



KIRBY
BUILDING
SYSTEMS
A **NUCOR** Company

Kirby Building Systems

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Preventive Maintenance Manual

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Introduction

Kirby Building Systems would like to take this opportunity to again thank you for your recent purchase of a Kirby building. The purpose of this manual is to assist your efforts in maintaining and protecting your new building. Just as with your home, your Kirby building will occasionally need attention to maintain current aesthetic appeal, warranty coverage, weather tightness and proper working order of accessory items. Please use and follow appropriate Safety guidelines when performing any maintenance activities.

Section 1 – Structural Steel

Rusting – Structural steel normally requires no maintenance, except in the event of rust. Should rust occur, clean the affected area and re-paint with primer supplied by Kirby Building Systems or a compatible substitute primer.

Loose Bolts – Structural bolts also normally require no maintenance except in instances where the structure is exposed to vibration, such as a building with an overhead crane. In this instance bolts should be inspected at least once a year or per OSHA requirements. Crane bracing should also be checked at least once a year.

Additional Loads – Before hanging any items from the building's framing or adding any additional loads to the roof (piping, roof top units, jib cranes, etc.), call your local Kirby Building Systems authorized Builder. In the event an authorized Builder is not available, contact the Customer Service Department of Kirby Building Systems for assistance.

Crane Loads – If the initial engineering and design of your building included an overhead crane, your building would have been designed in strict accordance with specific load requirements. Your local Kirby Building Systems authorized Builder must verify any change to the building from the original design. In the event an authorized Builder is not available, contact the Customer Service Department of Kirby Building Systems before proceeding.

Bracing – Kirby bracing is critical to the structural integrity of the building and should remain in place. No bracing should be relocated or removed without verification by your local Kirby Building Systems authorized Builder. In the event an authorized Builder is not available, contact the Customer Service Department of Kirby Building Systems for assistance.

Section 2 – Secondary Framing

Loose Bolts – Secondary-framing connections should be checked periodically in areas of high vibration, such as areas around overhead cranes and overhead or sliding doors. If loose bolts are found, they should be tightened and re-inspected annually.

Section 3 – Roof and Walls

Roof and Walls In General – Your roof and wall panels should not come in contact with wood, lead, copper, unprotected steel, graphite, concrete or harsh chemicals. Never allow air conditioning condensation to drain onto your roof, trim or wall panels! Roof and wall panels should be kept clear of dirt and soil.

Roof Debris – At least once a year, clean the roof and gutters of leaves or other debris which would trap or pond water on the roof. Wash dirt and debris from the panel surface annually. Local conditions will govern the frequency of these cleanings.

Ice and Snow Buildup – Excessive ice and snow should be removed from the roof areas. This is particularly important in gutter areas (eaves and valleys) and in areas of the roof sheltered from the wind (behind facades, step roof conditions, etc.). Reference pages 8, 9, & 10 for specific snow removal procedures.

Roof Traffic - Roof traffic is a leading cause of roof leaks. If routine traffic is unavoidable, have your builder install a walkway designed for use with your roof panel.

When walking on the roof is required:

- Avoid stepping on the ridge caps
- Avoid stepping on lap joints in roof panels and flashings
- Avoid walking near roof curbs or other roof penetrations
- Avoid stepping on panel ribs between purlins
- Do not step in or on gutters or the gutter hanging system
- Do not step on or near skylights

Foliage – While shrubs and trees enhance the appearance of any building, their contact with the wall panel can produce scratches in the painted surface that will eventually cause problems. Keep shrubs and trees trimmed back from the panel surfaces.

Yearly Lap Joint Inspection – Once a year check lap joints in the metal for proper seal or loose fasteners. Should repair be required, have your Builder remove fasteners, take connection apart, clean out existing sealant, install new tape mastic and/or polyurethane sealant to form a continuous gasket and reattach the connection using new and/or larger long life fasteners as necessary. Care should be taken to ensure the new gasket is in the old screw line or to the weather side of the screws.

