Protect 365® H4a Parapet

3 rail 1.6 m

Approved by UK Highways Agency and National Roads Authority (Ireland).

Designed, verified by computer modelling, and dynamically tested with modern cars (less than five years old) and rigid HGV's to meet the requirements of BS EN 1317.

Improved safety performance together with reduced bridge deck loadings than older steel systems.

Containment level	H4a
Height	1.6 m (1.83 m with optional coping)
Post centres	
• Proven range	2.5 m to 3.75 m
• End bay maximum	3.0 m*
Minimum length of parapet	20.0 m end post centres (8 bays, 9 posts)
Plinth height	50 to 100 mm
Grout bedding (plus any falls)	10 to 30 mm
Plinth width minimum	600 mm

*2.5 m to 3.75 m if connected to Protect 365 H4a Transition

Key features

- Reduced structure loading
- Reduced anchorage requirements
- Increased proven range of post centres
- Increased tolerance for installation

Availability

Supply and installation is by licensed companies having third party verified UK Highways Agency Sector Scheme 5A and 5B approval and a quality management scheme in accordance with ISO 9001 or 9002. For latest informaion, visit: www.steelparapets.com.

Performance

Post centres	2.5 m	3.75m
Impact severity level	B	B
Working Width class	W4 (1.2 m)	W4 (1.2 m)
Wheel penetration	0.4 m	0.4 m
Dynamic deflection	0.5 m	0.6 m

Anchorage load requirements

Bolt tensile load 1.4 x nominal	232.7 kN
Test load 1.1 x nominal	182.8 kN
Ultimate limit state 1.6 x nominal	265.9 kN

Structure loads

Post size	200 x 200 mm
Post ultimate moment capacity	124.4 kNm
Coexisting shear force	135.2 kN
Post ultimate shear capacity	515.3 kN

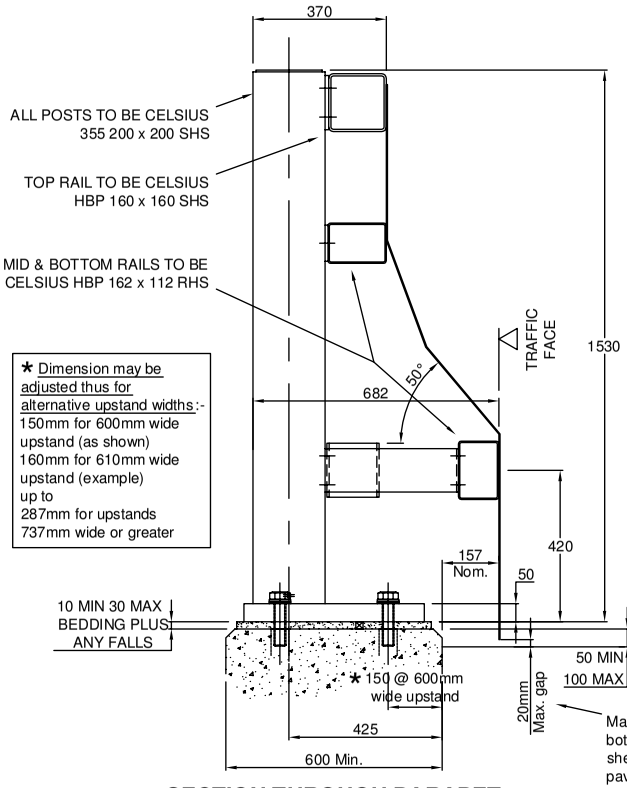
Finishing

Final finish	• Hot dip galvanised to BS EN ISO 1461
Service life	• 30+ years (dependent upon conditions in accordance with specification for highway works series 400) (Nov 2007)
Options	• Paint finish available if required • Coping - required over rail track • Rear anti-climb sheeting at ends

