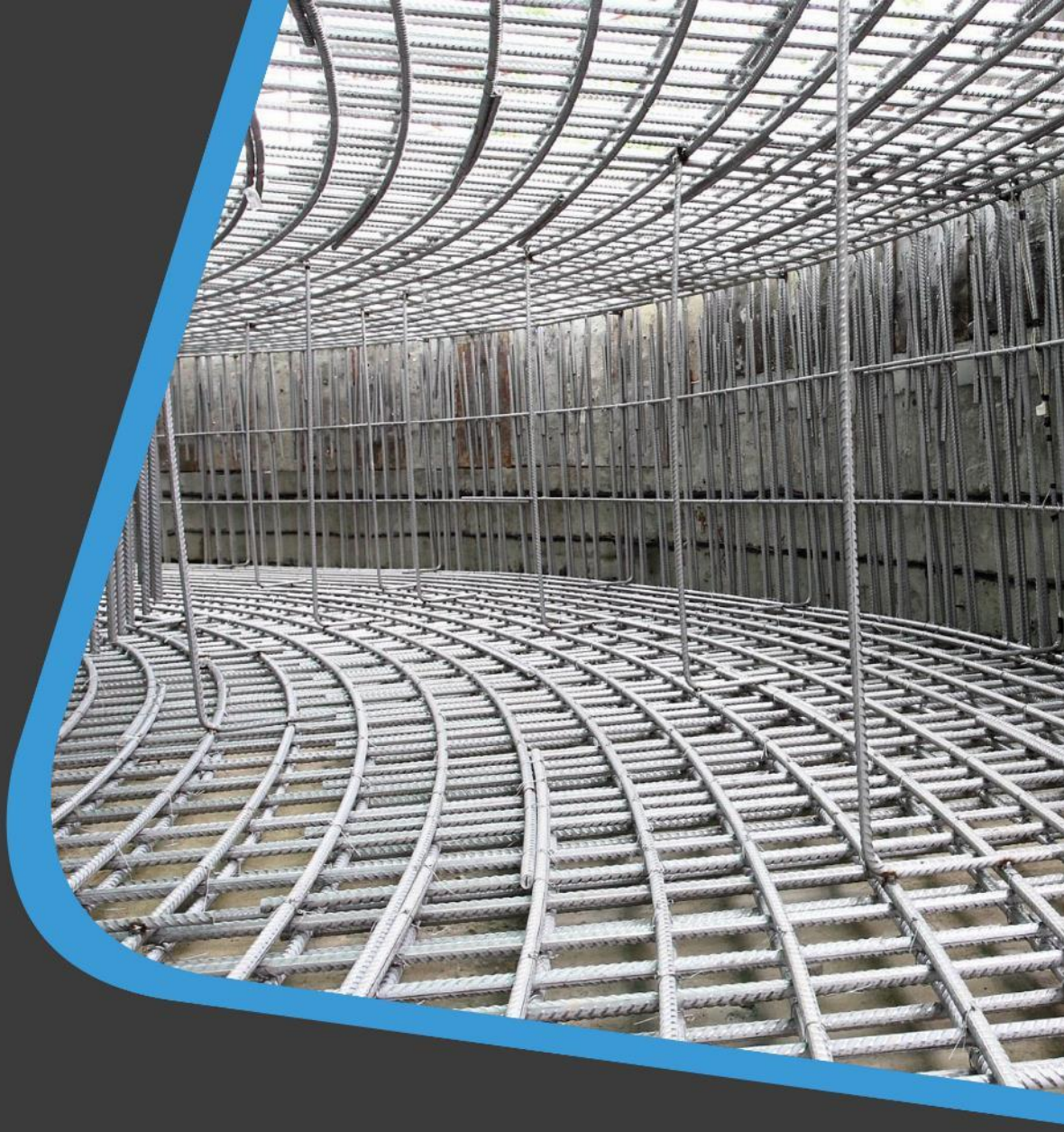


RebarCAD

Support for IS: 2502-1963 Shape Codes

CADS
GLOBAL CONSTRUCTION
SOFTWARE AND SERVICES

AUTODESK
Authorised Developer

Microsoft
Partner

Revision history

Date	Version	Description
Sep 2023	1.0	Compatible to RebarCAD India 2024.0
Nov 2024	2.0	Compatible to RebarCAD India 2025.0
Dec 2025	3.0	Compatible to RebarCAD India 2026.0

Contents

1 Introduction

This document will give you the details of IS2502:1963 shape codes supported in RebarCAD India.

