

**TNZ M/17P: 1989**

## **SPECIFICATION FOR W-SECTION BRIDGE GUARDRAIL**

### **1. SCOPE**

This specification covers the supply of steel and fabrication of all components for W-section bridge guardrail, excluding posts, post bolts and terminal fittings.

### **2. RELATED DOCUMENTS**

BS 18:Parts 2 and 3:1987	Methods for Tensile Testing of Metals
AS 1214:1983	Hot Dip Galvanised Coatings on Threaded Fasteners.
AS 1650:1989	Hot-Dipped Galvanised Coatings on Ferrous Articles
TNZ M/16	Specification for Normal W-Section Highway Guardrail

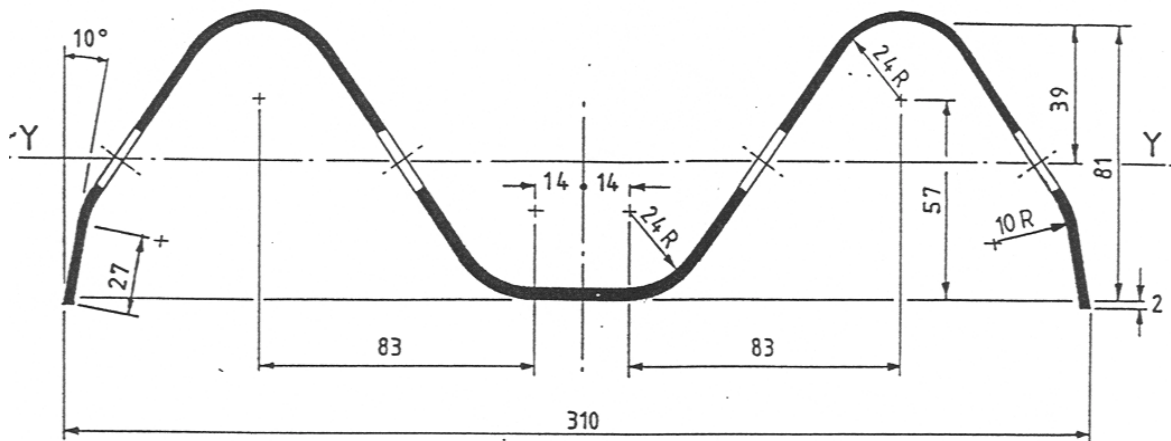
### **3. MATERIALS**

The rail section shall be fabricated from oxygen furnace or electric furnace steel having a carbon equivalent content ( $C + Mn/5$ ) of not greater than 0.5% and a silicon content of not greater than 0.03%. The steel shall, without cracking, withstand a cold bend of 180° around a mandrel of a diameter equal to 2.5 times the plate thickness and shall have the following mechanical properties (determined from tensile tests carried out in accordance with BS 18):

Minimum yield strength	=	400 MPa
Minimum ultimate strength	=	500 MPa
Minimum elongation at failure	=	25%

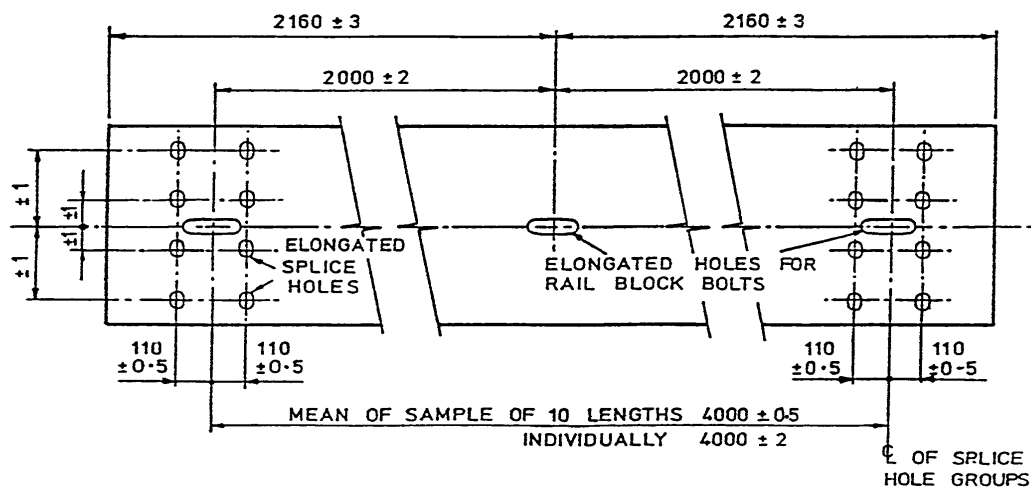
### **4. DIMENSIONS AND FABRICATION**

Rails shall be fabricated from sheet or strip steel and shall conform with the dimensions and properties shown in figures 1 and 2.



