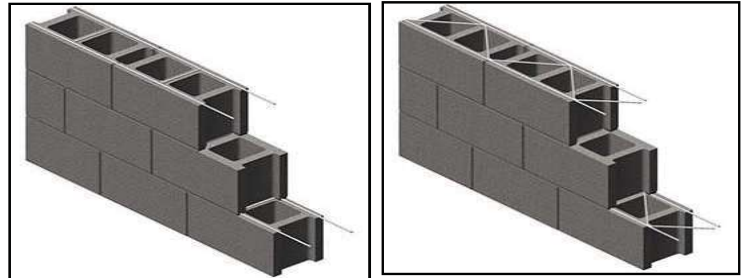
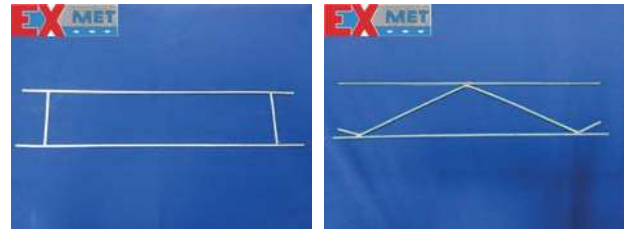


I - Block Reinforcement

1. Joint Reinforcement Ladder / Truss

Block Reinforcement Ladder / Truss is used for reinforcement of block and brick works to give high strength to masonry walls subjected to severe loadings. It will eliminate the cracks and reduce the effect of vibration and differential settlement as well as the effects of temperature changes, in simple words, it will make the masonry act as one unit.



Specifications

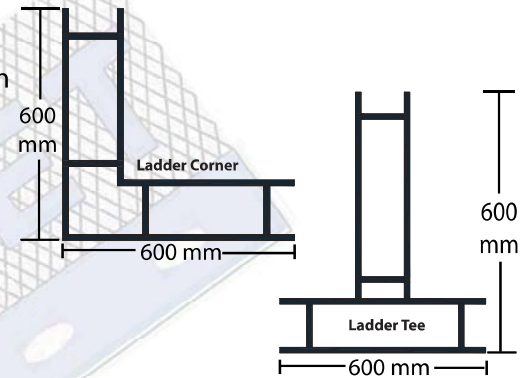
1. ASTM A 951 / A 951M
2. BS EN 845-3: 2003

Materials:

1. Mild Steel to ASTM A82 and Hot dip galvanized after fabrication to ASTM A123 / ASTM A 153 or BS EN ISO 1461.
2. Stainless Steel to ASTM A 276 or BS EN 10088.

Main Wires: not less than 3.8 mm diameter, deformed type, spaced not more than 400 mm between rungs. The use of deformed wires is recommended since it will increase the friction and accordingly the adhesion.

It is recommended to use joint reinforcement every two or three courses.



Type Code	Width (mm)	Block Width (mm)	Material	Length (m)
BRL / BRT-050-SS / HDG	50	100	Stainless Steel/ Hot dip Galvanized	2.9 / 3.0
BRL / BRT-100-SS / HDG	100	150	Stainless Steel/ Hot dip Galvanized	2.9 / 3.0
BRL / BRT-150-SS / HDG	150	200	Stainless Steel/ Hot dip Galvanized	2.9 / 3.0
BRL / BRT-200-SS / HDG	200	250	Stainless Steel/ Hot dip Galvanized	2.9 / 3.0

*wires of 4.8 mm can be produced as special order for severe conditions.
*Tee and Elbow sections can be produced.

2. Bar Positioner

Used to ensure right positioning of reinforcing bars in block work.
Diameter : 4 to 5mm; sizes = (block width - 35mm)

*As per Building Code Requirements for Masonry Structures (ACI 530-02/ASCE 5-02/ TMS 402-02) Reported by the Masonry Standards Joint Committee (MSJC) minimum cover is 15.9 mm.



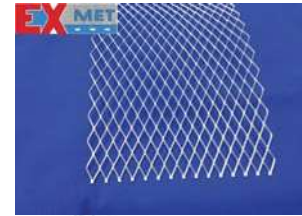
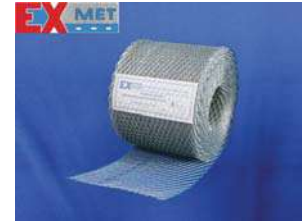
Materials:

1. Mild Steel to ASTM A82 and Hot dip galvanized after fabrication to ASTM A123 / ASTM A 153 or BS EN 1461.
2. Stainless Steel to ASTM A 276 or BS EN 10088.

3. Joint Reinforcement Mesh

Used in building construction for reinforcing of block / brick work to be embedded to give high strength and crack control.

It also reduces the effects of vibration, settlement and temperature changes.



1) Galvanized Steel Joint Reinforcement Mesh

Used for normal conditions and internal applications.

