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WATER-STOP Membrane

Installation Guide

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1. Product Description

WATER-STOP is a thin load bearing, bonded, sheet membrane for waterproofing applications.

Installed using an appropriate thin-set mortar and with the W-S waterproofing accessories; bands, tapes, corners and collars, is a complete assembly bonding together to create a watertight layer to protect the structure and the tile installation from moisture and minor substrate cracking.

1.1. Material Working Properties

WATER-STOP is a highly-flexible polyolefin sheet membrane 0.02" (0.5mm) thick.

It is formed from several layers: the central sheet is made of two layers of EVA Copolymer film and covered on both sides with a non-woven polyester/polypropylene webbing to anchor the membrane into the thin-set mortar.

WATER-STOP meets the American National Standard for Thin-Set Ceramic Tile and Dimension Stone Installations ANSI A118.10 for Load Bearing, Bonded, Waterproof Membranes and ANSI A118.12 for Crack Isolation Membranes.

WATER-STOP has been independently tested and found to emit zero VOCs.

1.2. WATER-STOP Membrane Physical Properties

Property	Test Method	Value
Seam Strength	ASTM D 751	24 lbs./in. (0.43 kg/mm)
Breaking Strength Transverse	ASTM D 751 Proc. B	1400 psi (9.6 MPa)
Breaking Strength Longitudinal	ASTM D 751 Proc. B	1100 psi (7.6 MPa)
Dimensional Stability	ASTM D 1204	±0.2%
Waterproofness	ASTM D 4068	Pass
Shear Strength		
7-Day Dry	ASTM C482	115 psi (0.8 MPa)
7-Day Water Immersion		80 psi (0.6 MPa)
4-Week		130 psi (0.9 MPa)
12-Week		136 psi (0.9 MPa)
100-Day Water Immersion		84 psi (0.6 MPa)
Resistance to Temperature		-22°F / +176°F (- 20°C /+ 80°C)
Total Thickness (approximate)	EN 1849-2	20 - 25 mils (0.57 mm)

1.3. WATER-STOP Products Specifications

WATER-STOP 5 Roll 3'3"x16'4"=54 ft² (1m x 5m =5m²)

WATER-STOP 10 Roll 3'3"x33'=108 ft² (1m x 10m =10m²)

WATER-STOP 30 Roll 3'3"x98'5"=323 ft² (1m x 30m =30m²)

WATER-STOP 40 Roll 6'6"x66'=323 ft² (2m x 20m =40m²)

W-S BASE 3 Shower pan liner Sheet 4'11"x6'6"=32.3 ft² (1.5m x 2m =3m²)

W-S BASE 4 Shower pan liner Sheet 6'6"x6'6"=43.05 ft² (2m x 2m =4m²)

1.4. W-S Waterproofing Accessories

Materials and components used when installing WATER-STOP membrane to ensure that waterproofing is complete and all critical points are sealed.

BANDA W-S 14 Roll 5·1/2"x66' (14 cm x 20 m)

BANDA W-S 34 Roll 13·1/3"x66' (34 cm x 20 m)

W-S DIN preformed, seamless 90º inside corners

W-S DEX preformed seamless 90º outside/dam corners

W-S TUBO section of WATER-STOP with preformed gasket to seal pipe protrusions

W-S DRAINFLASH preformed section of WATER-STOP to flashing connection to drain

W-S BUTIL Pre-formed butyl flashing tape

W-S MASTIC High-modulus MS polymer sealant

2. Areas of application and Requirements

WATER-STOP is suitable to be used in conjunction with ceramic and stone tile covering for wall and floor surfaces where protection against the penetration of moisture is necessary in new construction and renovation projects. It is suitable for interior applications and for exterior floors and walls over suitable substrates.

WATER-STOP isolates common shrinkage cracks found in residential and commercial construction from telegraphing to finished surface.

Applications include showers, tub surrounds, bathrooms, commercial and residential kitchens, backsplashes and areas surrounding swimming pools.

WATER-STOP is not to be considered the primary exterior waterproofing over occupied spaces

WATER-STOP membrane should be bonded to substrate with modified thin-set mortar. Thin-sets must be appropriate for the substrate and conform to ANSI A118.4 or the appropriate standards, and TCNA Handbook recommendations.

2.1. Substrate Requirements

Substrate must meet requirements set forth by the TCNA and ANSI standards.

Surfaces shall be structurally sound, stable and rigid enough to support ceramic tile, stone, thin brick and similar finishes. Substrate deflection under all kind of loads, must not exceed L/360 for thin bed ceramic tile/brick installations or L/720 for thin bed stone installations where “L” = the span length in inches.

