A guide to specifying and installing Expansion Joint Covers

Construction Specialties™

About the Authors

Founded in the United States, C/S has been a global manufacturer and supplier of a range of specialist building products for over 60 years.

Operating through 22 offices worldwide, with key manufacturing locations or sales offices in most European countries. Employing more than 2,000 people around the world, C/S have the skills and the knowledge to help you at any stage of your project.

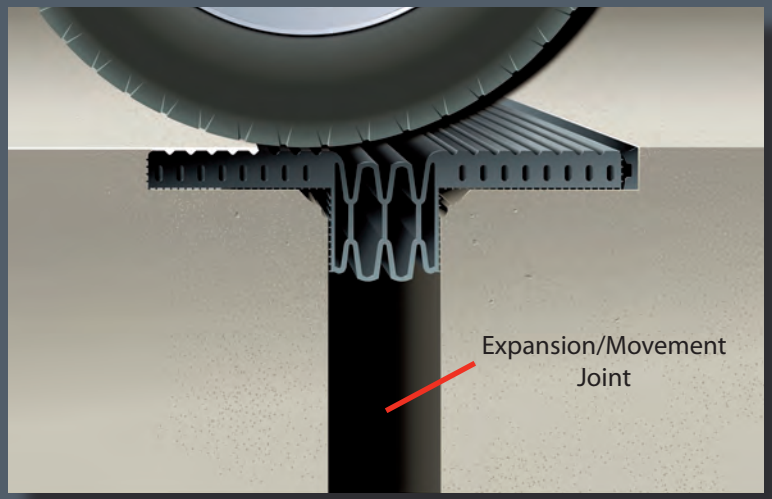
We have more than 40 years experience in the design, manufacture, specification and installation of Expansion Joint Covers and offer the most comprehensive range in the world.

With years of building protection experience under our collective belts, we've distilled our knowledge into this compact guide to specifying Expansion Joint Covers.

So lets get started...

Contents

What is an Expansion Joint?



An Expansion Joint or Movement Joint is a structural gap designed to accommodate the movement of a building in a controlled manner, preventing damage to the internal and external finishes.

Expansion joints run right through the structure of the building, from top to bottom and front to back and often become wider as you go higher up in the building, as movement becomes more prevalent.

What is an Expansion Joint Cover?

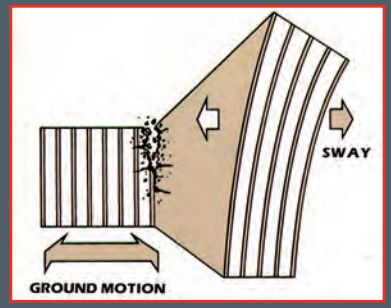
An Expansion Joint Cover or Movement Joint Cover provides a covered transition across the expansion or movement joint opening, remaining unaffected by the relative movement of the two surfaces either side of the joint.

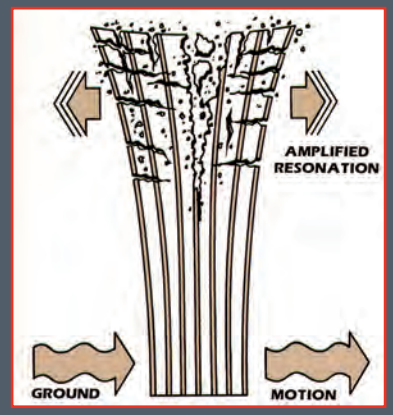
Click the image on the right to see how this expansion joint cover moves. ➔

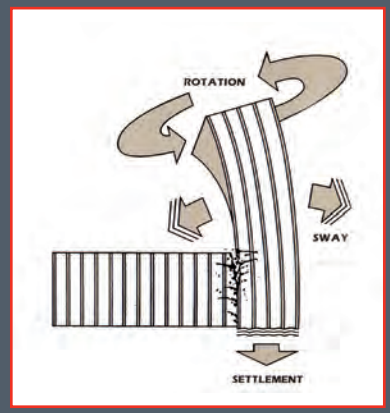
Types of Building Movement

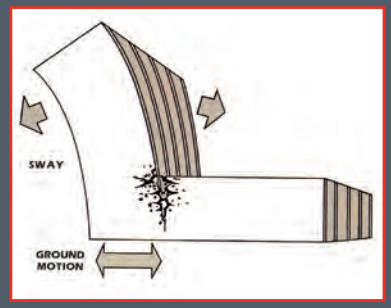
Building movement occurs in the following ways:

- **Thermal Expansion or Contraction**
  Movement caused by the structure expanding and contracting with temperature changes, or shrinking as it dries out
- **Building settlement**
  Movement caused by the dead and live loads of the structure on the supporting foundations
- **Wind Sway**
  Movement caused by the effect of strong winds on the structure, which is more pronounced on tall buildings
- **Seismic Activity**
  Multi-directional movement caused by seismic events, can be significant depending on the magnitude of the seismic activity.





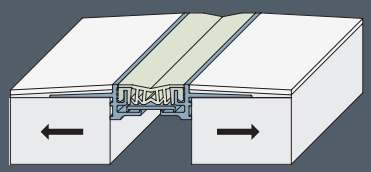




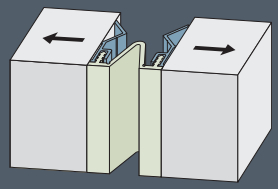
Expansion Joint Cover Movement

An expansion joint cover has to be able to accommodate multi directional movement. The diagrams below depict what that movement looks like for both a Floor/Ceiling Joint Cover and a Wall Joint Cover.

OPENING / CLOSING MOVEMENT

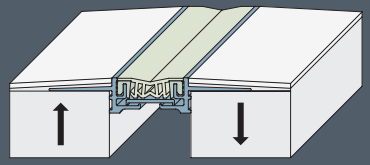


Floor/Ceiling Cover

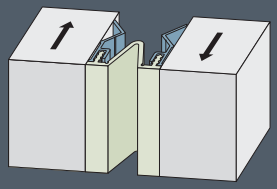


Wall Cover

CHANGE OF PLANE LEVEL

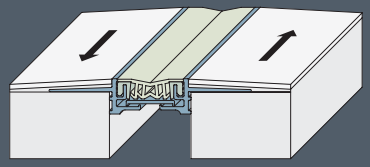


Floor/Ceiling Cover

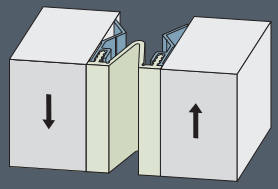


Wall Cover

MOVEMENT ALONG JOINT LENGTH



Floor/Ceiling Cover



Wall Cover

5 Steps To Selecting The Right Cover

Selecting the right cover for your application may not be as easy as you think and can cause major problems if not done properly. A lot of thought has to be put into the selection process, as the majority of product failures are caused by incorrect product selection.

On the next couple of pages we will give you a brief summary of our five step process to sizing the joints properly and what to consider when selecting the joint cover.

We encourage you to contact us if you have any questions or concerns with the process.

THE 5 STEP PROCESS:

Step 1: Understand the movement requirements

Step 2: Size the joints properly

Step 3: Consider joint locations and application requirements

Step 4: Identify adjacent surface finishes

Step 5: Installation method

Step 1: Understand the movement requirements

The most important part of selecting the proper expansion joint cover is to understand the movement requirements. Confusion can be caused as manufacturers convey movement in different ways.

Movement can be shown as an overall movement, as a percentage of the expansion joint width or more usually as a +/- movement.

For Example:
A 50mm nominal expansion joint with an anticipated expansion and contraction of 25mm could be shown in the following way:

- 50mm +/- 25mm
- 50mm with a total movement of 50mm
- 50mm +/- 50%

Each manufacturer means the same thing, but each is describing the allowable movement in totally different ways.

Step 1 continued...

