Staff Report

Report To:	General Committee
Meeting Date:	September 17, 2024
Prepared By:	Phil Wood, Director of Operations Vince Wijsman, Arenas and Facilities Supervisor
Report Number:	2024-155
Subject:	Brockville Memorial Center Roof Condition Assessment

Recommendation

THAT approval be provided to complete repairs to flat roofs 3 and 4 on the Memorial Center in an amount of $100,000 funded by reserves and in accordance with the City Procurement Policy; and

THAT staff be directed to include a capital project to replace the large metal roof on the Memorial Center including proposed funding source as part of the 2025 Capital Budget.

Background

The design of the future Multi-Use Recreational Facility (MURF) has included detailed analysis of the existing roof sections of the Brockville Memorial Center. The Memorial Center roofs vary in construction, condition and year in service. All existing roofs are in poor condition with observable leaking.

Repair and replacement of the separate roof sections had been postponed to ensure any work was done in accordance with the future plans for the larger MURF project. With the MURF design complete and further indication that replacement of the roof sections can be done independently of the other scopes of the project, staff recommend that these roofs be done as a priority to fix/stop leaking and harmful water infiltration.

The objective of this staff report is to provide detailed roof condition reports and obtain Council approval to:

- Repair to the smaller flat built-up roof portions at the rear of the building; and
- Prioritize the replacement of the primary metal roof section as a 2025 capital project

Analysis

Consultants:

The Garland Company Inc. (Garland) is a roofing specialist that provide specification, product specialty, assessment and inspection services for complex roofing systems. IDEA/N45 are the architectural and engineering consultant contracted by the City to produce the detailed design of the MURF project. IDEA/N45 have worked with staff and Garland to assess the construction makeup of the existing roof structures at the Memorial Center and provide detailed summary and condition assessment. The summary reports indicate the effect the roof condition has on the existing Memorial Center structural members.

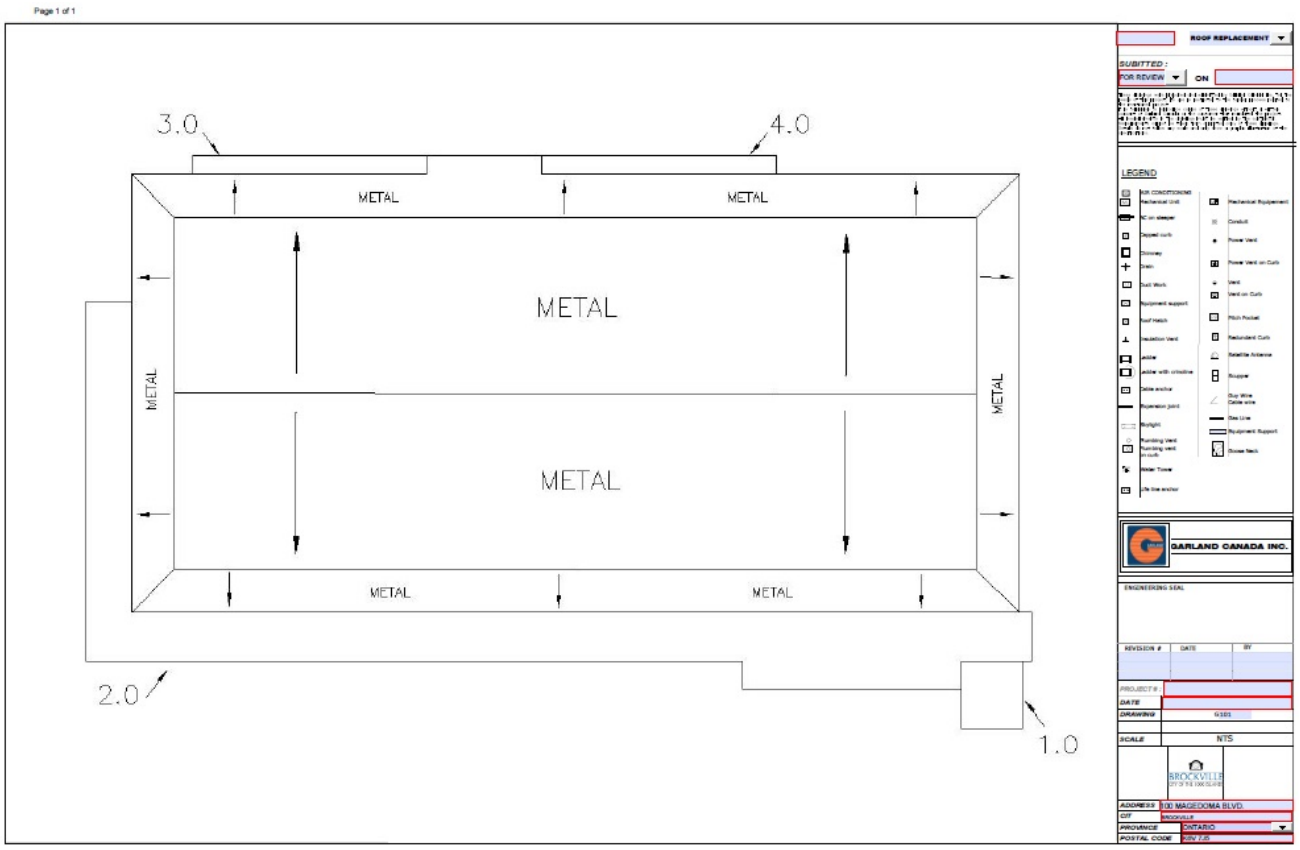
Garland, working with IDEA/N45 have conducted detailed inspections on the Memorial Center roof sections and summarized specific problems based on the inspections in two detailed reports.

Memorial Center Roof Construction:

The Memorial Center is constructed with three distinct roof sections. The roof sections are as follows:

1. The two front roof section 1 & 2, constructed as a flat built-up roof
2. The center and primary metal roof section, constructed as a pre-engineered steel structure
3. The two rear roofs 3 & 4 constructed as smaller flat built-up roofs

The Memorial Center was constructed in 1981. Roof sections 3 and 4 as well as the primary metal roof section are original to the 1981 construction. The identified roof sections have had repairs and modifications done as required.



Condition Assessment:

As detailed in the report by Garland, both the rear roof sections 3 & 4 and the primary metal roof section are the original construction, in service for 43 years. The identified roof sections are failed with compromising leaks that are progressively worsening.

On-site testing has confirmed that the insulation below the roofing system(s) has been infiltrated with moisture that was measurable at the time of inspection.

Options for Corrective Actions:

The report provides several options for replacement for the roof sections which are summarized below:

1. Roof sections 3 & 4:

- Option #1 - Repair
  - Provides no guarantee or warranty
  - Estimated at 35% of the cost of replacement with a30-year roof system
- Option #2 - Replacement (20-year roof system)
  - Provides a 20-year guarantee
  - Estimated at 75% of the cost of replacement with a30-year roof system

- Options #3 - Replacement (30-year roof system)
    - Provides a 30-year guarantee
    - Estimated cost of $100,000

Staff recommend approval of replacement of roof sections 3 & 4 with a 30-year roof system, Option #3, as the best value. Staff recommend commencing this work as soon as possible.

2. Primary metal roof section:

The report from Garland provided two primary options which are complete roof removal and replacement or retrofit of the roof in-place.

