Firestone PondGard Liner Bonding Installation Guidelines

Firestone

BUILDING PRODUCTS COMPANY

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PONDGARD SEAMING

The seaming of adjacent panels should be performed immediately after the relaxation of the PondGard membrane.

All panels must be installed without tension and without wrinkles overlapping by at least 4 in. (100 mm). All seams on slopes must be run up and down the slope with no horizontal seams allowed.

For soft or rough subsoils a board or piece of conveyor belt is used under the PondGard membrane in the area of the seam. The seaming board is moved by means of a rope as the seaming process progresses.

Seams should not be made under the following conditions:

- *moisture*
- *soft subgrade soil*
- *condensation on the primer or on the membrane*
- *rainfall*
- *ponded water*
- *other containments*

Moisture in the seam will cause failure of the seam.
Use only Firestone approved products. Non-Firestone products cannot be approved to make seams.

2.3 SEAMING PROCEDURES
2.3.1 - 6.0 INCH (150MM) WIDE COVER STRIP SEAMING TAPE SYSTEM

STEP 1: POSITION THE PONDGARD MEMBRANES

- Both adjacent panels are positioned with sufficient overlap 4 in. (100 mm).
- The panels should lay flat and without any tension.

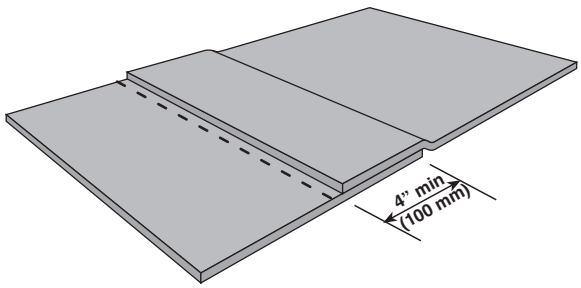

Figure 14.1

STEP 2: CLEAN THE OVERLAP

- If there is dirt in the overlap area, clean the overlap area using a clean cotton cloth. Soil should not be allowed to contaminate the PondGard membrane in the splicing area.

STEP 3: APPLY THE QUICKPRIME

- Stir the QuickPrime Plus before and during use and transfer a small quantity 0.4 gal. (1.5 l) to a bucket. The Primer is applied with a scrubbing pad.

- Immerse the scrubbing pad in the QuickPrime Plus, keeping the pad horizontal and let excess of QuickPrime Plus drip off the pad.

- Each pad immersed in QuickPrime Plus will cover an area of about 3.0 ft. (0.9 m) in length, over a width 4 in. (100 mm (one side)).

- Change scrubbing pads every 200 ft. (61 m) or when the primer has dried on the pad. Used pads are to be discarded at the end of the working day.

- Additional priming is required at factory seams, at the intersection of two seams and to areas covered with adhesive.

- Both sides to be seamed are treated simultaneously so as to obtain an identical drying time.

- Test QuickPrime Plus for readiness. Allow the primer to flash off. The primer needs to dry completely (approximately 5-10 minutes) before installing the tape. Check its dryness by touching the primed surface with a clean and dry finger (as indicated in the sketch) to be certain that the primer does not string. When touching the primer, push forward on the primed surface at an angle to ensure that the primer is dry through out its thickness. If either motion exposes a stringy primer when the finger is lifted, then the splice is not ready for installing the tape. Flash-off time will vary depending on ambient air conditions (relative humidity, wind...).

STEP 4: APPLY THE QUICKPRIME PLUS TO THE OVERLAP

- Prime a minimum of 3 in. (75 mm) on either side of the overlap edge.

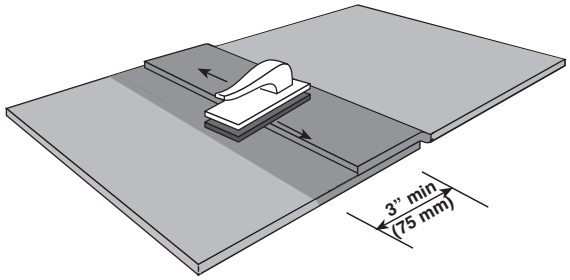

Figure 14.2

STEP 5: INSTALL THE COVER STRIP

- Place the roll of QuickSeam Cover Strip on ground a few feet ahead of the overlap starting point, positioned so that it unrolls from the top of the roll (release paper will be on top).

- Starting a minimum of 3 in. (75 mm) ahead of the edge of the panel, center the QuickSeam Cover Strip roll on the overlap edge and unroll onto the clean and primed surface.

