

ROOFS
TIMEEQUITIES INC.



PREVENTATIVE
MAINTENANCE
MANUAL

FOR ALL ROOF TYPES

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SECTION 1

ROOF WARRANTIES

If there is a roof warranty in effect, any work to be performed on the roofing material must be performed by a contractor approved in writing, by the roof warranty issuer.

The preventative maintenance inspection outlined in this manual has to be performed by the property manager or engineer assigned to the property.

The findings of a roof inspection as well as any preventative maintenance performed must be documented in detail, including pictures, and must be electronically submitted to the respective asset manager, as well as to the Director of Facilities, Shanna Thweatt.

SECTION 2

ROOF TYPES

1. EPDM ROOF

Ethylene Propylene Diene Monomer (M-class rubber), a type of synthetic rubber, is an elastomer characterized by a wide range of applications. The M refers to its classification in ASTM standard D-1418; the M class includes rubbers having a saturated chain of the polymethylene type.



2. TPO ROOF

Thermoplastic Polyolefin (TPO) is a single-ply reflective roofing membrane made from polypropylene and ethylene-propylene rubber polymerized together. It is typically installed in a fully adhered or mechanically attached system, allowing the white membrane to remain exposed throughout the life of the roof.



3. CORROGATED ROOF

A Roof Type of thin sheets of material that have a surface in which there are many folds that look like a series of waves.



4. BUILT UP – MODIFIED BITUMEN ROOF

A Roof System constructed with layers of felt and bitumen (either asphalt or coal tar pitch) that are applied hot and left to cool. They are then covered with gravel, a mineral sheet cap, or other weather resistant coatings.



5. ASPHALT SHINGLE ROOF

A Roof type utilizing asphalt shingles for waterproofing.



SECTION 3

PROTOCOL AND PROCEDURES FOR ALL ROOF INSPECTIONS

1. MANDATORY ROOF INSPECTIONS FREQUENCY

- A. Annually — If age of roof is 10 years or less
- B. Semi-Annually (Spring and Fall) — If age of roof is 10 years or more
- C. Major Issue Occurrence — Storm, earthquake or earth movement not caused by an earthquake
- D. Immediately after any non-roofing contractor does work on the building roof

2. MAJOR ISSUES TO LOOK FOR DURING ROOF INSPECTION

- A. Roof Contractors – Holes, Punctures, or Nails, Screws, Equipment Left on the Roof



LEFT: A PUNCTURE IN THE ROOF.



RIGHT: A TEAR IN THE ROOF MATERIAL.

- B. Roof Pulling Away



ROOF HAS PULLED FROM THE STRUCTURE.

C. Ponding/Improperly Pitched Roof



PONDING IS WHEN EXCESSIVE WATER IS SITTING ON THE ROOF. ANGLE ROOF FOR WATER TO BE DIRECTED TO DRAINS.

D. Seasonal Debris



E. Clogged Drainage, Drain Covers



F. Clogged Gutters, Scuppers and Leaders



G. Objects that Have Fallen or Will Fall on the Roof



H. Improperly Installed Satellite Dishes — Holes in Roofing Material



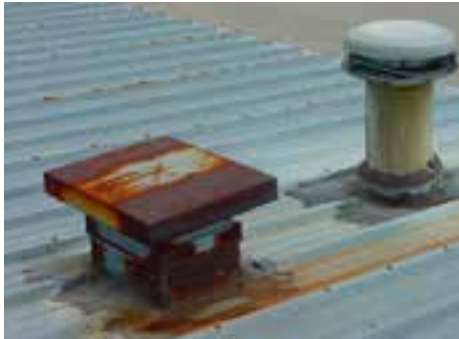
SATELLITE DISHES SHOULD SIT ON A SECURED, WEIGHTED SURFACE ON THE ROOF, NOT BE MOUNTED DIRECTLY ON THE ROOF. THIS COULD CAUSE LEAKS.

I. Cracked Mastic



MASTIC IS A COATING USED TO SEAL AREAS AROUND ROOF PENETRATIONS. WHEN CRACKED, WATER CAN PENETRATE THE ROOF.

J. Rust/Corrosion



REMOVE ALL RUST AND CORROSION FROM ROOF SURFACE AND PENETRATIONS UTILIZING A STEEL WIRE BRUSH AND PAINT WITH ANTI-CORROSIVE PAINT, I.E. RUST-OLEUM.