- Option #1 - Replacement
    - Entails complete removal of metal roof clad and associated hardware
    - Inspection of structural members
    - Surface preparation, addressing any corrosion or other irregularities
    - Installation of new metal roof and insulation
    - Provides a 30-year warranty
    - Has an estimated cost of $1.66 million
        - Detailed cost analysis provided by IDEA/N45

- Option #2 - Retrofit
    - Entails installing a metal spacer across the existing metal roof structure
    - Leaves existing roof in place
        - Requires additional structural analysis to ensure existing roof can bear the additional weight of an in-situ retrofit
    - New insulation material installed on top of existing roof between metal spacer (3-Options provided by Garland)
    - New roof materials are installed on top of the new insulation and metal spacers results in appealing appearance and finish
    - Option 1 (Standing metal seam)
        - Estimated cost of $3,100,000, 30-year warranty
    - Option 2 (Fibrated Aluminized Modified Bitumen Membrane)
        - Estimated cost of $2,500,000, 25-year warranty
    - Option 3 (Modified Bitumen Membrane)
        - Estimated cost of $2,200,000, 15-year warranty

<u>Additional Considerations:</u>

The primary metal roof of the Memorial Center needs to be complete in 2025 as a priority. The costs associated with the replacement of the primary metal roof was part of the scope of work and cost estimates presented to Council for the overall MURF project. If the Memorial Center roof work is complete prior to the undertaking of the larger MURF construction project, those costs will be a reduction of the overall MURF project that

follows. Addressing the primary metal roof is required to resolve the current water infiltration and leaking at the Memorial Center.

The common factor for all options to replace or retrofit roofing requires the removal of the existing solar panels. Solar panels can be sold or stored as spares for other locations at the Gord Watts Municipal Center (GWMC). The estimate to decommission and remove the solar panels is estimated at approximate $250,000 and is included in the estimated $1.66 million dollar cost to replace the primary metal roof.

Option #1 to replace the whole of the metal roof is the most complete solution. This method permits the installers to visually inspect structural members and make any remedial repairs. During replacement, all current insulation made wet by the existing leaks is removed and replaced. Removal of the metal roof system does expose the interior of the building to weather although controls to mitigate this will be taken.

Options #2 thru 4 are solutions that are built on top of the existing metal roof. As such, the existing metal roof would be left in place and a new layer of insulation new leak-proofing separation is installed. These optional methods are also more cost effective and vary in their respective aesthetic finish and longevity. Consideration needs to also be placed on the additional weight to the roof applied by each option. IDEA/N45 are undertaking the structural studies needed to confirm what the bearing capacity of the roof structure to determine which retrofit options can be considered.

Staff recommend that a capital project proposal be included in the 2025 capital budget, and that approval be given to expedite the tender of the work such that the preferred roof work method begin as soon as ice is removed in April of 2025.

Financial Implications

The estimated costs associated with the presented options are summarized below:

1. Roof sections 3 & 4:

- Option #1 - $35,000 - Repair (No warranty)
- Option #2 - $75,000 - Replacement (20-year roof system)
- Option #3 - $100,000 - Replacement (30-year roof system)

2. Primary metal roof section:

- Option #1 - $1,660,000 - Replacement, 30-year warranty
- Option #2 - $3,100,000 - Retrofit (Standing metal seam), 30-year warranty
- Option #3 - $2,500,000 - Retrofit (Aluminized MBM), 25-year warranty
- Option #4 - $2,200,000 - Retrofit (Bitumen Membrane), 15-year warranty

Policy Alignment

In accordance with Budgetary Control Policy POL.F.20.181, sections 1 - Sole Authority, 2 - Pre-Budget, 4 - Capital Budget, and 5 - Reporting:

- Council has the sole authority for approving funding for capital projects
- Council approval is required to purchase capital items prior to passing the budget
- Council authorization is required for additional expenditures
- Council approval is required for expenditures outside of the annual budget process

Contingent on approval of the proposed scope(s) of work, additional expenditures and capital items prior to passing the budget, any procurement related to roof replacement at the Memorial Center shall be in accordance with the Budgetary Control Policy POL.F.20.139, and Procurement Policy POL.F.20.139.

Conclusion

As part of the MURF project, IDEA/N45 have reviewed the conditions of roofs at the Memorial Centre. IDEA/N45 have worked together with Garland Inc. to provide detailed assessment and recommended options for repair and replacement.

In accordance with the reports from Garland Inc. and IDEA/N45, staff recommend approval of the following:

- Roof sections 3 & 4, flat roofs at the rear of the Memorial Centre be replaced with a 30-year roof system with a cost estimate of $100,000 as soon as possible.
- The replacement of the primary metal roof section be approved by Council as part of the 2025 Capital budget with a cost estimate for this work of $1.66 million and, that staff expedite the procurement prior to budget to ensure the work is complete during the summer of 2025.

Approved by:	Status:
Phil Wood, Director of Operations	Approved - 12 Sep 2024
Sandra MacDonald, City Manager	Approved - 12 Sep 2024

Attachments:

Garland Report - Brockville Memorial Centre - Primary Metal Roof
Garland Report - Brockville Memorial Civic Centre - Roof 3.0, 4.0

The Garland Company, Inc.

Roof Asset Management Program

R A M P



ROOF REPORT

Prepared By
Ryan Kinch

Prepared For
CITY OF BROCKVILLE

February 04, 2024

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Client Data

CITY OF BROCKVILLE
1 KING ST W
BROCKVILLE, ONTARIO K6V 7A5

BROCKVILLE
CITY OF THE 1000 ISLANDS

Client Data

Name	City of Brockville		
Address 1	1 King St W		
City	Brockville	**Province**	Ontario
Postal	K6V 7A5	**Country**	Canada

Contact Info

Contact Person	Vince WIJSMAN	**Title**	-
Mobile Phone:	(613) 342-8772	**Office Phone:**	(613) 342-8772
Email:	vwijsman@brockville.com		

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Building Owner: City of Brockville
1 King St W
Brockville, Ontario
K6V 7A5

Contact: Vince Wijsman
Supervisor- Arena and Facilities

Location: Brockville Memorial Civic Centre
100 Magedoma Blvd.
Brockville, Ontario

Date: February 4th, 2024

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Kingston, Ontario
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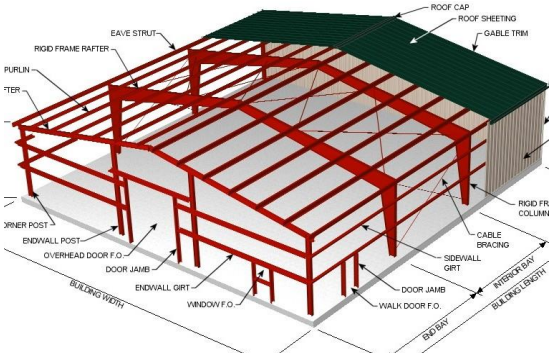


Figure 1 Example Pre-Engineered Structure

To Whom It May Concern,

In order to provide you with a condition assessment & capital budgets for the roofs reviewed at the Brockville Memorial Centre, the following information is provided based on a complete visual inspection by Garland Canada Inc.

Budget prices are for assistance with selecting the desired new roof and are not quotes. Quotes can be acquired upon approval of budgets and selection of roof type by a tender process. Garland Canada will include the following services as required for the City of Brockville:

1. Identify Customer needs and concerns
2. Comprehensive visual inspections and survey of building envelope system
3. Subsequent analytical testing, such as an infrared moisture scans, core analysis, on-site field testing or laboratory evaluation
4. Detailed report outlining building conditions and concerns, including supporting documentation and photographs.
5. Comparative analysis of recommended solutions
6. Assistance prioritizing recommended work to satisfy performance and budgetary requirements
7. Assistance preparing construction documents, including comprehensive design of roof and wall assemblies, custom details and specifications
8. Recommendation of pre-approved Garland authorized contractors
9. Project Management services to facilitate project budgeting, scheduling and logistics
10. Assistance interpreting building code requirements for each project
11. Installation monitoring to ensure Garland roof and wall systems are installed as designed and specified to provide long-term performance
12. Long-term comprehensive guarantee of leak-free performance

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Roof Type & Construction:

Arena *– Trapezoidal Panel over Fiberglass blanket insulation Pre-engineered steel structure*



Findings:

Overall Condition: Failed

Age: Constructed 1981, Metal Roof Panels believed to be original (43 years). Coating applied pre-solar panel installation 2010 (14 years).

