



# INNER STRENGTH IN CONSTRUCTION



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# inner strength in construction

ACS is a global leader in manufacturing specialist structural building components. We offer the most technologically advanced products backed up with unparalleled levels of customer service. As market leaders we continually invest in product development, delivering innovative designs that provide the unique solutions our customers demand. Working together with Brunswick, ACS are now bringing the latest technologies and products to the Australian market, offering the highest quality products direct from the manufacturer.

We offer a range of services:

- Sales
- Estimating
- Technical Support
- Specification
- Design
- Manufacturing
- Distribution

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## PRIDE IN OUR PEOPLE PRIDE IN OUR PRODUCTS

What sets ACS and Brunswick apart is the work of our passionate and committed team. Every member of our staff is dedicated to the needs of our customers – they are flexible, adaptable and motivated to deliver the best quality, engineered solutions on time, every time.

### RAPID DELIVERY

ACS and Brunswick give you the fastest manufacturing times in the industry. With a range of delivery options, our service is precisely tailored to your needs. We operate across all states in Australia, and offer express next day delivery and three day deliveries to suit your construction programme needs on our range of standard products.

### FLEXIBLE APPROACH

ACS and Brunswick's products have been specifically designed and manufactured to meet your needs and requirements. We take the time to listen to you, and continually adapt and refine the way we work to ensure we can surpass your expectations with a service that is second to none in the industry.

### COMPETITIVE PRICING

By buying direct from the manufacturer, and with our advanced manufacturing processes, we can offer very competitive pricing on all of our products. This ensures that you will always get the very best value for our unique range of innovative building solutions.

### QUALITY ASSURED

Our products are independently tested to ensure that they conform to the appropriate Australian standards. ACS and Brunswick operate a stringent quality inspection procedure to ensure that the goods received on site are to the highest standards.

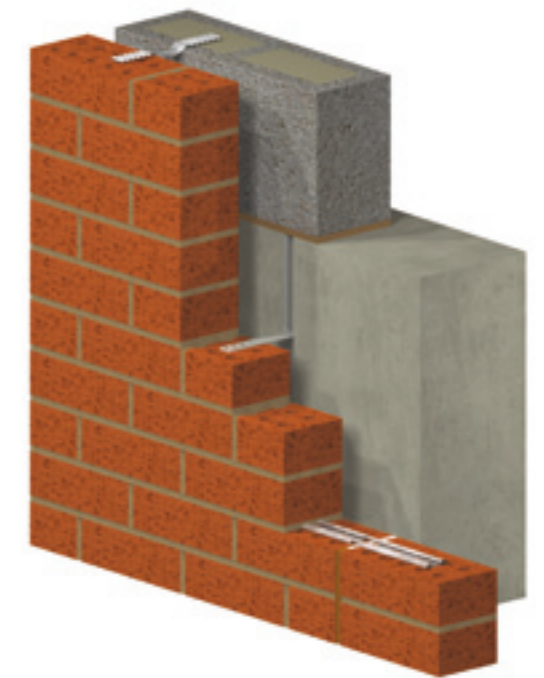
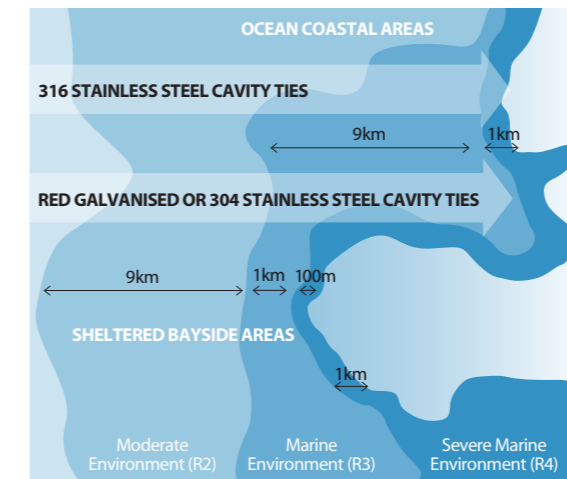
### EXPERT ADVICE

Our technical department has an in-depth specialist knowledge in the construction industry, and is able to design solutions to meet your specific requirements. They are also able to provide assistance for specifiers, contractors, architects and engineers with fully verified calculations. All ACS products are covered by our comprehensive indemnities and insurance warranties, so you can have complete confidence in all of our products and designs.



### Introduction & Wall Tie Selection

Brunswick Sales manufactures and supplies a full range of wall ties produced in either pre-galvanised steel, hot dip galvanised steel, or grade 316 stainless steel. Wall ties should be selected and positioned in accordance with the Australian Standards on Masonry Structures and Masonry Ties (AS 3700 & AS 2699). In addition to this, the choice of tie depends on the distance of the structure from the coast and whether that coast opens into a sheltered bay or clear ocean. For further information regarding the correct selection of wall ties please refer to the information below or contact Brunswick Sales for details.



### Ocean Coastal Areas

Tie Type	0-1 km severe marine	1-9 km marine	>10 km mod - mild
Steel strip ties	316 stainless steel R4	316 stainless steel R4 304 stainless steel R3 Hot Dipped Galv R3	316 stainless steel R4 304 stainless steel R3 Galvanised Z600 R2
Steel wire ties	316 stainless steel R4	316 stainless steel R4 304 stainless steel R3 Hot Dipped Galv R3	316 stainless steel R4 304 stainless steel R3 Hot Dipped Galv R3

### Sheltered Bayside Areas

Tie Type	0-1 km severe marine	1-9 km marine	>10 km mod - mild
Steel strip ties	316 stainless steel R4	316 stainless steel R4 304 stainless steel R3 Hot Dipped Galv R3	316 stainless steel R4 304 stainless steel R3 Galvanised Z600 R2
Steel wire ties	316 stainless steel R4	316 stainless steel R4 304 stainless steel R3 Hot Dipped Galv R3	316 stainless steel R4 304 stainless steel R3 Hot Dipped Galv R3

### Length of Tie and Embedment

Wall ties should be built into each leaf with a minimum embedment of 50mm for 50mm cavities. However Brunswick recommends an embedment of 75mm should be allowed when cavities exceed 75mm. The drip feature on a wall tie should be placed in the centre of an open cavity.

## Wall Ties

## Head Restraints



### MFA Posi Ties (Masonry/Masonry)

This standard heavy duty cavity tie is designed for standard cavity situations (50mm to 150mm) and can also be used in high wind and cyclonic areas. It has a minimum embedment of 50mm, and has a vertical raised centre profile to prevent moisture passing across the cavity. The MFA Posi Tie has been tested in accordance with AS2699: Wall Ties for Masonry Construction and offers a characteristic strength of 1.88kN in compression and 1.76kN in tension over a 50mm cavity. The MFA Posi Tie is available in sizes from 200mm up to 300mm in 50mm increments as standard and is available in either stainless steel grade 316 or galvanized steel depending on location criteria.

### MFA 4 /1 Head Restraint Tie (Masonry/Concrete)

The MFA 4/1 is designed to restrain the head of the inner leaf of a cavity wall or the top of internal walls. It is fixed using the backing plate connector that is fixed to the underside of the concrete slab, and the MFA 4/1 tail is then slotted into position. The head restraint is designed to allow for differential movement between the inner leaf and the structure whilst providing restraint to the panel. The foot of the restraint is bent into position to suit the brickwork coursing, whereas for blockwork the tie should be left straight, and should be installed into the bed or vertical joint no less than 50mm from an edge. The ties are designed and offer loading characteristics of 1.68kN and 0.29kN. The MFA 4/1 is manufactured as standard from galvanized mild steel and also in grade 316 stainless upon request.



### MFA Anchor Ties (Masonry/Masonry)

This extra heavy duty cavity tie is designed to be used for larger cavity situations (90mm or larger) or where a higher loading tie is required. It is designed for a minimum embedment of 50mm, and has a vertical twist to prevent moisture passing across the cavity. The MFA Anchor Tie has been tested in accordance with AS2699: Wall Ties for Masonry Construction and offers a characteristic strength of 1.88kN in compression and 2.87kN in tension over a 140mm cavity. The MFA Anchor tie is available in sizes from 200mm up to 400mm in 50mm increments as standard and also available in either stainless steel grade 316 or galvanized steel depending on location criteria.

### MFA 1 / MFA 2 Sliding Brick Head Restraint

The MFA 1 & MFA 2 is a sliding brick anchor system which is used where the inner and outer leaf of masonry needs to be tied back to the structure whilst allowing differential movement. The head of the anchor fixes to the soffit of the structure i.e. concrete, either by mechanical fixing method when using a MFA 1 or cast into the soffit using the MFA 2. Ties are slotted onto the stem leg and built into the inner and outer leaf to tie the masonry panel together. The stem leg is produced as a standard product at 500mm long, and is available in either hot dipped mild steel galvanized or grade 316 stainless steel. The ties shown on the drawings are supplied separately – details below.



### MFA 3/3M Straight Expansion Tie (Masonry/Masonry)

The MFA 3/3M is the most recognized wall tie in the Brunswick range of products. This tie is used for providing lateral stability to masonry walls where expansion or control joints are used. The tie allows up to 15mm of movement. The unit can be provided in a Galvanized steel finish or Grade 316 stainless steel. This product has been tested in accordance with AS2699: Wall Ties for Masonry Construction. The tie is supplied at 300mm in length.

### MFA 1/ MFA 2 Sliding Brick Component

The Brunswick MFA sliding brick component is designed to be used with the MFA 1 & 2 sliding brick head restraint system. The ties slot onto the stem and move up and down the stem leg tying the inner and outer leaves together. The ties are available in a range of sizes to suit the cavity size and come in either mild steel galvanized or grade 316 stainless steel.



## Frame Cramps

## Wall Ties



### MFA 10 Frame Cramp (Masonry/Concrete/Steel/Masonry)

The MFA 10 tie is used to tie masonry panels back to existing walls, either concrete, blockwork, or steelwork. The tie is mechanically fixed to the existing structure using the two fixing points in the upstand, and is designed to allow for vertical movement. The ties are supplied in a range of sizes from 100mm up to 250mm as standard in 50mm increments and are designed and tested in accordance with AS2699: Wall Ties for Masonry Construction. The MFA 10 offers characteristic strength of 0.58kN for a 0mm cavity, 0.57kN for a 40mm cavity and 0.31kN for a 65mm cavity. The ties are available in either stainless steel grade 316 or galvanized steel. When using the stainless steel ties against mild steel columns, these should be isolated to prevent bi-metallic corrosion from dissimilar materials.

### MFA 3/1 Movement Tie (Masonry/Masonry)

The MFA 3/1 is a standard flat movement tie to be used in vertical movement joints to allow the expansion of brickwork panels. Designed to allow 10mm differential movement, the tie is supplied 300mm long and is installed laterally into the brickwork panel at designed centres. The ties have been tested to achieve a loading capacity of 1.2kN in shear, and are available in stainless steel grade 316 and also in galvanized mild steel.



### MFA 12 Rigid Wall Tie (Masonry/Timber)

The MFA 12 is a face fix light duty wall tie designed to be used for brick veneer construction and as jamb ties. They are particularly convenient as a brick veneer tie when used in conjunction with reflective foil insulation. The face fixing method overcomes the need to puncture the foil during installation. The ties should be fixed with a 2.5mm diameter galvanized clout nail not less than 25mm long. The ties are available as standard with a 50mm upstand and in lengths of 100mm, 150mm and 200mm long and come in either galvanized steel or stainless steel.

### MFA Colgrip (Masonry/Steel Columns)

The MFA Colgrip tie is a revolutionary method of fixing masonry to steel columns without the use of costly welding or power fixings. The MFA Colgrip tie simply clips around the flange of the column allowing masonry to be tied back to the column whilst also allowing vertical and horizontal differential movement. The tie suits all column flange thicknesses and is designed to suit a range of cavity sizes up to 95mm and is supplied in 90mm, 110mm and 160mm long. The MFA Colgrip tie has been tested in accordance with AS2699: Wall Ties for Masonry Construction and offers characteristic strength at 1.55mm deflection of 1.80kN in compression and 0.40kN in tension over a 40mm span. The MFA Colgrip ties is manufactured from 5.6mm diameter wire and is available in both stainless steel grade 316 and also in galvanized mild steel.



### MFA 4 MB (Masonry/Concrete)

The MFA 4 MB is designed as a lateral support tie for single leaf walls requiring horizontal control gaps and also allows for differential movement in the place of the wall and allows for slab deflection. The tie opens along its sliders when the wall panel shrinks vertically and closes when the clay brick expands vertically. The tie is available as a standard product 75mm x 165mm and comes in either galvanized steel or grade 316 stainless steel. The ties have been tested and offer characteristic deflection at 1.5mm - 1.27kN.

### MFA 3/3 FB Restraint Tie (Masonry/Masonry/Concrete/Steel)

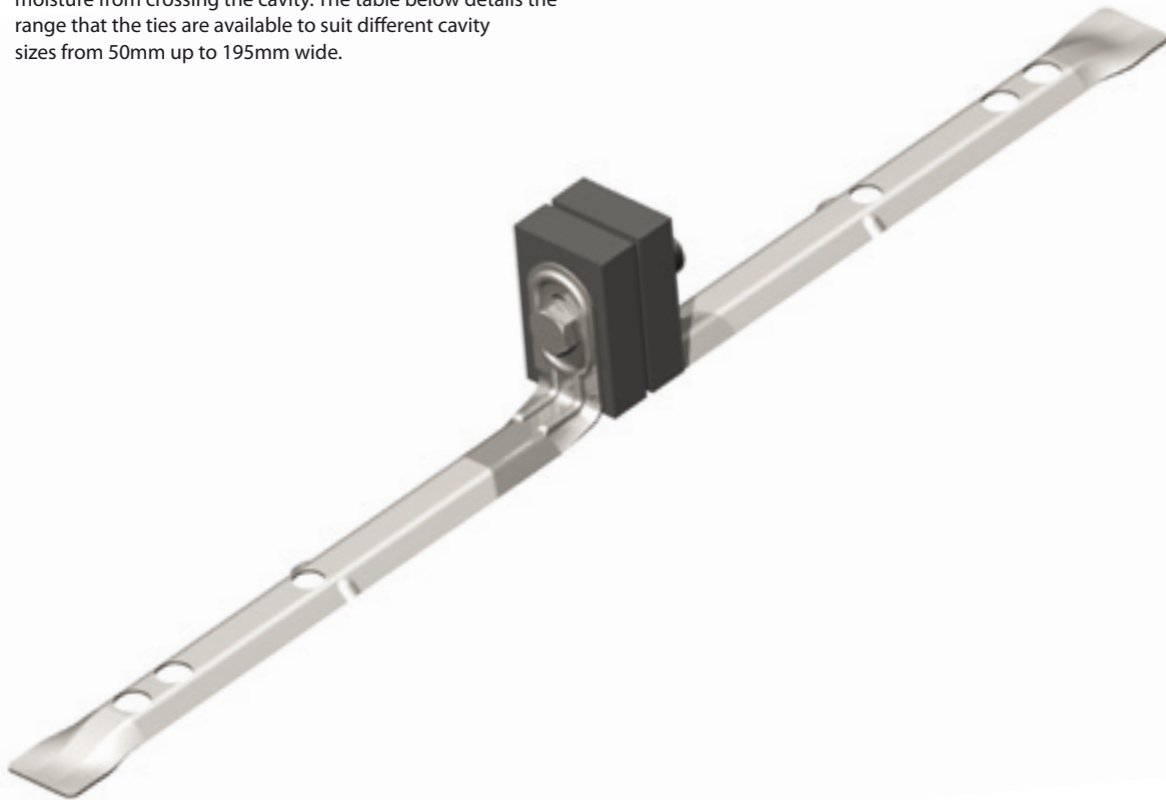
The MFA 3/3 FB is a tie designed for connecting new walls to either existing walls or structures. The tie can be fitted to either masonry walls, concrete panels or structural steelwork to allow for new walls to be constructed. The ties also allow for vertical or lateral differential expansion by use of the slider in the tie. The ties can be used to suit different types of brick or block combination – please consult Brunswick for details. The ties come in a range of sizes to suit different applications and come in either galvanized steel or grade 316 stainless steel. The ties have been tested in accordance with AS 2699 and offer a characteristic strength calculated on the load causing a deflection of 1.5mm – 0.41kN.