Material:

BS EN 10346 (replaced BS EN 10327) and ASTM A 653, G90

Thickness & Sizes:

According to the requirements of BS EN 845-3 and QCS 2014 Sec. 13, Part 3.4

Code	Mesh Width (mm)	Block Width (mm)	Length (m)	
			Strip	Coil
BRM100-gs	100 (4")	100 (4")	2.44	25 & 50
BRM150-gs	150 (6")	150 (6")	2.44	25 & 50
BRM175-gs	175 (7")	200 (8")	2.44	25 & 50
BRM200-gs	200 (8")	200 (8")	2.44	25 & 50

QCS 2014	
Mesh Width (mm)	Block Width (mm)
50	100 (4")
60	150 (6")
110	200 (8")

* weights are arranged as per requirement

** cover for bed joint reinforcement is as per Engineer's recommendation

2) Stainless Steel Joint Reinforcement Mesh

Used for severe conditions and external applications or as directed by engineer.

Material:

BS EN 10088 - 2, Grade SS 304 / 316 and ASTM A 240 (Type 304 & 316)

Thickness & Sizes:

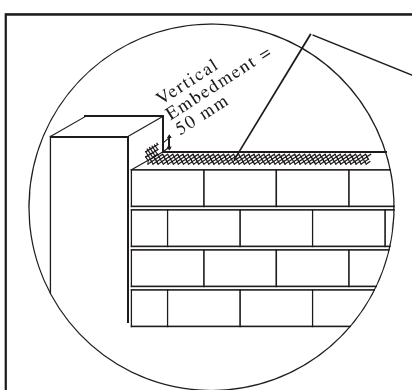
According to the requirements of BSEN 845 - 3: 2003 and QCS Sec. 13 part 3.4.

Code	Mesh Width (mm)	Block Width (mm)	Length (m)	
			Strip	Coil
BRM100-ss	100 (4")	100 (4")	2.44	25
BRM150-ss	150 (6")	150 (6")	2.44	25
BRM175-ss	175 (7")	200 (8")	2.44	25
BRM200-ss	200 (8")	200 (8")	2.44	25

QCS 2014	
Mesh Width (mm)	Block Width (mm)
50	100 (4")
60	150 (6")
110	200 (8")

* weights are arranged as per requirement

** cover for bed joint reinforcement is as per Engineer's recommendation



Joint Reinforcement Mesh Installation:

Mesh

- 0.92 kg/m; thickness - 0.5mm (EXMET recommended weight)
- 0.87 kg/m; thickness - 0.5mm (QCS 2014)

* Minimum embedment of 50mm and vertical embedment of 50mm; used every second course for partitions with high expected settlements such as:

1. No beams under the partitions
2. Deflection of beam or slab is expected under the partition.

II - Wall Ties

1. Cavity Wall Ties

Specifications:

1. BS EN 845-1: 2003 (replaced BS 1243)
2. QCS sec 13 Part 3.2
3. PD 6697: 2010 (replaced BS 5628)

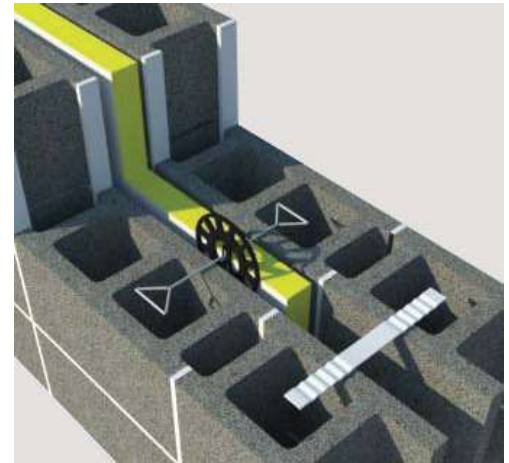
Material:

Wire / Rod:

1. Mild Steel to ASTM A82 and hot dip galvanized after fabrication to ASTM A123 / ASTM A 153 and BS EN ISO1461.
2. Stainless Steel to ASTM A 276 / BS EN 10088.

Sheet:

1. Mild Steel to ASTM A36 and hot dip galvanized after fabrication to ASTM A123 or ASTM A 153 or BS EN ISO 1461
2. Pre-galvanized to ASTM A 653 / BS EN 10346 (replaced BS EN 10327)
3. Stainless Steel to ASTM A 270 or ASTM A666 / BS EN 10088.



Criteria in Choosing Ties and Anchors

Type	Field of Use	
	Type of Structure	Geographical Location
Type 1	Suitable for most building sizes and types. Should not be used where large differential movements are expected to take place between leaves.	Suitable for most sites. However for relatively tall buildings or unusually shaped buildings in exposed areas – coastal areas for instance, the necessary tie provision should be calculated.
Type 2	Suitable for domestic dwellings and small commercial buildings of a height of up to 15m above ground level usually comprised of two leaves blockwork of similar thickness from 90mm to 150mm.	Suitable for buildings on flat sites where the fundamental basic wind velocity is up to 31 m/s except areas where the site is at an altitude of 150m or more above sea level.
Type 3	As Type 2	Suitable for buildings on flat sites where the fundamental basic wind velocity is up to 27 m/s.
Type 4	Light duty ties used in box-form domestic dwellings of up to 10m in height, comprising two leaves of similar thickness from 90mm to 150mm.	Suitable for flat sites in towns and cities except where the fundamental basic wind velocity exceeds 27 m/s) and any areas where the site is at an altitude of 150m or more above sea level.