Source: Google Earth Pro

Leaks have been reported on this roof for close to a decade, post solar panel installation, with various attempts made in the past to seal visible openings on metal roof details.

Continual leak inspection and minor repairs have been completed over this time in an attempt to limit the leaks, however the installation of solar panels over the majority of the roof area has created a scenario where the conditions of the roof are unknown and repairs cannot be performed without removing a large number of solar panels. The installation of the solar panels did not include a proper waterproofing detail. The panel mounting brackets were simply fastened through a through fastened metal system leaving a large quantity of holes in the roof throughout. The current roof area not covered by solar panels is limited. Within this limited area the condition of the roof is failed. Various conditions exist including splits in the reinforcing mesh, open seams, failed metal overlap seams, damaged metal panels, improper flashing conditions, missing eavestroughs, damaged & missing snow guard, open eave details, missing foam gaskets, drains blocked with debris and metal finish coat in poor condition.

There are several areas of concern within the arena that were pointed out during the February 2024 leak inspection. Since the May 2023 leak inspection, the quantity of leaks has increased as well as the the severity. There appear to be several leaks along the areas indicated by red lines, all appear to be at roof transitions. On the south side of the building the leaks follow the transition from the metal sloped roof to the flat roof section. On the north side they follow a transition of elevation change in the seam of the metal panels. At the eastern edge there are leaks that follow the roof edge. The rectangle indicated in the photo represents multiple on-going leaks above the rinks surface that work their way through the interior insulation and 250 feet of preventative eavestrough concealed above the insulation, down to the ice. The condition of the sloped metal roof section is poor as per the inspection performed in 2023. Further photos have been added to the report showing up to date interior conditions as of February 1, 2024.

See photo report below showing site conditions in depth.

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SCOPE #1 -- **RECOMMENDED SOLUTION** -- RETROFIT:

Retrofit over the existing metal roof system with infill insulation, new substrate, vapour barrier, insulation and roof system. Further details below.

Currently, the repairs seem to be utilizing resources inefficiently and demonstrating ineffectiveness. A new roof system is the only feasible option and should be applied as soon as budgets allow due to the increasingly poor performance of the roof.

ARENA SLOPED METAL ROOF ONLY:

Retrofit Systems Over Existing Metal Roofs

The goal of the following information is to compare commonly used methods of retrofitting existing metal roofs and determine which option the City would prefer to install on the Memorial Centre pre-engineered roof area. This project will be designed to provide a waterproof roof system, however with the intended use of the building remaining as an arena, any pre-existing condensation issues within the building may remain and shall not be in any way connected to the roof design, project or leak free warranty.



Why Retrofit?

Metal roofs have been documented to perform well and have a long service life. However, when an existing metal roof does reach the end of its service life, or is experiencing problems, it can either be repaired, reroofed, or retrofitted. Retrofitting (aka recovering) has many advantages over reroofing, including:

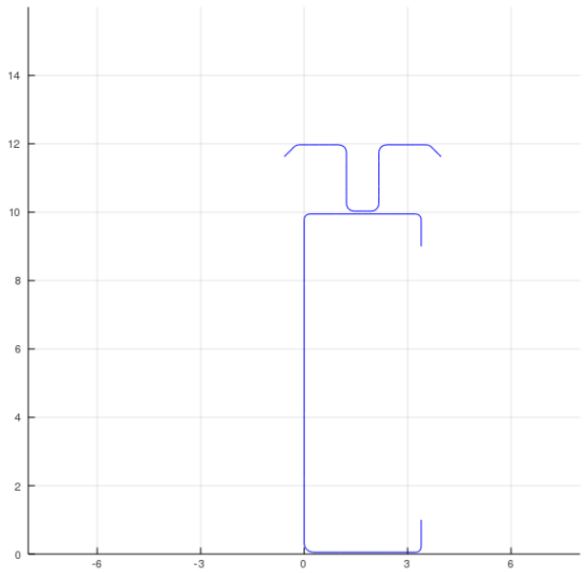


- Original roof provides temporary building interior protection during new roof installation
- Allows for building operations to continue
- Reduces landfill waste
- Reuses existing insulation and allows adding more insulation over the existing roof
- Provides a safer work surface than exposed existing secondary structural members
- Reduced cost
- The existing panels act as part of the structure. They hold the building diaphragm from twisting. If you remove the panels to install the same panels it is a risk.

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What are the Retrofit Options?

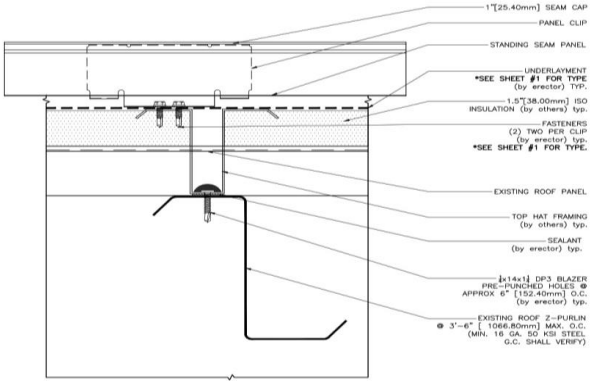
Adding dead load to the structure requires an engineer study to determine if the structure can withstand the applied loads. If the existing building's structure requires enhancement to accommodate the new roof retrofit system which can easily be achieved by adding a flange over the existing roof panel on each purlin as part of the retrofit buildup. Below are the suggested retrofit options:



1. Standing Seam Metal
   - Requires metal shop drawings which take 4 weeks to complete before an RFT can be issued. Stamped drawings by an engineer typically required for permits.
   - Metal panels will be continuous from ridge to eave with no overlap seams required
   - Standing seam metal panel with unlimited thermal movement
   - 30 Year Leak Free Warranty
2. 2 ply Fibrated Aluminized Modified Bitumen Membrane
   - Inherent advantages and proven performance of multi-ply protection with the strength, flexibility and elongation of elastomeric systems.
   - No shop drawings required. Stamped drawings by an engineer typically required for permits.
   - Solar Reflectance Index of 58 – Reduces roof temperatures of 15 degrees or more
   - 25 Year Leak Free Warranty
3. 2 ply Sunburst Modified Bitumen Membrane
   - Inherent advantages and proven performance of multi-ply protection with the strength, flexibility and elongation of elastomeric systems.
   - No shop drawings required. Stamped drawings by an engineer typically required for permits.
   - Solar Reflectance Index of 89 – Unmatched reflectivity for long-term protection and energy savings
   - 15 Year Leak Free Warranty

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OPTION 1 DETAIL- Standing Seam Metal:
RECOMMENDED SOLUTION
A new standing seam metal roof is installed over the existing metal roof [Figure 1]. Metal roof retrofit is the highest cost option, however due to the longevity of metal roof systems, the expected life cycle is longest. Therefore, this roof will provide the lowest cost of ownership per year.
Panels to be continuous from ridge to eave, with no overlap joints.
Unlimited thermal movement.



1. Example of a metal over metal retrofit assembly.

Includes a 30-year leak free warranty by Garland Canada Inc.

Expected additional loading to existing structure is ~ +3lbs/ sq ft



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Standing Seam Metal Roof designed for unlimited thermal movement with no end overlap seams (one continuous panel) and conforming to ASTM E 2140 (Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head).

Includes a 30 Year leak free, no dollar limit, non-prorated warranty covering material and labour.