K. Bubbles



A POCKET ON THE ROOF CONTAINING MOISTURE/WATER.

L. Open or Opening Seams



THE EXPANSION OF SEAMS IS WHEN ROOFING MATERIAL HAS PULLED FROM THE ADHERED SURFACE.

M. Loose Fasteners and Holes Around Fasteners



**MISSING FASTENERS/
SCREWS THAT LEAVE
HOLES SHOULD BE
REPAIRED.**

N. Soft Spots in Roofing Material



**USUALLY SEEN WHERE
ROOF HAS CAVED.**

O. Interior Roof Leaks



P. Trees and Bushes Overhanging the Roof



**ALL TREES/BUSHES
SHOULD BE CUT BACK
FROM ROOF AND
BUILDING SURFACE.**

Q. Deteriorating/Rusty Bad Flashings



FLASHING IS A THIN PIECE OF MATERIAL INSTALLED TO PREVENT THE PASSAGE OF WATER INTO A STRUCTURE FROM A JOINT AND DECREASES WATER PENETRATION INTO THE ROOF SYSTEM.

R. Deteriorating/Collapsing Bad Parapets



A PARAPET IS A BARRIER WHICH IS AN EXTENSION OF A WALL AT THE EDGE OF A ROOF. THESE AREAS SHOULD BE REPAIRED TO AVOID WATER PENETRATION INTO THE ROOF.

S. RTU Curbs Rust/Deterioration



METAL ROOF CURBS SEAL THE AREAS AROUND THE BASE OF THE EQUIPMENT AND THE ROOF SURFACE.

T. Dunnage Rust/Deterioration



DUNNAGE IS A STRUCTURAL PLATFORM/SUPPORT FOR MECHANICAL EQUIPMENT ON THE ROOF. ALL RUST SHOULD BE REMOVED FROM THESE SUPPORTS UTILIZING A STEEL METAL BRUSH.

U. Walk-off Mats/Walk Pads



WALK-OFF MATS ARE USED IN HIGHLY TRAFFICKED AREAS OF THE ROOF TO ELIMINATE ROOF DETERIORATION IN THESE AREAS.

3. TAKE ACTION TO REPAIR ROOF ISSUES

- A. Proper Specification — Identify exact areas of the roof needing repair
- B. Quotes — Obtain pricing for the repair
- C. Approvals — Obtain necessary expenditure approval
- D. Repair — Commit to repair and create time schedule

SECTION 4

INSPECTION GUIDELINES BY ROOF TYPE

EPDM — ETHYLENE PROPYLENE DIENE MONOMER (M-CLASS) RUBBER

- Clean all debris from the surface of the roof. This includes debris that has gathered behind HVAC units, satellite dishes, pipes and pitch pans, and any other roof penetrations. Debris has a tendency to hold water, and water will expedite roof deterioration.
- If your roof is starting to collect moss or algae, install some zinc or lead control strips.
- Check all flashings and make sure that they are not deteriorated and there are no holes in them.
- Check all seams to make sure they are water tight.
- Check the edge metal. Make sure that it isn't separating at the seams. If it is, then the repairs need to be made as soon as possible. This can usually be done easily by yourself if the roof is not covered by a warranty or by a qualified contractor.
- Water test any sump drains twice per year. Once in the spring and once in the fall before winter sets in. If they don't drain properly, call a plumber and get them working properly. Drains will often leak if they are holding water.
- Check all caulking and sealants on flashings and copings. Scrape and remove any caulking that is weather cracked and damaged. Clean the area thoroughly. Use a wire brush if necessary. Reapply polyurethane caulking such Vulkem, NP-1, or equivalent.
- Check the mortar on chimneys and parapet walls, both in between the brick and on top. If it's damaged or deteriorated, have it tuck-pointed. Any mason can perform this work.
- When the ultraviolet light has caused the fibers in the EPDM to be exposed visibly, acrylic coatings may need to be applied. Check with the EPDM warranty and manufacturer about types of coatings that are permissible without voiding the warranty. Acrylic coatings are available that can be applied directly to a prepared EPDM surface. Preparation usually consists of cleaning the EPDM with a pressure washer and a detergent solution or wash. Latex-based paint products can also be used. Again, the EPDM manufacturer should be contacted prior to application to ensure compatibility and continuation of warranty coverage.
- Check for holes in equipment and deterioration of rooftop HVAC curbs, flashings and counter flashings.
- Check the source of any leak as it may not be coming from the roof, i.e. window sills, window cracks, etc.
- Check all deteriorating walk-off mats or walk pads.

