

M. Gottfried, Inc.

Roofing and Sheet Metal Contractors

89 Research Drive, P.O. Box 2218, Stamford, Connecticut 06906-0218
PHONE: (203) 323 8173 Website: mgottfried.com FAX: (203) 359 2498

TO: Viking Construction, Inc.
1387 Seaview Avenue
Bridgeport, CT 06607
ATTN: JoAnn Michaels

DATE: October 14, 2019

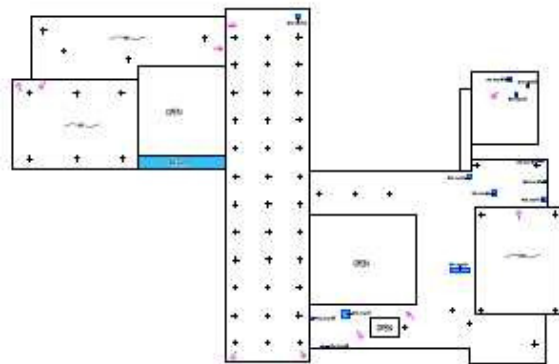
RE: Roof report and repair quotation
Turn of River Middle School
117 Vine Road
Stamford, CT 06905

Dear Ms. Michaels,

As per your request we went to the above school to perform an inspection of the roofs, and, using the Infrared Thermographic Roof Moisture Analysis Report as a guide, look for possible sources of water leaks in the noted "wet areas". We also were to perform test cuts, if necessary, to verify the wetness and determine the roof components in those areas. We were also asked to provide pricing on replacing the wet areas, and to provide a recommendation and pricing for roof maintenance.



Roofs labeled with warranties if present



Areas of moisture shown on Roof Scan

The roof areas at Turn of River Middle School can be broken up into 5 areas. The EPDM roof over the portable classrooms (outlined in red) have a GAF 20-year Everguard roofing system that will be in effect until 6/31/2025. The large modified bitumen system (outlined in green) has a Firestone 20-year warranty that will expire 10/21/2020. The long, modified bitumen system (outlined in orange) has a JM 20-year warranty that will expire in 2024. The large corner EPDM roof also has a JM roof with a 20-year warranty that will expire in 2033. The connector roof has a modified bitumen roof and does not appear to be under warranty.

The **GAF EPDM roof over the portable classrooms** is in good condition. It was installed in 2005 and has an active 20-year warranty in place. Three small wet areas; 10, 11 and 12 are found on this roof.



View of EPDM roof



Wet areas noted on the portable classrooms

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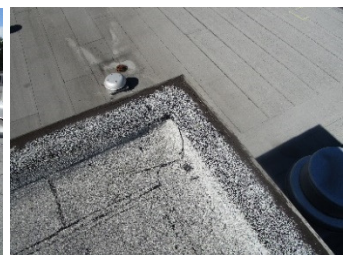
All of the wet areas appear to be on or near laps or near patches. These wet areas should be replaced, and the laps checked. The nearby areas should be checked for holes or other sources of water entry.

It looks like a tree limb or other problem might have occurred on this roof. There are areas with many patches present.



These patches were done using flashing membrane, rather than cured field sheet. Manufacturers require patches to be performed using the field sheet for longevity reasons. The flashing material when used as patches may tend to peel or lift over time. The large area of patches should be overlaid with new field sheet to; meet warranty requirements, repair any other holes that might have been missed and cover over patches that might lift.

The large Firestone modified bitumen roof looks to be the oldest roof on the school, installed in 2000. This area also has the most wet areas (not counting the connector which is completely wet).

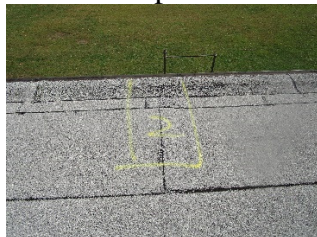


Views of main Firestone roof

upper Firestone roof

upper roof looking down

Wet areas 1, 2, 3 and 8 all lie on the perimeter of this roof area



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The perimeter membrane is aging, and the surface has minor cracks but that may not be causing the water infiltration. The laps should be checked, but the joint where the membrane meets the metal edging may be the source of the water leaks.



The joint between the end of the membrane and the edging is cracking and opening. This may be letting water into the system. The whole perimeter of this roof should be cleaned of debris and the cracked joint patched and filled with a liquid bitumen resin flashing membrane (Firestone Ultraflash).

Some of the wet areas like 4, 5 6 and 7, fall with the field of the roof.



No obvious cause of the wetness is found, but, after replacing the wet areas, the laps and cracks in the surrounding membrane need to be checked and repaired as necessary.

Areas 6 and 7 also fall near or around roof drains.



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The membrane blow out patches and/or stripping around the blow out patches are loose at some of the roof drains. All drain flashing needs to be checked and resealed or stripped with Ultraflash and reinforcing fleece as needed.

A problem area exists where the roof on either side of the courtyard meets the higher wall of the long building.



The membrane flashing is very low on these two walls. We were able to reach under the metal counterflashing and feel that the membrane had fallen back behind the cant strip. It is no longer adhered to the wall. This area is now open and can let water in, especially if snow builds up against the walls. In addition, the flashing at the windows, louvers and piers needs to be checked and repaired as needed. Wet area #9 lies against one of these locations.

The Firestone roof also needs general maintenance and patching at curbs and corners.