Standing seam metal roofs are a popular choice for commercial applications due to their numerous benefits. These roofs consist of vertical metal panels that have raised seams that interlock, providing a distinct appearance and a range of advantages. Here are some benefits of using a standing seam metal roof in a commercial setting:



1. **Durability**: Metal roofs are known for their exceptional durability and longevity. They can withstand harsh weather conditions, including heavy rain, snow, hail, and high winds. This durability results in a longer lifespan compared to many other roofing materials.
2. **Weather Resistance**: Standing seam metal roofs provide excellent protection against water infiltration. The interlocking seams prevent water from seeping into the roof system, reducing the risk of leaks and water damage to the interior of the building.
3. **Fire Resistance**: Metal roofs are inherently fire-resistant, which can be a crucial feature in commercial buildings where fire safety is a priority.
4. **Low Maintenance**: Metal roofs require minimal maintenance compared to some other roofing materials. They are less susceptible to issues such as rot, mold, and insect damage that can affect traditional ro ofing materials.
5. **Energy Efficiency**: Metal roofs are highly reflective and can help reflect a significant portion of the sun's energy away from the building. This reflective property can lead to reduce d cooling costs during hot weather, making them an energy-efficient option.



6. **Longevity**: Properly installed and maintained standing seam metal roofs can last 40-50 years or more, making them a long-term investment for commercial property owners.
7. **Design Flexibility**: Standing seam metal roofs come in a variety of colors, finishes, and profiles, allowing for design flexibility to match the aesthetic of the building. They can also be customized to fit complex architectural shapes and angles.
8. **Fast Installation**: Standing seam metal roofs are often pre-fabricated off-site, which can lead to faster installation times compared to some other roofing materials. This can be beneficial in minimizing disruptions to business operations during installation.
9. **Environmental Sustainability**: Metal roofing materials are recyclable, which can contribute to reducing the environmental impact of roofing materials. Additionally, the reflective properties of metal roofs can contribute to urban heat island reduction and energy conservation.
10. **Snow Shedding**: The smooth, sloped surface of standing seam metal roofs promotes the shedding of snow and ice, reducing the risk of excessive snow load buildup on the roof.
11. **Lightweight**: Metal roofing materials are relatively lightweight compared to some other roofing materials, reducing the load on the building's structure.

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12. **Resale Value**: The durability, energy efficiency, and aesthetic appeal of standing seam metal roofs can enhance the overall value of a commercial property, making it an attractive feature for potential buyers or tenants.

When considering a standing seam metal roof for a commercial application, it's important to work with experienced professionals who specialize in metal roofing design & installation to ensure a waterproof final product and an appropriate material for your specific building and climate conditions.

Continuous Standing Seam Panels: No metal panel end lap seams will be required accompanied by a Garland 30-year leak free warranty. A metal roof panel that is continuous from ridge to eave offers several benefits when compared to other typical systems with overlap seams. Here are some of the advantages of continuous metal roof panels:

1. Enhanced Weather Resistance:

- Reduced Leak Potential: Continuous panels have fewer seams, which means fewer opportunities for water infiltration. This makes them more resistant to leaks and water damage, especially in areas prone to heavy rain, snow, or wind-driven rain.
- Better Wind Resistance: The lack of end overlap seams means that there are fewer weak points where strong winds can lift or damage the panels. Continuous panels are better at withstanding high winds and severe weather conditions.

2. Longevity and Durability:

- Reduced Maintenance: Continuous panels typically require less maintenance over time because they have fewer seams that can deteriorate or require resealing.
- Longer Lifespan: Metal roofing is known for its durability, and continuous panels can have a longer lifespan due to their reduced vulnerability to seam-related issues.

3. Aesthetic Appeal:

- Clean, Modern Look: Continuous panels offer a sleek and modern appearance with clean lines. They can enhance the overall aesthetics of a building and are often chosen for architectural designs where a smooth, unbroken look is desired.
- Fewer Visible Seams: With no end overlap seams, the roof looks more uniform, which can be particularly important for buildings where aesthetics matter.

4. Energy Efficiency:

- Improved Thermal Performance: Continuous metal roof panels can be designed with insulation and ventilation systems to enhance energy efficiency. Their design allows for the creation of a thermal barrier, which can help reduce heating and cooling costs.

5. Installation Efficiency:

- Faster Installation: Continuous panels are often easier and faster to install compared to panels with end overlap seams, which require more precise alignment and sealing of seams.



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6. Sustainability:

- Recyclability: Metal roofing materials are highly recyclable, making them an environmentally friendly choice. Continuous panels contribute to the sustainability of a building due to their long lifespan and recyclability.

PROJECT EXAMPLE:



Figure FULL LENGTH PANELS FROM RIDGE TO EAVE



Figure SPREADER BAR TO LIFT PANELS



Figure LIFTING PANELS TO ROOF



Figure PANELS STACKED ON ROOF



Figure RABBIT RUNNING DOWN SEAM CAPS



Figure FINAL ROOF PHOTO

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OPTION 2 Two Ply Fibrated Aluminized Modified Bitumen Membrane: Membrane roof systems are also utilized for retrofits over existing metal roofs and have proven to be very cost effective while providing longevity.
Modified Bitumen Membrane roof retrofit offers a reflective solution with redundancy meaning less dependency on workmanship. A premium quality, high solids content, fibrated aluminum roof coating which is formulated with specially selected asphalts, oils and resins to combine the waterproofing capabilities of an asphalt
roof coating with the reflectivity of aluminum paint.



Includes a 25-year leak free warranty by Garland Canada Inc.

Expected additional loading to existing structure is ~ +4.9 lbs/ sq ft





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OPTION 3 Two Ply Modified Bitumen Membrane Roof over Metal: Similar to option 2, this membrane retrofit is also a 2-ply membrane. The difference is in the cap membrane. With this option, a modified bitumen membrane with a highly reflective mineral cap is pre-manufactured. This will provide the most cost-effective option. These membranes have a proven track record as they have been used in the roofing industry for over 40 years and are known for their reliability due to their built-in redundancy.

Includes a 15-year leak free warranty by Garland Canada Inc.

Expected additional loading to existing structure is ~ +4.5 lbs/ sq ft







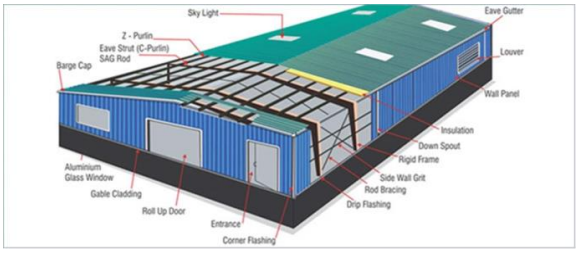
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BUDGET SUMMARY (Excluding HST):
ARENA ROOF RETROFIT

Roof Area	Option	Area (sq ft)	Warranty Length	Expected Budget
Arena Roof	1 Standing Seam	68,000	30	$3,100,000
Arena Roof	2 Aluminized Mineral	68,000	25	$2,500,000
Arena Roof	3 Sunburst Mineral	68,000	15	$2,200,000

Interior protection, permits, solar panel re&re, engineering, new structural components per engineering, HVAC, removal of wet insulation on the underside, electrical and plumbing additional as required.
ADDED R-VALUE TO BE DETERMINED BY THE CITY. BUDGETS REFLECT AN ADDITIONAL R-VALUE OF R12.
The above additional items should be expected to cost a minimum of $150,000 - $250,000 and needs to be confirmed by the City.

SCOPE #2 – COMPLETE RE&RE OF ROOF SYSTEM:



Complete removal of existing metal roof & insulation down to metal structure. New insulation and metal roof system installed over the existing structure.
This method is very intrusive and will require the closure of the arena, along with an extensive interior protection setup. A large expense will be expected to re&re any utilities attached to the underside of the roof.
Scope of Work: Low Slope Metal Roof Removal and Replacement on a Pre-Engineered Building

1. Site Preparation:
   - Erect temporary barriers on the interior to ensure a secure work area.
   - Remove any utilities on the underside to allow the roof system removal.
2. Roof Inspection:
   - Conduct a thorough inspection of the existing metal roof to assess its condition.
   - Document and report any structural deficiencies, corrosion, or areas requiring special attention.



