

Town of Richmond VT: Strategic Roof Replacement Impact & Environmental Assessment

Town of Richmond VT
Richmond Town Hall
203 Bridge St, Richmond, VT 05477

Current Roof Condition:

The current TPO roof system is at the point where ongoing repairs and patchwork may mitigate some active leaks temporarily, but the asset is at the end of its serviceable life. The roof has significant punctures, open conditions, loss of dimensional stability, open seams, degradation and shrinkage of the membrane. There are several active interior leaks in the post office with more severe leaks on the horizon. This isn't just a maintenance issue, it's a risk to operations, employee safety and satisfaction, and overall facility appearance and efficiency. The magnitude of the possible leaks will compromise productivity and introduce unnecessary risk.

Why TPO is Falling Short:

- **Limited Lifespan:** TPO roof systems typically lasts 15 to 20 years depending on the roof design, quality of materials, and workmanship.
- **Frequent Repairs and High Maintenance:** Single-ply membranes are vulnerable to damage from foot traffic due to equipment maintenance as well as the elements, nature, and other debris. This means ongoing maintenance costs and potential operational disruptions.
- **No Future Compatibility for Solar:** Single-ply systems are not designed to optimally handle the additional load and traffic that comes with solar arrays or increased rooftop equipment. Its susceptibility to damage means any rooftop expansion or solar installation would drastically increase the risk of failure, leading to more leaks and repairs.

Proposed Solution: Multi-Ply Modified Roof Assembly

Going forward, a multi-ply modified bitumen roof is a higher performing solution that is designed for facilities where long-term reliability, durability, low maintenance, and low environmental impact is valued. With a potential warrantable lifespan of up to 50 years, it's not just an upgrade—it's a significant investment in the future of Richmond.

Key Benefits of Modified Bitumen:

- **Exceptional Durability:** The multi-ply construction of the modified bitumen system provides multiple layers of protection and waterproofing capabilities. Each layer acts as a fail-safe against leaks, punctures, and weather damage. This means that even under high foot traffic, maintenance, and environmental hazards, the roof will maintain its integrity without requiring constant repairs. It's a system built for longevity, durability, and efficiency.

- **Longevity and Reduced Life Cycle Costs:** With an estimated serviceable life of roughly 35-45 years, this roof eliminates the need for a replacement in the foreseeable future. This not only saves on future capital expenditure, but it will significantly reduce maintenance costs. The cost of ownership over time will be significantly lower than other single-ply roof systems that have an estimated life cycle of only 15-25 years.
- **Solar-Ready and Expansion Capable:** Modified roofs are solar-compatible and can support the installation of rooftop photovoltaic systems without compromising its integrity or warranty. Its durability ensures that even with solar panels or additional rooftop units, the system will hold up over decades, providing a stable, low-maintenance platform.
- **Energy Efficiency and Environmental Impact:** UV reflectivity and smog reduction are two possible benefits of potential modified membranes. UV reflectivity will allow double sided photovoltaic systems to be utilized and will reduce heat absorption. Reducing heat absorption will help lower energy consumption and possible emissions throughout the building. An option to utilize the most sustainable modified bitumen membrane may also prove to be a valuable way for the Town of Richmond to support environmental sustainability initiatives. This membrane has the smog-reducing capabilities of planting over 216 trees on a typical 20,000sq. ft. roof. The granules in the membrane capture smog from the air and convert it into a water-soluble salt (nitrate salts). It's then washed away by rain and is returned to the natural nitrogen cycle so it can be utilized by plants.

Conclusion: A Strategic, Long-Term Investment

For Richmond Town Hall, the question isn't whether to replace the roof—it's about choosing the right solution that ensures long-term value and peace of mind that aligns with the towns' goals and efforts of sustainability and performance. This strategic investment will maximize efficiency, ensure longevity, protect the operations, and position the facility for sustained success in the years ahead.

