

Royston® Waterproofing Membrane Installation Guide

This document contains general instructions and recommended practices for the application/installation of Royston® Waterproofing Membranes. This guide will cover the recommended tools, materials, deck preparation and basic installation procedures. Aside from substrate preparation, temperature of the asphalt overlay is also extremely important. If the temperature of the overlay is not hot enough (290°F MINIMUM), the bituminous component within the membrane system will not soften enough to create a sufficient bond with the substrate. For assistance in membrane selection, surface preparation, application or inspection, please contact a Chase representative.

Fig. 1 Completed Membrane Installation



Fig 1.1 Royston Membranes



Recommended Tools for Installation:

- Paint roller, squeegee or airless spray equipment
- Utility knife, screw driver, hammer, 1" trowel
- Chalk line, tape measure
- 6-foot broom handle or equivalent
- Propane torch with rosebud tip
- Jiffy Mixer Blade
- ½ inch (12.7mm) drill
- Gloves, rags and clean-up solvents
- Moisture Meter

Other tools may be used based on individual job requirements, past experience and preference.

Royston® Materials Required:

- Royston® Waterproofing Membrane
- Royston® Roybond Primer
- Royston® Flex-Flo Adhesive Sealant (FFAS) or Royston® 104Caulkable Mastic (104CM)

Packaging and Storage

Royston® Waterproofing membranes are packaged in a reflective, high optical density material which provides protection from ultra-violet light.

- The product must be stored in a cool, dry place away from direct sunlight.
- Exposure to direct sunlight for extended periods of time will cause the membrane compound to become tacky.
- Prolonged exposure to ultra violet light will cause the compound to become dry and brittle.

- If ambient temperatures fall below 55°F (12.8°C) during the installation process, the membranes should be stored in a temperature controlled environment (above 55°F) or warmed in a sunny location prior to use to improve the flexibility and workability of the compound.

Royston® Primers and Adhesives must be stored in a cool dry place until used.

Royston® Flex-Flo Adhesive Sealant (FFAS) and Royston® 104 Caulkable Mastic (104CM) must be stored in areas with temperatures of 55°F (12.8°C) or higher at all times before use.

Substrate Types

Royston® Waterproofing Membranes can be placed over many different substrate types including new/old concrete, asphalt, wood, or steel.

New concrete

- The concrete surface must be “fully” cured for a minimum of seven (7) days or per agency specification.
- The concrete surface must be smooth broom finish or equivalent to an ICRI concrete surface profile #3.

Existing concrete

- The concrete surface must be structurally sound.
- All concrete repairs must be completed in advance of membrane application, in accordance with agency specifications, and using approved materials and procedures.
- The concrete surface must not have any irregularities greater than ¼ inch (6.35mm) peak to valley.
- Any pre-existing membrane material must be completely removed, allowing the new membrane to properly bond with the substrate.
- Any grooves in the deck (as a result of milling operation) must not exceed ¼ inch (6.35mm) in peak to valley.

Asphalt

- Asphalt bridge decks must be structurally sound.
- All asphalt repairs shall be completed in advance of membrane application in accordance with agency specification and with approved materials and procedures.
- Irregularities as a result of the milling process shall not exceed ¼ inch (6.35mm) peak to valley.
- Newly placed asphalt (less than 12 months old) does not require the use of the Roybond® primers. The membrane can be placed directly over the properly prepared asphalt surface.
 - This also applies in projects where an asphalt leveling/skim course for grading or leveling purposes is being used.

Wooden

- An asphalt leveling/scratch course must be applied to the wood deck to provide a smooth surface.

Steel bridge decks

- Due to the variance of the configuration and flexion of steel decks, agency specifications should be followed.

Box Culverts (new construction)

- Installation procedures are the same as for new concrete.
- The vertical face of the culvert shall have a 6 inch (152.4mm) turn-down of the membrane.
- The 6 inch (152.4mm) termination edge must be sealed with either FFAS or 104CM.

Deck Preparation Procedures

The deck shall be clean, dry, and free of all loose debris and moisture. Newly paved (12 months or less) asphalt surfaces including scratch/leveling courses do not require the application of Royston® Primer.