All of the corners, both on walls and at curbs must be checked to see if they are starting to open. If they are, they need to be properly patched before leaks develop. Some of the curbs are very low. Particular attention should be paid to these curbs and their difficult flashing conditions.

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One issue found on the Firestone roof that is hard to photograph, is blisters or bubbles in the membrane. We found about 10 blisters on the roof. Blisters are gas pockets that have expanded and lifted the membrane. On a multi-layer membrane like the one present, the blister can occur between the layers or membrane, or under all of the layers. A blister is water-tight until it breaks. Sometimes they break due to the lifted material not being able to expand any more, sometimes the break when someone walks on them. Broken blisters must be patched as soon as possible to prevent water getting into the roof system. Blisters can also be preventively cut, reset and patched to ensure that they don't cause problems in the future.

The Upper JM Modified Bitumen roof was installed in 2004 and has an active 20-year warranty. Only one small wet area #14, was found on this roof. (The infra-red scan drawing has this as #13. On the roof both the connector and this area are labeled #14)



View of upper JM roof

leak area "14"

We are not sure what is causing this leak, but as with the Firestone roof, the laps, flashings, etc., need to be checked, and general maintenance needs to be performed.

Penetration pockets on this roof level need to be checked and filled.



Voids or shrinkage in the filler can lead to water infiltration.

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Curb flashing is starting to open and needs to be repaired.



Many of the corners on the fan curbs, skylight and vent curbs are starting to shrink and open. In addition, it looks like some of the “newer” curbs have no counter flashing and the top of the membrane is open or were sealed with a coating. These should be properly flashed/counter flashed and brought up to the warranty requirements.

One of the HVAC curbs needs counterflashing.



The top of the base flashing on this curb is only nailed, no termination bar or counterflashing is present. The nails can not only loosen and rust, but the top edge of the flashing is vulnerable. A termination bar and/or a counterflashing should be installed to protect and secure the top edge of the base flashing.

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Problems also are present at the base flashing of one of the older HVAC units.



This curb is not properly flashed. The top of the membrane is open and the roofing cement that was used to seal the flashing to the curb has dried and has shrunk. The flashing should be properly sealed to the curb and a counterflashing installed if possible.

There is a gooseneck on the roof that should be replaced.



This gooseneck is dented and returns very close to the roof membrane. It should be removed and a new gooseneck that has the venting end higher off the roof should be installed.

Drain flashings need to be checked.



Openings in the flashings were found at some of the drain. These need to be repaired.

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Like the Firestone modified bitumen roof, this roof also has blisters. One large blister has opened and needs to be sealed before more water gets into the roofing system.

The last large area is a **JM EPDM roof** that was installed in 2013. It has an active 20-year warranty in place. The JM EPDM roof is relatively new and still in excellent shape. That being said, there are a number of items on the roof that need attention. No wet areas were found on this roof in the infra-red scan.



Views of the JM EPDM roof

Patches have been applied to the roof.



Some patches have been applied to the roof membrane, most likely to repair a hole. Unfortunately, flashing material rather than cured field sheet was applied and it has started to peel. A proper repair using JM material should be applied over these patches.

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Non-terminated base flashings and penetration flashings with fishmouths are present.



We noted that some areas of wall flashing at the columns are not terminated or have opened. These areas need to be properly sealed and repaired. In addition, some fishmouths were found at pipe flashings. These must be sealed before water gets in.

Debris needs to be removed from drains.



The roof needs to be cleaned of debris before it builds up and clogs scuppers and drains. Any missing drain baskets should be installed to prevent debris from going into and clogging pipes.

A roof ladder is present between the two levels of this roof. The ladder is bolted to the roof curb.



An access ladder was installed between the two roof levels. We cannot tell if water block was installed before the plate and fasteners were installed. As a precaution, we recommend flashing the plates and screw heads with JM materials.

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The connector is roofed with a modified bitumen roofing system. It is shown as completely wet on the infra-red scan. It is not known whether the connector roof was done in conjunction with either the JM or Firestone Modified Bitumen roofs or was a separate project. In either case, if the roof is soaked as noted in the scan report, it should be replaced. Because it is not over “occupied space”, it’s replacement may not be as important as other repair and maintenance work. Whether the roof is leaking, or the structure is showing signs of moisture infiltration may help in determining whether replacement or an attempt at repairs is undertaken. We can provide pricing for replacement upon request.



Views of the connector roof.

Summary

In summation all the main roof areas (not including the connector) have active roof warranties that have between 1 and 14 years of coverage left. All of the roofs need varying degrees of maintenance to bring them back up their remaining potential. By repairing the wet areas and noted preventative maintenance items the roofs should continue to perform past their warranty periods.

To achieve this goal, we recommend:

- Cleaning and removing all debris from the roofs and replacing missing drain baskets.
- Cutting out and replacing wet areas with new insulation and membrane.
- Inspecting the field of the roof, curb, vent and wall flashings and patching any fishmouths, open flashings, missing termination flashings, etc., as noted in the report.
- Checking and repairing penetration pockets.
- Sealing the perimeter edging on the Firestone roof as noted.
- Properly covering patches on the EPDM roofs as noted.
- Flashing ladder fastening plates.
- Repairing roof blisters.

Please let us know if you have any questions or need additional pricing.

Respectfully,

David Lederman