



11/21/2018

Andy LaFond
Director of Public Works
Village of Thiensville
250 Elm Street
Thiensville, WI 53092
Sent via email

Project: Village Hall Roof Assessments

Inspector: Ron Dorszynski
Date: 10/10/18 and 11/19/2018
Others Present: Andy LaFond and Diane Robertson

Dear Andy,

At your request, I performed an assessment of the various roofs on the Village Hall to determine their condition. This report was based on our discussions and my observations on site. This report includes the following:

- Background
- Aerial Image
- Elevations
- Individual Roof Area Information
 - o Roof Construction
 - o Conditions
 - o Recommendations
 - o Budgetary Information (Current pricing)
 - o Observations
- General Conclusions

The evaluations of existing construction details and roof conditions were based on material manufacturer's specifications, industry recommendations, field conditions and structural limitations. A list of industry resources accompanies this report.

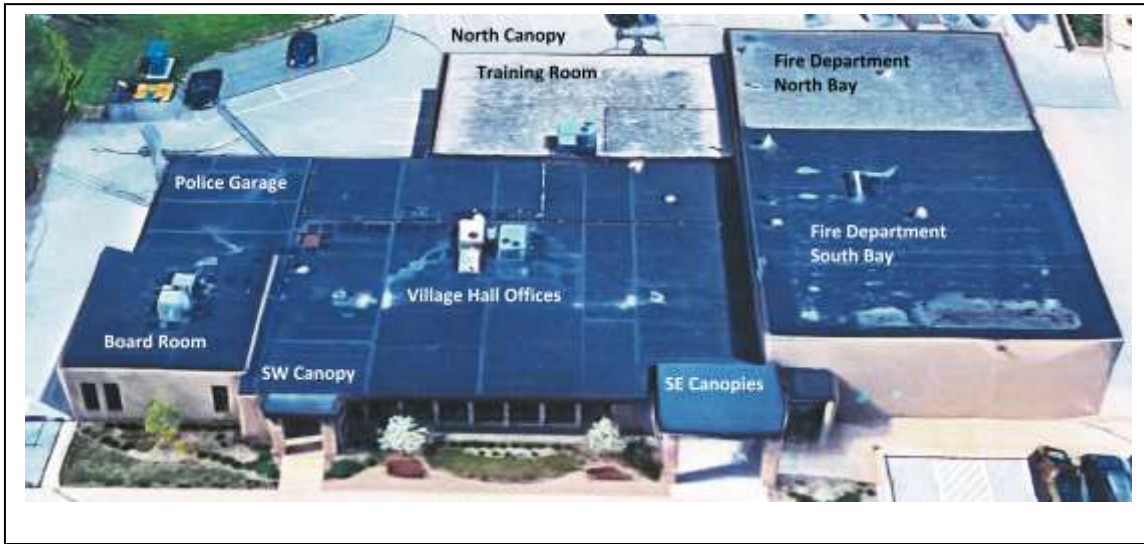
Background

The Village Trustees requested the inspection of these roofs to determine their condition, their remaining service lives and the possible need for repairs, alterations or replacement. An interior walk-thru revealed roof leak staining from more recent leakage in the following areas:

- Board Room
- Hall east of Board Room
- Roof hatch near NE corner of Board Room
- Village President's office
- Kitchen near vent
- Center Hallway
- Training Room near and along south wall and along the north wall
- Village Hall side of entrance to apparatus floor near main Village Hall public entrance

All roof areas were accessed and inspected.