This document also provides the comparison of length calculation as per IS: 2502-1963 code against the total length reported for same dimensions in RebarCAD India.

2 Hooks and bend allowances

Hook and bend lengths in RebarCAD India are as per **Table II Hook and Bend Allowances** in **IS: 25021963** code.

The Hook (H) and Bend (B) calculations for all the shapes in this document is assuming **10 mm** size of **cold worked steel bars**.

Hook allowance (H) used for 10mm bars → **130mm**

Bend Allowance (B) used for 10mm bars → **75mm**

TABLE II HOOK AND BEND ALLOWANCES

(*Clauses* 3.1 *and* 3.2.1)

Nominal Size of Bar	Hook Allowance (*H*)						Bend Allowance (*B*)					
	Mild Steel Conforming to *IS: 432-1960 or to †IS: 1139-1959		Medium Tensile Steel Conforming to *IS: 432-1960 or to †IS: 1139-1959		Cold Worked Steel Bars Conforming to ‡IS: 1786-1961		Mild Steel Conforming to *IS: 432-1960 or to †IS: 1139-1959		Medium Tensile Steel Conforming to *IS: 432-1960 or to †IS: 1139-1959		Cold Worked Steel Bars Conforming to ‡IS: 1786-1961	
	Min	*Recommd*	*Min*	*Recommd*	*Min*	*Recommd*	*Min*	*Recommd*	*Min*	*Recommd*	*Min*	*Recommd*
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
5	75	—	75	—	75	—	75	—	75	—	75	—
6	75	—	75	—	75	—	75	—	75	—	75	—
8	75	—	90	—	105	—	75	—	75	—	75	—
10	90	—	110	—	130	—	75	—	75	—	75	—
12	110	—	130	—	155	—	75	—	75	—	75	—
16	145	—	175	—	210	—	80	—	90	—	95	—
20	180	—	220	—	260	—	100	—	110	—	120	—
22	200	—	240	—	285	—	110	—	120	—	130	—
25	225	—	275	—	325	—	125	—	140	—	150	—
28	250	310	310	365	365	475	146	155	155	170	170	195
32	290	350	350	415	415	545	160	175	175	190	190	225
36	325	395	395	470	470	610	180	200	200	215	215	250
40	360	440	440	520	520	680	200	220	220	240	240	280
45	405	495	495	585	585	765	225	250	250	270	270	315
50	450	550	550	650	650	850	250	275	275	300	300	350

H = Hook allowance taken as 9*d*, 11*d*, 13*d* and 17*d* for *k* values 2, 3, 4 and 6 respectively and rounded off to the nearest 5 mm, but not less than 75 mm.

B = Bend allowance taken as 5*d*, 5·5*d*, 6*d* and 7*d* for *k* values 2, 3, 4 and 6 respectively and rounded off to the nearest 5 mm, but not less than 75 mm.

*IS: 432-1960 Specification for Mild Steel and Medium Tensile Steel Bars and Hard-Drawn Steel Wire for Concrete Reinforcement (*Revised*). (Since revised).

†IS: 1139-1959 Specification for Hot Rolled Mild Steel and Medium Tensile Steel Deformed Bars for Concrete Reinforcement. (Since revised).

‡IS: 1786-1961 Specification for Cold Twisted Steel Bars for Concrete Reinforcement. (Since revised).

