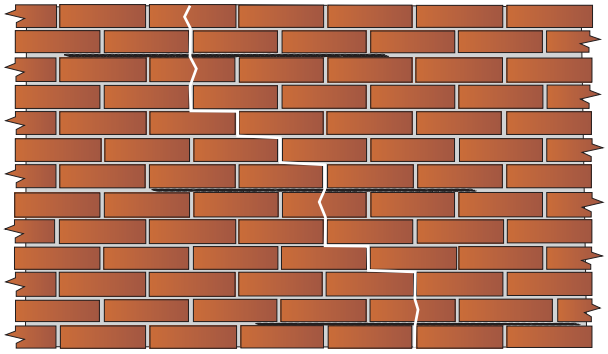
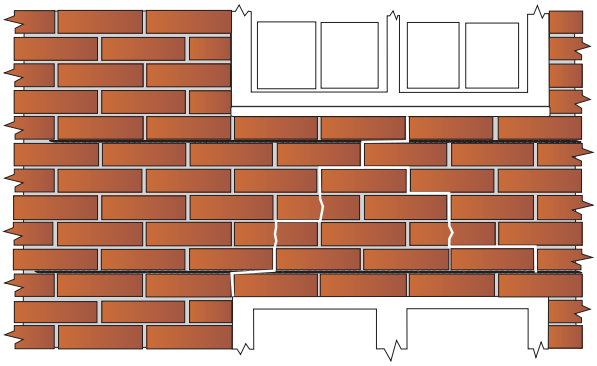
Tri-bar

Tri-bars are three finned helical Stainless Steel reinforcement rods, which can be used in accordance with (BS 5628 part 2) for reinforcing bed-joints to enhance lateral loading resistance in new and existing buildings, Tri-bars can also be used to repair many structural defects in existing masonry by using our repair strategies like over-pinning with ring beams, general crack stitching repairs, lintel failures and re-tying (disconnected and unconnected) solid or cavity masonry panels.

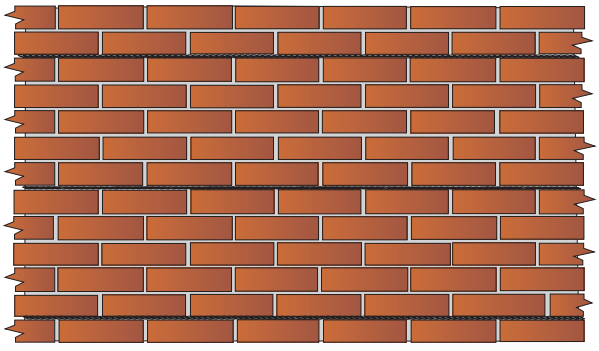
Crack stitching.



Re-stabilising existing masonry above failed lintels.



Ring beams to improve lateral load resistance and over pinning to reduce the under pinning cost.



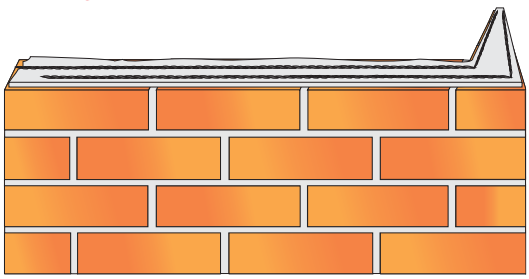
Benefits

- Quick installation.
- Low labour costs.
- Tensile strength more than double required by BS 5628.
- Good bonding to resins and grouts.
- Lengths up to 8 metres.
- Easily installed in bed-joints.
- Minor visual and structural disturbance
- Enhances lateral loading resistance.

Features

- Easy and problem free installation.
- Austenitic 304 or 316 Stainless Steel.
- Effective in cavity and solid walls.
- Bonded with Tri-set resin or cemspand grout.

Reinforcing mortar beds to enhance lateral loading resistance in new construction.



Tri-bar

Repair Strategy's

TB-01 General Crack Stitching 110mm walls

TB-01b General Crack Stitching 220mm walls

TB-02 Repairing Failed Lintels in Solid Walls

TB-03 Repairing Failed Lintels in Cavity Walls

TB-04 Repairing Failed Angle Iron Lintels in Cavity Walls

TB-05 Reconnecting of Internal Walls to Solid External Walls

TB-06 Reconnecting of Internal Walls to Cavity External Walls

TB-07 Repairing Cracks in Corners of Solid Walls

TB-08 Repairing Cracks in Corners of Cavity Walls

TB-09 Installing Reinforcement Beams to Cavity Wall Bed Joints

TB-10 Installing Reinforcement Beams to Solid Wall Bed Joints

TB-11 Installing Movement Joints in Solid Walls

TB-12 Installing Movement Joints in Cavity Walls

TB-13 Repairing Cracks at Junction of Solid and Cavity Walls

TB-14 Bay Window Repair, Crack Confined to Junction

TB-15 Bay Window Repair, Cracks in Various Places around Bay

TB-16 Bay Window Repair, Cracks in Various Places around Bay brickwork in Poor Condition

TB-17 Repairing Brick Arch Structures, Brick Arch Reinforcement

TB-18 Repairing Brick Arch Structures,Beam End Fixing

TB-19 Repairing Brick Arch Structures, Brick Arch Reinforcement

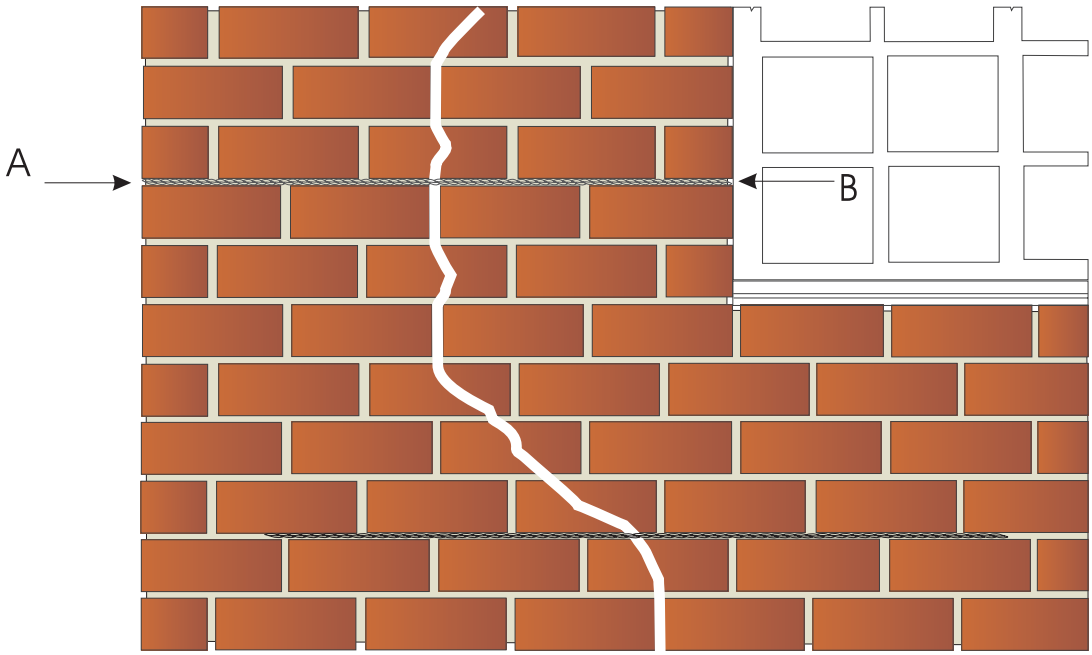
TB-20 Reconnect internal corners in Solid Walls

TB-21 Reconnect internal corners in Cavity Walls

TB-22 Repairing Cracks at Junction of untied Solid Walls

General Crack stitching

TB-01



(1) Cut out slots into horizontal mortar joint to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(6) When Cemspand has set repoint joint to match existing mortar joint.

Installation Notes: Unless specified otherwise the following criteria are to be used

a) The depth of slot to be 25 to 35mm

b) Normal vertical spacing of crack stitches is 450mm(6 brick courses).

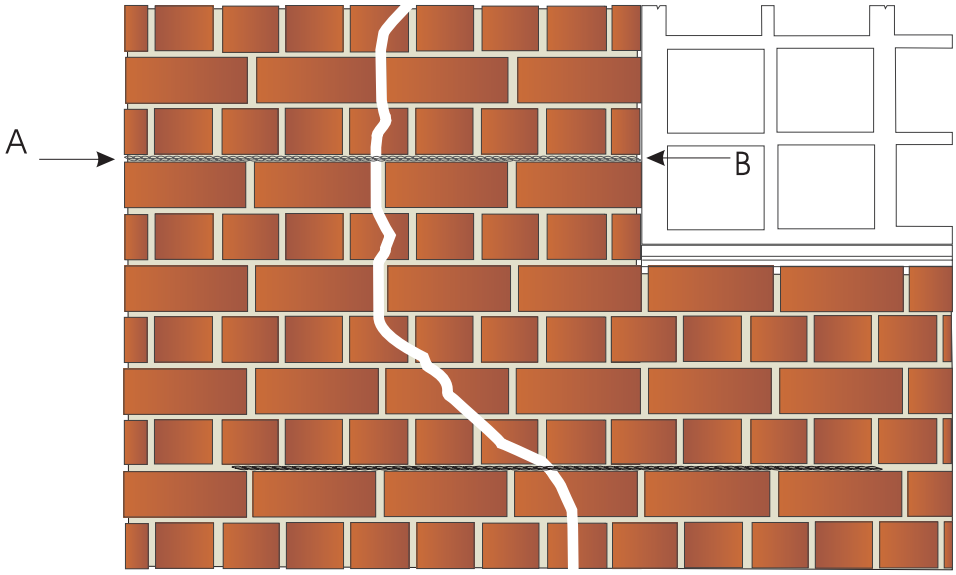
c) Tri-bars are to extend a minimum of 500 mm each side of crack.

d) Where a crack is within 500mm of the end of a wall (as shown by A above) the Tri-bar is to be continued for at least 100mm around the corner

e) Where a crack is within 500mm of an opening (as shown by B above) the Tri-bar is to be bent back and fixed into the reveal.

