

# DESIGN PRINCIPLES AND CALCULATIONS (MINI-JOIST SERIES)

## THE MINI-JOIST SERIES

The standard Hambro  $\zeta$  section, being  $3\text{-}\frac{3}{4}$  inches deep, possesses sufficient flexural strength to become the major steel component of the mini-joist series. The three sizes that are currently being used are illustrated in the figure below and spans beyond 8 feet can be achieved with the heavier SRTC unit. Other sizes are also available.

The composite capacities of the TC, RTC & SRTC units are calculated on the basis of "elastic tee beam analysis". The effective flange width,  $b$ , equals the lesser of span/4, or joist spacing. With the mini-joist spaced at 4 foot -  $1\frac{1}{4}$  inches and  $16t = 40$  inches,  $b$  is dictated by span/4. The calculations are simplified somewhat by using only two values for "b", 12" up to 7 foot - 6 inches spans and 24 inches for 8 foot spans. The load table lists total load capacity in plf.

Full scale tests have demonstrated consistently that shoe plates are not required - the Zee section is simply notched at each bearing end with the lower horizontal portion of the "Zee" becoming the actual bearing surface. **Note that where the non-composite end reaction exceeds 1,000 lbs. the notched ends are reinforced with a 1½ inch diameter bar 8 inches long.**

This is to prevent the Zee section from "straightening out" at the bearing ends. It is interesting to note that this is not a problem during the composite service stage, even with its higher total loads, as the 2-½ inch slab carries the vertical shears.

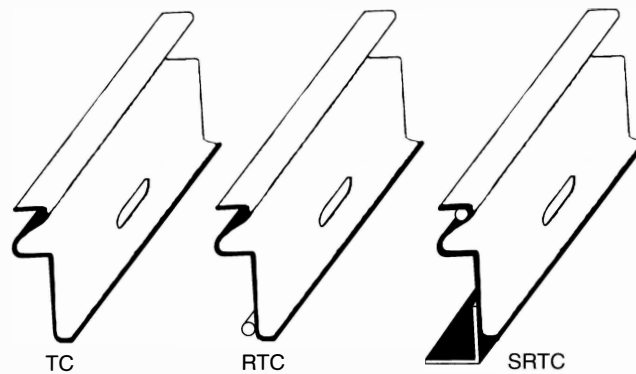





Fig. 10

TABLE 5: Mini-joist H Series Chart Capacity (Maximum Total Unfactored Load in plf)

TYPE	CONDITIONS	PROPERTIES		CLEAR SPAN								
		I	S	3' - 0"	3' - 6"	4' - 0"	4' - 6"	5' - 0"	6' - 0"	7' - 0"	7' - 6"	8' - 0"
		in. <sup>4</sup>	in. <sup>3</sup>									
TC 	COMPOSITE	2.29	0.60	1198	895	694	550	443				
	NON-COMP.	0.66	0.29	575	427	332	263	213				
RTC 	COMPOSITE	5.09	1.31	2627	1949	1519	1215	985	689	514	447	394
	NON-COMP.	1.63	0.75	1502	1125	870	694	566	398	291	254	222
SRTC 	COMPOSITE	b = 12" 9.84	2.36									
	NON-COMP.	b = 24" 11.60	2.55						1231	919	804	763
			1.60						845	624	546	497