* the above specifications is as per PD 6697: 2010 - Recommendations for the Design of Masonry Structures

Minimum Leaf Thickness (one or both)	Nominal Cavity Width (mm)	Tie Length (mm)	Classification
75	75 or less	200 ^(A)	Type 1, 2, 3 or 4 on the basis of design loading and cavity width
90	76 to 100	225 ^(A)	
90	101 to 125	250 ^(A)	
90	126 to 150	275 ^(A)	
90	151 to 175	300 ^(A)	
90	176 to 300	(B)	

(A) - embedment length not less than 50mm in both leaves, otherwise the length will be increased accordingly in 25mm increment.

(B) - For Cavities wider than 175mm, with an embedment of 50mm, calculate the length as nominal cavity width plus 125mm.

A. Cavity Wall Ties - Type 1

Suitable for most building sizes and types. Should not be used where large differential movements are expected to take place between leaves.



Product Details:

Type Code	Item Description	Width (mm)	Thickness (mm)	Length (mm)	Cavity Width (mm)
CT1	Corrugated Tie	25 – 40	1.50 – 4.00	190 – 350	50 – 200
CT1 – V	Corrugated Tie w/ V-Rib				
FT1	Fishtail Tie	30 – 40			
FT1 – V	Fishtail Tie w/ V-Rib				
FT1 – Twisted	Fishtail Tie – Twisted				
SDT	Symmetrical Tie – Diamond End	25 – 40			
SDT-V	Symmetrical Tie – Diamond End w/ V-Rib				
S6HT	Symmetrical Tie – 6 holes				

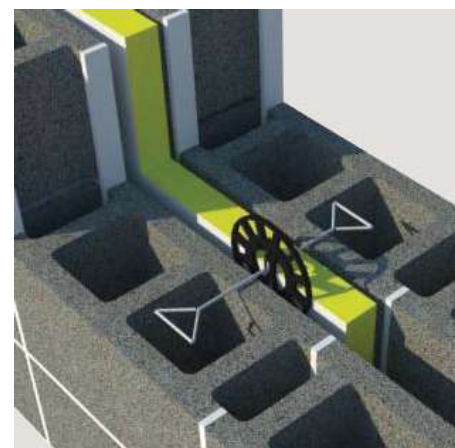
B. Cavity Wall Ties - Type 2 and 3

Suitable for domestic dwellings and small commercial buildings of a height of up to 15m above ground level usually comprised of two leaves block work of similar thickness from 90 mm to 150 mm.

Product Details:



Type Code	Item Description	Diameter (mm)	Width (mm)	Length (mm)
BFT1	Butterfly Wall Tie	3.0 - 3.8	75	200
DTT1	Double Triangle Tie		65 - 75	200 - 300
DZT1	Z-Type Wall Tie			



* based on Guideline in Selecting Wall Ties: BS 5628 - Code of Practice for Use of Masonry

C. Cavity - Wall Ties - Type 4

Light duty ties used in box-form domestic dwellings of up to 10 m in height comprising two leaves of similar thickness from 90mm to 150mm.

Product Details:

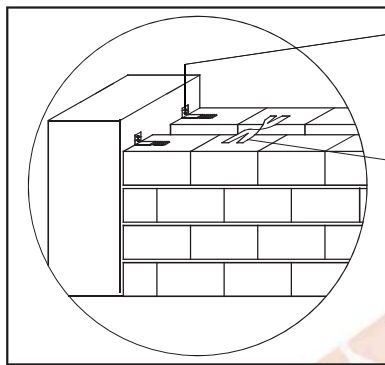
Material:

Sheet:

1. Stainless Steel to ASTM A 240 or ASTM A666 / BS EN 10088



Type Code	Description	Thickness (mm)	Length (mm)	Width (mm)	Cavity Width (mm)
T1	Wall Tie	not less than 0.6	190	19	50
T2	Wall Tie (longer)		220		75
BT3	L-Angle		120		At Column