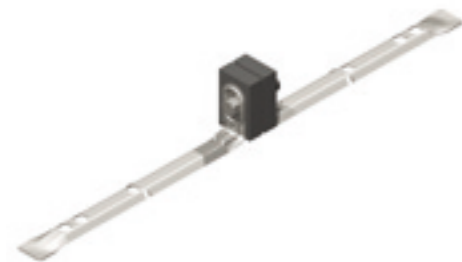
## Masonry Ties – Acoustic Type

### Acoustic Tie Heavy Duty (Masonry/Masonry)

The ACS Acoustic brickwork ties are designed to provide structural stability whilst attenuating noise and vibration between cavity walls. The ties, fixings and washers are manufactured from stainless steel grade 304 or 316 for high levels of corrosion resistance, and they are also available in galvanised mild steel. The natural rubber acoustic blocks are designed to ensure no metallic contact occurs between the external and internal brickwork or internal partitions reducing the passage of noise and vibration. The tie has a multi-drip feature that ensures a drip is positioned within the open cavity. The shape of the product and the multi-drip feature prevents moisture from crossing the cavity. The table below details the range that the ties are available to suit different cavity sizes from 50mm up to 195mm wide.



Registered design

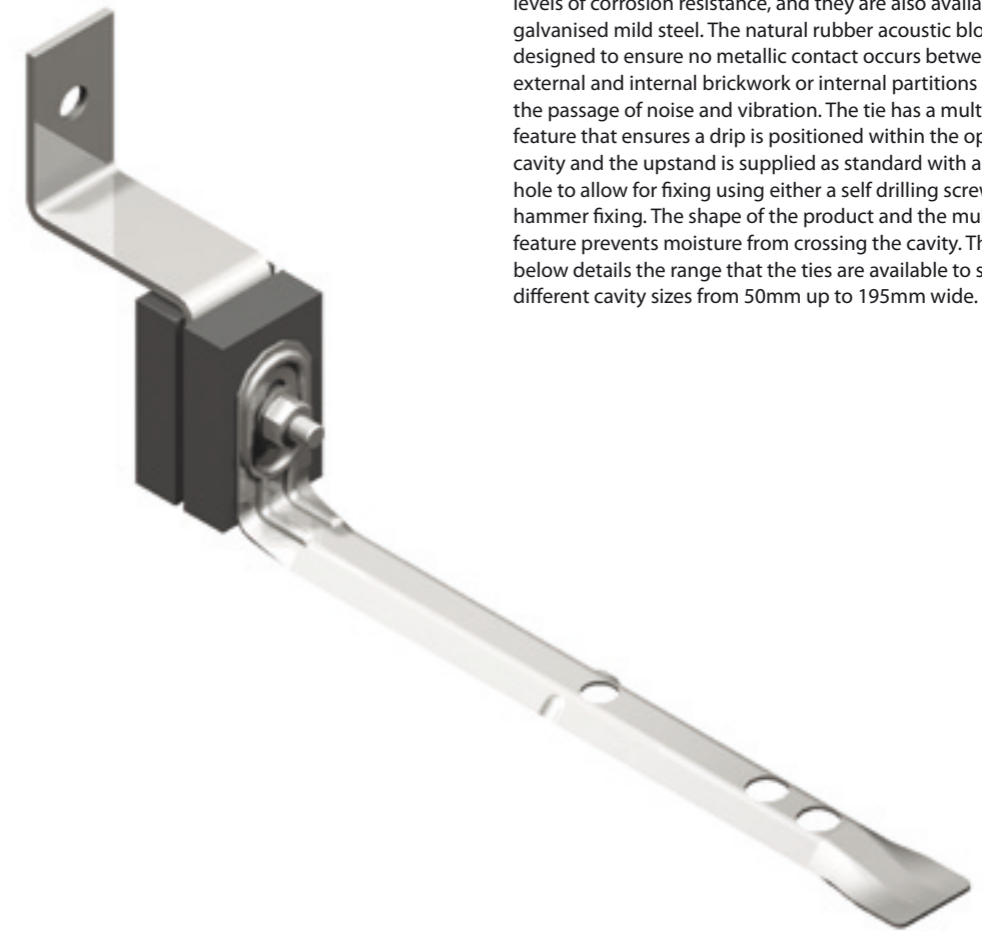


Nominal Cavity Width (mm)	Overall Length (mm)
50-70	200
71-95	225
96-120	250
121-145	275
146-170	300
171-195	325

## Masonry Ties – Post Fix Acoustic Type

### Acoustic Tie Heavy Duty Post Fix Cavity Tie (Masonry/Blockwork/Concrete)

The ACS Acoustic Post Fix brickwork ties are designed to provide structural stability whilst attenuating noise and vibration in cavity walls. The ties, fixings and washers are manufactured from stainless steel grade 304 or 316 for high levels of corrosion resistance, and they are also available in galvanised mild steel. The natural rubber acoustic blocks are designed to ensure no metallic contact occurs between the external and internal brickwork or internal partitions reducing the passage of noise and vibration. The tie has a multi-drip feature that ensures a drip is positioned within the open cavity and the upstand is supplied as standard with a 7mm hole to allow for fixing using either a self drilling screw or hammer fixing. The shape of the product and the multi-drip feature prevents moisture from crossing the cavity. The table below details the range that the ties are available to suit different cavity sizes from 50mm up to 195mm wide.



Registered design



Nominal Cavity Width (mm)	Overall Length (mm)	Outer Length (mm)
50-70	125	75
71-95	150	100
96-120	175	125
121-145	200	150
146-170	225	175
171-195	250	200

# Remedial Wall Ties

## Remedial Wall Ties

ACS supply a full range of remedial wall ties designed to replace existing wall ties that have failed, or where additional ties are required to meet the relevant Australian standards.

These are designed to suit the following materials:

- Dense Brick
- Soft Brick
- Hollow Brick
- Concrete Block 15N
- Lightweight Block 7N
- Concrete Reinforced Block
- Concrete Large Panel
- Timber Frame

Cavity wall tie corrosion is deemed to be a significant structural defect, and by using remedial wall ties to rectify the failure, this can save on the cost of removing entire facades and rebuilding brickwork elevations.

The ties are available in various sizes to suit a range of brick, block, concrete and timber applications, and our technical team can offer assistance on the best type of fixing method to suit each application. The ties are available in grade 304 stainless steel, and also grade 316 stainless steel to order. ACS can supply all the necessary installation tools, special torque wrenches, drill bits and resins to aid in the correct installation of these products.



# Masonry Support

## Introduction

ACS provides a wide range of masonry support systems designed to support the external leaf of masonry for all types of structures. The presence of a masonry support angle allows differential movement of the structure and the external cladding via a horizontal movement joint.

Horizontal movement joints are usually positioned at every storey or every other storey depending on the detail. However, the maximum allowable height of masonry to be supported is 9m or 3 storeys in height, whichever is less (refer to BS 5628: Part 1 - 2005).

Note: British Standards states that buildings not exceeding 4 storeys or 12 metres in height, whichever is less, may be uninterrupted for its full height.

## Materials

ACS masonry support systems are manufactured from stainless steel grade 304 and 316 as standard. Grade 316 stainless should be considered where the building is in a particularly corrosive environment or where part of the masonry support will be exposed.

## Adjustments/tolerances

ACS masonry support systems may be adjusted in 3 directions depending on the fixing detail to overcome site tolerances.

### • Vertical adjustment

This can be accommodated via the use of ALPHA or serrated washers over the vertical slots in the system.

### • Longitudinal adjustment

This can be accommodated via horizontal slots in steelwork or via a continuous cast in channel.

### • Lateral adjustment

This can be accommodated via stainless steel shims. The maximum allowable shim is the thickness of the bolt or 12mm whichever is less. If shimming exceeds this figure please liaise with ACS Technical Department.

ACS can also design a masonry support system where the support level is below the soffit of the structure. This is referred to as the "projection", and is denoted with "P" in the masonry support description. i.e. T1/L/50/6.9/CH/TB/P50 would be a masonry support system for a 50mm cavity, carrying 6.9kN of masonry bolted back to a cast in channel using T bolts with a 50mm projection below the soffit.



Isometric showing ALPHA Bracket & washer  
Patented design  
Registered design

## ALPHA Bracket System

Almost every support system designed and manufactured by ACS now incorporates the new ALPHA Bracket.

The ALPHA Bracket has been developed to replace the traditional serrated bracket and offers many advantages including the following:

## FEATURES

### • Lock safe

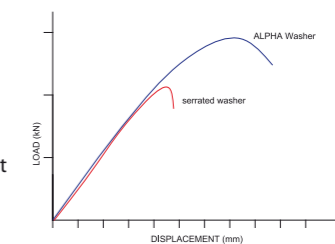
Where a serrated pad and washer fails, the positive locking ALPHA Bracket locks in on itself preventing catastrophic failure.

### • Finer adjustment

The ALPHA Bracket has over 5mm more vertical adjustment than a traditional serrated bracket system; in addition to this the ALPHA Washer allows 4mm fixing increments.

### • Economic

Because much greater loads can be achieved, in most cases fewer brackets need to be used. On a typical system we estimate this could save over 10%.



The ALPHA Bracket has been independently tested at Sheffield University and has been proven to perform on average over 20% better in shear than the traditional serrated bracket system.

The following guide allows designers to specify masonry support systems for most situations. However, ACS offers a full design service which includes sketch proposals & technical advice for all standard & nonstandard conditions.

## HOW TO ORDER

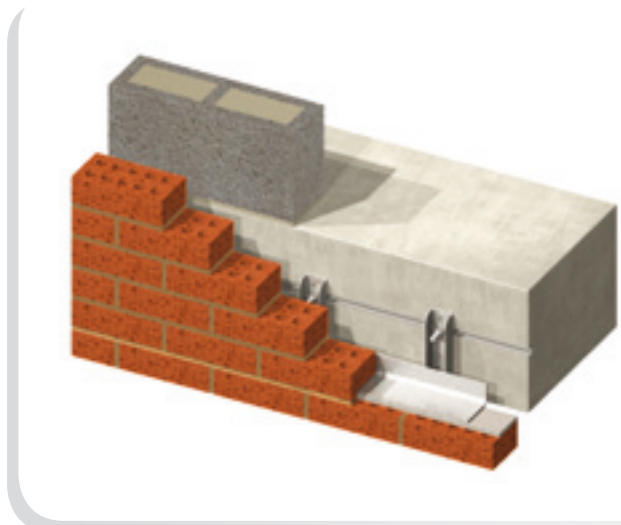
Type of system	Stone thickness	Cavity	Load	Structure	Bolt type
T1 = Bracket/ Angle	I = Inverted angle L = Standard	Fixing cavity (mm)	kN/m	S = Steel	EA = Expansion Anchor
T2 = Angle	U = Inverted			C = Concrete	RA = Resin Anchor
T3 = Individual	system			TC = Top Cleat	TB = T Head Bolt
	R = Radiused			CH = Channel	BB = Blind Bolt
				CET = Edge trim	SS = Set Screw

Example: **TL / L / 100 / 6.0 / C / RA**

This would indicate a Type 1 bracket angle system to suit a 100mm cavity & 6.0kN/m loading bolted back to concrete with resin anchors.

# T1 Masonry Support Variances to Concrete

# T1 Masonry Support Variances to Concrete & Steel

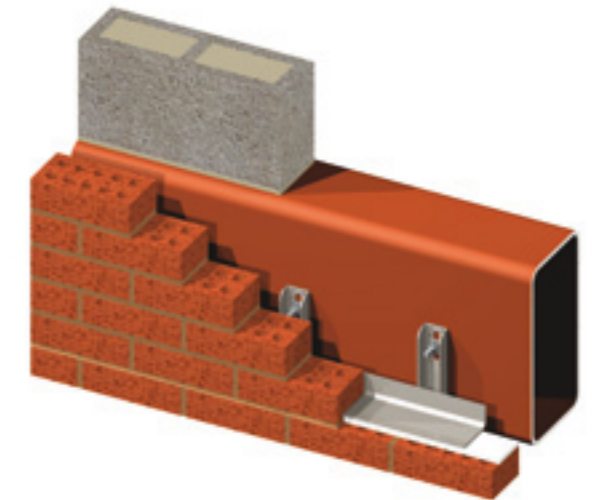


**Type 1 - Concrete Slab (Cast in Channel)**  
 ACS Type 1 masonry support systems can be bolted back to a stainless steel cast in channel at the slab edge using "T" head bolts. This allows for quicker installation of the masonry support system and negates the need for drilling into the slab edge which may contain reinforcement. ACS recommends the use of our 31/21 Curve Channel for most applications, but for particularly high loadings ACS offer alternative channels to suit. Please liaise with ACS for optimum setting out and levels of the cast in channel locations prior to casting of the structure.

Ref: T1 / L / \*\* / \*\* / CH / TB  
 fixing cavity (mm)      kN/m

**Type 1 - RHS (Blind Bolts)**  
 ACS Type 1 masonry support may be bolted back to the face of the rolled hollow section via a Blindbolt HD fixing. This bolt is specifically designed for fixing back to steel members where access is restricted.

Ref: T1 / L / \*\* / \*\* / S / BB  
 fixing cavity (mm)      kN/m

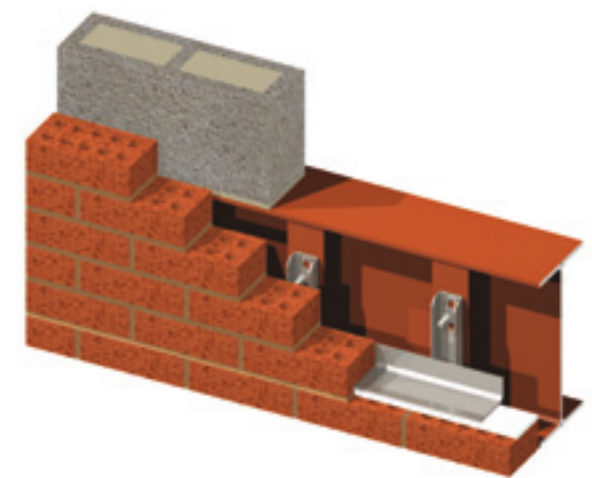


**Type 1 - Concrete Slab (Cleats)**  
 ACS Type 1 masonry support systems may be bolted with hex head setscrews back to cleats, bolted to top of slab via expansion or chemical fixings.

Ref: T1 / L / \*\* / \*\* / TC / SS  
 fixing cavity (mm)      kN/m

**Type 1 - Steel UB (Plates/Tees)**  
 ACS Type 1 masonry support systems may be bolted to welded plates/tees via hex head setscrews. Please liaise with ACS for optimum spacing of plates/tees prior to manufacture of the structure.