Concrete and masonry must be free of curing agents, sealers, water repellents or other treatments that prevent membrane bonding. The maximum amount of moisture in the concrete substrate should not exceed 5 lbs./1000 sq. ft. (2.26 kg/92.9 m2)/24hrs per ASTM F-1869 or 75% relative humidity as measured with moisture probes per ASTM F2170 and should be between 45°F (7°C) and 90°F (32°C).

Plywood floors (interiors only) – minimum construction for direct bond: Subfloor: 5/8" (15 mm) thick, exterior glue, tongue and groove plywood over bridged 2" x 10" (40 mm x 240 mm nominal) joists spaced 16" (400 mm) o.c. maximum; fasten plywood 6" (150 mm) o.c. along sheet ends and 8" (200 mm) o.c. along intermediate supports with 8d (65 mm) ring-shank nails or screws; allow 1/8" (3 mm) between sheets; all sheet ends must be supported by a framing member; glue sheets to joists with construction adhesive; Underlayment: 5/8" (15 mm) thick exterior glue plywood fastened 6" (150 mm) o.c. along sheet ends and 8" (200 mm) o.c. in the panel field (both directions) with 8d (65 mm) ring-shank nails or screws; allow 1/8" (3 mm) between sheets and 1/4" (6 mm) between the underlayment and any abutting surfaces; offset underlayment joints from joints in subfloor and stagger joints between sheet ends; glue underlayment to subfloor with construction adhesive. The fasteners used to fasten the underlayment to the subfloor should not penetrate beyond the underside of the subfloor nor into the joints.

In floors waterproofing the surface need a minimum slope to drains of 1/4" per 1' (6 mm per 0.3 m). As shower pan liner WATER-STOP membrane should be installed over properly prepared sloped fill or pre-sloped substrates.

2.2. Suitable Substrates

2.2.1. Interiors

Concrete, concrete & brick masonry, cement mortar beds, cement plaster, gypsum wallboard, exterior glue plywood, ceramic tile & stone, cement terrazzo, cement backer board, poured gypsum underlayment, fiber-cement underlayment, fiber-reinforced water-resistant gypsum backer board/underlayment

2.2.2. Exteriors

Concrete, ceramic tile & stone, cement terrazzo

2.3. Limitations

Do not use as a primary roofing membrane over occupied space.

WATER-STOP cannot accommodate deflection greater than industry guidelines for the flooring surface.

Do not use over dynamic expansion joints, structural cracks or cracks with vertical differential movement. Do not use over cracks >1/8" (3 mm) in width.

Do not bond to particle board, OBS, interior glue plywood or hardwood surfaces.

Do not expose to negative hydrostatic pressure.

WATER-STOP is not designed for use as a wearing surface or exposed roof membrane. It must be covered with ceramic tile, stone, brick, concrete, screeds, terrazzo or other protective surface. For temporary cover, use protection board.

Do not expose membrane directly to sun or weather for more than 5 days.

3. Installation Procedures

WATER-STOP membrane should be bonded to substrate with modified thin-set mortar. Thin-sets must be appropriate for the substrate and conform to ANSI A118.4 or the appropriate standards, and TCNA Handbook recommendations.

After installation, sheet must be kept clean to enable tile adhesive to bond. For temporary cover, protect the installed sheet from damage and all foot or vehicular traffic. Use protection board, rugs, plywood, etc.

3.1. Surface Preparation

Check and prepare the surface: it must be clean, firm and flat and have the correct slope.

It is important to note that the substrate or setting bed surface must meet the same substrate smoothness criteria required for direct bond tile / stone applications.

The substrate should be cleaned just prior to installing the membrane. Remove dust, dirt, oil, grease, paint, laitance, efflorescence, curing compounds, sealers, water repellents and other materials that prevent bond. Dampen hot, dry surfaces and sweep off excess water.

Use a suitable substrate mortar or underlayment, to patch, pitch, level, plumb, flatten or smooth substrates.

Existing ceramic/stone tile, glazed concrete masonry units or cementitious terrazzo must be cleaned and skim coated with suitable patching compound or latex thin-set mortar (consult with thin set mortar manufacturer for their specific product recommendations).

3.2. Planning & Layout

Cut the membrane to size. Be sure to allow for 2-3" overlap at all seam locations, 4-6" for upturn at walls when waterproofing.

In floors installations lay the sheets so that seams overlap in the direction of the slope at shingled fashion. Avoid cross-lapped seams and seams over drains, protrusions etc. Use chalk lines to maintain sheet alignment.

Sheet may be pre-folded and cut to accommodate upturns and other requirements per industry guidelines and specifications.