IS : 2502 - 1963

3 Radius for standard bends

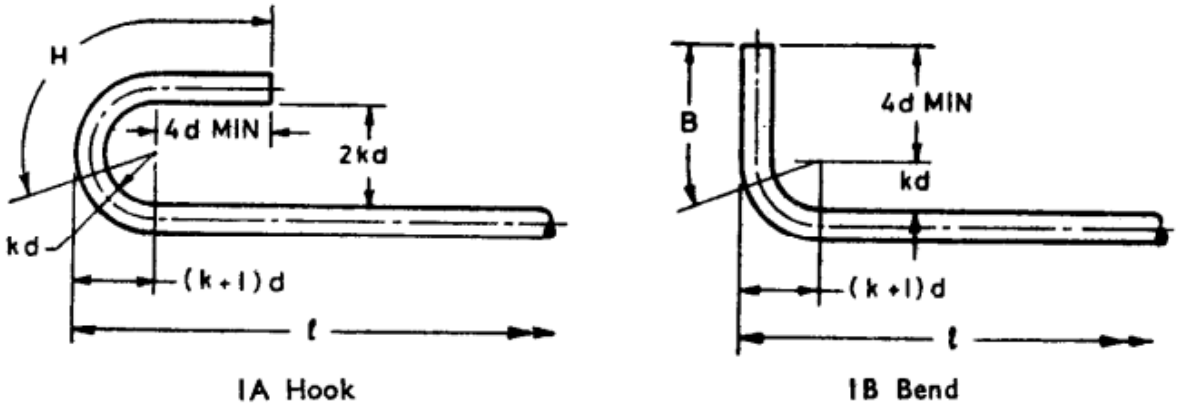
The Radius for standard bends is calculated as mentioned in clause 3.2.1 of IS: 2502-1963

Since all bar lengths are calculated assuming **10mm cold worked steel bars, "R"** value is calculated as explained below

As per **IS: 2502-1963** code the "k" value for **10mm** (less than 25mm) **cold worked steel bars** is mentioned as **4**

R= kd = 4*10 = **40mm**

IS : 2502 - 1963



1A Hook 1B Bend

NOTE 1 — k has a value of 2, in the case of mild steel conforming to *IS: 432-1960 Specification for Mild Steel and Medium Tensile Steel Bars and Hard-Drawn Steel Wire for Concrete Reinforcement (*Revised*) or †IS: 1139-1959 Specification for Hot Rolled Mild Steel and Medium Tensile Steel Deformed Bars for Concrete Reinforcement; 3, in the case of medium tensile steel conforming to *IS: 432-1960 or †IS: 1139-1959; and 4, in the case of cold worked steel conforming to †IS: 1786-1961 Specification for Cold Twisted Steel Bars for Concrete Reinforcement. In the case of bars above 25 mm, however, it is desirable to increase the k value to 3, 4 and 6 respectively.

NOTE 2 — H and B refer to hook allowance and bend allowance respectively (*see* Table II).

FIG. 1 STANDARD HOOK AND BEND

4 Rounding

As per IS: 2502-1963 code it is recommended to round off the total length to the next greater 25mm.

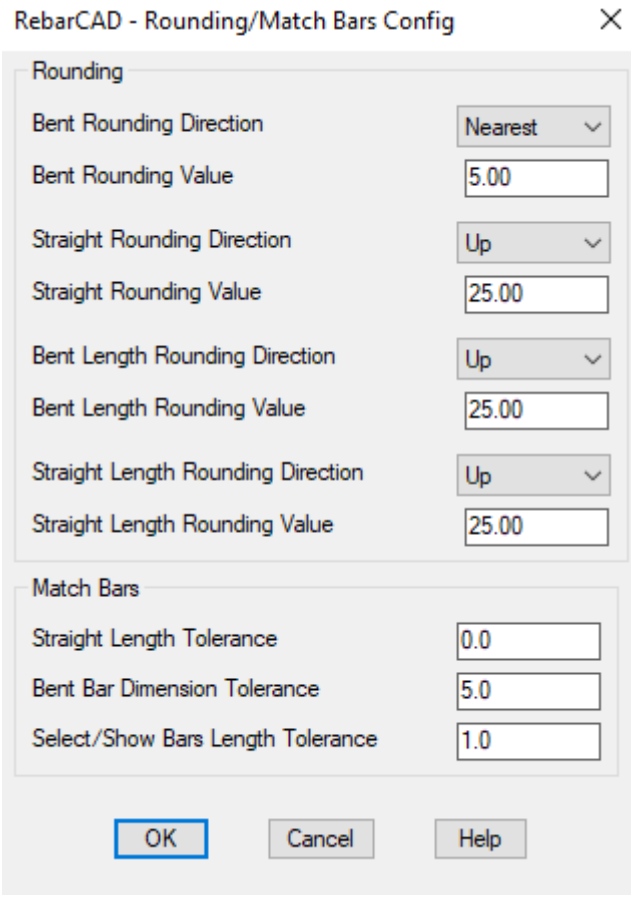
5. BENDING AND CUTTING TOLERANCES

5.1 Bars shall be bent in accordance with the appropriate dimensions shown in the schedule. Where an overall or an internal dimension of the bent bar is specified, the tolerance, unless otherwise stated, shall be as in Table XI (*see* p. 15).

