CHUBB

Tangbar anti-burglar reinforcement for strongroom construction

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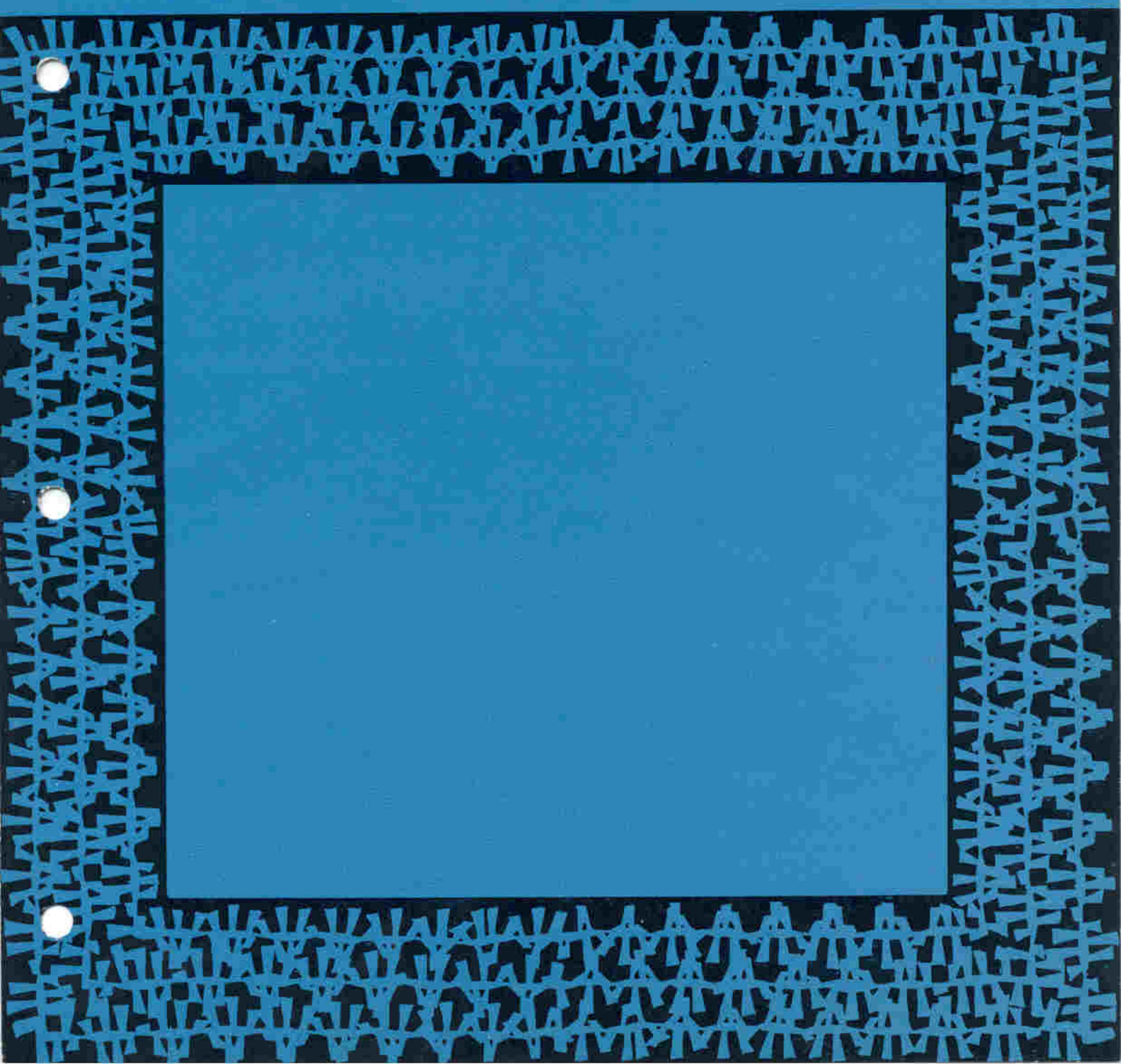


Design
Tangbar is made from steel 9in or 7in wide by $\frac{1}{8}$in thick (288 or 178 by 3mm) and is stamped in the form of a double comb after which it is twisted to radiate the tangs in all directions.

