limited Material Warranty for Commercial Buildings dated September 22, 2016.
9. Second letter to Contractor listing corrective work items still outstanding dated October 4, 2016.

## **Structural Description**

The subject structure is a one-story masonry commercial building. The subject roof structure is constructed in a low-slope configuration with the slope pitching to the north, east and west directions. The roof structure consists of pre-manufactured/pre-engineered metal bar joists decked with corrugated metal panels. The roof surface is covered with tapered polystyrene foam insulation board and a 60 mil TPO roofing membrane system.

## **Project History**

The following information was obtained from Mr. Fish at the time of the assessment:

1. The City of New Port Richey contracted with Professional Roof Systems, Inc. (Contractor) on June 7, 2016
2. Contractor commenced construction on July 12, 2016.
3. The scope of work consisted of:
  - a. Removal of the previous low-slope roof system down to the metal roof decking at the north end of the building, including the expansion joint.
  - b. Removal and replacement of drip edge metal, boots, and vents.
  - c. Install new tapered insulation board system. Install the submitted and approved roof system which is Mule-Hide mechanically attached white 60 mil TPO.
4. Mr. Fish claimed throughout the construction process that once the Contractor began tearing off sections of the roof for replacement, areas torn off were not properly weather tight at the end of each work day causing substantial leaking and damage into the interior building components below.
5. On September 6, 2016 Mr. Fish sent a letter to Mr. Dennis Rogers of Professional Roof Services Inc. listing corrective work items to be



- completed prior to the contracted project completion date of September 28, 2016.
6. The Contractor claimed to be substantially complete on September 22, 2016 and submitted warranty documents.
  7. On October 4, 2016 Mr. Fish sent a second letter to Mr. Dennis Rogers of Professional Roof Services Inc. listing corrective work items yet to be completed.
  8. On November 18, 2016 Mr. Fish stated to BillerReinhart that the Contractor has ceased communication with him and refuses to address the remaining corrective work items.

### Survey of the Roof Area

The roof areas were visually observed. Typical conditions observed throughout the roof surface are listed as follows:

1. The roof system was observed to consist of a TPO roofing system. Refer to *Figure A-1*.
2. Areas of standing water and evidence of water staining were observed along the perimeter of the roof areas – typical condition along the roof perimeter. Refer to *Figure A-2*, *Figure A-3*, and *Figure A-4*.
3. Voids in seams of the membrane / hot air welds were observed throughout the roof. Seam welds must be a minimum 1-1/2 inches wide and free of voids. Refer to *Figure A-5* through *Figure A-8*.
4. “T” Patches are missing at numerous joints throughout the roof. “T” Patches are required on all 60 mil membranes to be welded directly over a “T” joint. Refer to *Figure A-9* through *Figure A-11*.
5. “T” Patches were observed to be 5-inch diameter circle patches. “T” Patches are required to be minimum 6-inch x 6-inch non-reinforced TPO membrane centered over a “T” joint and hot air welded. Refer to *Figure A-12* and *Figure A-13*.
6. Wrinkles were observed throughout the TPO membrane and seams. The presence of wrinkles indicates an improper installation. Refer to *Figure A-14* through *Figure A-16*.
7. Cut edges of TPO membrane were observed to be installed without the required Mule-Hide TPO Cut-Edge Sealant. Mule-Hide Cut-Edge Sealant is required to seal all cut edges of the membrane (seams, patches, and flashing) where the reinforcing scrim fibers are exposed to weather. Fibers of the cut edge were observed to be sticking out and can act as a wick for water intrusion. Refer to *Figure A-17* through *Figure A-19*.
8. Miscellaneous metal screws, washers, razor blades, and other metal objects were left on the TPO membrane which could potentially cause a



- tear in the membrane as well as leave rust staining on the brand new TPO membrane. Refer to *Figure A-20* through *Figure A-24*.
9. Voids in the membrane where reinforcing fibers are exposed were observed in the middle and east side of the roof. A patch must be 3-inches larger in all directions than the void. Refer to *Figure A-25* and *Figure A-26*.
  10. Asphalt petroleum based products were observed throughout the roof membrane. Per Mule-Hide Products Co., Inc., no asphalt or petroleum based products should be used on any single-ply roof as it will degrade the membrane. Refer to *Figure A-27* through *Figure A-30*.
  11. Depressions in the Iso tapered insulation board were observed/detected in sporadic areas throughout the roof membrane. Refer to *Figure A-31*.
  12. A fastener was missing in the termination metal flashing at the expansion joint near the center of the roof. Refer to *Figure A-32*.
  13. The Johns Manville Expand-O-Flash Expansion Joint Cover splice connections were observed to be out of line by one-inch or more in areas throughout the expansion joint run. According to John Manville installation guidelines adjacent sections shall be aligned and uniform in profile. Refer to *Figure A-33* and *Figure A-34*.