5.1.1 Any excess in length of bar supplied over the total of the lengths of the various portions of the bar between bends, including the specified tolerances or not, shall be taken up in the end anchorages, or in that portion of the bar which shall be indicated on the schedule. The cutting lengths shall be specified to the next greater whole 25 mm of the sum of the bending dimensions and allowance.

*Since second revision issued as IS : 432 (Part I)-1966 and IS : 432 (Part II)-1966.
†Since revised.

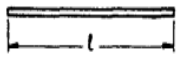
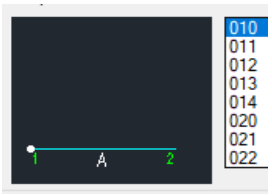
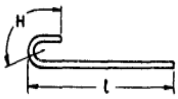
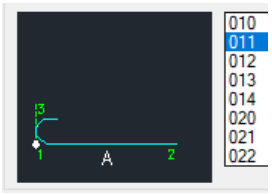
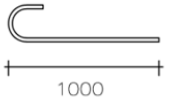
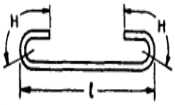
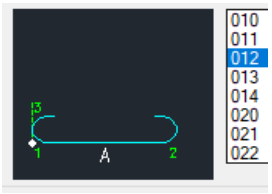
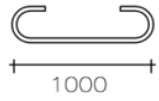
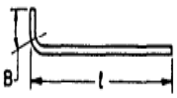
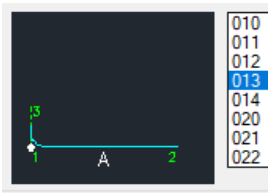
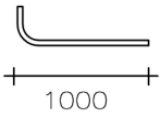
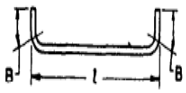
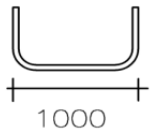
In RebarCAD India the rounding of individual legs and totals lengths can be controlled via configuration settings. By default, the rounding settings in RebarCAD India is set to accommodate the rounding as mentioned in the code but in this document, to confirm the accuracy of length calculation in RebarCAD India, the length calculations for all the shapes are calculated by applying rounding to next 1mm as shown below.



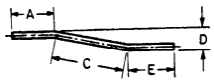
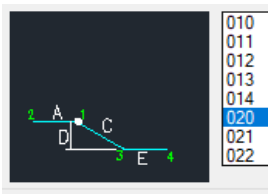
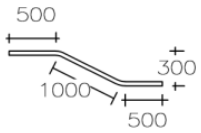
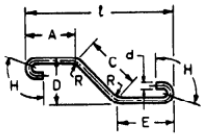
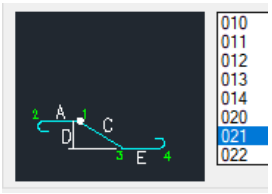
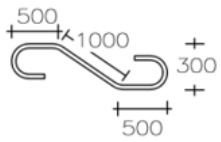
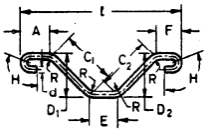
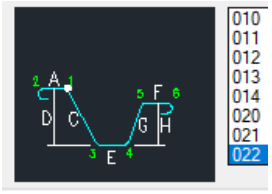
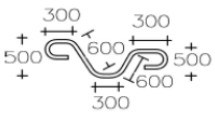
5 Length Calculations

Comparison of IS: 2502-1963 shape code length calculation against RebarCAD India length calculations as follows.