A single-ply roof system may seem like a less expensive budget-friendly option, but its short life cycle, high maintenance needs, and lack of compatibility with future growth make it an inferior and unsustainable choice in the long run. Modified roof systems offer comprehensive solution options that are designed for durability, longevity, sustainability, and energy efficiency. They're built to handle the demands of a high-output facility like this one, with 40 to 50 years of reliable performance, significantly lower maintenance costs, as well as the added benefit of being solar-ready and environmentally sustainable.

The Garland Company, Inc.

Roof Asset Management Program

RAMP



Richmond VT, Town Hall Assessment

Prepared By
Nick Giangarra

November 15, 2024

FACILITY CONDITIONS

TOWN OF RICHMOND, VT

TOWN HALL



- 5 (Excellent)
- 4 (Good)
- 3 (Fair)
- 2 (Poor)
- 1 (Failed)
- N/A

SQFT:
11,322

ASSET	SYSTEM TYPE	AGE	SQFT	CONDITION
Exterior Masonry Walls				
Lower Low Slope Roof Section	Thermoplastic		5,519	Failed
Steep Slope Roof Sections	Shingles		5,479	Fair
Upper Low Slope Roof Section	EPDM: Fully Adhered		324	Fair

Town of Richmond, VT
203 Bridge St
Richmond, Vermont 05477



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The Garland Company, Inc.



Inspection Report



TOWN OF RICHMOND, VT

FACILITY: Town Hall	ROOF SECTION: Steep Slope Roof Sections	DATE: 11/15/2024
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Inspection Information

Inspection Date	11/15/2024	Core Data	No
Inspection Type	Visual Inspection	Leakage	No

Overall

Rating	Fair
Condition	<p>Assessment:</p> <p>A visual assessment was completed at the Town of Richmond's Town Hall on 11/15/24. The upper roof sections were observed to be in overall fair condition. The upper EPDM low slope roof section showed some areas of separation along seams and flashing strips as well as a couple punctures. The lower TPO roof section was observed to be in failed condition. Heavy deterioration and degradation is prevalent throughout the membrane, flashings conditions, and masonry. There are a vast number of open conditions throughout this roof section that are actively allowing water to penetrate the roof composition. The exterior masonry walls show heavy deterioration throughout.</p> <p>Recommendation:</p> <p>The lower roof section needs to be replaced as soon as funding allows. Due to this roof being well past the serviceable life expectancy, repairs at this time would not be a useful allocation of funds. Although a single-ply and a multi-ply roof system are outlined in the solution options, a redundant multi-ply modified roof system is recommended. This roof system will offer a lower overall life cycle cost and a substantially longer estimated serviceable life expectancy of a single-ply roof system. Once Richmond makes a decision as to which solution option is best for their future visions and allowable budgetary expenditure, Garland will start the design and engineering of the proposed system. At the time of completion of the necessary specification and project manual, Richmond will be able to post these documents along with the RFP to start the competitive closed bid process. We will assist in making sure the contractors who submit proposals are vetted and able to complete the roofing project as outlined in the specifications.</p>



Overview.



Overview.



Overview.



Overview.



Open area along ridge cap junction.



Inspection Report



TOWN OF RICHMOND, VT

FACILITY: Town Hall	ROOF SECTION: Upper Low Slope Roof Section	DATE: 11/15/2024
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Inspection Information

Inspection Date	11/15/2024	Core Data	No
Inspection Type	Visual Inspection	Leakage	No

Overall

Rating	Fair
Condition	



Improperly flashed penetration.



Open conditions surrounding flashing strips.



