CrowdTuff® Pedestrian Barrier Fence System

System description	The fencing consists of 2400mm long (standard length) panels with uprights with a sharp crushed spear top profile welded into horizontal rails. The panel is then connected to a post with a shroud or proprietary security bracket that is fixed to both with a series of self-drilling tek screws.
System function	To prevent pedestrians leaving a designated area and coming into contact with adjacent hazards resulting injury to the pedestrians or other members of the public.
Typical applications	Along pedestrian paths where there are hazards adjacent to the path such as moving vehicles, vertical falls and steep batters, trees, and water bodies. Also used in open spaces to restrict and control the movement of pedestrians such as through parks.
Panel height	1200mm (standard).
Post spacing	2480mm post centres or 2415mm gap between posts (standard)*. **This assumes a 65x65mm post.*
Gap under fence	50-100mm on level ground. *Recommended maximum of 150mm on sloped ground.*
Panel configuration	The horizontal rails have a hole punched in one or both sides of the tube to suit the profile of the vertical picket. The picket is then inserted through/ into the rail and welded in place in the top and bottom rail. The pickets extend 120mm above the top rail for 19mm round Rod Top and Loop Top styles. The pickets extend 150mm above the top rail for 25mm square Rod Top styles.
Picket profile	19x1.2mm Circular Hollow Section (CHS) steel; or 25x25x1.2mm Square Hollow Section (SHS) steel.
Picket spacing	19mm round: 106mm centre-to-centre of each vertical picket (child-safe spacing at 1200mm high). 25mm square: 140mm centre-to-centre of each vertical picket. **A picket spacing of 87mm is recommended for applications where is desirable for the fence to be child-safe and/ or a more severe hazard is being protected by the barrier.*
Picket top profile	Flat Top (i.e. the top face of the panel is smooth and continuous as there is not picket extending above the rail); Loop Top (i.e. a round picket in a looped style extends above the rail); or Rod Top (i.e. the picket extends above the rail and has a plastic insert in the top of the picket)
Rails	40x40x1.6mm SHS steel
Panel brackets	1mm gauge pressed zinc plated shrouds (four per panel: one at each corner). The shroud fits over the end of the rail of the panel and mounts on the face of the post in line with the panel. There are two fixing points through the shroud to the post and one through the shroud to the rail of the panel; or *Recommended alternative for heavier duty application*: Bluedog SmartaBracket®: 3mm gauge mild steel material, 1-piece heavy duty, hot dipped galvanised security bracket (four brackets per panel). The bracket fits over the end of the 40x40mm rail of the panel and mounts on the non-attack side (normally the inside) of a 65x65mm fence post. There are two fixing points to the post and one to the rail of the panel. This bracket centres the panel on the post along the fence alignment.

Change of direction brackets	Bluedog SmartaBracket®: 3mm gauge mild steel material, 1-piece heavy duty, hot dipped galvanised security bracket. The bracket fits over the end of the 40x40mm rail of the panel and mounts in-line with the panel on the post. There are two fixing points through the bracket to the post and two through the bracket to the rail of the panel. The bracket neatly accommodates changes of direction in the fence without the need to cut or bend the bracket.
Fasteners	Colour matched 12 gauge self-drilling tek screw (three screws per shroud); or *Recommended alternative for heavier duty application*: 12g x 25mm long tamper proof self drilling Tek screw in a Class 3 (minimum) corrosion finish (three screws per bracket). Requires a special setting tool that fits to a drill to install and remove the screw.
Post for in-ground footings	65x65x1.6mm SHS (1800mm long for 1200mm high system); or *Recommended alternative for heavier duty applications*: 65x65x2.5mm post (1800mm long).
In ground post footings	Fence posts Ø300mm x 550mm deep using 20mpa concrete for 1200mm high fencing*. Gate posts Ø450mm x 650mm deep using 20mpa concrete for 1200mm high fencing* **adequacy subject to the fixing surface, fence height and potential loadings.*
Post with base flanges for hard surfaces	130x130x5mm square steel flange* with 4xØ13 holes (one at each corner) to suit M10 or M12 anchors. The flange has a cut out in the centre to accommodate a 65x65 post. The post inserts into the flange and is then welded in place. The base flanges are hot dip galvanised after fabrication (before welding to the post). **Adequacy subject to the fixing surface, fence height and potential loadings.*
Post cap	Bluedog pre-galvanised steel square cap (powder coated). The pressed steel cap is fitted on site (tap on with rubber mallet) and fits tightly over the top of the post and is not easily removed once installed.
Gate frame	Stiles (i.e. vertical sections at each end of the gate leaf) and rails 40x40x1.6mm (three horizontal rails for increased rigidity). Recommended alternative for heavier duty application: Stiles and Rails 65x65x1.6mm SHS (three horizontal rails).
Gate configuration	The horizontal rails have a hole punched in one or both sides of the tube to suit the profile of the vertical picket. The picket is then inserted through/ into the rail and welded in place in the top and bottom rail.
Gate locking hardware	Bluedog Boltn'Lock® heavy duty Ø20mm slide-bolt unit. This unit fixes to the gate latch stile on site with a combination of 14 gauge tek screws and/or M8 bolts. The slide-bolt is lockable with a standard padlock in both the open and closed positions. A slide bolt receiver (5mm thick mild steel material, hot dip galvanised after fabrication) fixes to the gate post or adjacent double gate latch stile on site with a combination of 14g tek screws and M8 bolts. The unit is zinc plated and then powder coated.
Gate drop-bolt hardware	Ø16mm x 550mm long drop bolt (screw on site with 3 x 14g self-drilling tek screws).
Gate hinging	Heavy duty self-closing hinge* that screws to the hinge stile and gate post on site with 8 x 14g tek screws. The hinge does not hold the gate open at 90 degrees. This hinge allows the gate leaf to swing back on itself but not through the opening; or *Recommended alternative for heavier duty applications*: SureClose hydraulic self-closing hinge that screws to the hinge stile and gate post on site with 8 x 14g tek screws. The hinge does not hold the gate open at 90 degrees and has a final 'snap-close' function to ensure a heavier gate closes properly. This hinge allows the gate