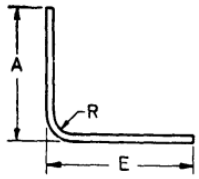
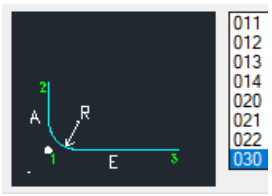
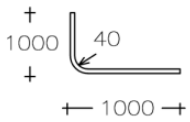
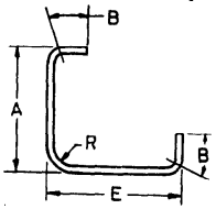
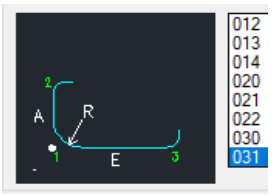
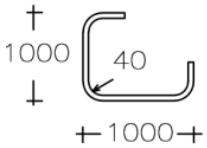
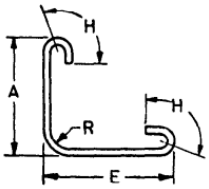
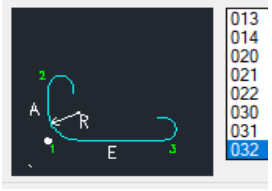
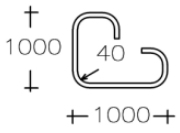
5.1 Table III shape codes

IS 2502		RebarCAD India		
Ref No	Shape	Shape Code	Length Comparison	
A				**Length as per IS 2502** Length = ℓ => 1500 = **1500** **RebarCAD India Length** = **1500**
B				**Length as per IS 2502** Length = ℓ + H => 1000 + 130 = **1130** **RebarCAD India Length** = **1130**
C				**Length as per IS 2502** Length = ℓ + 2H => 1000 + 2 (130) = **1260** **RebarCAD India Length** = **1260**
D				**Length as per IS 2502** Length = ℓ + B => 1000 + 75 = **1075** **RebarCAD India Length** = **1075**
E				**Length as per IS 2502** Length = ℓ + 2B => 1000 + 2 (75) = **1150** **RebarCAD India Length** = **1150**

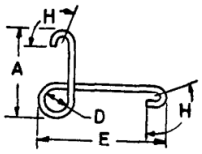
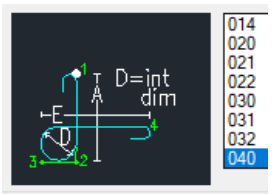
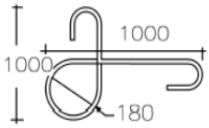
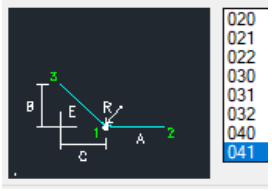
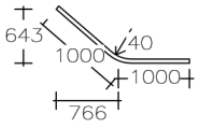
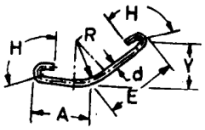
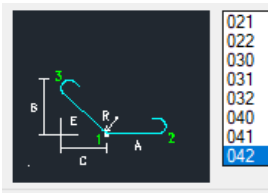
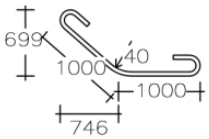
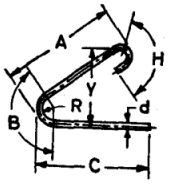
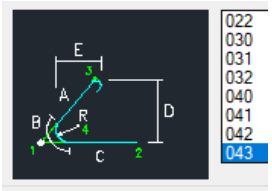
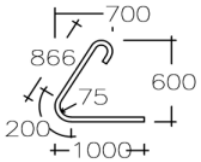
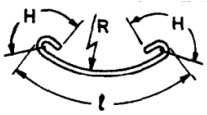
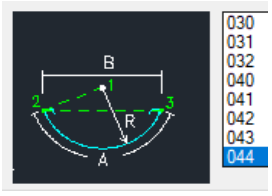
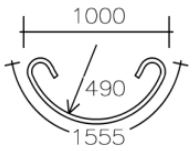
5.2 Table IV shape codes