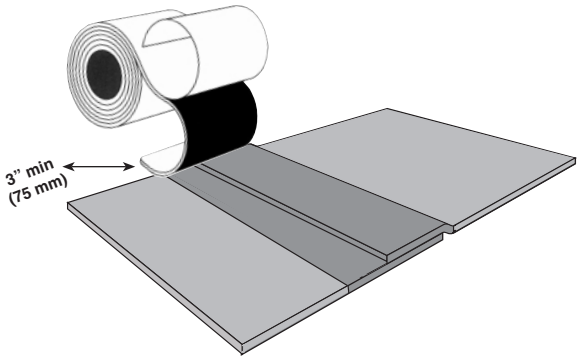

Figure 14.3

- Advance the roll keeping the cover strip centered over the overlap edge. Peel the release paper as you apply the cover strip.

- When it is necessary to cover a longer overlap edge than the length of one roll of cover strip, it is required to overlap the next roll a minimum of 1 in. (25 mm) onto the installed roll before continuing to unroll the second roll. When the end of the over lap is reached, extend the cover strip 3 in. (75 mm) before cutting.

STEP 6: ROLL THE COVER STRIP

- Apply pressure along the entire length of the cover strip by hand to completely mate the two surfaces. Using a 1-1/2" (38 mm) wide silicone rubber roller, roll the QuickSeam Cover Strip with positive pressure towards the outside edge then along the entire length of the cover strip.

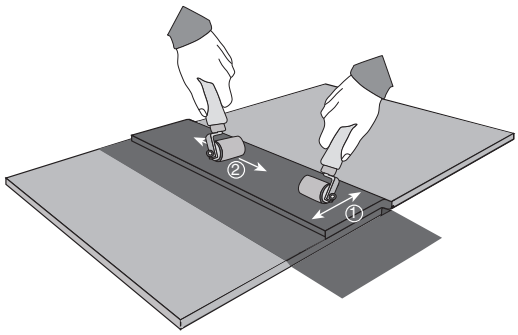

Figure 14.4

STEP 7: INSTALL COVER STRIP AT THE END OF SEAMING RUNS OR T-JOINTS

- At the 1 in. (25 mm) laps of the cover strip it is required to install a 12 in. (300 mm) long section of cover strip parallel with the lap edge and centered over it. Before installing the cover strip, the area to be covered must be cleaned and primed in the normal fashion.

- When cover strips intersect at any point, a 12 in. (300 mm) long section of cover strip shall be installed centered over each T-joint area.

- Round the corners on the 12 in. (300 mm) section and then install it onto the dry-primed area. Roll with the silicone rubber roller in the same manner as done to the cover strip.

STEP 8: APPLY QUICKPRIME PLUS TO THE COVER STRIP SECTION

- Use the QuickScrubber to apply the primer a minimum of 1 in. (25 mm) on either side of the cover strip section edge.

STEP 9: APPLY LAP SEALANT TO THE COVER STRIP SECTION EDGE

- At the end of seaming runs and T-joints, allow the primer to flash off. Apply a continuous bead of Lap Sealant 3/8 in. x 1/4 in. (9.52 mm x 6.35 mm) around the cover strip section edge. Using the supplied Lap Sealant tool, feather the Lap Sealant immediately, taking care to leave a mound of sealant directly over the cover strip section edge.

2.3.2 - DOUBLE FACED OVERLAP INSEAM TAPE SYSTEM

Two overlapping PondGard panels are seamed by means of a patented splicing tape or cap strip system. Section 2.3 provides details of the various steps required for correct seam procedures for the PondGard membrane.