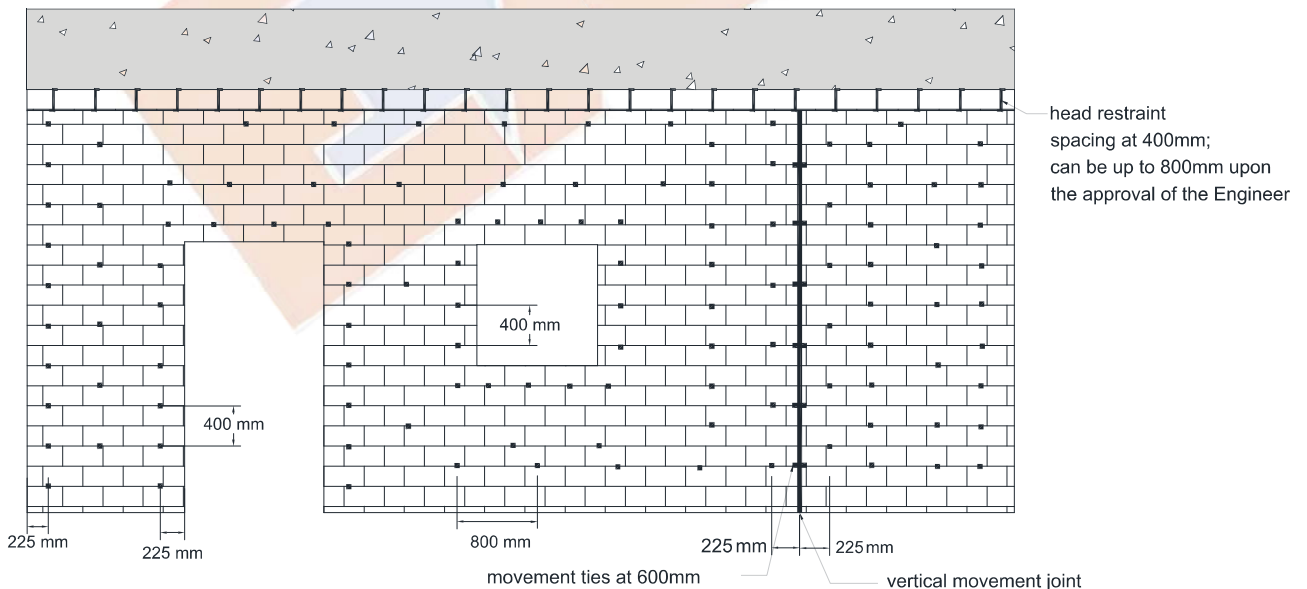


Block tie (corrugated type or fishtail type)
width - 30mm ; neck height - 50mm with two holes (preferably)
length - same as block width (minimum of 120mm)
Min. Thickness - 1.50mm

Cavity Wall Tie (corrugated or fishtail type)
width - 30mm ; length = cavity width + 75mm each side embedment
Min. Thickness - 1.50mm

Material:
Galvanized steel - for internal application and normal conditions
Stainless steel - for external application and severe conditions

Recommended Installation:



QCS 2014

Cavity Width	Max. Horizontal Spacing (mm)	Max. Vertical Spacing (mm)
50 – 75	1000	400
75 – 100	800	400
100 – 150	500	400

BS 5628

Both Leaves	≥ 90 mm	2.5 ties / m ²
Either Leaf	< 90 mm	4.9 ties / m ²

* additional ties should be placed at 225 to 250 mm around openings or at end wall situations

2. Masonry to Concrete

Specifications:

1. BS EN 845-1: 2003 (replaced BS 1243)
2. QCS sec 13 Part 3.2
3. PD 6697: 2010 (replaced BS 5628)

Material:

Wire / Rod:

1. Mild Steel to ASTM A82 and hot dip galvanized after fabrication to ASTM A123 / ASTM A 153 / BS EN ISO 1461
2. Stainless Steel to ASTM A 276 and BS EN 10088.

Sheet:

1. Mild Steel to ASTM A36 and hot dip galvanized after fabrication to ASTM A123 / ASTM A 153 and BS EN ISO 1461
2. Pre-galvanized to ASTM A 653 / BS EN 10346 (replaced BS EN 10327)
3. Stainless Steel to ASTM A 240 / ASTM A666 / BS EN 10088.

a. Angle Ties

One way of connecting masonry to concrete is with the use of Angle Ties. These ties will be fixed on the concrete and the tie extends to the masonry.

Thickness	Width	Return	Length
1.5-400	30-40	40 - 50	190-350

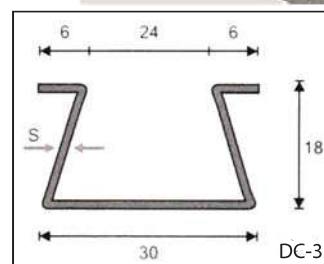
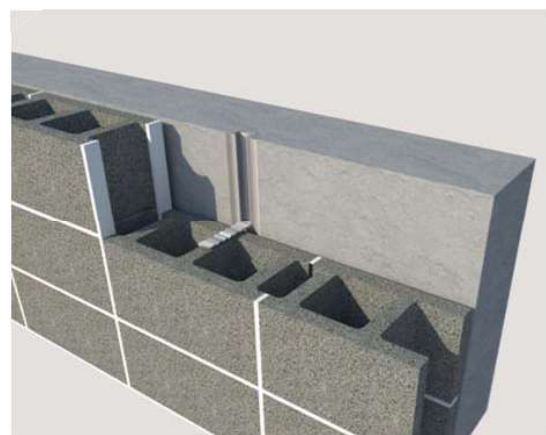
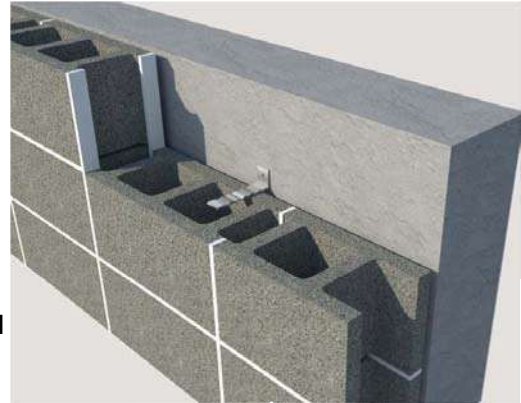
* other sizes can be arranged