Deck Moisture Content

Moisture content shall be monitored prior to and during the application/installation to ensure no moisture becomes trapped under the preformed sheet membrane or primer. In the event that rain or other precipitation occurs, the moisture of the deck must be checked to avoid potential blistering or other adverse effects. Use of a moisture meter to measure moisture content of the concrete is required. The maximum moisture content must not exceed 4%.

Asphalt Overlay Temperature

Temperature and thickness of the asphalt overlay are critical to a successful installation. The asphalt overlay should be at least 1 ½" thick and 290°F (coming out of the paver). If the mat is not thick enough, there may not be enough mass to prevent heat loss of the overlay resulting in insufficient bonding between layers. If the temperature of the overlay is not high enough, the bituminous component of the membrane system will not soften to create a bond with the substrate.

Royston® Primer and Adhesive Application

Royston® offers several primer options.

- **Roybond 713A** is a general purpose primer.
- **Roybond 713B** is a low VOC primer to be used when an agency has restrictions on VOC content.
- **Roybond 740** is a highly tacky primer for application in ambient temperatures below 45°F (7.2°C).
- **Roybond 750** is a sprayable version of the 713A primer.

Refer to the product TDS and SDS for further information on various primers.

Thoroughly mix the primer using a ½ inch (12.7mm) drill with a jiffy mixer to ensure a homogeneous mixture.

Application rates per gallon should be as follows for each primer as follows:

- **Roybond 713A & 713B** - 200 to 300 sq. ft. (18.58m² to 27.87m²)
- **Roybond 740** - 150 to 200 sq. ft. (13.94m² to 18.58m²)
- **Roybond 750** - 250 to 300 sq. ft. (22.23m² to 27.87m²)

The primer must be dry to the touch prior to the placement of the membrane. This is normally achieved in approximately 30 minutes on a 70°F (21.1°C) degree day. If primer is not allowed to dry completely, there is risk of blistering under the membrane due to solvent entrapment. The resulting effect could be poor adherence of the membrane to the substrate. Only apply the primer to the deck area which will be covered with membrane within 24 hours.

Primers 713A, 713B, and 740 can be applied using a roller, brush, or squeegee. **Roybond 750** is a spray applied primer using a plural component sprayer capable of metering products up to a 30:1 ratio. **There should be no puddling or ponding of primer. The primer shall uniformly cover the surface to ensure proper adhesion to the substrate.**

Adhesive/Sealant Application

Chase offers two adhesive/sealant options depending on agency requirements. The Royston® Flex Flo Adhesive Sealant (FFAS) is used for optimal waterproofing applications, it can be applied under and over the Royston® waterproofing membranes for optimal performance. The Royston® 104 Caulkable Mastic (104CM) is used only at surface terminations as a sealant.

Sealer/Adhesive:

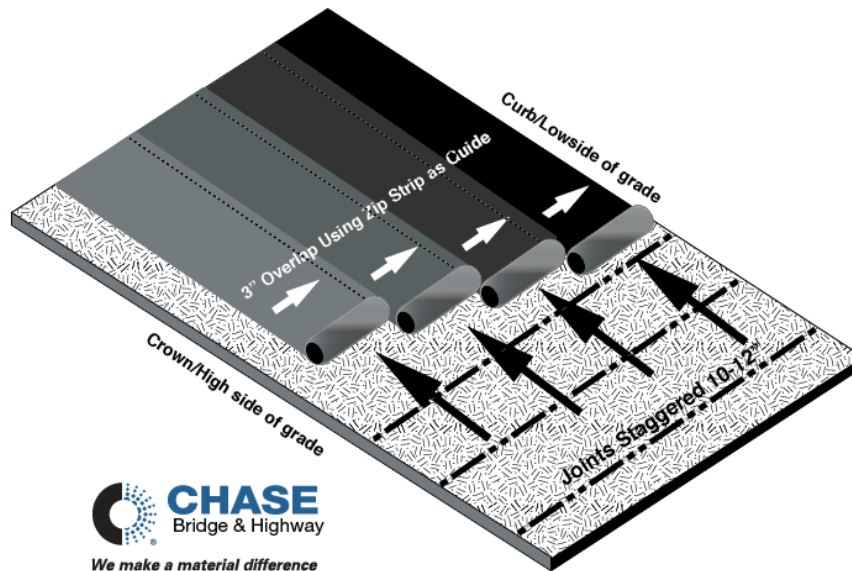
- Royston® Flex-Flo Adhesive Sealant (FFAS) is applied in a 4" bed that the membrane is embedded in at substrate terminations. See figures 5 & 6 below. The FFAS is an adhesive as well as a sealant. It is intended for use both under the sheet membrane and on the surface.
- Royston® 104CM is only used as a sealant to be used on the surface of the sheet membrane, applied at the perimeter joints and terminations of the membrane.