General Crack stitching
Solid Walls

TB-01b



(1) Cut out slots into horizontal mortar joint to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(6) When Cemspand has set repoint joint to match existing mortar joint.

Installation Notes: Unless specified otherwise the following criteria are to be used

a) The depth of slot to be 55 to 70mm

b) Normal vertical spacing of crack stitches is 450mm(6 brick courses).

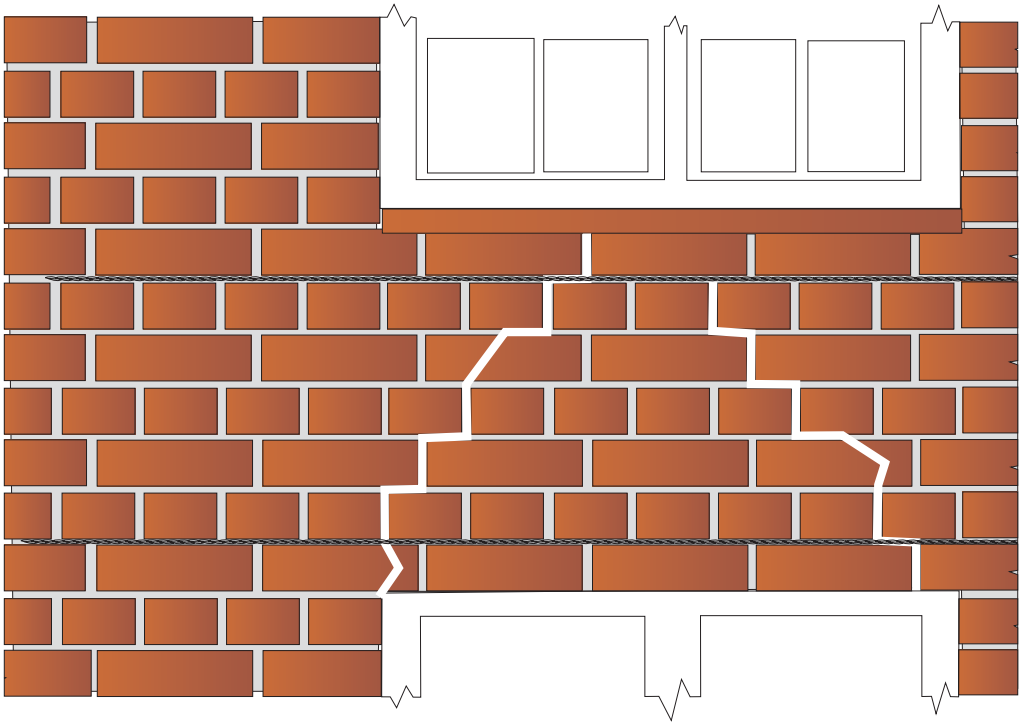
c) Tri-bars are to extend a minimum of 500 mm each side of crack.

d) Where a crack is within 500mm of the end of a wall (as shown by A above) the Tri-bar is to be continued for at least 100mm around the corner

e) Where a crack is within 500mm of an opening (as shown by B above) the Tri-bar is to be bent back and fixed into the reveal.

TB-02

Repairing Failed Lintels in Solid Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(6) Push second Tri-bar rod into the grout until a good coverage is achieved.

(7) Insert a third 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set repoint joint to match existing mortar joint.

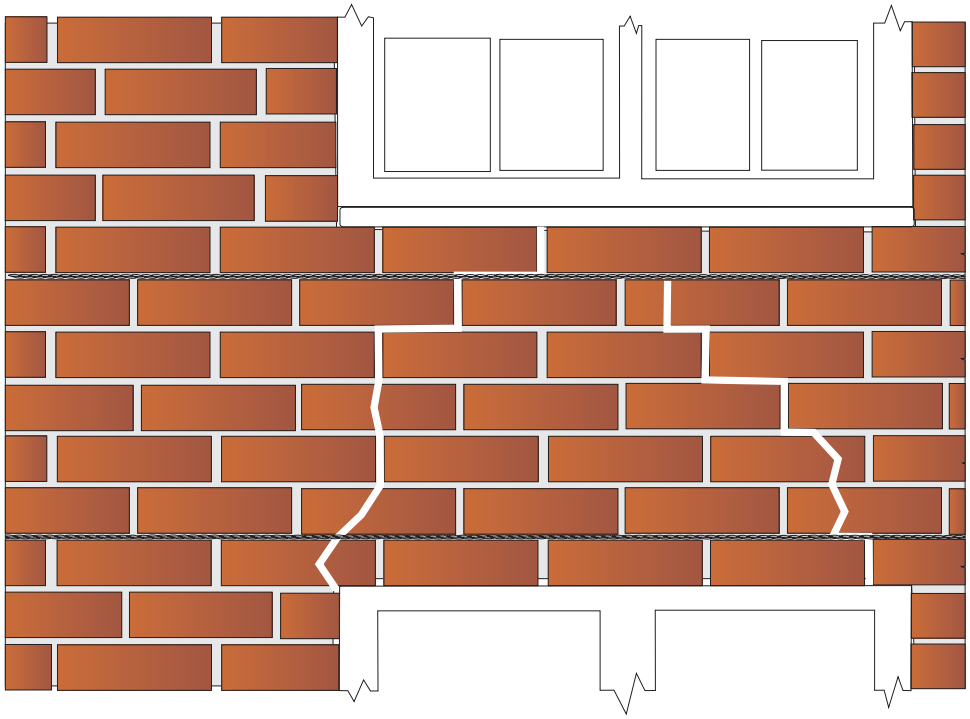
Installation Notes: Unless specified otherwise the following criteria are to be used

a) The depth of slot to be 55 to 70mm

b) Tri-bars are to extend a minimum of 500 mm each side of opening.

TB-03

Repairing Failed Lintels in Cavity Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slots.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(6) Push second Tri-bar rod into the grout until a good coverage is achieved.

(7) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set repoint joint to match existing mortar joint.

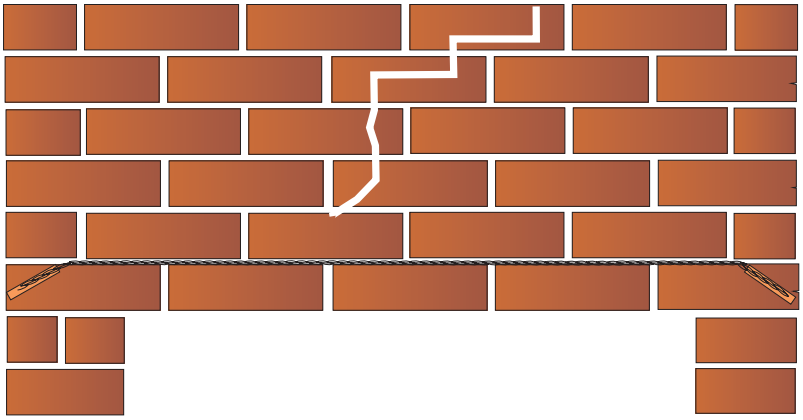
Installation Notes: Unless specified otherwise the following criteria are to be used

a) The depth of slot to be 40 to 55mm

b) Tri-bars are to extend a minimum of 500 mm each side of opening.

TB-03b

Repairing Failed Lintels in Cavity Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings, continue slots has far as possible.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots end, drill 14 mm hole into the wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bar's to required length and bend the end to suit hole and slot

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill hole with Tri- set resin push Tri-bar rods into the resin and grout until a good coverage is achieved.

(8) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(9) Push second Tri-bar rod into the resin and grout until a good coverage is achieved.

(10) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(11) When Cemspand has set replaster joints.

Installation Notes: Unless specified otherwise the following criteria are to be used.

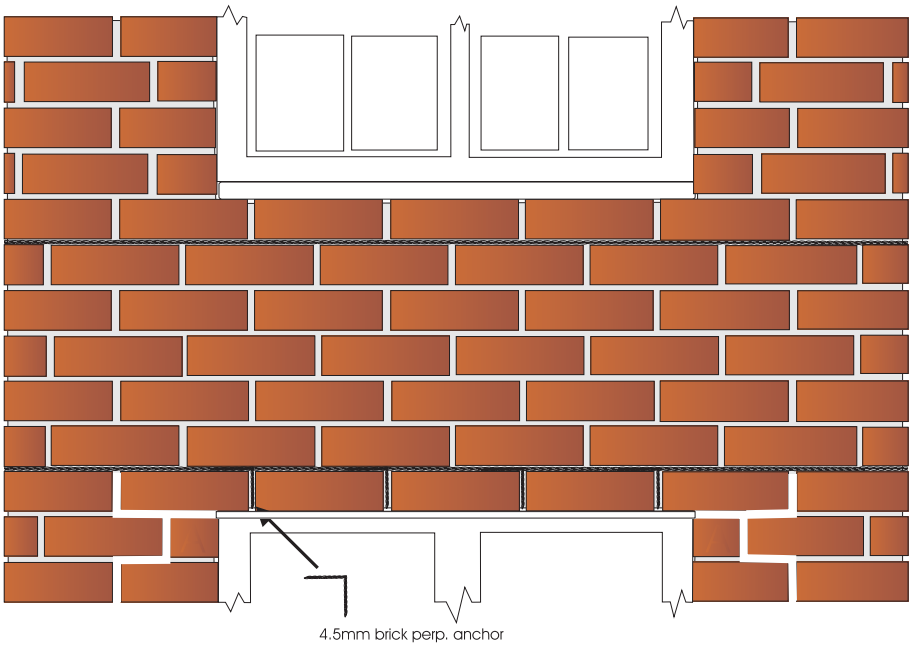
a) The depth of slot to be 55 to 70 mm (not including plaster).

b) Normal vertical spacing of internal crack stitching is 450mm and Tri-bars to extend 500mm beyond any cranks in the internal wall.

