

# Protect 365<sup>®</sup> N2 Parapet

## 5 rail 1.8 m

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

Designed and verified by computer modelling to meet the requirements of BS EN 1317.

Improved safety performance together with reduced bridge deck loadings than older steel systems or current accredited steel or aluminium systems.

Containment level	N2
Height	1.8 m
Post centres	
• Proven range	2.5 m to 3.75 m
• End bay maximum	3.0 m*
Minimum length of parapet	12.5 m end post centres (5 bays, 6 posts)**
Plinth height	50 to 100 mm
Grout bedding (plus any falls)	10 to 30 mm
Plinth width minimum	450 mm

\*2.5 m to 3.75 m if connected to Protect 365 N2 Transition

\*\*May be reduced to 7.5m end post centres (3 bays, 4 posts) when connected to Protect 365 N2 transition

For all non standard designs contact us at the details below

### Key features

- Reduced structure loading
- Reduced anchorage requirements
- Increased proven range of post centres
- Increased tolerance for installation to accommodate out of position foundations

### 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.

### Performance

Post centres	2.5 m	3.75 m
Impact severity level (estimated)	B	B
Working Width class (estimated)	W2	W3
Wheel penetration (estimated)	0.4 m	0.4 m
Dynamic deflection (estimated)	0.5 m	0.6 m

### Anchorage load requirements

Bolt tensile load 1.5 x nominal	61.5 kN
Test load 1.1 x nominal	45.1 kN
Ultimate limit state 1.8 x nominal	73.7 kN

### Structure loads

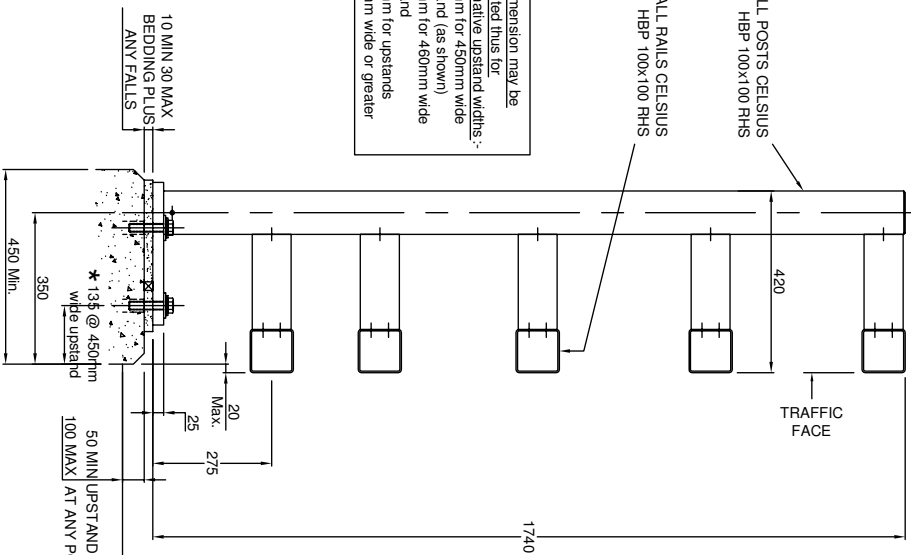
Post size	100 x 100 mm
Post ultimate moment capacity	19.8 kNm
Coexisting shear force	36.8 kN
Post ultimate shear capacity	164.9 kN

### Finishing

Final finish	• Hot dip galvanised to BS EN ISO 1461
Service life	• 30+ years (dependent upon conditions in accordance with specifications for Highways Works Series 400) (Nov 2007)
Options	• Infill: Mesh or solid sheet • Available in various heights from 1.0 m up to 1.8 m • Paint finish available if required

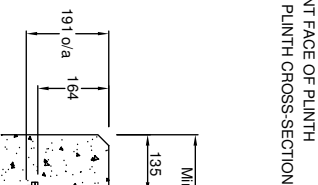
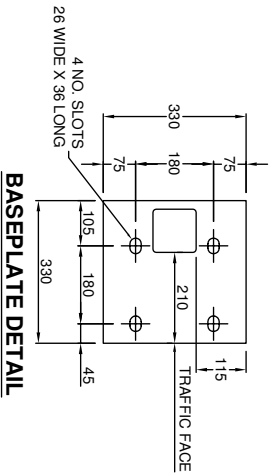
END TRANSITIONS	DRAWING NO.	END BAY
P365 N2	P365/7/108	2500 - 3750
P365 H4a	P365/7/109	2500 - 3750
Vehicle N2	VT100	2500 - 3000
SPLAY / OPEN END	-	2500 - 3000
OTHERS	REFER TO CORUS TUBES	

\* Dimension may be adjusted thus for alternative upstand widths:-  
 135mm for 450mm wide upstand (as shown)  
 145mm for 460mm wide upstand  
 155mm for upstands 470mm wide or greater



M20 ANCHORAGE BY CORUS TUBES APPROVED SUPPLIER.  
 ANCHOR BOLTS TO BE M20 HEXAGONAL HEAD STAINLESS STEEL SCREWS TO GRADE A4.80 COMPLETE WITH M20 FORM 'A' GRADE A4 STAINLESS STEEL WASHER, NYLON TOP HAT WASHER & M2 X 50mm O/DIA X 4mm THICK GALVANISED STEEL WASHER, 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.