IS 2502		RebarCAD India		
Ref No	Shape	Shape Code	Length Comparison	
A				**Length as per IS 2502** Length = A + C + E => 500 + 1000 + 500 = **2000** RebarCAD India Length = **2000**
B				**Length as per IS 2502** Length = A + C + E + 2H Or Length = $l + 2H + C - \sqrt{C^2 - D^2}$ => 500 + 1000 + 500 + 2 (130) = **2260** RebarCAD India Length = **2260**
C				**Length as per IS 2502** Length = $A+C_1 + C_2 + E + F + 2H$ Or Length = $l + C_1 + C_2 + 2H - \sqrt{{C_1}^2 - {D_1}^2} - \sqrt{{C_2}^2 - {D_2}^2}$ => 300 + 600 + 600 + 300 + 300 + 2 (130) = **2360** RebarCAD India Length = **2360**

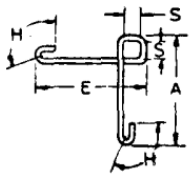
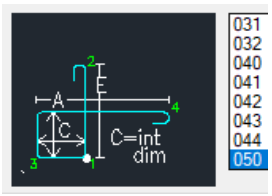
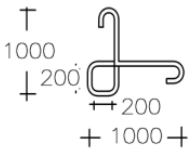
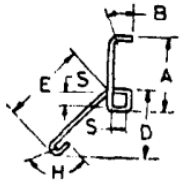
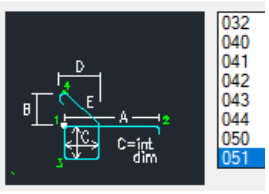
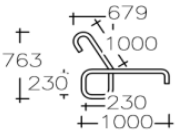
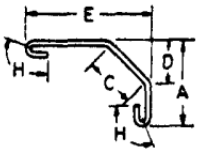
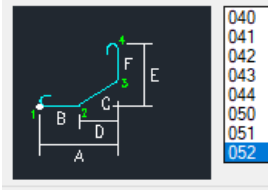
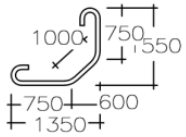
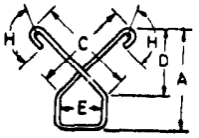
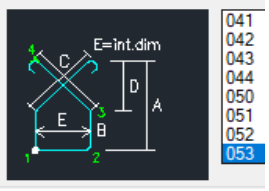
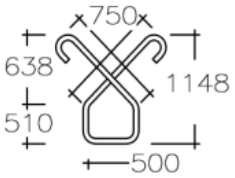
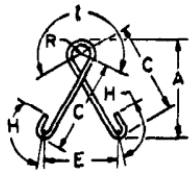
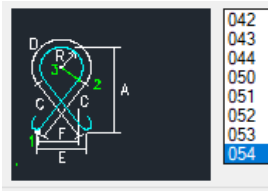
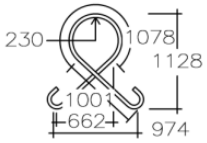
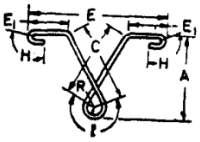
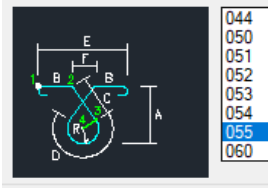
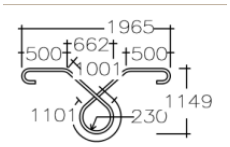
5.3 Table V shape codes

IS 2502		RebarCAD India		
Ref No	Shape	Shape Code	Length Comparison	
A				**Length as per IS 2502** Length = $A + E - \frac{1}{2}R - d$ => 1000 + 1000 - 0.5 (40) - 10 = **1970** **RebarCAD India Length** = **1970**
B				**Length as per IS 2502** Length = $A + E - \frac{1}{2}R - d + 2B$ => 1000 + 1000 - 0.5 (40) - 10 + 2 (75) = **2120** **RebarCAD India Length** = **2120**
C				**Length as per IS 2502** Length = $A + E - \frac{1}{2}R - d + 2H$ => 1000 + 1000 - 0.5 (40) - 10 + 2 (130) = **2230** **RebarCAD India Length** = **2230**