Corus Tubes
PO Box 101
Corby
Northamptonshire NN17 5UA

Technical hotline: +44 (0) 1536 404163
www.corusgroup.com/protect365

CT70-1:PDF:11/2009



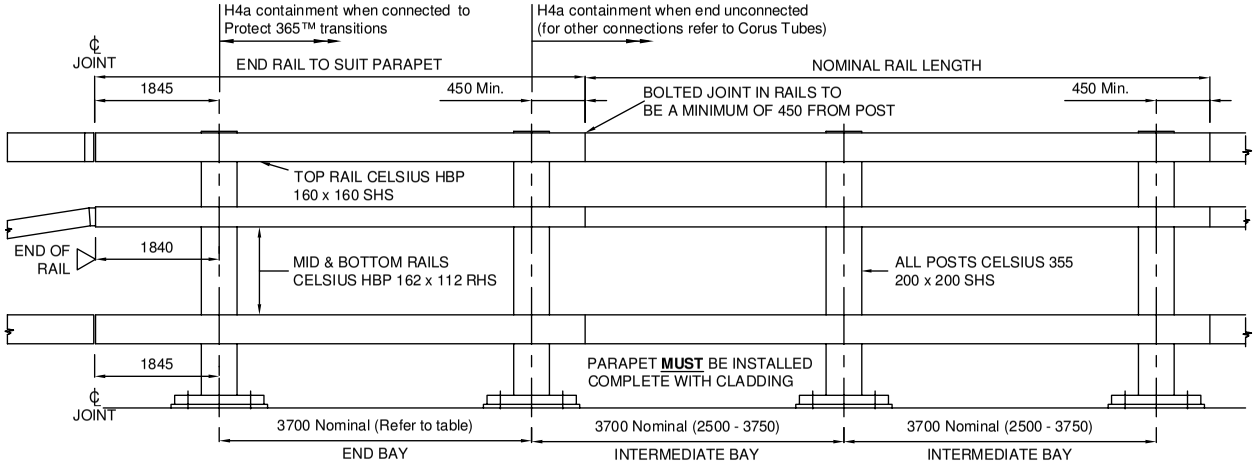
* Dimension may be adjusted thus for alternative upstand widths:-
150mm for 600mm wide upstand (as shown)
160mm for 610mm wide upstand (example)
up to
287mm for upstands
737mm wide or greater

M33 ANCHORAGE BY CORUS TUBES APPROVED SUPPLIER.
ANCHOR BOLTS TO BE M33 HEXAGONAL HEAD STAINLESS STEEL SCREWS TO GRADE A4.80 COMPLETE WITH M33 FORM 'A' GRADE A4 STAINLESS STEEL WASHER, NYLON TOP HAT WASHER & 36 I/DIA. X 72mm O/DIA. X 5mm THICK GALVANISED STEEL WASHER (Form 'C').
NYLON TOP HAT WASHER TO BE FITTED ABOVE THE GALVANISED STEEL WASHER & BELOW THE STAINLESS STEEL WASHER & SCREW HEAD.
ENGAGEMENT OF SCREWS INTO ANCHORAGE SOCKET TO BE IN ACCORDANCE WITH THE MANUFACTURERS STIPULATED REQUIREMENTS.

MECHANICAL PROPERTIES OF ANCHOR BOLTS TO BE AS FOLLOWS:
Tensile strength: 800 N/mm² (Minimum)
Stress at 0.2% permanent strain: 600 N/mm² (Minimum)

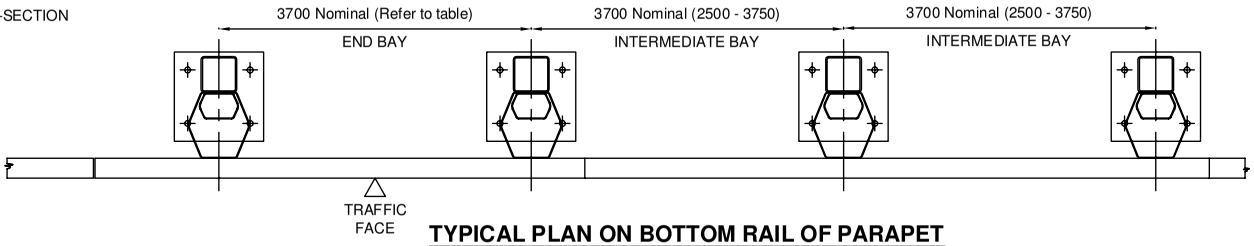
SECTION THROUGH PARAPET

POST ULTIMATE MOMENT CAPACITY TO ALL POSTS: 125 kNm
COEXISTING SHEAR: 135 kN
POST ULTIMATE SHEAR CAPACITY: 515 kN

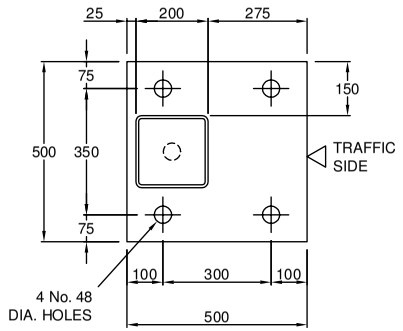


TYPICAL ELEVATION ON TRAFFIC FACE OF PARAPET

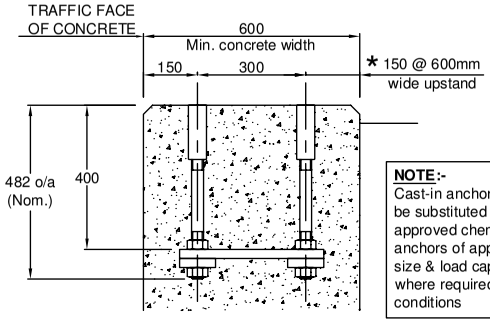
END TRANSITIONS	DRAWING No.	END BAY
P365 H4a	P365/T/109	2500 - 3750
OTHERS	REFER TO CORUS TUBES	