TPO — THERMOPLASTIC OLEFIN — SINGLE PLY ROOFS

- Remove all debris from the roof surface. This includes vegetation, dirt, loose nails and screws, unused equipment, etc. With a single-ply roof, you have only one layer of protection, so if a nail head gets stepped on and penetrates that one thin layer, there will be a leak.
- Remove debris that has gathered behind HVAC units, pipes and pitch pans, and any other roof penetrations. Debris has a tendency to hold water, and water will expedite roof deterioration.
- Check the seams. If they are coming apart, then they need to be patched as soon as possible.
- Check all flashings and make sure that they are not deteriorated and there are no holes in them.
- Check the edge metal. Make sure that it isn't separating at the seams. If it is, then the repairs need to be made as soon as possible. This can usually be done easily by yourself if the roof is not covered by a warranty or by a qualified contractor.
- Check for bubbles and blisters in the roof. **DO NOT STEP ON OR PUNCTURE THEM.** These areas need to be cut out and infilled by a qualified contractor.
- Clean out and refill any pitch pockets where the filler is cracked and/or shrinking.
- Make sure that the gutters, scuppers, downspouts and leaders are draining properly by water testing them.
- Water test any sump drains twice per year. Once in the spring and once in the fall before winter sets in. If they don't drain properly, call a plumber and get them working properly. Drains will often leak if they are holding water.
- Check all caulking and sealants on flashings and copings. Scrape and remove any caulking that is weather cracked and damaged. Clean the area thoroughly. Use a wire brush if necessary. Reapply polyurethane caulking such Vulkem, NP-1, or equivalent.
- Check the mortar on chimneys and parapet walls, both in between the brick and on top. If it's damaged or deteriorated, have it tuck-pointed. Any mason can perform this work.
- Check for holes in equipment and deterioration of rooftop HVAC curbs, flashings and counter flashings.
- Check the source of any leak as it may not be coming from the roof, i.e. window sills, window cracks, etc.
- Check all deteriorating walk-off mats or walk pads.

CORRUGATED ROOFS

- Clean all debris from the surface of the roof. This includes debris that has gathered behind HVAC units, satellite dishes, pipes and pitch pans, and any other roof penetrations. Debris has a tendency to hold water, and water will expedite roof deterioration.
- Scrape all Rust and deteriorated Mastic with Metal Brush then Paint. Maintaining a sound paint film prolongs the life of corrugated roofing, even when much of the zinc coating has been lost from the sheet. Rust converters, alkyd-based primers containing anti-corrosive pigments, and special primers for use over zinc coatings are readily available. Modern rust converters provide a ready-primed surface that accepts most types of anti-corrosive paint.
- Keeping the roof clean is an important maintenance objective. Steeply pitched sections are straightforward, as dirt and water run off readily. This is why steep pitches last longer. It is good practice to regularly sweep lower angle sections, such as verandahs, to keep the roof free of debris. Stones, twigs, branches, heavy seed pods, and indeed anything else (such as pieces of timber and old roofing nails) left lying on the roof, produce small crevices between object and roofing, leading to accelerated loss of zinc coating in that area. Frequency of cleaning will vary from place to place and needs to be balanced against any adverse effects, such as excessive walking on the roof.
- Regular checks to ensure that the roof sheeting is well nailed or screwed down are important. Loose fixings allow wind to blow rain in and further dislodge the sheeting, and cause leaks.
- Patching of small holes can extend the life of a sheet and delay its replacement. Traditional patching materials include lead soldered over the hole as if it were a flashing, thick bituminous pastes and even cement reinforced with hessian. Modern patching usually involves the ubiquitous silicone resin applied from a convenient 'gun'.
- Temporary repairs -When lap sheets have rusted around their fixings the insertion of a slip sheet can extend the life of the roof covering. This can be a meter length of matching profiled corrugated sheeting placed between a rusted lap joint. It protrudes 100 mm below the lap joint and is secured on the adjacent corrugate.
- Check all flashings and make sure that they are not deteriorated and there are no holes in them.
- Check the edge metal. Make sure that it isn't separating at the seams. If it is, then the repairs need to be made as soon as possible. This can usually be done easily by yourself if the roof is not covered by a warranty or by a qualified contractor.
- Water test any sump drains twice per year. Once in the spring and once in the fall before winter sets in. If they don't drain properly, call a plumber and get them working properly. Drains will often leak if they are holding water.
- Check all caulking and sealants on flashings and copings. Scrape and remove any caulking that is weather cracked and damaged. Clean the area thoroughly. Use a wire brush if necessary. Reapply polyurethane caulking such Vulkem, NP-1, or equivalent.
- Check the mortar on chimneys and parapet walls, both in between the brick and on top. If it's damaged or deteriorated, have it tuck-pointed. Any mason can perform this work.

