AssaFlex

Manufacturer of Bridge Components

Installation Procedures

For

Elastomeric Expansion Joints-RE

Contents

Please read this document in its entirety before commencing any work

1 Introduction

To ensure the full life cycle of the expansion joint units are realised it is imperative to carry out the installation methodically and to the following standards.

1.1 Materials used during this work

1.1.1-Depending on the size of expansion joints, one of the following types of AssaFlex RE unit will be used: RE280, RE360. RE361, RE440, RE580, RE780, RE900, RE1100.

1.1.2-Holding down nuts & bolts – The bolt size varies according to RE unit

1.1.3- Adhesive to use with holding down bolts.

1.1.4- Damp barrier & drainage- Width of this membrane varies according to the RE unit used.

1.1.5- Bedding Strip. Width of this membrane varies according to the size of the RE unit used.

1.1.6- Repair mortar- If the Nosing is damaged.

1.2 Tools required during installation

1.2.1- Pry bar

1.2.2- A torque wrench

1.2.3- Lifting equipment should be used for RE580 and bigger units.

1.2.4-Trowl and bucket for the repair mortar.

2 Site Investigation, Setting out,

Prior to commencement of work a site visit is essential to establish the following:

Site Investigation

2.1- Request from the client engineer to confirm the movement criteria of the expansion joints in writing. Once received the contractor must ensure that the movement criteria and dimensions set out by client engineer fall within the RE data sheets technical details.

2.2- The contractor will have to establish the depth of the pavement at the Crown and verge.

2.3- Measure the width of the joint at both sides

2.4- Inspect state of the nosing - Do they require repair?

2.5- Establish if the thickness of the tarmac corresponds with the depth of the type of RE + a layer of damp barrier + a layer of bedding strip. Depending on your finding you may have to increase the No of layers of the bedding strip or you may have to remove the structural concrete. **Check with the client representative and ensure you receive confirmation in writing in either case.**

Setting out

2.6- Establish the setting out lines including the centre line and kerb lines, (if kerbs are not constructed, use a spray line to establish the kerb line). This should be carried out by the help of client's engineer

2.7- Mark the area to be cut using a string and spray line. The marked area should be the width of the RE unit + 20 / 25mm of mastic to either side of the unit.ie; for RE280 the width of the cut area should be: 280 + 25 + 25 =330mm.

(In order to stop the over spray on the road surface, mask the road in line with saw cut line.)
2.8- Plan how the work is to be carried out depending on the type of project (e.g.live traffic lane, or new project) , ie: one lane at a time, etc. In any case the work should always start from the kerb side and progress towards the centreline.

2.9-Cordon off the working area from live traffic and any potential access by the public.

2.10- With the depth of the cut established, use a masonry floor saw to cut down through the surfacing to concrete deck. Ensure the cut is clean with no step

2.11- Break the pavement with excavation equipment and remove the debris from the cut area to a skip or designated area and clean the area using a mechanical blower.
Note:

- ✓ Do NOT use the edge of the tarmac cut area as a lever, as this will damage the road surface
- ✓ Always work away from live traffic or other trades.

2.12- At this point a survey / site investigation of the existing cut area should be carried out; this includes dipping the depth of the cut tarmac at 1m intervals at both sides of the cut and actual width of the expansion joint gap. These finding should be recorded and checked against information from the drawings and corresponding with the required tolerance on the selected joint. The findings must be signed off by the client /representative.

2.13- With the cut area completely clean and the survey signed off, proceed with preparation for nosing mortar if required.

3 Preparation-Nosing Mortar

3.1- Inspect the nosing for spalls and splayed edges. Depending on the size of the damage if splayed edge is over 20mm use the suggested materials by client engineer to repair the edges.
3.2- To repair the nosing, a metal / plate shutter is required to be fixed to the edge of the concrete deck-expansion gap. The depth of the plate shutter will need to be the depth of the splayed edge plus 50mm.
3.3- Before placing the nosing apply primer to the area. When applying the nosing mortar always leave the surface level and slightly higher than the structural concrete, so that once it is dried it is level with the concrete structure. Ensure it does not over hang.
3.4- remove all the fallen debris from the expansion gap.
3.5- Allow for the nosing mortar to dry-(Refer to manufacturer instructions), remove the shutter from the expansion gap and ensure the edge is ready to receive the AssaFlex damp barrier & drainage.