b. Dovetail Channel System

Another way of connecting masonry to concrete column or any concrete wall it is advisable to use EXMET Dovetail Channel system.

The channels offer a significant cost and time advantage over drilled normal fixings. The channel will be installed on the inside face of the formwork, then concrete will be poured.

**Note that the channel should be filled with suitable filler such as Polystyrene to avoid being filled with concrete during pouring. After removing the formwork, the channel is ready to hold the ties.*



	Thickness
Dovetail Slot /Channel	1.0 – 1.5 mm
Dovetail Tab	1.0 – 2.0 mm

* other sizes can be arranged

3. Masonry to Steel

Adjustable Anchors and ties connected to structural steel which allow vertical or horizontal adjustment which can resist both tension and compression.

Specifications:

1. BS EN 845-1: 2003 (replaced BS 1243)
2. QCS sec 13 Part 3.2
3. PD 6697: 2010 (replaced BS 5628)

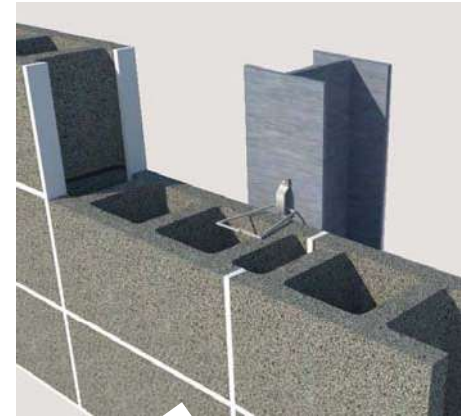
Material:

Wire / Rod:

1. Mild steel to ASTM A 82 and hot dip galvanized after fabrication to ASTM A 123 / ASTM A 153 or BS EN ISO 1461.
2. Stainless Steel to ASTM A 276 / BS EN 10088.

Sheet:

1. Mild steel to ASTM A 36 and hot dip galvanized after fabrication to ASTM A 123 / ASTM A 153 / BS EN ISO 1461.
2. Stainless steel to ASTM A 240 / ASTM A666 / BS EN 10088.



4. Other Ties and Anchors

Material:

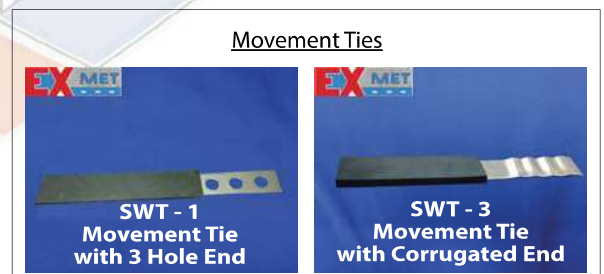
Sheet:

1. Mild Steel to ASTM A36 and hot dip galvanized after fabrication to ASTM A123 or ASTM A 153 or BS EN ISO 1461
2. Pre-galvanized to ASTM A 653 / BS EN 10346 (replaced BS EN 10327)
3. Stainless Steel to ASTM A 240 or ASTM A666 / BS EN 10088.

a. Movement Ties

Restraints the masonry against the lateral wind loads while the sleeve will allow the masonry to contract or expand during movement.

Type Code	Thickness (mm)	Width (mm)	Length (mm)
SWT-1, SWT-3	1.50 - 4.00	25 - 40	190 - 350

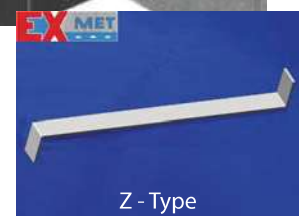
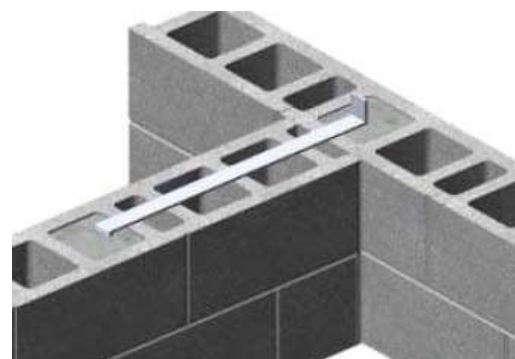


b. Rigid Anchor

Material:

Sheet:

1. Mild Steel to ASTM A36 and hot dip galvanized after fabrication to ASTM A123 / ASTM A 153 or BS EN ISO 1461
2. Stainless Steel to ASTM A 240 / ASTM A666 or BS EN 10088.
3. Pre-galvanized to ASTM A 653 or BS EN 10346 and epoxy coated after fabrication.