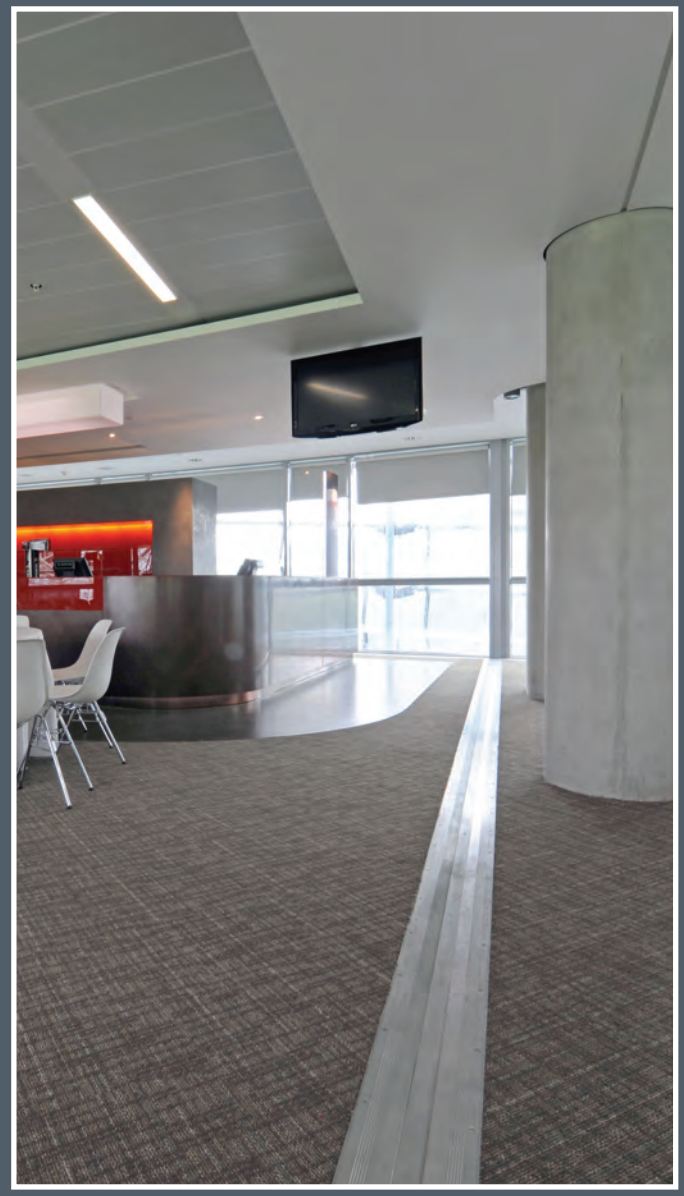
In order to understand the movement correctly we need to deal with such terms as nominal, minimum and maximum:

- Nominal width is the size of the joint before any movement takes place
- Minimum is the width of the joint when it has reached its maximum closing potential
- Maximum is the width of the joint when it has reached its maximum opening potential

We recommend that when the engineer tells you the joint width, you ask them for the minimum and maximum dimensions at full movement.

The structural engineer will indicate the location of the joints and the joint width needed for movement to occur. Our experience tells us that the width provided by the engineer is typically the movement needed and is not necessarily the joint width required for the covers and/or fire barrier systems so it is worth checking exactly what they mean.

For example:
If the engineer states that a 50mm joint is required, they might expect it to open to 100mm and close to 0mm. If they tell you that you need a 300mm joint, they might expect it to open 600mm and close to 0mm.