!!! CAUTION !!! If skylights are present in your roof, extreme care should be exercised when working in those areas. **NEVER STEP DIRECTLY ON A SKYLIGHT, OR IN THE SURROUNDING AREA ADJACENT TO A SKYLIGHT.** Skylights may not support the weight of a worker, and bodily harm could result from a fall. Please follow all OSHA and/or other state and local safety guidelines applicable for the particular jurisdiction.

Section 4 – Panel Finishes

Always test cleaning procedures in a small inconspicuous area before use on a large scale.

Routine Washing – (IMPORTANT WARRANTY NOTICE: If located within a 1000 feet of a saltwater shoreline, painted roofing or siding must be washed with potable water annually to maintain warranty coverage.) A log sheet has been provided on page 12 to record annual washing data, necessary for continued warranty coverage. A 5% solution of commonly used commercial detergents can be used on heavily soiled areas and will not harm your panel surface. Always rinse thoroughly with water. Do not use wire brushes, steel wool, sandpaper, abrasives or similar cleaning tools which will mechanically abrade the coating surface. Use a cloth, sponge or a soft bristle brush for application. For best results, cleaning should be done in the shade or on a mild cloudy day.

Rust – Once a year inspect the panels for rust. Should any rust or rust stains be found, determine the source, such as steel filings from drilling, sawing, grinding, etc. and remove them. The rust stain can generally be cleaned off with one of the following: soap and water, mineral spirits, or a mild polishing compound as used on a car finish.

Paint Scratches – Scratches to the paint should be brush touched (artist brush) with touchup paint. If the scratched area has not rusted, the paint may be applied without surface preparation. If the area is rusted, remove the rust; prime the affected area and brush with color matched touchup paint. Primer and additional touchup paint is available from your Kirby Building Systems authorized Builder or from Kirby Building Systems.

Mildew Removal – Mildew can be expected in areas of high humidity. Mildew is more of an appearance problem than an actual threat to the paint finish. Mildew can be removed by using a basic solution of the following:

- 1/3 cup of detergent
- 2/3 cup trisodium phosphate
- 1 quart sodium hypochloride, 5 % solution
- 3 quarts of water

Rinse with clean water immediately after use.

Non-Water Soluble Deposits On Zinc-Aluminum Finishes – Use mineral spirits to remove non water soluble deposits (tar, grease, oil, paint, graffiti, etc.) from the panel surface.

Non Water Soluble Deposits On Kynar paint finishes – Solvents that may be used to remove these items from Kynar paint panel finishes include:

Alcohols - Not aesthetically detrimental when properly applied
Denatured Alcohol (Ethanol)
Isopropyl (Rubbing) Alcohol
Methanol (Wood Alcohol)-Note: Methanol is toxic

Petroleum Solvents - Not aesthetically detrimental when properly applied
VM & P Naphtha
Mineral Spirits
Turpentine (Wood or Gum Spirits)

Aromatic and Other- Use with caution on Diamond Kote
Xylol (Xylene)
Toluol (Toluene)

Limit contact time to 5 minutes maximum and test before using.

Ketones, Esters, Lacquer Thinner – Use very cautiously on Kynar paint surfaces. Limit contact time to 1 minute maximum and **test before using**. Kirby Building Systems is not responsible for damage caused by unrestricted use.

DO NOT use acetone paint remover, Methyl Ethyl Ketone, or Methyl Isobutyl Ketone on Kynar paint surfaces. Continued contact with these products could result in blemishes detrimental to the aesthetics of your metal building.

Most organic solvents are flammable and/or toxic and must be handled accordingly. Keep away from open flames, sparks and electric motors. Use adequate ventilation, protective clothing and goggles.