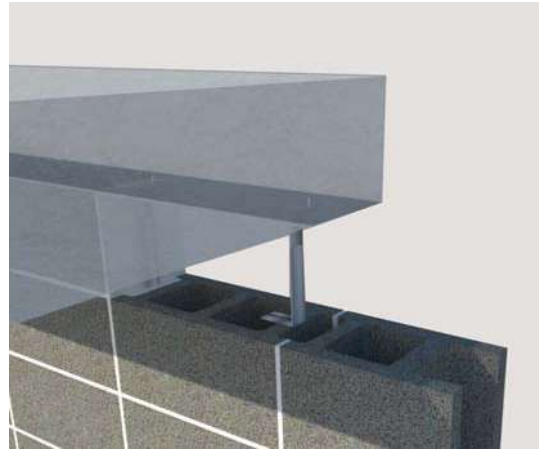


5. Head Restraints

Material:

Sheet:

1. Mild steel to ASTM A 36 or BS 1449 - 1 and hot-dip galvanized after fabrication to ASTM A 123 / ASTM A 153 or BS EN 10088.
2. Pre-galvanized to ASTM A 653 or BS EN 10346 (replaced BS EN 10327).
3. Stainless steel to ASTM A 240 / ASTM A 666 or BS EN 10088.



a. Adjustable Head Restraint

These are used to restrain the top of the masonry walls and allow vertical movement during shrinkage or thermal movement.

	Thickness (mm)	Embedment (mm)	Width (mm)
Tie	1.5-2.0	50-70	30-40
Sleeve	1.0-1.2	70-100	



b. Ceiling Wall Tie

Used to tie the ceiling to the masonry wall below.

Thickness (mm)	Embedment (mm)	Width (mm)	Length (mm)
1.5 - 2.0	50 - 70	30 - 40	200



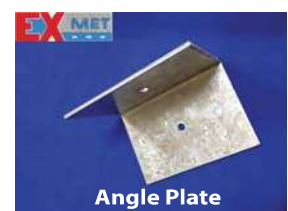
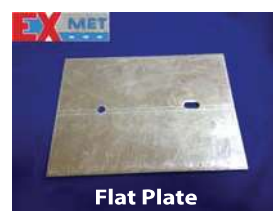
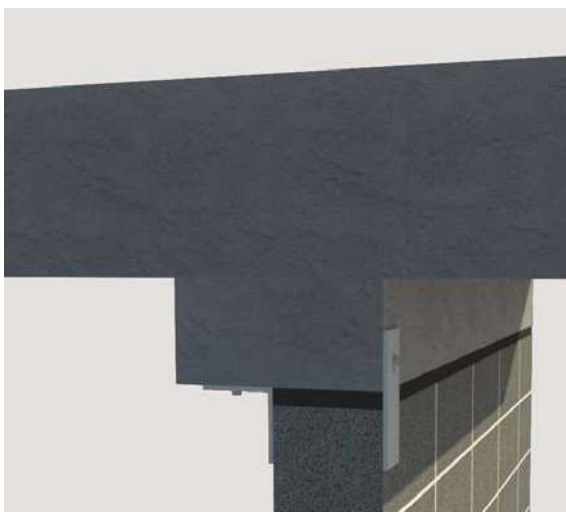
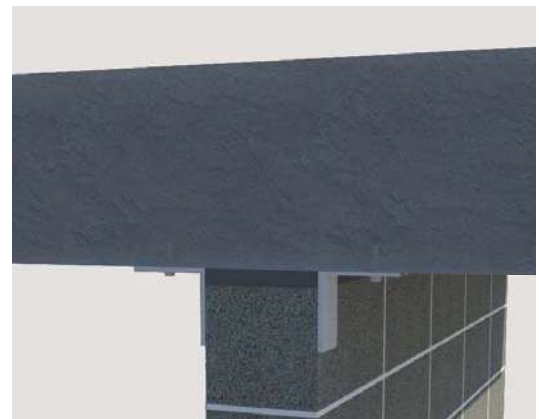
c. Plates and Loading Brackets

In some cases, the designer needs to have a masonry wall that resists shear or wind loads. To achieve this, some brackets, angles or plates are used to connect the slabs and the beams to masonry.

Material:

Sheet:

1. Mild steel to ASTM A 36 and hot dip galvanized after fabrication to ASTM A 123 / ASTM A 153 or BS EN 1461.



6. Partition Top Anchors

Partition Top Anchors provides lateral shear resistance at the upper limit of the masonry walls. They permit vertical deflection of the slab above, without transferring compressive loads to the masonry below.