TYPICAL PLAN ON BOTTOM RAIL OF PARAPET

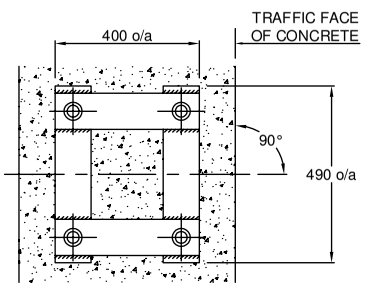


BASEPLATE DETAIL



NOTE:-
Cast-in anchor cradle may be substituted for HAPAS approved chemical anchors of appropriate size & load capacity where required by site conditions

SECTION THROUGH UPSTAND



PLAN VIEW ON UPSTAND

ANCHOR CRADLE DETAIL

Anchor cradle shown: M33 SSR170 as manufactured by Fixing Centre Ltd.
(Alternative HAPAS approved anchor cradle of appropriate size & load capacity may also be used.
Dimensions for alternative anchor to be checked with Fabricator)

GENERAL NOTES

1/. **ALL** RAILS TO BE CELSIUS HBP (SECTION SIZES AS NOTED) AS MANUFACTURED BY CORUS TUBES.
2/. ALL OTHER HOLLOW SECTIONS TO BE CELSIUS 355 STRUCTURAL HOLLOW SECTIONS AS MANUFACTURED BY CORUS TUBES.
3/. OTHER STEEL SECTIONS TO BE TO GRADES AS NOTED.
4/. STAINLESS STEEL HEXAGONAL HEAD SCREWS TO BE GRADE A4 CLASS 80 TO BS EN ISO 3506-1 & BS EN ISO 4017.
PLAIN WASHERS TO BE TO BS EN ISO 7089.
SPRING WASHERS TO BE TO BS 4464.
STEEL WASHERS TO BE GALVANISED TO BS EN ISO 1461.
STAINLESS STEEL WASHERS TO BE GRADE A4.
5/. POSTS SHALL BE VERTICAL TO WITHIN ±15mm OVER 1000mm.
6/.RAILS SHALL BE SET TO GIVE A SMOOTH FLOWING LINE WITH A **MINIMUM HEIGHT OF 1580mm FROM ADJOINING PAVED SURFACE TO TOP OF TOP RAIL** .
7/. POST/RAIL CONNECTION BRACKETS/PLATES SET TO FOLLOW SLOPE OF RAILS.
8/. PARAPET MANUFACTURE & INSTALLATION SHALL ONLY BE CARRIED OUT BY COMPANIES APPROVED & LICENSED BY CORUS TUBES.
9/. ALL CARBON STEEL MATERIALS TO BE HOT DIPPED GALVANISED AFTER MANUFACTURE TO BS EN ISO 1461.

corus
Corus Tubes
PO Box 101
Weldon Road
Corby
Northamptonshire
NN17 5UA
ENGLAND
Tel: +44 (0)1536 402121
Fax: +44 (0)1536 404049

Rev.	Revision note	Date	Sign
04	Note regarding containment added	Oct '09	A.M
03	Parapet details revised to suit MIRA testing June 2008	June '08	J.L.L
02	Dimension between centreline of post & centreline of joint increased from 300 to 450	May '07	J.L.L
01	Material thickness for post removed	Jan '07	J.L.L

GENERAL ARRANGEMENT OF Protect 365™ H4a VEHICLE PARAPET DETAILS (VERY HIGH CONTAINMENT) - P365/P/007

3 rail system - 1.600m Nominal height

Title	STANDARD DETAILS OF H4a VEHICLE PARAPET TO B.S EN 1317-1, 2 & 5 (General details) P365/P/007		
Drawn	J.L.L	Date	Sept' 2006
Checked	T.R.M	Date	Sept' 2006
Approved	T.R.M	Date	Sept' 2006
Drg. No.	P365/P/107	Rev.	04