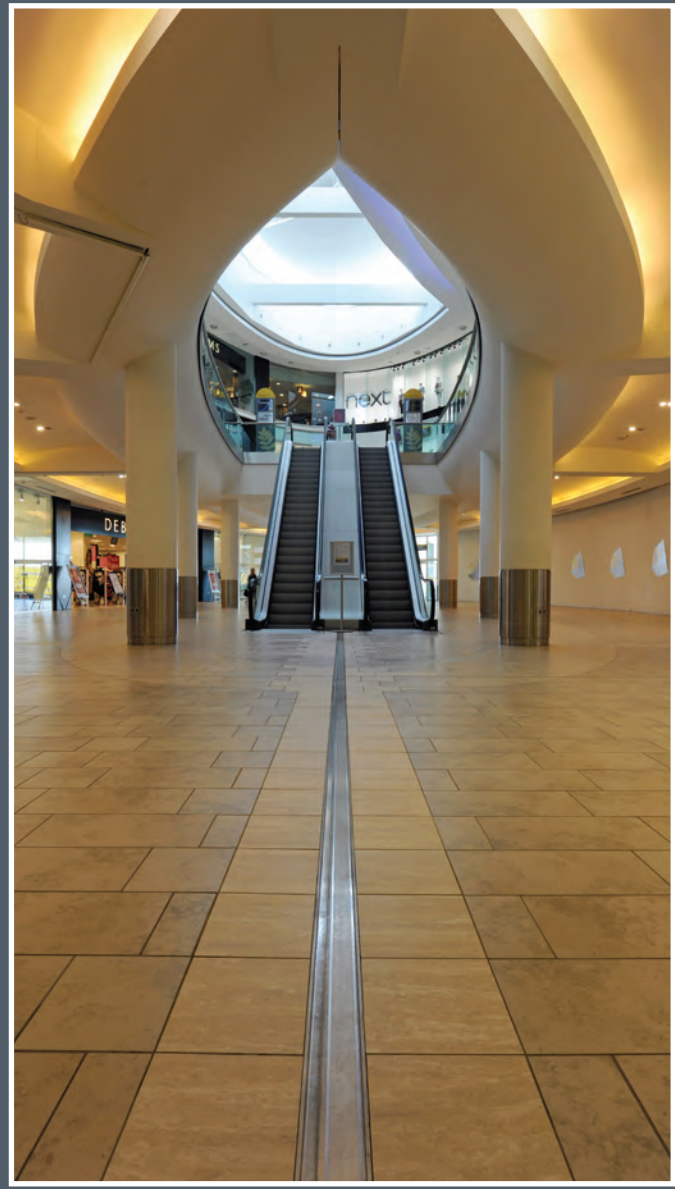
Step 2: Size the joints properly

Once the movement requirements are understood, the joints can be sized properly to accommodate the expansion joint covers.

Most joint covers have components that take up space in the joint opening, and fire rated floor and wall conditions will require a fire barrier. These materials will not allow a joint to close to 0mm without damaging the system or surrounding construction. So it is very important that you work together with the manufacturer to size the joint accordingly, to meet the movement requirements and accommodate the desired joint cover systems.

For example:
If you selected our GTR as the style of cover you want to use, and the engineer has told you that you need a 50mm joint that has a 25mm minimum and a 75mm maximum at full movement. GTR-200 might be your first thought for the 50mm joint. But if you refer to the movement criteria, you will see that the GTR-200 does not meet the movement requirements. The joint must actually be increased to 75mm wide (using GTR-300) to meet the movement requirements set forth by the engineer.

PLEASE NOTE: *It is important to let the engineer know if you have increased the joint size to allow for the covers, to ensure that the structural and architectural drawings match and the correct blockout is specified (see Step 5: Installation Method)*