	leaf to swing back on itself but not through the opening.* **A gate stop fitted to the latch stile or gate post is recommended for both hinge types to prevent the hinges being damaged from 'over-swing' through the gate opening.* Goliath (single) ball bearing hinge (top and bottom). Fitted on site to the gate post and gate stile with a combination of 4 x 14g teks and 2 x M8 bolt; or *Recommended alternative for heavier duty applications*: Bluedog Eternity® greasable tapered roller bearing (bottom) and sealed deep groove ball bearing hinging (top) to suit the 65mm gate stile. The top assembly allows the level of the gate leaf to be lifted or lowered. A 10mm gate post bracket is secured to the gate post with 4 x M10x25mm long stainless steel screws (that requires a specialist setting tool to install for tamper resistance). The gate post is drilled and tapped to suit the M10 fasteners. The gate stile bracket inserts into the top and bottom gate stiles and is fixed with a 14g tek.
Gate posts	75x75x3mm (1800mm long to suit 1200mm high fence) for small single gates. 100x100x4mm (1800mm long to suit 1200mm high fence) for openings up to 4800mm.
Tubular pre-galvanised material	Mild steel. Strength grade: C250 minimum. Zinc coating inside and out with 50 grams/ square metre minimum. Recommend 135 grams/ square metre minimum for increased corrosion resistance.
Weld type	All welds are Silicon bronze*. **This weld has superior corrosion resistance and powder coating film adhesion to a standard mild steel weld.*
Metal pretreatment process	The product undergoes a 7 stage chemical pretreatment process to clean, etch and prepare the metal surface for powder application. This process includes first submerging the product in two consecutive heated alkali degreasing baths, then a series of rinse baths and then a nanoceramic conversion coating bath that places a fine crystalline structure on the surface of the steel for the powder to 'key' into and prevent oxidisation on the surface before powder coating. This facilitates improved powder film adhesion.
Powder coat process	The product is powder coated using an automated conveyorised powder coating line. Powder is applied to the metal surface using air pressure and an electrostatic charge. The product then passes through a heated curing oven. This causes the powder to gel and then harden to a tough durable surface. The thickness and curing times are closely monitored as these variables influence the mechanical characteristics of the finished coating.
Powder coat for standard outdoor applications	For standard outdoor application D1000 Excel™ polyester powder is used as standard. All powders used are supplied by Interpon and formulated by Akzo Nobel. Interpon D1000 exhibits a tougher cured film which provides superior damage resistance to packaging materials. It is designed to give excellent long term exterior durability and colour retention and is available in a limited range of colours and in gloss, satin and matt finishes. Film thickness: ~80µm minimum.
Powder coat for applications at risk of graffiti	For applications at risk of graffiti, EasyClean™ can be used as an alternative to the standard polyester coating. EasyClean is a Polyurethane coating that is designed to allow the simple and rapid removal of most forms of graffiti. This ease of graffiti removal reduces overall maintenance costs. Interpon Typical applications include fence installations at train, tram and bus stations, schools and playgrounds. Film thickness: ~80µm minimum.

Powder coat for higher corrosion environments	For applications that will be subject to higher corrosion, a zinc-rich epoxy primer can be applied under the top coat of polyester to give much greater corrosion resistance. The epoxy primer provides a non-porous barrier between the corrosive elements (salt, pollutants etc.) and the metal surface. Alternatively, the product can be hot dip galvanised after fabrication. This involves immersing the product in a bath of molten zinc. This applies a heavy coating of continuous protective zinc over all surfaces (internal and external)
Applicable Australian Standards	AS 1450 – Steel tubes for mechanical purposes - Product Designation AS 1450/C250/ERW. AS 1397 – Steel sheet and strip – Hot-dip zinc-coated or alu/zinc coated - Product Designation AS 1397/G2. AS 1163 – Structural steel hollow sections – Product Designation AS 1163 C350LO. AS/NZS 4680:2006 – Hot dip galvanized (zinc) coatings on fabricated ferrous articles AS 4506.2005 Metal finishing - Thermoset powder coatings. AS 1296.1 – 2007 Swimming Pool Safety – Safety Barriers for swimming pools. AS 1170.1 Structural design actions – Permanent, imposed and other actions – Table 3.3 “Minimum imposed actions for barriers; .Clause 3.6 “Barriers” and withstanding crowd loading Category – Type of Occupancy “C3”.
Testing	Internal: AS 1296.1 – 2007 Swimming Pool Safety – Safety Barriers for swimming pools; Appendix A Test for Strength & Rigidity of Fencing Openings. External: Engineering certification
Bluedog reference material	Drawing set Installation guide Proforma product specification