C) depth of holes to be 100mm

TB-04

Repairing Failed Angle Iron Lintels in Cavity Walls



(1) Cut out slots into horizontal and perp mortar joints to specified depth and at required vertical spacings.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slots.

(4) Push the Perp anchors and then Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rods and anchors.

(6) Push second row of Perp anchors and Tri-bar rods into the grout until a good coverage is achieved.

(7) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rods and iron into slot using a finger trowel.

(8) When Cemspand has set remove bricks A to allow removal of laminated angle Lintel, then re-bed bricks A and repoint joints to match existing mortar joint.

Installation Notes: Unless specified otherwise the following criteria are to be used

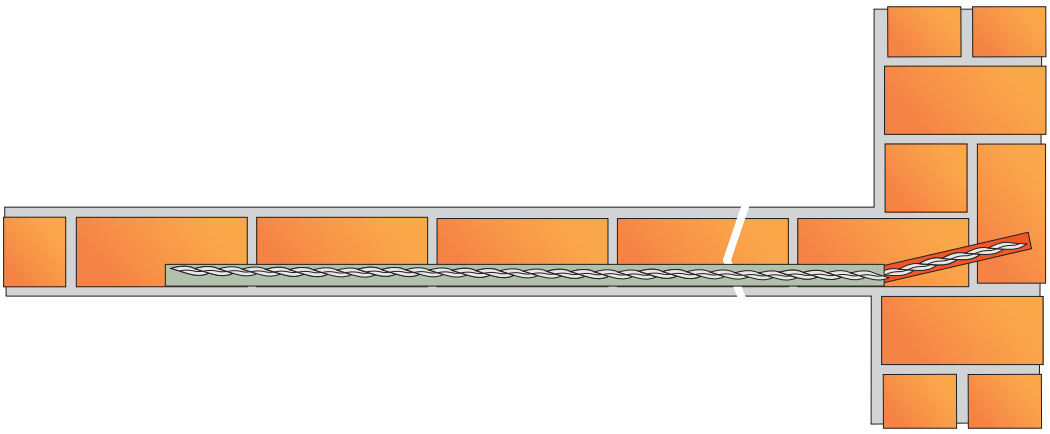
a) The depth of slot to be 40 to 55mm

b) Perp anchors to be fitted to all perps spaning lintel

b) Tri-bars are to extend a minimum of 500 mm each side of opening.

TB-05

Reconnect of Internal Walls with Solid External Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings, continue slots into corner.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots meet an internal corner, drill 10 mm hole into the adjoining wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bar to required length and bend the end to suit hole and slot

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill hole with Tri- set resin push Tri-bar rod into the resin and grout until a good coverage is achieved.

(8) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set replaster joints.

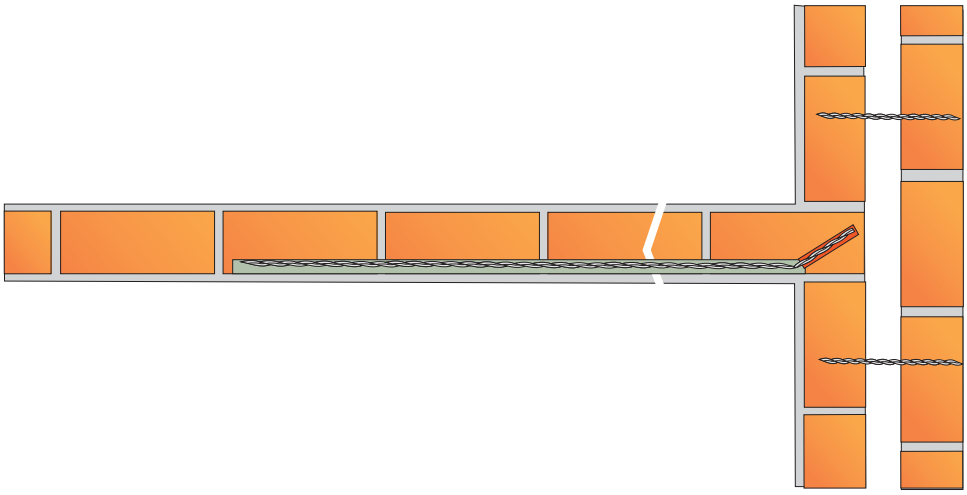
Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 25 to 35mm (not including plaster).

b) Normal vertical spacing of internal crack stitching is 450mm and Tri-bars to extend 500mm beyond any cranks in the internal wall

TB-06

Reconnect of Internal Walls with Cavity External Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings, continue slots into corner.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots meet an internal corner, drill 10 mm hole into the adjoining wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bar to required length and bend the end to suit hole and slot

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill hole with Tri-set resin push Tri-bar rod into the resin and grout until a good coverage is achieved.

(8) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set replaster joints.

(9) Tie inner and outer leaves using Tri-fix wall ties.

Installation Notes: Unless specified otherwise the following criteria are to be used.

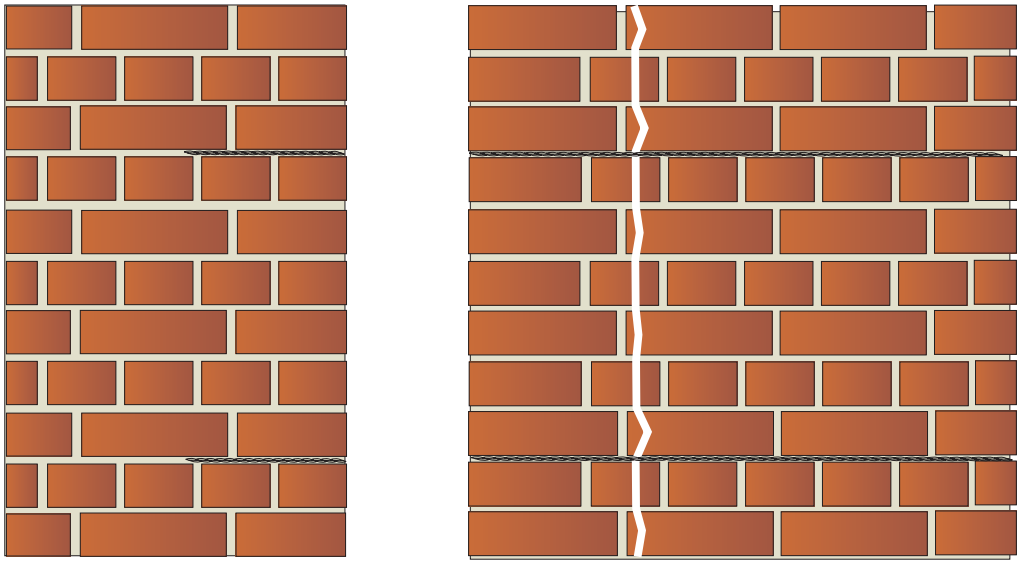
a) The depth of slot to be 25 to 35mm (not including plaster).

b) Normal vertical spacing of internal crack stitching is 450mm and Tri-bars to extend 500mm beyond any cranks in the internal wall

c) Wall ties to be inserted 225mm either side of junction and staggered vertical 225mm.

TB-07

Repairing Cracks with Tri-Bar Near Corners of Solid Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

.

(6) When Cemspand has set repoint joint to match existingt.

Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 35mm.

b) Normal vertical spacing of crack stitches is 450mm(6 brick courses).

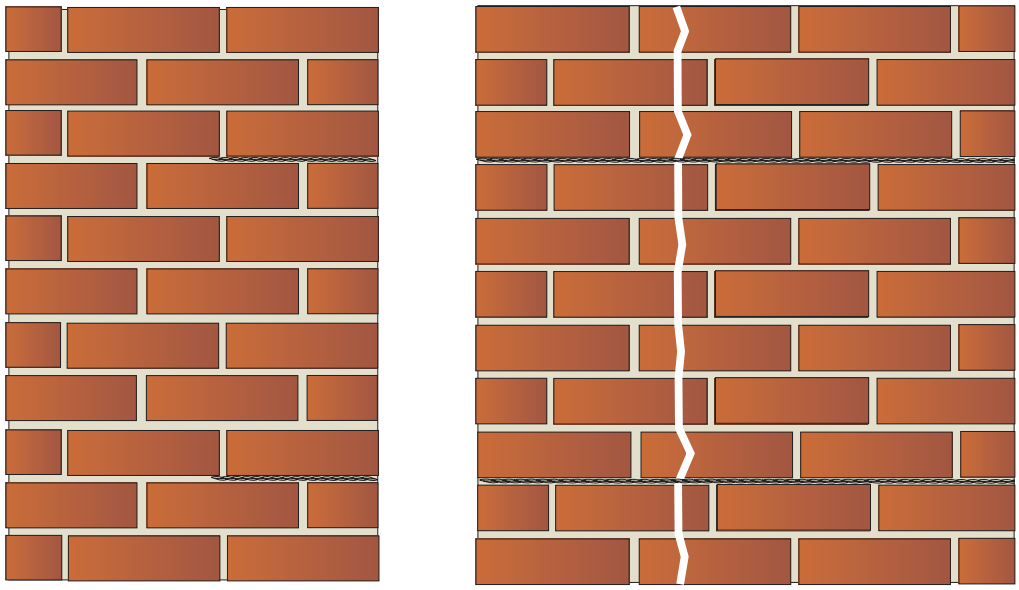
c) Tri-bars are to extend a minimum of 500 mm each side of crack.

d) Where a crack is within 500mm of the end of a wall the Tri-bar is to be continued for at least 100mm around the corner.

e) Where a crack is within 500mm of an opening the Tri-bar is to be bent back and fixed into the reveal.

TB-08

Repairing Cracks with Tri-Bar Near Corners of Cavity Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

.