PTA - R Partition Top Anchor - Rod

The anchor is attached to the concrete or steel structure. A Neoprene sponge or any compressible filler is placed between the above structure and the masonry below thus allowing vertical expansion and contraction.

The clear butyrate tubes with compressible polyethylene filler placed over the rod anchor isolates the anchor from the surrounding mortar so the anchor will slide vertically.

Material:

Pre-Galvanized, Hot Dip Galvanized or Stainless Steel

** for specifications, refer to page 1*

Dimensions:

Plate:

Thickness - 2 to 3mm

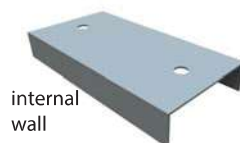
Rod:

Diameter - 8 to 12mm

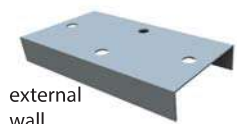


PTA - C Partition Top Anchor - Channel

The anchor is attached to the concrete or steel structure and Neoprene Sponge or any other compressible filler is placed between the above structure and the masonry below thus allowing vertical expansion and contraction.



internal wall



external wall

Material:

Pre-Galvanized, Hot Dip Galvanized or Stainless Steel

** for specifications, refer to page 1*

Dimensions:

Thickness - 2 to 3mm

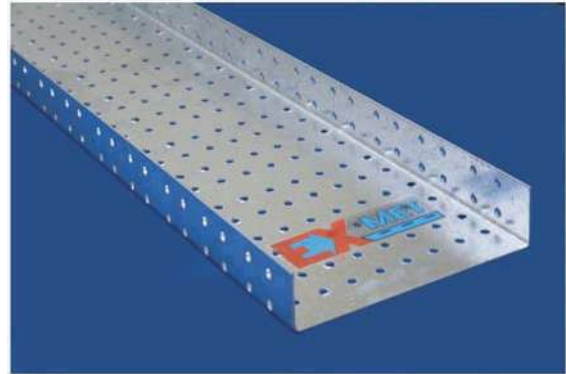
* other dimensions or sizes and material finishes can be arranged

STEEL LINTELS

EXMET Steel Lintels are manufactured according to BS 5977 : Part 2: 1983. The design procedure which was followed by our technical department is the LRFD method by (American Institute of Steel Construction) (AISC) 1st edition 1993 second printing.

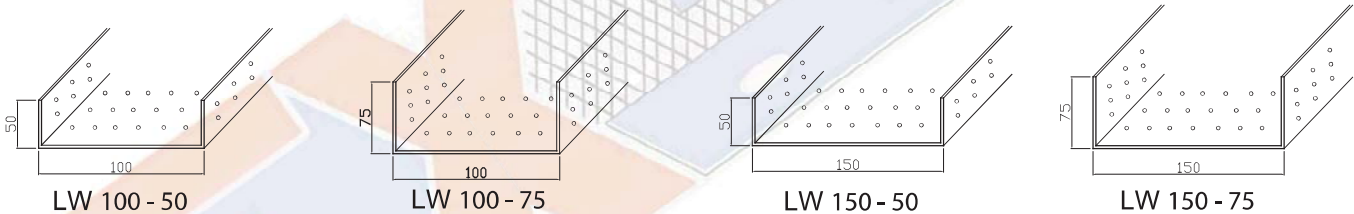
Advantages of using EXMET steel Lintels than the conventional method:

- No need for lifting equipment.
- Saving the time for the contractor.
- Ready design by our technical department.
- Our steel lintels are resistant to corrosion and have good adhesion to plaster by the perforations.
- Brackets for column fixing save the time efficiently.



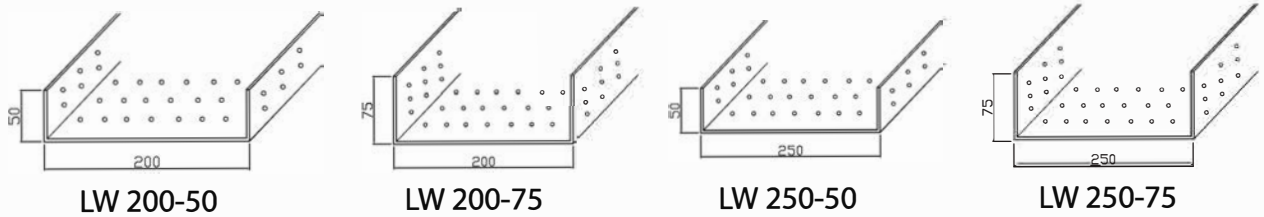
Materials:

1. Pre-galvanized steel: According to BS EN 10327 - DX 51 D + Z275 (revised of BS 2989)
2. Hot dip galvanized steel after fabrication according to BS 729: 1971.
3. Stainless Steel: According to BS EN 10088-2-5 grade 304 (equivalent to BS 1449)
4. Powder coated steel, mild steel to BSEN 10327, then coating by polyester / epoxy powder.