- Both FFAS and 104CM can be used where the membrane terminates such as curbs, parapet walls, abutments, joints and drains. (Note: **104CM is applied to the surface of the membrane only and is a sealant not to be used underneath membrane as an adhesive**).
 - Apply a 4" wide bed of FFAS, 60 mils thick, where the vertical face of the curb meets the deck.
 - For scuppers and drains: apply a 4" wide bed of material, 60 mils thick, around and into the scupper or drain.
 - See curb and drain detail drawings and procedures on pages 7 & 8 of this document for more detailed instruction.

Membrane Application

- Application of the membrane begins only once the Royston® Roybond Primer is dry (tacky to touch but no pickup by traffic). On crowned deck surfaces, place membrane sections in a "shingle" fashion beginning at the curb and working to the center crown. On flat or graded decks, start at one curb and proceed across the entire width to the opposite curb. Measure the width of the deck in at least three places and divide the widest number by 44-½" (110.3mm) to determine the number of sheets it will take to cover the deck width.

- **Fig. 2 Shingle Fashion Placement**



- Start the first roll with the **Zip Strip** (3" leading edge) facing away from the curb. See Figure 3 below.

Fig. 3 "Zip Strip" Facing away from curb



- Roll out the section of membrane with the release liner side facing down. Remove the release liner from the bottom by pulling the liner at a 45° angle as the membrane is unrolled. This helps to keep tension on the membrane as it is placed, minimizing wrinkles and air pockets. Once the membrane is down, apply pressure ensuring sufficient contact with the deck (use a push broom, squeegee or hand roller to apply pressure.) Make sure the edge at the curb is embedded in the FFAS (when necessary) or terminated with a ½" bead of 104CM.
- All additional rolls of membrane are to be overlapped in a shingle fashion utilizing the 3" (88.9mm) zip strip/leading edge as a guide for sufficient coverage and ensuring optimal bonding between sections.
- With the installation of each section of membrane, apply pressure to the membrane ensuring sufficient contact with the deck. Use a push broom, squeegee or hand roller to eliminate wrinkles and air pockets.
- Once the membrane has been placed, the final step is to pull the zip strip release liner from the roll. See Figure 4 below.

- **Fig. 4 Zip Strip being removed from membrane**




- When terminating the membrane at the crown, ensure that there is a clean and dry overlap of the adjoining membrane with a minimum of 3" (88.9mm)
- All longitudinal sections of membrane terminations shall be staggered and heat sealed with a 6" (152.4mm) overlap.
- Should heat sealing not be an option, then the use of either FFAS or 104CM shall be used at all longitudinal and transverse joints.

Heat Sealing is the process of using a propane torch to seal the termination of a section of membrane either to another section of membrane or to the substrate. This is done by waving a propane torch over the section of membrane as an indirect heat source. Visually inspect the top of the membrane for signs of the bituminous compound melting. Caution needs to be taken to ensure the flame is NOT in direct contact with the membrane surface which could result in burning through the membrane. Some smaller, hand-held types of propane torches will not effectively heat seal the membrane. A standard 20 lb. (9.07kg) propane bottle is recommended for the heat sealing of the membrane.

- The actual flame from the torch MUST NOT contact the membrane directly, it is intended to heat/soften the bitumen component for optimal adhesion.
- All edges that are overlapped should be heat sealed and sealed with FFAS or 104CM to prevent water permeation.