Sealant Removal – Precautions should be taken to prevent sealants from getting on the Kynar paint surface, as they may be difficult to remove. Sealants should be removed promptly with a solvent such as alcohol or a naphtha type of solvent. *Caution: It may be possible for solvents to extract materials from sealants that could stain the painted surface or could prove harmful to the sealants. Test a small inconspicuous area first, before wide spread use.*

Section 5 – Trim

Gutter and Downspouts – Clear all debris (leaves, dirt, etc.) from gutters and downspouts as required. The frequency required is dependent on the building's surroundings.

Damaged Trim – Trim around openings sometimes gets damaged by vehicle traffic. Replacement trim can be obtained through your local Kirby Building Systems authorized Builder.

Section 6 – Accessories

Walk Doors – Walk doors should be checked periodically to assure tightness of locksets, closure hardware and door hinges. Any loose bolts or screws should be tightened. Any moving parts that start to stick or squeak should be properly lubricated.

Windows – Caulking in windows will deteriorate in time, usually resulting in window leakage. If this happens remove the old caulk and apply new caulk in its place. Windows that become hard to slide should have the track area thoroughly cleaned and a light coat of lubricant applied to the tracks.

Overhead Doors – Periodically check the attachment bolts around an overhead door and tighten as required. Call the door manufacturer should the door get out of alignment or the mechanical parts within the door become hard to operate.

Sliding Door - Periodically clean the sliding door tracks and lubricate the rollers to help assure ease of use.

Roof Vents – Hard to operate roof vents are usually the result of pulleys and damper rods needing lubrication or the chains and cords not being on track. Check operating hardware and lubricate as needed.

Louvers – The operating hardware within a louver occasionally needs to be cleaned and a new light coat of oil or grease applied. This will improve the ease of operation.

Roof Curbs – Heavy vibration from a mechanical unit can cause water leakage around a roof curb. Should this occur, check the sealant and fasteners around the curb. Any loose fasteners should be tightened or replaced with the next larger size. Any sealant or mastic that has deteriorated should be removed and replaced with new. If possible, isolate the unit from the curb to minimize vibration to the curb.

Windows, doors, vents, and louvers should be checked yearly for loose fasteners and any moving parts lubricated as necessary.

Section 7 – Insulation

****Inspect the exterior of your building for exposed insulation and call your contractor immediately if found. Exposed insulation will wick and hold water against the ends and back side of the panels, causing rust to occur.**

Insulation Facings – Insulation facings should be monitored continuously and a thorough inspection made once a year. Any holes or tears in the facing should be repaired with patch tape as supplied by the insulation supplier. Remember, even a perfectly installed barrier is not a perfect vapor barrier.

Condensation – If your building is experiencing excessive condensation, consult your HVAC contractor to assure that humidity levels and air movement are as projected. Also, have your building contractor check to make sure there are no obvious openings in the insulation splices.

Section 8 – Roof Leaks

Should you observe evidence of a roof leak, such as water on the floor, stained ceiling tiles or a bubble in the insulation vapor barrier, contact your building contractor immediately. After the leak has been repaired, have your contractor cut the vapor barrier where the water has collected to allow the wet insulation to drain. Once the insulation has thoroughly dried, repair the vapor barrier with patch tape available from the insulation supplier. There are various reasons a roof leak might occur, such as:

- Improper installation
- A lack of routine maintenance
- Damage to a component
- Deterioration of a component

It is also possible that a leak might not be the result of the above referenced conditions, but rather the result of a strong negative pressure inside the building from an improperly balanced HVAC system.

Section 9 – Replacement Parts or Service

Replacement parts or service can be obtained through your local Kirby Building Systems authorized Builder. In the event an authorized Builder is not available call Kirby Building Systems at (615) 325-4165 and ask for Customer Service. When calling Kirby, have the original job number, year built, name of the project and original Builder handy. This will help us identify and locate your specific building and aid us in supplying replacement parts.