(6) When Cemspand has set repoint joint to match existingt.

Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 25mm.

b) Normal vertical spacing of crack stitches is 450mm(6 brick courses).

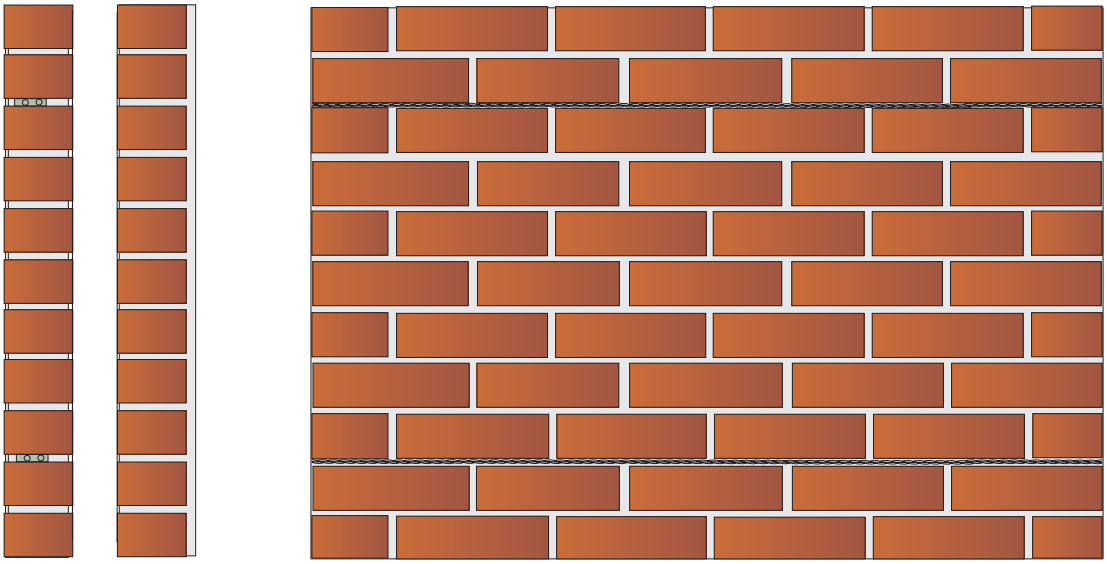
c) Tri-bars are to extend a minimum of 500 mm each side of crack.

d) Where a crack is within 500mm of the end of a wall the Tri-bar is to be continued for at least 100mm around the corner.

e) Where a crack is within 500mm of an opening the Tri-bar is to be bent back and fixed into the reveal.

TB-09

Installing Reinforcement Beams in Cavity Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slots.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(6) Push second Tri-bar rod into the grout until a good coverage is achieved.

(7) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set repoint joint to match existing mortar joint.

Installation Notes: Unless specified otherwise the following criteria are to be used

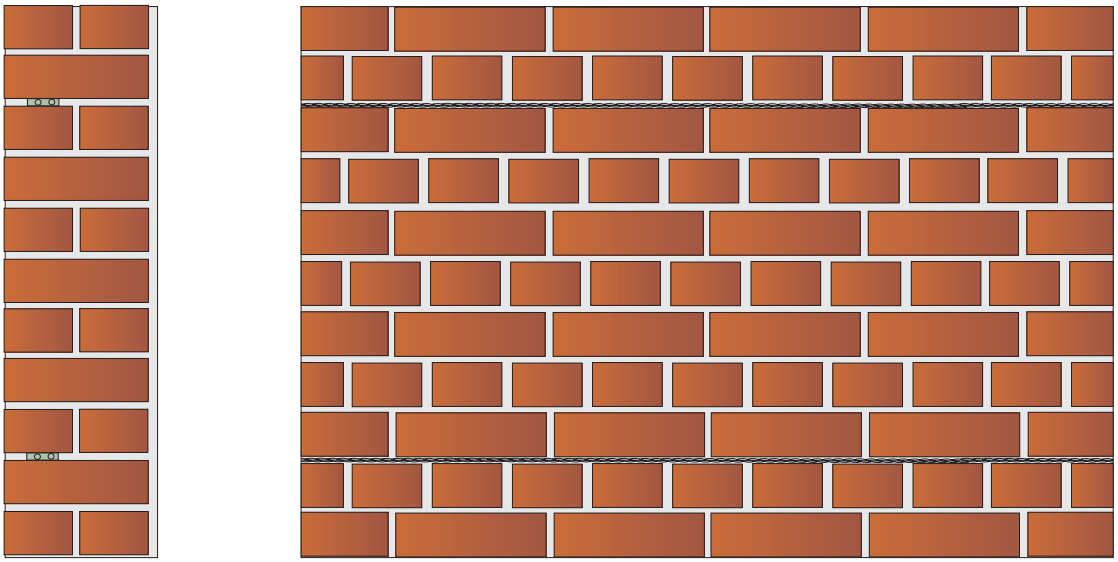
a) The depth of slot to be 40 to 55mm

b) When joining in long runs of Tri-bars a minimum of 500 mm overlap must be allowed.

C) Spacing between top and bottom beams should be positioned as far apart has practicable to a maximum distance of 0.9m (12 brick courses).

TB-10

Installing Reinforcement Beams in Solid Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slots.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(6) Push second Tri-bar rod into the grout until a good coverage is achieved.

(7) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set repoint joint to match existing mortar joint.

Installation Notes: Unless specified otherwise the following criteria are to be used

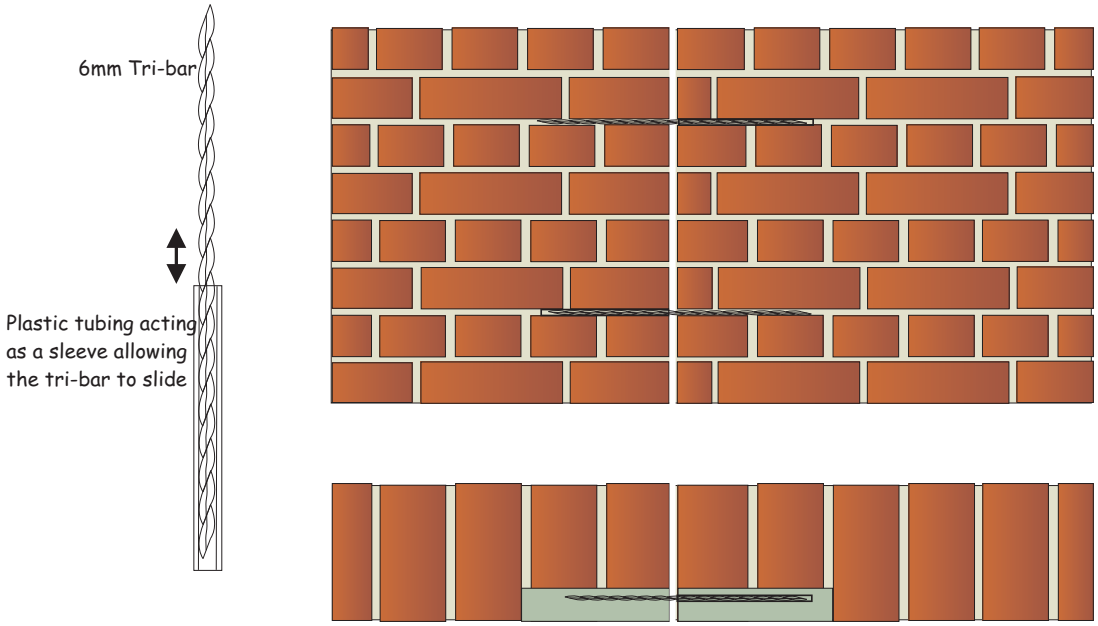
a) The depth of slot to be 55 to 70mm

b) When joining in long runs of Tri-bars a minimum of 500 mm overlap must be allowed.

C) Spacing between top and bottom beams should be positioned as far apart has practicable to a maximum distance of 0.9m (12 brick courses).

TB-11

Installing Movement Joints in Solid Walls



(1) Cut out movement joint to specified width and location.

(2) Cut out slots into horizontal mortar joints to specified depth and length on either side of the movement joint at required vertical spacings.

(3) Blow out slots and insert a bead of Tri-set resin Approx 10mm in depth into the back of the slots.

(4) Slide the plastic tubing over one end of the Tri-bar rod and push the complete assembly into the resin, make sure that no resin comes into contact with the tri-bar being sleeved by the tubing.

(5) Insert a second 10mm bead of resin over the Tri-bar and Tubing until a good coverage is achieved.

(6) When resin has set, repoint slots to match existing mortar joints and seal movement joint with foam and colour matching polysulphides.

Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 70mm.