- Check for holes in equipment and deterioration of rooftop HVAC curbs, flashings and counter flashings.
- Check the source of any leak as it may not be coming from the roof, i.e. window sills, window cracks, etc.
- Check all deteriorating walk-off mats or walk pads.

BUILT-UP AND MODIFIED BITUMEN ROOFS

- Clean all debris from the surface of the roof. This includes debris that has gathered behind HVAC units, satellite dishes, pipes and pitch pans, and any other roof penetrations. Debris has a tendency to hold water, and water will expedite roof deterioration, especially if your roof is asphalt based such as a built-up roof.
- If your roof has a gravel surfacing and there are some bare spots present, clean the bare spot thoroughly using a broom. Be sure to remove all loose dirt generated from brushing and sweeping. Use a blower on the area if need be. Spread a thin layer of asphalt roof cement (mastic) over the bare area about 1/8 inch thick. Gather some loose gravel from other areas of the roof and embed it in the roof cement.
- Check all flashings and make sure that they are not deteriorated and there are no holes in them.
- Check the edge metal. Make sure that it isn't separating at the seams. If it is, then the repairs need to be made as soon as possible. This can usually be done easily by yourself or by any local qualified contractor.
- Check for blisters in the roof. **DO NOT STEP ON OR PUNCTURE THEM.** Call a qualified contractor to cut them out and to patch them.
- Clean out and refill any pitch pockets where the filler is cracked and/or shrinking.
- Keep all gutters, scuppers and leaders free of debris. Make sure that the downspouts and leaders are draining properly by water testing them.
- Water test any sump drains twice per year. Once in the spring and once in the fall before winter sets in. If they don't drain properly, call a plumber and get them working properly. Drains will often leak if they are holding water.
- Check all caulking and sealants on flashings and copings. Scrape and remove any caulking that is weather cracked and damaged. Clean the area thoroughly. Use a wire brush if necessary. Reapply polyurethane caulking such Vulkem, NP-1, or equivalent.
- Check the mortar on chimneys and parapet walls, both in between the brick and on top. If it's damaged or deteriorated, have it tuck-pointed. Any mason can perform this work.
- Check for holes in equipment and deterioration of rooftop HVAC curbs, flashings and counter flashings.

- Check the source of any leak as it may not be coming from the roof, i.e. window sills, window cracks, etc.
- Check all deteriorating walk-off mats or walk pads.

ASHPALT SHINGLES

- Clean all debris from the surface of the roof. This includes debris that has gathered behind HVAC units, satellite dishes, pipes and pitch pans, and any other roof penetrations. Debris has a tendency to hold water, and water will expedite roof deterioration, especially if your roof is asphalt based such as a built-up roof or asphalt shingles.
- If your roof is starting to collect moss or algae, install some zinc or lead control strips.
- Check all flashings and make sure that they are not deteriorated and there are no holes in them.
- Dab some roof cement under any loose shingle tabs. One dab on either side should do.
- Replace any damaged shingles.
- Keep all gutters, scuppers, leaders and downspouts free of debris. Make sure that the downspouts and leaders are draining properly by water testing them.
- Check the open valley metal for rust. Wire brush the rust then prime and paint the metal. If rust is prevalent, it can be removed using Rust-Away® Oxidation and Corrosion Remover.
- Check all caulking and sealants. Scrape and remove any caulking that is weather cracked and damaged. Clean the area thoroughly. Use a wire brush if necessary.
- Reapply polyurethane caulking such Vulkem, NP-1, or equivalent.
- Check the mortar on chimneys and parapet walls, both in between the brick and on top. If it's damaged or deteriorated, have it tuck-pointed. Any mason can perform this work.
- Check the edge metal. Make sure that it isn't separating at the seams. If it is, then the repairs need to be made as soon as possible. This can usually be done easily by yourself if the roof is not covered by a warranty or by a qualified contractor.
- Water test any sump drains twice per year. Once in the spring and once in the fall before winter sets in. If they don't drain properly, call a plumber and get them working properly. Drains will often leak if they are holding water.
- Check for holes in equipment and deterioration of rooftop HVAC curbs, flashings and counter flashings.
- Check the source of any leak as it may not be coming from the roof, i.e. window sills, window cracks, etc.
- Check all deteriorating walk-off mats or walk pads.