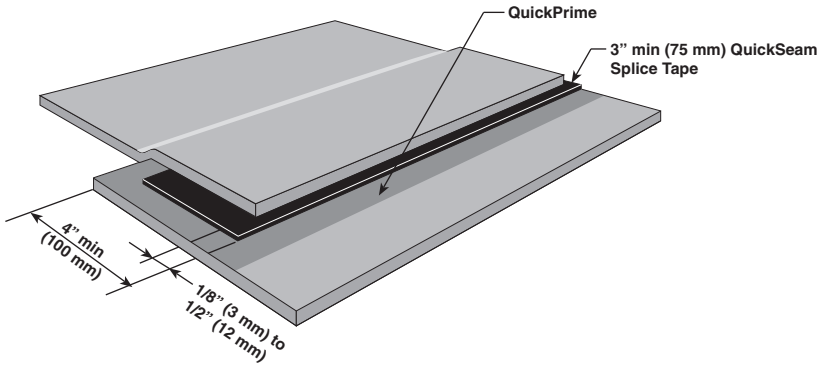

Figure 15 EPDM seam

STEP 1: POSITION THE PONDGARD

- *Both adjacent panels are positioned with a minimum overlap of 4 in. (100mm).*
- *The panels should lay flat and without any tension.*
- *A marker is used to indicate on the lower sheet the exact location where the splice tape is to be installed.*
- *The mark shall be situated at between 0.4 to 0.8 in. (10 and 20mm) from the edge of overlapping sheets, and is repeated every 3.0 ft. (0.9m) of seam length.*

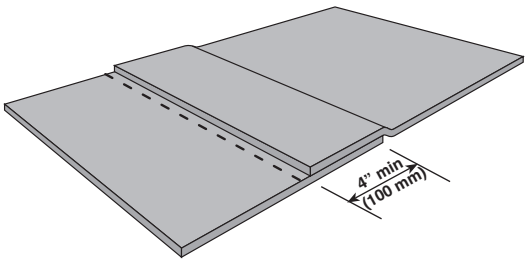

Figure 15.1

STEP 2: TACK-BACK THE OVERLAP

- The upper PondGard membrane panel edge is folded back 10 in. (25 mm) and the fold is tacked down every 3.0 ft. (0.9 m) with QuickPrime Plus.

- If there is dirt in the overlap area, clean the overlap area using a clean cotton cloth soaked in QuickPrime Plus. Soil should not be allowed to contaminate the PondGard membrane in the splicing area.

STEP 3: APPLY THE QUICKPRIME

- Stir the QuickPrime Plus before and during use and transfer a small quantity 0.4 gal. (1.5 l) to a bucket. The Primer is applied with a scrubbing pad.

- Immerse the scrubbing pad in the QuickPrime Plus, keeping the pad horizontal and let excess of QuickPrime Plus drip off the pad.

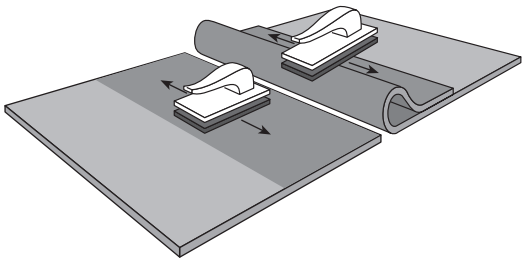

Figure 15.2

- Apply the QuickPrime Plus uniformly along the length of the overlap seam area, with long back and forth strokes, both to the lower face of the top sheet and the upper face of the lower sheet, until the surfaces become a dark gray in color. Avoid traces and wet spots. Each pad immersed in QuickPrime Plus will cover an area of about 3.0 ft. (0.9 m) in length, over a width of 4 in. (100 mm (one side)).

- Change scrubbing pads every 200 ft. (61 m) or when the primer has dried on the pad. Used pads are to be discarded at the end of the working day.

- Additional priming is required at factory seams, at the intersection of two seams and to areas covered with adhesive.

- Both sides to be seamed are treated simultaneously so as to obtain an identical drying time.

- Test QuickPrime Plus for readiness. Allow the primer to flash off. The primer needs to dry completely (approximately 5-10 minutes) before installing the tape. Check its dryness by touching the primed surface with a clean dry finger to be certain that the primer does not string. When touching the primer, push forward on the primed surface at an angle to ensure that the primer is dry throughout its thickness. If either motion exposes a stringy primer when the finger is lifted, then the splice is not ready for installing the tape. Flash-off time will vary depending on ambient air conditions (relative humidity, wind...).

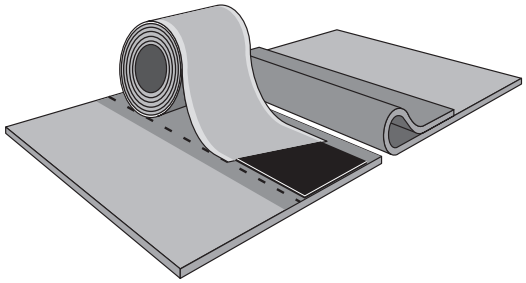

Figure 15.3

STEP 4: INSTALL THE TAPE

- Apply the QuickSeam Splice Tape (with release paper intact) on the bottom sheet, aligning the edge of the release paper with the markings.