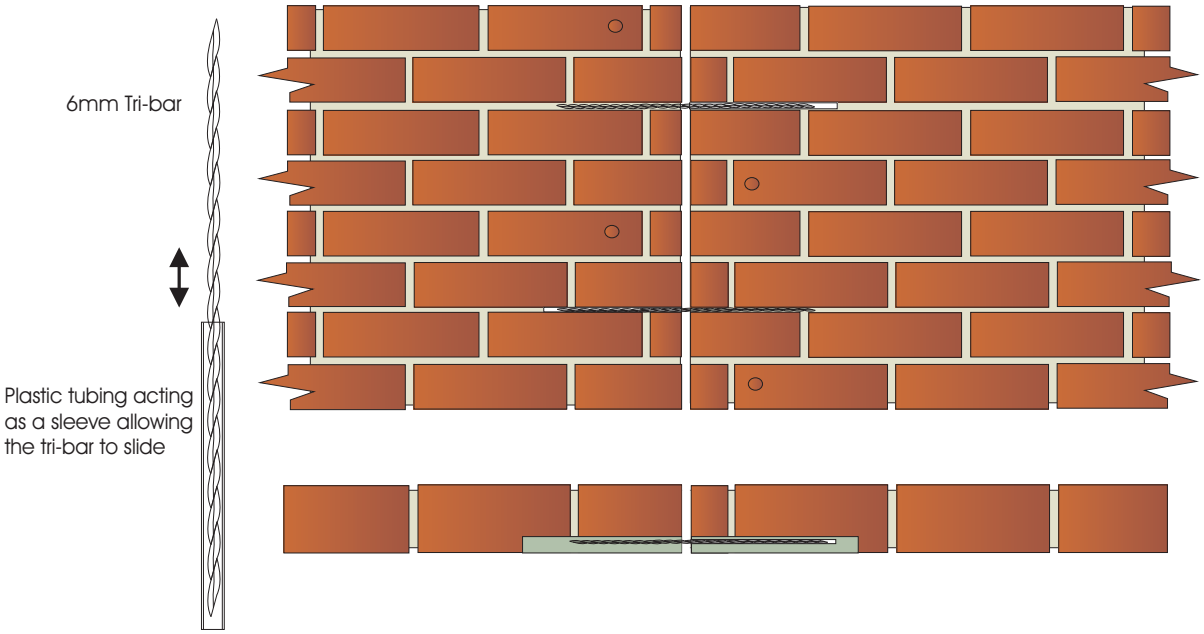
b) Tri-bar and sleeving length to extend 200mm either side of movement joint.

c) Normal vertical spacing of Tri-bar assemblies is 300mm (4 brick courses).

d) Alternate sleeves either side of movement joint.

TB-12

Installing Movement Joints in Cavity Walls



(1) Install specified number of wall ties either side of new movement joint position

(2) Cut out movement joint to specified width and location.

(3) Cut out slots into horizontal mortar joints to specified depth and length on either side of the movement joint at required vertical spacings.

(4) Blow out slots and insert a bead of Tri-set resin Approx 10mm in depth into the back of the slots.

(5) Slide the plastic tubing over one end of the Tri-bar rod and push the complete assembly into the resin, make sure that no resin comes into contact with the tri-bar being sleeved by the tubing.

(6) Insert a second 10mm bead of Tri-set resin over the Tri-bar and Tubing until a good coverage is achieved.

(7) When resin has set, repoint slots to match existing mortar joints and seal movement joint with foam and colour matching polysulphides.

Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 70mm.

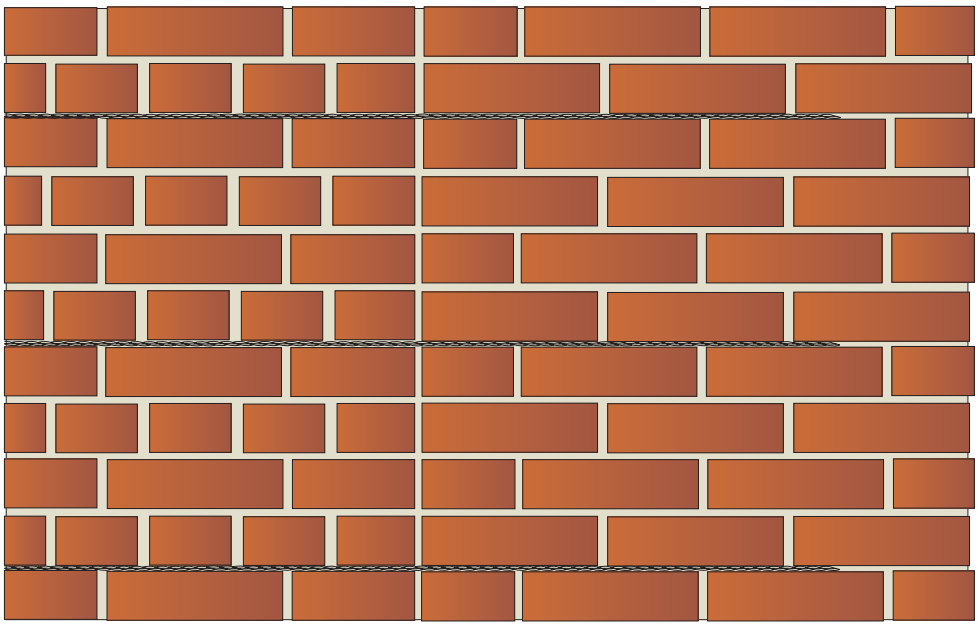
b) Tri-bar and sleeving length to extend 150mm either side of movement joint.

c) Normal vertical spacing of Tri-bar assemblies is 300mm (4 brick courses).

d) Alternate sleeves either side of movement joint.

E) Vertically stagger wall ties 225mm either side of movement joint, and not more than 225mm from joint.

Repairing Cracks at Junction of Solid and Cavity Walls



(1) Cut out slots into horizontal mortar joint to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(6) When Cemspand has set repoint joint to match existing mortar joint.

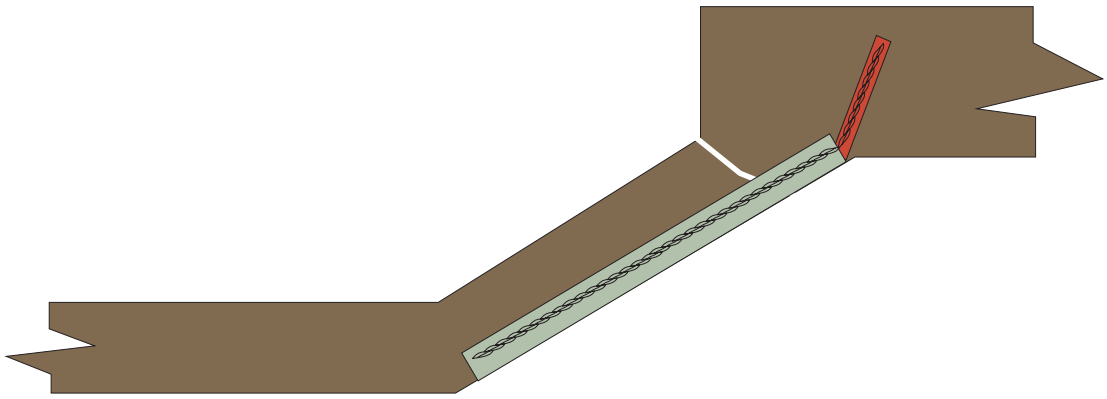
Installation Notes: Unless specified otherwise the following criteria are to be used

a) The depth of slot to be 35mm.

b) Normal vertical spacing of crack stitches is 300mm(4 brick courses).

c) Tri-bars are to extend a minimum of 500 mm each side of crack.

Bay Window Repair, Crack Confined to Junction



(1) Cut out horizontal slots to specified depth and at required vertical spacings, continue slots into bay junction.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots meet an internal corner, drill 10 mm hole into the adjoining wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bar to required length and bend the end to suit hole and slot.

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill hole with Tri- set resin push Tri-bar rod into the resin and grout until a good coverage is achieved.

(8) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

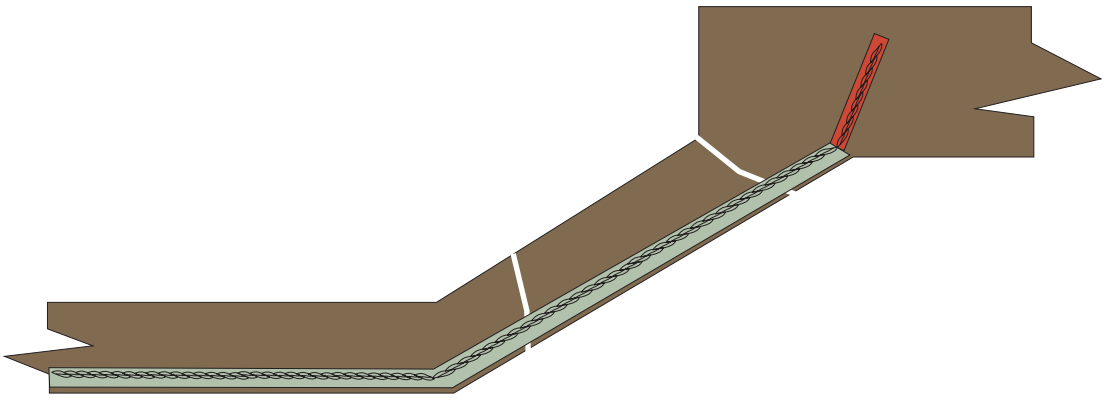
(8) When Cemspand has set replaster joints.

Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 25 to 35mm (not including plaster).

b) Normal vertical spacing of crack stitching is 450mm and Tri-bars to extend 500mm beyond any cranks in the Bay.

Bay Window Repair, Cracks in Various Places around Bay



(1) Cut out horizontal slots to specified depth and at required vertical spacings, continue slots into bay junction.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots meet an internal corner, drill 10 mm hole into the adjoining wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bar to required length and bend the end to suit hole and slot.

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill hole with Tri- set resin push Tri-bar rod into the resin and grout until a good coverage is achieved.

(8) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set replaster joints.

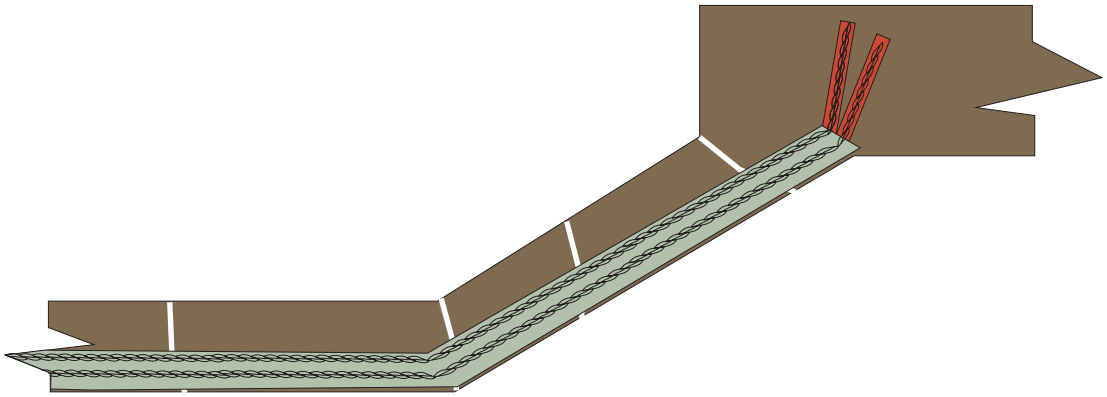
Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 25 to 35mm (not including plaster).

b) Normal vertical spacing of crack stitching is 450mm and Tri-bars to extend 500mm beyond any cranks in the Bay.