3.3. Treat Connections to Fixed Building Elements & Joints

Treat all elements such as expansion joints, penetrations and floor gully connections using the W-S Waterproofing Accessories. All flashings and penetrations of pipes, conduits, fixtures, etc. must be sealed using W-S MASTIC sealant or other suitable similar sealing compounds.

3.3.1. Drains

Drains must have a suitable membrane clamping collar or an integrated bonding flange.

In areas when more than one sheet or more than one drain is needed; if installing with a clamping ring type drains with weepers as per ASME A112.6.3 treat the drain connection before the waterproofing installation.

Install W-S DRAINFLASH or treat with a drain flashing made with a 12x12" section of WATER-STOP membrane:

- Remove strainer and clamping ring. Lay the flashing piece over the top of the drain and cut an “X” where each bolt will penetrate the membrane. Carefully cut a hole in the membrane to allow the drain grate to be threaded into the clamping ring and seal with 2 beads of W-S MASTIC SEALANT between the drain body and the underside of the membrane. Reset the drain clamping ring and tighten clamping ring bolts.
- Apply thin-set mortar to the floor area from the outer edge of the drain.
- Bond the flashing membrane to substrate with latex modified thin-set. Embed the piece into bond coat.
- When installing the WATER-STOP membrane in main application remove the clamping ring, and do as indicated for drains with bonding flange bellow.

In small areas with a single floor drain as in showers, the connection to drain of WATER-STOP membrane sheet can be done at waterproofing installation.

When installing with a clamping ring type drains with weepers as per ASME A112.6.3:

- Remove strainer and clamping ring. Lay the WATER-STOP membrane over the top of the drain and trace drain hole opening and bolt holes: cut an “X” where each bolt will penetrate the membrane. Carefully cut out inside drain opening to allow the drain grate to be threaded into the clamping ring.
- Apply thin-set mortar to the floor area from the outer edge of the drain outward.
- Apply 2 beads of W-S MASTIC sealant around the drain hole opening to seal between the drain body and the underside of the membrane and install the WATER-STOP membrane properly embedded into bond coat, making sure to align the previously cut holes for the bolts and drain opening.
- Apply pressure to the membrane with the flat side of the trowel squeezing the sealant toward the drain hole and the thin-set mortar outward toward the sheet edges or the perimeter of the shower.
- Reset the drain clamping ring and tighten clamping ring bolts through openings in the membrane. Protect weep holes from clogging. Replace the strainer and adjust to proper height for tile

When installing with a drain with integrated bonding flange, follow the manufacturer instructions to install the drain. Once the mortar is cured enough to walk on, the WATER-STOP membrane can then be installed.

- Apply thin-set mortar to the floor area including the drain bonding flange except the inner 3-4" area
- To seal between the drain and the underside of the membrane Apply 2 beads of W-S MASTIC sealant separated 2'' in concentric circles around the drain hole opening and a third drop interposed therebetween in a zigzagged pattern.
- Install the WATER-STOP membrane. Apply pressure to the membrane with the flat side of the trowel squeezing the sealant toward the drain hole and the thin-set mortar outward toward the sheet edges or the perimeter of the shower.
- When you are ready to install the drain assembly, cut an X in the Vapor-shield toward the edges of the drain hole to insert drain height adjustment sleeve.

3.3.2. Penetrations

Treat pipe penetrations and mixing valves with W-S TUBO (Figure 3):

- Apply thin-set mortar with notched trowel on the substrate around the penetration.
- Apply a bead of W-S MASTIC sealant over the pipe or mixing valve, slide the W-S TUBO flashing collar over and press firmly into the thin-set. Remove any trapped air and guarantee full adhesion to the material by spreading the thin-set from the inside out using a trowel.

3.3.3. Expansion Joints

It is the installer's responsibility to follow the architectural specifications (based on TCNA Handbook section EJ171). WATER-STOP membrane shall be separated at existing expansion and structural joints (Figure 6)

- Apply thin-set mortar with notched trowel on the substrate on both sides along the joint
- Cover the joint with BANDA W-S 34. To allow for greater movement, the center section of the BANDA can be tucked into the cavity of the expansion joint prior to bonding.
- Embed the BANDA into bond coat. Remove any trapped air and guarantee full adhesion to the material by pressing firmly with the flat side of the trowel in diagonal sweeps.
- When installing the main area WATER-STOP membrane must be joined to the BANDA. Seams must be made by overlapping the edges of the WATER-STOP adjacent sheets 2-3" (5-8 cm) using W-S BUTIL Pre-formed butyl flashing tape, W-S MASTIC sealant or a latex modified dry-set cement mortar conform to ANSI A118.4
- Finally cover the seams applying a second BANDA W-S 34 as described above but bonding using W-S BUTIL Pre-formed butyl flashing tape or W-S MASTIC sealant for a water-tight seam

3.4. Main Area Application

To create the watertight system, the installation process will rely on the layering of components; walls layers must overlap floor to wall upturns and corners flashings likewise these must overlap floor membrane.