Any structural steel required for normal reinforcing purposes will not make a significant contribution against penetration. This resistance can, however, be materially increased by the incorporation of Tangbar which is a specially designed anti-burglar reinforcement. Tangbar is not intended to replace structural steel; it serves an entirely different purpose and is in an entirely different form.

Resistance to attack
By enforcing a change in the type of cutting tool required Tangbar serves to defeat or delay an attack on a concrete strongroom. The thief is required to carry extra equipment and needs to be skilled in its use.

The irregular shape prevents prediction of the precise location of the tangs although distribution is throughout the full thickness of the strongroom structure in such a way as to provide a dense steel barrier against attempts at penetration.

Properly laid Tangbar will offer protection immediately below the entire surface area of the structure as well as throughout its thickness.

Maintains structural strength
Tangbar overcomes the problem of over-steeling which is bound to arise from the introduction of large quantities of steel to reinforced concrete. Its form is such that it will not interfere with the homogeneity of the concrete, nor with the structural steel reinforcement.

All the requirements for high grade concrete can be met without modification.

Ease of handling
Tangbar is supplied in convenient lengths of 6ft 6in (198cm) and can be handled easily by unskilled labour. In the larger quantities and for export, it is despatched untwisted to facilitate transportation, handling and storage. A twisting machine is supplied for twisting to be carried out on site.

Strongroom construction
A properly designed and well built in-situ concrete strongroom should provide a high degree of protection against burglary, but the successful application of concrete to this purpose requires a thorough appreciation of the issues involved. The basic strength of the structure in resisting penetration will depend largely on the quality of the concrete used and no effort should be spared to ensure that the best use is made of the materials available. Care should be taken in specifying, mixing, laying and consolidating to ensure that the best possible results are obtained.

The concrete mix
Where granite or whinstone are available we recommend, as a guide, the following mix:
1 part ferrocrete cement.
$1\frac{1}{2}$ parts clean sharp sand.
$2\frac{1}{2}$ parts $\frac{3}{4}$in (19mm) granite or whinstone chippings.
$\frac{1}{2}$ part $\frac{1}{4}$in (6mm) granite or whinstone chippings. This aggregate should be free from dust or other impurities.

The water content will depend largely on the method of consolidation, but it should be carefully controlled and kept to the minimum for efficient working. We recommend that experimental mixes should be made before starting work and that test cubes should be taken to determine the best results. Great care should be exercised in mixing with a view to providing as dense a concrete as possible to achieve maximum resistance to penetration.

Laying Tangbar on site
Full instructions are supplied with Tangbar giving the recommended method of laying, together with additional instructions for twisting on site.

As Tangbar has been designed specifically to increase resistance to penetration, without affecting structural values, it is important to remember that on no account should structural reinforcement be omitted or displaced in order to accommodate Tangbar. The length of Tangbar–6ft 6in (198cm)–has been chosen as the most convenient for handling, but individual lengths have to be cut to make up the correct lengths in the walls, floor and roof.

Floors
The general principle of laying is that the Tangbar is introduced after a layer of concrete equivalent to the amount of cover has first been put down. Wherever possible, the whole floor area should be laid with Tangbar before the remainder of the concrete is poured; this may necessitate wiring the lengths to maintain the 2in (50mm) overlap both horizontally and vertically.

The end of the lengths of Tangbar should overlap the centre line of the outer row of Tangbar in the walls by $1\frac{1}{2}$in (38mm). For raft foundations or suspended floors refer to the comments on the procedure for the roof.

Walls
The wall shuttering is erected to the full height on one face, and the shuttering on the other face is built up as work proceeds. The rows of Tangbar are introduced one horizontal layer at a time, and concreted to within 2in (50mm) of the ends of the uppermost 'tangs'. This process is repeated, and the shuttering is built up until the full wall height has been reached.

Roofs
Whilst the recommendations for laying the floor will apply in general terms for the roof, it is essential that the method adopted does not impair the efficiency of the structural reinforcement. The precise procedure may require variation to suit individual jobs, and may call for the advice of the Architect or Structural Engineer.

