

16.1 Bridge Deck Waterproofing - General

A hot applied rubberized membrane waterproofing system complete with protection board is applied to the deck concrete prior to installation of the ACP wearing surface. This system is intended to stop the ingress of salt into the substrate concrete of the deck, thereby preventing concrete delamination and corrosion of reinforcing steel.

- It is IMPERATIVE that the waterproofing be applied in accordance with the Specifications.
- The Bridge Inspector shall ensure that all phases of work relating to the application of the waterproofing system are performed properly and completely for each subsequent operation.

16.2 Environmental Constraints

Be aware of the environmental constraints. Note the following requirements:

- All over sprayed tack oil shall be satisfactorily removed and cleaned.
- Waterproofing material should not enter into a stream or adjacent embankments.
- Deck sandblast spoil shall not be blown into the stream.

16.3 Safety

The bridge deck waterproofing procedures requires the use of “hot” material and proper protective equipment must be worn. All site meetings between the Bridge Project Engineer, the Bridge Inspector and the waterproofing contractor should address all safety concerns.

Refer to the following Parts of the Alberta’s Occupational Health and Safety Regulation, General Safety Requirements for specific safety requirements.

- Part 3 Health and Safety Plan
- Part 4 Hazard Assessment, Elimination and Control
- Part 11 Fire and Explosion Hazards
 - Section 136 Hot Work
- Part 15 Personal Protective Equipment

- Part 16 Powered Mobile Equipment
- The Bridge Inspector must monitor the safety practices of the waterproofing Contractor.
- Issue “STOP WORK” order to waterproofing contractor, if necessary.
- Be aware of the public traffic.

Traffic control usually only applies to the restoration of an old structure, since a new structure is normally closed to traffic.

- Traffic control required to be adjusted to suit traffic conditions.

16.4 Weather

If weather factors are detrimental to the acceptable placement of waterproofing, the work should be suspended until suitable conditions exist.

16.5 Surface Preparation

To be effective, it is ESSENTIAL that the bridge deck be properly prepared before applying the waterproofing. The existing surface of the concrete is completely sandblasted or shot blasted to expose sound, laitance free concrete. It is imperative that the Bridge Inspector approves the surface preparation before the Contractor applies the tack coat.

16.6 Application of Waterproofing

When applying the deck waterproofing, the requirements of the Specifications must be followed.

16.6.1 Tack Coating Deck Surface and Curbs with Primer

The clean, dry, dust free concrete deck surface and portion of front face of curbs must be treated with a primer prior to the application of the waterproofing.

- The primer will turn brownish in color when cured.
- The primer should be applied to the vertical curb face for the full height of the ACP.

- The primer may be applied by brushing or spraying but brush application is preferable for curb face.

16.6.2 Applying Butyl Rubber Membrane

- In addition to the hot asphalt membrane, a butyl rubber membrane material is applied to all cold joints, grout keys and up on the curb face or other areas as determined by the Bridge Project Engineer.

16.6.3 Applying Hot Waterproofing Membrane

The asphalt membrane is manufactured by an approved manufacturer and supplied in cakes to the job site for re-melting. The asphalt membrane should be melted in an approved mechanically agitated heating and mixing unit, capable of maintaining the material at the manufacturers recommended temperature.

- Ensure the re-melted membrane in the mixer is uniform and free of lumps.
- Apply waterproofing over the entire deck area including the rubber membrane strips and up the curb face to the required grade of the ACP.
- Ensure that the waterproofing covers the underside and the surrounding areas of the deck drains and the vertical face of any deck joints.

16.6.4 Applying Protection Board

The function of the protection board is to prevent the paving equipment and the coarse aggregate in the hot mix from damaging the pliable membrane. Care must be taken to ensure the spreading of the hot waterproofing membrane does not get too far ahead of the protection board placement, as the membrane will lose its tack upon cooling. Protection boards are to be used in conjunction with the asphalt membrane only.