Apply modified thin-set mortar to the substrate using a 1/8" to 1/4 (3 a 6 mm) V-notched trowel.

Trowel an area as wide as the sheet and as deep as can be comfortably reached. In order to avoid trapping air under the sheet, trowel mortar in parallel rows across the width or length of the sheet.

Unroll sheet into the fresh bonding material and pressed in an effort to achieve a 100% bond and coverage, thus eliminating air bubbles and voids between the membrane and substrate. This can be done using a 75 or 100 lbs. (34-45kg) sheet vinyl roller. Work from center of sheet to edges.

Then install the next layer leaving overlaps free. The remaining lengths can now be installed in this same manner.

After installing the total area, proceed to bond and seal joins and treat floor to wall intersections and corners as indicated below.

3.4.1. floors

The WATER-STOP installation for waterproofing must start laying the first sheet at the lowest point and then overlap the next layer.

Apply the membrane to the entire floor surface and up the walls. WATER-STOP should be turned up wall a minimum of 2 inches and at least to flood point.

3.4.2. Walls

Treat pipe penetrations and mixing valves with W-S TUBO.

Start in a corner and work your way out from the corner to the edge of the installation. Apply the thin-set to the surface.

Install the first length. It may be easiest to unroll the sheet membrane up the wall. Be certain to overlap the upturn sheet from floor at least 2” (5 cm). Smooth the section of WATER-STOP membrane with a flat trowel or hand roller from the middle towards the outside edges to assure that no air is trapped underneath.

Then install the next layer leaving overlaps free. The remaining lengths can now be installed in this same manner.

3.5. Shower Pans

Verify that floor has proper slope and shower drain is installed.

Start with the floor section first bay connecting with shower drain and taking the perimeter of the floor membrane up the wall a minimum of 2’’.

3.5.1. Shower Drains

- For shower drains, refer to the Drains section above.
- For EVOLUX System shower drains, refer to product installation instructions.

3.6. Bathtub Surrounds

Keep a 1/4 inch gap between the top edge of the bathtub and the bottom of the substrate.

Apply W-S MASTIC sealant to the top edge of the bathtub to the substrate, and then imbed the bottom edge of the WATER-STOP membrane into the sealant (Figure 4).

3.7. Seaming & Joining

When more than one sheet is needed we must seam sheets together. Seams can be done after all sheets have been installed. Seam areas must be clean and free of bond breakers (mortar, adhesives, etc.)

Seams can be constructed by overlapping the edges of the WATER-STOP, or by abutting the edges and covering the joint with BANDA W-S 14.

- By overlapping: The edges of the WATER-STOP adjacent sheets should be lapped 2-3" (5-8 cm) in direction of water flow to drain. Seams must be made using a latex modified dry-set cement mortar conform to ANSI A118.4, or using W-S BUTIL Pre-formed butyl flashing tape or W-S MASTIC sealant for a water-tight seam.
- By abutting and joint covering: Lay the BANDA W-S 14 tape over the joint. Make sure that the tape overlaps each WATER-STOP membrane section by a minimum of 2” (5 cm). Seam using a latex modified dry-set cement mortar conform to ANSI A118.4, or W-S MASTIC sealant for a water-tight seam. For any sections where two strips of BANDA W-S 14 tape will be joined, be certain to overlap the material by 2” (50 mm).

3.7.1. W-S BUTIL Pre-Formed Butyl Flashing Tape

Lay the tape on the sheet being overlapped and remove all air pockets by pressing with flat edge of trowel or hand roller.

Remove the protective paper from W-S BUTIL flashing tape by pulling in a flat angle while overlapping top sheet.

Remove any trapped air and guarantee full adhesion to the material by pressing firmly with flat edge of trowel or hand roller in diagonal sweeps.

For any sections where two strips of W-S BUTIL flashing tape will be joined, be certain to overlap the material by 1" (2.5 mm).

3.7.2. W-S MASTIC High-modulus MS Polymer Sealant

W-S MASTIC sealant is applied with a commercial grade caulk gun. Beads must be continuous without skips or voids. Beads must be continuous without skips or voids.

At 1/2'' from edge of sheet being overlapped apply two 1/8'' beads separated 2'' and a third bead interposed therebetween in a zigzagged pattern. Close and flatten pressing with flat edge of trowel.

