PVC WATERSTOP
METHOD STATEMENT FOR WELDING

Greenstreak

BUILDING TRUST

PVC WATERSTOP - SPLICING
METHOD STATEMENT FOR SPLICING AND INSPECTION OF SPLICES

INTRODUCTION

One of the most important aspects of PVC waterstop installation is proper splicing of intersecting or connecting segments of PVC waterstop. Improper waterstop splicing yields the potential for water to circumvent a waterstop at improperly made connections. Interconnecting segments of Sika Greenstreak PVC waterstop MUST be spliced together using a Sika Greenstreak Waterstop Welding Iron. Waterstop splicing with a direct flame, adhesives, epoxies, or primers shall be strictly prohibited.

LOCATION OF WATERSTOP SPLICES

Waterstop splices will be required at any location where coils of PVC waterstop are joined, where a PVC waterstop makes a directional change, or where a PVC waterstop intersects with another length of PVC waterstop. Sika Greenstreak highly suggests the use of factory fabrications (T's, L's, and Crosses) so that only straight butt welds will be necessary on the jobsite.

CUTTING THE WATERSTOP

The first step to making a quality waterstop weld is making sure that adjoining ends of intersecting waterstop segments are cut extremely straight. Proper cutting is typically achieved with a miter saw (see Figure 1) or a manual hand saw and miter box (see Figure 2) to ensure a high-quality, square cut. Reciprocating saws (see Figure 3) have also been used with success, but it is necessary to use a straight edge as a cutting guide to keep the cut straight. Pocket knives, "exacto" knives, and circular handsaws do not typically provide the high quality cut that is required to yield a good waterstop weld. If the waterstop ends are not cut straight, uneven melting is experienced at the end of the abutting PVC waterstop segments, which could lead to waterstop charring or no melt at all. When cutting PVC waterstop to the required length, it should be noted that the welding process will decrease the length of the PVC waterstop by approximately 1/8-inch to 1/4-inch due to melting of the material. Therefore, it is necessary to cut the required length of waterstop slightly longer than required.

Figure 1: miter saw

Figure 2: saw with miter box

Figure 3: Reciprocating Saw

CONSTRUCTION OF A WELDING TABLE

It is highly suggested that a waterstop welding table is constructed to ensure high-quality welds. A waterstop welding table can be built easily with plywood and screws. See Figure 4 for an example of a welding table that can be built easily on the jobsite. By constructing a welding table, one can usually reduce the amount of workers required to make a weld from 3 workers to 2. An adequate welding table also ensures that the two spliced segments of PVC waterstop are properly

aligned, both in width and thickness, and help keep the waterstop edges, ribs, and centerbulb continuous through the welded connection.