Sheet width	-	483 mm ± 3 mm
Overall size of rail	-	310 ± 3 mm x 83 ± 3 mm
Plate thickness	-	3.4 ± 0.3 mm
Nominal cross-sectional area	-	1600 mm <sup>2</sup>
Nominal section modulus, Z <sub>yy</sub>	-2	8 x 103 mm <sup>3</sup>

**Figure 1: Cross Sectional Dimensions and Properties**



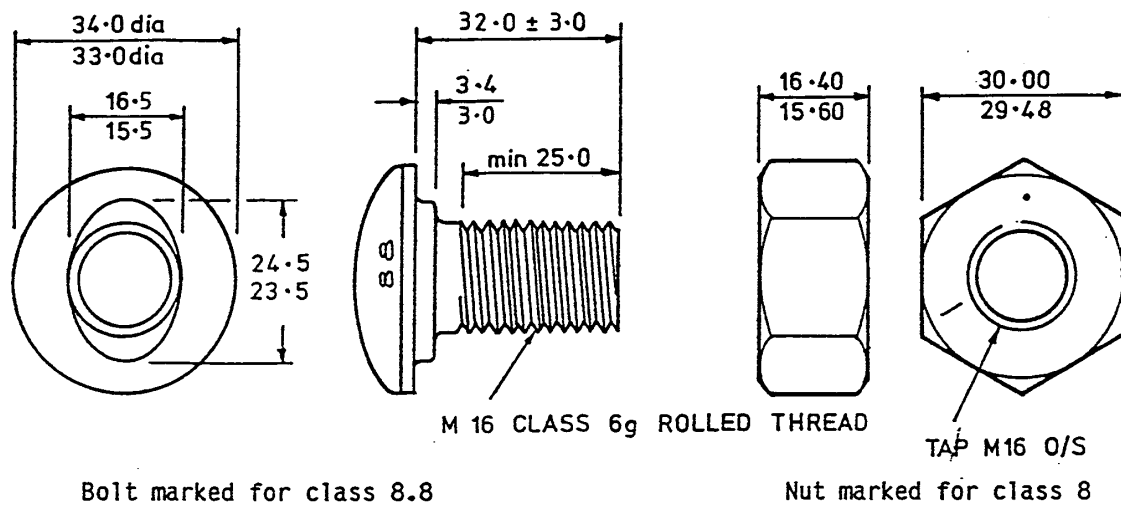
SPLICE HOLES 29mm HIGH x 18mm LONG

RAIL - BLOCK BOLT HOLES 19mm HIGH x 150mm LONG

**Figure 2 : Elevation of Rail**

The rails are designed for splicing together longitudinally to give a length between centres of splices of 4.000 m with a nominal overlap of 320 mm. Specials may be ordered of lesser length than 4.000 m, in which case the same tolerances shall apply. Each splice shall have eight bolts; splice holes shall be slotted, 29 mm x 18 mm overall, arranged in two parallel rows across the rail, 220 mm between centre lines of rows. The longitudinal axes of the holes shall be transverse to the length of the guardrail.

Splice bolts and **nuts**, as detailed in figure 3, shall be M16, of property class 8.8 and 8 respectively and marked accordingly.



**Figure 3: Splice Bolts and Nuts**

Three rail-block bolt holes shall be formed along the axis of the rail, symmetrically at 2.000 m spacing of centres. These shall be slotted holes, 150 mm x 19 mm.

The rails shall be shaped and ready for assembly when delivered. Metal edges shall be rolled or rounded to eliminate sharp corners. Rails may be required to be shop curved to fit any radius from 6 m to 45 m; longer radii do not require shop curving. Rails (except those specially curved) shall be straight within a tolerance at any point of  $\pm 3$  mm measured from a straight line joining the ends.

A backing piece is required for intermediate post connections where there is no splice. This shall consist of a 300 mm length of standard rail having a centrally placed rail-block bolt hole of 19 mm diameter. The backing piece may be either to this specification or to TNZ Specification for Highway Guardrail.

## 5. SURFACE FINISH

All steel components shall be hot-dip galvanised after fabrication in accordance with AS 1650 or AS 1214 as appropriate.

## 6. INSPECTION

Fabrication may be subject to inspection at the factory and the supplier shall inform the Purchasers representative, at least 10 days in advance of the proposed starting date of fabrication. Steel test certificates for the material to be fabricated shall be made available upon request.

**7. TESTING**

The Engineer may take one sample from the fabricating plant, warehouse or after delivery to the site of construction, for determination of compliance with specification requirements. If this sample fails to meet the requirements, two further samples shall be tested. If either of these pieces fails to conform to the requirements of this specification, the lot of material represented by these samples shall be liable to rejection.

All tensile testing shall be carried out in accordance with BS 18.

**8. DESCRIPTION AND MEASUREMENT FOR ORDERING**

*"TNZ W-section Bridge Guardrail"* describes the material in this specification, and the order will state the number of standard lengths of rail, the number and length of specials, the number of splice bolts complete with nuts, and the number of backing pieces.