Simple precautions to ensure bonding at corners and at the junction of the walls with the floor and roof are set out in the instructions sent with the Tangbar.

Cost
The cost of Tangbar is very reasonable in proportion to the substantial extra protection provided. A plan and section through the strongroom is all we require to prepare a quotation. Our representatives are always available to offer advice on any of the problems associated with the construction of burglar resisting strongrooms, and we are able to produce complete layout drawings if required.

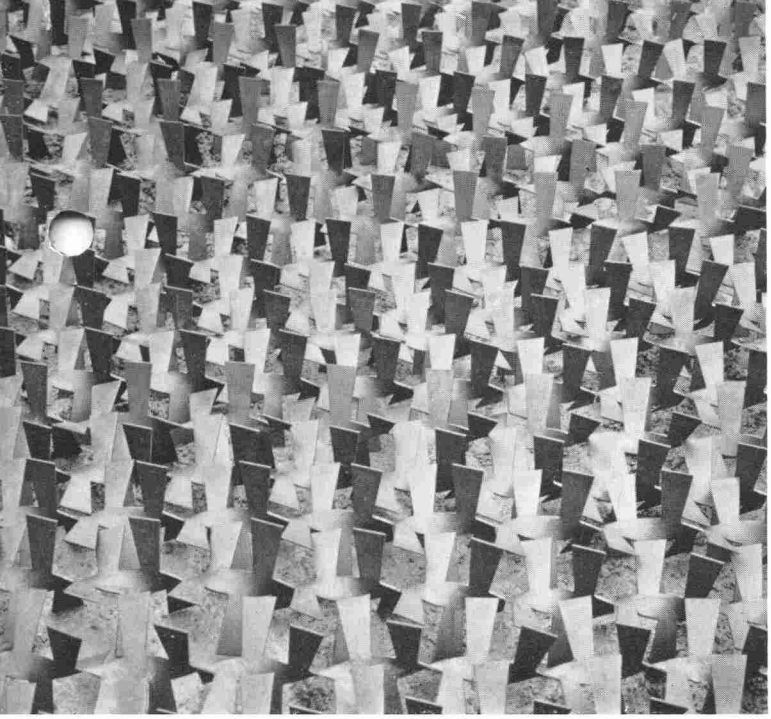
Strongroom equipment
A comprehensive range of Chubb strongroom doors and fittings is available, including dividing grillework, security cupboards and safe deposit lockers. Please ask for other brochures as follows:
Treasury doors
$3\frac{1}{2}$in anti-arc doors
Safe deposit lockers
Strongroom construction
Security cupboards.

Top left
An excellent impression of the density and irregularity of the Tangbar reinforcement barrier.

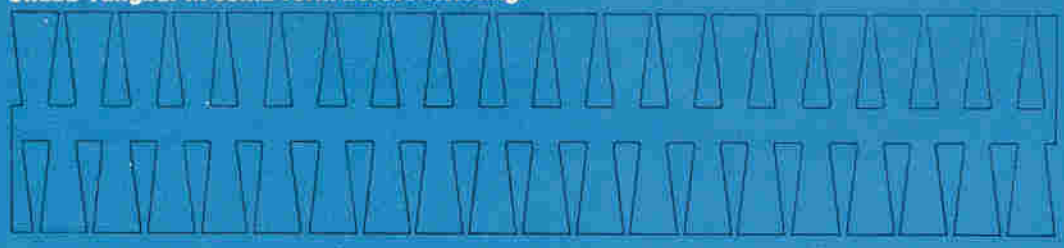
Top right
Tangbar being laid in a wall, and concreted one lift at a time, the shuttering being erected as work proceeds.

Bottom
A vault roof with two rows of Tangbar, the lower row running between RSJ's and the upper row above the structural steelwork, being laid continuously at close pitch.

Chubb policy is one of constant improvement. We therefore reserve the right to alter any part of the specification outlined in this publication without incurring any obligation.