Aerial Image



Elevations



Roof ID: Village Hall Offices

Total Roof Area: 6400 square feet

Age: 8-years

Remaining Service Life approximately 12 -15 years

Roof Construction & Conditions

- Roof Deck: Steel deck over steel trusses
- Drainage: Good drainage to roof drains with tapered insulation. Minor debris accumulation at roof drain strainers creates occasional minor ponding.
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Tapered rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Black 60-mil EPDM rubber well adhered in field area. Cover tape over several field seams. Minor repairs had been performed at 'T'-patches. Wear is typical for age of roof.
 - o Surfacing: No additional surfacing
 - o Walkways: Traffic pads at rooftop unit only
- Base Flashings: EPDM base flashings appeared sound.
- Metal Flashing Components: Roof edge / fascia metal appeared sound. Most roof ventilation components appeared sound with mild corrosion. Rusted roof hatch cover

Recommendations

- Short- to Mid-term
 - o Reseal or cover any defective T-patches or cover tape flashings.
 - o Routinely clean debris from around roof drain strainers
 - o Refinish or replace roof hatch cover. Monitor flashing around hatch curb.
- Long-term
 - o Replace roof system within 10 – 12 years

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$54,200 - \$67,000

Observations

Observation #1 - This roof is in fairly-good condition and drains itself fairly-well.



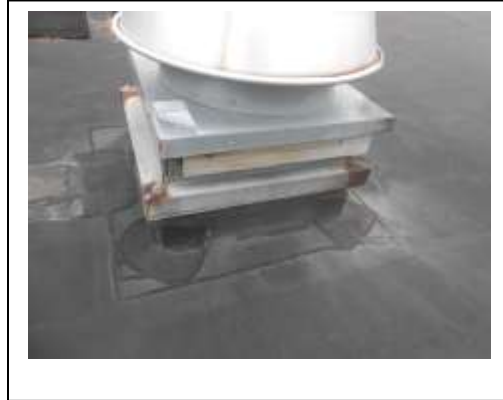
Observation #2 - Some of the field seams, T-joint covers and other flashings have been resealed with cover tape and sealant.



Observation #3 - Some leak patching has occurred in the field area and around the roof access hatch.



Observation #4 - Flashings around the various roof vents and rooftop units appeared fairly-sound.



Observation #5 - Base and metal flashing components appeared fairly-sound around the roof edges.



Roof ID: Board Room

Total Roof Area: 1050 square feet

Age: 26-years

Remaining Service Life approximately 1 - 2 years

Roof Construction & Conditions

- Roof Deck: Steel deck over steel trusses
- Drainage: Good drainage to roof drains with tapered insulation. Minor debris accumulation at roof drain strainers creates occasional minor ponding.
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Tapered rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Black 60-mil EPDM rubber well adhered in field area. Cover tape over several field seams. Minor repairs had been performed at 'T'-patches. Wear is typical for age of roof.
 - o Surfacing: N/A
- Base Flashings: Mostly sound with some previous repairs and some portions sagging with poor attachment to roof edge.
- Metal Flashing Components: Roof edge / fascia metal appeared sound. Metal curb cap fairly-corroded.

Recommendations

- Short-term:
 - o Reseal or cover any defective T-patches and defects on base flashings
 - o Routinely clean debris from around roof drain strainers.
 - o Monitor metal curb cap for rust-through. Seal over corroded areas to keep watertight until rooftop unit gets replaced.
- Mid-term:
 - o Replace roof system as soon as feasible.

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$10,400 - \$12,500

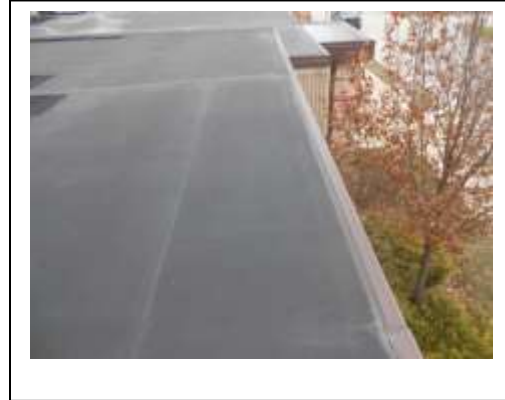
Observations

Observation #6 – This older adhered EPDM rubber roof is showing its age with spot loss of adhesion of the field membrane, defects in the flashings and leakage.



Observation #7 - The 26-year old EPDM membrane was fairly-weathered but still functioning.

Adhesion of the field membrane to the substrate was failing along the west roof edge and in the northeast corner.