4 Drainage

Installation of the drainage should be carried out at this stage.
AssaFlex Damp Barrier & Drainage is a single membrane acting as both a damp barrier and drainage.

5 Installation

Installation procedures for ***AssaFlex RE*** fall in to two categories;

- New high way / bridge work
- Refurbishment works

5.1 -New highway works;
Installation Sequence

5.1.1-When setting out the position of anchor bolts ensure that the tongue and grooved interlocks are located tightly, forming a row of units all in line with NO open gaps between the units. Line the units up in position ensuring that the start and finish points of the units are exactly lined up with the end lines previously marked(or kerbs if already in place). **Note**: In the case of heavier units, templates should be used.
5.1.2- Mark the position of the locating holes directly on the deck through the units or templates. Once the marking process is complete you should remove the modules / templates from the deck in preparation for drilling the bolt holes.
Note: Refer to drawings for the relevant bolt depth depending on the size of bolts.
5.1.3 - Drill bolt positions. Taking great care to ensure that, the holes are drilled perpendicular to the expansion joint - surface area/deck. An air blower should be arranged to blow away the drilled dust as it emerges from the bore hole during the drilling process. To clear each bore hole a lance should be attached to the air hose to ensure dust is cleared from the base of the bore holes.
5.1.4-On completion of drilling and cleaning each bore hole, visually inspect to ensure that the hole is clean; it is a good practice to push some cotton packing in to the holes to avoid the holes being filled again with dust or other debris before you proceed to the next hole.
5.1.5-Ensure that positions of holes are accurate prior to placing of the bolts and chemical bonding agent.
5.1.6-Placing the accessories prior to the module;

- ✓ If the expansion joint bed / the surface area of the deck are within tolerance no other works are required before putting the damp barrier in place. However,
- ✓ If the bed is not within tolerance, you may need to apply grout as instructed by the Structural Engineer. Our advice is to use the ***AssaFlex Bedding Strip***. It is manufactured to take up unevenness and is designed to be used in conjunction with the RE type modules, forming a unique block with the Damp Barrier & Drainage membrane.

5.1.7-To form the camber on the deck, carry out the following;
The camber details should be provided by the client or main contractor's engineer prior to the start of work. On commencement of the work, use the rubber fillet / spacer to form the fall on the deck using adhesive to fix it to the concrete structure. Rubber fillet / spacers are manufactured in 10mm increments. Before using the adhesive ensure that the concrete surface is clean and primed. Rubber fillet, primer and adhesive are available from AssaFlex.

5.1.8.1 -***AssaFlex-Damp Barrier & Drainage*** membrane should be placed on the surface or the concrete structure. The drainage channel is formed by pushing the membrane inside down in to the joint gap forming a **V** shape.
Ensure that the membrane starts and finishes at the marked lines (or kerbs, if they have been constructed) where the modules eventually will be placed.
Please refer to drawings**, "Typical layers for AssaFlex RE"**

Note:
1) Damp barrier & Drainage width varies according to the size of the module.
In the case of RE 360 or 361 the width of the module is 420mm allowing enough room to form the drainage.
2) The damp barrier has an additional 150mm length for the over laps, i.e.; 1150mm.

5.1.8.2- Place ***AssaFlex Bedding Strip*** over the damp barrier. Bedding strips consists of two pieces for each unit and should be placed on either sides of the formed drainage channel. You are now ready to lower the units in place.
5.1.8.3 -Lower the ***AssaFlex RE*** in position by lowering a module at a time over the bolt holes. Ensuring the ends of the units are engaged each time a unit is put in place so that they are locked in position.