Seams must be allowed to cure to develop strength. Do not stress until allowed to cure for 24 hours.

3.8. Flashings, Upturns & Corners

WATER-STOP should be turned up wall at least to flood point and creased for a tight fit at floor/wall juncture. Cut the excess out of the corners.

Floor to wall intersections and upturns can also be constructed with overlapping floor and applied with a latex modified dry-set cement mortar conform to ANSI A118.4, or using W-S BUTIL Pre-formed butyl flashing tape or W-S MASTIC sealant.

Corners should be installed overlapping floor but prior to BANDA W-S 14 or BANDA W-S 34 if used in floor to wall joint flashing. (Figure 1)

Bond W-S DIN and W-S DEX Preformed Corners to sheet and/or substrate with a latex modified dry-set cement mortar conform to ANSI A118.4 or W-S MASTIC sealant.

Check again the seal on the overlaps and corners, edges and other critical points. Caulk generously with W-S MASTIC sealant or other suitable similar sealing compounds all inside and outside corner areas, flashings, seams or any area that might present a potential leak.

3.9. Flood Testing

Waterproofing installations should be flood tested to insure that they are watertight prior to setting tile. Wait 24 hours before testing to allow for final set of the mortar to ensure waterproof performance of the assembly at seams and connections

4. Tile Installation

Once the entire membrane with seams, corners, and connections has been completely bonded, and therefore waterproofed, the covering may be applied.

For tile installations using the thin-bed method, apply modified thin-set mortar directly to the exposed WATER-STOP surface and install the tiles. Complete coverage of WATER-STOP Membrane by the bond coat is required. For acid-resistant coverings, use an epoxy adhesive to set and grout the tile

Set tile in accordance with TCNA Handbook recommendations, ANSI A108 standards and bond coat manufacturer's directions.

Refer to bond coat manufacturer's instructions far cure time and suitability and allow 50% additional time. Rapid-curing type of thin-set mortar may be used with approval of mortar manufacturer.