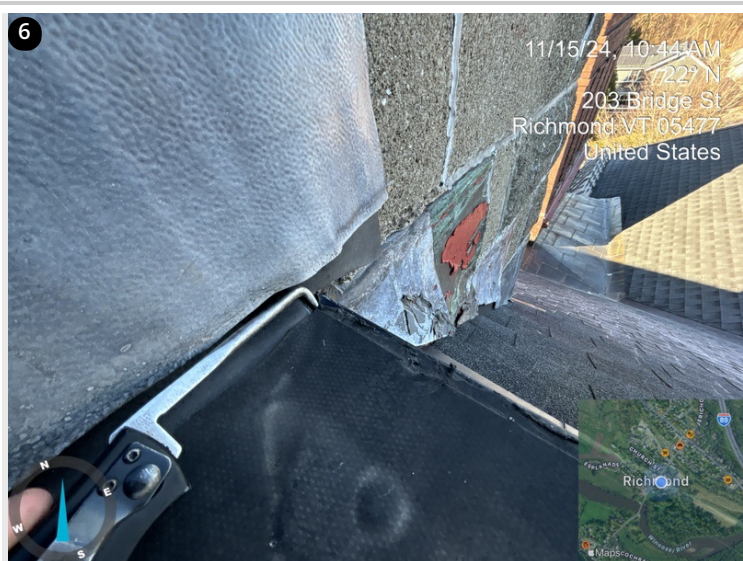
Minor ponding areas throughout the roof section. Perimeter flashing strip bubbling.



Punctures in the flashing strip.



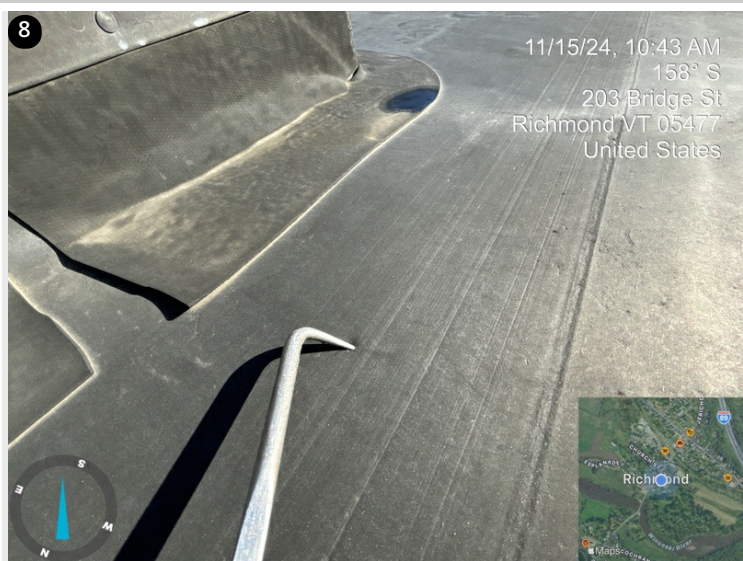
Fastener not fastened through the fastener plate.



Corner flashing showing minor open conditions.



Flashing strip losing adhesion.



Puncture in the EPDM membrane.



Deteriorated masonry throughout. Corrosion on the metal components attached to the chimney.



Inspection Report



TOWN OF RICHMOND, VT

FACILITY: Town Hall	ROOF SECTION: Lower Low Slope Roof Section	DATE: 11/15/2024
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Inspection Information

Inspection Date	11/15/2024	Core Data	No
Inspection Type	Visual Inspection	Leakage	No

Overall

Rating	Failed
Condition	



Overview photo.



Overview photo.



Overview photo.



Overview photo.



Hole through the degraded single-ply membrane. Exposed scrim throughout the membrane.



Fastener back out is prevalent throughout the roof sections. Several patches over the fasteners that have already punctured the membrane.



Improperly flashed penetrations in the masonry.



Improperly flashed penetration detail.



Several previously installed patches throughout the single ply roof system.



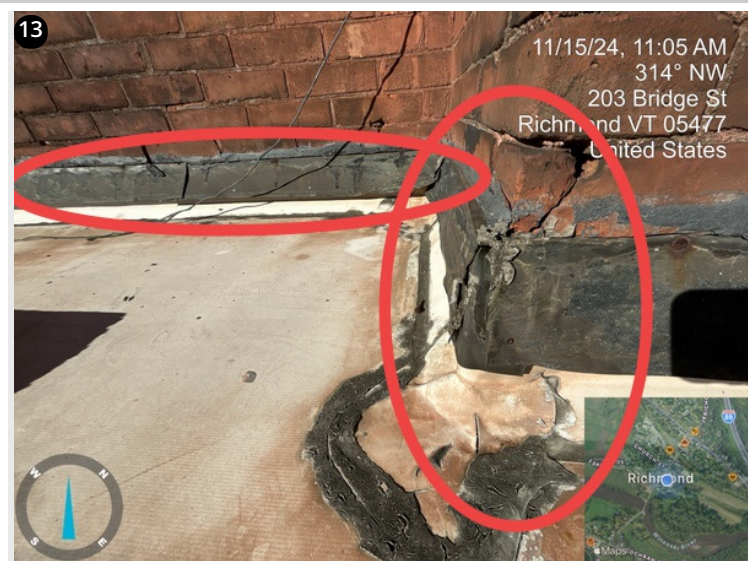
Perimeter flashings are deteriorated and cracked throughout.



