Project:	OLYMPIA
Project No:	MY01.
Sheet No:	100 Rev:
Date:	MAY 26.
Section of Project:	BALUSTRADE.

Ref	Calculations	Output

DESIGN SYNOPSIS

IT IS PROPOSED TO INSTALL A NEW BALUSTRADE ALONG THE BALCONY EDGE AT FIRST FLOOR IT HAS TO SUPPORT 3.0 kN/m RUN AT TOP RAIL AND 1.5 kN/m² OR 1.5kN POINT LOAD TO THE INFILL. THIS BALUSTRADE WILL NEED TO BE SUPPORTED/BOLTED BACK TO THE CONCRETE FLOOR.

DESIGN

INTRODUCE POSTS @ 850mm CTRS APPROX.

$F = 3.0 \times 1.6 = 4.8$ kN/m.

$m = 4.8 \times 1.25 \times 1.2 = 7.2$ kNm.

TRY 60×60×6.3 SHS. $m_R = 9.23$ kNm

$d = \frac{3 \times 1.25 \times 10^3 \times 1200^3}{3 \times 205 \times 10^3 \times 10^4} \times 61.6 = 17.1$ mm.

PROVIDE 60×60×6.3 SHS @ 125 CTR GSSS

TOP RAIL

$3.0 \times 1.6 \times 1.25^2 / 8 = 0.94$ kNm

$s = M/Z = \frac{0.94 \times 10^6}{275} = 3418.$

$z = 5d^2/6 = \sqrt{\frac{3418 \times 6}{10}} = 45$ mm

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	Project:	OLYMPIA.	
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Ref	Calculations	Output
	$d = \frac{5 \times 3.0 \times 1.25 \times 60^3 \times 1250^3}{384 \times 205 \times 10^3 \times 180000.} = 2.6mm$	
	$I = bd^3/12$	
	PROVIDE 60×10 FLAT.	$10 \times 60^3/12 = 180000$
	BY INSPECTION PROVIDE 60×10 FLAT BOTTOM MEMBER	
	ENDS OF BARS ARE FULLY WELDED TO FLAT SO THIS PROVIDES FIXITY SO $M = WL/8$.	
	$F = 1.5 \times 1.6 = 2.4kN.$	
	$M = WL/8 \Rightarrow 2.4 \times 0.9/8 = 0.27kNm.$	
	$S = M/\sigma \Rightarrow 0.27 \times 10^6/275 = 981$	
	$z = bd^2/6 = \sqrt{981 \times 6/20} = 17.2mm < 20mm$	
	CHECK DEFLECTION	
	$\frac{1.5 \times 10^8 \times 900^3}{192 \times 205 \times 60^3 \times 1333} = 20.8mm < 25mm$	$I = 20 \times 20^3/12 = 1333$
	PROVIDE 20×20 □ BARS	

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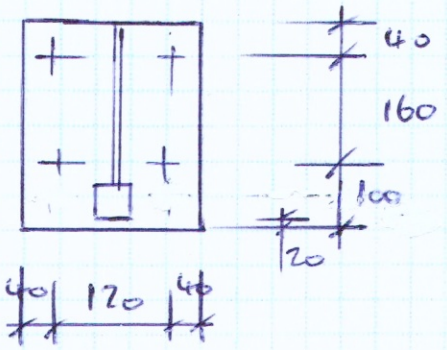
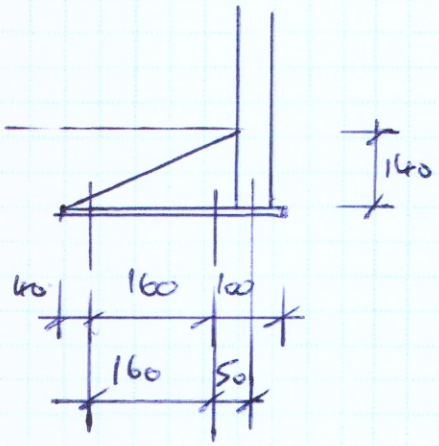
BASEPLATE

↷ 1.5 × 1.6 × 1.25 = 3.0kN

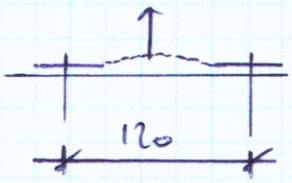




F bolt bolts = 3.0 / 0.16 = 18.75kN / 2 = 9.4kN/bolt.

HORIZONTAL SHEAR = 1.5 × 1.6 × 1.25 = 3.0kN / 2 = 1.5kN/bolt.

18.8kN.



M = 18.8 × 0.12 / 8 = 0.28 kNm

$S = M/\sigma = 0.28 \times 10^6 / 275 =$

$t = 6d^2/(c^2) \sqrt{1025 \times 6 / 80} = 8.76mm$

PROVIDE 10mm BASEPLATE.

300mm × 200mm S 275

+ STIFFENER @ 10mm 4mm F.W.

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