Lintel Type	LW 100 - 50		LW 100 - 75	LW 150 - 50		LW 150 - 75	
Sheet Thickness (mm)	2.0	3.0	3.0	2.0	3.0	2.0	3.0
Length of opening(m)	Maximum Distributed Dead Loads (kg)						
Up to 1.00	451	661	2,059	483	718	1,085	1,607
1.05 - 1.30	267	391	1,218	304	445	834	1,236
1.35 - 1.60	176	258	804	200	293	621	912
1.65 - 1.90	125	183	570	142	208	440	647
1.95 - 2.20	81	119	371	92	135	286	420
2.25 - 2.55	--	81	253	--	92	195	287

Factor of Safety is already applied in calculations.



Lintel Type	LW 200 - 50		LW 200 - 75		LW 250 - 50		LW 250 - 75
	Sheet Thickness (mm)	2.0	3.0	2.0	3.0	2.0	3.0
Length of opening(m)	Maximum Distributed Dead Loads (kg)						
Up to 1.00	490	733	1,093	1,627	479	749	1,645
1.05 - 1.30	328	479	841	1,251	344	504	1,264
1.35 - 1.60	216	316	673	990	227	332	1,028
1.65 - 1.90	153	224	477	702	161	236	743
1.95 - 2.20	99	146	310	457	105	153	483
2.25 - 2.55	--	99	211	311	-	104	329

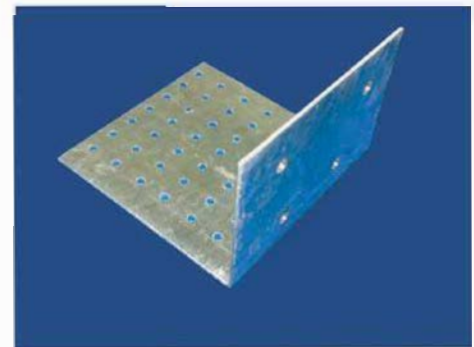
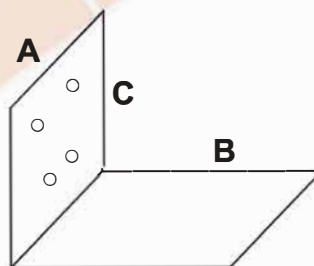
Factor of Safety is already applied in calculations.

Installation

- 1) Provide a minimum of 20 cm at each side as an end bearing except areas where columns are at the edge of the opening, Angle brackets will be supplied in such cases.
- 2) Lintels should not be cut down in the site.
- 3) Damaged or used Lintels should not be used.

Lintel Bracket Angles:

Used to support lintels at column or edges.



Type Code	Dimensions (mm)			Used With Lintel	Minimum required Anchors
	A	B	C		
LA - 100	100	170	145	LW 100	4M8*
LA - 150	150	190	145	LW 150	4M8*
LA - 200	200	200	145	LW 200	4M10*
LA - 250	250	200	145	LW 250	4M10*

* Please consult our technical department to design the requirements of Anchor Bolts as well as thickness required for the angle.

Gauge No.	SWG		BG	BWG	USG
	inches	mm	inches	inches	inches
0	.324	8.230	.3964	.340	-
1	.300	7.620	.3532	.300	-
2	.276	7.010	.3147	.284	-
3	.252	6.401	.2804	.259	.2391
4	.232	5.893	.250	.238	.2242
5	.212	5.385	.2225	.220	.2092
6	.192	4.877	.1981	.203	.1943
7	.176	4.470	.1764	.180	.1793
8	.160	4.064	.157	.165	.1644
9	.144	3.658	.1398	.148	.1495
10	.128	3.251	.125	.134	.1345
11	.116	2.946	.113	.120	.1196
12	.104	2.642	.0991	.109	.1046
13	.092	2.337	.0882	.095	.0897
14	.080	2.032	.0785	.083	.0747
15	.072	1.829	.0699	.072	.0673
16	.064	1.626	.0625	.065	.0598
17	.056	1.422	.0556	.058	.0538
18	.048	1.219	.0495	.049	.0478
19	.040	1.016	.0440	.042	.0418
20	.036	0.914	.0392	.035	.0359
21	.032	0.813	.0349	.032	.0329
22	.028	0.711	.03125	.028	.0299
23	.024	0.610	.02782	.025	.0269
24	.022	0.559	.02476	.022	.0239
25	.020	0.508	.02204	.020	.0209
26	.018	0.457	.01961	.018	.0179
27	.0164	0.4166	.01745	.016	.0164
28	.0148	0.3759	.015625	.014	.0149
29	.0136	0.3454	.0139	.013	.0135
30	.0124	0.3150	.0123	.012	.0120
31	.0116	0.2946	.011	.010	.0105
32	.0108	0.2743	.0098	.009	.0097
33	.0100	0.254	.0087	.008	.0090
34	.0092	0.2369	.0077	.007	.0082
35	.0084	0.2134	.0069	.005	.0075
36	.0076	0.1930	-	.004	-