



  
**JENNMAR**  
CIVIL

STEEL RIBS



## INTRODUCTION

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Steel ribs are efficient and safe ground control elements in underground construction. Selection of section type and dimension is accomplished following structural and project requirements. Besides custom-bent steel ribs, straight beams, forepoling sheets, and steel lagging can also be fabricated.

JENNMAR Civil manufactures cold-formed beams for underground support applying sound techniques for shaping steel required in the tunneling industry.

Techniques learned about shaping steel for strength, performance, and value in the world's tunnels and shafts can be applied to the benefit of each project.

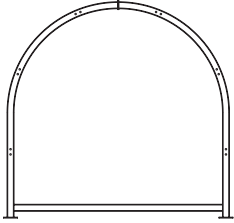
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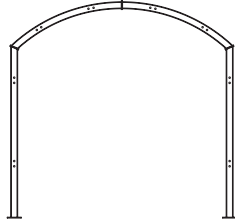
# STEEL RIB SUPPORT TYPES

## MAIN ADVANTAGES

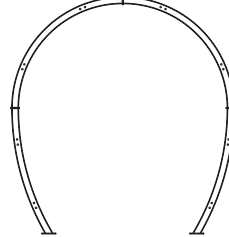
- Customized cold formed beam constructions
- Various rib support types available on request
- Flexible adaptation of the beam geometry to the respective excavated cross-section
- TH sections and other special support profiles available on request
- Custom formed lagging resistant to machine jack thrusts and impact loads



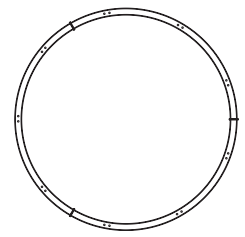
**Type 1:**  
2 pcs. horseshoe  
with optional invert strut



**Type 2:**  
4 pcs. modified  
horseshoe



**Type 3:**  
4 pcs.  
horseshoe



**Type 4:**  
3 pcs.  
circular

## ACCESSORIES USED WITH RIBS

### BUTT JOINT

- Butt plate height: rib depth plus 1"
- Width: flange width plus 1"
- Thickness: 4" and 5" sections – 3/8"
  - 6" sections – 1/2"
  - 8" sections – 5/8"
  - 10" sections – 3/4"
  - 12" sections – 1"
- Bolt size (A325) and quantity:
  - 4" sections: (2) 3/4" dia
  - 5" and 6" sections: (2) 1" dia
  - 8" and 10" sections: (4) 1" dia
  - 12" sections: (6) 1" dia

The above are for normal loading conditions. For extreme conditions, a full-moment strength joint may be required.

## SPECIFICATIONS

### US CUSTOMARY UNITS

- Pipe spacers
  - Schedule 40 pipe stock  $\varnothing$  2" (for  $\varnothing$  3/4" tie rods)
  - Length: rib spacing minus web thickness
- Tie rods
  - ASTM A706  $\varnothing$  3/4" rod stock with 4" NC threaded each end
  - Length: rib spacing plus 6"
  - Beam width 12" and above: structural spreaders are recommended
- Jacking Luggs - 1"
- Invert Slip Plates

Characteristic Value	Unit	4"	5"	6"	8"	10"	12"
Butt joint thickness	[in]	3/8	3/8	1/2	5/8	3/4	1
Bolt quantity <sup>1)</sup>	H	2	2	2	4	4	6
Bolt diameter <sup>1)</sup>	[in]	3/4	1	1	1	1	1
Foot plate dimensions	[in]	1/2" x 7" x 7"	5/8" x 9" x 9"	5/8" x 9" x 9"	3/4" x 12" x 12"	1" x 14" x 14"	1 1/4" x 16" x 16"



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