5. Figures / Drawings

Figure 1

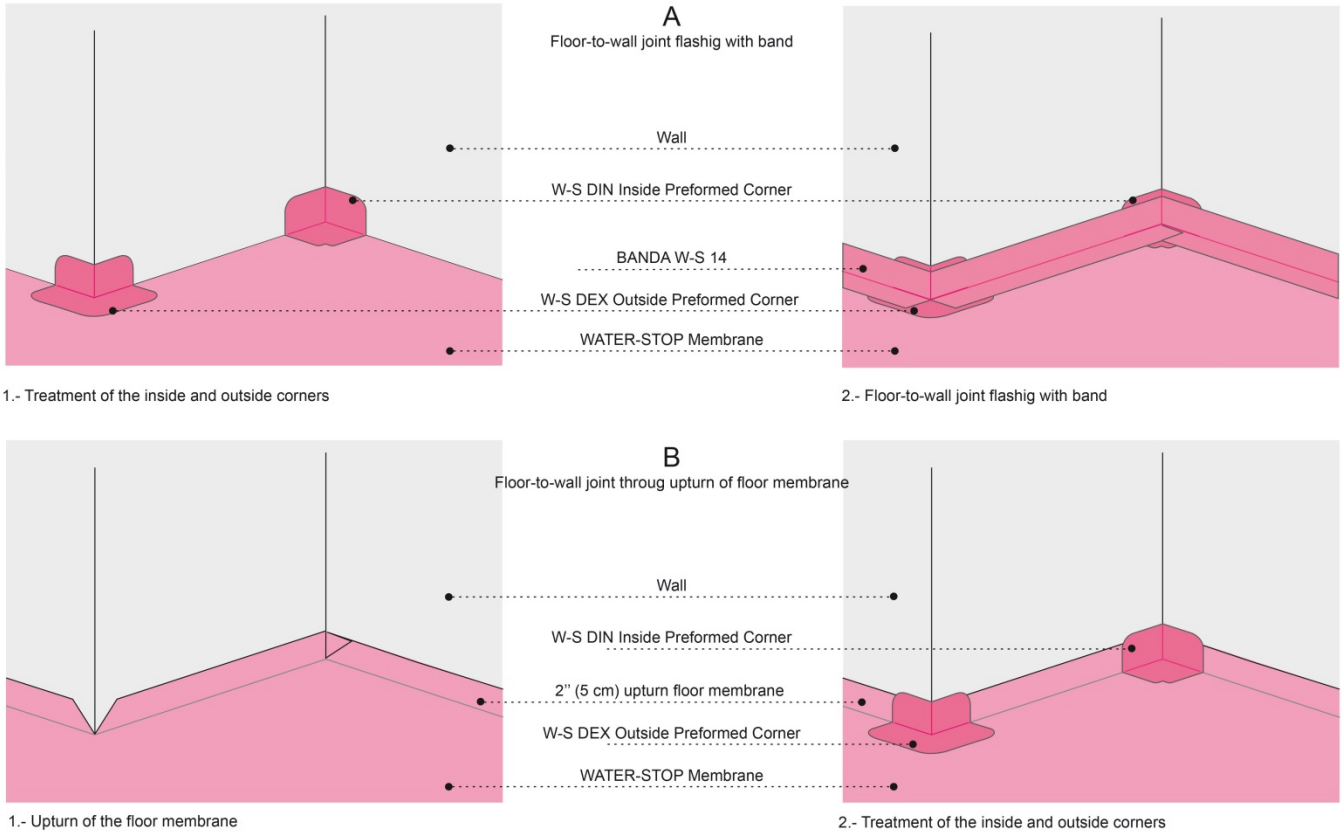


Figure 2

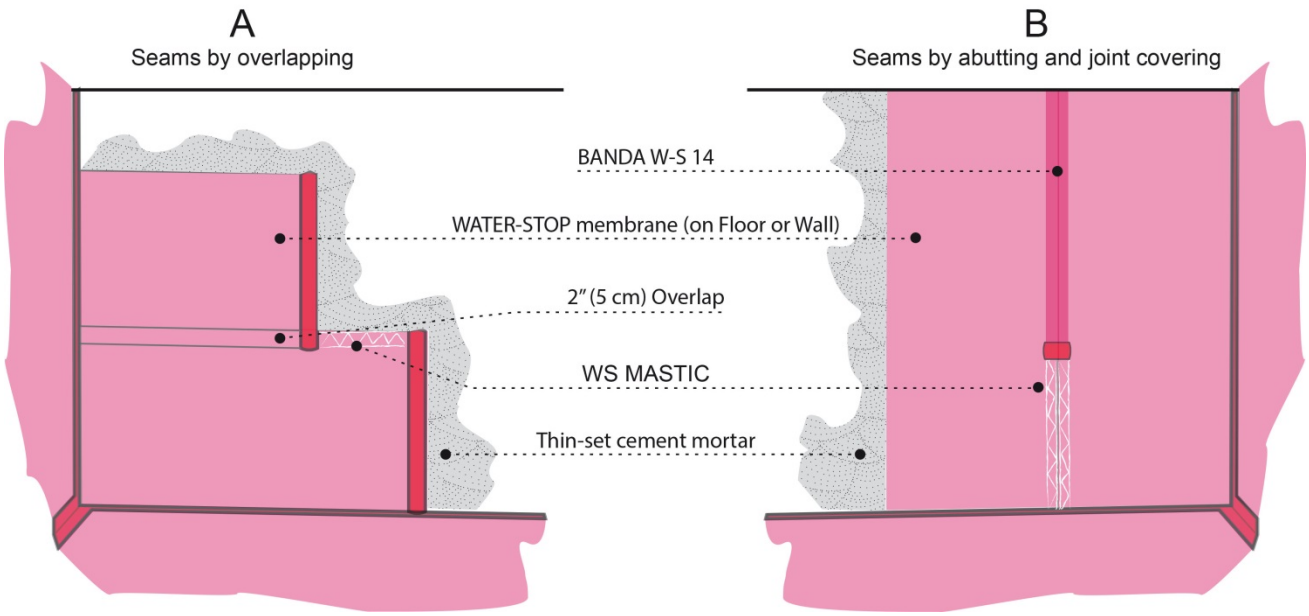