3. Material Selection:
   - Install a new metal panel system capable of spanning the purlin spacing & withstanding all expected thermal movement of the building. A continuous panel from ridge to eave with a leak free warranty is desired to ensure a waterproof solution for the long term peace of mind operating this facility.
4. Demolition and Removal:
   - Remove existing metal roofing panels systematically to minimize disruptions.
   - Safely dispose of removed materials in accordance with environmental regulations.

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- Inspect and address any structural repairs or reinforcements as needed.

5. Surface Preparation:
   - Inspect and prepare the underlying roof substrate for installation.
   - Address any surface irregularities, rust, or corrosion.
   - Apply necessary coatings or primers to enhance adhesion.
6. New Roof Installation:
   - Install or upgrade insulation materials to meet energy efficiency requirements.
   - Install new low slope metal roofing system according to manufacturer guidelines and project specifications.
   - Ensure proper alignment, fastening, and sealing of roofing panels.
   - Implement best practices for flashing details, edge treatments, and penetrations.



7. Flashing and Trim Installation:
   - Fabricate and install flashing details around roof penetrations, edges, and transitions.
   - Install trim components for a finished and watertight appearance.
8. Quality Control and Testing:
   - Conduct quality control inspections daily to ensure installation per manufacturer's requirements.
9. Final Inspection and Client Walkthrough:
   - Conduct a final inspection of the completed metal roof installation.
   - Schedule a walkthrough with the client to address any questions, provide maintenance guidelines, and ensure satisfaction.

ARENA ROOF COMPLETE REMOVAL DOWN TO STRUCTURE

Roof Area	Option	Area (sq ft)	Warranty Length	Expected Budget
Arena Roof	Standing Seam	68,000	30	$5,000,000

Interior protection, permits, solar panel re&re, engineering, new structural components per engineering, HVAC, electrical and plumbing additional as required.
The above additional items should be expected to cost a minimum of $300,000 - $400,000 and needs to be confirmed by the City.

NEXT STEPS: Once the City has reviewed and considered the options outlined above, the next expected steps will be as follows:

- City Council and integral employees consider capital budget parameters for the project and selects the year in which the project(s) will be performed
- City provides their approval to Garland Canada Inc. to proceed with procuring the project as outlined in this report and provides feedback regarding approved budget parameters and expected project outcomes
- Garland Canada Inc. engages and assists local professional A&E firms as required to establish engineered construction drawings, plans and specifications

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  - The scope development and execution must adhere to Ontario building code and other applicable international codes.
- Develop a bidding document to attain local firm subcontractor pricing with all savings passed onto the Owner.
  - Garland will provide the City with a Guaranteed Maximum Price proposal via the Kinetic GPO project based on the final engineered construction documents, sub-contractor pricing and all other components of the project.
    - All Kinetic contracts are awarded using a competitive solicitation consistent with Chapter 5 of the Canadian Free Trade Agreement (CFTA) and other international trade agreements. There are no fees to join the Kinetic program and the contracts are completely voluntary. Members benefit from savings, compliance and efficiency in the procurement process.
    - Transparency provided with all tender information available to be reviewed by the City, including line items for labour, materials, overhead, profit, and contingency. Net pricing competitively tendered with high quality contractors.
    - Turnkey complete accountability for the design assistance and installation of complex exterior roofing and waterproofing projects.
- Stringent pre-qualification certifications and education for all subcontractors, combined with timely inspections of work in progress and complete management of all roofing projects. Proper installation is essential to the long-term integrity of every roof system. The Garland commitment to the most stringent roofing application guidelines begins with our authorized roofing contractor program. As a provider of the highest quality, commercial roofing products, Garland also provides comprehensive support services to ensure that our roofing solutions provide their warranted performance.
  - With Garland as your General Manager, we will assume complete accountability for all aspects of your roofing project management, including but not limited to:
    - The pre-approval of all roofing contractors
    - Pre-bid meetings
    - Pre-construction meetings on an as-needed basis
    - Coordination of all roof-related subcontractors
    - Daily inspections during roof construction projects
    - Weekly progress reports to the appropriate authorities on inspection results, using our Roof Asset Management Program
    - Additional technical support on an as-needed basis
    - Final inspection and contractor punch list
    - Various term NDL leak free warranties available covering labour and material
    - No charge annual inspections for the life of the roof

I trust this provides you the required information. If you would like further clarification or more detail on any of these items, please do not hesitate to contact me.

Sincerely,

Ryan Kinch
rkinch@garlandcanada.com
613 805 7691

Inspection Report

CITY OF BROCKVILLE
1 KING ST W
BROCKVILLE, ONTARIO K6V 7A5

FACILITY: Memorial Centre	ROOF SECTION: Metal Roof	DATE: 02/01/2024

Inspection Information

Inspection Date	02/01/2024	**Core Data**	No
Inspection Type	Visual Inspection	**Leakage**	Yes

Perimeter

Rating	Poor
Condition	

Field

Rating	Poor
Condition	

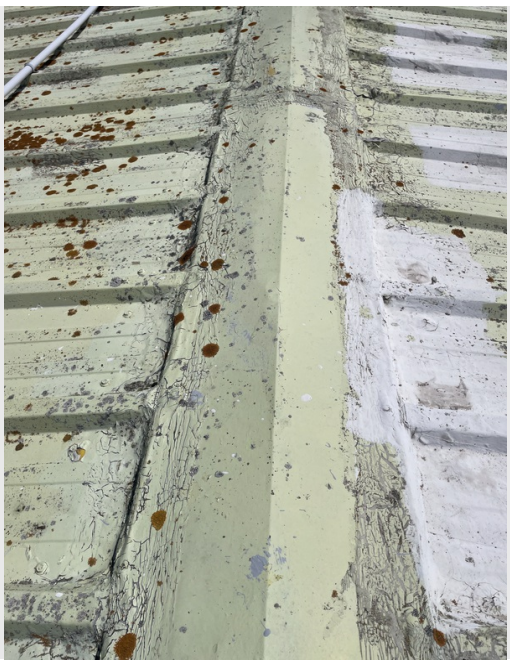
Overall

Rating	Poor
Condition	The following report outlines the leak inspection performed by Garland Canada on January 31, 2024. The inspection was refined to the interior of the building but photos from the 2023 roof inspection have been included. The overall condition of the roof is poor due to the severity of water penetrating the roof system throughout the entire building, as detailed in the report below the coating on the sloped metal roof panels is failing as well as failure points at multiple transitions throughout.



(**1**) There are several areas of concern within the arena that were pointed out during the inspection. There appear to be several leaks along the areas indicated by red lines, all appear to be at roof transitions. On the south side of the building the leaks follow the transition from the metal sloped roof to the flat roof section. On the north side they follow a transition of elevation change in the seam of the metal panels. At the eastern edge there are leaks that follow the roof edge. The rectangle indicated in the photo represents multiple on going leaks above the rinks surface that work their way through the interior insulation and 250 feet of preventative eavestrough concealed above the insulation, down to the ice.

The condition of the sloped metal roof section is poor as per the inspection performed in 2023. Photos below detail the poor condition of the roof coating over the metal panels at the noted transition areas above.



(2) It is important to note that with the roof system in place the issues could be occurring above the noted transitions and just reaching the interior at these points, it is possible that the issues could stem anywhere from the peak down.

The following photos are an example of the poor condition of the peak, and roof system in general. The coating on the metal panels is beginning to fail.