SECTION 5

ROOF MAINTENANCE & REPAIR LOG

To fill out your Roof Maintenance & Repair Log, please click on the link below:

[CLICK HERE FOR THE ONLINE ROOF
MAINTENANCE & REPAIR LOG](#)

PROTECT TEI

HIRING REPUTABLE CONTRACTORS — PROTECTING THE ORGANIZATION FROM LAWSUIT

Height related fall hazards may be present whenever contractors are hired to perform work on your property. Falls do occur; approximately two deaths per day on average reported in the United States involved fatal falls from ladders (41% of all falls reported), scaffolds, buildings, and other height-related incidents according to a study conducted by the National Institute of Occupational Safety and Health (NIOSH). Falls from scaffolds on average represent 50 deaths annually and approximately 4,500 injuries. Other height hazards are falls from rooftops, girders, poles, through unprotected walls, and floor openings. Loss trend reports indicate that contractor workers can and do sustain injuries attributed from falls from elevation or by being struck by falling objects or construction debris on the jobsite. Injured workers may bring lawsuit against property owners for damages. Courts traditionally have held property owners “absolutely liable”, along with the contractor, for worker injuries sustained from height-related falls or accidents.

FOLLOW THE 5 HRVOR RULES

1. Hire only reputable firms known to specialize in the work you are contracting with them to perform; ask for references.
2. Review all fall exposures and written safe work plans in an effort to eliminate or substantially reduce falls from elevation potentials.
3. Verify insurance and indemnification or hold harmless agreements.
4. Obtain Certificates of Insurance (COI's) on ALL contractors reflecting adequate General Liability and Workers' Compensation coverage in force.
5. Require your organization be named as “Additional Named Insured” and request all contractors' to provide COI's with this status declared on their General Liability policy.

INDEMNIFICATION — EXAMPLE

TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL FULLY PROTECT, INDEMNIFY, AND SAVE AND HOLD HARMLESS THE OWNER FROM AND AGAINST ANY AND ALL CLAIMS, DEMANDS, DAMAGES, LIENS, LIABILITIES, ATTORNEYS' FEES, LOSSES AND EXPENSES, AND/OR CAUSES OF ACTION OF ANY AND EVERY NATURE WHATSOEVER ARISING IN ANY MANNER, DIRECTLY OR INDIRECTLY, OUT OF OR IN CONNECTION WITH, OR IN THE COURSE OF OR INCIDENTAL TO ANY OF CONTRACTOR'S WORK OR OPERATIONS HEREUNDER. CONTRACTOR'S OBLIGATIONS TO INDEMNIFY AND HOLD HARMLESS OWNER AS STATED ABOVE SHALL APPLY IF AND TO THE EXTENT SUCH CLAIM, CAUSE OF ACTION, DEMAND, DAMAGE, LIEN, LIABILITY, FEE, LOSS OR EXPENSE IS CAUSED, IN WHOLE OR IN PART, BY ANY NEGLIGENT ACT OR OMISSION OR BREACH OF CONTRACT BY CONTRACTOR OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY CONTRACTOR OR ANYONE FOR WHOSE ACTS CONTRACTOR IS OR MAY BE LIABLE OR IS CAUSED BY OR ARISES OUT OF THE USE OF ANY PRODUCTS, MATERIAL OR EQUIPMENT FURNISHED BY CONTRACTOR.