Observation #8 - The roof drained well to the roof drain.



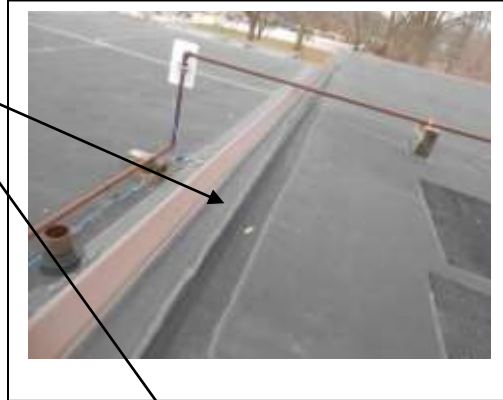
Observation #9 - Leakage appeared to originate from the north end of the rooftop unit curb and metal cap.

Rubber traffic pads protected the rubber roofing to and around the rooftop unit.



Observation #10 - The base flashing was well adhered at the perimeter edges except for of a portion of the flashing along the west edge which had sagged.

There had been some prior repairs to the corners of the roof edge flashings.



Roof ID: Police Garage

Total Roof Area: 950 square feet

Age: > 10-years

Remaining Service Life: Approximately 10 – 15 years

Roof Construction & Conditions

- Roof Deck: Steel deck over steel trusses
- Drainage: Good drainage to roof drains with tapered insulation. Minor debris accumulation at roof drain strainers creates occasional minor ponding.
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Tapered rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Black 60-mil EPDM rubber well adhered in field area. Cover tape over several field seams. Minor repairs had been performed at 'T'-patches. Wear is typical for age of roof.
 - o Surfacing: N/A
- Base Flashings: EPDM base flashings appeared sound.
- Metal Components: Roof edge / fascia metal appeared sound. Most roof ventilation components appeared sound with mild corrosion.

Recommendations

- Short- to Mid-term
 - o Reseal or cover any defective T-patches and defects on base flashings
 - o Routinely clean debris from around roof drain strainers
- Long-term
 - o Replace roof system within 10 – 15 years

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$8,400 - \$10,300

Observations

Observation #11 – No leakage was reported from this adhered rubber roof.



Observation #12 - The metal roof deck over steel trusses was typical construction on all the main roof areas.



Observation #13 -Tapered insulation channeled water to the roof drain.



Observation #14 - Some seam and flashing repairs had already been performed.



Roof ID: Training Room

Total Roof Area: 2,550 square feet

Age: 26-years

Remaining Service Life: 2 - 4 years

Roof Construction & Conditions

- Roof Deck: Steel deck over steel trusses
- Drainage: Good drainage to roof drains with tapered insulation. Minor debris accumulation at roof drain strainers creates occasional minor ponding.
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Tapered rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Loose-laid black 45-mil EPDM rubber anchored with stone ballast in field area. Minor repairs had been performed. Wear is typical for age of roof.
 - o Surfacing: Smooth river rock ballast.
- Base Flashings: Mostly sound with some previous repairs.
- Metal Flashing Components: Coping covers on west and north walls loose and previously-patched. Counter flashing on east wall appeared sound. Gravel stop / roof edge along south wall appeared sound.

Recommendations

- Short-term:
 - o Reseal or cover any defective T-patches and defects on base flashings
 - o Routinely clean debris from around roof drain strainers.
 - o Re-anchor and seal metal coping covers.
- Mid-term:
 - o Replace roof system in the next 2 – 4 years.

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$23,400 – 28,400

Observations

Observation #15 - The older ballasted EPDM rubber roof over the training room roof drained well.



Observation #16 - No defects were noted during random checks of the field seams.

Approximately 10 – 14lbs per square foot of ballast stone anchored the loosely-laid EPDM rubber in place.

Ballast coverage in the field areas, perimeter edges and corners was good.



Observation #17 - The rubber base flashing at the north and west outer walls and at the adjacent North Apparatus Bay wall to the east appeared sound, though some prior patching had been performed.