(3)



(4)



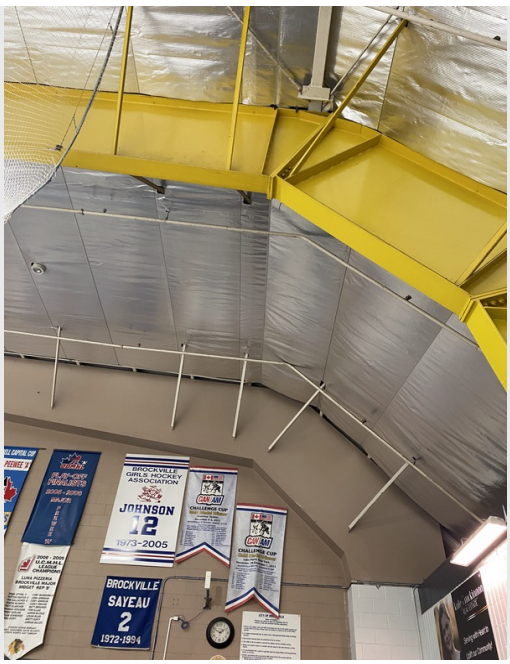
(5)



(**6**) View of roof transition from sloped metal to flat on the south side of the building, multiple leaks report along this transition.



(**7**) The following photos detail the interior of the south side of the building where evidence of water damage is present in the interior insulation.



(**8**)



(**9**) Insulation falling away due to water damage.



(**10**) Transition along north side of building. Multiple leaks along this transition as detailed in the following photos.



(**11**)



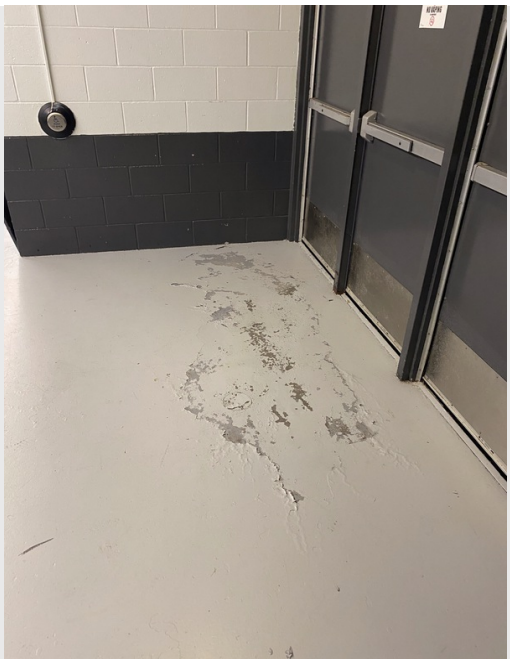
(**12**)



(**13**) Doors on north side of the building.



(**14**) Water damage to cieling.



(**15**) Damage to floor coating.



(**16**) View of the press box damage.



(**17**) Water actively dripping during inspections, appears to coincide with transition at seam in metal roof panels.



(**18**) Leaks extend across pictured beam, all insulation above drop ceiling saturated.



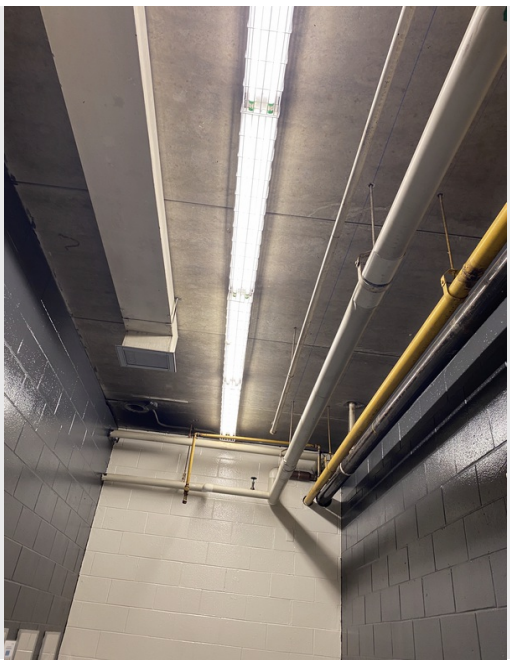
(**19**) Damage to floor coating along back hallway on the north side of the building.



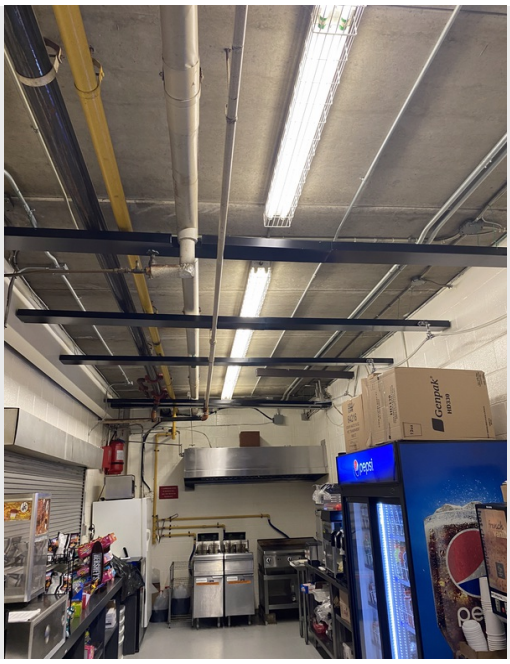
(**20**) The following photos detail the bathrooms, canteen, and storage rooms on the north side where leaks have be present at all seams in the hollow core cement deck.



(**21**)



(22)



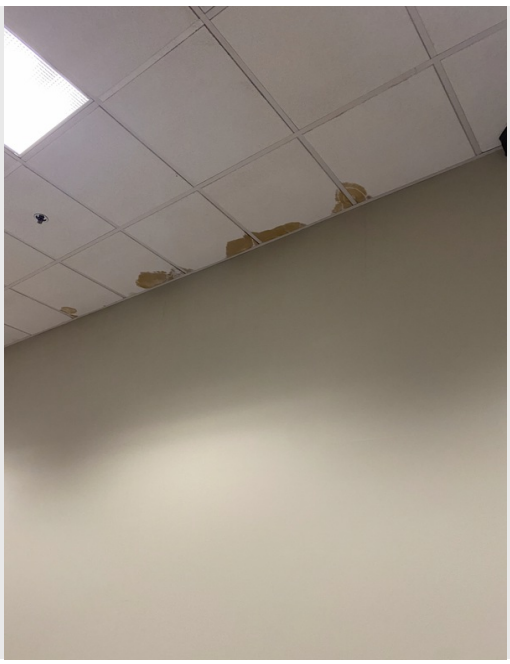
(23) Eavestrough installed inside the canteen to help direct water to the sinks.



(**24**)



(**25**) The following photos detail leaks in the community hall and bathrooms that coincide with the eastern roof edge. There is a large dead space area above the drop ceiling, it is possible that the issue could stem up to the peak water then works its way down the sloped deck.



(26)



(27)



(28)



(29)



(30)



(31)



(**32**) The following photos detail the interior insulation above the ice surface, there are continuous leaks across the ice that are an issue. Measures have been taken to cut away the insulation to install 250 feet of eavestrough to help direct the water to bins along the side of the ice.



(**33**)



(**34**)



(**35**) Water damage.



(36)



(37)



(38)



(39)

The Garland Company, Inc.