TB-16

Bay Window Repair, Cracks in Various Places around Bay, Brickwork in Poor Condition



(1) Cut out horizontal slots to specified depth and at required vertical spacings, continue slots into bay junction.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots meets bay junction , drill 10 mm hole into the adjoining wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bars to required length and bend the bars to suit holes and slot.

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill holes with Tri- set resin push Tri-bar rod into the resin and grout until a good coverage is achieved.

(8) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(9) Push second Tri-bar rod into the resin and grout until a good coverage is achieved.

(10) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(11) When Cemspand has set repoint joints.

Installation Notes: Unless specified otherwise the following criteria are to be used.

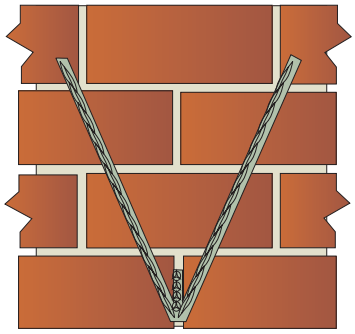
a) The depth of slot to be 40 to 55mm.

b) Normal vertical spacing of crack stitching is 450mm, install beams above and below windows.

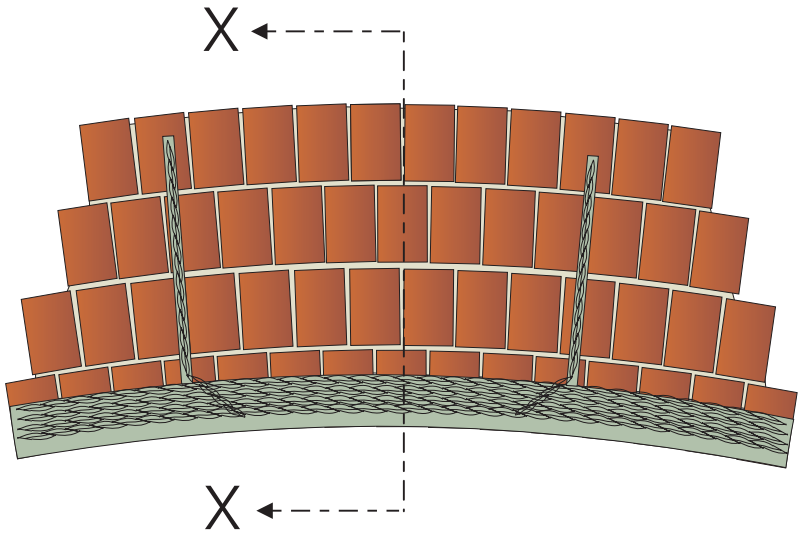
C) Run Tri-bars around bay as in TB-09 and insert ends as in TB-06 into main wall either side of bay

d) Provide additional support to any failed lintels or arches, and Bow-fix into floor and ceiling timbers

Repairing Brick Arch Structures, Brick Arch Reinforcement



Section xx



(1) Cut out slots into underside of arch to specified depth and at required spacings.

(2) Drill clearance holes (12mm-16mm diameter depending upon length of tie to be used) to required depth and required spacing along slots. The holes to be angled at approximately 60 degrees to the right or left of the slots. Alternate holes to go in opposite directions.

(3) Blow out holes and thoroughly flush with water.

(4) With the aid of a grout gun and correct length of nozzle, pump Cemspand cementitious grout until nozzle is full. Insert nozzle to the full depth of drilled hole and pump grout to fill hole. Allow the back pressure to push nozzle out while filling or voids with grout.

(5) Push correct length of Cem-Fix tie into the hole using insertion tool. The end of the tie to be left bent slightly and protruding in slot for Tri-bar reinforcing.

(6) Clean grout away from all protruding ends of Cem-Fix ties and allow 24 hours for grout to achieve an initial set.

(7) After 24 hours blow out slots and thoroughly flush with water.

(8) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot. Push first Tri-bar rod into the grout until a good coverage is achieved.

(9) Insert another 10mm bead of Cemspand cementitious grout over existing Tri-bar and push next Tri-bar rod into the grout until a good coverage is achieved.

(10) Continue to install reinforcements as per (9) above until required number of Tri-bar rods have been installed.

(11) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(11) When Cemspand has set repoint joints.

Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 65 to 75mm.

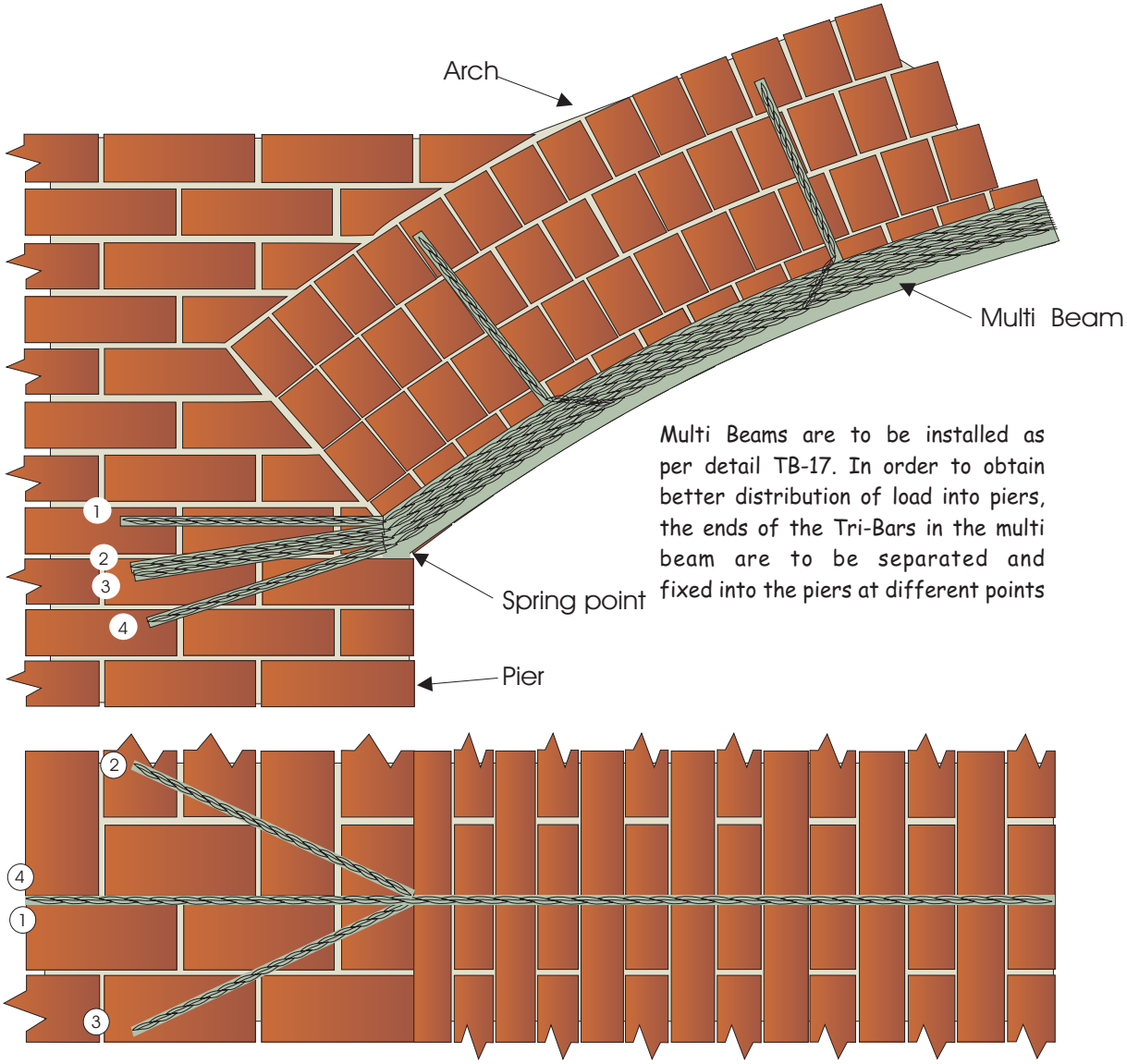
B) Number of Tri-Bars per slot to be 4

c) Normal spacing of reinforcement slots to be 450mm,

d) Normal spacing between Cem-Fix ties along slots to be 450mm.

E) When joining runs of Tri-Bar a minimum of 500mm overlap must be allowed and all joints must be staggered

Repairing Brick Arch Structures,Beam End Fixing



(1) Cut out slots for multi Beams down to start point of arch. Drill clearance holes (12mm-16mm diameter depending upon length of tie to be used) to required depth in line with slot for Tri-Bar 1 (Top) and Tri- Bar 4 (bottom). The holes should be angled upwards and down wards from the line of the reinforcing to give an angle of about 30 degrees between them.