Observation #18 - The low-profile angled roof edge along the south wall, along with the east wall counter flashing and the north and west wall copings were generally sound.

There were however some portions of the copings where the joints had loosened and become possible points of water intrusion.



Observation #19 - The curbs and flashings at the rooftop unit appeared sound.

Some of the miscellaneous metal roof vent components were fairly-corroded.



Roof ID: Fire Department – North Bay

Total Roof Area: 2,350 square feet

Age: > 20-years

Remaining Service Life: 1 – 2 years

Roof Construction & Conditions

- Roof Deck: Steel deck over steel trusses
- Drainage: Good drainage to roof drains with tapered insulation. Minor debris accumulation at roof drain strainers creates occasional minor ponding.
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Tapered rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Loose-laid black 45-mil EPDM rubber anchored with stone ballast in field area. Minor repairs had been performed. Wear is typical for age of roof.
 - o Surfacing: Smooth river rock ballast.
- Base Flashings: Poor condition with current defects and extensive previous repairs.
- Metal Flashing Components: Coping covers on west and north walls loose and previously-patched. Counter flashing on east wall appeared sound. Gravel stop / roof edge along south wall appeared sound.

Recommendations

- Short-term:
 - o Reseal or cover any defective T-patches and defects on base flashings.
 - o Routinely clean debris from around roof drain strainers.
 - o Re-anchor and seal metal coping covers.
- Mid-term:
 - o Replace roof system in the next 1 - 2 years.

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$20,800 - \$25,300

Observations

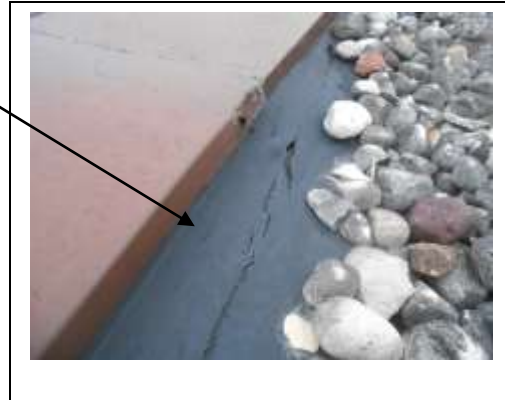
Observation #20 – The field area of this older ballasted EPDM rubber roof drained well and had been relatively watertight.



Observation #22 – Ballast coverage in the field and perimeter areas was good.



Observation #23 – The weakest part of this roof has been the perimeter flashings. The badly-weathered exposed portion of the flashings had numerous splits and holes which allowed water to enter and wet the immediate area of the defect.



Observation #24 – The inside corners of the perimeter flashings were a bit of a mess and, like the balance of the perimeter flashings, needed additional repair to stay watertight.



Observation #25 – The flashings on the various roof protrusions appeared sound.



Observation #26 – Water drained well to the roof drains. The drains need to be inspected regularly so debris does not have a chance to accumulate and create ponding water conditions.



Roof ID: Fire Department – South Bay

Total Roof Area: 3,750 square feet

Age: 7-years

Remaining Service Life: Approximately 10 -13 years

Roof Construction & Conditions

- Roof Deck: Steel deck over steel trusses
- Drainage: Good drainage to roof drains with tapered insulation. Minor debris accumulation at roof drain strainers creates occasional minor ponding.
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Tapered rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Black 60-mil EPDM rubber well adhered in most of the field area but un-adhered in several spots. Minor repairs had been performed at 'T'-patches and flashings. Wear is typical for age of roof.
 - o Surfacing: No additional surfacing
 - o Walkways: Traffic pads at rooftop unit only
- Base Flashings: EPDM base flashings appeared sound.
- Metal Components: Roof edge / fascia metal appeared sound. Most roof ventilation components appeared sound.

Recommendations

- Short- to Mid-term
 - o Reseal or cover any defective T-patches or defects on flashings.
 - o Routinely clean debris from around roof drain strainers
- Long-term
 - o Replace roof system in approximately 10 - 13 years

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$32,500 - \$40,000

Observations

Observation #27 - This roof was wearing well and well adhered.



