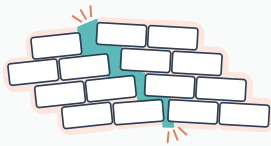


# STITCH-TIE<sup>®</sup> BAR

## Provides supplemental reinforcement in mortar joints

The stainless steel Stitch-Tie Bar repairs cracked masonry and can provide reinforcement to create structural beams within existing masonry walls. The Stitch-Tie Bar is installed with SureGrout S, which is a high-performance, non-corrosive, non-oxidizing, non-shrinking, thixotropic, cement-based grout that's suitable for injecting by hand.

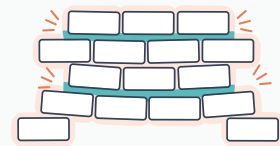
The bar is composed of stainless steel, twisted with a helical-pitched thread to provide intimate contact with the surrounding material. When used together with SureGrout S, they offer a superb combination of axial strength and flexibility, which helps absorb further localized stress.



**CRACK REINFORCEMENT**

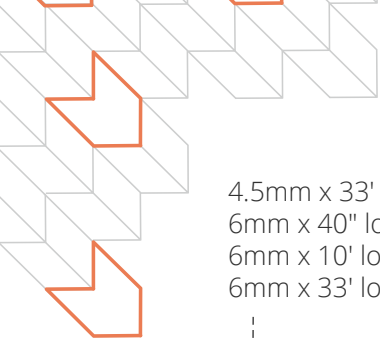


**CORNER CRACKING**

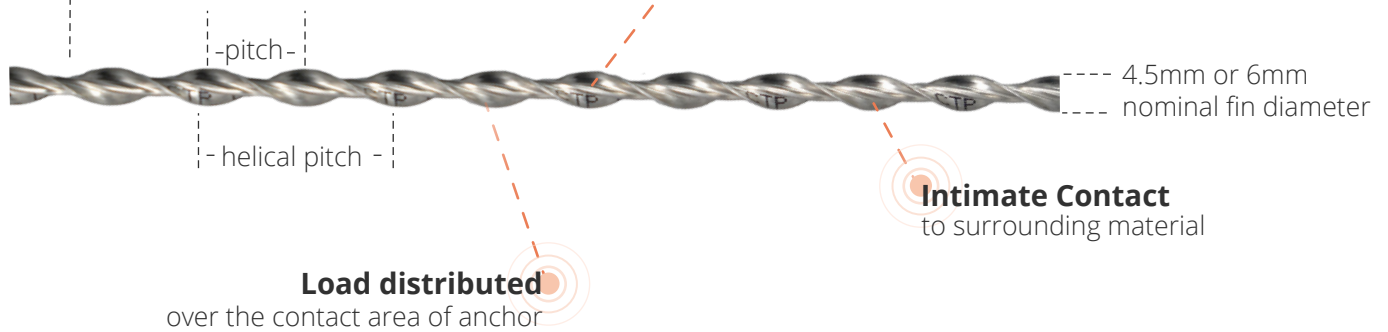


**HELICAL BEAMING TO REINFORCE ROUGH OPENINGS**





4.5mm x 33' long coils  
 6mm x 40" long segments  
 6mm x 10' long coils  
 6mm x 33' long coils



# Stitch-Tie Bar Physical Characteristics\*

	nominal dimensions
Outside Tie Diameter	6mm
Mass: lb/ft (kg/m)	0.043 (0.062)
Cross Sectional Area: in <sup>2</sup> (mm <sup>2</sup> )	0.012 (8)
Yield Strength: ksi (N/mm <sup>2</sup> )	108 (745)
Ultimate Tensile Strength: ksi (N/mm <sup>2</sup> )	130 (1060)
Ultimate Shear Load: lbs (N)	265 (1180)
Elastic – Modulus: ksi (Gpa)	22,625 (156.3)
Helix Angle: (to longitudinal axis)	32.14 <sup>o</sup>
Pitch Length: in. (mm)	0.59 (15)
Helical Pitch Length: in. (mm)	1.18 (30)

\* Material: ASTM A580 TYPE 304 Stainless Steel

## Stitch-Tie Bar Kit

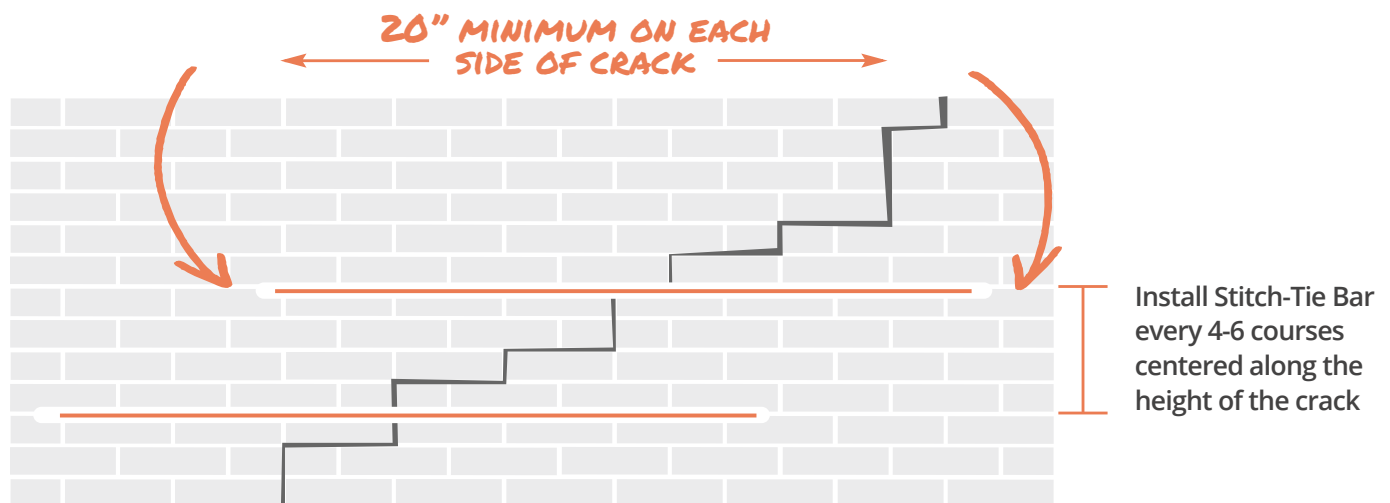
- SureGrout S
  - 3 liter tub, 3900psi (27.5 Mpa) compressive strength
- 30 oz. Crack Stitching Gun and Nozzle
- Mixing Paddle



# Crack Stitching

## with Stitch-Tie Bar

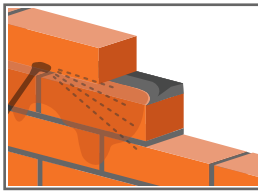
The Stitch-Tie Bar is used to repair cracked masonry and can provide reinforcement to create structural beams from existing brick veneers. The bars are manufactured of Type 304 stainless steel (Type 316 available upon request). The Stitch-Tie Bar and SureGrout S provide excellent bonding characteristics within the masonry. When used together, Stitch-Tie Bar offers a superb combination of axial strength and flexibility, which helps absorb further localized stress. They are installed in existing mortar bed joints that have had mortar removed to accommodate the bar and grout material.



# Installation Instructions:

Reinforce cracked masonry with 6mm (or 4.5mm for thin mortar joints)

1



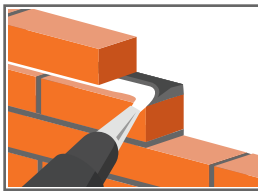
## GRIND AWAY EXISTING MORTAR.

Grind existing mortar 1-1/2" to 2" in depth and clean with water prior to installation



1-1/2" to 2"

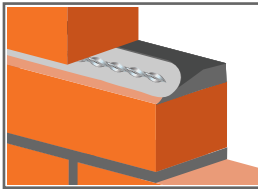
2



## APPLY A BEAD OF SUREGROUT S AT THE BASE OF THE GROUND JOINT.

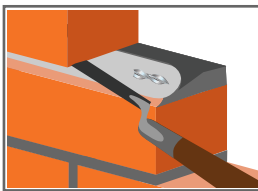
**SureGrout S preparation:** Mix the two-part, ready-to-mix packs of powder with the provided admixture. Pour the liquid into the pail provided, pour the powder slowly into the pail, and mix with a paddle mixer for a full 2 minutes, ensuring that the powder is completely blended. (No additional water or powder should be added.) Once mixed, the grout is ready to be used and has a usability time of 45 minutes. Cover pail from direct sunlight.

3



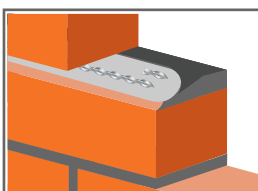
## INSERT STITCH-TIE BAR INTO BEAD OF SUREGROUT S.

4



## APPLY SECOND/THIRD BEAD OF SUREGROUT S OVER STITCH-TIE BAR, and compact with appropriate trowel.

5



If an **ADDITIONAL REINFORCING** Stitch-Tie Bar is required, repeat steps 3 & 4. Compact with trowel when complete and allow enough room in slot to re-point with mortar.

for helical beaming applications

## Additional Installation Notes:

1. When installing in a non-linear joint, the Stitch-Tie Bar can be bent to follow the mortar's path or even be turned 90 degrees, wrapping a corner.
2. For areas where multiple vertical cracks are in close proximity, extend the Stitch-Tie Bar 20" past the outermost cracks. Either a longer length coil could be used and cut to size, or shorter lengths can be lapped (providing a minimum 12" overlap).
3. For multi-wythe walls, where it is observed that the crack propagates through the full thickness, the wall should be repaired on both sides, if accessible.
4. SureGrout S can be re-agitated by re-mixing the remaining contents in the pail to achieve a blended consistency again. DO NOT add additional water.
5. Under no circumstances should the grout be used where freezing may occur within 24 hours. The grout performance may be impaired if not protected from freezing.
6. Suregrout S can be pointed after installation once thumb-print hard.
7. Coatings can be applied to Suregrout S after being allowed to cure for 24 hours.

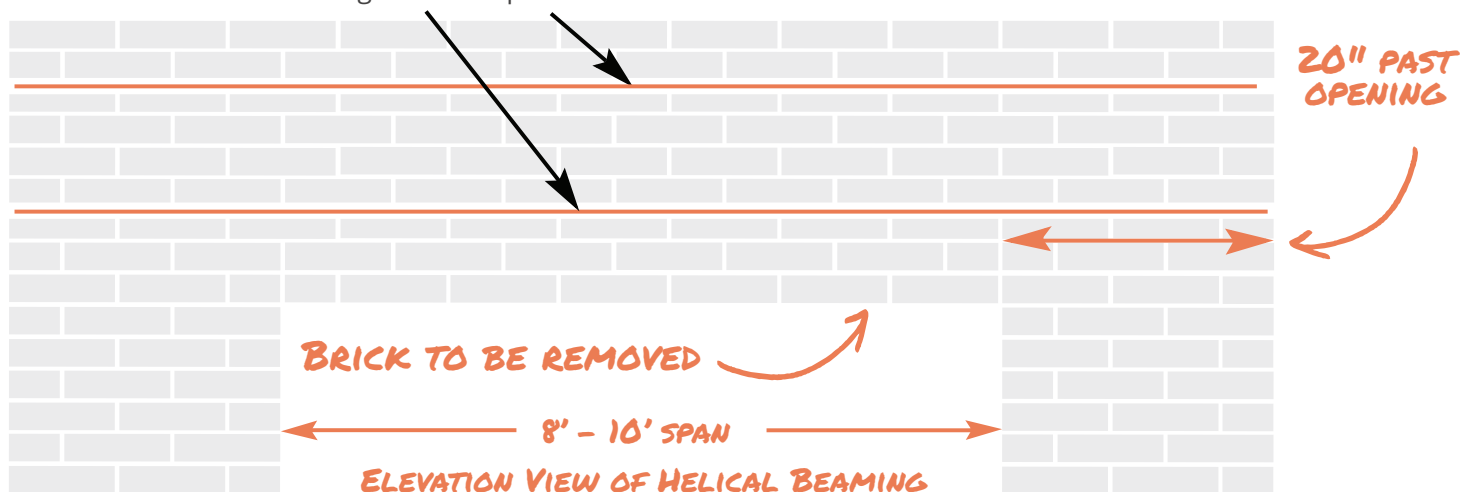
# Helical Beaming with Stitch-Tie Bar

Create a new doorway, replace window lintels, or repair flashing by using the PROSOCO Stitch-Tie Bar for helical beaming. This method eliminates tedious and cost-intensive alternatives, including shoring, needling, or removing whole sections of the wall.

Used in conjunction with SureGrout S, the PROSOCO Stitch-Tie Bar reinforces areas of masonry and produces composite brick beams, allowing the masonry to span over openings. In multi-wythe construction, the helical beaming can be further strengthened if installed on the interior and exterior wythes.

By using this system, one will be able to install larger pieces of flashing, thus eliminating unnecessary lap joints and reducing future water problems.

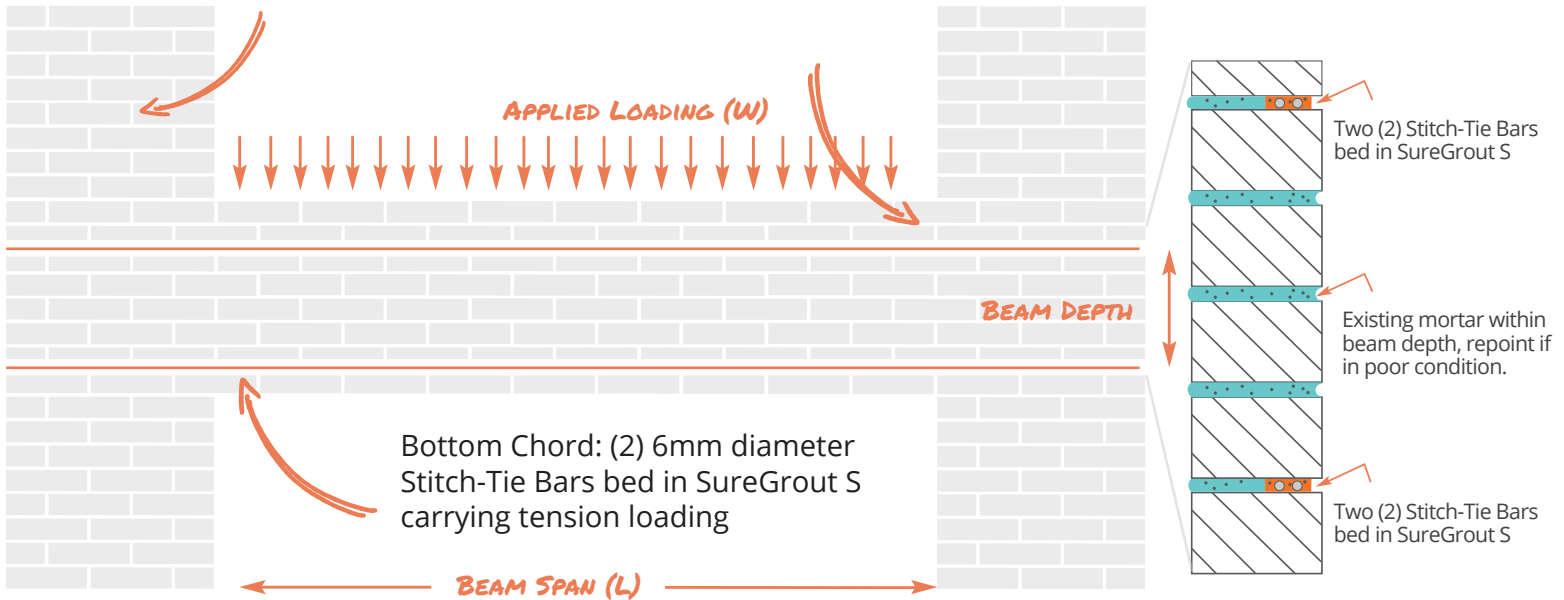
Install two (2) rows of two (2) 6mm Stitch-Tie Bars and SureGrout S to create a composite masonry beam to help support the load. Extend bars 20" past opening on both sides. Vertical spacing varies, contact a PROSOCO Anchoring Technical Specialist for more detailed information.



## Helical beaming saves money, labor, and time.

Sufficient gravity loading above to resist thrust, providing a fixed end connection for the beam

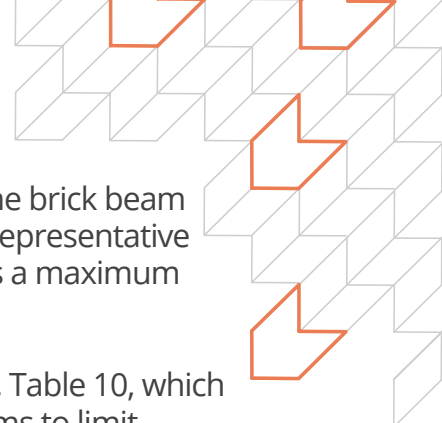
Top Chord: (2) 6mm diameter Stitch-Tie Bars bed in SureGrout S and two adjacent brick courses carrying compression loading



## Retrofit Helical Beaming Methodology:

The use of PROSOCO Stitch-Tie Bars in conjunction with SureGrout S has the ability to locally reinforce areas of masonry, producing composite brick beams, allowing the masonry to span over openings. It should be noted that in buildings using a multi-wythe construction, to provide a more effective solution, the helical beaming approach should be installed on the interior and exterior wythes if accessible. The testing performed summarized in the load tables below was performed on both a single wythe and two wythe brick construction with a filled collar joint. For thicker sections or walls in poor condition, the wall should be analyzed to determine if composite action could occur within the brick beam, and should be reinforced if required.