- Immediately roll the splice with a 4 in. (100 mm), wide silicone sleeved hand roller or other methods to achieve 100% bond area.

- When it is necessary to start a new roll of tape to continue seaming, it is required to overlap the installed tape by 1 in. (25 mm) minimum before unrolling the second roll.

STEP 5: CHECK THE SPLICE TAPE ALIGNMENT

- The PondGard membrane is released and the seam is closed by hand. To avoid wrinkling, close the splice gently with a movement perpendicular to the splice. The upper sheet must fall without wrinkling or tension onto the lower sheet. Allow the top sheet to rest on top of the tape's paper backing.
- Trim the top sheet as necessary to assure that 0.4 to 0.6 in. (10 to 15 mm) of the QuickSeam Splice Tape will be exposed on the finished splice

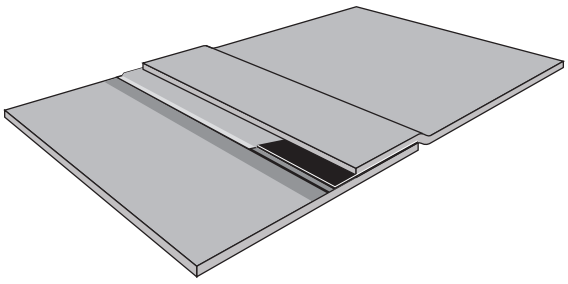

Figure 15.4

STEP 6: REMOVE PAPER BACKING

- To remove the paper backing from the tape, first roll back the upper PondGard panel. Peel the paper backing off the QuickSeam Splice Tape by pulling against the weight of the bottom sheet at approximately a 45° angle to the tape.

- Allow the top sheet to fall freely onto the exposed QuickSeam Splice Tape. Mate the entire length of the seam as the release paper is being removed.

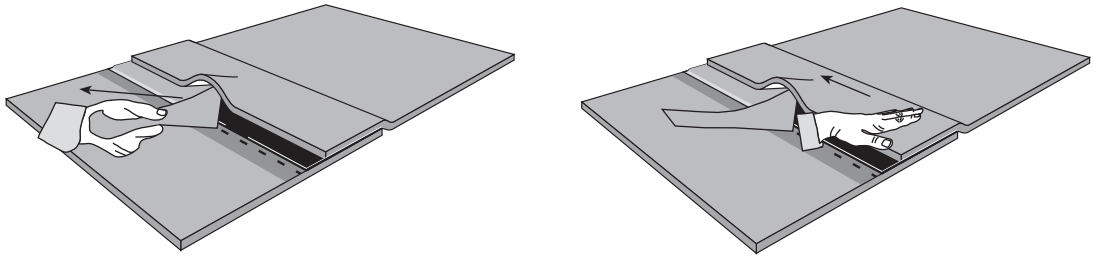

Figure 15.5

STEP 7: ROLL THE OVERLAP SEAM

- Finally, roll the seam area by means of a 1-1/2" wide (38 mm) silicone rubber roller, first across the splice and then along the entire length of the splice.

- For uneven or soft subgrades, a seaming board is required directly under the seam area. The seaming board is moved as the seam is completed.

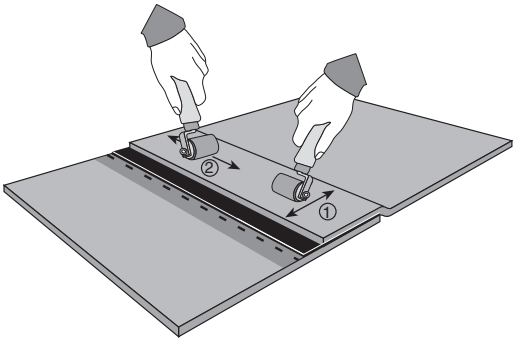

Figure 15.6

STEP 8: INSTALL QUICKSEAM JOINT COVERS OR COVER STRIP AT THE END OF SEAMING RUNS AND T-JOINTS

- Install a 5.75 in. (145 mm) QuickSeam Joint Cover over end laps or T-joints. Before installing the Joint Cover, the area to be covered must be cleaned and primed in the normal fashion. Roll the Joint Cover with the silicone rubber roller in the same manner as the overlap seam.
- At 1 in. (25 mm) laps in the seam tape it is required to install a 6 in. x 6 in. (150 mm x 150 mm) section of cover strip centered over the seam edge and over the lap. Before installing the cover strip, the area to be covered must be cleaned and primed in normal fashion.