Failing previously installed patch. Incompatible materials (EPDM & TPO).



Degraded and split membrane.



Significant masonry deterioration present throughout. Failing flashings and flashing patches/strips.



Masonry overview. Deterioration and degradation present throughout.



Shingle transition overview.



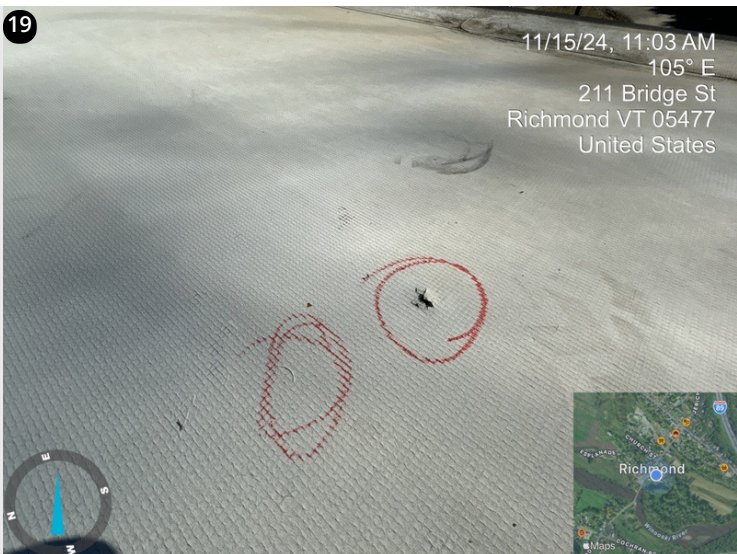
Cracked membrane due to degradation.



Large hole in the membrane.



Puncture.



Punctures throughout this failed roof system.



Failed flashing section. Membrane is brittle and is cracking and chipping away.



11/15/24, 11:02 AM
57° NE
211 Bridge St
Richmond VT 05477
United States

Split in the membrane at a vertical transition.



11/15/24, 11:00 AM
36° NE
211 Bridge St
Richmond VT 05477
United States

Puncture in curb corner.



11/15/24, 11:00 AM
234° SW
211 Bridge St
Richmond VT 05477
United States

Temporary flashing along perimeter is starting to lose adhesion.



11/15/24, 10:58 AM
310° NW
211 Bridge St
Richmond VT 05477
United States

Hole in membrane.



Solution Options



TOWN OF RICHMOND, VT

FACILITY: Town Hall	ROOF SECTION: Exterior Masonry Walls	TITLE: Masonry Repairs	DATE: 11/15/2024
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Report Data

Report Date	11/15/2024
Title	Masonry Repairs

Repair Options

Solution Option:	Repair	Action Year:	-
Square Footage:	-	Expected Life (Years):	-
Budget:	-		

Masonry Repairs:

1. Brick Repointing: Existing deteriorated mortar will be removed to a uniform depth of 3/4", twice the joint width, or until sound mortar – whichever is greatest. Do not damage masonry units during mortar removal. All damaged units must be replaced at no cost to the owner. All mortar must be removed to achieve a uniform depth. Remove fins and excess mortar at top and bottom of head joints by manual chipping or other means as necessary. New mortar will be installed in three (3) 1/4" lifts fully compacted into the joint and tooled to match existing color and profile as closely as possible (mortar color to be approved by owner).
2. Crack Rout & Caulk: Existing cracks 1/16" (1.5 mm) to 1/8" (3.0 mm) wide shall be routed to a 1/4" x 1/4". Crack shall be cleared of all loose dirt and debris and caulked with elastomeric hybrid sealant in accordance with industry standards and the manufacturer's specifications (new sealant color to be selected by owner from manufacturer's standard color chart).
3. Brick Replacement: Existing spalled or deteriorated brick as well as the surrounding mortar joints will be removed. New brick and mortar will be installed to match the surrounding area as closely as possible (new brick and mortar to be approved by owner prior to installation).
4. Wash & Water Repellent:
 1. Washing: Specified masonry/stone surfaces shall be washed using high pressure water only.
 2. Water Repellent: After masonry substrates have dried, Seal-A-Pore WB high performance clear silane masonry sealer will be applied according to the manufacturer's specifications.
5. Any new debris caused by newly completed repairs will be contained and cleaned.



Solution Options



TOWN OF RICHMOND, VT

FACILITY: Town Hall	ROOF SECTION: Lower Low Slope Roof Section	TITLE: 20-year Roof Replacement	DATE: 11/15/2024
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Report Data

Report Date	11/15/2024
Title	20-year Roof Replacement

Replace Options

Solution Option:	Replace	Action Year:	-
Square Footage:	5,519	Expected Life (Years):	-
Budget Range:	\$125,000.00 - \$175,000.00		

The single-ply roof assembly is past the end of its serviceable life and is in failed condition. It is recommended that the roof be replaced as soon as funding allows.

The following deficiencies and failures are consistent throughout the assemblies.

- Compromised insulation - loss of dimensional stability, buckling/deteriorating, and moisture contamination
- Membrane deficiencies - Tears/splits/slices/punctures/degradation
- Seam separation & loss of adhesion
- Open conditions
- Failing previous repairs

We suggest a redundant, modified roof assembly installed in cold applied adhesive, which has been proven to be the most durable roof assembly available.

This single-ply roof is warranted for 20 years and has a potential life expectancy of up to 25 years with proper inspections and maintenance.

Core sample analysis should be performed to help determine roof system composition (vapor barriers, insulation heights, coverboards, and membranes), the structural deck type, number of roofs on the building, and slope.

Budget (approximately 5,500 sq. ft.): \$125,000 - \$175,000

The scope of work is as follows:

1. Furnish and facilitate all necessary labor, materials, equipment, and related services necessary to properly and efficiently complete the specified roofing project.
2. Remove and properly dispose of any and all existing roof systems down to the roof deck. Including but not limited to membranes, insulation, coverboards, edge metal, and all flashing components.
3. Inspect the substrate and decking to verify and ensure no deterioration, deficiencies, or failures are present.
4. Mechanically fasten R-30 average polyisocyanurate insulation through the roof deck per the wind uplift calculations and updated building codes. Specified fasteners must be used. All insulation joints must be staggered.
5. Install 1/2 Gypsum based coverboard installed in high rise insulation adhesive per wind uplift.

6. Adhere one layer of "Solarbrite" 60 mil fleeceback KEE membrane in the specified adhesive.
7. Flashings to be constructed of one layer of "Solarbrite" 60 mil non-fleece KEE membrane.
8. Masonry through wall flashings to be repaired/replaced as necessary to ensure proper long term watertight performance.
9. Properly flash all penetrations per specified details and drawings.
10. New wood blocking to be installed around all perimeters and curbs as needed to allow for new insulation height.
11. Properly install and flash new .040 aluminum drip edge metal throughout. Owner to verify and confirm the color choice with awarded contractor prior to project commencement.
12. All debris to be cleaned up and properly disposed of.

Garland to provide the following services for no additional cost:

- **Engineering & Design Services:** (Full project manual to include specifications, drawings, details, code compliance review, etc.)
- **Closed Competitive Bidding:** (From 3+ approved and vetted contractors)
- **Project Management:**
 - Attend pre-bid and pre-construction meetings to answer any questions
 - Perform daily job site inspections at least 3 out of every 5 working days to ensure the proper materials are being used and procedures are being followed
 - Provide the client with weekly inspection reports
 - Perform a final inspection with any punch list follow up
- **Annual Roof Inspections:** (As requested by owner)
- **30-Year Warranty:** (Covering material & workmanship, guaranteeing leak free performance)

*All measurements should be verified. These figures are for budgetary purposes only. Budgetary estimates are based upon 2024 market values and can fluctuate due to inflation, labor availability, and unforeseen existing conditions.