Ref: T1 / L / \*\* / \*\* / S / SS  
 fixing cavity (mm)      kN/m



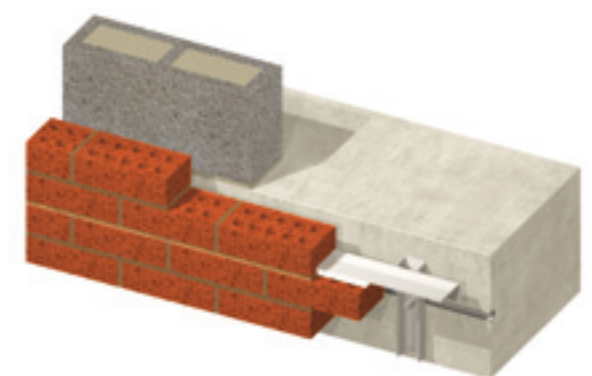
**Type 1 - Concrete Slab (Site Drilled)**  
 ACS Type 1 masonry support systems may be bolted back to the concrete slab edge using either stainless steel expanding anchors or chemical resin fixings. The fixings offered are specifically designed for each application to suit.

Ref: T1 / L / \*\* / \*\* / C / RA or EA  
 fixing cavity (mm)      kN/m

**Type 1 - Inverted (Cast-in Channel)**

ACS Type 1 masonry support can be supplied inverted, and fixed back to either concrete or steel (shown fixed back to ACS 31/21 channel for illustration purposes).

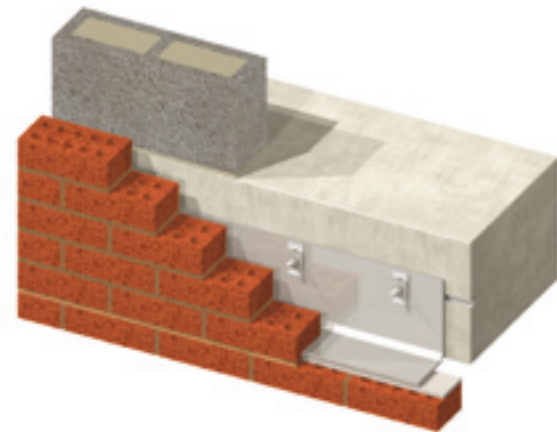
Ref: T1 / U / \*\* / \*\* / CH / TB  
 fixing cavity (mm)      kN/m





## T2 Masonry Support Variances to Concrete & Steel

## T3 Masonry Support Variances



### Type 2 - Concrete Slab (Cast in Channel)

ACS Type 2 masonry support systems can be bolted back to a stainless steel cast in channels at the slab edge using T head bolts. This allows for quicker installation of the masonry support system and negates the need for drilling into the slab edge which may contain reinforcement. ACS recommends the use of our 31/21 Curve Channel for most applications, but for particularly high loadings ACS offer alternative channels to suit. Please liaise with ACS for optimum setting out and levels of the cast in channel locations prior to casting of the structure.

Note: Detail shown indicates the use of serrated patches – ACS also offer this system supplied with the patented ALPHA washer system.

Ref: T2 / L / \*\* / \*\* / CH / TB  
 fixing cavity (mm)      kN/m

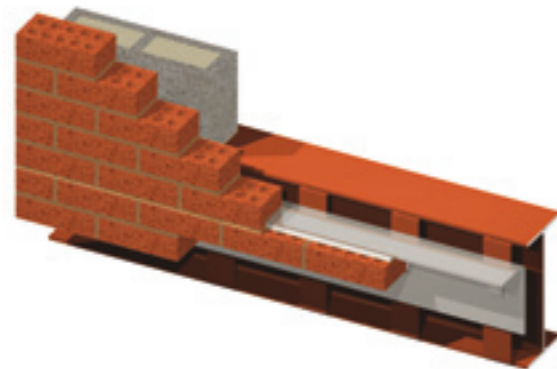


### Type 2 - Concrete Slab (Site Drilled)

ACS Type 2 masonry support systems may be bolted to the concrete edge using either expansion anchors or chemical resin fixings.

Detail shown indicates an angle c/w horizontal slots. This system is the most economical of the T2 systems, and is generally used where no vertical tolerance is required.

Ref: T2 / L / \*\* / \*\* / C / RA or EA  
 fixing cavity (mm)      kN/m



### Type 2 - Steel UB (Plates/Tees)

ACS Type 2 masonry support systems may be bolted to welded plates / tees via hex head setscrews. Detail shown indicates the use of serrated patches and the system inverted.

Please liaise with ACS for optimum spacing of plates/tees prior to manufacture of the structure.

Ref: T2 / I / \*\* / \*\* / S / SS  
 fixing cavity (mm)      kN/m

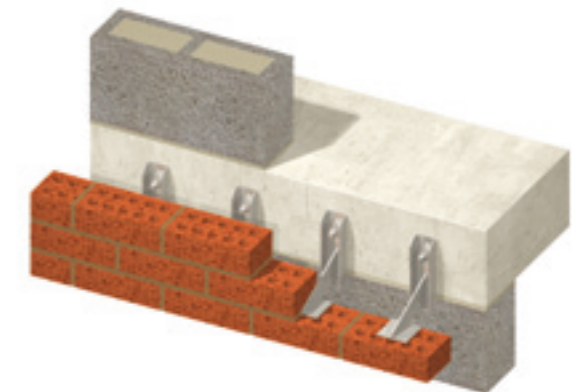
### T3 Masonry support variances and special fabrication

ACS Type 3 individual support brackets are ideal where masonry is curved or irregular on plan or elevation. This type of system is generally used on concrete structures where the brackets are bolted to a continuous cast in channel with T head bolts or to the concrete face via site drilled fixings. The brackets are easy to handle, install and align.

#### Type 3A

This system is used where masonry is to be supported with individual brackets and angles. Brackets are bolted to the structure at positions to suit the perpend of the masonry i.e. 225mm for brickwork or 450mm for blockwork. Note that the overall capacity of the bracket will reduce when positioned at 450mm centres.

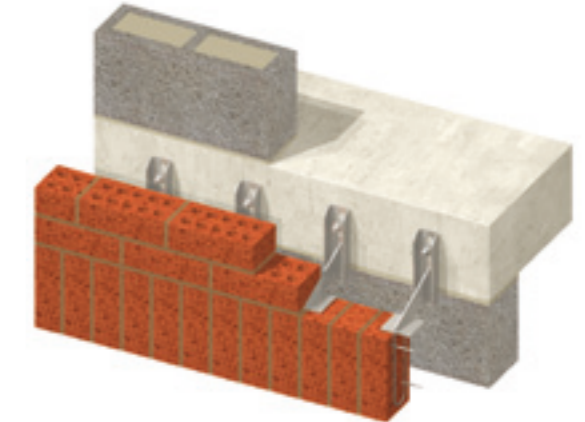
Ref: T3a / \*\* / \*\* / C / RA or EA  
 fixing cavity (mm)      kN/m



#### Type 3B

This system is used where a soldier course is beneath the supported masonry and the system needs to be hidden from below. The soldier course is supported via a welded stirrup; stitching rods are then inserted in fully mortared brick cores between the stirrups.

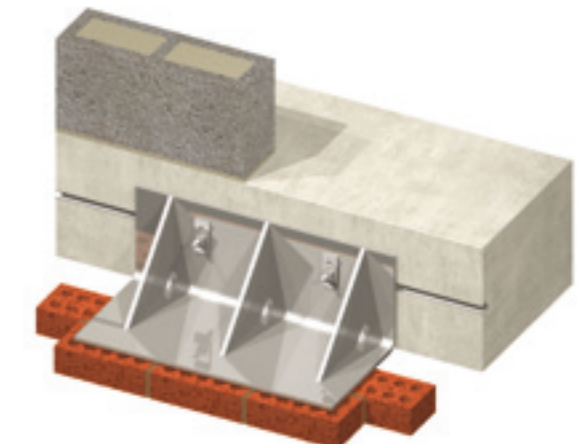
Ref: T3b / \*\* / \*\* / C / RA or EA  
 fixing cavity (mm)      kN/m



#### Special Fabs

It may be necessary in some instances to design and manufacture special angles to suit various details. The detail shown here indicates a pier being supported via a fabricated angle complete with welded gussets. This would be necessary to take the large eccentric loads back to the main structure.

ACS can design and manufacture to almost every special condition, however please liaise with the technical department for advice on the most appropriate system and fixing detail.



# ATLAS Adjustable Masonry Support

# Benefits



## Off-the-shelf ATLAS masonry support for modern construction

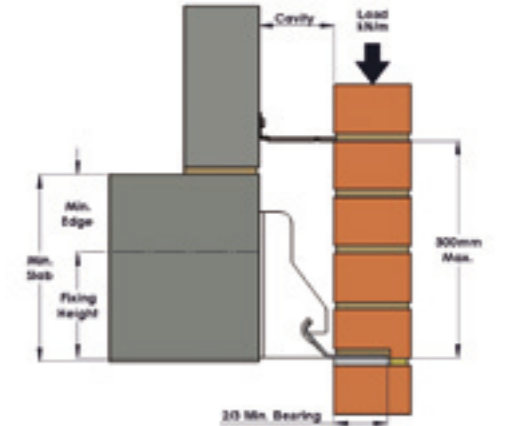
As clients and main contractors take a more proactive approach to design and value engineering, traditional welded masonry support systems are increasingly struggling to deliver the flexibility and adaptability required by modern fast-track projects.

Conventional welded systems simply do not allow for on-site adjustment or accommodate variations in cavities and loads, and the smallest of changes can make an entire system obsolete. These bespoke systems often require a lengthy approval process, take longer to manufacture and are often more expensive to install. This, coupled with a need for fast, flexible construction, has led ACS to develop a revolutionary alternative.

## Front-loading for effortless installation

For ease of use, ATLAS has been designed with a patented front-loading bracket and separate 'clip-in' angle. This allows it to be easily fitted and adjusted by only one non-specialist construction worker, reducing labour costs to a minimum and ensuring considerable time savings.

For added convenience, ATLAS angles are supplied in easy to handle 1000mm\*\* lengths. A standard front-loading corner system, comprising two 45 degree mitred angles and three brackets per angle is available from stock. An innovative self-encapsulated design with fewer components also means fewer tools are required for installation - minimising the risk of losing equipment or components down the cavity.



## Prepare for the unknown

Unlike bespoke welded support systems, ATLAS can be instantly adjusted on site, to meet your requirements.

A co-ordinated range of interchangeable brackets and shims allows the system to be adjusted in 1mm increments. Printed fixed zones on each angle allow for lateral adjustments of 25mm on either side preventing unnecessary drilling. And our unique ALPHA Bracket and Washer system offers 5mm more of vertical adjustment than traditional serrated systems. The system also includes a positive lock mechanism which increases load capacity and safeguards against catastrophic failure. This enables fewer brackets to be used and could mean cost savings of 10% on a typical installation.

## Easy to specify

Other off the shelf support systems often place all the responsibility for design on the client; a daunting prospect for all but the most talented of engineers.

With the ACS Atlas system, our team of specially trained engineers can offer advice on the correct system to specify, and provide section details to incorporate into your project. For further information, please contact ACS technical department directly for advice

## Patented Product

ACS Atlas masonry support was designed and developed in conjunction with the demands of the construction industry. This is protected by a number of patents covering the unique features and designs of the product.

\*\* May differ on 14kn or above

## How the ACS ATLAS system works:

- Two brackets are installed on the structure\*\*\*, and the angle platform simply clips onto the front of the bracket within the printed zones.
- Finger-tightening of the integrated locking screw on the side of the bracket securely locks the angle in place.
- The process can easily be reversed where a different depth bracket is required.

\*\*\* 3 Brackets on corner systems



Patented design  
Registered design

## The ATLAS Advantage

- Non project specific
- Fast and simple to install
- Easily assembled by one person
- Revolutionary front-loading system
- Highly adaptable and adjustable
- Simple online specification process
- Easy to store and transport



## ATLAS: the fast, flexible alternative

ATLAS is a patented off-the-shelf masonry support system designed and manufactured to meet the demands of modern construction projects.

Engineered specifically to support the external masonry facades of concrete and steel structures, it is cost-effective, convenient and is designed to accommodate cavities ranging from 60mm to 150mm, and loads of up to 14kN\*.

As an off-the-shelf system, ATLAS brackets and angles are interchangeable, can be easily moved around site and require no setting out or detailed layouts.

\* 14kN + systems also available as special order



# Channel Systems

# Channel Systems

## Introduction

ACS can supply a wide range of channels and T head bolts to suit any application within the construction industry. These are available in a variety of lengths, sections and materials to suit your specific needs.

Our range of channels include

- Cast In Channels
- Surface Fixed Channels
- Plain Back Channels

## Cast in Channels

These are split into two groups – self anchoring & welded anchor types. The self anchoring channels are predominantly used for restraint ties whilst the channels with welded anchors are used for heavier loadings such as for fixing masonry support systems. Cast in Channels offer continuous adjustment longitudinally and can eliminate the need for site drilling thus reducing the labour required on site. ACS produce a range of cast in channels to suit any applicable loading requirement, and are supplied in either stainless steel grade 304, grade 316, or in a mild steel galvanised finish.

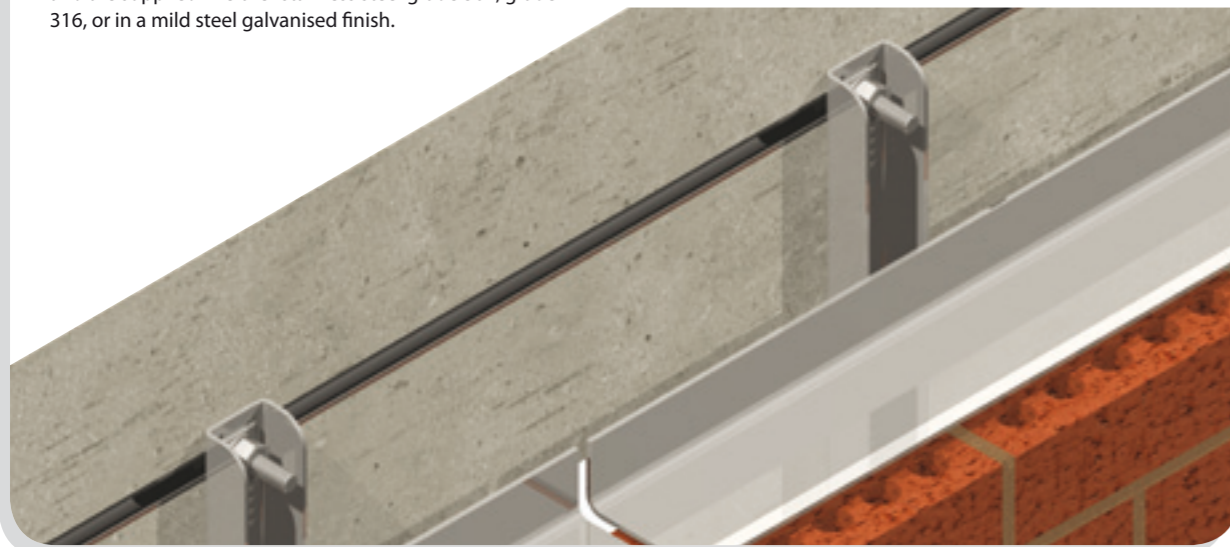
ACS recommends the use of its patented 31/21 Curve™ Cast in Channel for most masonry support applications, as the loading capacities offered will suffice for the majority of project applications. For high load applications, please consult with ACS technical department for further information.

## Surface Fixed Channels

These channels are generally used for restraint ties, and may be bolted back to masonry, concrete, steelwork or steel studding with appropriate fixings. They are usually installed in continuous lengths to allow the secondary fixer continuous adjustment longitudinally when installing masonry ties.