Figure 3

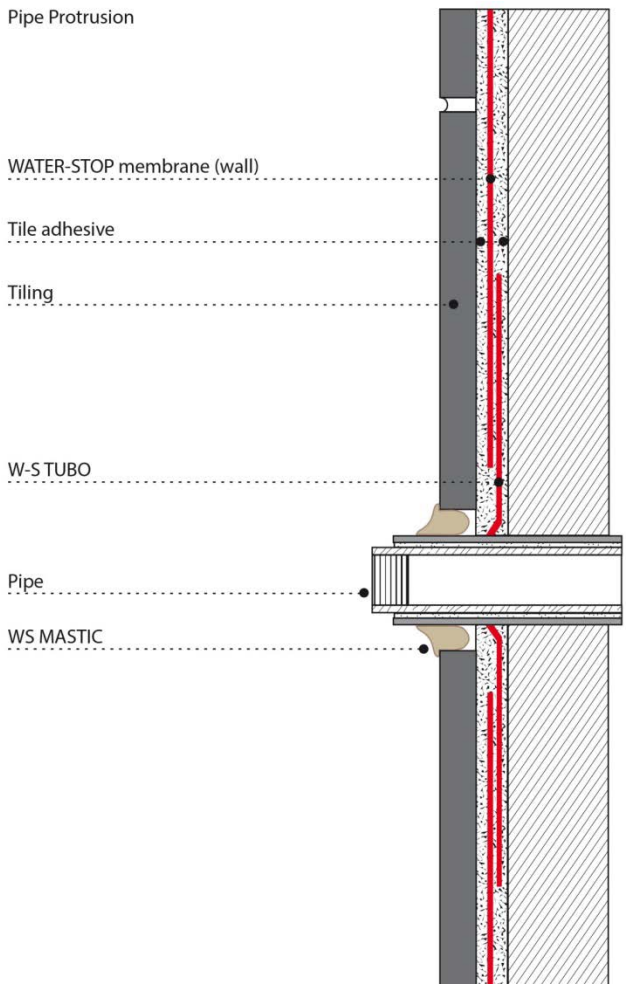
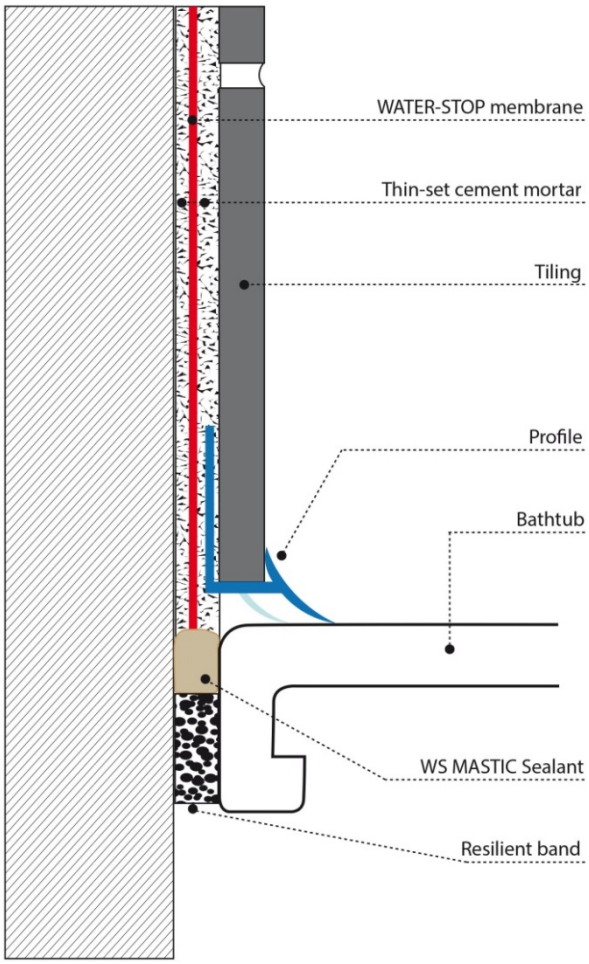