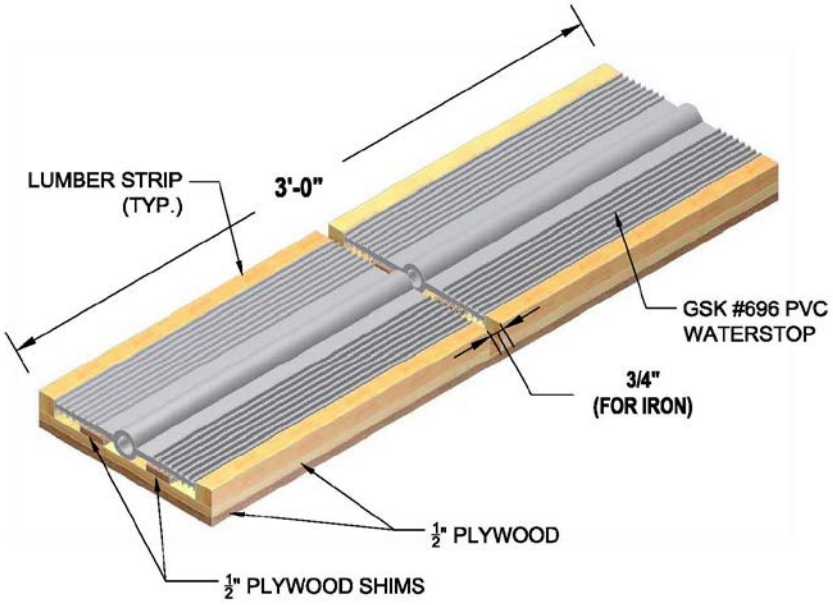

Figure 4: Example plywood welding table

PROPER USE OF WELDING IRON AND SPLICING TECHNIQUE

All Sika Greenstreak welding irons are shipped with a Teflon peel-and-stick cover already adhered to the welding iron. The welding iron should ALWAYS be used with the peel-and-stick cover in place. The covers are replaceable, and should be replaced when they show signs of damage or delamination from the iron. Under normal daily use, the covers should be replaced every 2 to 4 weeks. The peel-and-stick cover ensures that the melted waterstop material stays on the end of the waterstop, and does not stick to the iron. A towel or piece of cloth should be kept near the welding iron when in use to remove any melted PVC material from the face of the iron after EVERY weld is made. For PVC waterstops, the welding iron shall be heated to a temperature of 380°F (the thermometer on the welding iron is in Fahrenheit units). The adjustable temperature dial is used to control the temperature of the welding iron.

If using the suggested welding table, position the welding iron in the iron slot on the table so that it supports itself. The two ends of the waterstop to be spliced together shall be placed against opposing faces of the welding iron, and held against the welding iron with significant pressure (pressure is important). Allow the ends of the waterstops to melt. This can take several minutes with a thicker waterstop profile. Continue melting the ends of the waterstop until at least 1/8-inch of melted PVC appears around the entire waterstop/iron interface on both pieces of waterstop being welded. At that time, quickly pull the waterstops away from the iron and immediately place the two melted ends together, being careful to keep the two waterstops properly aligned after joining. You only have a few seconds to place the melted waterstop ends together, so speed is important. Immediately after the two waterstop ends are butted together, use your fingers (wearing gloves) to press the melted material against the waterstop to improve the welded connection. Extreme caution should be used when moving a welded waterstop connection when the material is still hot, as the weld is still very weak at this time. So after sliding the welding table away from the welded waterstop connection, allow the waterstop to cool for at least 10 minutes before handling it.

WATERSTOP WELD QUALITY ASSURANCE

After allowed to cool, a visual inspection shall be made on each waterstop weld to observe the following:

- The waterstop weld shall not display significant discoloration or pin-holes that penetrate through the waterstop.

- You should be able to bend and pull on the waterstop without separating the weld (allow the weld to completely cool before doing this).
- Misalignment of centerbulb greater than 1/16 inch.
- Misalignment that reduces waterstop cross-section area more than 15%.
- Bond failure at joint, deeper than 1/16 inch or 15% of material thickness.
- Combination misalignment and bond failure with net reduction of waterstop cross-section area greater than 15%.

It is also possible to test a waterstop weld using a Holiday Spark Tester. This is a small tool that detects holidays (pin-holes, essentially) between two materials joined by heat/fusion welding. Spark Testers are typically used in the steel industry for things such as steel pipe or steel tank lining, to test the integrity of welds. If you place a steel plate behind the waterstop weld, and slide the tip of the spark tester along the length of the weld, a spark will jump from the tip of the tester to the metal plate if there is a pin-hole in the weld. This spark indicates an improper weld. However, the spark test should never be used as the only method for determining the quality of a weld. It must be used in conjunction with a thorough visual inspection.

Sika Greenstreak sells Spark Testers for approximately $350, shown in the figure below:

Figure 5: Holiday Spark Tester

It is also highly suggested to perform destructive testing on one or more welded waterstop segments at the beginning of each day that waterstop welding is performed. To do this, make a standard butt weld with two short lengths of waterstop, roughly 12 inches in length. After the weld has been allowed to fully cool, using a sharp knife, cut the welded waterstop segment along its entire length (parallel to the waterstop ribs) in 3 or 4 locations, including one cut down the length of the centerbulb. This will expose the inside of the waterstop at the weld at these multiple locations where the waterstop was cut. There should not be significant voids or pinholes where the two waterstop lengths were joined or significant discoloration of the waterstop material. The welded portion of the waterstop cross-section should essentially look the same as the parent material.

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