## Plain Back Channels

These channels may be used for supporting or restraining masonry. The channels are mainly welded to either steel columns or beams during fabrication and prior to treating the steelwork to increase the life expectancy. Plain backed channels again offer continuous adjustment longitudinally and can eliminate the need for site drilling thus reducing labour on site.



## ACS 31/21 Curve™ Cast In Channel

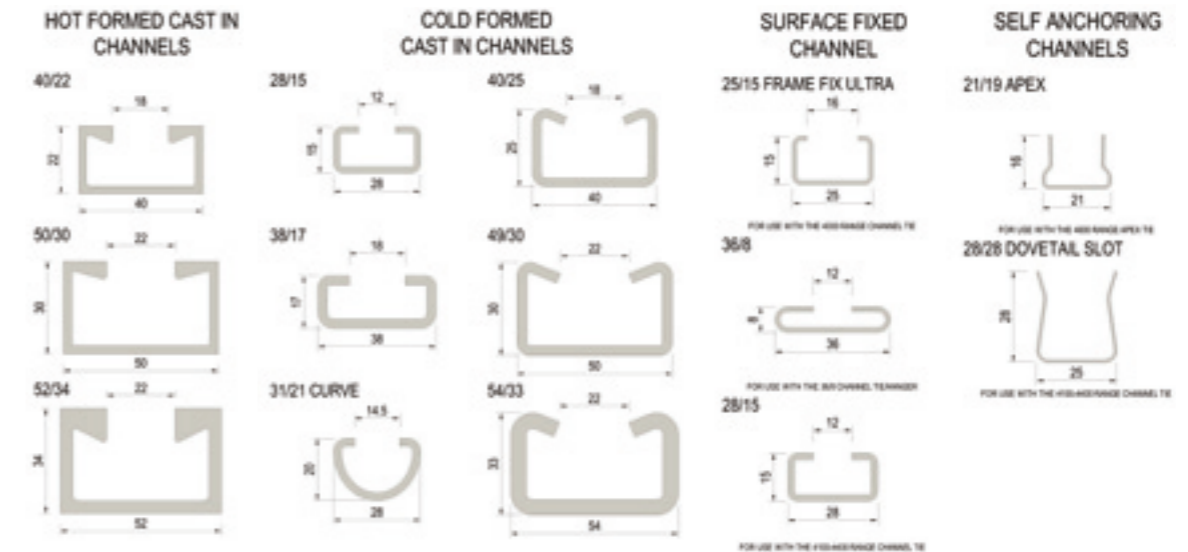
- Unique Profile
- High Loading Capacity
- Designed specifically for use with Masonry Support Systems

The new ACS 31/21 Curve channel and bolt system is a uniquely designed cast in channel for use with masonry support systems and other fixing modules. Offering higher loadings than the 38/17 channel, the ACS 31/21 Curve channel is available in both grade 304 and 316 stainless steel materials. Supplied complete with special cast in anchors on the rear of the channel, the channel is supplied as standard in 3 metre lengths.



Worldwide Patented design  
Registered design

## Channel Profiles



Channel reference	Hot Rolled/ Cold Rolled	Stainless Steel 304	316	Mild Steel	Mild Steel HDG	Lengths (mm)	Fixing Method	Available T Head bolt sizes
21/19	Cold Rolled	✓	✗	✗	✗	100, 150, 3000	SA	n/a
28/28	Cold Rolled	✓	✗	✗	✗	100, 150, 3000	SA	n/a
25/15	Cold Rolled	✓	✗	✗	✗	2700	SF	n/a
36/8	Cold Rolled	✓	✗	✗	✗	3000	SF	n/a
28/15	Cold Rolled	✓	✓	✓	✓	100, 150, 3000	SF/PB/CI	M6.M8.M10.M12
31/21	Cold Rolled	✓	✓	✗	✗	3000	CI	M12
38/17	Cold Rolled	✓	✓	✓	✓	100,150,3000	SF/PB/CI	M10.M12.M16
40/25	Cold Rolled	✓	✓	✓	✓	3000	CI	M10,M12,M16
49/30	Cold Rolled	✓	✓	✓	✓	3000	CI	M10,M12,M16,M20
54/33	Cold Rolled	✓	✓	✓	✓	3000	CI	M10,M12,M16,M20
40/22	Hot Rolled	✓	✓	✗	✓	3000	CI	M10,M12,M16
50/30	Hot Rolled	✓	✓	✗	✓	150,300,3000	CI	M10,M12,M16,M20
52/34	Hot Rolled	✓	✓	✗	✓	150,300,3000	CI	M10,M12,M16,M20
72/48	Hot Rolled	✓	✓	✗	✓	150,300,3000	CI	M20,M24,M27,M30

\*NOTE 1. Other lengths are also available on request, please contact ACS Stainless Steel Fixings for further information.  
2. Bolt sizes are available in a variety of lengths and finishes. Please contact ACS for further information.  
3. Fixing method references: SA – Self Anchoring, SF – Surface Fixed, PB – Plain Back, CI – Cast In.



### CET Cast in Channel & Edge Trim

CET has been developed for use with steel frame structures that act as a permanent shuttering when pouring concrete in situ onto ribbed decking floors.

One of the main advantages of this system is that the profiled trim incorporates a channel for casting into the concrete. Fixing to the face of thin slabs with site drilled bolts can become impractical or very expensive especially when trying to transfer loads from masonry support angles, curtain walling or even windposts back into the structure.

There are four types of system available:

- CET 28/15
- CET 31/21 Curve™
- CET 38/17
- CET 40/25

CET is manufactured from pre-galvanised sheet & incorporates a stainless steel channel. However, mild steel channels can be incorporated on request, especially if located internally e.g. lift shafts.

The type of channel, depth, projection & thickness of pre-galvanised trim depends on the loading applied and the section detail.

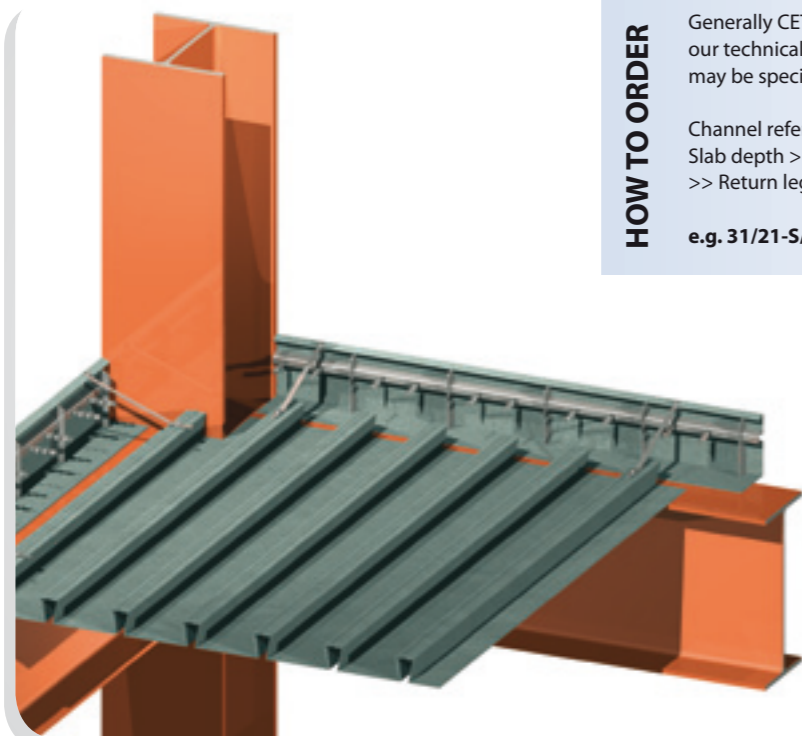
CET is supplied in standard 3m lengths; however, other lengths may be manufactured on request.

#### HOW TO ORDER

Generally CET will be designed by a qualified member of our technical department at design stage, although CET may be specified as follows:

Channel reference >> Channel material >> O/A length >> Slab depth >> Dimension from top of slab to c/l of channel >> Return leg dimension

e.g. 31/21-S/S-3000-130-50-150



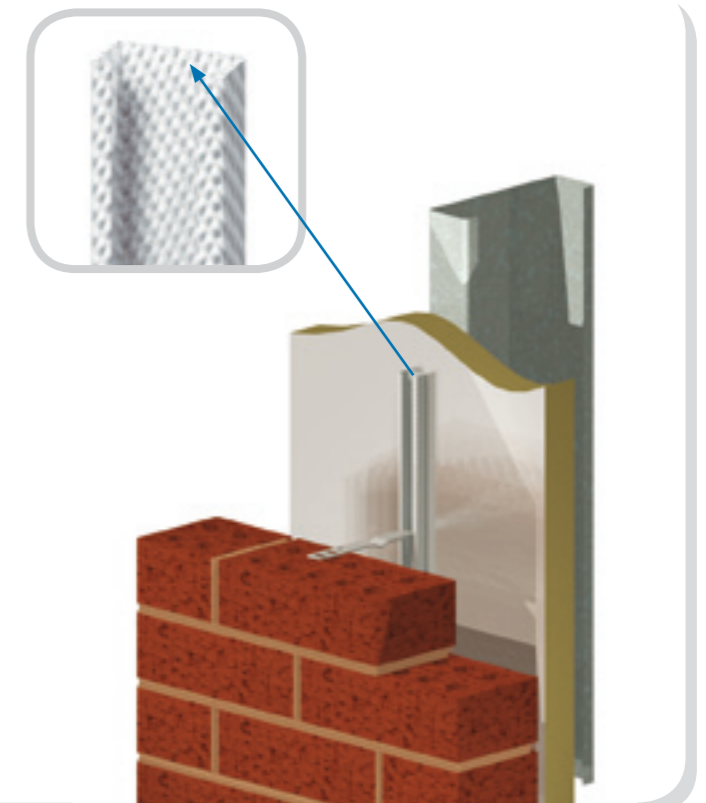
### 25/15 Frame Fix ULTRA Channel

ACS 25/15 frame fix ULTRA channel has been developed in response to the increasing need to tie masonry cladding back to steel framed structures.

Supplied in 2700mm lengths, the ACS 25/15 frame fix ULTRA channel system is pre drilled at 112.5mm centres and is also complemented with a range of channel ties to suit.

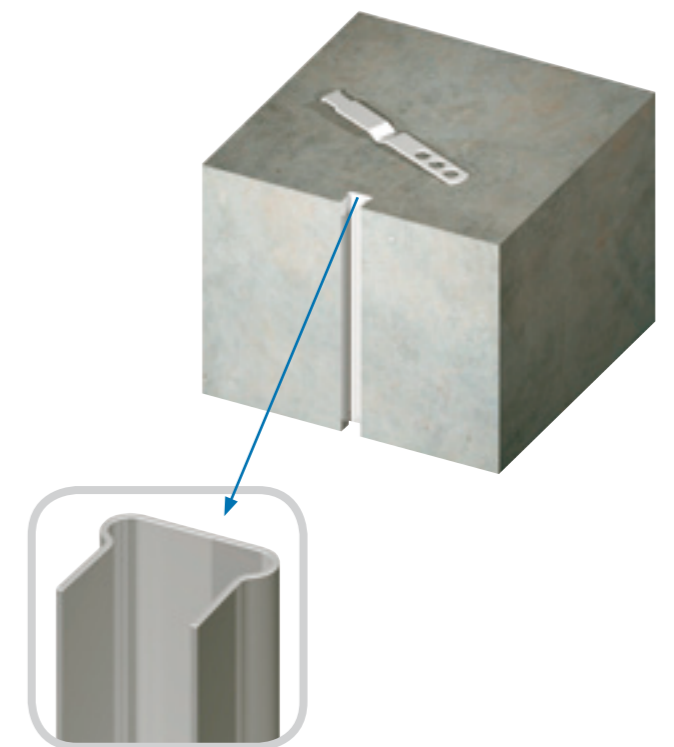
In addition to this, ACS also offers a range of both stainless and zinc plated fixing screws designed specifically for holding the channel in position, whilst not crushing the composite material, along with drive units for the installation of the screws.

The 25/15 ULTRA channel system is supported by independent testing from the Sheffield Hallam University's Department of Structural and Civil Engineering - technical data available, please ask for details.



### 21/19 APEX Channel

The ACS 21/19 APEX channel is a self anchoring cast in channel that is designed to be used with either our 4600 or 4700 range of channel ties. Supplied in 3000mm or 100mm pieces, the 21/19 APEX channel has a shallow profile that allows this product to be used where there is reduced cover to reinforcement. The 21/19 APEX channel is supplied complete with polystyrene infill to prevent the ingress of concrete and also has nail holes to aid fixing to the formwork.



# Stonework

## Introduction

ACS offers a range of systems designed to support and restrain stone cladding and facades. These products are specifically engineered to suit each application as the size and density of stone can vary from project to project.

## Design

With a technical department of qualified engineers, ACS has the knowledge and experience to design a bespoke, economical and practical solution to suit your needs. All of the engineered designs that ACS supply are covered by our own design warranties and indemnities. ACS work in accordance with the British Stone Code, and all of our designs are backed up with full engineering calculations for verification and approval. To enable a system to be fully designed, the following information would be required: -

- Type of structure (concrete / steel)
- Cavity size (from face of structure to inside face of stone)
- Stone Thickness
- Type of stone (natural / reconstituted)
- Density
- Height to be supported
- Typical section through stone at support location

Note: to ensure grooves, cast in channels etc, are positioned correctly, ACS recommends being appointed at the same time as the stone supplier to allow for full integration into the design process.

## Types of Support

The standard types of systems available are shown on pages 24 and 25, which include CFA (cold formed angle) cleats, which are normally used in cavities smaller than 40mm & ALPHA bracket systems for cavities larger than 40mm. Both systems are available with welded dowels, lips or over bent angles to restrain the stone facade.

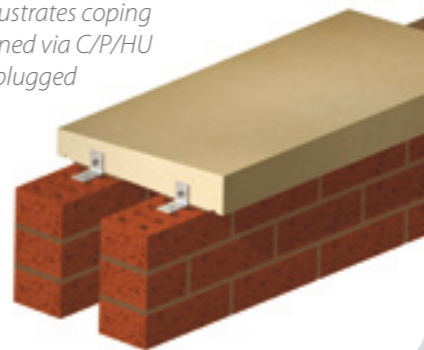
## Stone restraints

ACS offers a range of stone restraints to suit different applications. The ACS Adjustable Stone Restraint system offers a flexible approach to restraining stone work without the need for a variety of different sized ties for each application. ACS also offers a bespoke "design a tie" facility to cover almost every other possible restraint combination that may be required. For details on the "design a tie" service, please contact ACS or visit our website for more information. .

*This image illustrates a stone panel supported via type SB3 cleats bolted to the face of a concrete slab. The stone is also restrained via C/P/SU restraint ties fixed to the blockwork.*



*This image illustrates coping stones restrained via C/P/HU restraint ties plugged and screwed to the top of the masonry.*



The following guide allows designers to specify stone support systems for most situations. However, ACS offers a full design service, which includes sketch proposals & technical advice.

### HOW TO ORDER

Type of system	Stone thickness	Cavity	Load	Structure	Bolt type
Angle Bracket See page 24/25	Thickness of stone cladding (mm)	Fixing cavity (mm)	kN/m	S = Steel C = Concrete TC = Top Cleat CH = Channel	EA = Expansion Anchor RA = Resin Anchor TB = T Head Bolt BB = Blind Bolt SS = Set Screw

Example: **SA1(c) / 125 / 40 / 8.0 / CH / TB**

This would indicate a SA1 continuous support system to suit a 125mm thick stone, 40mm cavity and 8.0kN loading per metre, bolted back to cast in channel with M12 T head bolts.