Section 10 – Primer Touchup Procedures /Field Painting

Shop Coat Primer – General

The coat of shop primer is intended to protect the steel framing for only a short period of exposure to ordinary atmospheric conditions. The coat of shop primer does not provide the uniformity of appearance, or the durability and corrosion resistance of a field applied finish coat of paint over a shop primer. Minor abrasions to the shop coat caused by handling, loading, shipping, unloading and erection after painting are unavoidable.

Field Primer Touchup – Procedures

All surfaces to receive touch up primer must be cleaned of loose rust, scale, dirt and other foreign matter by using the hand tool cleaning method SSPC-SP2 (Society for Protective Coatings) prior to touch up. Power tool cleaning, sandblasting, flame cleaning, or chemical cleaning is not required or recommended.

Only a water-based or latex primer may be used to touch up steel framing. Application of touch up primer may be through the use of spray equipment or standard brushes and rollers. Primer can be purchased through your local Kirby Building Systems authorized Builder or contact the Components Department of Kirby Building Systems.

Field Applied Finish Paint

Steel Framing or Sheeting Wash Coat

Any water based latex paints may be used. Do not use shop coat primers that either contain over 10% aromatic solvents or that contain ketone or acetate solvents. Typical enamels that contain mineral spirits or VM and P Naphtha solvents may be used.

If top coating with epoxy or ketone based coatings is required, it is recommended that a barrier coating primer be used. Check with your paint supplier before top coating with epoxy or ketone based coatings.

Always test paint in an inconspicuous area to ensure good results before painting entire structure.

Sheeting Finish Coat

It is recommended that you contact a reputable paint supplier for instruction and suggested materials to use for painting over any sheeting finish coat.

SNOW REMOVAL PROCEDURES

Introduction

One of the most detrimental climatological conditions to metal buildings is snow and ice buildup on the roof. Snow buildup to any significant depth greatly increases loads on the roof. While much of the snow will tend to slide off steeper roofs, (4:12 slope), much will remain that falls on a cold surface or previously covered surface. Snow will tend to slide more readily on a warm roof, caused either from sunshine or heat loss through the roof. Relatively little snow will slide off roofs with low slope.

Drainage

Gutters, downspouts and interior roof drains allow for the controlled removal of water from a roof system. They must be kept open and free flowing to work. During cold temperature conditions gutters, downspouts and drains can freeze solid allowing for ice build-up on the roof. This ice build-up causes additional water back up on the roof deck. These circumstances create extreme loading conditions on the roof system and building. Freezing conditions are particularly likely on the north side of a building and in shaded areas of a building.

One recommended precaution is to have heat tape installed in gutters and downspouts. This will help maintain open and flowing gutters and downspouts. However, in extremely low temperature conditions, heat tapes may not be 100% effective and should be checked regularly.

When to Remove Snow

Defining a specific depth of snow that a building has been designed to support is not possible because the density of snow is variable and dependent upon weather conditions both during and after a snowfall. With the variability of snow density, it is possible for conditions to exist that exceed the designs specified by the building codes. Snow density also changes as the snow melts. Not all water drains off the roof as the underlying snow absorbs some water from the melted snow above. This leads to ice build-up on the roof as the temperature varies from day to night.

Normal snowfall weighs between 10 and 12 pounds per cubic foot (pcf) but will greatly increase as it compacts and becomes heavier with water. When there is snow on the roof of a building and rainy conditions occur, excessive loads can develop rapidly. Snow acts as a sponge in these conditions and loads can approach the weight of water, 62.4 pcf or 5.2 pounds per square foot (psf) per inch of depth. Rarely will a cubic foot of snow and ice equal the weight of water due to the expansion that takes place as water freezes. However, these conditions must be monitored with extreme caution.

Snow will build up in areas around firewalls, parapet walls, valleys, dormers and on lower roof levels where a step in the roof occurs. All current building codes require design for snow build-up conditions so that the structural systems in these areas can support the additional loads. However, due to the variability of snow density, as noted above, it is possible for conditions to exist that exceed the design specified by the building codes.