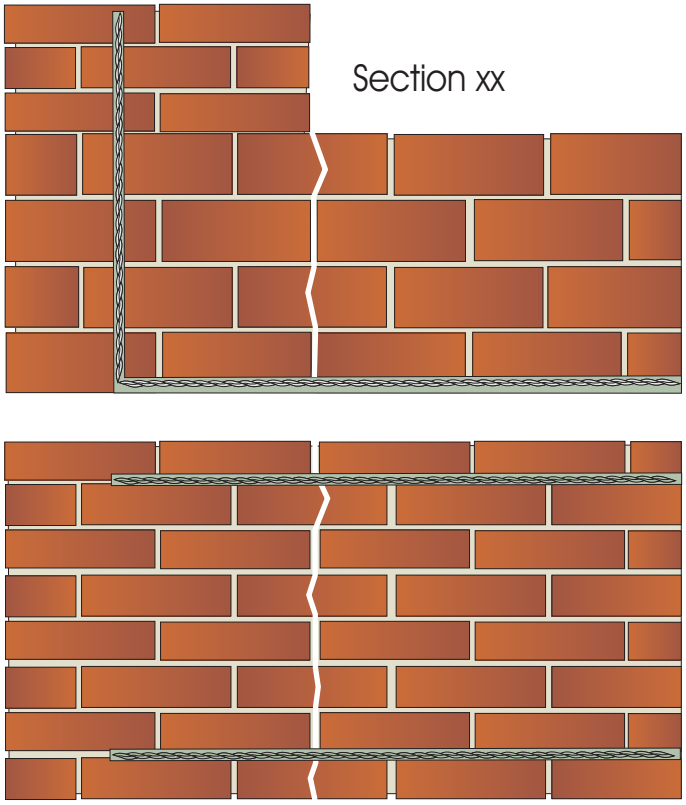
(2) Drill clearance holes (12mm-16mm diameter depending upon length of tie to be used) to required depth outwards from the slot for Tri-Bars 2 and 3 (central bars). The holes should be angled left and right to give an angle of about 30 degrees between the line of the hole and the line of the reinforcing to be 60 degrees between holes.

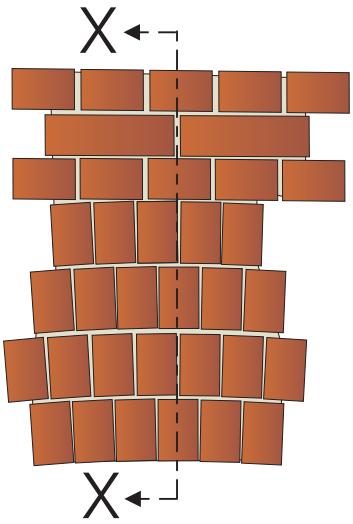
(3) Blow out holes and thoroughly flush with water. With the aid of a grout gun and correct length of nozzle, pump Cemspand cementitious grout until nozzle is full. Insert nozzle to the full depth of drilled hole and pump grout to fill hole. Allow the back pressure to push nozzle out while filling or voids with grout. Bend Tri-Bar to correct shape and insert end of tri-bar into full depth of grout filled hole. Install remainder of Tri-Bar around arch as per detail in TB-17.

Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of holes in pier to be 450mm.

Repairing Brick Arch Structures, Brick Arch Reinforcement





Plan of underside of arch

(1) Cut out 10mm wide slots in bed joints to underside of arch to specified depth and at required spacings.

(2) Drill clearance holes (12mm-16mm diameter depending upon length of tie to be used) torequired depth at ends of slots.

(3) Blow out holes and thoroughly flush with water.

(4) With the aid of a grout gun and correct length of nozzle, pump Cemspand cementitious grout until nozzle is full. Insert nozzle to the full depth of drilled hole and pump grout to fill hole. Allow the back pressure to push nozzle out while filling or voids with grout

(5) After changing nozzle insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(6) Bend Tri-bar to correct length and shape and insert end of Tri-bar into full depth of the hole. Then pushremainder of Tri-bar into bead of grout in slot to obtain good coverage.

(7) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(8) When Cemspand has set repoint joints.

Installation Notes: Unless specified otherwise the following criteria are to be used.

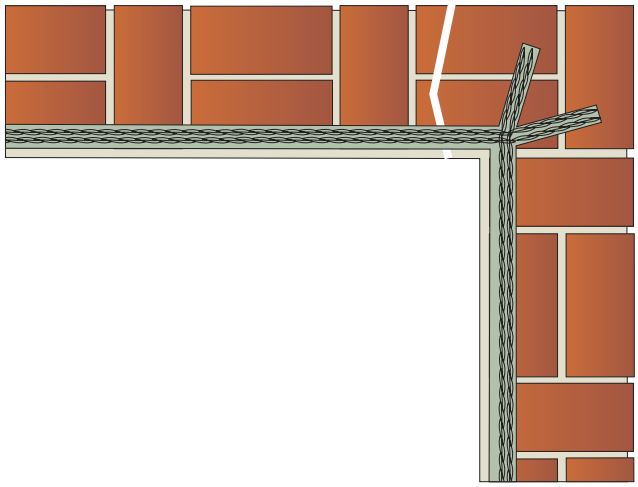
a) The depth of slot to be 45mm.

b) Normal spacing between Tri-bars to be 450mm.

c) Tri-Bars are to extend a minimum of 500mm either side of the crack. If this is not possible then ends of each Tri-bar to be bent and grouted into the brickwork.

TB-20

Reconnect internal corners in Solid Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings, continue slots into corner.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots meet an internal corner, drill 14 mm hole into the wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bar's to required length and bend the end to suit hole and slot

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill hole with Tri- set resin push Tri-bar rods into the resin and grout until a good coverage is achieved.

(8) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(9) Push second Tri-bar rod into the resin and grout until a good coverage is achieved.

(10) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(11) When Cemspand has set replaster joints.

Installation Notes: Unless specified otherwise the following criteria are to be used.

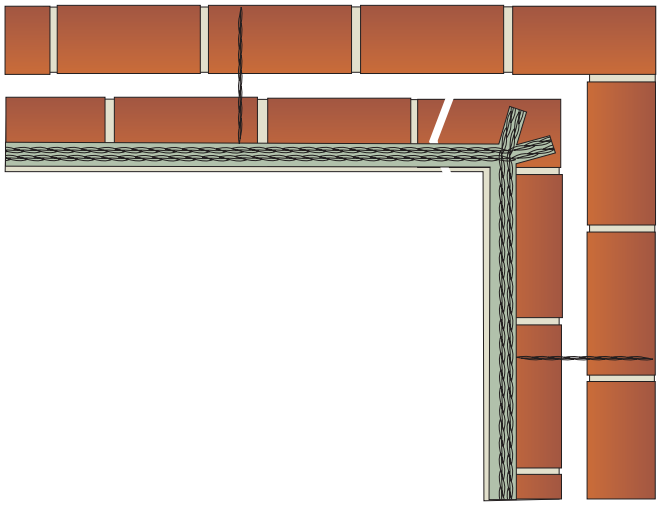
a) The depth of slot to be 55 to 70 mm (not including plaster).

b) Normal vertical spacing of internal crack stitching is 450mm and Tri-bars to extend 500mm beyond any cranks in the internal wall.

C) depth of holes to be 150mm

TB-21

Reconnect internal corners in Cavity Walls



(1) Cut out slots into horizontal mortar joints to specified depth and at required vertical spacings, continue slots into corner.

(2) Blow out slots and thoroughly flush with water.

(3) Where slots meet an internal corner, drill 14 mm hole into the wall as shown.

(4) Blow out hole to remove dust debris.

(5) Cut Tri-bar's to required length and bend the end to suit hole and slot

(6) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(7) Fill hole with Tri- set resin push Tri-bar rods into the resin and grout until a good coverage is achieved.

(8) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod.

(9) Push second Tri-bar rod into the resin and grout until a good coverage is achieved.

(10) Insert a final 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(11) When Cemspand has set replaster joints.

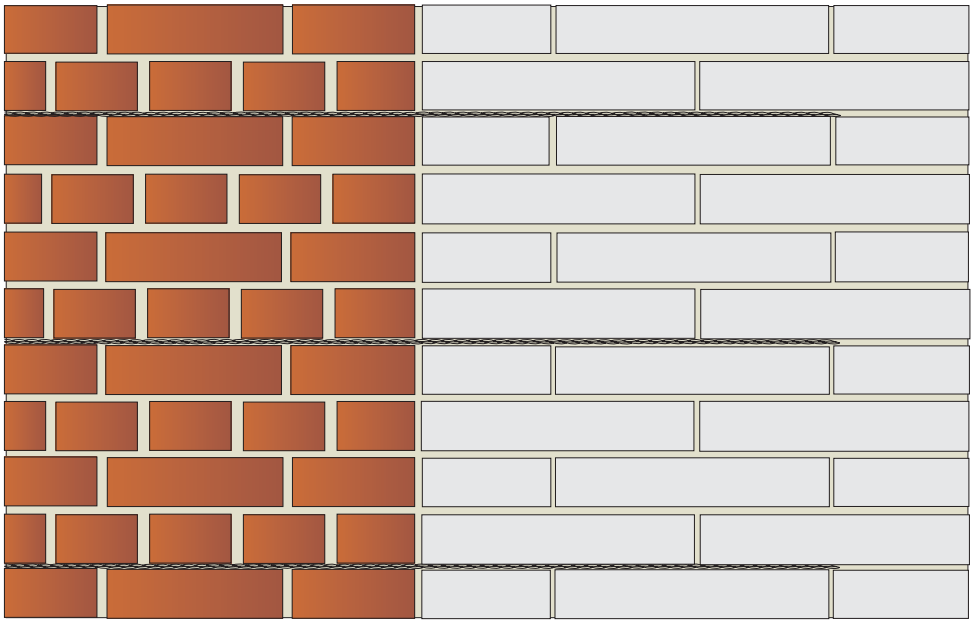
Installation Notes: Unless specified otherwise the following criteria are to be used.

a) The depth of slot to be 40 to 45 mm (not including plaster).

b) Normal vertical spacing of internal crack stitching is 450mm and Tri-bars to extend 500mm beyond any cranks in the internal wall.

C) depth of holes to be 80mm

Repairing Cracks at Junction of untied Solid Walls



(1) Cut out slots into horizontal mortar joint to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(6) When Cemspand has set repoint joint to match existing mortar joint.