Figure 4

Wall - Bathtub surronds



Floor to wall joint treatment with BANDA W-S 14

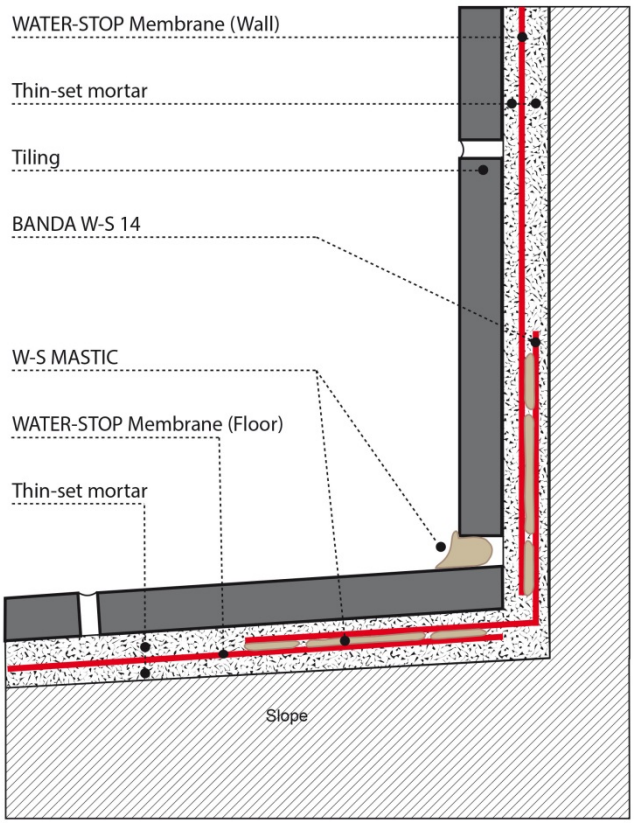
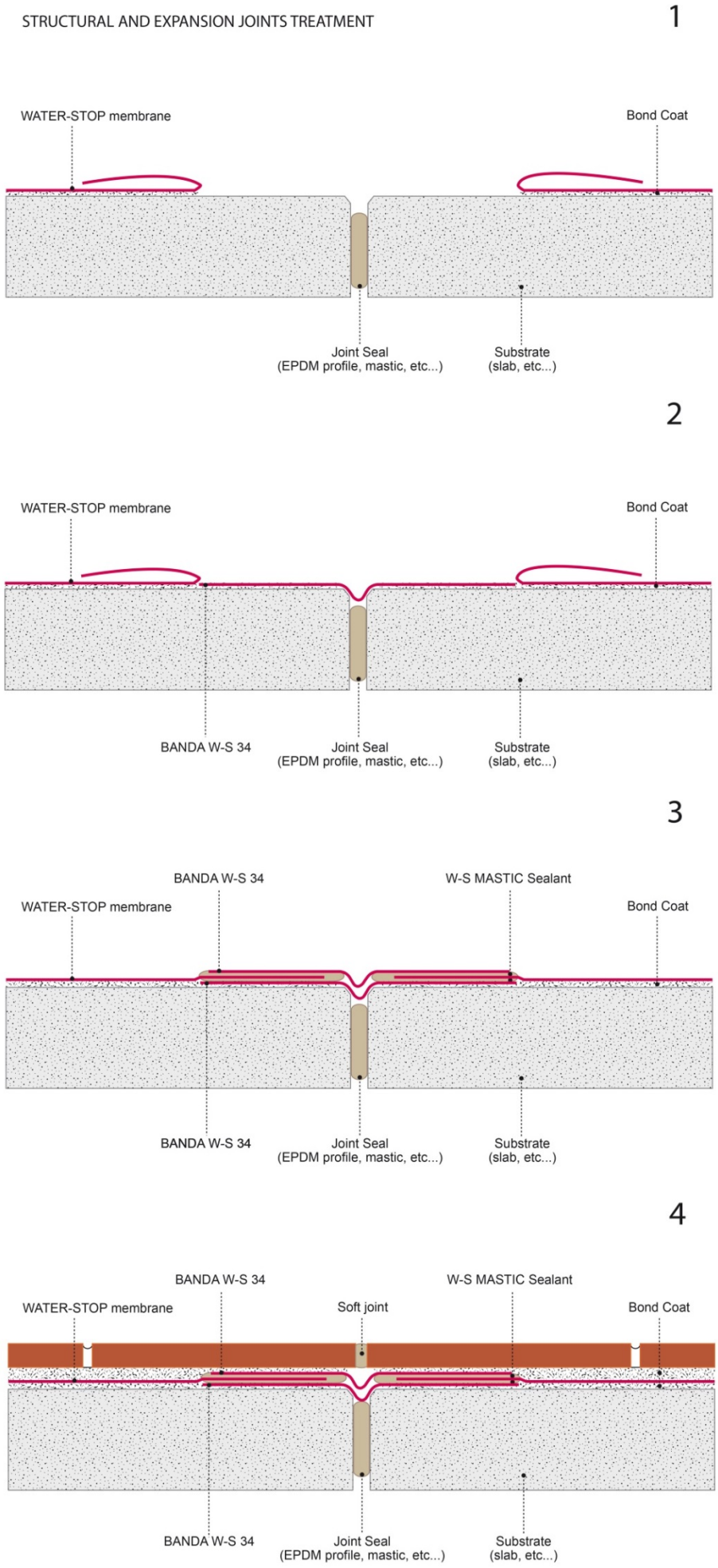


Figure 5

Figure 6


1
WATER-STOP membrane
Bond Coat
Joint Seal
(EPDM profile, mastic, etc...)
Substrate
(slab, etc...)
2
WATER-STOP membrane
Bond Coat
BANDA W-S 34
Joint Seal
(EPDM profile, mastic, etc...)
Substrate
(slab, etc...)
3
BANDA W-S 34
W-S MASTIC Sealant
WATER-STOP membrane
Bond Coat
BANDA W-S 34
Joint Seal
(EPDM profile, mastic, etc...)
Substrate
(slab, etc...)
4
BANDA W-S 34
W-S MASTIC Sealant
WATER-STOP membrane
Soft joint
Bond Coat
BANDA W-S 34
Joint Seal
(EPDM profile, mastic, etc...)
Substrate
(slab, etc...)