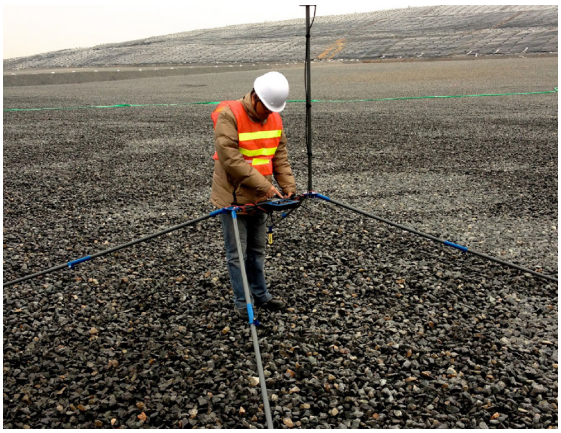
SOLMAX

INSTALLATION GUIDELINE

GSE Leak Location Conductive liner

Contents

1. INTRODUCTION



Installing our **GSE**® Leak Location® Conductive liner is very similar to installing a standard HDPE or LLDPE lining system, but with a few added CQA steps and some additional welding equipment accessories. The following guidelines are to be used in addition to the procedures outlined in the Geomembrane Installation Quality Assurance Manual (IQAM). Using this equipment and following these steps is essential to ensuring that the electrical liner integrity surveys enabled by the **GSE** Leak Location Conductive liner can be performed thoroughly and accurately.

2. DEPLOYING THE LINER

GSE Leak Location Conductive must be deployed with the electrically conductive surface facing down. The best way to confirm which side of the sheet is electrically conductive is with the use of an ohmmeter, or a multi-meter with an auto ranging resistance setting. To check if a side is electrically conductive, place both probes onto the same side of the sheet while making sure not to touch the metal parts of the probes with your hands. If any conductivity is found then that side is electrically conductive. Note: Most meters will display “OL” when testing the non-conductive side of the sheet and will show an actual value of resistance when measuring the conductive side.

3. WELDING EQUIPMENT

In order to properly install **GSE** Leak Location Conductive liner, a modified heater wedge called an Iso-Wedge and its respective inserts are required. These special parts were designed specifically for use in installing the conductive liner and are available on a project-by-project basis when **GSE** Leak Location Conductive liner is being used. Contact your Regional Sales Manager for information on obtaining an Iso-Wedge for your upcoming installation.

The procedure for configuring the wedge placement and contour roller position is identical to setting up using a standard heating wedge. Please refer to manufacturer guidelines as following manufacturer instructions closely for this process is crucial to ensuring the Iso-Wedge functions as designed.

4. TRIAL WELD AND ISOLATION TESTING

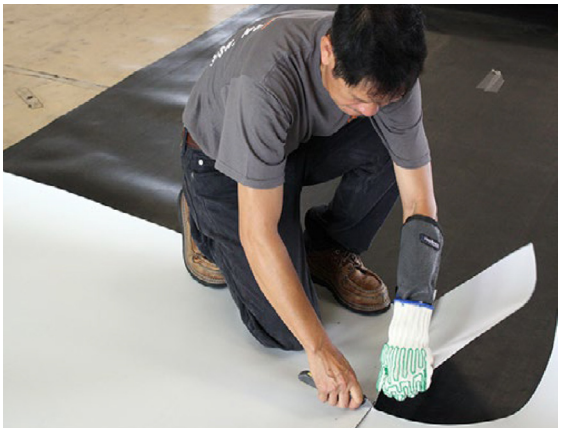


Figure 1

Figure 2

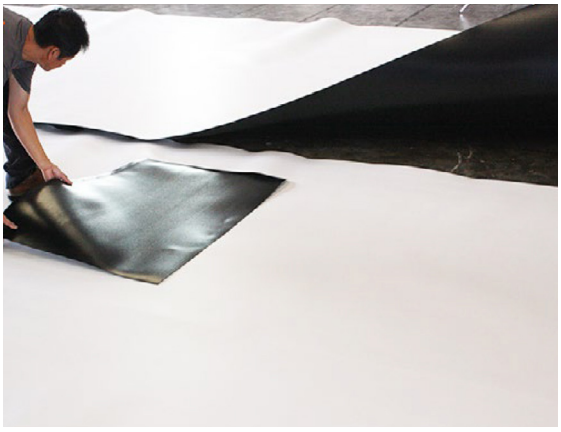


Figure 3

As outlined in the Geomembrane IQAM, all welders must pass a trial weld on site before welding a seam in the field. In addition to checking shear strength and peel strength of the weld, must also check to verify that the Iso-Wedge is functioning properly and is isolating the conductive layer of the flap from the rest of the sheet, called Isolation Testing. In order to test this, use the following procedure:

Step 1

Weld a minimum 10-foot (3 m) long sample using a fusion welder with an Iso-Wedge.

Step 2

Trim away both the start and end of the weld so that the trial sample contains only the portion of the weld where the machine was fully engaged in the weld. (Figure 1).

Step 3

Using an ohmmeter or multi-meter that is auto-ranging with a minimum measured resistance of 20 MOhms set to its resistance setting, check for conductivity between the conductive layer on the exposed flap and the conductive layer of that same sheet on the other side of the weld as shown. (Figure 2).