5.1.9-Ensure tongue and grooved interlocks are correctly in place. The sides should be all correctly aligned, forming a row of units all in line with NO open gaps between the units.
5.1.10-Now that the expansions joint modules are in place use a spirit level to check there is adequate fall from the centre to the road gullies. This may not be necessary on all installations dependent on road/carriageway type or car parks.
5.1.11- Prepare the anchor bolts by screwing the nuts on to the bolts, ensuring that the correct depth of thread is left as shown on the relevant 'layers' drawing.
5.1.12-At this stage break one capsule of compound in to each bolt recess and then insert the bolt into the hole. If you are using a two part adhesive, follow the manufacturer's instruction on the relevant data sheet.
5.1.13-Ensure the bolts are all in place before the next step.
5.1.14-Tighten the bolts as far as possible and leave them for around 24 hours
Note: Always refer to adhesive manufacturer technical guide.
5.1.15- Tighten all the bolts. Once completed Replace the temporary nuts with the long life nuts using the correct torque (RE table 4) on all anchor bolts.
5.1.16- Use mastic, ***GAM 182 HE*** to fill the cavity between the RE units and the tarmac.
Note: -Preparation of the mastic is important to ensure the expected resilience is achieved, please refer to the data sheet.
5.1.17-The bolt recess should be filled with a small portion of mastic and cap placed inside the bolt recess.

Note: We advise that mechanical / masking protection is applied to ***AssaFlex RE*** units before top coat tarmac is laid.

5.2 -Refurbishment Works

Removal of the old Expansion Joint;

Care should be taken at this stage to minimise the damage to the nosing and the concrete structure,

The sequence;

5.2.1- Remove the nuts.
5.2.2- Remove the old expansion joints / the modules one at a time.
5.2.3
5.2.4
5.2.5 Remove the bolts if possible taking care not to damage the nosing.

Preparation prior to Installation of expansion joints

Depending on the state of the concrete structure / the expansion joint bed when the old expansion joints are removed, the following works should be carried out:

5.2.6 Inspect the position of the bolts to establish that they match the holes on ***AssaFlex RE***.
5.2.7 If positions of holes are different; begin by filling the holes. The structural engineer will advise on the best materials to use.
5.2.8 On completion of filling the holes, the next step is to survey the surface area to establish if it is level enough for placing of the new modules.
5.2.9 At this stage the following should be noted:
- ✓ If the surface area is badly damaged it might require concreting. In any case the structural engineer will advise.
- ✓ If the damage to surface area can be managed without concreting, it is possible to use "***AssaFlex***-**Bedding Strip**"

Installation Sequence

Once the bed surface area is correctly prepared, carry out installation sequence as on **new highway works,** described on previous pages.

6 Quality Assurance

The authorized contractor will carry out the following during the installation process while on site:

6.1 Maintain a record of major activities.
6.2 Ensure that documents requiring approval by the client agent are signed.
6.3 Ensure that the quality of works is to the standard set by AssaFlex UK,
6.4 Digital Photos are taken at key stages of the work.
6.5 The work is completed to the satisfaction of the client and the relevant paperwork is signed by the client's agent.

7 Cleaning of tools & Equipments

7.1 Clean all tools and application equipment for mixing adhesive with thinner immediately after use. Hardened / cured materials can only be mechanically removed
7.2 On completion of mastic application clean all tools with white sprit.
7.3 Clean other equipments such as jack hammer, etc daily.

8 Packaging and Storage of materials on site

8.1 All AssaFlex components will be supplied to site either vacuum packed or plastic wrapped, larger quantities supplied on pallets, with all relevant labels including Quality Assured label.

8.2 All nuts and bolts will be delivered in boxes. They should remain in boxes until use.

8.3 All components should be stored in cool, dry conditions, away from direct sunlight and in accordance with the relevant site Health & Safety regulations.

8.4 Adhesive and the mastic materials should be stored in a temperature not exceeding 25 C- Do not store near naked flames or foodstuff.

8.5 The protective cover should not be removed from the pallet/materials until the time of installation.

9 Health & Safety

9.1 Materials Safety Data sheets for all components of the AssaFlex RE system and accessories products should be available on site. The authorised contractor must have read and understood them before commencing work. Any question regarding the use of the materials must be addressed by either contacting AssaFlex UK or the relevant supplier.

9.2 It is the company's policy that all reasonable steps will be taken to prevent personal injuries. The authorised contractor must ensure relevant lifting equipment is in place for lifting and placing the heavier RE unit types. Ensure all items over 20kg are lifted according to Health and Safety Executive guidelines.

9.3 A Method Statement & Risk Assessment is to be prepared prior to start of the work. This should be carried out in accordance to the H&S policy of the relevant site on which the works are being carried out.