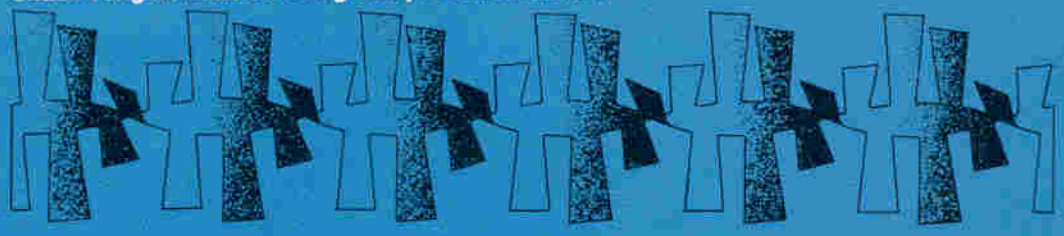
Chubb Tangbar in comb form before twisting:



Plan

Section

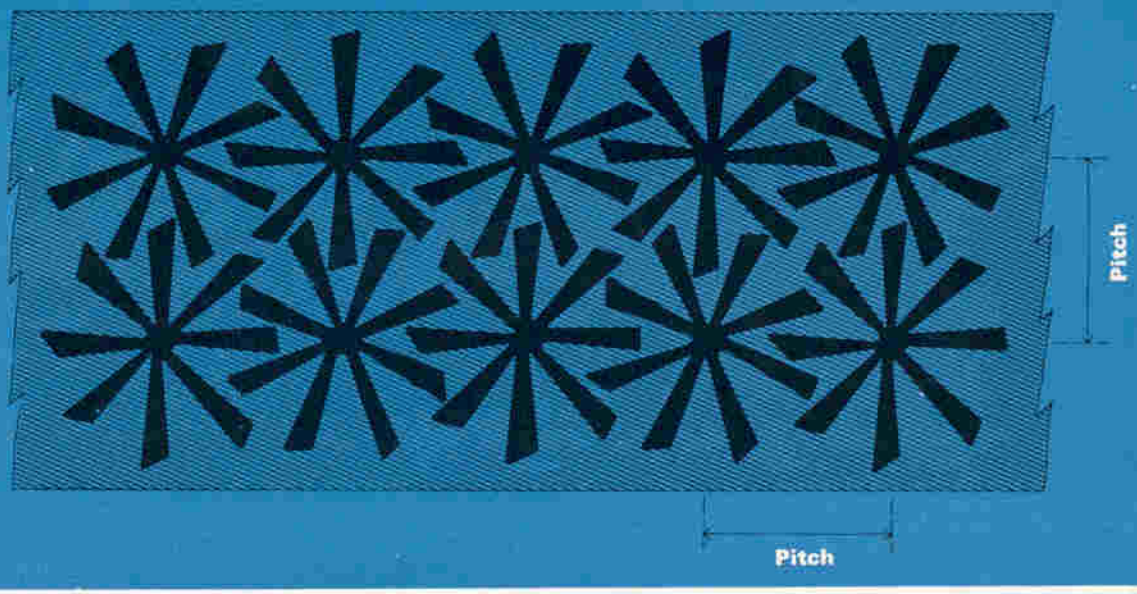
Chubb Tangbar after twisting ready for installation:



Plan

Section

Section of Strongroom wall showing the pitch of Chubb Tangbar in relation to wall thickness.



Schedule of recommendations

Thickness of walls, floor or roof		No. of rows of Tangbar	Size of Tangbar		Pitch		Weight per sq. ft. or metre of surface of wall, floor or roof	
Inches	mm		**Inches**	mm	**Inches**	mm	**lb/ft²**	kg/m²
9	229	**1**	**7**	178	**5**	127	**4·45**	21·7
12	305	**1**	**9**	229	**7**	178	**4**	19·5
15	381	**2**	**7**	178	**5**	127	**8·9**	43·4
18	457	**2**	**9**	229	**7**	178	**8**	39
21	533	**2**	**9**	229	**7**	178	**8**	39
24	609	**3**	**9**	229	**7**	178	**12**	58·6
30	762	**3**	**9**	229	**7**	178	**12**	58·6
36	914	**4**	**9**	229	**7**	178	**16**	78·2
42	1067	**4**	**9**	229	**7**	178	**16**	78·2
48	1219	**5**	**9**	229	**7**	178	**20**	97·8

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