# Stonework Support

## SB1 Support Cleat

The SB1 cleat is designed to carry stonework over cavities greater than 50mm. It can be supplied with or without welded dowels. Also the SB1 benefits from the ACS ALPHA bracket and washer system offering greater load capacity and increased adjustment.

The system shown is indicative and may vary in length depending on the design requirements.

The SB1 support cleat is also available in continuous lengths. Please suffix reference with a (c).



Illustration shows ALPHA washer system – serrated pad and washer system also available.

## SB2 Lipped Support Cleat

The SB2 lipped support cleat is designed to carry stonework over cavities greater than 50mm and incorporates a welded lip on the cleat. Also the SB2 benefits from the ACS ALPHA bracket and washer system offering greater load capacity and increased adjustment.

The system shown is indicative and may vary in length depending on the design requirements.

The SB2 support cleat is also available in continuous lengths. Please suffix reference with a (c).



Illustration shows ALPHA washer system – serrated pad and washer system also available.

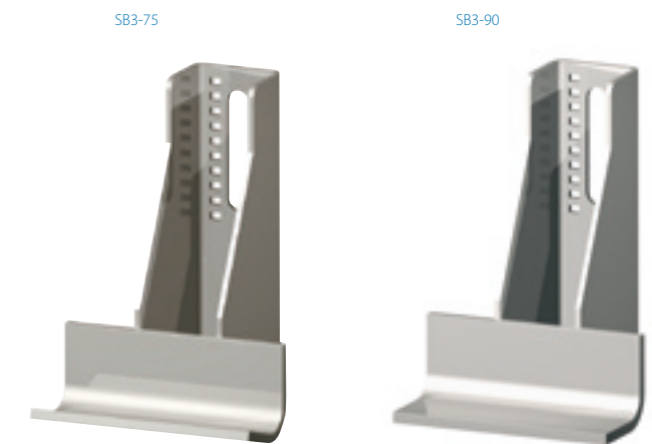
## SB3 Support Cleat

The SB3 support cleat is designed to carry stonework for cavities from 50mm upwards, and incorporates the ACS ALPHA bracket and washer offering greater load capacity and increased adjustment. This is available with a conventional 90 degree angle (SB3-90) or with an overbent angle (SB3-75) typically 15 degrees, to suit customer preference.

The system shown is indicative and may vary in length depending on the design requirements.

The SB3 support cleat is available in lengths up to a maximum of 200mm long.

Illustration shows ALPHA washer system – serrated pad and washer system also available.





### SA1 Support Cleat

The SA1 support cleat is designed to carry stonework over small cavities from 20mm upwards. It can be supplied with or without welded dowels and incorporates a serrated slotted pad and washer for increased vertical adjustment.

The system shown is indicative and may vary in length depending on the design requirements.

The SA1 support cleat is also available in continuous lengths. Please suffix reference with a (c).

Illustration shows serrated pad and washer system – ALPHA washer system also available.



### SA2 Lipped Support Cleat

The SA2 lipped support cleat is designed to carry stonework over small cavities from 20mm upwards, and incorporates a welded lip and serrated slotted pad and washer for increased vertical adjustment.

The system shown is indicative and may vary in length depending on the design requirements.

The SA2 support cleat is also available in continuous lengths. Please suffix reference with a (c).

Illustration shows serrated pad and washer system – ALPHA washer system also available.



### SA3 Support Cleat

The SA3 support cleat is designed to carry stonework over small cavities from 20mm upwards, and incorporates a serrated pad and washer for increased vertical adjustment. This is available as a conventional angle (SA3-90) or as an overbent cleat (SA3-75) typically 15 degrees, to suit customer preference.

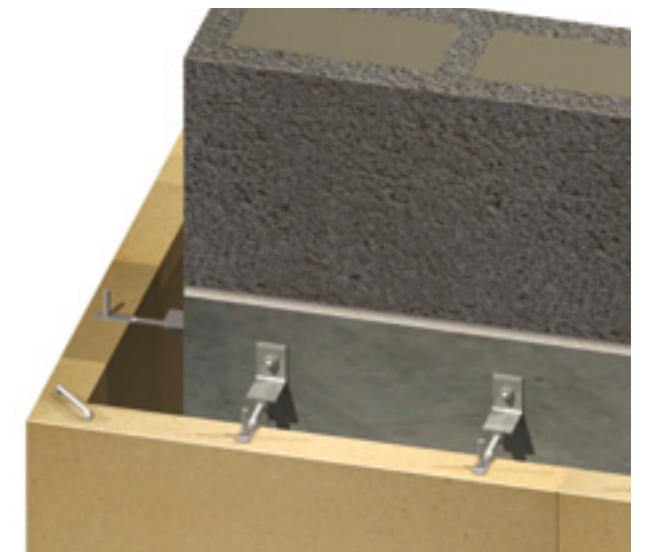
The system shown is indicative and may vary in length depending on the design requirements.

The SA3 support cleat is available in a maximum length of 200mm.

Illustration shows serrated pad and washer system – ALPHA washer system also available.

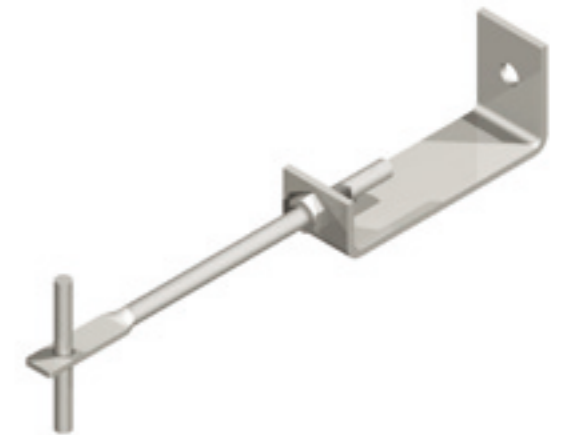
### Introduction

The ACS Adjustable Stone Restraint is designed specifically to accommodate large variations in cavity dimensions (typically +/- 40mm) and is designed to fix back to various structures and substrates using the appropriate fixings. This is particularly beneficial when working with structures that have a fluctuating cavity and negates the need for a range of different sized bespoke restraint ties. The tie allows positive or negative cavity adjustments in 0.5mm increments by turning the spade anchor through 180° in a clockwise or anti-clockwise direction. The ACS Adjustable Stone Restraint has been designed to suit the requirements of BS8298 (The design and installation of stone cladding and lining) as an effective method of restraint. Further technical information about the use of the ACS Adjustable stone restraint is available from ACS's technical department.



### ACS Adjustable Stone Restraint 60-160

This adjustable stone restraint tie is supplied in two formats – either to suit 60mm – 100mm cavities or to suit 100mm – 160mm cavities. The tie should be used to fix into the stone using the dowel supplied at 1/5 points for stack bonded stones and 1/4 points for 1/2 bonded stones. The dowel should extend at least 20mm into the stone with the hole positioned centrally in the unit to ensure the restraint provides sufficient resistance to lateral loads. There should be a maximum of 4 fixings per stone, generally located at the top and bottom joints of the stone.



Registered design

### ACS Adjustable Stone Restraint 40-60

This adjustable stone restraint tie is specifically designed to suit small cavities of between 40mm and 60mm in size, and can be fixed back to a variety of structures and substrates. The tie should be used to fix into the stone using the dowel supplied at 1/5 points for stack bonded stones and 1/4 points for 1/2 bonded stones. The dowel should extend at least 20mm into the stone with the hole positioned centrally in the unit to ensure the restraint provides sufficient resistance to lateral loads. There should be a maximum of 4 fixings per stone, generally located at the top and bottom joints of the stone.



Registered design

## Standard Lintels

ACS manufactures a large range of stainless steel lintels to suit most applications where the external leaf of masonry is required to be supported. The standard range of lintels consists of:

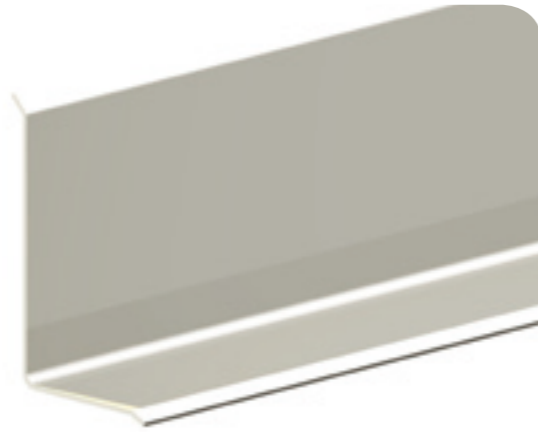
- Single Leaf "L" Type
- Single Leaf "C" Type
- Timber Frame "L" Type

## Materials

ACS offer the range of lintels in grade 304 stainless steel as standard, but for corrosive environments such as coastal areas, the ACS range of lintels are also available in grade 316 stainless steel. For further details on our standard range contact ACS with your requirements.

## Installation

The lintel should be firmly bedded into mortar with a minimum bearing of 150mm at each end into the brick or blockwork. Single leaf lintels should always be propped during construction to reduce and limit deflection. When installing timber lintels, these are supplied with restraint clips, and these should always be installed prior to installing the brickwork. For further information, please consult with ACS technical department.



## HOW TO ORDER

1. Specify lintel type
2. Confirm structural opening type
3. Confirm material finish

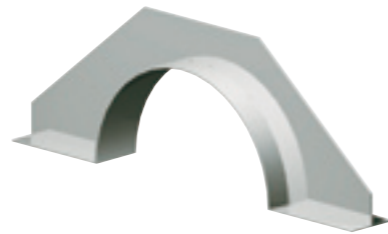
**E.g. L1/1530/SS/316 indicates a L1 lintel to suit a 1530mm opening manufactured from grade 316 stainless steel.**

## Bespoke Lintels

ACS also offers a range of bespoke lintels designed and manufactured to suit your individual requirements, which include:

- Corner post lintels
- Cantilever brick lintels
- Timber arch lintels
- Notched lintels
- End plate lintels
- I beam lintels
- Venetian arch lintels
- Islamic arch lintels
- Cranked lintels
- Stepped lintels
- Mitred lintels
- Radiused lintels

For further details please consult ACS.



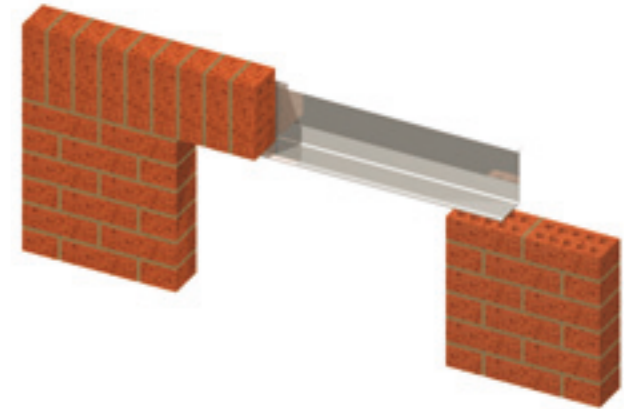
## HOW TO ORDER

**Due to the complexity of some bespoke lintels ACS recommends the following drawings be provided in order to complete the design:**

1. Plans that indicate the structural opening sizes & the floor construction / direction
2. Elevations that indicate masonry heights, radiuses or rises of arches
3. Sections of dimension wall construction (outer / inner leaf & cavity size)

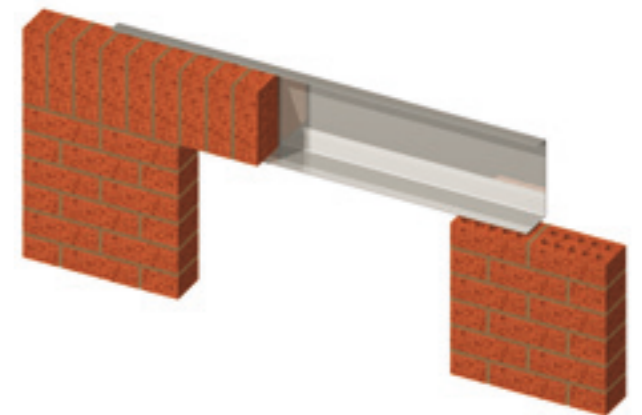
## ACS L1 Type Lintels (Single Leaf)

ACS's L1 range of L Type single leaf lintels are designed for the supporting of loads over openings, from half brick to full brick width, in solid or block wall construction. The ACS L1 range is available in lengths up to 2.7m long, with increments of 150mm as standard, although other sizes are available upon request. For further details please consult ACS.



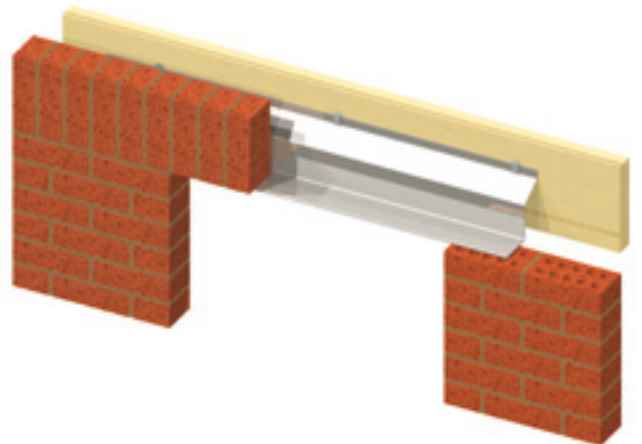
## ACS L2 Type Lintels (Single Leaf)

ACS's L2 range of C Type single leaf lintels are designed for the supporting of loads over openings, from half brick to full brick width, in solid or block wall construction. The ACS L2 range is available in lengths up to 2.7m long, with increments of 150mm as standard, although other sizes are available upon request. For further details please consult ACS.



## ACS L3 Type Lintels (Timber Frame)

ACS's L3 range of timber frame lintels have been designed specifically for use within timber frame buildings where support is required over openings to the external leaf. Designed for cavities from 40mm to 90mm in width, and available in lengths up to 4.8m long in 150mm increments, the ACS L3 range of timber frame lintels come complete with restraint clips for fixing. For further details, please consult ACS.



# Masonry Reinforcement

## Introduction

ACS has the capability to design and supply various types of bed joint reinforcement to suit your requirements. Reinforcement is placed in horizontal bed joints and is designed to increase the tensile and flexural strength of masonry. It resists the stresses that are inherent in loaded masonry panels and thus substantially reduces the risk of cracks developing.

ACS's reinforcement can be used as an economical but effective bed joint reinforcement on either a single or double leaf construction. The ACS reinforcement is manufactured in stainless steel grade 304 and is supplied in 2.7m lengths as standard, and supplied in a variety of widths and wire diameters.

