Connolly Key Joint
Frequently Asked Questions

Question 1
Are there any safety issues with the use of the Connolly key joint product?
Answer 1
Although the rolled section is not inherently dangerous, it is manufactured from thin sheet galvanized steel and the pegs are manufactured from reinforcing bar. Accordingly, it is recommended that gloves be worn when handling the sections to prevent cuts.

Question 2
How do I hold the Connolly key joint in place during the concreting operations?
Answer 2
Connolly key joint sections are supplied with 8 pegs and 8 wedges. While holding the key joint in the desired location, drive the pegs vertically through the holes in the profile and into the ground. The pegs should be driven to a level approximately 20mm below the proposed concrete surface. Adjust the key joint to the correct height and secure in position by tapping in the supplied wedges between the pegs and the key joint section. If capping strips are to be used allow the appropriate set down distance and apply capping strip prior to pouring concrete

Question 3
Are there any precautions required when placing key joints on a sloping surface?
Answer 3
To ensure that the key joint's correct completed profile is achieved, it is recommended the key joint profile be orientated at right angles (normal) to the finished surface of the concrete. This ensures maximum concrete depth is achieved both over and under the keyway.

Question 4
What should I do if the ground is soft and the pegs are not long enough to support the key joint properly?
Answer 4
Longer pegs can be purchased or you may cut some on site from 8mm to 10mm bar to your desired length.

Question 5
If the concrete around the keyway fractures will the slabs move up and down?
Answer 5
During the pouring operation, it is essential to ensure that the fluid concrete completely fills and is compacted around the key joint profile. Failure to do this will leave voids and thus increase the potential for neighbouring slabs to become displaced relative to each other.

Question 6
Which way up does the key joint go?
Answer 6
The longest flange on the key joint section always goes to the top. Stickers are applied to each length indicating which way is up along with other important information. “THIS WAY UP” is also printed along the full length of the key joint section. Failure to install the key joint the right way up will increase the possibility of the keyway fracturing when the slab is loaded.

Question 7
Should the key joint continue right to the formwork or should I leave it back from the edge?
Answer 7
It is essential to continue the key joint all the way to the side of the slab (i.e. to the edge formwork) to ensure a uniform joint line continues for the full width of the slab.

Question 8
Can I use a 100mm key joint in a 150mm or 200mm thick slab.
Answer 8
No. The depth of the keyway profile has not been designed to carry the loads that will be applied to the thicker slabs.

Question 9
What size key joint should I use for a 125mm slab?
Answer 9
It depends on the use of the slab and the loads it will be subjected too. For pedestrian and light pneumatic tyred traffic (eg cars and light commercial vehicles) the KJ100 will be satisfactory. It should be installed to finish flush with to the top surface of the concrete.

If the slab is to be subjected to heavier industrial load and small hard wheeled traffic (eg. Forklifts) the joint should be formed using the KJ150 product to maximise the joint strength. This is achieved by creating a local slab thickening beam at the joint line.

Question 10
Why has the key joint produced a wriggly crack along the surface?
Answer 10
The concrete has not been finished of flush with the top of the key joint section. It must be finished to the top of the KJ profile (or capping strip if it was used), not over it. Any concrete over the top level of the key joint will inevitably crack unevenly along the general direction of the joint.

Question 11
Is it possible to edge tool the pavement if the key joint butts up to the formwork?
Answer 11
Yes. To facilitate edge tooling past the key joint, the corners of the key joint should be trimmed off (chamfered) with a pair of snips prior to pouring the concrete.

Question 12
Should I run an edger along the key joint?
Answer 12
No. Do not tool or edge the concrete along the key joint section. This will lead to a poor appearance and if capping strips are used this may prevent the permanent capping strips from remaining fixed in the slab.

Question 13
How should I prepare the sub-grade?
Answer 13
Ensure that the sub-grade is adequately prepared and compacted as per normal concreting applications. For best results the sub-grade should smooth and free of any obstructions or irregularities that may restrict the concrete from contracting freely.