Patches: If debris becomes trapped under the membrane, it must be removed to prevent potential puncturing of the membrane when the asphalt overlay is placed. Remove the debris by making a "C" shaped cut around the foreign object creating a flap. Peel back the membrane, remove the debris and then flip the flap created back into place. Cut a 6" (152.4mm) by 6" (152.4mm) patch of fresh membrane to cover the area. Center the patch over the cut and heat seal into place. Similarly, any cuts, nicks, gouges, rips, tears, etc., can be repaired using the same procedure.

Curb Strips: If required by specification, curb strips should be positioned so the edge is ½" below the top of the proposed asphalt overlay/wearing surface. Royston® Roybond Primer and FFAS (if necessary) are

A wide-angle photograph of a modern, curved highway bridge with a large arch, set against a clear blue sky and distant mountains. The bridge has a white railing and is surrounded by greenery and a clear sky.

to be applied on the vertical curb surface and at the termination of the curb strip. Establish a reference point by striking a chalk line. (For example: If 6" (152mm) wide curb strips and the overlay depth is 2-1/2" (63.5mm) deep, strike a chalk line on the deck 4" (101mm) from the curb. Align the edge of the 6" (152mm) wide strip with the chalk line, smooth and press the strip toward the curb, and tightly into the corner, then up the vertical curb for 2" (50mm) to the pre-established height of 1/2" (12.7mm) below the final pavement). Curb strips can be installed before or after the deck membrane is installed; this does not change the curb detail involving the Flex-Flo Adhesive Sealant. Heat sealing of the curb strip to the deck membrane and to the curb is required. Use a small trowel to press the vertical edge against the curb as you are while heating ensuring the membrane is not overheated.

The Asphalt Overlay should be at least 1 1/2" thick and the temperature **MUST** be **above 290°F** (coming out of the paver) to ensure proper bonding occurs between the membrane and the substrate. Asphalt temperatures below 290°F will **NOT** soften the bituminous layer of the membrane causing adhesion or slippage to occur between the asphalt overlay and the substrate. The overlay should be applied as soon as possible following the membrane installation to avoid damage to the membrane. Do not allow general traffic to drive on the exposed membrane before paving. Minimize equipment turning on the membrane which can cause damage. If for any reason the equipment picks up the membrane or the membrane tears, then a repair patch must be applied.

Repair Procedure for Royston® Waterproofing Membrane

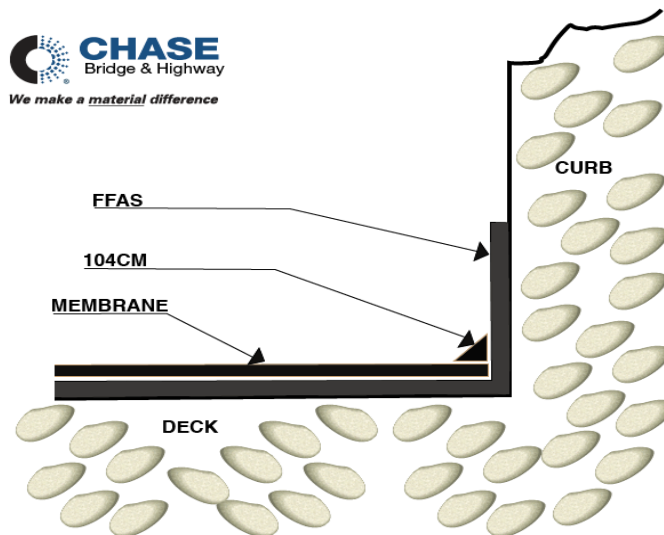
- Remove all paved asphalt surrounding the area in question.
- Trim and remove all loose membrane around the area.
- Saw cut approximately 6" of asphalt around the parameter of the area without penetrating or damaging the membrane.
- Carefully remove asphalt overlay.
- Ensure the exposed surface (concrete and membrane) is dry before continuing. The area may be heated with a torch if necessary however, ensure the flame does NOT come in contact with the exposed membrane.
- Apply desired Royston® Roybond primer to the exposed concrete.
- FFAS (Flex Flo Adhesive Sealant) should then be applied to the perimeter of the area being repaired. Then the membrane is applied and embedded into the FFAS sealant.
- A thin bead of FFAS or 104CM is then applied to the perimeter/termination on the surface of the membrane.
- The area may now be paved and opened to traffic under same paving conditions noted above in membrane application.