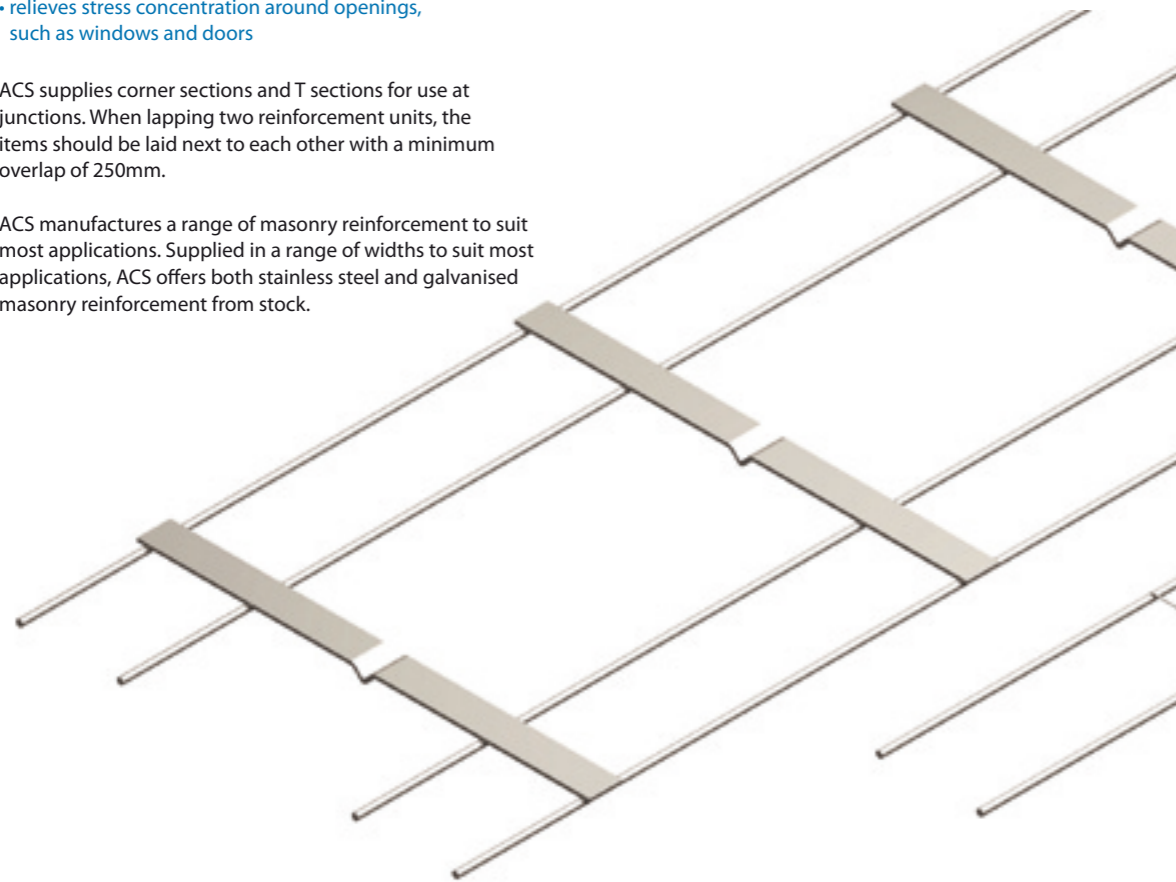
This ladder type reinforcement enhances structures resistance to wind and other lateral loadings.

It can be used:

- to increase the recommended distance between movement joints
- to strengthen areas of concentrated loads and assist in resisting effects of stresses caused by earth movements, therefore reducing the likelihood of cracking in the brickwork
- to allow cladding panels to be increased in size
- relieves stress concentration around openings, such as windows and doors

ACS supplies corner sections and T sections for use at junctions. When lapping two reinforcement units, the items should be laid next to each other with a minimum overlap of 250mm.

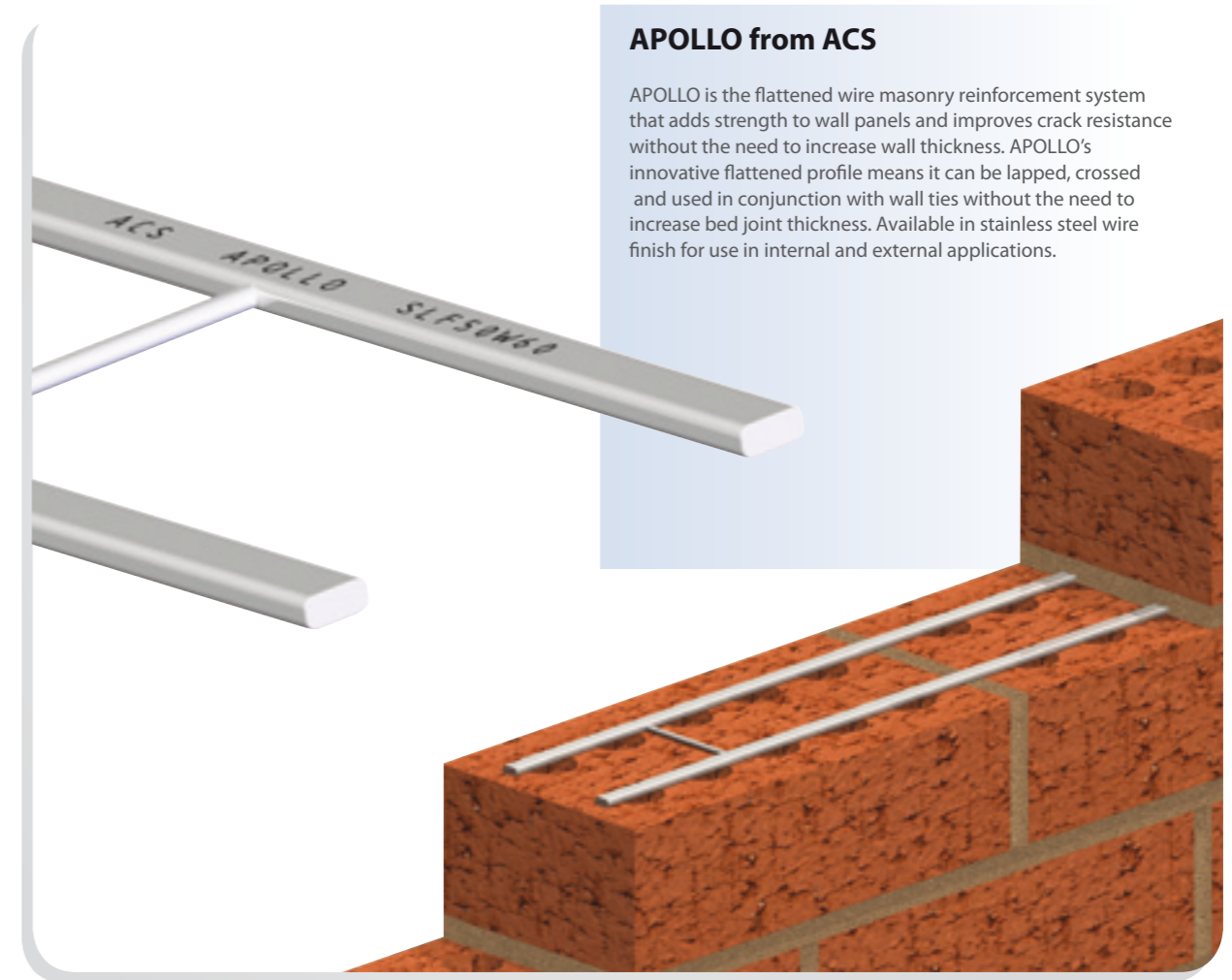
ACS manufactures a range of masonry reinforcement to suit most applications. Supplied in a range of widths to suit most applications, ACS offers both stainless steel and galvanised masonry reinforcement from stock.



# Introducing the all new ACS APOLLO

## APOLLO from ACS

APOLLO is the flattened wire masonry reinforcement system that adds strength to wall panels and improves crack resistance without the need to increase wall thickness. APOLLO's innovative flattened profile means it can be lapped, crossed and used in conjunction with wall ties without the need to increase bed joint thickness. Available in stainless steel wire finish for use in internal and external applications.



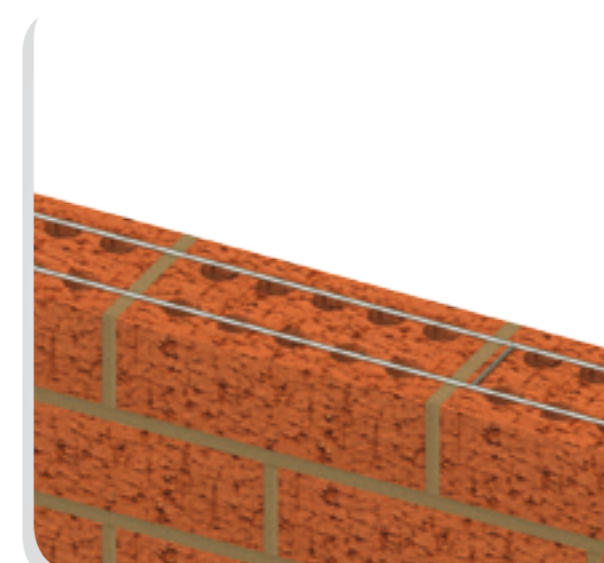
## ACS APOLLO SLF Flattened Wire Single Leaf System

The ACS Apollo SLF single leaf system consists of two flattened horizontal wires with the welded cross wires. The SLF system is supplied in a variety of widths from 60mm to 150mm wide as standard and is available in a range of wire diameters to suit.

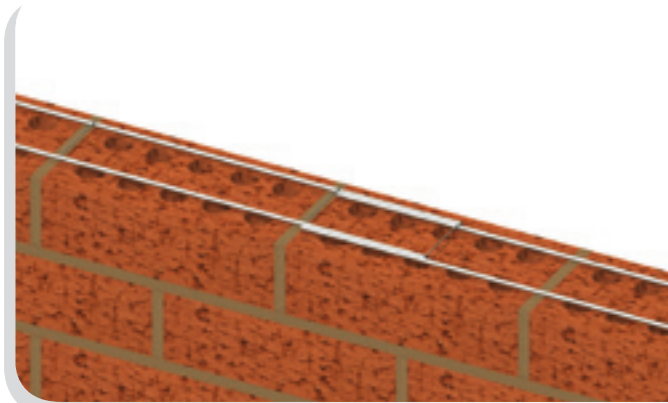
Masonry thickness	Product width and reference	Length	Wire diameters (in mm)
100mm	SLF 60mm	2.7m	3.0, 3.5*, 4.0, 4.5*, 5.0
140mm	SLF 100mm	2.7m	3.0, 3.5*, 4.0, 4.5*, 5.0
215mm	SLF 150mm	2.7m	3.0, 3.5*, 4.0, 4.5*, 5.0

### How to order

Please denote wire thickness in product code e.g. SLF35W60 (3.5mm wire)



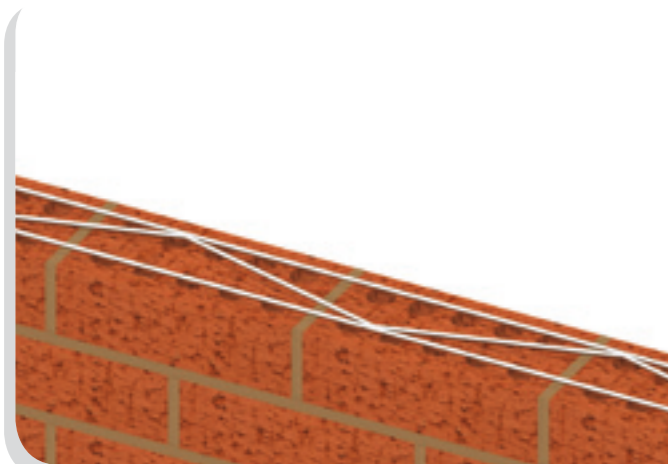




### SL Single Leaf System

The ACS SL single leaf ladder system consists of twin horizontal rod wires with welded cross wires. The SL system is available in a variety of widths from 60mm up to 175mm as standard and is available in a range of wire diameters to suit.

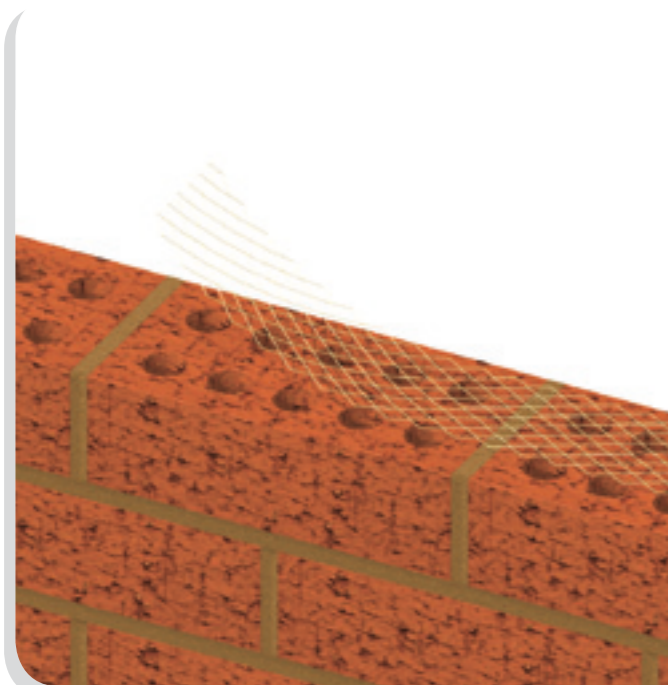
Masonry thickness	Product width and reference	Length
100mm	SL 60mm	2.7m
140mm	SL 100mm	2.7m
190mm	SL 150mm	2.7m
215mm	SL 175mm	2.7m



### SZ Single Leaf System

The ACS SZ single leaf system comprises horizontal twin rod wires with diagonally welded cross wires along the length and is available in 50,100mm and 150mm widths as standard. This is for use in single leaf construction where a lower characteristic strength is required compared to the SL single leaf system.

Masonry thickness	Product width and reference	Length
100mm	SZ 50mm	2.7m
140mm	SZ 100mm	2.7m
215mm	SZ 150mm	2.7m
215mm	SLF 150mm	2.7m



### EX Expanded Metal Bed Reinforcement

The ACS expanded metal reinforcement provides extra strength and support in stress areas of walls to prevent cracking where settlement has occurred.

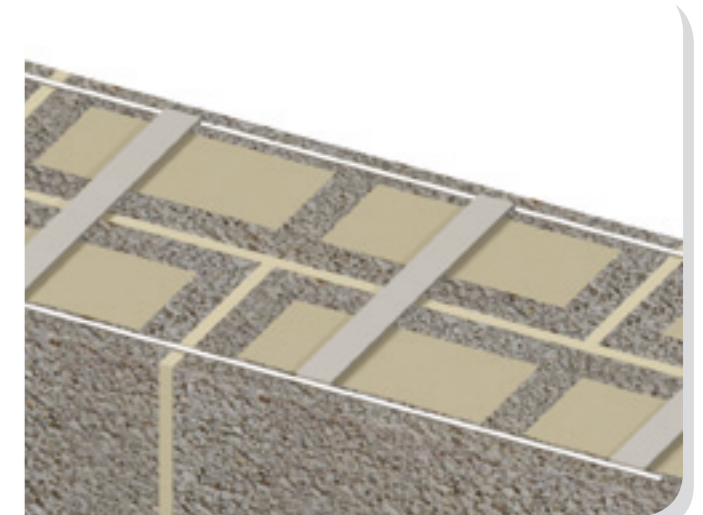
ACS suggests that when using EX it should be placed in every third brickwork or every blockwork bed joint. It can also be used to bond a section of wall to a concrete frame. EX is available in 20 metre rolls in 304 (1.4301) stainless steel.