- The boards are laid into the waterproofing membrane before it loses its initial tack, with the length of the board running transverse on the deck.
- Subsequent rows of protection boards are placed with the longitudinal joints staggered and all joints overlapped according to specifications.
- The boards must be cut to fit within 6 mm of the curb and deck drains and overlap boards 25 mm.
- ACP must be installed as soon as possible to prevent the corners of the protection boards from curling up.

16.7 Checklist**16.7.1 Bridge Inspector's Responsibilities**

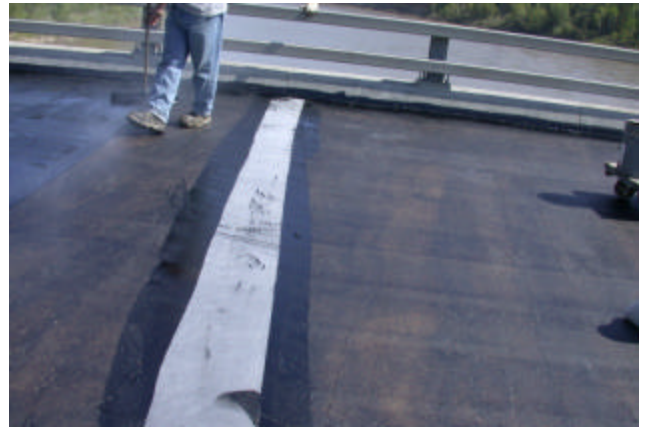
- Inspect the dryness and cleanliness of the deck surface prior to proceeding with the waterproofing application.
- Monitor the uniform application of primer and adequate curing.
- Calculate the application rate for primer and hot asphalt membrane outlined in the Specifications.
- Check the membrane thickness frequently.
- Sample the hot asphalt membrane as required.
- Check that the kettle temperature maintained is within the recommended application range.
- Check to ensure that the protection boards are not damaged and are overlapped sufficiently during installation.
- Monitor the uniform application of SS-1 emulsion over the protection boards and that there is sufficient curing prior to paving.

SECTION 16

BRIDGE DECK WATERPROOFING



16-1 Surface preparation by shot-blasting



16-4 Placing 300 mm wide butyl rubber membrane over transversal crack prior to applying hot waterproofing membrane



16-2 Apply tack coat to bridge deck prior to waterproofing



16-5 Applying hot waterproofing membrane



16-3 Waterproofing membrane material heater



16-6 Applying hot waterproofing membrane and protection board

SECTION 16

BRIDGE DECK WATERPROOFING



16-7 Placing protection board on top of hot-applied waterproofing membrane



16-10 Wick drain running into weeping drainpipe at abutment



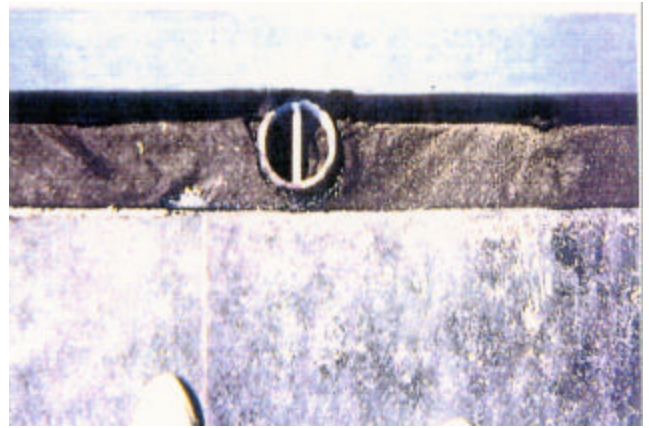
16-8 Placing 300 mm wide butyl rubber membrane over construction joint prior to hot-applied waterproofing membrane



16-11 Waterproofing completed with wick drain running horizontally along curb



16-9 Wick drain running horizontally along curb into rectangular deck drain prior to placing of protection board



16-12 Wick drain running along curb at circular deck drain