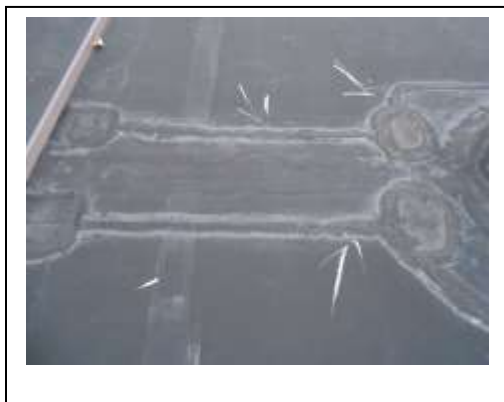
Observation #28 - The southwest corner of the roof was loose. The corners of roofs can receive more uplift stress from winds than other parts of the roof. This corner could be monitored to see if the condition worsens or simply re-adhered in the short-term.



Observation #29 - Drainage was good with only minor ponding having been observed.



Observation #30 – Numerous repairs had been performed to some field seams and numerous T-joint patches and flashings.



Observation #31 - Prior repairs had been performed to some of the various roof flashings. Re-caulking with lap sealant provided a short-term seal. Seams repaired with lap sealant only should be covered with cover tape for longer performance.



Observation #32 - The intersection of the south bay roof with the north bay roof had been repaired previously and required some additional repair.



Observation #33 - The metal roof edge components appeared sound.



Roof ID: Southeast Canopies

Total Roof Area: 350 square feet

Age: 6-years

Remaining Service Life: Approximately 15 years

Roof Construction & Conditions

- Roof Deck: N/A (likely wood)
- Drainage: Good
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Flat rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Black 60-mil EPDM rubber well adhered in field area and in very good condition.
 - o Surfacing: No additional surfacing
- Base Flashings: EPDM base flashings appeared sound.
- Metal Flashings: Roof edge / fascia metal in very good condition.

Recommendations

- Short- to Mid-term
 - o Routinely clean debris from roof.
- Long-term
 - o Replace roof system in approximately 15 years

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$5,600 – \$6,400

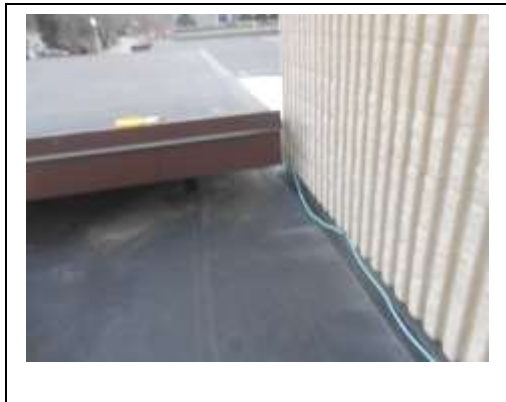
Observations

Observation #34 – The two southeast canopy roofs were new with the facade improvements several years ago.



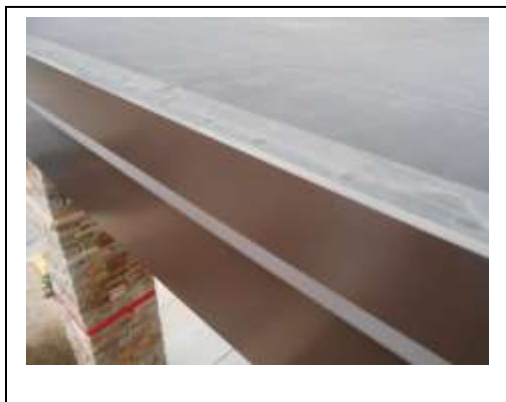
Observation #35 -The two southeast canopy roofs were fairly new and in very good condition.

The lower easts roof was well adhered and flashed well to the outer edges and adjacent South Apparatus Bay wall to the north.



Observation #36 - The upper roof to the west was also well adhered, drained well and was flashed securely on all four edges.

No defects ere noted in the perimeter roof edge / fascia metal.