Step 4

If on the exposed flap, any conductivity is below 20 MOhms, then that weld has FAILED the Isolation Test. Note: Most digital meters will display “OL” when a weld has passed.

A. Deploying the liner

In order to facilitate the electrical liner integrity surveys that are performed using **GSE** Leak Location Conductive liner, an electrical connection must be made between all of the individual panels at the site. To do so, excess liner material with dimensions greater than 3 ft x 3 ft (1 m^2) must be placed every 50 ft (15 m) under the seam (conductive side up) before welding (Figure 3).

5. MAKING A WELD

Weld according to the instructions in the Geomembrane IQAM. If you need to adjust the welder to get over an uneven piece of subgrade, wrinkle or a board , mark the area so that it is known to be a possible location for flap isolation issues.

Note: While the machine is welding do not lift, pull, push, or in any other way try to move the welder. Doing so can disrupt the function of the Iso-Wedge and lead to a seam that fails isolation inspection.

6. EXAMINATION OF THE WELDS

All fusion-welded seams must be isolation tested using the same procedure that was used in the trial welds. Because of the length of some welded seams, this isolation test must be done at both ends of the seam after they have been trimmed. If a seam fails this isolation test, see section “Troubleshooting a seam that fails the Isolation Test.”

7. PATCHES AND SEAM INTERSECTIONS

Figure 4

When panel layouts require that seams intersect as T’s, it is permissible to continue welding through the intersecting seam. However, after the welding there are two options in ensuring that the T-seam is isolated. These flaps will need an isolation check by leaving a “Flap-Tab” next to the weld junction of the seam.

In any area where a patch is required, regardless of the cause for repair, the following procedure must be used to ensure that the leak survey can be performed accurately on the entire site after repair.

Step 1

Cut away any weld intersections or liner irregularities where the patch is to be placed (Figure 4).

Figure 5

Step 2

Trim back all seam flaps which extend under where the patch is to be placed while leaving some of the flap under the patch as shown, called the “Flap-Tab” (Figure 5).

Figure 6

Step 3

Grind through the weld track anywhere along the trimmed portion that will not be covered by the patch (Figure 6).

Figure 7

Step 4

Use an Ohmmeter to check for continuity using the previously stated procedure across the grind (From flap to Flap-Tab) as shown. If there is any continuity, repeat steps 3 & 4 until continuity is disrupted (Figure 7).

Figure 8

Step 5

Trim patch to size: Large enough to cover holes, but small enough that it stays within any grind isolations along seams (Figure 8).

8. WELDED SEAMS THAT ENTER AN ANCHOR TRENCH

Fusion welded seams are permitted to be placed into an anchor trench but their flaps must be isolated between the area to be covered and the anchor trench, to ensure that the leak survey can be performed.

To accomplish this use the following procedure.

Figure 11

Step 1

Trim back a portion of the seam flap of the weld between the containment area of the liner which will be covered and where the liner enters the anchor trench, as shown below (Figure 11).

Step 2

Grind through the weld track anywhere along the trimmed section.

Use an Ohmmeter to check for continuity using the previously stated procedure across the grind (from flap to Flap-Tab) as shown. If there is any continuity, repeat previous step until continuity is disrupted.

Use an extrusion welder to cover any area that was ground down. If geocomposite or any other material is placed over the liner before covering, mark that top layer where the flap was removed as a guide during cover placement to not go any closer to the anchor trench.

9. TROUBLESHOOTING A SEAM THAT FAILS THE ISOLATION TEST

1. Have you trimmed both ends of the seam?

Trim both ends of the seam as stated in step 2 in “Trial Weld”.

2. Are there any suspect parts of the seam?

According to “Making a Weld,” any suspect areas of the weld should be marked for future repair. If the seam fails the Isolation Test, completely cut out the suspect area on each section of the now segmented fusion weld and perform the Isolation Test again.

3. Is the welding machine set up correctly?

As stated in “Welding Equipment,” the machine must be set up according to manufacturer instructions.

4. Are the Iso-Wedge inserts within height specifications?

For inserts used on 60 mil (1.5 mm) liner: Height must be greater than .035 in (0.88 mm) above the surface of the wedge.
For inserts used on 40 mil (1 mm) liner: Height must be greater than .030 in (0.75 mm) above the surface of the wedge.

5. Are you welding at the correct speeds and temperatures?

In addition to making welds that may fail destructive testing, failure to weld slowly enough or at a high enough temperature can cause the Iso-Wedge to not function properly. To ensure everything is working, make sure the machine is running at the same parameters as your trial weld throughout the entirety of your actual weld.

If a seam fails the Isolation Test and the failing part of the seam cannot be removed using the instructions under #2 above, the entire seam must be removed, the material moved over, and welded again.

About Solmax

Solmax is a world leader in sustainable construction solutions, for civil and environmental infrastructure. Its pioneering products separate, contain, filter, drain and reinforce essential applications in a more sustainable way – making the world a better place. The company was founded in 1981, and has grown through the acquisition of GSE, TenCate Geosynthetics and Propex. It is now the largest geosynthetics company in the world, empowered by more than 2,000 talented people. Solmax is headquartered in the province of Quebec, Canada, with subsidiaries and operations across the globe.

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