While it is not possible to accurately determine a specific depth of snow that is considered a safe maximum, an approximation can be made. The first step is for the building owner to obtain information as to the snow load that the building has been designed to carry. For example, a building designed for a 30 psf snow load can be assumed to be overloaded with three feet of snow weighting 10 to 12 pcf and could be overloaded with just one foot of snow under wet conditions. While a 30 psf design snow load may allow roughly 45 to 50 psf before the possibility of collapse exists, there is such a wide variation in snow density that it would be unwise to allow this much snow load to accumulate. Cleaning the roof is, of course, the only way to relieve this. It is a common industry practice that roofs be cleared of snow when half of the safe maximum snow depth is reached. The maximum snow depth can be estimated based on the design snow load and the density of the snow and/or ice buildup.

Snow/Ice Removal Procedure

Following are some suggestions, which generally apply; however, it is recommended that the building manufacturer or a structural engineer be consulted before snow removal is initiated.

1. Remove all hanging icicles from eaves and gutters. These will be quite heavy and if snow hangs up on them during removal, it can only increase this load. Care must be exercised to not damage the building and not endanger pedestrians.
2. Always provide proper safety precautions when working on the roof. If possible, remove snow by not getting on the roof. This can sometimes be done by using draglines through the snow, working from the end walls.
3. Place ladders at the end of the building so sliding snow will not dislodge them.
4. Never send one person alone on a roof to remove snow.

5. Remove snow in a pattern that does not cause an unbalanced loading condition. Avoid large differences in snow depth between adjacent areas of the roof. Do not remove all of the snow from small areas and then move on to another area. Instead, remove the snow in layers from all over the roof. This gradually decreases the load.
6. Remove drifted areas first, down to a level with other snow. If an area has drifted four feet deep and the main roof is two feet deep, trim off the drifts to two feet before proceeding.
7. Remove snow from the eave towards the ridge, sliding the snow off the roof over the gutter.
8. Progress from each end of the building towards the center. On larger roof areas, additional people working from the center of the building towards the ends is recommended.
9. On gable buildings, remove snow on both sides of the ridge at the same time.
10. Never use metal shovels on any type of roof. Do not use picks, axes or other sharp tools to break up ice on the roof. It is quite easy to damage the roofing with these tools.
11. Do not remove snow to less than a 3" depth over roof sheets. Care must be taken to eliminate hitting panel fasteners, snow guards, etc. If an ice layer is next to a panel, it should be left if not extraordinarily thick.
12. Care must be taken in removal of ice and snow around ventilator bases, pipe flashings, and HVAC units, due to the ease of damaging neoprene boots, pipes, conduits, etc.
13. Be cautious of snow or ice breaking away and sliding down the roof, even on low slope roof buildings.
14. Use extreme care when working along the edge of the roof.
15. Watch for extreme deflections and listen for unusual noises when snow and ice build-up conditions exist.

!!! CAUTION !!! If skylights are present in your roof, the snow you are in the process of removing may conceal their location. Extreme care should be exercised when working in those areas. **NEVER STEP DIRECTLY ON A SKYLIGHT, OR IN THE SURROUNDING AREA ADJACENT TO A SKYLIGHT.** Skylights may not support the weight of a worker, and bodily harm could result from a fall. Please follow all OSHA and/or other state and local safety guidelines applicable for the particular jurisdiction.



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BUILDING MAINTENANCE LOG

(WASH YOUR BUILDING ANNUALLY, IF WITHIN 1000' OF SEASHORE)

YEAR	DATE	SIGNATURE		YEAR	DATE	SIGNATURE
1				19		
2				20		
3				21		
4				22		
5				23		
6				24		
7				25		
8				26		
9				27		
10				28		
11				29		
12				30		
13				31		
14				32		
15				33		
16				34		
17				35		
18						

COMMENTS: