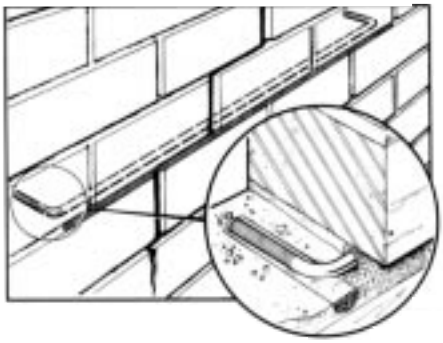
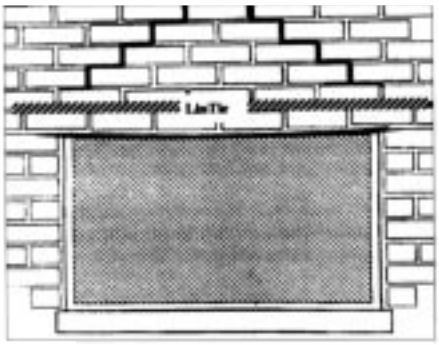
LINTIE

LINTEL REINFORCING

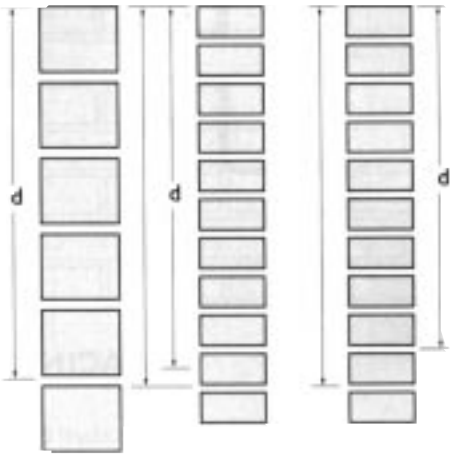




The introduction of SPIT LINTIE reinforcement into the walls allow these to span over soft areas of sub-soil or underpinning points and hence prevent further damage to the property.
Where lintels over door and window openings have failed, LINTIE reinforcement introduced to the bed joint(s) immediately above will create masonry lintels capable of spanning the openings while tying any induced cracks which have appeared.
Such lintels utilise well established reinforced masonry principles in accordance with BS 5628: Part 2: 1985 allowing the bending resistance of the steel reinforced section to be calculated.

LENGTH REQUIRED
Opening Width + 400mm (2 x 200mm) e.g. 1100mm opening Tie length = 1100 + 400 = 1500mm

Code	Drill Ø mm	Tie length mm	Window width mm
94701	12	1000	up to 600
94702	12	1500	up to 1100
94703	12	2000	up to 1600
94704	12	2500	up to 2100
94705	12	2900	up to 2500



1 BAR 2 BARS 3 BARS

The design ultimate moment of resistance (kNm) for one leaf reinforced with 1, 2 or 3 LinTies is the lesser of that obtained from the following two expressions:

1 $Md = 0.016nz$ n = No. of LINTIES

$$z = \frac{d \times 179.5n}{f_k}$$

2 $$Md = \frac{1.78d^2 f_k}{10^3}$$ d = effective depth in mm.

f_k = compressive strength of brickwork from Table 2 of BS 5628 in N/mm².

Note: When perforated bricks are used, the value of fk must be taken as ⅔ of the normal value.

LINTIE

Design Bending Strength of Reinforced Solid Masonry Using ITW LINTIE Reinforcing Steel

1. The value of fk for any particular brick crushing strength and mortar combination must be obtained from BS 5628 Table 2.Interpolation of the tables may be used.
2. The table gives Design Moment of Resistance for solid masonry units the size of normal clay bricks one leaf thick. The values may also be used for blockwork but only in the case of 1 reinforcing bar. Partial safety factors γ_m = 2.3 and γ_s = 1.15 have already been allowed.
3. No check for deflection will be required if the span: effective depth ratio is not greater than 20 for single spans, 26 for continuous spans and 7 for cantilevers.
4. The above M of R values do not apply for span: effect depth ratios less than 1.5.
5. The Design Moment of Resistance values given assume a normal tensile ductile failure except where these are given in ***bold.italics***.
6. The average design shear stress over the effective depth of the beam must not be greater than 0.175N/mm² except under special circumstances (see BS 5628 Part 2).
7. The reinforcing bars to be used are ITW LINTIE and must be installed entirely in accordance with the recommended procedure of ITW.
8. Effective lateral tying of the brick leaf has been assumed, i.e. part of a cavity wall system with a minimum of 2.5 per meter².