Question 14
Can I pour concrete to both sides of the key joint?
Answer 14
Yes. This is one of the main advantages of using a preformed metal key joint. It allows the slab to be broken into smaller sections (reducing shrinkage problems) yet still allows a large pour area. During pouring operations, concrete should be poured uniformly on each side of the key joint profile to ensure it does not move.

Question 15
Can I use the Connolly Key Joint at the end of a pour?
Answer 15
Yes. Its main use is as a contraction joint in continuous pour applications but it can also be used at the end of a pour (i.e. Construction Joint). In these situations it may be necessary to use additional timber pegs behind the key joint to prevent it moving as the concrete is placed up against the other side.

Question 16
How do you join lengths together?
Answer 16
When butt joining key joints end to end, use Connolly Key Joint Joiners (Product Code KJJ). Alternatively they can be overlapped 25-30mm and screwed or pop riveted together at the joint.

Question 17
Why is the Key Joint oily?
Answer 17
The key joint profile is lightly oiled during manufacture to minimise concrete sticking to it. For use in high strength concrete, re-oiling may be appropriate.

Question 18
Will the concrete stick to the key joint?
Answer 18
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Question 19
Can I join the key joint at a Tee intersection?
Answer 19
Yes. At "tee" intersections it is best to run one length of key joint right through and butt the other one up to the back or female side of the profile (i.e. No tongue protruding).

Question 20
Can I joint the key joint at a 4 way or cross intersection?
Answer 20
Yes. At these intersections it is best to form the intersection using 4 separate pieces of key joint. To produce the strongest joint in the finished concrete the tongue of the key joint sections should all be facing in the same "circular" direction when viewed from on top of the joint. This also eliminates any need to trim or scribe any ends of the key joint sections to fit over the other sections.

Question 21
How far apart do I put the pegs?
Answer 21
Although the peg holes are at every 300mm in the key joint sections, it is not necessary to use a peg in every hole. Pegs are generally spaced at 900mm. Each 6.0m length of key joint should be supplied with 8 pegs and 8 wedges for fixing the key joint in position. The extra pegs can be used for additional support in soft soils or if the key joints are cut into shorter lengths.

Question 22
How far apart should the joints be?
Answer 22
This is dependant on many factors and can only be answered specific to each site. The following are some guidelines to assist.

Try to keep ea Slab design / layout: The slab sections or panels should have a length to width ratio of a maximum of 1.5:1 and preferably 1:1. Panel shapes such as "L" and "T" should be avoided where possible.

Generally the thicker the slab the further apart the joints may be.

Joints in un-reinforced slabs should be spaced at closer intervals than in reinforced slabs.

Cement type and quantity, aggregate size, quantity and quality, water/cement ratio and the use of any admixtures will all affect the amount of shrinkage that will occur. The more shrinkage, the closer the contraction joints should be.

The sub-base should be as smooth and even as possible to allow the concrete to move freely as its volume decreases. A rough sub-base means closer joints.

High air temperature, drying wind and low humidity will all accelerate the drying process and increase shrinkage. Some of these factors such as temperature and humidity are seasonal and therefore joints spacings may not be the same for all jobs poured throughout the year.

For various reasons, different curing methods may apply to different jobs. The slower the concrete is cured, the further apart the joints may be placed.

Question 23
Will the key joints rust?
Answer 23
All Connolly key joints (and crack inducers) are galvanised to AS1397. Galvanised coatings are predominantly zinc based where some other coatings are a combination of zinc and aluminium. Metallic coating of steel with zinc or zinc/aluminium alloy by the hot dip method is a universally proven and accepted system.

Zinc coatings, as provided on Connolly key joints, give an added feature of sacrificial protection at areas where the steel base can be exposed, such as at cut edges, holes and scratches. Zinc coatings are also superior where products manufactured from them come into contact with concrete or cement based products.

Life expectancy of the galvanised coating on our key joint products can be assumed to be similar to almost any other Galvanised steel product in use. As with any steel based product, some corrosive environments may require additional protection. Stainless steel key joints are available by request.