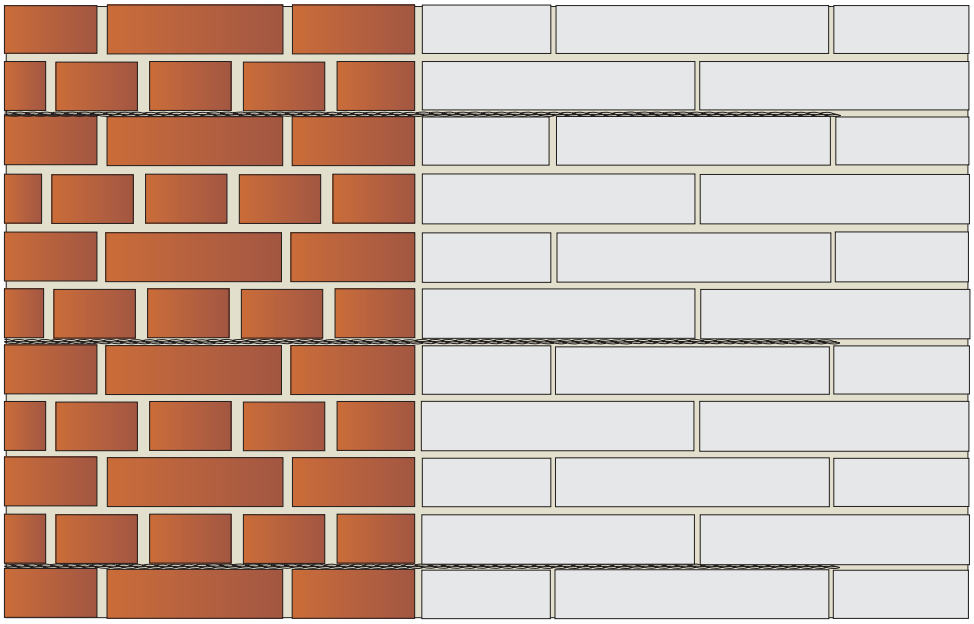
Installation Notes: Unless specified otherwise the following criteria are to be used

a) The depth of slot to be 35mm.

b) Normal vertical spacing of crack stitches is 300mm(4 brick courses).

c) Tri-bars are to extend a minimum of 500 mm each side of crack.

Repairing Cracks at Junction of untied Solid Walls



(1) Cut out slots into horizontal mortar joint to specified depth and at required vertical spacing.

(2) Blow out slots and thoroughly flush with water.

(3) With the aid of a grout gun insert a 10mm bead of Cemspand cementitious grout into the back of the slot.

(4) Push the Tri-bar rod into the grout until a good coverage is achieved.

(5) Insert a second 10mm bead of Cemspand cementitious grout over the exposed rod and iron into slot using a finger trowel.

(6) When Cemspand has set repoint joint to match existing mortar joint.

Installation Notes: Unless specified otherwise the following criteria are to be used

a) The depth of slot to be 35mm.

b) Normal vertical spacing of crack stitches is 300mm(4 brick courses).

c) Tri-bars are to extend a minimum of 500 mm each side of crack.

PRODUCT DATA SHEET

Chemical Composition, Mechanical & Design Properties for product profiles used in the manufacture of Tri-bars, Ties and Fixings.

Chemical Composition

Austenitic Steel	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Ni %
304.S15	0.06	1.0	2.0	0.045	0.030	17.5-19.0	-	8.0-11.0
316.S31	0.07	1.0	2.0	0.045	0.030	16.5-18.5	2.00-2.50	10.5-13.5

Mechanical Properties

Size ∅mm	0.1%PS N/mmsq	**0.2%PS N/mmsq**	1%PS N/mmsq	2%PS N/mmsq	UTS% N/mmsq	ELONg ON 50mm
4.5	813.1	**911.8**	1205.0	1276.3	1284.9	5.18
6.0	698.7	**803.4**	1015.1	1132.1	1155.38	7.37
8.0	707.9	**814.0**	1065.0	1147.1	1170.6	7.28

Design features

Size ∅mm	Cross Section Area mm2	Pitch of Helix mm	Angle of Helix Degrees	Core Diameter mm2	Number of Finns Units	Length of Finns mm	Radius of Finn end mm
4.5	5.250	10	25	1.5	3	1.5	0.35
6.0	10.056	14	25	1.8	3	2.5	0.35
8.0	10.913	16	25	1.95	3	3.0	0.35

Cem-Spand

Cem-spand is a specially formulated High performance injectable cementitious grout for bonding metal to all types of common masonry substrates. Cem-spand has the added benefit of being able to control its properties to suit the required applications when carrying out structural works and repairs. Cem-spand is supplied in a bucket container with a controlled amounts of clean aggregates, liquid milk and additional expanding agent.

Cem-spand with injection gun

Benefits

- Controlled expansion.
- Controlled compression strength.
- Thixotropic grout
- Rapidly cures and develops high compressive strength.
- Clean, safe and easy to use.

Testing Compression strength

Monitoring expansion

Manufacturers of Wall Ties, Structural Repair Systems & fixings
Unit 3.5 Central Point, Kirpal Rd Portsmouth, PO3 6FH
TEL 023 92298443 Fax 023 9229 8445 Email mail@ wallfast.co.uk Web wallfast.co.uk

TRISET PRODUCT DATA SHEET

DESCRIPTION

Triset is a rapid curing 'one shot' two part chemical anchoring cartridge system based on a polyester resin. Applied in one single action to produce a cost effective, tough, chemical resistant fixing. Triset is ideal for close-to edge applications (unlike expansion anchors) as no stress is placed on the surrounding substrate. Versatile in use, Triset is suitable for fixing wall ties, starter bars, studs, bolts or large screws in a wide range of substrates including brickwork, concrete, masonry, stone and PF A blocks. Hollow base materials can be securely fastened into by using Triset in conjunction with a sleeve or sieve.

PREPARATION

1. Drill hole to the correct diameter and depth (see chart for guide), ideally using a rotary percussion machine. For optimum results the hole must be coarse sided. If the holes are produced by diamond drilling the surfaces should be thoroughly roughened.

2. Remove all dust and debris from the hole using a hand air pump or a stiff rotary brush.

3. All bars should be clean and free from oil or grease and all flaking rust should be removed. Threaded rod or struts should be chisel-ended to prevent them being unscrewed from the cured resin.

APPLICATION

1. Attach the mixing nozzle tot he cartridge (screw down hand tight).

2. Mount the cartridge into the dispensing gun.

3. Squeeze out material through the nozzle until an even colour is achieved (approximately 5-6 inches of extruded material should be adequate).

4. Apply to the hole working from the base out. Once the required fill is obtained release the pressure and wipe away excess material. Place the bolt or screw into the hole with a rotary action. Wipe away excess material. Attach fixture once resin has cured.

NB Once material has started to extrude through the nozzle over pressuring the system will not

Manufacturers of Wall Ties, Structural Repair Systems & fixings
Unit 3.5 Central Point, Kirpal Rd Portsmouth, PO3 6FH
TEL 023 92298443 Fax 023 9229 8445 Email mail@ wallfast.co.uk Web wallfast.co.uk

increase flow rate. And can cause 1eakage from the rear of the cartridge.

TECHNICAL DATA

MIXING RATIO 10: 1 by volume

Supplied in 380ml cartridges

TEMPERATURE (C)	(F)	GEL TIME (Minutes)	CURE TIME (Minutes)
5	41	12	240
10	50	9	180
15	59	6	150
20	68	5	120
25	77	3	60

ULTIMATE PHYSICAL PROPERTIES

Tensile Strength	**(ASTM 638)**	-> **1ON/mm sq.**
Compressive Strength	(ASTM 695)	-> **78N/mm sq.**
Flexural Strength	(ASTM 790	- **21N/mm sq.**
Elastic Modulus		**- 4570N/mm sq.**
Mixed Density		- **1.65g/cm sq.**

The above physical properties were arrived at independently by Birmingham City Laboratories.

ANCHOR SIZE (mm)	HOLE DIAMETER (mm)	HOLE DEPTH (mm)	TENSION (kN) (Ultimate pull out)	FIXINGS PER UNIT (Holes Filled 2 Quarters Full) 380ml
8	10	80	23.7	90
10	12	90	25.7	56
12	14	110	43.3	34
16	18	125	53.7	18
20	22	150	58.3	10

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Tension figures quoted are tested in accordance with BS5080 part 1 in 63 N/mm sq concrete blocks (12 x 12 x 12 inches). In all cases for 16mm and 20mm anchors failure of the concrete block was observed before the anchor was dislodged.

The ultimate pull out strength is varied by:

1. The strength of both the substrate and bar/stud
2. The length of the resin bond to bar
3. Hole preparation
4. Anchor separation

Safety factors of between 2:1 and 4:1 should be considered depending on the strength and nature of the substrate. Due to the inconsistent nature of hollow blocks and bricks tension figures may vary. Site testing should be carried out where necessary to establish particular suitability. In order to achieve maximum performance the distance between the centres of the anchors should be a minimum of2.5 x the embedment depth, and 1.25 x the embedment depth for the minimum distance from edges.

STORAGE

Store in a dry area between 5 C and 25 C. Do not expose to direct sunlight. Storage at higher temperatures will reduce the shelf life.

HEALTH AND SAFETY DATA

Triset contains styrene and is flammable. Do not smoke and do not allow naked flames to come into contact with this material. Avoid breathing vapour and wear suitable protective clothing such as gloves and overalls. On contact with skin wash off immediately with plenty of soap and water.

IMPORTANT

The information and data given is based on our own experience, research and testing and is believed to be reliable and accurate. However, as Wallfast Ltd. cannot know the varied uses to which its products may be applied, or the methods of application used, no warranty as to the fitness or suitability of its products is given or implied. It is the users responsibility to determine suitability of use. For further information, please contact our Technical Department.