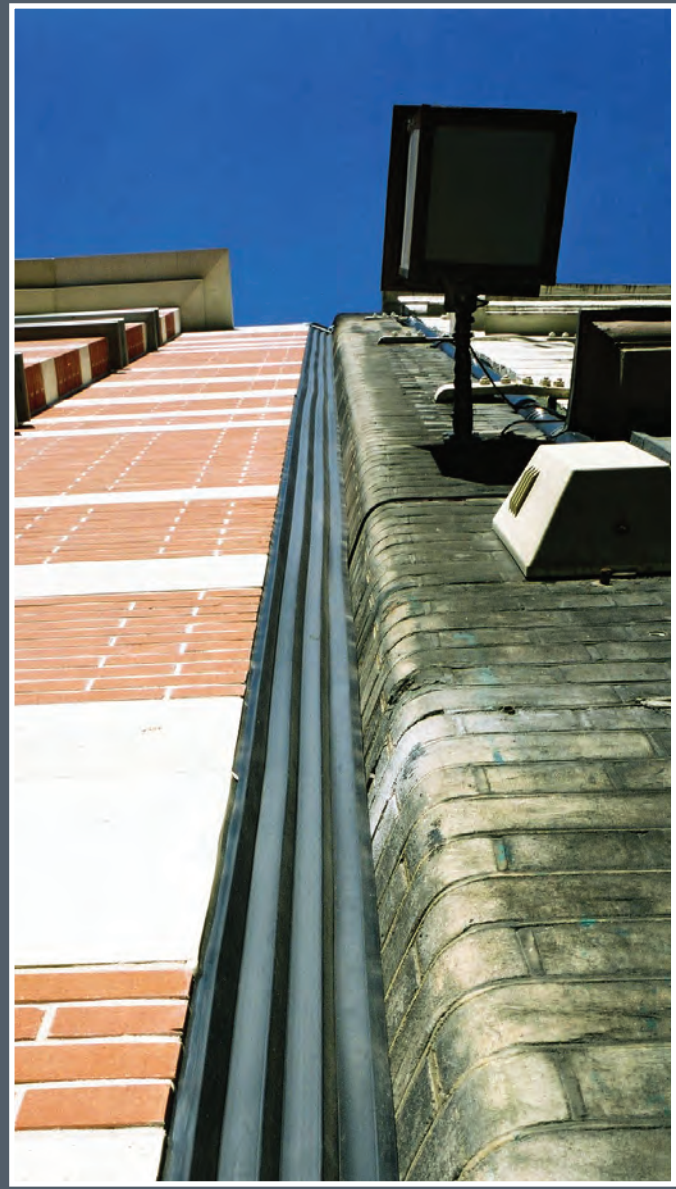


Step 2 continued...

As you continue up the building, it's not uncommon for joint sizes to increase on each floor (with the roof having the largest joints). Changing sizes on the interior joints is acceptable, but it may be recommended to group certain floors together in order to reduce the number of different sized joints required.

Exterior joints should always be the same size from the roof to the ground. Any joint size changes on the exterior result in unsightly transitions and difficulties in maintaining weather protection.

Expansion joints must pass through the structure from top to bottom and front to back. If the joint appears to end abruptly within a building, be sure to consult the engineer for clarification to make sure it isn't a mistake.

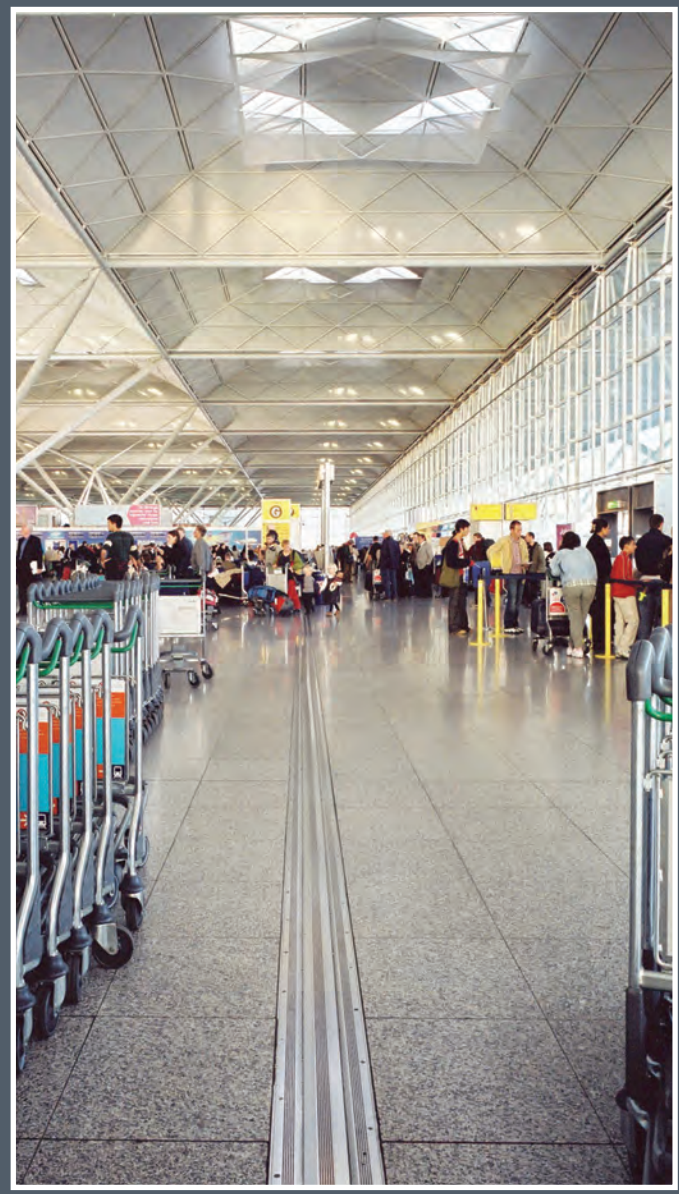


Step 3: Consider joint locations & application requirements

When selecting cover systems, it is important to consider their location and usage before a selection is made. Generally the floor cover application is the element most affected by intended usage. We recommend starting with the floor cover and progressing from there.