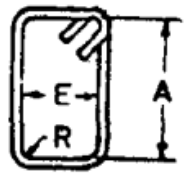
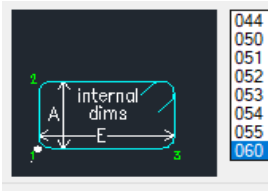
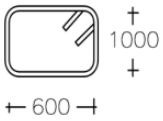
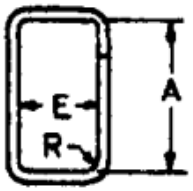
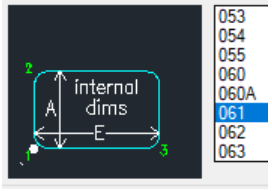
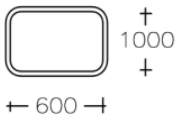
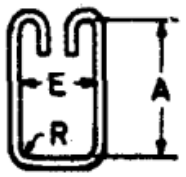
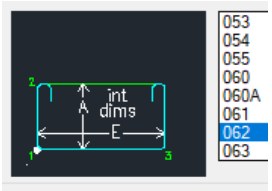
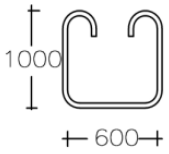
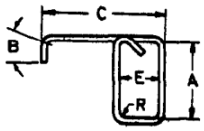
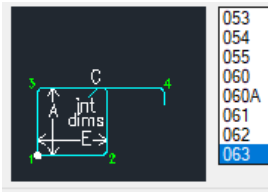
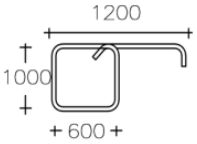
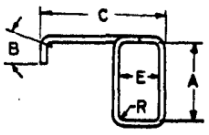
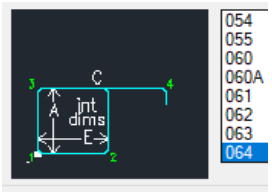
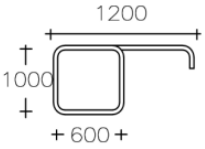
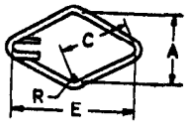
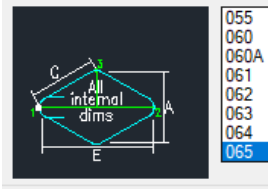
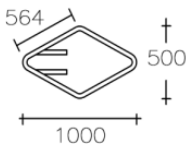
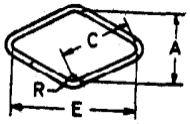
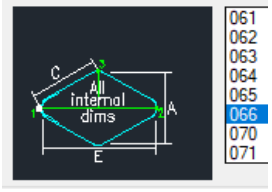
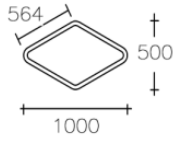
5.4 Table VI shape codes

IS 2502		RebarCAD India		
Ref No	Shape	Shape Code	Length Comparison	
A				**Length as per IS 2502** Length = $A + E + 1\frac{1}{3}D + 2H$ => 1000 + 1000 + 1.33 (180) + 2 (130) = **2500** **RebarCAD India Length** = **2500**
B				**Length as per IS 2502** Length = $A + E$ => 1000 + 1000 = **2000** **RebarCAD India Length** = **2000**
C				**Length as per IS 2502** Length = $A + E + 2H$ => 1000 + 1000 + 2 (130) = **2260** **RebarCAD India Length** = **2260**
D				**Length as per IS 2502** Length = $A + B + C + H - 2(R + d)$ => 866 + 200 + 100 + 130 - 2 (75 + 10) = **2026** **RebarCAD India Length** = **2026**
E				**Length as per IS 2502** Length = $l + 2H$ => 1555 + 2 (130) = **1815** **RebarCAD India Length** = **1815**