This method involves the insertion of PROSOCO Stitch-Tie Bars into bed joints, set in SureGrout S at various heights in a masonry wall, to create a composite brick beam. The two (2) 6mm diameter Stitch-Tie Bars in the lower joint carry the tensile loading, acting as the bottom chord of a beam, while the additional two (2) 6mm diameter Stitch-Tie Bars in a higher course and its adjacent brick courses carry the compressive loading, acting as the top chord of a beam. The distance between the top and bottom courses reinforced with Stitch-Tie Bar and SureGrout S is considered the "beam depth" in the table below. The unreinforced brick masonry in-filled within this depth is equivalent to the web of the beam, allowing shear transfer. To provide a fixed end condition, sufficient dead load must be provided at the adjacent column sections to resist thrust. If sufficient dead loading is not present, the overall capacity of the beam will be reduced.



The bending capacity of the brick beam is based on beam bending theory. The brick beam scenario in an existing wall doesn't fall into a specific category, but the most representative capacity would be related to a beam with a fixed-fixed end condition that has a maximum bending moment of  $(WL^2)/12$ .

The limiting span to depth ratio in this method is derived from the BS 5628-2, Table 10, which provides limiting ratios of span to effective depth of reinforced masonry beams to limit deflection and cracking. A safety factor of 2 is used to limit the maximum span to effective depth ratio to 10.

## Helical Masonry Beaming is formed by reinforcing two separate mortar beds, each with a pair of Stitch-Tie Bars embedded in SureGrout S.

Beam tables for use with two 6mm diameter Stitch-Tie Bars used as retrofitted bed joint reinforcement when installed in two joints creating a "beam depth." All load values below correspond to allowable loading for serviceability/deflection, and the values shown in lb/ft correspond to the uniformly distributed loading (W) across the beam span (L). The design table is for guidance only, always seek the advice of a structural engineer before undertaking any structural repair.

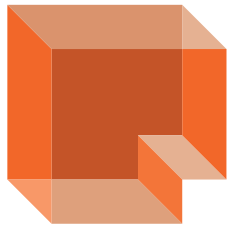
Span	Beam Depth		
	0.3 m (12")	0.6 m (24")	0.9 m (36")
1 m (3.3')	26.9 KN/m (1,840 lb/ft)	26.9 KN/m (1,840 lb/ft)	26.9 KN/m (1,840 lb/ft)
1.5 m (5')	17.7 KN/m (1,210 lb/ft)	17.7 KN/m (1,210 lb/ft)	17.7 KN/m (1,210 lb/ft)
2.0 m (6.6')	13.0 KN/m (890 lb/ft)	13.0 KN/m (890 lb/ft)	13.0 KN/m (890 lb/ft)
2.5 m (8.2')	8.9 KN/m (610 lb/ft)	9.6 KN/m (660 lb/ft)	9.6 KN/m (660 lb/ft)
3.0 m (9.8')	-	8.7 KN/m (600 lb/ft)	8.7 KN/m (600 lb/ft)
3.5 m (11.5')*	-	7.5 KN/m (515 lb/ft)	7.5 KN/m (515 lb/ft)

\* Note: value for 3.50 m span is for 215 mm brickwork (double wythe) only. The values for 215 mm brickwork assume that the vertical joint through the thickness of the wall is filled and the wall acts compositely.

	Beam Depth		
	0.3 m (12")	0.6 m (24")	0.9 m (36")
Average Equivalent Bending Capacity ( $WL^2/12$ )	3,550 lb-ft	6,985 lb-ft	10,435 lb-ft
Average Equivalent Shear Capacity ( $WL/2$ )	2,920 lb	2,920 lb	2,920 lb

• Consult with an engineer or PROSOCO technical support to help with beam placement and load and calculations





**PROSOCO**

**You. Us. The project.**