- Is hygiene important? - In areas where hygiene is an important consideration like hospitals, flush gasketed covers are often installed for their ease of cleaning.
- Is durability an issue? - In high traffic areas such as retail environments the best choice is an all metal cover that is hard wearing and tamperproof. Heavy duty options are often available for areas with very high traffic such as airports where heavy rolling loads are often passed over covers.
- Will the cover be used in a car park? - In areas like car parks heavy duty rubber options are often used, for their durability and ability to cope with high rolling loads.
- Is moisture an issue? - In areas where moisture ingress is an issue such as sports stadiums etc. special waterproof joints are available, or moisture barriers can be incorporated into standard covers.
- Is fire integrity an issue? - In most cases fire barriers can be incorporated with an expansion joint cover to maintain fire integrity.

Please note it is important to check when using fire barriers, moisture barriers or acoustic barriers, that they do not impede the movement of the joint.



Step 4: Identify adjacent surface finishes

Will the joint cover be located in a hidden area or in a highly visible area (such as a lobby), where aesthetics are more important?

Form and function have often been in conflict with the design and use of expansion joint cover systems. Improvements in function have often come at the expense of aesthetics, and vice versa.

Traditionally trying to conceal expansion joint covers with surface finish in-lays often led to thicker joint cover assemblies. These thicker assemblies resulted in obstacles for wheeled equipment.

As technology and joint cover design has improved, it is now possible to conceal wider cover plates without affecting their functionality. Today, a wide variety of joint cover systems are available to meet form and function requirements, incorporating anything from vinyl floors to solid stone floor tiles.

When selecting expansion joint cover systems, consideration should be given to the adjacent floor and wall finishes. Most finishes can be integrated into the cover assembly for maximum harmony with the surrounding design elements, minimising the visual impact of the joint covers.

Step 5: Installation Method

The installation method for the chosen expansion joint cover really depends on your aesthetic considerations and the required movement the cover has to accommodate.

There are 2 methods/types of joint to choose from:

1. Surface Mounted Joint Cover
2. Recess Mounted Joint Cover

Surface mounted joint covers are typically smaller, single gasketed models, installed in areas where a small lump in the floor surface isn't an issue. Surface mounted joint covers are best suited for retrofit situations for their simple installation with no requirement for a blockout to be formed. For example our GFPS series is quite popular in Hospitals as it allows vinyl floor finishes to butt up to the joint cover helping with infection control.