Solution Options



TOWN OF RICHMOND, VT

FACILITY: Town Hall	ROOF SECTION: Lower Low Slope Roof Section	TITLE: 30-year Roof Replacement	DATE: 11/15/2024
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Report Data

Report Date	11/15/2024
Title	30-year Roof Replacement

Replace Options

Solution Option:	Replace	Action Year:	-
Square Footage:	5,519	Expected Life (Years):	-
Budget Range:	\$200,000.00 - \$250,000.00		

The single-ply roof assembly is past the end of its serviceable life and is in failed condition. It is recommended that the roof be replaced as soon as funding allows.

The following deficiencies and failures are consistent throughout the assemblies.

- Compromised insulation - loss of dimensional stability, buckling/deteriorating, and moisture contamination
- Membrane deficiencies - Tears/splits/slices/punctures/degradation
- Seam separation & loss of adhesion
- Open conditions
- Failing previous repairs

We suggest a redundant, modified roof assembly installed in cold applied adhesive, which has been proven to be the most durable roof assembly available.

This multi-ply roof is warranted for 30 years and has a potential life expectancy of up to 40 years with proper inspections and maintenance.

Core sample analysis should be performed to help determine roof system composition (vapor barriers, insulation heights, coverboards, and membranes), the structural deck type, number of roofs on the building, and slope.

Budget (approximately 5,500 sq. ft.): \$200,000 - \$250,000

The recommended scope of work is as follows:

1. Furnish and facilitate all necessary labor, materials, equipment, and related services necessary to properly and efficiently complete the specified roofing project.
2. Remove and properly dispose of any and all existing roof systems down to the roof deck. Including but not limited to membranes, insulation, coverboards, edge metal, and all flashing components.
3. Inspect the substrate and decking to verify and ensure no deterioration, deficiencies, or failures are present.
4. Mechanically fasten R-30 average polyisocyanurate insulation through the roof deck as outlined in the specified engineered tapered insulation plan per the wind uplift calculations and updated building codes. Specified fasteners must be used. All insulation joints must be staggered.

5. Install 1/2 Gypsum based coverboard installed in high rise insulation adhesive per wind uplift.
6. Ensuring there are no voids or gaps in the substrate, install 80 mil modified bitumen membrane base sheet in 2-2.5 gallons per square cold process adhesive.
7. Install new 155 mil modified bitumen membrane set in 2.5 gallons per square modified cold process adhesive. Heat weld all field seams.
8. Properly flash all penetrations per specified details and drawings.
9. New wood blocking to be installed around all perimeters and curbs as needed to allow for new insulation height.
10. Properly install and flash new .040 aluminum drip edge metal throughout. Owner to verify and confirm the color choice with awarded contractor prior to project commencement.
11. Provide manufacturer 30-year NDL warranty and 3-year contractor workmanship warranty.

Garland to provide the following services for no additional cost:

- **Engineering & Design Services:** (Full project manual to include specifications, drawings, details, code compliance review, etc.)
- **Closed Competitive Bidding:** (From 3+ approved and vetted contractors)
- **Project Management:**
 - Attend pre-bid and pre-construction meetings to answer any questions
 - Perform daily job site inspections at least 3 out of every 5 working days to ensure the proper materials are being used and procedures are being followed
 - Provide the client with weekly inspection reports
 - Perform a final inspection with any punch list follow up
- **Annual Roof Inspections:** (As requested by owner)
- **30-Year Warranty:** (Covering material & workmanship, guaranteeing leak free performance)

*All measurements should be verified. These figures are for budgetary purposes only. Budgetary estimates are based upon 2024 market values and can fluctuate due to inflation, labor availability, and unforeseen existing conditions.