9.4 All relevant Health & Safety signage must be posted in advance of any works to inform the public, road users or other contractors of the application being undertaken; ie: Noise, dust & hot work, etc.

10 Completion & handover

This stage of the application is to ensure that you leave a clean and tidy site;

10.1 All areas are complete.

10.2 All masking tapes have been removed.

10.3 All rubbish has been removed to a skip or the designated area.

10.4 Any full or part containers of materials are removed to a special place agreed by site management or removed from site.

10.5 All excess materials are to be removed from site.

Handover:

10.6 The authorised contractor has the responsibility to carry out the steps in section 5 of this document.

10.7 On signing of the paperwork by client's agent the authorised contractor has handed over the completed work to the client.

Appendices

I. AssaFlex RE - Installation Check list

II. RE-Table 4-Installation Guide

I. AssaFlex Installation Check list

AssaFlex RE installation sequence;

It is important that authorised contractor works to a sequence / check list. In some cases there could be activities that are not necessarily in the check list such as repairing of the nosing, therefore the list should be used more as a guideline during the installation.

Sequence	Summary of task	Guideline	Completed
1	Identify joint location, ensure correct movement criteria	2	
2	Site Investigation	2.1-2.12	
3	Setting Out	2.6	
4	Mark out area to cut	2.7	
5	Direction of cut: kerb towards the centreline	2.8	
6	. Cut floor using floor saw.-	2.10	
7	Break out the excavation area using extraction equipment	2.11	
8	Remove the excavated materials to skip / designated area.	2.11	
9	Use blower / compressor to clean the area.	2.11	
10	Carry out a survey of the excavated joint to establish: 1. width of joints 2. Determine asphalt depth at verges and crown by dipping 3. Condition of the nosing, does it require repairing 4. Establish No of layers to make up- ie; How many bedding strips	2.12	
11	Get client's engineer to approve the findings for sequence 8 (of this Table).		
12	If nosing required, carry out the nosing	5.1.1	
13	Use template or units to mark out position of holes	3.1-3.5	
14	Form the holes by drilling one at a time & remove dust and spoil using blower / compressor.	5.1.3	
15	Check hole positions to ensure they line up with correct spacing	5.1.5	
16	Clean the area ready for installation of membranes.	5.1.4	
17	Form the fall before placing the Damp Barrier.	5.1.7	
18	Lay damp barrier and form drainage channel	5.1.8.1	
19	Place Bedding strip-Follow sequence 8.4, for the No of layer of Bedding Strip	5.1.8.2	
20	Place the expansion joint units, starting from kerbs to centreline.	5.1.8.3	
21	Check line & level on all units with the interlocking system in place.	5.1.10	
21	Prepare fixings by adding the nuts to the bolts ready for installation.	5.1.11	
22	Add the adhesive and place the bolts. Leave for 24 hours	5.1.12-14	
23	Tighten the bolts in place on all units	5.1.15	
24	Remove the ordinary nut and replace with long life nut and torque.	5.1.15	
25	Prepare the mastic to fill the cavity between the tarmac and the unit.	5.1.16	
26	Pour mastic	5.1.16	
27	Use a small amount of mastic and place the cap.	5.1.17	
28	Clean tools & the area	7.1-7.3	
29	Dispose of the containers correctly or remove from site	10.4	
30	Remove from site all excess materials	10.5	
31	. Hand over the work to client agent	10.7	

II. RE-Table 4-Installation Guide

Following table has all the required information for the installation of the RE expansion joint

Type of RE	Max Movement mm	Joint mm	Width Mm	Length Mm	Bolt Holes Centres mm	End of unit to first Bolt mm	Module Thickness mm	Anchor Bolt mm	Bolt Torque Nm	Weight Of Module-kg
280	45	40	280	1000	200	200	42	16	40	27
360	65	60	360	1000	280	200	46	16	95	35
361	65	60	360	1250	280	200	46	16	95	41
440	80	70	440	1000	340	200	52	18	175	41
580	100	80	580	1000	450	200	55	20	180	125
750	165	120	750	1000	600	200	75	20	190	150
900	200	150	900	1000	740	200	92	22	275	175
1100	320	200	1120	1000	940	200	110	24	300	200