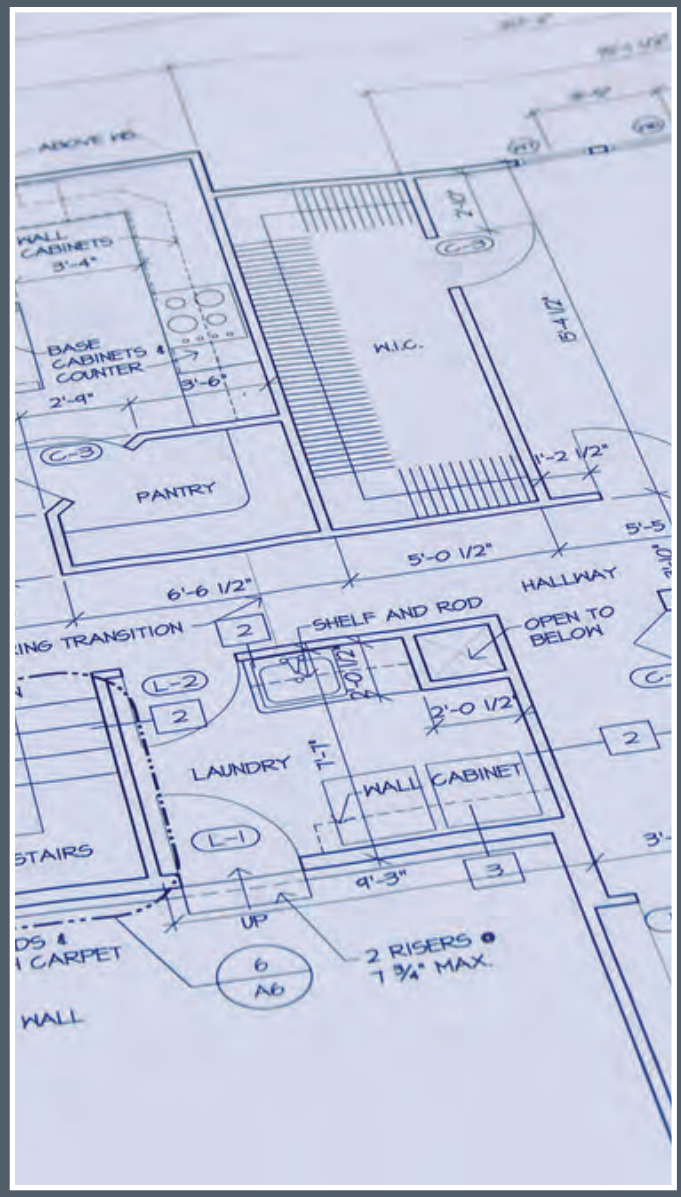
Recess mounted joint covers are typically larger in construction, and can incorporate single or double gaskets. The main difference with recess mounted joint covers is the requirement for a block-out to be formed prior to installation. It is essential to specify and correctly form the blockout for any recess mounted EJCs as any errors can be very expensive to put right.

When forming a blockout we recommend that the recess be formed a minimum of 5mm deeper to allow for levelling prior to installation and we recommend using a non-shrink, self-levelling bedding compound to form a structurally sound base under the EJC. For more information on the required blockouts for your EJC it's best to contact your supplier or consult their brochures/ installation instructions.

Specification check list

Having been through our 5 step process, you should have all the information you need to choose the correct EJC for your project:

- ☐ Expansion/Movement Joint Width
- ☐ Anticipated Movement
- ☐ Building Usage/Loading Requirements
- ☐ Aesthetics
- ☐ Recess or surface mounted cover
- ☐ Is a blockout required?
- ☐ Is a fire barrier required?
- ☐ Is a moisture barrier required?
- ☐ Is an acoustic barrier required?



Choosing your supplier

After you have done all the hard work deciding what sized expansion joint cover you need and what movement it should provide, you need to find a supplier that can provide a product to meet your requirements

It's important that your supplier brings experience to the table, even if this isn't your first encounter with Expansion Joint Covers. It's handy to have someone on the team who can provide you with the technical back-up and support to complete the job on time and on budget with minimal disruptions.

You need a supplier with a large range of products. Whether you need a small surface mounted joint cover or a large recess mounted cover, you need to be sure that your supplier can provide you with the exact product required. Keep hold of the Specification check list on the previous page - if you've gone to the trouble of finding all that information, use it to your advantage! It'll make it a lot easier to ensure you get exactly what you need.

If you're worried about the installation of the Expansion Joint Covers it could be beneficial if your supplier has an in-house installation team that can install the product for you, someone who's been there and done it.

At C/S we are proud to say we offer:

- more than 40 years experience working with Expansion Joint Covers
- the most comprehensive range of covers in the world
- support at every stage of the selection process right through to the technicalities of installation
- an in-house installation team who can install any of our joints

Found our ebook useful?

Why not share it with your colleagues & friends...

share this ebook

www.c-sgroup.co.uk

We have more great content on our website:
www.c-sgroup.co.uk
and on our blog
info.c-sgroup.co.uk

If you have any questions or comments we'd love to hear from you, please get in touch via:

Phone: (+44) 01296 652800
Email: enquiries@c-sgroup.co.uk
Twitter: @csgroupnews
Facebook: www.c-sgroup.co.uk/facebook