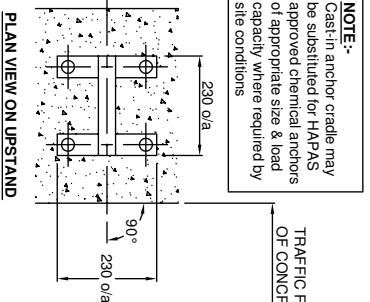
**SECTION THROUGH PARAPET**  
 POST ULTIMATE MOMENT CAPACITY TO ALL POSTS 19.8 kNm  
 COEXISTING SHEAR 36.1 kN  
 POST ULTIMATE SHEAR CAPACITY 164.9 kN



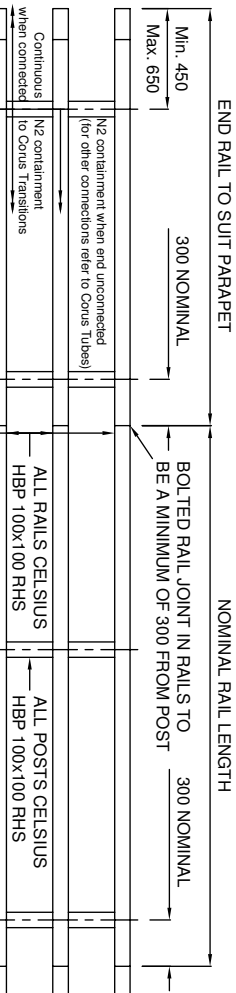
**SECTION THROUGH UPSTAND**

**ANCHOR CRADLE DETAIL**

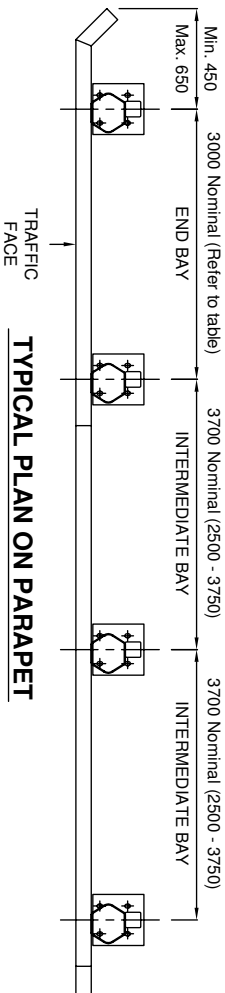
Anchor cradle shown: M20 SSR170 as manufactured by Fixing Centre Ltd.  
 (Alternative HAPAS approved anchor cradle of appropriate size & load capacity may also be used. Dimensions for alternative anchor to be checked with Fabricator)



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



**TYPICAL ELEVATION ON TRAFFIC FACE OF PARAPET**



**TYPICAL PLAN ON PARAPET**

Adjoining paved surface

- GENERAL NOTES**
- RAILS TO BE CELSIUS HBP 100 x 100 RHS AS MANUFACTURED BY CORUS TUBES.
  - ALL OTHER HOLLOW SECTIONS TO BE CELSIUS 555 STRUCTURAL HOLLOW SECTIONS AS MANUFACTURED BY CORUS TUBES.
  - OTHER STEEL SECTIONS TO BE TO GRADES AS NOTED.
  - 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.
  - POSTS SHALL BE VERTICAL TO WITHIN +15mm OVER 1000mm.
  - RAILS SHALL BE SET TO GIVE A SMOOTH FLOWING LINE WITH A MINIMUM HEIGHT OF 1800mm FROM ADJOINING PAVED SURFACE TO TOP OF TOP RAIL.
  - POST/RAIL CONNECTION BRACKETS SET TO FOLLOW SLOPE OF RAILS.
  - ALL CARBON STEEL MATERIALS TO BE HOT DIPPED GALVANISED AFTER MANUFACTURE TO BS EN ISO 1461.
  - ALL PLATES TO BE GRADES NOTED TO BS EN 10 025.
- ADDITIONAL REFERENCE DRAWINGS**
- P365/P/133 MESH AND SHEETING DETAILS

**GENERAL ARRANGEMENT OF**  
**Protect 365™ N2 VEHICLE PARAPET**  
**(110km/h TRAFFIC SPEED) - P365/P/011**  
**5 Rail system - 1.800m Nominal height (Equestrian)**

Rev	Date	By	App'd	Check'd	Date	By	App'd
02	Nov '06	JLL			Sept '2006		
01	Nov '06	JLL			Sept '2006		

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