- Trim seam so that the edge of seam tape and the edge of the membrane are flush beneath the T-joint area. Apply a 9 in. (225 mm) long section of cover strip centered over the seam step-off.

- Round the corners of the cover strip section and then install it onto the dry-primed area. Be sure to center the cover strip so that it extends 3 in. (75 mm) in each direction from the center of the overlap and the edge of the seam. Roll with the silicone rubber roller in the same manner as done with the overlap seam.

STEP 9: APPLY QUICKPRIME TO THE COVER STRIP SECTION

- Use the QuickScrubber to apply the primer a minimum of 1 in. (25 mm) on either side of the cover strip section edge.

STEP 10: APPLY LAP SEALANT TO THE COVER STRIP SECTION EDGE AT THE END LAPS

- After the primer has dried, apply a continuous bead of Lap Sealant 3/8 in. x 1/4 in. (9.52 mm x 6.35 mm) around the cover strip section edge. Using the supplied Lap Sealant tool, feather the Lap Sealant immediately, taking care to leave a mound of sealant directly over the cover strip section edge.

REPAIR PROCEDURES

A small tear or hole in the PondGard membrane may be repaired by placing a piece of the 6" cover strip over the area to be repaired with an overlap of 1 in. (25 mm) extending all directions beyond the repair. The patch must be round, oval, or contain rounded corners. QuickSeam Joint Cover patches may also be used.

- Clean the damaged area by scrubbing with a cloth soaked in QuickPrime Plus. The surface should be dark gray in color with no streaking. Allow the area to dry.

- Repair the larger tears or holes by cutting a piece of PondGard membrane that extends beyond the tear or hole by a minimum of 4 in. (100 mm) extending all directions beyond the repair. Tape all edge seams as per section 2.3.1 - 6.0 inch (150 mm) wide cover strip seaming tape system.

SPECIAL CONSIDERATIONS

- When the seam is greater in length than the tape, the overlap between the two adjoining tapes should be at least 1 in. (25 mm). A protective sealant - Lap Sealant - is applied over a length of 3 in. (75 mm) on either side of the overlap.

- When several membranes meet at a common point, only three sheets may overlap each other. Apply a QuickSeam Formflash reinforcement (9 x 9 in. (225 x 225 mm)) over this joint area.

- Apply a QuickSeam Formflash reinforcement (9 x 9 in.(225 x 225mm)) over the area where a field splice runs from the horizontal area into the slope of the embankment.

- Clean the seam area with water and dry before applying the QuickPrime Plus, if it is contaminated (mud, etc.).

- Stop the application of the QuickSeam tape and FormFlash when the atmospheric conditions are unfavorable (humidity, condensation on the QuickPrime Plus or rain).

- Movement of the PondGard membrane during application of the QuickSeam Splice Tape and during the first few minutes after application should be avoided.

- Positioning of a larger number of panels than can be spliced in one day is not allowed.

- Field seams on side slopes must be parallel with the slope (i.e., up and down the slope). Horizontal field seams on slopes are not allowed.

2.4 SEAM TEST PROCEDURES

TEST SEAM OR TRIAL SEAM - DESTRUCTIVE MECHANICAL TESTING

At the start of a shift or at the beginning of each day, the seaming crew should complete a trial seam of approximately 10 ft. (3 m) in length. From the trial seam, 1.0 in. (25 mm) wide strips are cut for testing in the field tensometer - 3 in peel and 3 in shear. Shear and peel tests are carried out in general accordance with ASTM D413 and D4437 NSF modified with the exception of strain rate which is 20 in./min. (500 mm/min.) for both peel and shear due to the elastometric properties of PondGard. The minimum requirements are as follows:

Shear: 35 lb/inch (6.15 kn/m) at 200 percent strain.

Peel: 14 lb/inch (2.45 kn/m) in cohesive bond mode.

The same minimum requirements can be expected for specimens taken from a destructive field seam cut out when required.

NON-DESTRUCTIVE TEST (NDT) PROCEDURE

Air Lance Test – Inspect all field seams for unbonded areas using an air nozzle directed on the upper seam edge and surface to detect loose edges, riffles indicating unbonded areas within the seam, or other undesirable seam conditions. Check all bonded seams using a minimum 50 psi (345 kPa) (gage) air supply directed through a $^{3}/_{16}$ in. (4.8 mm) (typical) nozzle, held not more than 2 in. (51 mm) from the seam edge and directed at the seam edge.

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