Roof Asset Management Program

RAMP

BROCKVILLE
CITY OF THE 1000 ISLANDS

2024 Roof Report

Prepared By
Ryan Kinch

Prepared For
City of Brockville

June 19, 2024

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Client Data

CITY OF BROCKVILLE
1 KING ST W
BROCKVILLE, ONTARIO K6V 7A5

BROCKVILLE
CITY OF THE 1000 ISLANDS

Client Data

Name	City of Brockville		
Address 1	1 King St W		
City	Brockville	**Province**	Ontario
Postal	K6V 7A5	**Country**	Canada

Contact Info

Contact Person	Vince WIJSMAN	**Title**	-
Mobile Phone:	(613) 342-8772	**Office Phone:**	(613) 342-8772
Email:	vwijsman@brockville.com		

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Building Owner: City of Brockville
1 King St W
Brockville, Ontario
K6V 7A5

Ryan Kinch
Garland Canada Inc.
Kingston, Ontario
Email: rkinch@garlandcanada.com
Mobile: (613) 805 7691

Contact: Vince Wijsman
Supervisor- Arena and Facilities
Location: Brockville Memorial Civic Centre
100 Magedoma Blvd.
Brockville, Ontario
Date: June 19th, 2024

To Whom It May Concern,

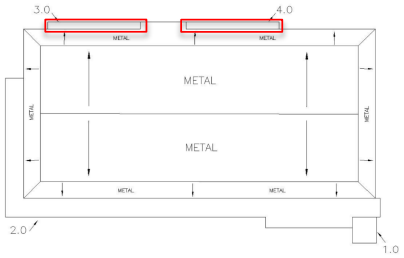
In order to provide you with a condition assessment & capital budgets for the roofs reviewed at the Brockville Memorial Centre, the following information is provided based on a complete visual inspection by Garland Canada Inc.
Budget prices are for assistance with selecting the desired new roof and are not quotes. Quotes can be acquired upon approval of budgets and selection of roof type by a tender process. Garland Canada will include the following services as required for the City of Brockville:

1. Identify Customer needs and concerns
2. Comprehensive visual inspections and survey of building envelope system
3. Subsequent analytical testing, such as an infrared moisture scans, core analysis, on-site field testing or laboratory evaluation
4. Detailed report outlining building conditions and concerns, including supporting documentation and photographs.
5. Comparative analysis of recommended solutions
6. Assistance prioritizing recommended work to satisfy performance and budgetary requirements
7. Assistance preparing construction documents, including comprehensive design of roof and wall assemblies, custom details and specifications
8. Recommendation of pre-approved Garland authorized contractors
9. Project Management services to facilitate project budgeting, scheduling and logistics
10. Assistance interpreting building code requirements for each project
11. Installation monitoring to ensure Garland roof and wall systems are installed as designed and specified to provide long-term performance
12. Long-term comprehensive guarantee of leak-free performance

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Roof Area Reviewed: Sections 3.0 and 4.0

Roof Type & Construction: Flood & Gravel, BUR, Fibreboard, Iso, Asphalt Vapour barrier & Concrete deck



Findings:

Overall Condition: Failed

Age: Constructed 1981, believed to be original (43 years)

Leaks have been reported on this roof for close to a decade.



Continual leak inspections been completed over this time in an attempt to identify & limit the leaks. The inspections have not yielded obvious defects which appear to be simple fixes. In the past, major vegetation growth on these areas has been noted and is required for cleaning & disposal bi-annually to ensure the drains are free flowing at all times. Within these areas the condition of the roof is failed mainly shown by the moisture present within the lower layers of the insulation which indicates a failure that is allowing moisture to enter the roof down to deck level & then migrate throughout the insulation layers from the bottom up. Various leaks have presented themselves in various areas inside the facility under these roof areas which are believed to be travelling across the vapour barrier & concrete deck until they find an opening in the deck.

Various conditions exist including vegetation growth, improper transition construction with open cavity at the transition from sloped metal roof to flat roof, improper slope on metal edge, open metal flashing seam on parapet and deteriorated metal roof coating & sealants, .

See photo report below showing site conditions in depth.

OPTION #1 – REPAIR – SCOPE OF WORK:

Repair the existing roof. Includes cutting & removal of the existing metal roof 4' up from the eave/flat roof flashing. Removing all metal flashings. Installing waterproofing membrane under the bottom of the newly cut metal roof and shingled down overtop of the existing flashings. Includes blocking & sheathing as required to fill the cavity between the two systems. Addressing all penetrations including caulking on rain collars, fully insulating vent stacks, new sealant around all penetrations, 3 coursing all vertical flashing seams & installing new metal flashings.

No guarantees will be provided by this option.

Budget: $35,000 + HST

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OPTION #2 ****RECOMMENDED***– REPLACEMENT – SCOPE OF WORK:***

Replace the existing roof. Includes cutting & removal of the existing metal roof 4' up from the eave/flat roof flashing. Removing all metal flashings. Installing waterproofing membrane under the bottom of the newly cut metal roof and shingled down overtop of the new flat roof flashings. Includes blocking & sheathing as required to fill the cavity between the two systems. Remove all existing roof components down to deck. Install new vapour barrier, insulation, recovery board, roof membranes, flood & gravel surfacing & installing new metal flashings.

Includes a leak free, non-prorated warranty covering labour & material.

BUDGET SUMMARY (Excluding HST):

Building	Roof Section, Type	Area(sq ft)	Suggested Action Year	New 20-YR Roof System	New 30-YR Roof System
CITY OF BROCKVILLE MEMORIAL CIVIC CENTRE	3.0 & 4.0	1,400	2024	$75,000	$100,000

Assumptions: *New drain, vent stacks, pitch pans and other accessories included. No deck replacement or repair required. No wood blocking/sheathing replacement required. New metal flashings. Set up areas will be made available next to building closest the roof to be replaced as required. Localized tapered insulation improvements included. 8', 2% tapered drain sumps and 8', 2% back sloping at walls included. HVAC, plumbing and Electrical work additional. Engineering additional if required. Interior protection additional if required. Hoisting of all roof materials included.*

.

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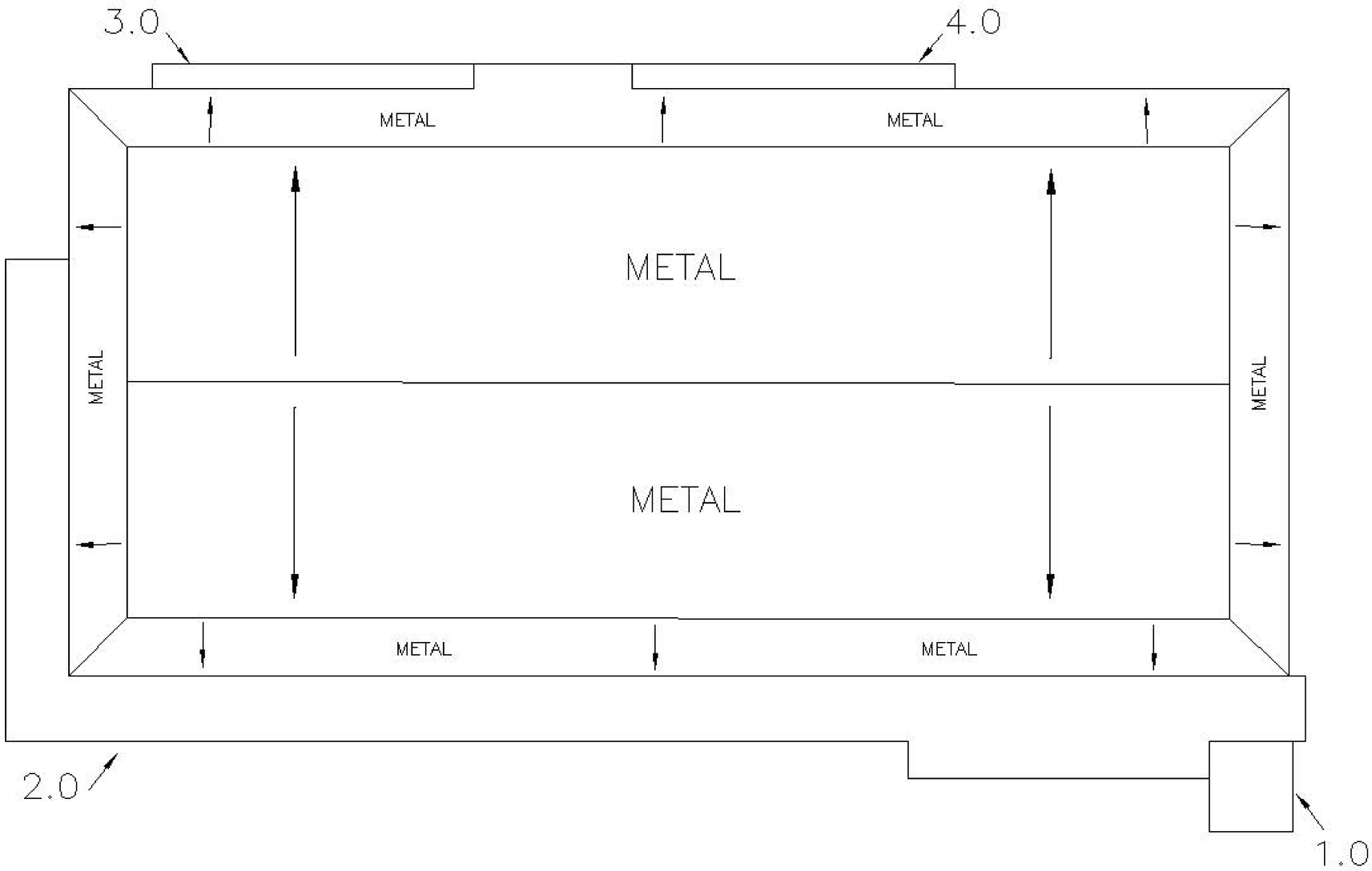
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        - No charge annual inspections for the life of the roof