TECHNICAL DATA

LINTIE LINTEL REINFORCING

Sample Calculation

DESIGN CONDITION Outer leaf lintol of span 2.8m supporting 900mm of masonry to the cill of the window above. The masonry is of standard format SOLID frogged bricks, compressive strength 10 N/mm², in mortar designation (iii), i.e. 1: 1: 6 mortar.

Span: Eff Depth ratio = $\frac{2800}{900}$ = 3.11 ≤ 20 ≥ 1.5 ok.

Weight of outer leaf to be supported = 2.4 x 0.9 x 2.8
= 6.05kN

Design (Ultimate) Load = 6.05 x 1.4 = 8.47 kN
Design Bending Moment = $\frac{8.47 \times 2.8}{8}$ = 2.96 kN.m

From Table 2 of BS5628: Part 1. f_k = 4.1 N/mm²

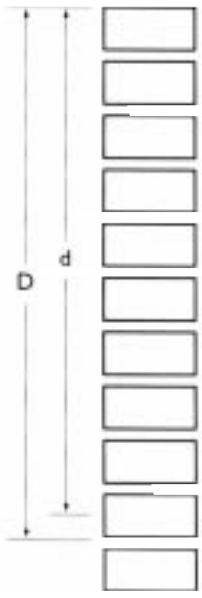
'D' for one LINTTIE reinforcing bar = 900 –75 = 825 mm

Refering to the table and interpolating for f_k = 4.1 : -

Design Moment of Resistance, Md = 12.42 kN.m > 2.96 ok.

Shear Stress, v = $\frac{8.47 \times 10^3}{2 \times 102 \times 825}$ = 0.05 N/mm² < 0.175 ok.

'D' Depth to bottom reinforcing layer(mm) \ Compressive strength of brickwork fk	Design Moment of Resistance (ULTIMATE) Md kNm								
	1 Reinforcing Bar			2 Reinforcing Bars			3 Reinforcing Bars		
	3.5	7.0	15.0	3.5	7.0	15	3.5	7.0	15.0
150	***1.4***	2.0	2.2						
225	2.8	3.2	3.4		4.3	5.2			
300	4.0	4.4	4.5	***4.3***	6.7	7.6			9.1
375	5.2	5.6	5.7	6.2	9.1	10.0		10.7	12.7
450	6.4	6.8	6.8	9.9	11.5	12.4		14.3	16.3
525	7.6	8.0	8.0	12.3	14.0	14.8	***12.6***	17.9	19.9
600	8.8	9.1	9.1	14.7	16.4	17.1	***17.2***	21.5	23.5
675	10.0	10.3	10.3	17.1	18.7	19.4	21.4	25.1	27.1
750	11.2	11.4	11.4	19.5	21.1	21.7	25.0	28.7	30.7
825	12.4	12.5	12.5	21.9	23.6	24.0	28.6	32.3	34.2
900	13.6	13.7	13.7	24.3	26.0	26.2	32.2	35.9	37.6
1050	16.0	16.0	16.0	29.1	30.7	30.7	39.4	43.1	44.4
1200	18.2	18.2	18.2	33.9	35.3	35.3	46.6	50.3	51.3
1350	20.5	20.5	20.5	38.7	39.9	39.9	53.8	57.5	58.1
1500	22.8	22.8	22.8	43.5	44.5	44.5	61.0	64.7	65.0
1650	25.1	25.1	25.1	48.3	49.0	49.0	68.2	71.8	71.8
1800	27.4	27.4	27.4	53.1	53.6	53.6	75.4	78.7	78.7
1950	29.6	29.6	29.6	57.9	58.1	58.1	82.6	85.5	85.6
2100	31.9	31.9	31.9	62.7	62.7	62.7	89.8	92.3	92.3



Typical 2 Bars

For further technical information relating to perforated bricks contact our Technical Department.