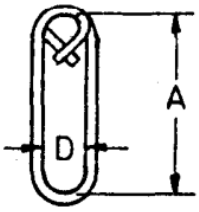
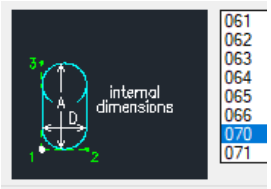
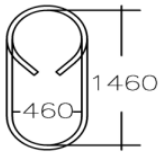
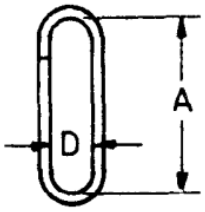
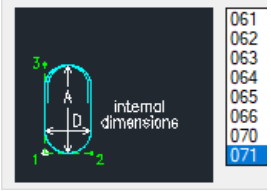
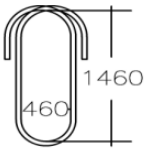
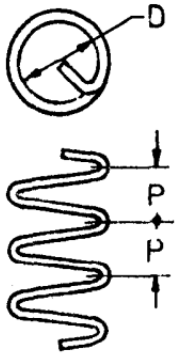
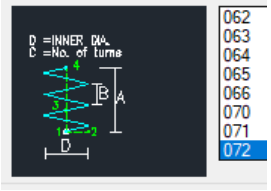
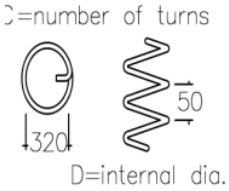
5.5 Table VII shape codes

IS 2502		RebarCAD India		
Ref No	Shape	Shape Code	Length Comparison	
A				**Length as per IS 2502** Length = $A + E + 2S + 2H + d$ => 1000 + 1000 + 2 (200) + 2 (130) + 10 = **2670** **RebarCAD India Length** = **2670**
B				**Length as per IS 2502** Length = $A + E + 3S + 2d + B + H$ => 1000 + 1000 + 3 (230) + 2 (10) + 75 + 130 = **2915** **RebarCAD India Length** = **2915**
C				**Length as per IS 2502** Length = $A + E + C + 2H - \sqrt{C^2 - D^2} - D$ => 1350 + 1550 + 1000 + 2 (130) + $\sqrt{1000^2 - 600^2}$ - 600 = **2760** **RebarCAD India Length** = **2760**
D				**Length as per IS 2502** Length = $E + 2\,(A - D + C + H)$ => 500 + 2 (1148 - 638 + 750 + 130) = **3280** **RebarCAD India Length** = **3280**
E				**Length as per IS 2502** Length = $l + 2C + 2H$ => 1078 + 2 (1101) + 2 (130) = **3340** **RebarCAD India Length** = **3340**
F				**Length as per IS 2502** Length = $2C + 2E_1 + l + 2H$ => 2 (1001) + 2 (500) + 1101 + 2 (130) = **4363** **RebarCAD India Length** = **4363**

5.6 Table VIII shape codes

IS 2502		RebarCAD India		
Ref No	Shape	Shape Code	Length Comparison	
A				**Length as per IS 2502** Length = $2\ (A + E) + 24d$ => 2 (1000 + 600) + 24 (10) = **3440** **RebarCAD India Length** = **3440**
B				**Length as per IS 2502** Length = $2\ (A + E) + 20d$ => 2 (1000 + 600) + 20 (10) = **3400** **RebarCAD India Length** = **3400**
C				**Length as per IS 2502** Length = $2A + E + 28d$ => 2 (1000) + 600 + 28 (10) = **2880** **RebarCAD India Length** = **2880**
D				**Length as per IS 2502** Length = $2A + E + C + 12d + B$ => 2 (1000) + 600 + 1200 + 12 (10) +75 = **3995** **RebarCAD India Length** = **3995**
E				**Length as per IS 2502** Length = $2A + E + C + 9d + B$ => 2 (1000) + 600 + 1200 + 9 (10) +75 = **3965** **RebarCAD India Length** = **3965**
F				**Length as per IS 2502** Length = $4C + 24d$ => 4 (564) + 24 (10) = **2496** **RebarCAD India Length** = **2496**
G				**Length as per IS 2502** Length = $4C + 20d$ => 4 (564) + 20 (10) = **2456** **RebarCAD India Length** = **2456**

5.7 Table IX shape codes

IS 2502		RebarCAD India		
Ref No	Shape	Shape Code	Length Comparison	
A				Length = $2A + 3D + 22d$ => 2 (1460) + 3 (460) + 22 (10) = **4520** **RebarCAD India Length** = **4520**
B				**Length as per IS 2502** Length = $2A + 3D + 22d$ => 2 (1460) + 3 (460) + 22 (10) = **4520** **RebarCAD India Length** = **4520**
C				**Length as per IS 2502** Length = $N\pi(D + d) + 8d$ => 9.6 (π) (320 + 10) + 8 (10) = **10033** **RebarCAD India Length** = **10033**