I trust this provides you the required information. If you would like further clarification or more detail on any of these items, please do not hesitate to contact me.

Sincerely,

Ryan Kinch
rkinch@garlandcanada.com
613 805 7691



ROOF REPLACEMENT

SUBITTED :

FOR REVIEW **ON**

These drawings were prepared and submitted by Garland Canada inc. for the needs of this project. Its use is restricted to the tender process related to the mentioned project.
It is forbidden to reproduce copies of these drawings without a written consent of Garland Canada or the customer that mandated the project.
All measurements in the drawings must be verified by the contractor.
Measurements cannot be taken from a printed copy of these drawings.
Details do not follow any scale and only show a graphic illustration of the specifications.

LEGEND

	AIR CONDITIONING		
MU	Mechanical Unit	ME	Mechanical Equipement
AUM	AC on sleeper		Conduit
	Capped curb		Power Vent
	Chimney		
	Drain		Power Vent on Curb
D	Duct Work		Vent
	Equipment support		Vent on Curb
	Roof Hatch	PP	Pitch Pocket
	Insulation Vent		Redundant Curb
	Ladder		Satellite Antenna
	Ladder with crinoline		Scupper
	Cable anchor		Guy Wire Cable wire
	Expansion joint		Gas Line
	Skylight		Equipment Support
	Plumbing Vent		
	Plumbing vent on curb		Goose Neck
TOUR D'EAU	Water Tower		
	Life line anchor		

GARLAND CANADA INC.

ENGINEERING SEAL

REVISION #	DATE	BY

PROJECT # :

DATE	
DRAWING	G 101
SCALE	NTS

BROCKVILLE
CITY OF THE 1000 ISLANDS

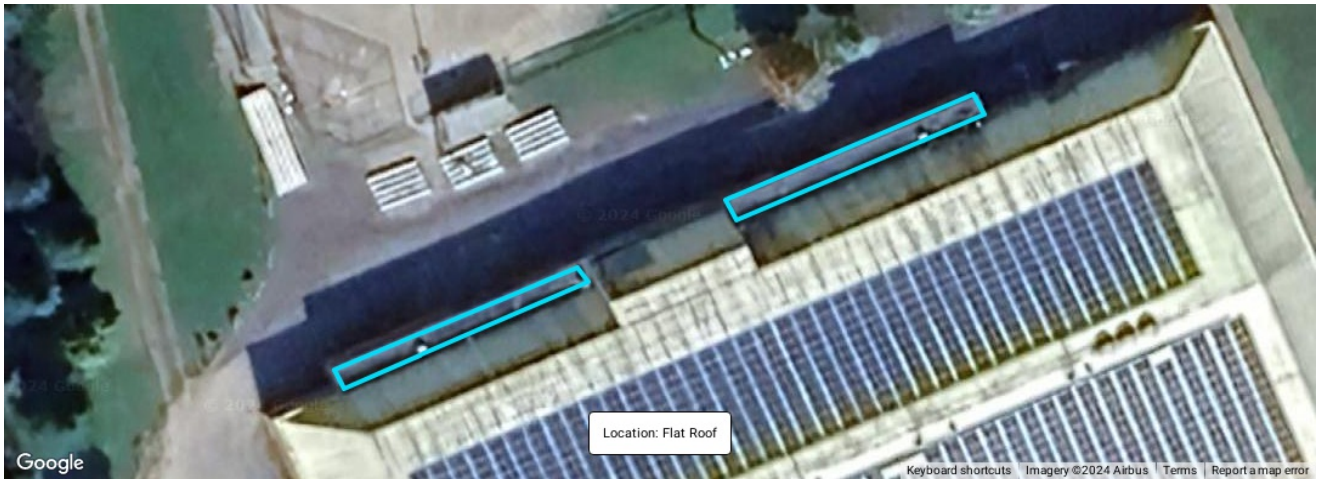
ADDRESS	100 MAGEDOMA BLVD.
CIT	BROCKVILLE
PROVINCE	ONTARIO
POSTAL CODE	K6V 7J5

Photo Report

CITY OF BROCKVILLE
1 KING ST W
BROCKVILLE, ONTARIO K6V 7A5

FACILITY: Memorial Centre	**ROOF SECTION:** Flat Roof	**TITLE:** LEAK INSPECTION 2024	**DATE:** 06/13/2024

Map



Summary

LEAK INSPECTION 2024

The following report outlines the leak inspection performed by Garland for the City of Brockville at the Memorial Civic Center Arena. The investigation was directed to the areas indicated above on the satellite image, both sections are considered to be failed and require replacements.

Existing Composition:
Flood & Gravel Surfacing
BUR membrane
1” fb-partially wet
1.5” iso-wet
Asphalt vb
Concrete deck

1		Overview of section 3.0.
2		

3



Metal edge indicated in the photo is angle back into the roof panels allowing water to pool and work its way back up under the metal roof panels. Note staining from standing water.

4



5



6



7



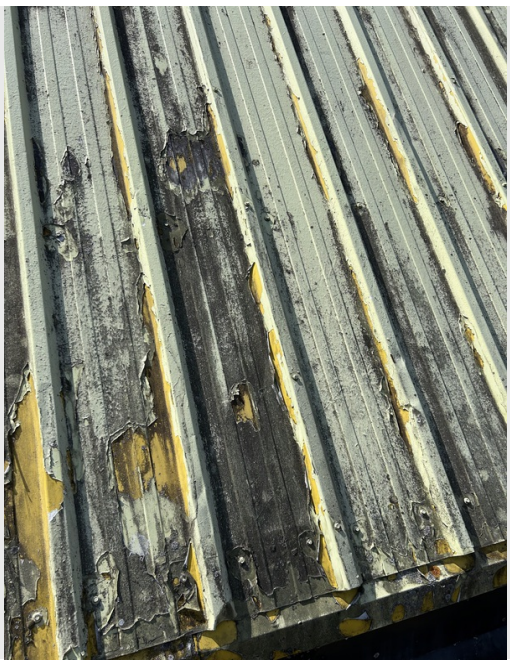
At the transition from the sloped metal roof to the flat roof sections, there is an open cavity which will need to be addressed during the replacement.

8



Standing seam in metal flashings is open and allowing water to penetrate.

9



Existing coating on metal roof panels has failed throughout.

10



The following two photos indicate interior areas where leaks are present.

11



12



Confirmation that roof system is mostly dry at the top layer of the core location.

13



Confirmation the bottom portion of the 1" fiberboard is wet.
Iso insulation was confirmed wet at the same time.

14



Confirmation core has been sealed.