Masonry thickness	Product width and reference	Length
100mm	EX 65mm	20m
140mm	EX 115mm	20m
215mm	EX 175mm	20m
300mm	EX 225mm	20m

### DLC Double Leaf Collar System

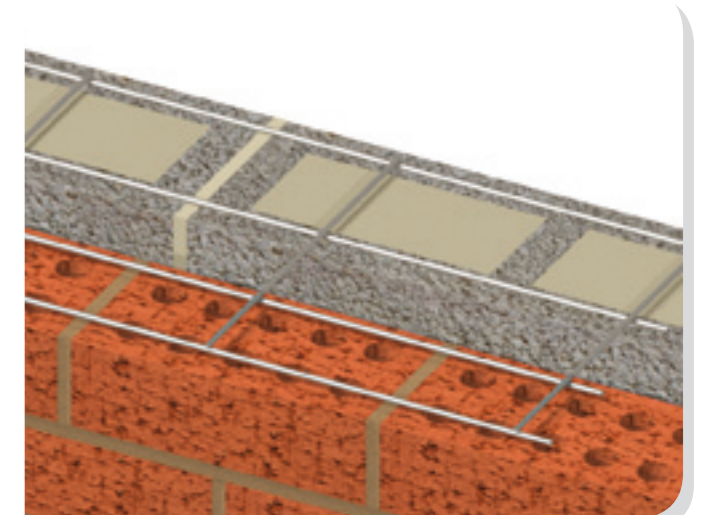
The ACS Double Leaf Collar system consists of horizontal twin rod wires with welded flat ties. The DLC system is designed for use in double leaf collar jointed walls. When two blocks are tied with the DLC system site problems using single heavy blocks can be minimised. It ensures correct positioning of ties at 450mm centres whilst providing resistance to cracking in one leaf and structural reinforcement in the other.

The DLC system is supplied as 175mm wide as standard. Other widths are available upon request.



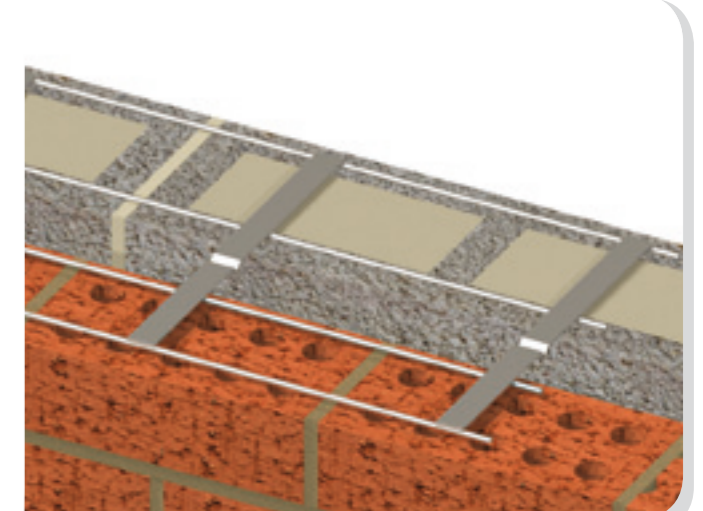
### DL Double Leaf System

The ACS Double Leaf system consists of 4 horizontal wires with welded cross wires. The DL system is designed for use in cavity walls, and ensures correct positioning of ties at 450mm centres. In walls consisting of two parallel leaves with up to a 75mm cavity the DL system provides structural reinforcement. It provides the bricklayer with the same benefits as the DLC system as it also eliminates the need to use and lift heavy blocks.

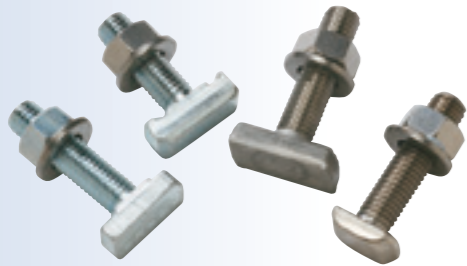


### HDDL Heavy Duty Double Leaf System

The ACS heavy duty double leaf system consists of four horizontal wires with cross welded flat ties. This system ensures correct positioning of ties at 450mm centres and provides structural reinforcement in both leaves. Where a cavity is larger than 75mm please specify the HDDL, which is available in a variety of configurations to suit site requirements.



## Fixings & Bolts



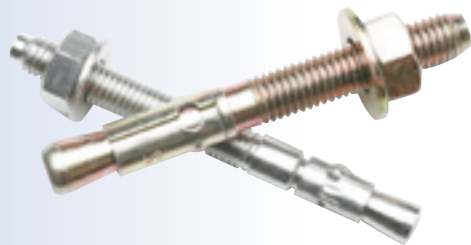
### T-Head Bolts

Available to suit the ACS range of cast-in or surface fixed channels, our T-head bolts are manufactured from either stainless steel or hot dip galvanised steel, and come in a variety of lengths and thread diameters to suit your requirements.



### Resin Anchors (Pump in Resin)

ACS offers a range of styrene and styrene free injection resins suitable for most applications, along with stainless and zinc plated studs to suit low axial spacings and edge distances. ACS also offers a range of applicator guns, extra nozzles, extended delivery tubes and blow pumps to suit.



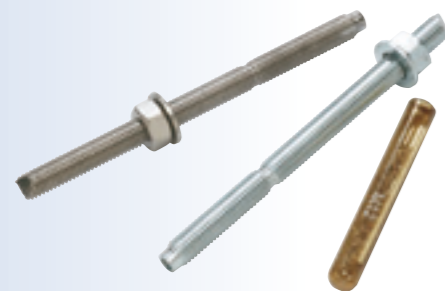
### Single Expansion Bolts

Available in stainless steel, hot dip galvanised and zinc plated, ACS expansion bolts are an ideal heavy duty solution for fixing into solid substrates such as concrete, where edge distances are not critical.



### Blindbolt HD Fixings

Suitable for fixing in areas where access is restricted, or in cavities, these fixings are available in zinc, Dorrtech or stainless steel. These fixings allow for installation without specialist tools, and without the need for oversize holes to be drilled for fitting.



### Resin Anchors (Glass Capsule)

The ACS glass capsule system permits a safe anchoring system into concrete for stainless or zinc plated studs where there are low axial spacings and edge distances.



### Hexagon Head Set Screws

Supplied fully threaded and in a choice of materials, ACS offers a range of standard set screws to suit most applications and also carries a full range of hexagon full nuts and washers to complement the range. Nonstandard sizes available on request. Please contact ACS for details.

## Windposts

### Introduction

ACS has designed and developed an extensive range of windposts that span vertically between floors to provide lateral support to a variety of brick and blockwork applications. They often eliminate the need for additional steel or reinforced concrete columns, thus reducing time and costs involved in this method of construction. Windposts provide greater strength and stability in large areas of cladding or where there are two or more window apertures in a masonry panel.

### Typical Windpost Types

C Type windposts are installed within a cavity, leaving the blockwork undisturbed. They are commonly used in masonry panels that are subject to lower wind loadings.

L Type windposts are a cost effective structural system, designed for use where high wind loadings may occur and in some cases where cavity widths restrict the use of C Type windposts.

### Special Windposts

ACS also offers a selection of posts to support spandrel panels and parapets. They are designed as 'cantilevers' but require a much larger base connection than simply supported beams to resist bending movements. Please contact the ACS Technical Department for further details.

### Fixings

Windposts are supplied complete with ACS masonry ties and bolt fixings, and are available in a range of configurations to suit individual requirements. The method of fixing top and bottom connections is usually determined by the structure to which the post is fixed. The top connection is usually designed to provide vertical adjustment to allow for any site tolerances and differential movement that may occur in the structure.

### Fixing Kits



To simplify the installation of posts, ACS has created a series of kits that come complete with all necessary drill bits, fixing bolts & washers etc. to suit a variety of connections. All kits come complete with site installation notes that clearly show the fixer bolt types, tightening torques, curing times etc.

### Materials

Windposts are predominantly manufactured from grade 304 or grade 316 stainless steel, however they may be manufactured from other materials and be supplied in a number of finishes.



Please refer to the mild steel windpost section (page 38) for further details.

### Design

Windpost sizes may or may not be known depending on the status of the project.

The tables shown for the L & C Type windposts detail typical section sizes to aid design. However, to ensure the most economical section is specified please liaise with a member of the technical department or alternatively please supply the following information:

- Wall construction (internal and external masonry thicknesses and cavity size)
- Masonry panel width (dimension of load that is to be applied to windpost)
- Masonry panel height
- Wind loading per m<sup>2</sup>

This will allow a basic design to be carried out. However, for special posts such as parapet posts please consult ACS.

### HOW TO ORDER

When ordering windposts please supply the following:

- Section size
  - Overall opening height
  - Base fixing (e.g. concrete / steel / timber)
  - Top fixing (e.g. concrete / steel / timber)
  - Wall construction (internal and external masonry thicknesses and cavity size)
  - Material & finish (stainless / mild steel)
- Alternatively please complete a windpost information sheet. (available on request).

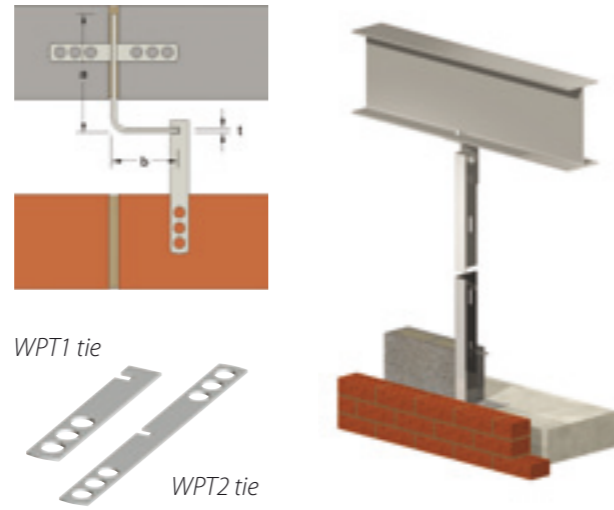
# L Type Windposts

## Sectional properties and loading data for L Type windposts.

L Type windposts are a cost effective structural system designed to suit each and every individual project. The posts are built into the internal skin of blockwork and bolted to the structure via suitable fixings. The use of WPT1 clip on ties to the external leaf & WPT2 clip in ties to the inner leaf transfer the loadings applied to the cladding back to the structure.

The following tables illustrate the typical sizes available, however almost any size can be designed / manufactured.

Note: for windposts positioned at movement joint positions plastic sleeves will be provided. Please specify this when ordering.



### L TYPE Windposts

Windposts are designed as simply supported beams. Maximum deflection is height/360 and maximum stress is 185N/mm<sup>2</sup>.

Section	I <sub>xx</sub>	Z <sub>xx</sub>	2.5m	3.0m	3.5m	4.0m	4.5m	5.0m	5.5m	6.0m
a x b x t	cm <sup>4</sup>	cm <sup>3</sup>	← Maximum unfactored load for height of windpost (UDL) kN →							
125 x 70 x 4	128.30	15.40	8.8	6.1	4.5	3.4	2.7	2.2	1.8	1.5
140 x 70 x 4	174.46	19.01	11.9	8.3	6.1	4.7	3.7	3.0	2.5	2.1
130 x 70 x 6	208.88	24.44	14.3	9.9	7.3	5.6	4.4	3.6	3.0	2.5
155 x 70 x 4	229.71	22.96	15.7	10.9	8.0	6.1	4.8	3.9	3.2	2.7
170 x 70 x 4	294.81	27.24	16.7	14.0	10.3	7.9	6.2	5.0	4.2	3.5
150 x 70 x 6	308.40	31.95	16.7	14.6	10.7	8.2	6.5	5.3	4.4	3.7
160 x 70 x 6	367.54	36.03	16.7	17.4	12.8	9.8	7.7	6.3	5.2	4.4
185 x 70 x 4	370.46	31.85	16.7	16.6	12.9	9.9	7.8	6.3	5.2	4.4
150 x 80 x 8	421.50	43.00	16.7	20.0	14.7	11.2	8.9	7.2	6.0	5.0
185 x 70 x 5	458.69	39.58	16.7	20.0	16.0	12.2	9.7	7.8	6.5	5.4
160 x 80 x 8	502.82	48.54	16.7	20.0	17.5	13.4	10.6	8.6	7.1	6.0
200 x 70 x 5	566.57	45.72	16.7	20.0	19.7	15.1	11.9	9.7	8.0	6.7

### L TYPE Parapet posts

Parapet and spandrel posts are designed as fixed base cantilevers. Maximum deflection is height/180 and maximum stress is 185N/mm<sup>2</sup>.

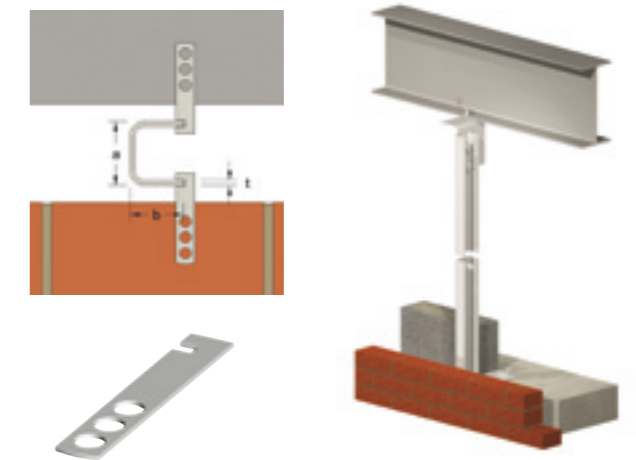
Section	I <sub>xx</sub>	Z <sub>xx</sub>	0.8m	1.0m	1.2m	1.4m	1.6m	1.8m	2.0m
a x b x t	cm <sup>4</sup>	cm <sup>3</sup>	← Maximum unfactored load for height of parapet post (UDL) kN →						
125 x 70 x 4	128.30	15.40	5.3	6.0	5.0	4.3	3.8	3.3	2.9
140 x 70 x 4	174.46	19.01	5.3	6.7	6.2	5.3	4.6	4.1	3.7
130 x 70 x 6	208.88	24.44	5.3	6.7	8.0	6.8	6.0	5.3	4.6
155 x 70 x 4	229.71	22.96	5.3	6.7	7.5	6.4	5.6	5.0	4.5
170 x 70 x 4	294.81	27.24	5.3	6.7	8.0	7.6	6.6	6.0	5.3
150 x 70 x 6	308.40	31.95	5.3	6.7	8.0	8.9	7.8	7.0	6.2
160 x 70 x 6	367.54	36.03	5.3	6.7	8.0	9.3	8.8	7.8	7.0
185 x 70 x 4	370.46	31.85	5.3	6.7	8.0	9.3	7.8	6.9	6.2
150 x 80 x 8	421.50	43.00	5.3	6.7	8.0	9.3	10.5	9.3	8.4
185 x 70 x 5	458.69	39.58	5.3	6.7	8.0	9.3	10.7	8.6	7.7
160 x 80 x 8	502.82	48.54	5.3	6.7	8.0	9.3	10.7	10.5	9.5
200 x 70 x 5	566.57	45.72	5.3	6.7	8.0	9.3	10.7	9.9	8.9

# C Type Windposts

## Sectional properties and loading data for C Type windposts.

C Type windposts are designed within the cavity and eliminate the need for cutting blockwork. The posts are bolted to the structure with suitable fixings. The use of WPT1 clip on ties to both the external & internal leaf transfer the loadings applied to the cladding back to the structure.

The following tables illustrate the typical sizes available, however, almost any size can be designed / manufactured.



### C TYPE Windposts

Windposts are designed as simply supported beams. Maximum deflection is height/360 and maximum stress is 185N/mm<sup>2</sup>.