## Conclusion/Recommendations

Proper installation of a roofing membrane and its flashings in accordance with Building Codes, Construction Details, and Manufacturer's Specifications is critical to the performance of a roofing system as well as meeting manufacturer's warranty requirements. Product installation guidelines and good construction practices must be followed in order to ensure the integrity of the roofing system. Proper adhesion and welds are required to resist wind pressures, meet warranty requirements, and to prevent water intrusion. Voids, improper weld sizes, improper patch sizes, wrinkles in the membrane, inadequate slope, unsealed edges of membrane, low lying areas that pond water are potential failure areas that are prone to cause water intrusion related issues. Water intrusion into the building by way of roof failures are known to cause unforeseen damages to the tapered polystyrene foam insulation board, structural decking and framing, which can reduce the roof's load bearing capacity, as well as damages to interior finishes.

Based on the information obtained from the condition assessment, substantial deficiencies in the as-built construction of the new roofing system have been revealed. BillerReinhart believes that the newly installed roof system will not function properly to protect the building for its intended use or withstand the life of its intended warranty. Defective workmanship whereas the Contractor failed to comply with the manufacturer's instructions and specifications and accepted practices for good and workmanlike



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construction are attributed to these defects. Should these defects not be corrected, these conditions will likely allow water intrusion into the building.

BillerReinhart recommends that the existing TPO roofing system be removed and replaced.

Neither the survey nor this report is intended to cover hidden defects, mechanical, electrical, or architectural features, nor environmental concerns. Unauthorized use of this report, without the permission of BillerReinhart, shall not result in any liability or legal exposure to Biller Reinhart Engineering Group, Inc.

Biller Reinhart Engineering Group, Inc. reserves the right to update the information contained in this report if deemed necessary due to modified site conditions or the availability of new/additional information.

Thank you for offering us the opportunity to provide our services for this project. Please contact our office if you have any questions regarding this report.

Sincerely,

**Biller Reinhart Engineering Group, Inc.**  
State of Florida Certificate of Authorization No. 9149

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Michael H. Biller, P.E., RRC  
President/Principal Structural Engineer  
Florida P.E. No. 49972

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## **Appendix A**

# **Photographic Documentation – Incubator Building North Roof Area**





**Figure A- 1**



**Figure A- 2**





Figure A- 3



Figure A- 4





Figure A- 5



Figure A- 6





Figure A- 7



Figure A- 8





Figure A- 9



Figure A- 10





Figure A- 11



Figure A- 12





Figure A- 13



Figure A- 14





Figure A- 15



Figure A- 16





**Figure A- 17**



**Figure A- 18**





Figure A- 19

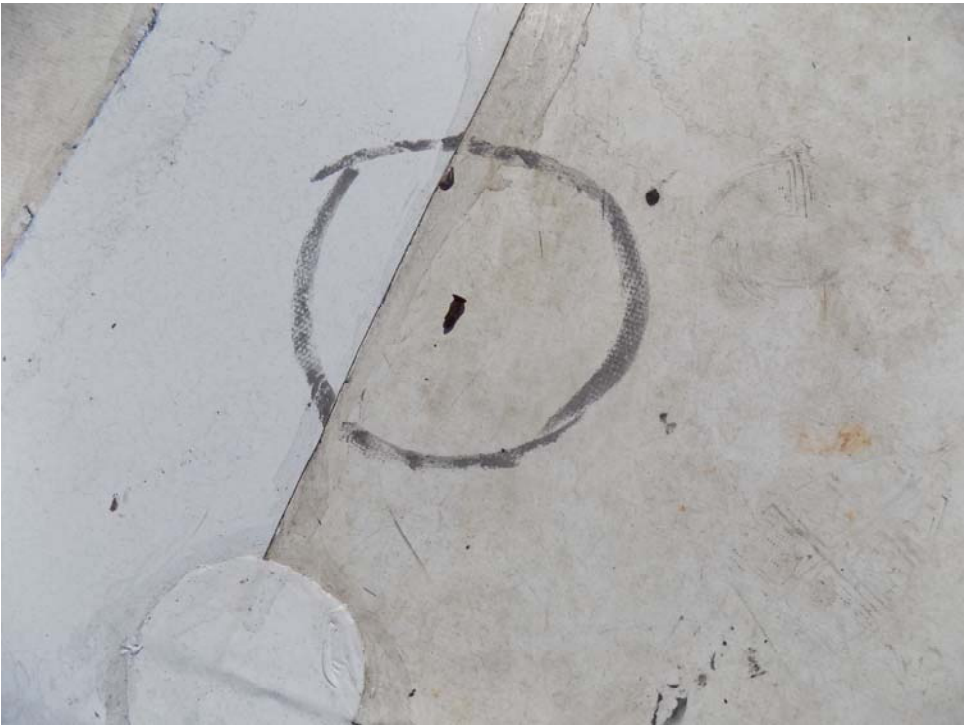


Figure A- 20





Figure A- 21



Figure A- 22





**Figure A- 23**



**Figure A- 24**





Figure A- 25



Figure A- 26





Figure A- 27



Figure A- 28





Figure A- 29



Figure A- 30





Figure A- 31



Figure A- 32





Figure A- 33



Figure A- 34