Curb Detail

Below are general instructions and recommended practices for applying Royston® Bridge Deck Membranes where a curb or other vertical surface, such as a parapet wall, meets the deck surface. In this detail, FFAS is used in conjunction with 104CM. This is not always the case but is the recommended procedure to achieve maximum waterproofing properties.

- As part of the deck preparation, make sure the entire area is clean and dry.
- Using Royston® Flex-Flo Adhesive Sealant (FFAS), apply a 4" wide band, 60 mils thick, starting from the curb face, and extending onto the deck. Coat the curb face up to a point that is level with the finished asphalt overlay. This overlay height is usually 1½" to 2½" up the curb. A metal trowel works well in placing the FFAS. On uneven decks which require a leveling course of asphalt prior to placing the membrane, the FFAS will be applied after the leveling course. On decks that do not require a leveling course, the FFAS will be applied before the Royston® Primer is applied to the deck.
- Place the membrane on the deck with the edge of the membrane butting into the corner where the curb face starts. Press the membrane edge into the FFAS making sure a complete bond is achieved, this will assist in preventing water from getting under the membrane.
- Once the membrane is placed, install a final top ½" bead of 104CM in the corner where the membrane terminates to the curb, sealing the membrane edge into the corner. This will assist in preventing water or contaminants from getting under the membrane. This is also done in applications that do not use the FFAS bedding at the curb termination.

Figure 5 Curb Detail for Membrane Installation

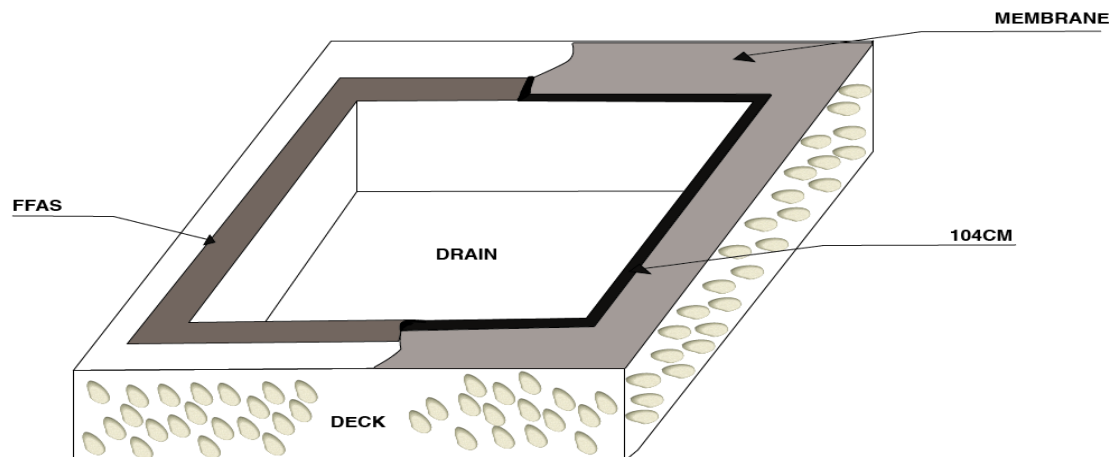


Drain Detail

This document provides general instructions and recommended practices when applying Royston® Bridge Deck Membranes to any utilities or penetrations that exist in the bridge deck surface.

- As a part of deck preparation, make sure the entire area is clean and dry.
- Using Royston® Flex-Flo Adhesive Sealant (FFAS), apply a 4" wide band, 60 mils thick, around the drain opening on the deck surface. On uneven decks which require a leveling course of asphalt prior to placing the membrane, the FFAS will be applied after the leveling course. On decks that do not require a leveling course the FFAS will be applied before the Royston® Primer is applied to the deck.
- Place the membrane around the drain opening, terminating the membrane at the drain edge. Press the membrane edge into the FFAS making sure a complete bond is achieved, this will assist in preventing water from getting under the membrane.
- Once the membrane is in place, apply a final top ½" bead of 104CM onto the edge of the membrane where it terminates at the drain opening. This will assist in preventing water or contaminants from getting under the membrane.

Figure 6 Drain Detail for Membrane Installation



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