Section	I <sub>xx</sub>	Z <sub>xx</sub>	2.5m	3.0m	3.5m	4.0m	4.5m	5.0m	5.5m	6.0m
a x b x t	cm <sup>4</sup>	cm <sup>3</sup>	← Maximum unfactored load for height of windpost (UDL) kN →							
55 x 60 x 4	34.74	12.63	2.4	1.7	1.2	0.9	-	-	-	-
55 x 60 x 5	41.42	15.06	2.8	2.0	1.4	1.1	-	-	-	-
65 x 60 x 4	50.89	15.66	3.5	2.4	1.8	1.4	1.1	-	-	-
65 x 60 x 5	61.06	18.79	4.2	2.9	2.1	1.6	1.3	1.0	-	-
75 x 60 x 4	70.58	18.82	4.8	3.3	2.5	1.9	1.5	1.2	1.0	-
75 x 60 x 5	85.07	22.68	5.8	4.0	3.0	2.3	1.8	1.5	1.2	1.0
85 x 60 x 4	94.01	22.12	6.4	4.5	3.3	2.5	2.0	1.6	1.3	1.1
85 x 60 x 5	113.70	26.75	7.8	5.4	4.0	3.0	2.4	1.9	1.6	1.4
95 x 60 x 5	147.21	30.99	10.1	7.0	5.1	3.9	3.1	2.5	2.1	1.7
105 x 60 x 5	185.85	35.40	12.7	8.8	6.5	5.0	3.9	3.2	2.6	2.2
115 x 60 x 5	229.86	39.98	15.7	10.9	8.0	6.1	4.8	3.9	3.2	2.7
115 x 60 x 6	268.71	46.73	16.7	12.7	9.4	7.2	5.7	4.6	3.8	3.2
115 x 65 x 8	362.92	63.12	16.7	17.2	12.6	9.7	7.7	6.2	5.1	4.3

### C TYPE Parapet posts

Parapet and spandrel posts are designed as fixed base cantilevers. Maximum deflection is height/180 and maximum stress is 185N/mm<sup>2</sup>.

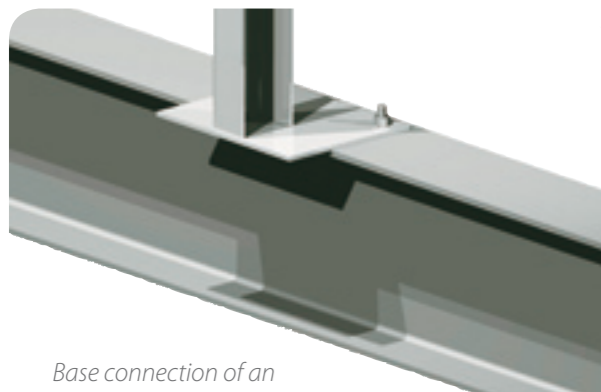
Section	I <sub>xx</sub>	Z <sub>xx</sub>	2.5m	3.0m	3.5m	4.0m	4.5m	5.0m	5.5m	6.0m
a x b x t	cm <sup>4</sup>	cm <sup>3</sup>	← Maximum unfactored load for height of parapet post (UDL) kN →							
55 x 60 x 4	34.74	12.63	4.8	3.1	2.1	1.6	1.2	1.0	0.8	0.8
55 x 60 x 5	41.42	15.06	5.3	3.7	2.6	1.9	1.4	1.1	0.9	0.9
65 x 60 x 4	50.89	15.66	5.3	4.5	3.1	2.3	1.8	1.4	1.1	1.1
65 x 60 x 5	61.06	18.79	5.3	5.4	3.8	2.8	2.1	1.7	1.4	1.4
75 x 60 x 4	70.58	18.82	5.3	6.3	4.4	3.2	2.5	1.9	1.6	1.6
75 x 60 x 5	85.07	22.68	5.3	6.7	5.3	3.9	3.0	2.3	1.9	1.9
85 x 60 x 4	94.01	22.12	5.3	6.7	5.8	4.3	3.3	2.6	2.1	2.1
85 x 60 x 5	113.70	26.75	5.3	6.7	7.0	5.2	4.0	3.1	2.5	2.5
95 x 60 x 5	147.21	30.99	5.3	6.7	8.0	6.7	5.1	4.0	3.3	3.3
105 x 60 x 5	185.85	35.40	5.3	6.7	8.0	8.4	6.5	5.1	4.1	4.1
115 x 60 x 5	229.86	39.98	5.3	6.7	8.0	9.3	8.0	6.3	5.1	5.1
115 x 60 x 6	268.71	46.73	5.3	6.7	8.0	9.3	9.3	7.4	6.0	6.0
115 x 65 x 8	362.92	63.12	5.3	6.7	8.0	9.3	10.7	10.0	8.1	8.1

# Windpost fixing Details

## Typical Base Fixing Details



Base connection of an ACS "L" Type windpost fixed to the top of a concrete slab using chemical resin studs.

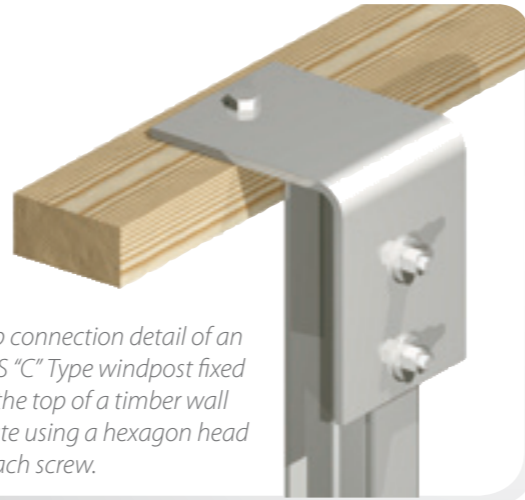


Base connection of an ACS "C" Type windpost fixed to the top of a steel beam using hexagon set screws.



Base connection of an ACS "C" Type windpost fixed to the face of concrete slab using chemical resin studs.

## Typical Top Fixing Details



Top connection detail of an ACS "C" Type windpost fixed to the top of a timber wall plate using a hexagon head coach screw.



Top connection detail of an ACS "L" Type windpost fixed to the underside of a steel beam using hexagon set screws



Top connection detail of an ACS "L" Type windpost fixed to the underside of concrete slab using site drilled bolts.

# Mild Steel Windposts

## Introduction

In addition to the range of stainless steel windposts available, ACS also manufactures a full range of mild steel windposts. These are supplied in a variety of finishes to suit the customers requirements and specification.

A full range of section sizes are available to choose from including:

- Circular Hollow Section (CHS)
- Spine Section
- Parallel Flange Channel Section (PFC)
- Rolled Steel Angle (RSA)
- Square/Rectangular Hollow Section (SHS/RHS)

## Materials

Normally windposts are manufactured using grade S275 in either cold or hot finished mild steel, however if other grades are required ACS has access to a wide range of materials and grades, and will manufacture to your requirements.

## Finishes

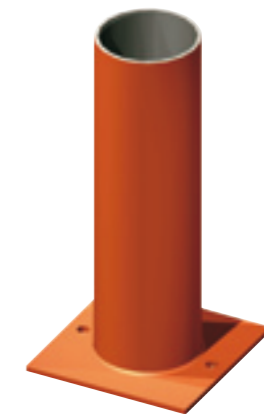
Mild steel components may be finished in a number of ways to suit the requirements of the client. The following details the typical finishes, however, please contact ACS for specific requirements.

- Painted with zinc phosphate primer (note: components will be shot blasted to SA 2.5 prior to painting unless specified otherwise)
- Galvanised (note: components will be acid dipped prior to galvanising and a minimum coating of 86 microns applied to BS EN ISO: 1461: 1999)
- Factory finished
- Bituminous painted (note: components may be supplied pre painted with the required fire protection, however, ACS recommends components are painted on site as the finish is susceptible to damage in transit.

## CHS Windpost

Illustrated is a CHS windpost with a typical welded base plate. These types of post are available in a range of sizes, lengths and finishes to suit each application and come complete with necessary fixings. This illustrates a finish with a red zinc phosphate primer. Ties would either be shot fired or tech screwed to the section.

Note: these are also available in stainless steel. Please consult ACS for further details on sizes and availability.



## Spine Windpost

Illustrated is a spine or I windpost with a typical welded base plate. These types of post are available in a range of sizes, lengths and finishes to suit each application and come complete with necessary fixings.

This illustrates a galvanised finish.

Ties would either be shot fired or tech screwed to the section or alternatively slots could be provided for clip-in ties.

Note: these are also available in stainless steel. Please consult ACS for further details on sizes and availability.



## Mild Steel Windposts



### PFC Windpost

Illustrated is a PFC windpost with a typical welded base plate. These types of post are available in a range of sizes, lengths and finishes to suit each application and come complete with necessary fixings.

This illustrates a galvanised finish.

Ties would either be shot fired or tech screwed to the section.



### RSA Windpost

Illustrated is a RSA windpost with a typical welded base plate. These types of post are available in a range of sizes, lengths and finishes to suit each application and come complete with necessary fixings.

This illustrates a mild steel black finish.

Ties would either be shot fired or tech screwed to the section.



### SHS/RHS Windpost

Illustrated is a SHS windpost with a typical welded base plate. These types of post are available in a wide range of sizes, lengths and finishes to suit each application and come complete with necessary fixings.

This illustrates a finish with a red zinc phosphate primer.

Ties would either be shot fired or tech screwed to the section.

Note: these are also available in stainless steel. Please consult ACS for further details on sizes and availability.

## Special Fabrications

### Introduction

In almost every residential and commercial development there is a requirement for structural steel members, especially in concrete framed structures where wide expanses of brickwork or blockwork need to be restrained or supported.

Steel members are designed into the structure as a cost effective solution to restrain/support the masonry as it is uneconomical and unpractical to cast large concrete columns, beams and downstands.

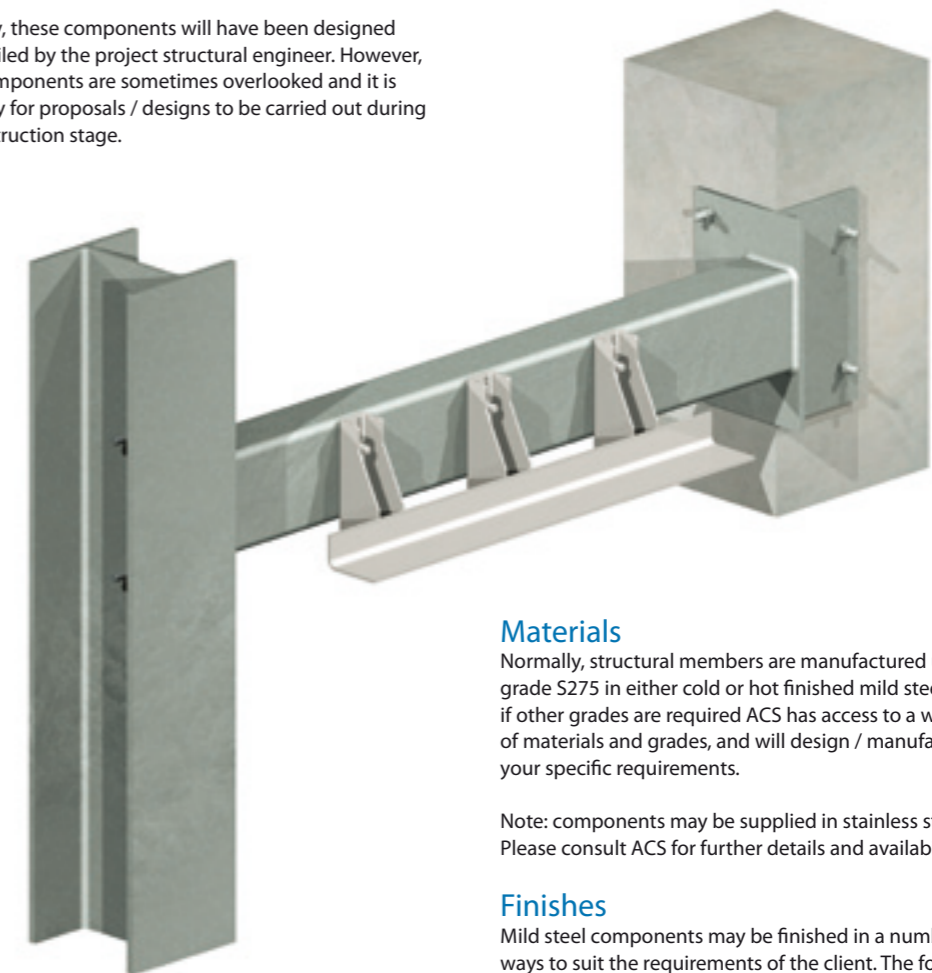
These structural members may include windposts, columns, beams, welded frames or even structural frames that incorporate masonry support systems.

Generally, these components will have been designed and detailed by the project structural engineer. However, these components are sometimes overlooked and it is necessary for proposals / designs to be carried out during the construction stage.

ACS has the facility to design and/or manufacture medium to heavy-duty components in almost any shape, size and finish to suit the customer's requirements.

With a technical department of qualified engineers, ACS has the experience and expertise to design the most economical solutions using the latest technology.

For further information or advice please consult ACS.



### Materials

Normally, structural members are manufactured using grade S275 in either cold or hot finished mild steel, however if other grades are required ACS has access to a wide range of materials and grades, and will design / manufacture to your specific requirements.

Note: components may be supplied in stainless steel. Please consult ACS for further details and availability.

### Finishes

Mild steel components may be finished in a number of ways to suit the requirements of the client. The following details the typical finishes, however, please consult ACS for specific requirements:

- Painted with zinc phosphate primer (note: components will be shot blasted to SA 2.5 prior to painting unless specified otherwise)
- Galvanised (note: components will be acid dipped prior to galvanising and a minimum coating of 86 microns applied to BS EN ISO: 1461: 1999)
- Factory finished (untreated)

## ARIS Corner Guard

### Introduction

In heavy traffic areas, for example multi-storey car parks or factories, concrete walls or columns are prone to damage especially from moving vehicles. To protect arises of columns and walls ACS has developed the ACP-1250.

### Description

The ACP-1250 is formed from flat plate and anchors are then welded to the internal faces of the angle to ensure a secure bond is achieved with the concrete. (Anchors are positioned accordingly to ensure they miss any reinforcement). Holes are provided at either end to suit preferred method of fixing.



### Materials

Normally, corner guards are manufactured from grade 304 and grade 316 stainless steel, however they may be manufactured in mild steel & galvanised to order.

### Specials

Almost any length, size, material or finish may be manufactured to order.

For all bespoke requirements please liaise with the ACS Sales Department.

ACS offers a dedicated specification service to engineers, architects, main contractors and brickwork sub-contractors. The dedicated team can advise on all aspects of restraining and supporting masonry and stone, and offers training via CPD seminars to the industry.

Facilities and services available:

[CPD Seminars](#)

[Detailed Design Proposals](#)

[Re-Specification](#)

[Value Engineering Solutions](#)

### CPD Seminars

#### (Continuing Professional Development)

Seminars cover the use and design of masonry and stonework support systems in the modern construction industry, with all the relevant design considerations and standards explained to ensure the most cost effective and value engineered solutions available. Seminars can be conducted at a time and location of your choosing by contacting ACS.

### Detailed Design Proposals

ACS is renowned for exceptional design solutions, and our team will advise on the most cost effective design for any given situation. We produce calculations, designs and specification proposals for discussions with contractors design teams. In addition our design engineers will advise on locations of cast in channels and additional structural elements where necessary to enable the design process to be completed and ensure cost price certainty is achieved. From early concept ACS can offer the kind of package that enables the complete integration of design into the build.



### Re-Specification

ACS is able to re-specify its products in lieu of other manufacturers products, and offer the full technical back up necessary.

### Value Engineering

ACS offers a complete value engineering service by utilising the latest software and calculation suites to design the most cost effective solution for masonry and stonework support systems. In addition our team of dedicated technical engineers can aid with putting forward alternative designs with the prospective cost savings available.

Whilst every effort has been made in producing this literature to ensure that any advice or recommendations are factually correct, ACS Stainless Steel Fixings Ltd accepts no liability or responsibility in respect of the published details. As we are continually improving and developing our products, ACS Stainless Steel Fixings Ltd reserve the right to amend, withdraw or change the design of our products without notification.



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