Question 24
Will the pegs go rusty because they a driven into the ground.
Answer 24
The pegs may develop some surface rust over time. However oxygen is required for rust to occur and this is in limited supply under the slab the rusting process is very slow. This has not been a problem with key joints in service over the last 15 years as the pegs are not structural elements nor are they in contact with any reinforcement. For highly corrosive environments, fibreglass pegs are available by request.

Question 25
Will Connolly key joints protect pavements from cracking by tree roots?
Answer 25
Yes, although the degree of protection depends where the tree root is located and the level of movement in the pavement. If the tree root is located in or near the centre of a pavement panel it may lift the entire panel and crack the pavement at that point.

The tapered tongue of the Connolly Key Joint allows the slabs adjacent to the joint line to tilt relative to each other and form an articulated pavement that moves with the ground movements.

Question 26
Does the tapered tongue produce a step at the surface as the joint opens up?
Answer 26
All keyed joints have a taper on the tongue. This is necessary to allow the joints to move apart freely. Square tongues can cause the joint to bind and cause stress cracking adjacent to the joint line.

For correct joint spacings, the degree of stepping with Connolly key joints is minimal and undetectable in most cases. For areas where stepping tolerances need to be at a minimum (eg. for trolley or forklift traffic) it is advisable that the joints be doweled as well. (i.e. a doweled key joint)

Question 27
Can I use deformed bars for the dowels through the joints?
Answer 27
Some confusion exists between the terms dowel bars and ties bars. Both can have a use through a keyed joint but for completely different purposes.
Dowel Bars provide load transfer across a joint prevent vertical movement but allow the slabs to move horizontally at the joint. They are larger diameter and shorter in length than tie bars and have a smooth surface. They must be ‘de-bonded” from the concrete on at least ½ of their length (i.e. ane side of the joint line). Dowel bars must be accurately positioned and maintain their alignment perpendicular to the joint line in both the vertical and horizontal planes.
Tie Bars bind to the concrete and hold a joint tightly together in the horizontal direction. This keeps the joint edges in close contact so that the loads can be transferred across the joint by other means (eg. key-ways, aggregate interlock or friction). They are smaller diameter and longer in length than dowel bars with a deformed surface to allow them to bond with the concrete. They should NOT be put in sleeves. Although tie bars must be positioned perpendicular to the joint line their alignment is not as critical as with dowel bars.

Question 28
Should I use a removable or permanent capping strip?
Answer 28
For outdoor use a permanent capping strip is frequently used. This strengthens the joint edge by creating a bevel and provides a compression area to absorb foreign matter that may enter the joint.
If the joint is required to be watertight, or if the foundation material may be subject to deterioration from water entering through the joints, it is advisable to use one of the removable capping strips or rebate moulds and fill the joint with an appropriate sealant to the manufactures specifications.

Question 29
How long should I leave the removable capping in place before removing it?
Answer 29
It is best to leave the removable capping strips and rebate moulds in long enough for most initial shrinkage to occur. This places less stress on the sealants and permits them to adhere better to the drier concrete surfaces. Prior to applying any sealants, the joints should be cleaned and primed to the sealant manufactures specification. The use of a "backing tape" is recommended to prevent the sealant adhering to the bottom of the sealant void.

Question 30
If I put the capping strip on the top of the key joint will it be too high?
Answer 30
When setting the height of the key joint it should be positioned the appropriate distance below the proposed surface level to allow for the capping to fit on the top. See the specification chart for each particular capping for this "key joint set down distance".

Question 31
Why is a 100mm key joint only 90mm high?
Answer 31
All Connolly key joints (and in fact, most key joints) are slightly narrower than the slab height. This provides clearance under the key joint when installing it to allow for any minor irregularities in the slab foundation material. The concrete will crack through this small clearance depth as it shrinks and allow the joint to function as it is intended.

Question 32
What is the main difference between Connolly Key Joint and other key joints?
Answer 32
There are two main differences. Only Connolly key joint has the internationally patented peg and wedge fixing system. This is recognised as being the fasted, simplest and most secure key joint fixing method.

Connolly key joint also has a unique profile that produces a stronger concrete key profile than other products on the market. This provides for higher loading capabilities from both static and dynamic loads.