Roof ID: Southwest Canopy

Total Roof Area: 75 square feet

Age: 6-years

Remaining Service Life: Approximately 15 years

Roof Construction & Conditions

- Roof Deck: N/A (likely wood)
- Drainage: Good
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Flat rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Black 60-mil EPDM rubber well adhered in field area and in very good condition.
 - o Surfacing: No additional surfacing
- Base Flashings: EPDM base flashings appeared sound.
- Metal Flashings: Roof edge / fascia metal in very good condition.

Recommendations

- Short- to Mid-term
 - o Routinely clean debris from roof.
- Long-term
 - o Replace roof system in approximately 15 years

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$2,100 – \$2,700

Observations

Observation #37 - The southwest canopy roof was new with the facade improvements several years ago.



Observation #38 - The southwest canopy roof was well adhered and in very good condition.



Observation #39 - The perimeter edges were sealed well to the outer roof edge metal, the board room sidewall and the adjacent Village Hall roof.



Roof ID: North Canopy

Total Roof Area: 50 square feet

Age: 6-years

Remaining Service Life: Approximately 15 years

Roof Construction & Conditions

- Roof Deck: N/A (likely wood)
- Drainage: Good
- Roof Assembly
 - o Thermal Barrier: N/A
 - o Air / Vapor Retarder: N/A
 - o Insulation: Flat rigid insulation board felt firm under foot
 - o Cover Board: N/A
 - o Membrane: Black 60-mil EPDM rubber well adhered in field area and in very good condition.
 - o Surfacing: No additional surfacing
- Base Flashings: EPDM base flashings appeared sound.
- Metal Flashings: Roof edge / fascia and wall counter flashings in very good condition.

Recommendations

- Short- to Mid-term
 - o Routinely clean debris from roof.
- Long-term
 - o Replace roof system in approximately 15 years

Budgetary Information

- Roof tear-off and replacement with updated but similar roof system - \$2,100 – \$2,700

Observations

Observation #40 - The north canopy roof was new with the facade improvements several years ago.



Observation #41 - The north canopy roof was well adhered, drained well and was in very good condition.



Observation #42 - The south base flashing and metal counter flashing on the sidewall appeared sound.



Observation #43 - The membrane was sealed well at the low-profile metal outer roof edge flashing.



Observation #44 - The small drain scuppers appeared to be functioning well.



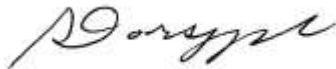
Conclusions

The quality of the initial installations of the various roof systems was fairly-good. The roofs appear to have been maintained over the years. Performing the restoration, repairs and routine maintenance as noted above can help extend the lives of the various roof systems. As the roofs approach the ends of their service lives they can become less dependable and increasingly prone to leakage. The quality of interior finishes, along with the criticality of the contents, uses and occupancies should be considered in the decisions to maintain or replace these roof systems.

I offer these professional opinions to you and to others, with the representation that they are opinions which I hold to a reasonable degree of certainty. I reserve the right however to reconsider any of these professional opinions if additional, relevant information is made available to me.

Please feel free to call with any questions on this report.

Sincerely,



Ron Dorszynski, RRO

Feel free to visit our website at www.skylinetechnical.com

Sources of Industry Technical Information

NRCA – National Roofing Contractors Association Roofing & Waterproofing Manual
NRCA Architectural Sheet Metal & Metal Roofing Manual
SMACNA – Sheet Metal & Air Conditioning Contractors National Association
SPRI – Single Ply Roofing Institute
APA – The Engineered Wood Association

Limitations

This report is based on conditions that were readily observable at the time of the inspection. Invasive testing and inspections were performed only as described in this report. Skyline Technical LLC does not accept responsibility for deficiencies not evident during an investigation of this type.

This report is intended to inventory existing conditions of the observed areas. Repair recommendations provided in this report are conceptual in nature and are not intended for construction. Skyline Technical LLC is able to provide construction details and specifications for repair at your request.

Conditions observed on the date of investigation may change if noted deficiencies are not corrected.